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jc962 U.S. PTO 04/13/01

jc921 U.S. PTO 09/834785 04/13/01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	EDWARD A. HUBBARD
Filed:	APRIL 13, 2001
For:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
Serial No.:	UNKNOWN
Group Art Unit:	UNKNOWN
Examiner:	UNKNOWN
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EXPRESS MAIL CERTIFICATION

NUMBER: EL703719665US

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Dear Sir:

Transmitted herewith for filing are:

☒ New Patent Application consisting of 70 pages and 31 sheets of Figs.

☐ Continued Prosecution Application (37 CFR §1.53(d)) -- The parent application is USSN _____ filed on _____. The prior Examiner was _____ in Group Art Unit _____.

☐ Response to Missing Parts

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☐ Inventors' Declaration for Patent Application

- ☐ Information Disclosure Statement
- ☐ Petition for a _____ month extension of time
- ☐ Response to Office Action
- ☐ Preliminary Amendment
- ☒ Formal Drawings
- ☐ Informal Drawings
- ☐ Notice of Appeal
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- ☒ Check in the amount of $427
- ☒ The Commissioner is authorized to deduct any requisite fees under 37 CFR 1.16 to 1.21 from, or deposit any credits to, Deposit Account No. 10-1205/UNTD:021.
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FEE CALCULATION:

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	Total Claims (37 CFR 1.16(e))	28- 20 =	8	x $ 18.00	$ 144.00
	Independent Claims (37 CFR 1.16(b))	2- 3 =	0	x $ 80.00	$ 0
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))			x $ 260.00	$ 0
				Basic Fee (37 CFR 1.16(a))	$ 710.00
			Total of above Calculations =		$ 854.00
	Reduction by 50% for filing by Small Entity (Note: 37 CFR 1.9, 1.27, 1.28)				$ 427.00
	Surcharge for submission of Response to Missing Parts if applicable ($130)				$ 0
	ASSIGNMENT FEE (IF FILED WITH APPLICATION)				$
				TOTAL =	$ *427.00*

The Examiner is invited to contact the undersigned at 512-347-1611 with any questions or comments, or to otherwise facilitate expeditious prosecution of the application.

Respectfully submitted,

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Patent Application for

SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

Inventors: Edward A. Hubbard

This application is a continuation-in-part application of the following co-pending applications: Application SN 09/538,543 entitled "DISTRIBUTED PARALLEL PROCESSING SYSTEM HAVING CAPABILITY-BASED INCENTIVES AND ASSOCIATED METHOD," Application SN 09/539,023 entitled "SWEEPSTAKES INCENTIVE MODEL AND ASSOCIATED SYSTEM," Application SN 09/539,448 entitled "CAPABILITY-BASED DISTRIBUTED PARALLEL PROCESING SYSTEM AND ASSOCIATED METHOD," Application SN 09/539,428 entitled "METHOD OF MANAGING DISTRIBUTED WORKLOADS AND ASSOCIATED SYSTEM," Application SN 09/539,106 entitled "NETWORK SITE TESTING METHOD AND ASSOCIATED SYSTEM," Application SN 09/538,542 entitled "NETWORK SITE CONTENT INDEXING METHOD AND ASSOCIATED SYSTEM," and Application SN 09/539,107 entitled "DISTRIBUTED BACK-UP SYSTEM AND ASSOCIATED METHOD," each of which was filed on March 30, 2000, and each of which is hereby incorporated by reference in its entirety.

This application is also a continuation-in-part application of the following co-pending applications: Application SN 09/603,740 entitled "METHOD OF MANAGING WORKLOADS AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," Application SN 09/602,789 entitled "MACHINE GENERATED SWEEPSTAKES ENTRY MODEL AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," Application SN 09/602,803 entitled "DATA SHARING AND FILE DISTRIBUTION METHOD AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," Application SN 09/602,844 entitled "DATA CONVERSION SERVICES AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," and Application SN 09/602,983 entitled "CUSTOMER SERVICES AND ADVERTISING BASED UPON DEVICE ATTRIBUTES AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," each of which was filed on June 23, 2000, and each of which is hereby incorporated by reference in its entirety.

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This application is also a continuation-in-part application of the following co-pending application: Application SN 09/648,832 entitled "SECURITY ARCHITECTURE FOR DISTRIBUTED PROCESSING SYSTEMS AND ASSOCIATED METHOD," which was filed on August 25, 2000, and which is hereby incorporated by reference in its entirety.

This application is also a continuation-in-part application of the following co-pending application: Application SN 09/794,969 entitled "SYSTEM AND METHOD FOR MONITIZING NETWORK CONNECTED USER BASES UTILIZING DISTRIBUTED PROCESSING SYSTEMS," which was filed on February 27, 2001, and which is hereby incorporated by reference in its entirety.

Technical Field of the Invention

This invention relates to distributed processing and more particularly to techniques and related methods for managing, facilitating and implementing distributed processing in a network environment.

Background

The NAS (Network Attached Storage) market is currently one of the fastest growing segments of the overall storage market. NAS devices typically take the form of stand-alone devices or systems that contain their own storage, processing, connectivity and management resources. Through these internal capabilities, the NAS device becomes a storage resource that connects to any network enabling many devices on the network to share data via the NAS device.

A NAS device is a term that is often used to refer to a specialized file server that connects to the network to provide storage capacity to network-connected users. NAS devices typically contain a slimmed-down (micro-kernel) operating system and file system. NAS devices often process only input/output (I/O) requests by supporting popular file sharing protocols such as NFS (UNIX) and SMB (DOS/Windows). NAS devices also typically use traditional LAN protocols such as Ethernet and TCP/IP to communicate over the network. Some general-purpose computers using full-blown operating systems such as Windows or UNIX are often labeled as NAS products because they can provide storage that is attached to a network. However, a pure NAS device is one built from scratch as a dedicated file I/O device. As used herein, the term "NAS device" broadly refers to a device that makes data storage resources available to network-connected user devices. A "dedicated NAS device" is a device whose primary operational purpose is for providing NAS services.

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A related term is the storage area network (SAN). "SAN" is a term that is often used to refer to a back-end network connecting storage devices to servers via peripheral channels such as SCSI, SSA, ESCON and Fibre Channel. By using a SAN, the data storage traffic is off-loaded from the primary user network, which includes the user machines and the server machines. The servers then utilize the SAN to move and store data in storage devices connected to the storage network. SAN environments are becoming increasingly popular for enterprise storage solutions.

With respect to lower cost devices that are currently marketed as dedicated NAS devices, many have common personal computer (PC) specifications such as the following: Pentium III processor, 40GB HD and a 10/100 Ethernet connection, along with other components. Considering the specifications of an average corporate desktop computer, the capabilities of these desktop computers often exceed the capabilities computers being sold as dedicated NAS devices, and these desktop computers often sit idle for significant amounts of time each day.

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Summary of the Invention

The present invention provides software-based network attached storage (NAS) services that are hosted on a massively distributed computing system. More particularly, a client agent program is configured to run on the network-connected client devices that are part of the distributed computing system to provide what appears to user devices as dedicated NAS functionality, for example, through the Internet. This NAS functionality takes advantage of unused or under-utilized resources of these distributed devices to advantageously provide NAS capabilities. In addition, storage priority controls may be utilized to facilitate the full us of available storage resources, such as user specified constraints, standard bit, block or file priority levels and direct bit, block or file priority markings.

In one embodiment, the present invention is a method of operating a distributed processing system to provide network attached storage (NAS) services, including configuring a client agent program to have a software-based NAS component and to take advantage of unused or under-utilized resources of a plurality of network-connected distributed devices put into operation for purposes distinct from operating the client agent program to provide NAS services, and utilizing the plurality of distributed devices running the client agent to provide NAS services to network-connected user devices with the network-connected user devices recognizing at least a portion of the plurality of distributed devices as dedicated NAS devices. In a more detailed respect, at least a portion of the plurality of network-

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connected distributed devices may operate only as stand-alone dedicated NAS devices without knowledge of other NAS devices connected to the network. Still further, at least one of the network-connected distributed devices may store location information for data stored by the plurality of network-connected distributed devices. Still further the provided NAS services may be managed utilizing at least one centralized server system. And the server system may download the NAS component to the plurality of network-connected distributed devices with the NAS component being configured to operate as part of the client agent program already installed on the distributed devices. In yet another respect, the method of the present invention may include managing storage resources for the plurality of distributed devices using a storage priority control that facilitates full use of available storage resources. In addition, the storage priority control may include, for example, a parameter selectable through the client device, storage priority level schemes that prioritize data storage and deletion, and priority markings directly given to data or files.

In another embodiment, the present invention is a distributed processing system that provides network attached storage (NAS) services, including a client agent program and a plurality of network-connected distributed devices running the client agent program. The client agent program may be configured to have a software-based NAS component and to take advantage of unused or under-utilized resources of a network-connected distributed device put into operation for purposes distinct from operating the client agent program to provide NAS services. The plurality of network-connected distributed devices may operate to provide NAS services to network-connected user devices with the network-connected user devices recognizing at least a portion of the plurality of distributed devices as dedicated NAS devices. In more detailed respects, at least a portion of the plurality of network-connected distributed devices operate only as stand-alone dedicated NAS devices without knowledge of other NAS devices connected to the network. In addition, at least one of the network-connected distributed devices stores location information for data stored by the plurality of network-connected distributed devices. Still further, at least one centralized server system may be included to manage at least in part the NAS services provided by the plurality of network-connected distributed devices. And the NAS component may be configured to be downloaded from the server system to the plurality of network-connected distributed devices with the NAS component being configured to operate as part of the client agent program already installed on the distributed devices. In yet another embodiment, a storage priority control may be used to manage storage resources for the plurality of distributed devices with the storage priority control configured to facilitates full use of available storage resources.

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Description of the Drawings

It is noted that the appended drawings illustrate only exemplary embodiments of the invention and are, therefore, not to be considered limiting of its scope, for the invention may admit to other equally effective embodiments.

FIG. 1A is a block diagram for a distributed processing system having client capability and incentive features, according to the present invention.

FIG. 1B is a block diagram for information flow among customer systems, server systems and client systems, according to the present invention.

FIG. 2A is a block diagram for a client system, according to the present invention.

FIG. 2B is a block diagram for processing elements within a client system, according to the present invention.

FIG. 2C is a block diagram for a client system agent installed on a client system, according to the present invention.

FIG. 2D is an example user interface for a client system agent, including incentive advertising, according to the present invention.

FIG. 3A is a block diagram for server systems, according to the present invention, including a control system, a sweepstakes system and a workload database.

FIG. 3B is a block diagram for server systems, customer systems, client systems and outsourced host systems, according to the present invention.

FIG. 3C is a block diagram for a server system processor, according to the present invention.

FIG. 3D is an alternative block diagram for a server system processor, according to the present invention.

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FIG. 4 is a functional block diagram for an example sweepstakes incentive operation according to the present invention.

FIG. 5A is a block diagram for a distributed processing system for a network site indexing application, according to the present invention.

FIG. 5B is a functional block diagram for an indexing operation according to the present invention.

FIG. 6A is a block diagram for a server system according to the present invention, including a control system, a workload database, and a database of client capabilities balancing vectors.

FIG. 6B is a functional block diagram for client capabilities balancing of workloads according to the present invention.

FIG. 7A is a block diagram for a distributed processing system, according to the present invention, including example network sites on which site testing is to be conducted, such as load testing and/or quality-of-service (QoS) testing.

FIG. 7B is a functional block diagram for site-testing, according to the present invention.

FIG. 8 is a block diagram of a distributed processing system for a data backup application, according to the present invention.

FIG. 9 is a block diagram of an alternative representation of an interconnection fabric for a distributed processing system environment, according to the present invention.

FIG. 10 is a block diagram of a more detailed block diagram for a client system agent installed on a client system, according to the present invention.

FIG. 11A is a more detailed flow diagram for machine generated sweepstakes entries according to the present invention.

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FIG. 11B is an alternative detailed flow diagram for machine generated sweepstakes entries according to the present invention.

FIG. 12A is a block diagram of a distributed processing system that allows customers to select client system attributes, according to the present invention.

FIG. 12B is a block flow diagram for client system attribute selection, according to the present invention.

FIG. 13A is a block diagram of a distributed processing system that provides data conversion services, according to the present invention.

FIG. 13B is a block flow diagram for data conversion services within a distributed processing system, according to the present invention.

FIG. 14A is a block diagram of a distributed processing system that provides data transmission caching, according to the present invention.

FIG. 14B is a block diagram of a distributed processing system that provides data sharing and file distribution, according to the present invention.

FIG. 15 is a block diagram of an alternative representation for a distributed processing system, according to the present invention.

FIG. 16 is a block diagram of a representation for a distributed processing system including security subsystems, according to the present invention.

FIG. 17A is a block diagram of a client system and server systems communication interface, according to the present invention.

FIG. 17B is a block diagram of communication layers for client system and server systems communication, according to the present invention.

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FIG. 18A is a detailed block diagram for an embodiment of security activities for server systems, according to the present invention.

FIG. 18B is a detailed block diagram for an embodiment of security activities for client systems, according to the present invention.

FIG. 19 is a block diagram for a distributed processing system and environment in which network service providers are enabled to monitize their user bases.

FIG. 20 is a block diagram representing the components for a client agent along with a representative indication of responsibility for those components.

FIG. 21 is a block diagram for a network attached storage (NAS) embodiment for a distributed processing system according to the present invention.

Detailed Description of the Invention

The present invention contemplates the identification of the capabilities of distributed devices connected together through a wide variety of communication systems and networks and the aggregation of these capabilities to accomplish processing, storage, broadcasting or any other desired project objective. For example, distributed devices connected to each other through the Internet, an intranet network, a wireless network, home networks, or any other network may provide any of a number of useful capabilities to third parties once their respective capabilities are identified, organized, and managed for a desired task. These distributed devices may be connected personal computer systems (PCs), internet appliances, notebook computers, servers, storage devices, network attached storage (NAS) devices, wireless devices, hand-held devices, or any other computing device that has useful capabilities and is connected to a network in any manner. The present invention further contemplates providing an incentive, which may be based in part upon capabilities of the distributed devices, to encourage users and owners of the distributed devices to allow the capabilities of the distributed devices to be utilized in the distributed parallel processing system of the present invention.

The number of usable distributed devices contemplated by the present invention is preferably very large. Unlike a small local network environment, for example, as may be used by an Internet

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Service Provider (ISP), which may include less than 100 interconnected computers systems to perform the tasks required by the ISP, the present invention preferably utilizes a multitude of widely distributed devices to provide a massively distributed processing system. With respect to the present invention, a multitude of distributed devices refers to greater than 1,000 different distributed devices. With respect to the present invention, widely distributed devices refers to a group of interconnected devices of which at least two are physically located at least 100 miles apart. With respect to the present invention, a massively distributed processing system is one that utilizes a multitude of widely distributed devices. The Internet is an example of a interconnected system that includes a multitude of widely distributed devices. An intranet system at a large corporation is an example of an interconnected system that includes a multitude of distributed devices, and if multiple corporate sites are involved, may include a multitude of widely distributed devices. A distributed processing system according to the present invention that utilizes such a multitude of widely distributed devices, as are available on the Internet or in a large corporate intranet, is a massively distributed processing system according to the present invention.

FIG. 1A is a block diagram for a distributed parallel processing system 100 according to the present invention. The network 102 is shown having a cloud outline to indicate the unlimited and widely varying nature of the network and of attached client types. For example, the network 102 may be the Internet, an internal company intranet, a local area network (LAN), a wide area network (WAN), a wireless network, a home network or any other system that connects together multiple systems and devices. In addition, network 102 may include any of these types of connectivity systems by themselves or in combination, for example, computer systems on a company intranet connected to computer systems on the Internet.

FIG. 1A also shows client systems 108, 110 ... 112 connected to the network 102 through communication links 118, 120 ... 122, respectively. In addition, server systems 104, other systems 106, and customer systems 152 are connected to the network 102 through communication links 114, 116 and 119, respectively. The client system capabilities block 124 is a subset of the server systems 104 and represents a determination of the capabilities of the client systems 108, 110 ... 112. The incentives block 126 is also a subset of the server systems 104 and represents an incentive provided to the users or owners of the clients systems 108, 110 ... 112 for allowing capabilities of the clients systems 108, 110 ... 112 to be utilized by the distributed processing system 100. The client systems 108, 110 and 112 represent any number of systems and/or devices that may be identified, organized and utilized by the server systems

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104 to accomplish a desired task, for example, personal computer systems (PCs), internet appliances, notebook computers, servers, storage devices, network attached storage (NAS) devices, wireless devices, hand-held devices, or any other computing device that has useful capabilities and is connected to a network in any manner. The server systems 104 represent any number of processing systems that provide the function of identifying, organizing and utilizing the client systems to achieve the desired tasks.

The incentives provided by the incentives block 126 may be any desired incentive. For example, the incentive may be a sweepstakes in which entries are given to client systems 108, 110 ... 112 that are signed up to be utilized by the distributed processing system 100. Other example incentives are reward systems, such as airline frequent-flyer miles, purchase credits and vouchers, payments of money, monetary prizes, property prizes, free trips, time-share rentals, cruises, connectivity services, free or reduced cost Internet access, domain name hosting, mail accounts, participation in significant research projects, achievement of personal goals, or any other desired incentive or reward.

As indicated above, any number of other systems may also be connected to the network 102. The element 106, therefore, represents any number of a variety of other systems that may be connected to the network 102. The other systems 106 may include ISPs, web servers, university computer systems, and any other distributed device connected to the network 102, for example, personal computer systems (PCs), internet appliances, notebook computers, servers, storage devices, network attached storage (NAS) devices, wireless devices, hand-held devices, or any other connected computing device that has useful capabilities and is connected to a network in any manner. The customer systems 152 represents customers that have projects for the distributed processing system, as further described with respect to FIG. 1B. The customer systems 152 connect to the network 102 through the communication link 119.

It is noted that the communication links 114, 116, 118, 119, 120 and 122 may allow for communication to occur, if desired, between any of the systems connected to the network 102. For example, client systems 108, 110 ... 112 may communicate directly with each other in peer-to-peer type communications. It is further noted that the communication links 114, 116, 118, 119, 120 and 122 may be any desired technique for connecting into any portion of the network 102, such as, Ethernet connections, wireless connections, ISDN connections, DSL connections, modem dial-up connections, cable modem connections, fiber optic connections, direct T1 or T3 connections, routers, portal computers, as well as any other network or communication connection. It is also noted that there are any

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number of possible configurations for the connections for network 102, according to the present invention. The client system 108 may be, for example, an individual personal computer located in someone's home and may be connected to the Internet through an Internet Service Provider (ISP). Client system 108 may also be a personal computer located on an employee's desk at a company that is connected to an intranet through a network router and then connected to the Internet through a second router or portal computer. Client system 108 may further be personal computers connected to a company's intranet, and the server systems 104 may also be connected to that same intranet. In short, a wide variety of network environments are contemplated by the present invention on which a large number of potential client systems are connected.

FIG. 1B is a block diagram for information flow 150 among customer systems 152, server systems 104 and client system 134, according to the present invention. The server systems 104, as discussed above, may include any number of different subsystems or components, as desired, including client system capabilities block 124 and incentives block 126. The server systems 104 send project and benchmark workloads 130 to client systems 134. A benchmark workload refers to a standard workload that may be used to determine the relative capabilities of the client systems 134. A project workload refers to a workload for a given project that is desired to be completed. The project workload may be, for example, a workload for projects such as network site content indexing, network site testing including network site load testing and network site quality of service testing, data back-up, drug design, drug interaction research, chemical reaction studies, bioinformatics including genetic and biological analyses, human genome analyses, pair-wise comparisons including fingerprint and DNA analyses, data mining, internet hosting services, intranet hosting services, auction services, market clearing services, payment systems, bioinformatic simulations, knowledge management services, trading services, data matching services, graphics rendering, or any other desired project.

Client systems 134, as discussed above, may be any number of different systems that are connected to the server systems 104 through a network 102, such as client systems 108, 110 ... 112 in FIG. 1A. The client systems 134 send results 132 back to the server systems 104 after the client systems 134 complete processing any given workload. Depending upon the workload project, the server systems 104 may then provide results 156 to customer systems 152. The customer systems 152 may be, for example, an entity that desires a given project to be undertaken, and if so, provides the project details and data 158 to the server systems 104.

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FIG. 2A is a block diagram for an example client system 108 according to the present invention. In this simplified block diagram, an original workload 204 is received through line 208 from an interface 206. The original workload 204 represents a portion of the processing, storage or other activity required to complete the desired task for which the server system 104 is trying to accomplish. This original workload 204 is sent by the server system 104 through the network 102 and received by the client system 108 through communication link 118. The client system 108 processes the original workload 204. Following line 212, results 202 are then stored for transferring along line 210 to interface 206. Interface 206 may then communicate the results back to the server system 104 through communication line 118, or to other client systems (for example, with peering of client systems) and then through the network 102.

It is noted that the workload received by client system 108 and the processing or activity performed may depend up a variety of factors, as discussed further below. In part, this workload allocated by the server system 104 to each client system 108, 110 and 112 may depend upon the capabilities of the client system, such as the processing power, disk storage capacity, communications types, and other capabilities available from the various components of the systems within the client system 108.

The server systems 104 can select the workloads for the client system 108 and may control when these workloads are performed, through operational code (i.e., an agent) residing and installed on the client system 108. Alternatively, the owner or user of the client system 108 may determine when workloads are procured or obtained from the server systems 104, as well as when these workloads are performed, for example, by accessing the server systems 104 through the network 102. For example, the server systems 104 may download to the client system 108 upon request one or more workloads. At the same time, an agent residing on the client system 108 may operate to process the workload or multiple workloads downloaded to the client system 108. It is noted, therefore, that the agent may be simultaneously managing more than one workload for any number of projects. When the workload is complete, the agent may inform the owner or user of the client system 108 the results are ready to be communicated back. The client system 108 may then upload results to the server system 104 and download new workloads, if desired. Alternatively, these logistical and operational interactions may take place automatically through control of the agent and/or the server systems 104.

FIG. 2B is a block diagram for processing elements within a client system 108 according to the present invention. In this diagram, client system 108 is contemplated as a personal computer. In a

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personal computer, an internal bus 260 would typically have a variety of different devices connected to it. For example, a CPU 250 could be connected through the bus 260 to a video processor 252, a floating point processor 254 (often integrated within the CPU itself), and digital signal processors 256 (DSPs), such as those found on sound cards and modems. In addition, any of a variety of other processing devices 258 may be included. Furthermore, other types of devices may be connected, such as hard drives 264, which provide disk storage capabilities, and a digital camera 262.

It is noted, therefore, that the capabilities for client systems 108, 110 ... 112 may span the entire range of possible computing, processing, storage and other subsystems or devices that are connected to a system connected to the network 102. For example, these subsystems or devices may include: central processing units (CPUs), digital signal processors (DSPs), graphics processing engines (GPEs), hard drives (HDs), memory (MEM), audio subsystems (ASs), communications subsystems (CSs), removable media types (RMs), and other accessories with potentially useful unused capabilities (OAs). In short, for any given computer system connected to a network 102, there exists a variety of capabilities that may be utilized by that system to accomplish its direct tasks. At any given time, however, only a fraction of these capabilities are typically used on the client systems 108, 110 ... 112. The present invention can take advantage of these unused capabilities.

It is also noted that along with receiving the workload, the client system 108 will also receive an agent that manages the completion of the workload. This agent may be software that is customized for the particular computer system and processing capabilities of the client system 108. For example, if the client system is a personal computer as shown in FIG. 2B, the agent may be a program that operates in the background of the computer's operating system. When the agent determines that there is unused processing or other capabilities, the agent may take advantage of it. For example, if the user is using a word processing application to create a document, little processing power is being utilized by the word processing program, leaving the computer's CPU and video processor underutilized. Thus, the agent could execute commands to these processors during dead cycles. In this way, the agent may facilitate the completion of workload processing in a reduced time. In addition, this agent may be self-updating upon connecting to the server systems 104, so that the agent may be kept up to date with current software revisions and workload activities. It is also noted that the agent may manage work on multiple workloads at the same time, so that any given distributed device connected to the network 102 may be working on a plurality of workloads at any given time.

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FIG. 2C is a block diagram for an example client system agent 270. The agent 270 may include a security subsystem 272 that controls the interface of the client system 108 with the agent 270. The security subsystem 272 may help keep the workloads secure and may help to keep the client systems 108 from suffering any security problems in completing the workload. For example, the agent 272 may operate to keep viruses from attacking the client system 108 while the client system 108 is processing the workload through the operation of the agent. The security subsystem 272, therefore, may provide the interface for the workloads 130 and the results 132.

The clients system agent 270 may also include a workload engine 274, a statistics / user interface / incentive advertising block 276, and a workload package and update processing block 278. In the example shown in FIG. 2C, workloads 130 pass through the security subsystem 272 and along line 280 to the workload package and update processing block 278. In this block 278, the agent 270 may be updated by the server systems 104. Alternatively, the agent 270 may determine, when connected to the server systems 104, whether it needs to be updated and then accomplish that updating automatically. Once the workload package is processed, the workload engine 274 may receive the workload following line 288. The workload engine 274 works on the workload, ultimately completing the workload. The results or status of the workload may then be sent through the security subsystem 272 following line 282. The results 132 may then be provided back to the server systems 104.

The statistics / user interface / incentive advertising block 276 may provide workload, incentive and other statistics, as well as any other desired interface features, to the user of the client system. For example, the block 276 may show a user the expected amount of processing time it will take for the client system to complete a workload task based upon the capabilities of the system. As also shown, the block 276 may receive information following lines 286 and 284 from the workload package and update processing block 278 and from the workload engine 274. If desired, security information from the security subsystem 272 could also be displayed to the user of the client system. It is noted that the information displayed to the user of the client system may be modified and selected as desired without departing from the present invention.

With respect to incentive advertising, the block 276 may also show the user of the client system how this processing time might change depending upon various possible upgrades to the capabilities of the client system, such as a faster microprocessor, more memory, more disk storage space, etc. Furthermore, the client system capabilities may be shown correlated to the incentives provided to the

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client system for participation. Thus, the user may be provided information as to how the user's incentives would increase or change depending upon other computer systems or upgraded capabilities the user could acquire. This incentive value increase may also be tied to upgrades to particular vendor's devices. For example, if the user's device is a computer system having an ABC microprocessor, the block 276 may provide the user information as to increased incentive values based upon an upgrade to a more powerful ABC microprocessor. Similarly, if the user's device is a computer system obtained from ABC, the block 276 may provide the user information as to increased incentive values based upon an upgrade to a more powerful ABC computer system.

FIG. 2D is an example user interface 276 for a client system agent, including incentive advertising, according to the present invention. In the example shown, interface 276 is a window 230 that may be displayed on a distributed device, for example, a computer system. This window 230 displays the desired information for the agent client manager. As indicated above, this agent client manager is initially downloaded from the server systems 104 and thereafter may be updated at various times when the client system is communicating with the server systems. The interface 276, as shown, includes interface tabs 221, 222, 224, 226, 228, 244, 246 and 248. These interface tabs may be selected through the user of a pointing device or keyboard attached, for example, to a computer system graphically displaying the window 230. It is noted that the interface tabs 221, 222, 224, 226, 228, 244, 246 and 248 are only examples, and the number, arrangement and content of tabs may be modified as desired. In addition, the example user interface 276 depicted in FIG. 2D is only an example and may be modified as desired.

In FIG. 2D, the processor values interface tab 224 is the one currently selected by the user. This tab 224 (Processor Values) includes example information that may be displayed to the user. Assuming that a workload is being processed by the agent client manager, the user may select the button 242 (Show My Incentive Values) to show the user's current incentive values associated with the workload being performed. The personal incentive values chart 232 (My Personal Incentive Values) may then be displayed to the user. As shown, the incentive values are provided in a relative scale from 1 to 10. The key designation 240 represents the incentives associated with the users current central processing unit (CPU) or microprocessor.

As indicated above, this incentive information may also be tied to the specific vendor of the user's CPU, for example, ABC Company's CPU. Thus, as shown, the key designation 240 (My current

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processor) and the corresponding bar graph portion 236 represent incentives for the user's current CPU (e.g., a 166 MHz processor). The key designation 238 represents the incentives that the user is projected to have if the user were to upgrade the CPU. Again, this upgrade incentive information may be tied to the specific vendor of the user's CPU or to any other vendor, if desired. Thus, as shown, the key designation 238 (NEW ABC 1GHz processor!) and the corresponding bar graph portion 234 represent incentives for an upgrade to a new ABC CPU (e.g., a new ABC 1 GHz processor). In this manner, a user may be provided an incentive to increase the capabilities of the distributed device, and a vendor may be provided advertising so that the user is also directed to a particular upgrade.

Looking further to FIG. 2D, other similar incentive related information tabs may be provided for any desired capability of the distributed device. For example, tab 246 (Memory Values) represents information that may be provided for the memory capabilities of the distributed device. Tab 222 (Graphics Values) represents information that may be provided for the graphics capabilities of the distributed device. Tab 226 (Communications Values) represents information that may be provided for the communication capabilities of the distributed device. Tab 228 (Storage Values) represents information that may be provided for the storage capabilities of the distributed device. Tab 248 (System Values) represents information that may be provided for the system capabilities as a whole for the distributed device.

In addition to these incentive related information tabs, other tabs may be included to provide information and control for any desired features of the agent client manager. For example, the tab 244 (Current: Prime Search) represents information that may be displayed to the user about the current workload being performed by the agent client manager, for example, a search for large prime numbers. The tab 221 (Settings) represents information that may be displayed to the user about various settings for the client agent manager. In particular, the tab 221 may provide the user the ability to control any desired aspect of the operation of the agent client manager. For example, the user may be able to select a portion of the capabilities that may be utilized (e.g., a maximum of 20% of the system memory), the types of workloads that may be performed (e.g., only scientific research projects), the times when the agent may utilize system resources (e.g., only between 12 to 6 am, or only when the system is idle), or any other desired operational feature. It is noted that in addition to upgrade incentive information indicated above, the user may also be provided information as to how incentives would increase if the user allocated or changed the settings for the agent client manager.

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This user selection of operational features allows for workloads to be scheduled or balanced based upon user input and desires. These user vectors, as indicated above, would allow users to dedicate their device capabilities to specific research projects (cancer, Parkinson's disease, Internet, genetics, space science, etc.), to specific non-profit or for profit organizations (Greenpeace, Celera, etc.), educational institutions (University of Texas), a specific group of like minded users, or any other entity or endeavor. This affiliation selection allows the distributed processing system to automatically include a user's device capabilities in a pool dedicated to the chosen affiliation. Additionally, a user could choose to mix various percentages and allocations of device capabilities among multiple affiliations. It is noted that the user need not make any affiliation selection and need not allocate 100 percent of device capabilities. Rather, only a portion of the device capabilities may be allocated to a particular affiliation, leaving the remainder non-allocated and not affiliated. The capability allocation may also be a system-wide (i.e., course) allocation, such as some desired percent of overall device capabilities. The capabilities allocation may also be subsystem specific (i.e., fine) allocation, such as allocation of particular subsystem capabilities to particular affiliations.

Now looking to FIG. 3A, the server systems 104 may be one or more computer systems that operate to identify client system capabilities, organize workloads, and utilize client systems to accomplish a desired task. The server systems 104 includes a control system 304 a workload database 308, and a sweepstakes system 306, as discussed more below. The workload database 308 stores any desired project task, which may be broken up into discrete workload tasks WL1, WL2 ... WLN, as represented by elements 336, 338 ... 340. The workload database may also store one or more benchmark workloads (BWL) 335 that may be utilized to determine client system capabilities in response to a standard workload. Through line 312, the workload database 308 communicates with control system 304. Control system 304, for example, receives original workload 322 and transfers it to the interface 320 through line 326. The interface 320 then transfers the workload 322 to the network 102 through line 114. This workload 322 is ultimately received as workload 204 by client system 108, 110 or 112, as shown in FIG. 2A. The result 324 is ultimately received by the control system 304 through interface 320 and line 328.

In allocating workloads, the control system 304 may consider the capabilities of the client systems 108, 110 and 112 to which the control system 304 is sending workloads. For example, if client 108 has more processing power than client 110, the control system 304 may allocate and send more difficult or larger workloads. Thus, client 108 may receive WL1 336 and WL2 338, while client 110

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would only receive WL3. Alternatively, the workload database 308 could be organized with differing levels of processing power or capability requirements for each workload. In this way, WL1 336 may represent a greater processing or system capability requirement than WL2 338. It should be noted that workload may be a processing task, a data storage task, or tied to any other of a variety of capabilities that may be utilized on the client systems 108, 110 ... 112.

As indicated above, to encourage owners or users of client systems to allow their system capabilities to be utilized by control system 304, an incentive system may be utilized. This incentive system may be designed as desired. Incentives may be provided to the user or owner of the clients systems when the client system is signed-up to participate in the distributed processing system, when the client system completes a workload for the distributed processing system, or any other time during the process. In addition, incentives may be based upon the capabilities of the client systems, based upon a benchmark workload that provides a standardized assessment of the capabilities of the client systems, or based upon any other desired criteria.

One example use of a benchmark workload is to use the benchmark workload to determine incentive values. For example, the server systems 104 may be designed to send out a standard benchmark workload once an hour to each client system 108, 110 ... 112. If a client system is not available at that time for any reason, the workload would not be completed by the client system, and there would be no incentive value generated for that client system. In this example, the benchmark workload may be a timed work-set that would exercise each subsystem with capabilities within the client system that was desired to be measured. A more capable client system would then generate greater incentive values from executing the benchmark workload, as compared to a less capable client system. These incentive values may be utilized as desired to determine what the client system should get in return for its efforts. For example, if the incentive were a sweepstakes as discussed further below, the number of entries in the sweepstakes may be tied to the system's performance of the benchmark workload. Thus, the faster or better the client system performs the benchmark workload, the more entries the client system would receive.

In the embodiment shown in FIG. 3A, the server systems 104 includes a sweepstakes system 306 that functions with control system 304 to provide incentives for the users or owners of client systems 108, 110 and 112 to allow their system capabilities to be used by the server systems 104. The control system 304 may determine a sweepstakes entry value 302 that is sent along line 310 to the sweepstakes

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system 306. The sweepstakes system 306 may then receive sweepstakes entry 332 and provide it to the sweepstakes engine 330 through line 334. The sweepstakes engine 330 may process the entries and determine a winner, when desired. In the embodiment shown, therefore, entries to the sweepstakes may be generated each time a unit of work is accomplished by one or more of the subsystems within a client system 108, 110 or 112 via an agent installed on the device for the purposes of managing and completing units of work. The total entries for any period of time would, therefore, be dynamic depending on how many are received. Odds of winning would then be determined by the total number of entries received and the total number of entries contributable to any given entrant.

FIG. 3B is another example block diagram of a distributed processing system 300 including server systems 104, customer systems 152, client systems 134 and out-sourced host systems 340, according to the present invention. The server systems 104 may include an analytic subsystem 346, a results/workload production subsystem 344, a project pre-processing subsystem 342, a client agent subsystem 343, and an incentive advertising subsystem 345. The incentive advertising subsystem 345 may operate to provide advertising information, for example, the upgrade incentive information as discussed with respect to FIG. 2D. The client agent subsystem 343 may operate to download an agent to the client systems 134 and to update this agent at times when the server systems 104 are communicating with the client systems 134.

The customer systems 152, which represent customers that have projects that they desired to be processed by the distributed processing system, may be connected to the project pre-processing subsystem 342 to provide projects to the server systems 104. These projects are processed by the project pre-processing subsystem 342 and passed to the results/workloads production subsystem 344, which produces and sends out workloads 130 and receives back results 132. The analytic subsystem 346 then takes the results and processes them as desired. Completed project information may then be provided from the analytic system 346 to the customer systems 152. In this manner, the projects of the customer systems 152 may be processed and project results reported by the distributed processing system of the present invention.

Also, as shown, the workloads 130 and the results 132, or other tasks of the server systems 104, may be processed and handled by out-sourced host systems 340, if desired. Thus, some or all of the workloads 130 may be sent first to out-sourced host systems 340. Out-sourced host systems 340 then send workloads 130A to the client systems 134 and receive back results 132A. The out-sourced host

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systems 340 then send the results 132 back to the server systems 104. It is noted that this out-sourcing of server system tasks may be implemented as desired for any given task that the server systems 104 may have. It is further noted that, if desired, the server systems 104 may perform all of the desired functions of the server systems 104 so that no out-sourced host systems 340 would be used.

FIG. 3C is a block diagram for one embodiment of a server system processor 350, according to the present invention. An agent abstraction layer 360 may send workloads 130 and receive results 132. The security subsystem 354 may interact with the agent abstraction layer 360 and provide information to a data parser 352 and an application programming interface (APIs) block 356. The APIs block 356, the data parser 352 and a workload manager 358 may interact to accomplish the desired tasks for the server system processor 350. It is noted that for this embodiment, the API protocol could be controlled and provided to other host systems.

FIG. 3D is an alternative block diagram for a server system processor 350, according to the present invention. In this embodiment, the APIs block 356 and the agent abstraction layer 360 are not present. The data parser 352, the workload manager 358 and the security subsystem 354 interact to provide the desired server system tasks. It is noted that for this embodiment, the security subsystem is controlled and utilized for communicating with client systems.

FIG. 4 is a functional block diagram for a sweepstakes operation 400 by the system server 104 according to the present invention. In block 402, the server systems 104 may sign-up client systems in "accept clients" block 402. Following line 418, the server systems 104 identifies the capabilities of the client's computer and processing systems in the "determine client system capabilities" block 404. Control passes along line 420 to the "distribute workloads to client systems" block 406, where the server systems 104 allocates workloads to each client system 108, 110 and 112. This workload may also be an benchmark workload, as indicated above, that acts as an entry workload to determine the entries or entry values for the client system. As also indicated above, in distributing the workloads in block 406, the server system 104 may take into consideration the capabilities of the client systems to which workloads are being distributed. The client systems 108, 110 and 112 then operate to complete the workloads allocated to them. Along line 423, the server system 104 receives back workload results in "receive workload results" block 408.

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At this point, control passes along line 424 to the "determine sweepstakes entries" block 410. In this block 410, the server system 104 determines the entry value for the workload completed or for a standard benchmark or entry workload completed. This entry value may be weighted upon a variety of factors including factors such as the amount of work completed, the difficulty level of the processing required, and the accuracy of the results. It is noted that any desired weighting may be utilized. Thus, it is understood that a wide variety of considerations may be utilized to determine the entry value weighting for the sweepstakes.

Although the weighting determination is shown in block 410 in FIG. 4, the entry value may also be determined, in whole or in part, when a client system signs on to the distributed processing distributed system of the present invention. For example, if a client system has state-of-the-art CPU, video processor, DSP engine, memory, and large amounts of free disk storage space, a high entry value may be allocated to this client system up-front. In contrast, a client system that has a slow CPU, a weak video processor, no DSP engine, little memory, and little free disk storage space may be allocated a small entry value. In this way, the owners or users of the client systems may be provided immediate feedback as to the potential sweepstakes entry value of their computer systems, devices and system capabilities.

It is further noted that the entry value may take any desired form and may be, for example, a multiplier that will be used for each unit of workload completed. In this way, the owner or user will readily be cognizant that a state-of-the-art system will yield a high multiplier, where as an older system, system capability or device will yield a low multiplier. Such feedback, whether communicated to the owner or user immediately upon signing up or upon completion of each workload, will create an incentive for owners and/or users to acquire state-of-the-art systems, thereby further increasing the potential processing power of the distributed processing system of the present invention.

In addition, different workload projects may be designated with different entry values, as well. For example, some workload projects may require particular hardware or software processing systems within a client system or device. Thus, the number of client systems that are capable of performing the task would be limited. To further encourage participation by those owners or users with capable systems, the entry value for taking on particular workloads and/or systems with the desired features may be allocated higher entry values.

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Referring back to FIG. 4, control passes along line 426 to the "process entries" block 412. In this block 412, the sweepstakes entries are processed and stored as desired. Following line 428, "end of entry period" decision block 414 represents a determination of whether the time for getting entries into the sweepstakes has ended. If not, the control continues to line 430 and back to blocks 402, 404 and/or 406, depending upon what is desired. Once the entry period has ended, control flows along line 432 to "determine winners" block 416. The server system 104 then identifies from among the entries, who the winning client system or systems will be.

The entry period may be any desired time frame and may include multiple overlapping time frames, as desired. For example, winners may be determined daily for entries each day, monthly for entries within a month, and/or yearly for entries within one year. In addition, special entry periods may be generated, if desired, for example where a particularly important workload project had a short time frame in which it needed to be completed.

FIGS. 1, 2A-C, 3A-D, and 4 are directed to example embodiments for a distributed processing system according to the present invention, including a sweepstakes reward or incentive feature, as shown in the embodiments of FIG. 3A and FIG. 4.

FIGS. 6A and 6B further describe a capabilities scheduling feature, in which the server systems 104 may identify and consider any of a variety of client system capability vectors in determining how to organize, allocate and manage workloads and projects. FIGS. 5A and 5B describe a distributed processing system and workload project that accomplishes network site indexing. FIGS. 7A and 7B describe a distributed processing system and a workload project that accomplishes network site testing, such as quality of service (QoS) testing and load testing. And FIG. 8 describes a distributed processing system, preferably with respect to a corporate intranet, that accomplishes distributed data back-up.

FIG. 9 is an alternative representation for the interconnection fabric for a distributed processing system environment and describes idle client system identification and shared component client systems. FIG. 10 describes a client system agent installed on a client system. FIGS. 11A and 11B further describe machine generated sweepstakes entries. FIGS. 12A and 12B describe client capability selection features. FIGS. 13A and 13B describe data conversion services. FIG. 14A describes a distributed processing system that provides data transmission caching. FIG. 14B describes a distributed processing system that

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provides data sharing and file distribution functions. And FIG. 15 describes an alternative representation for a distributed processing system, according to the present invention.

Looking now to FIG. 5A, block diagram is depicted of a distributed processing system 550 for a network site indexing application, according to the present invention. As stated above with respect to FIG. 1A, the network 102 may be a wide variety of networks. For this network site indexing application, the network 102 may preferably be the Internet having a multitude of network sites 552 ... 554. Each network site 552 ... 554 may have a variety of different content types that may be indexed, ranging from complex sites to relatively simple sites. For example, network site 552 includes text 570A, images 570B, audio streams 570C, video streams 570D, files 570E and other content 570F. Network site 554 is less complex and includes text 572A, images 572B, and other content 572C. Both network sites 552 and 554 are connected to the network 102 through communication lines 558 and 556, respectively.

As discussed above, the server systems 104 manage workloads for the client systems 108, 110 ... 112. The client systems 108, 110 ... 112 process these workloads and produce indexing results. The resulting index may be stored at a centrally managed site, such as central index storage block 560, or may itself be distributed over the possibly millions of indexing clients 108, 110 ... 112, as shown by remote index storage blocks 562, 564 ... 566. If remote index storage is utilized, a master database content index may be stored locally, for example, in the central index storage block 560. This content index may then direct relevant searches to the distributed massively parallel engine for search queries.

Referring now to FIG. 5B, a functional block diagram is shown for a network site indexing operation 500 according to the present invention. As described in FIG. 1A with respect to other systems 106, there may be any number of computer and processing systems connected to the network 102. Any one of these others systems 106 may publish information on the network 102 for access by any other system connected to the network 102. This information to be indexed may take a wide variety of forms, including, for example, text, images, audio streams, video streams, databases, spreadsheets, PDF files, Shockwave data, Flash data, applications, data files, chat streams, or any other information, data or data streams that may be accessible on a network site. The distributed processing system of the present invention may have as a workload the task of indexing this potentially massive amount of information.

For example, where the network 102 is the Internet or a large intranet, a large amount of processing power and time is needed to create an accurate, complete and up-to-date index of the

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information. The Internet uses an IP (Internet Protocol) address protocol to direct traffic around the Internet. The IP address is the address of a computer attached to a TCP/IP (Transmission Control Protocol/Internet Protocol) network. Every system on the network must have a unique IP address. IP addresses are typically written as four sets of numbers separated by periods. The TCP/IP packet uses 32 bits to contain the IP address, which is made up of a network and host address (NETID and HOSTID). The more bits used for network address, the fewer remain for hosts. Web pages within a particular web site with a unique address may be addressed through URLs (Uniform Resource Locator) associated with that web site. In short, there is a limited, but very large, number of possible IP addresses for uniquely identifiable Internet sites that may be accessed and analyzed to generate an index of Internet sites and web pages via URLs.

The operation diagram of FIG. 5B starts with the "clients receive indexing workloads" block 502. In this block, the system server 104 provides the clients systems 108, 110 ... 112 with a workload task to index a portion of the information accessible on the network 102. For example, with the Internet, each workload may be single IP address or groups of URLs or, in some cases, large data types contained on single sites or pages. Following line 514, the "clients interact with other systems" block 504 represents the operation of the agent installed on the client systems 108, 110 ... 112 to access the network sites, according to the assigned workload, and index the information accessible on that site. This indexing may include all types of information accessible on that site, including text, audio, image, video, etc.

Next, following lines 516 and 518, the client systems 108, 110 and 112 complete the workload tasks, get the results ready for transmission, and sends those results back to the system server 104 in "clients complete workload" block 506 and "indexing results sent to server system" block 508. Control passes along line 520 to "index compiled for use" block 510 where the server system formats and/or compiles the results for use. For example, the index results may be utilized for accurate, complete and up-to-date search information for the network 102. As indicated with respect to FIG. 5A, the resulting index may be stored remotely or locally following line 522. Thus, element 524 represents remote storage of the index, and element 526 represents central storage of the index. It is noted that the index may also be stored with a mixture of central and remote storage, as desired. In addition, as indicated above, a directory or summary index for the resulting index may be generated and stored centrally, if desired. It is further noted that the summary index may be stored in any other desired fashion, for example, it may be distributed and stored on a number of client systems.

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FIG. 6A is a block diagram for a server system 104 according to the present invention, including a control system 304, a workload database 308, and a database of capability vectors 620. The workload database 308 includes a variety of sets of workload projects WL1, WL2 ... WLN. For each workload project, there may be multiple workload units. For example, workload project WL1 includes workload units WL11, WL12 ... WL1N, as represented by elements 640, 642 ... 644, respectively. Similarly, workload project WL2 includes workload units WL21, WL22 ... WL2N, as represented by elements 646, 648 ... 650, respectively workload project WLN includes workload units WLN1, WLN2 ... WLNN, as represented by elements 652, 654 ... 656, respectively.

It may be expected that different workload projects WL1, WL2 ... WLN within the workload database 308 may require widely varying processing requirements. Thus, in order to better direct resources to workload projects, the server system may access various system vectors when a client system signs up to provide processing time and other system or device capabilities to the server system. This capability scheduling helps facilitate project operation and completion. In this respect, the capability vector database 620 keeps track of any desired feature of client systems or devices in capability vectors CBV1, CBV2 ... CBVN, represented by elements 628, 630 ... 632, respectively. These capability vectors may then be utilized by the control system 304 through line 626 to capability balance workloads.

This capability scheduling according to the present invention, therefore, allows for the efficient management of the distributed processing system of the present invention. This capability scheduling and distribution will help maximize throughput, deliver timely responses for sensitive workloads, calculate redundancy factors when necessary, and in general, help optimize the distributed processing computing system of the present invention. The following TABLE 1 provides lists of capability vectors or factors that may be utilized. It is noted that this list is an example list, and any number of vectors or factors may be identified and utilized, as desired.

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TABLE 1 -- Example Client Capability Vectors or Factors

1. BIOS Support:	a. BIOS Type (brand)
b. ACPI	c. S1, S2, S3, and S4 sleep/wake states
d. D1, D2 and D3 ACPI device states	e. Remote Wake Up Via Modem
f. Remote Wake Up Via Network	g. CPU Clock control
h. Thermal Management control	i. Docked/Undocked state control
j. APM 1.2 support	k. Hotkey support
l. Resume on Alarm, Modem Ring and LAN	m. Password Protected Resume from Suspend
n. Full-On power mode	o. APM / Hardware Doze mode
p. Stand-by mode	q. Suspend to DRAM mode
r. Video Logic Power Down	s. HDD, FDD and FDC Power Down
t. Sound Chip Power Down	u. Super I/O Chip Power Down
2. CPU Support:	a. CPU Type (brand)
b. MMX instruction set	c. SIMD instruction set
d. WNI instruction set	e. 3DNow instruction set
f. Other processor dependent instruction set(s)	g. Raw integer performance
h. Raw FPU performance	i. CPU L1 data cache size
j. CPU L1 instruction cache size	k. CPU L2 cache size
l. CPU speed (MHz/GHz...)	m. System bus (MHz/GHz...) speed supported
n. Processor Serial Number	o. CPUID
3. Graphic Support	a. Graphics type (brand)
b. # of graphics engines	c. Memory capacity
d. OpenGL support	e. Direct3D/DirectX support
f. Color depth supported	g. MPEG 1/II decode assist
h. MPEG1/II encode assist	i. OS support
j. Rendering type(s) supported	k. Single-Pass Multitexturing support
l. True Color Rendering	m. Triangle Setup Engine

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n. Texture Cache	o. Bilinear/Trilinear Filtering
p. Anti-aliasing support	q. Texture Compositing
r. Texture Decompression	s. Perspectively Correct Texture Mapping
t. Mip-Mapping	u. Z-buffering and Double-buffering support
v. Bump mapping	w. Fog effects
x. Texture lighting	y. Video texture support
z. Reflection support	aa. Shadows support
4. Storage Support	a. Storage Type (brand)
b. Storage Type (fixed, removable, etc.)	c. Total storage capacity
d. Free space	e. Throughput speed
f. Seek time	g. User dedicated space for current workload
h. SMART capable	
5. System	a. System Type (brand)
b. System form factor (desktop, portable, workstation, server, etc.)	
6. Communications Support	a. Type of Connection (brand of ISP)
b. Type of Connection Device (brand of hardware)	c. Hardware device capabilities
d. Speed of connection	e. Latency of connection
f. Round trip packet time of connection	g. Number of hops on connection type
h. Automatic connection support (yes/no)	i. Dial-up only (yes/no)
j. Broadband type (brand)	k. Broadband connection type (DSL/Sat./Cable/T1/Intranet/etc.)
7. Memory	a. Type of memory error correction (none, ECC, etc.)

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b. Type of memory supported (EDO, SDRAM, RDRAM, etc.)	c. Amount of total memory
d. Amount of free memory	e. Current virtual memory size
f. Total available virtual memory size	
8. Operating System	a. Type of operating system (brand)
b. Version of operating system	c. Health of operating system
9. System application software	a. Type of software loaded and/or operating on system
b. Version of software	c. Software features enabled/disabled
d. Health of software operation	

FIG. 6B is a functional block diagram for capabilities determination and scheduling operation 600 for workloads in a distributed processing system according to the present invention. Initially, various vectors are identified for which capability information is desired in the "identify client system capability vectors" block 602. Following line 612, the server systems 104 then capability balances workloads among client systems 108, 110 and 112 based upon the capability vectors in the "capability scheduling workloads based on vectors" block 604. Then the capabilities scheduled workloads are sent to the client systems for processing in the "send capability scheduled workloads" block 606.

This capability scheduling and management based upon system related vectors allows for efficient use of resources. For example, utilizing the operating system or software vectors, workloads may be scheduled or managed so that desired hardware and software configurations are utilized. This scheduling based upon software vectors may be helpful because different software versions often have different capabilities. For example, various additional features and services are included in MICROSOFT WINDOWS '98 as compared with MICROSOFT WINDOWS '95. Any one of these additional functions or services may be desired for a particular workload that is to be hosted on a particular client system device. Software and operating system vectors also allow for customers to select a wide variety of software configurations on which the customers may desire a particular workload to be run. These varied software configurations may be helpful, for example, where software testing is

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desired. Thus, the distributed processing system of the present invention may be utilized to test new software, data files, Java programs or other software on a wide variety of hardware platforms, software platforms and software versions. For example, a Java program may be tested on a wide proliferation of JREs (Java Runtime Engines) associated with a wide variety of operating systems and machine types, such as personal computers, handheld devices, etc.

From the customer system perspective, the capability management and the capability database, as well as information concerning users of the distributed devices, provide a vehicle through which a customer may select particular hardware, software, user or other configurations, in which the customer is interested. In other words, utilizing the massively parallel distributed processing system of the present invention, a wide variety of selectable distributed device attributes, including information concerning users of the distributed devices, may be provided to a customer with respect to any project, advertising, or other information or activity a customer may have to be processed or distributed.

For example, a customer may desire to advertise certain goods or services to distributed devices that have certain attributes, such as particular device capabilities or particular characteristics for users of those distributed devices. Based upon selected attributes, a set of distributed devices may be identified for receipt of advertising messages. These messages may be displayed to a user of the distributed device through a browser, the client agent, or any other software that is executing either directly or remotely on the distributed device. Thus, a customer may target particular machine specific device or user attributes for particular advertising messages. For example, users with particular demographic information may be targeted for particular advertisements. As another example, the client agent running on client systems that are personal computers may determine systems that are suffering from numerous page faults (i.e., through tracking operating system health features such as the number of page faults). High numbers of page faults are an indication of low memory. Thus, memory manufacturers could target such systems for memory upgrade banners or advertisements.

Still further, if a customer desires to run a workload on specific device types, specific hardware platforms, specific operating systems, etc., the customer may then select these features and thereby select a subset of the distributed client systems on which to send a project workload. Such a project would be, for example, if a customer wanted to run a first set of simulations on personal computers with AMD ATHLON microprocessors and a second set of simulations on personal computers with INTEL PENTIUM III microprocessors. Alternatively, if a customer is not interested in particular configurations

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for the project, the customer may simply request any random number of distributed devices to process its project workloads.

Customer pricing levels for distributed processing may then be tied, if desired, to the level of specificity desired by a particular customer. For example, a customer may contract for a block of 10,000 random distributed devices for a base amount. The customer may later decide for an additional or different price to utilize one or more capability vectors in selecting a number of devices for processing its project. Further, a customer may request that a number of distributed devices be dedicated solely to processing its project workloads. In short, once device attributes, including device capabilities and user information, are identified, according to the present invention, any number of customer offerings may be made based upon the device attributes for the connected distributed devices. It is noted that to facilitate use of the device capabilities and user information, capability vectors and user information may be stored and organized in a database, as discussed above.

Referring now to FIG. 12A, a block diagram depicts a distributed processing system 1200 that allows customers to select client system attributes, such as device capabilities and user characteristics, according to the present invention. In this embodiment, the network 102 is depicted as the Internet to which server systems 104, customer 152A, customer 152B, and client systems 1202A, 1202B ... 1202C are connected. These systems are connected through communication links 114, 119A, 119B, 1204A, 1204B ... 1204C, respectively. As noted above, these communication links may include any of a wide variety of devices and/or communication techniques for allowing a system to interface with other connected systems.

As shown in FIG. 12A, and as discussed above, the customers 152A and 152B may desire to send information or projects, such as advertisements (ADV) 1206A and 1206B and/or projects (PROJ) 1208A and 1208B, to groups of client systems that have particular or selected capabilities. The number of different groups of client systems is as varied as the capability and user data available for those client systems. The client systems 1202A represent client systems that include a first set (Set 1) of desired attributes. The client systems 1202B represent client systems that include a second set (Set 2) of desired attributes. And the client systems 1202C represent client systems that include a Nth set (Set N) of desired attributes. Once attributes are selected, the client systems with those attributes may be accessed as desired by customers 152A and 152B. For example, customer 152A may send its advertisement to client systems 1202B. Customer 152B may send its advertisement to client systems 1202A. The project

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1208A from customer 152A may be processed by client systems 1202C. And the project 1208B from customer 152B may be processed by client systems 1202B. It is noted, therefore, that any combination of desired attributes, such as device capabilities and user characteristics, may be identified and utilized to satisfy customer objectives, whether those objectives be advertising, project processing, or some other desired objective.

FIG. 12B is a block flow diagram for client system attribute selection, according to the present invention. In the embodiment shown, process 1250 begins with the customer selecting desired attributes in block 1252. Next, client systems with selected attributes are accessed in block 1254. And, then in block 1256, the customer objective, such as advertising or project, is processed by the client system. Control of this process 1250 may be provided by the server systems 104, if desired, such that the customer interfaces with the server systems 104 to select device attributes and then the servers systems 104 access the client systems. Alternatively, the server systems 104 may simply provide the customer with a list of contact information (e.g., IP addresses) for the client systems, so that the customer may directly access the client system, for example, in providing advertisements to the users of the client systems. It is further noted that other control techniques may also be used to identify and access client systems with particular desired device capabilities, user characteristics, or other device attributes, according to the client system attribute selection method of the present invention.

FIG. 7A is a block diagram for a distributed processing system 100 according to the present invention, including example network sites 106A and 106B on which site testing is to be conducted, such as load testing and/or quality-of-service (QoS) testing. FIG. 7A is similar to FIG. 1A except that other systems 106 in FIG. 1A has been represented in the embodiment of FIG. 7A with network sites 106A and 106B. Communication line 116A between the network 102 and the network site 106A represents a interaction by one client system 108, 110 and 112. Communication lines 116B, 116C and 116D represent interactions by more than one client system 108, 110 and 112.

Site testing is typically desired to determine how a site or connected service performs under any desired set of test circumstances. With the distributed processing system of the present invention, site performance testing may be conducted using any number of real client systems 108, 110 and 112, rather than simulated activity that is currently available. Several tests that are commonly desired are site load tests and quality of service (QoS) tests. Quality of service (QoS) testing refers to testing a user's experience accessing a network site under normal usability situations. Load testing refers to testing what

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a particular network site's infrastructure can handle in user interactions. An extreme version of load testing is a denial-of-service attack, where a system or group of systems intentionally attempt to overload and shut-down a network site. Advantageously, the current invention will have actual systems testing network web sites, as opposed to simulated tests for which others in the industry are capable.

Network site 106B and the multiple interactions represented by communication lines 116B, 116C and 116D are intended to represent a load testing environment. Network site 106A and the single interaction 116A is indicative of a user interaction or QoS testing environment. It is noted that load testing, QoS testing and any other site testing may be conducted with any number of interactions from client systems desired, and the timing of those interactions may be manipulated and controlled to achieve any desired testing parameters. It is further noted that periodically new load and breakdown statistics will be provided for capacity planning.

FIG. 7B is a functional block diagram for a site-testing operation 700 according to the present invention. Initially, client systems 108, 110 and 112 receive workloads that identify testing procedures and parameters in the "clients receive testing workload" block 702. Following line 714, the client systems 108, 110 and 112 access the site being tested and perform the testing in block "clients interact with other systems" block 704. Next, following lines 716 and 718, the client systems 108, 110 and 112 complete the site testing workload tasks, get the results ready for transmission, and send those results back to the system server 104 in "clients complete testing workload" block 706 and "site testing results sent to server system" block 708. Control passes along line 720 to "site testing results compiled for use" block 710 where the server system formats and/or compiles the results for use by the network site. For example, the site testing results may be utilized determining modifications that need to be made to the network site to handle peak volume activities.

FIG. 8 is a block diagram for a distributed processing system 800 for a data back-up system application, according to the present invention. As stated above with respect to FIG. 1A, the network 102 may be a wide variety of networks, including an intranet network. Intranet networks, such as internal networks set up by corporations, are particularly suited for this application because the systems holding the data being backed-up would be owned by the same entity owning other systems with excess data storage capabilities. In this way, security would not be as great of an issue and the client system types could be better controlled. It is noted, however, that this data back-up application would be equally applicable to other networks, such as for computer systems connected through the Internet.

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Referring back to FIG. 8, client systems 108, 110 ... 112 are shown each having a back-up data blocks 804, 806 ... 808. Customer systems 152 is shown as having data 802, which is desired to be backed-up with the distributed back-up system 800. The server systems 104 manage the flow of data from the data 802 and the client systems that have extra storage space represented by back-up data blocks 804, 806 ... 808. In operation, the server systems 104 identifies client system storage capabilities. With this information, the server systems 104 can receive data for back-up from any system on the network 102. It is noted, and as indicated with respect to FIG. 1A, the client systems 108, 110 ... 112 and the customer systems 152 may communicate directly with each other in peer-to-peer type communications.

The server systems 104 may also manage the storage and transfer of data so that the data will be readily retrievable once backed-up and stored on the client systems 108, 110 ... 112. If desired, an summary index or directory of the backed-up data may be stored centrally on the server systems 104, or may be stored remotely on the client systems 108, 110 ... 112. It is also noted that the server systems 104 may also distribute data back-up workloads so that each portion of the data 802 is stored redundantly on at least two of the client systems 108, 110 ... 112. This redundancy provides added security should any one or more client systems suddenly cease to be operational.

Looking now to FIG. 9, a block diagram is depicted of an alternative representation of an interconnection fabric for a distributed processing system environment 100, according to the present invention. In this diagram and as described above, the network environment may be the Internet, an internal company intranet, a local area network (LAN), a wide area network (WAN), a wireless network, a home network, or any other system that connects together multiple systems and devices. In addition, the server systems and clients systems may be interconnected by a variety of possible connection interfaces, for example, Ethernet connections, wireless connections, ISDN connections, DSL connections, modem dial-up connections, cable modem connections, direct T1 or T3 connections, fiber optic connections, routers, portal computers, as well as any other network or communication connection. It is noted, therefore, as discussed with respect to other embodiments such as the embodiment of FIG. 1A, that systems may be coupled into an interconnected fabric in any of a variety of ways and communications can potentially occur directly or indirectly between any of the systems coupled into the fabric, as would be understood by those of skill in the art.

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Within this environment, as depicted in FIG. 9, server systems 104 are interconnected with any number of client systems, for example, client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G, 108H, 108I, 108J, 108K and 108L. In addition, these client systems may also include idle client systems 902A, 902 B, and 902C, as discussed further below. Furthermore, these client systems may include client system 904A with a component A, client system 904B with a component B, and client system 904C with a component C. It is also noted that the interconnection fabric may include any number of devices that are not client systems, in that they themselves are not providing components or processing capabilities for the distributed processing system of the present invention. Nevertheless, these devices may be considered part of the system because they may relay, interpret, process or otherwise transmit or receive information from or to client systems that are part of the distributed processing system.

Aggregation of component level resources, according to the present invention, will now be discussed. As described above, the capabilities of client systems are determined for purposes of allocating, scheduling and managing distributed processing workloads. In other words, each of the client systems may be made up of many individual subsystems with various capabilities. In some cases, it may occur that particular components on different machines may provide added value if combined or aggregated. Thus, utilizing subsystem or component level resources from a heterogeneous group of devices may be the most efficient or otherwise advantageous way of taking advantage of these resources to complete various desired tasks.

Referring now more particularly to FIG. 9, the client systems 904A, 904B and 904C may have component A, component B and component C, respectively, that are better utilized in combination. For example, client system 904A may have a fast processor, a high-speed network connection, but little available storage space. Client system 904B may have large amounts of available free storage space but little processing power. Client system 904C may also have a fast processor, but relatively little available storage space. In this example, a workload that requires both a large storage capacity and a fast processor may be efficiently completed by dedicating component level resources to various parts of the workload from different machines. Thus, the workload may be managed by having client systems 904A and 904C processing data stored on and transmitted from client system 904B. Once clients systems 904A and 904C process data, this resulting data may then be transmitted back to client system 904B for aggregation and eventual transmission back to the server systems 104. The client system 904B, therefore, essentially acts as a server for a workload subset, sending out portions of a subset workload, receiving back the processed data, and aggregating the data to build a completed workload subset.

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It is noted that any number of different components from different client systems may be aggregated, as desired. For example, for wireless devices, DSP processing and storage components could be aggregated with components from other client systems. For display devices, graphics rendering power could be aggregated. For relatively dumb machines, such as connected household appliances, vending machines, etc., slow-speed processing components could be aggregated. In short, an appropriate workload may include instructions to numerous client systems that will enable collaboration and aggregation of component level resources. Such instructions may include things, such as, where to receive input, where to send output, and ultimately which client systems return final results.

It is further noted that the control instructions may be de-centralized as well. In other words, as indicated above, client systems may communicate directly with each other, for example, in a peer-to-peer fashion. In this way, workload communications may occur directly between client systems, and workload control and management may occur through the client system agents located on client systems.

Still referring to FIG. 9, idle system determination will now be discussed. As stated above, client system capabilities are determined and utilized within the distributed processing system of the present invention. The more idle any particular client system, the more processing it is arguably able to accomplish, and the more incentives it is likely to receive. In other words, the client system capabilities may be utilized more often and more intensely if the client system is more idle. As such, it is advantageous to identify idle client systems and allocate them to more processor and time sensitive tasks. By identifying these idle client systems, resources available on the network at any given time may be more fully utilized, and otherwise idle resources may be utilized for highly intensive, real-time activities that would otherwise require dedicated devices. Examples of such real-time activities include data caching, indexing, etc. In FIG. 9, idle client systems are designated as 902A, 902B and 902C.

Identifying idle resources may be determined in any of a variety of ways. It is possible, for example, to simply look at whether a machine is not being used or has low processor utilization at any given time. This simple determination, however, may not yield an accurate picture of how idle a client system may or may not be over a given time period. More particularly, discovery methods may be implemented to identify the activity of a variety of client system components and subsystems. For example, subsystems may be monitored, such as network activity, device output activity, user input, processing activity, executing task monitoring, or mode of operation parameters (e.g., mobile or power

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management modes, stationary or powered mode). In addition, any number of other device vectors may be monitored or analyzed to determine the true usage and idleness of a client system.

The following TABLE 2 provides a list of idleness vectors or factors that may be utilized in determining the level of device usage or idleness. In particular, TABLE 2 provides two primary categories of activities to monitor or analyze for determination of how idle a client system may or may not be. These activities are user activity and device activity. By monitoring, analyzing and tracking these client system elements and activities over time, a better determination of device usage and idleness may be made. It is noted that the list provided in TABLE 2 is an example list, and any number of categories, vectors or factors may be identified and utilized, as desired, according to the present invention.

TABLE 2 -- Example Client Idleness Vectors or Factors

1. User Activity (e.g., monitor input activities, monitor output activities, monitor time elapsed since last input event and between input events, etc.)	a. keyboard input
b. mouse input	c. microphone/voice input
d. tablet input	e. pen input
f. touch screen input	g. joystick input
h. gamepad input	i. video output
j. printer output	k. any other user activity that could be utilized to classify if a device is idle
2. Device Activity (e.g., monitor utilization levels, monitor time elapsed since last device activity, monitor time between changes in device utilization levels, etc.)	a. power state (e.g., time since last power state change event)
b. mobility state (e.g., time since device last in mobile state)	c. screen saver activity or trigger (e.g., time elapsed since screensaver activity or trigger)

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d. screen output (e.g., time elapsed since last screen output, paint event or pixel change)	e. network or communication packets sent or received (e.g., time elapsed since last network or communications activity)
f. storage device activity (e.g., time elapsed since last storage device activity, such as hard drives, flash memory cards, removable drives, CD drives, DVD drives, etc.)	g. processor, DSP, microcontroller, embedded device, or other processor activity (e.g., time elapsed since last processor activity)
h. processor, DSP, microcontroller, embedded device, or other processing device utilization (e.g., change in utilization levels)	i. tasks or processes executing (e.g., time elapsed since change in number of tasks or processes executing)
j. task or process device utilization (e.g., time since change in task or process device utilization)	k. any other device activity that could be used to classify if a device is idle

As a further example of the usefulness of this determination, reference is made back to FIG. 9. Server systems 104 may have, for example, a large, intensive task that it would like to place on these idle devices. After using a number of the vectors in TABLE 2 to determine the utilization level for client systems, the server systems 104 determines that client systems 902A, 902B and 902C are idle and capable of handling significant time sensitive processing tasks. For example, idle client systems 902A, 902B and 902C may be personal computers that can act as a local internet cache for other connected devices, such as some of the other client systems depicted in FIG. 9, that are interested in a data type that benefits from a local network cache. Thus, data or content may be transmitted from a remote network site to the idle machines 902A, 902B and 902C. These idle devices 902A, 902B and 902C may then re-transmit this same data or content to other connected devices also interested in the data or content.

One example for such network caching is Internet video or multimedia broadcast events that are desired to be viewed or received by a very large number of geographically close connected devices at about the same time. In order to meet the demand of these connected devices, web sites broadcasting an event have to be able to handle a huge increase in network traffic over a short period of time. By locally

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caching the transmission to idle client systems, a web site can reduce the direct demand on its own resources. This is so because other connected devices may receive a re-transmitted broadcast, although delayed, from the idle client system. It is noted that according to the present invention idle client systems 902A, 902B and 902C may work independently or in combination. Even though idle client systems are suited for providing the caching function, it is also noted that that network caching may be accomplished using one or more client systems regardless of their respective levels of idleness.

FIG. 10 is a more detailed block diagram for a client system agent 270 installed on a client system, according to the present invention. This diagram includes a security subsystem 1010, a capabilities subsystem 1006, a workload processor 1004, a user interface 1002, and a project management and agent control subsystem 1008. The various components and subsystems may communicate with each other, for example, through lines 1012, 1014, 1016, 1018 and 1020. Externally, the client system agent 270 may communicate through its security subsystem 1010 with the other components within the client system and ultimately to other devices connected into the network fabric. It is noted that configuration of the client system agent and its operation, both internal and external, may be selected and designed, as desired.

As depicted, the capabilities subsystem 1006 includes an idle system monitor 1022, as described above, that monitors and analyzes user and device activities associated with the client system to determine the level of activity or idleness for the client system. The information determined by this idle system monitor 1022 may then be communicated externally, for example, through the security subsystem 1010 to the server systems 104. The server systems 104 may then store and analyze system idleness data from across the distributed processing system. This idleness data may become part of the capabilities database that is utilized to allocate and manage workloads and processing system resources.

Still referring to FIG. 10, the workload processor 1004 includes a machine entry generation subsystem 1024. As described above, the workload processor 1004 may send completed workloads back to server systems 104 to generate sweepstakes entries for the host client system. In this way, when the incentive is a sweepstakes, the client system may generate entries by completing workloads. The machine entry generation subsystem 1024 refers to this entry generation through workload completion. As discussed above, the workload processed to generate entries may be a project workload, an entry workload, or any other workload, as desired.

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FIGS. 11A and 11B provide more detailed flow diagrams of process embodiments for machine generated sweepstakes entries through processing of entry workloads, according to the present invention.

Looking first to FIG. 11A, an entry workload process flow 1100 is depicted that provides machine generated sweepstakes entries. Process moves from start block 1102 to block 1104 in which entry workloads are loaded on client systems. Next, process flows to block 1106 which represents a periodic timer or other timing control for entry workload processing. After this timing control, the client system executes or processes the entry workload in block 1108. In block 1110, a sweepstakes entry is thereby generated and returned to the server system 104 based upon the completion of this entry workload. Process control then may proceed back to the periodic timing block 1106, where timing control determines when the entry workload is next processed. The completed workload represents the machine generated sweepstakes entry.

FIG. 11B is an alternative entry workload process flow 1150. The process flow 1150 is similar to the process flow 1100 except that the entry workload is sent to the client system each time it is to be run. Process starts in block 1102 and passes to the periodic timer block 1106, in which the process is controlled. For example, server systems 104 may determine when it is desirable for the client systems to receive and process an entry workload. In block 1104, the entry workload is sent to the client systems. As with FIG. 11A, the client systems then execute the entry workload in block 1108, and an entry is generated and returned to the remote server systems 104 in block 1110. The process then proceeds back to the periodic timer 1106 until it is determined that another entry workload should be processed. The primary difference between process 1150 and process 1100 is that process 1150 is depicting an entry workload that is transmitted to the client system each time it is to be run.

One example utilizing the process 1150 or the process 1100 is for server systems 104 to query the client systems for entry workload processing at regular time intervals. If a distributed device returns a completed entry workload back within a selected period of time from the distribution of the entry workload, the server system may conclude that the distributed device should receive an entry because the distributed device is providing resources to the distributed processing system. In this way, the server systems 104 may determine at regular intervals whether a given client system is working on project workloads for the distributed processing system. Alternatively, the client system agent may locally control the workload processing and may, for example, cause the client system to process and generate

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entries at regular time intervals. It is noted that non-regular and varying time intervals may also be utilized and that combinations of remote and local control may also be utilized, as desired.

The timing of when a client system processes the entry workload, therefore, may be determined locally by the client system agent or remotely, for example, through commands sent by the server systems 104. In addition, periodic timing control may also be accomplished through various combinations of control routines residing locally and remotely. It is further noted that any number of different variations may be utilized to provide machine generated entries to a sweepstakes, according to the present invention. Thus, a client system may generate sweepstakes entries in any of a variety of ways and still have machine generated sweepstakes entries, according to the present invention.

FIGS. 13A and 13B describe a data conversion application 1300 for a massively parallel distributed network according the present invention. In particular, FIG. 13A is a block diagram of a distributed processing system that provides data conversion services, according to the present invention. And FIG. 13B is a block flow diagram for data conversion services within a distributed processing system, according to the present invention.

Converting file types, web pages, graphics images, etc., between device types can be a highly intensive processing task. Example devices that often need converted data are wireless devices, such as pagers and cell phones, that request Internet web page information from their respective device servers. The device server, instead of incurring the overhead of reformatting the requested data for the wireless devices, may instead distribute the requested page or data address, the device type information of the requesting device, and return address for the reformatted data. According to the present invention, the data conversion, translation or processing may be performed by a client system of the distributed processing system of the present invention. The resulting data may then be returned or provided to the original requesting device. In addition to data formatting for cell phones, language conversion, text translation and media translation services, or any other desired data conversion can also be hosted for a customer through the distributed processing system of the present invention.

It is noted that the data conversion operation contemplated by the present invention is not limited to any particular requesting device, any particular service provider, any particular type of data to be processed, any particular type of resulting processed data, or any particular data source. Thus, the data processed may include voice, text, application, image, source code, or any other data type or combination

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of data types, and the resulting processed data may also include voice, text, application, image, or any other data type or combination of data types. According to the present invention, the distributed processing system is utilized to process any data that is desired by a requesting device and that must be converted or processed before being provided to the requesting device. For example, end-user devices connected to the Internet, such as personal computers, may sign up for data conversion services through the server system so that the end-user device may request data conversion of any desired data, file, web site content, etc. Language translations and data formatting for connected wireless are just two examples of such applications for the present invention.

Looking now to the embodiment of FIG. 13A, the network 102 is depicted as the Internet, and the requesting device is one or more wireless devices 1306 connected to the Internet 102 through communication links 1308 and to the wireless device server systems 1304 through communication link 1309. The data to be converted, translated or otherwise processed is represented by block 1302 and may be, for example, content from an Internet web site that is connected to the Internet through communication link 1312. Also, as shown in FIG. 13A, a massively parallel distributed network (MPDN) server 104 is connected to the Internet 102 through communication link 114. The wireless device server systems 1304, or any other connected system that desires to off-load data conversion processing requirements (e.g., web site content servers), are connected to the Internet 102 through communication links 1310 and to the MPDN server 104 through communication links 1311. Any number of client systems 108, 110 ... 112 may also be connected to the Internet 102, through communications links 118, 120 ... 122, respectively. As also stated above, any of the connected devices may communicate with each other in any of a wide variety of communication techniques (e.g., wireless, electrical, digital, analog, light-based, etc.) and protocols (e.g., static or dynamic IP addresses), and through any number of other devices, as would be understood by one of skill in the art.

In the application contemplated by FIG. 13A, the wireless devices 1306 at times request data, for example, images or text from a web site, that must be converted, translated or otherwise processed by wireless device server systems 1304 before it can be transmitted to, and displayed on, a requesting wireless device. Instead of converting the information, the wireless device server systems 1304 may request that the MPDN server 104 accomplish the data conversion or translation. The device server systems 1304 may then provide to the MPDN server 104 any pertinent information, such as information concerning the requesting device, the nature of the data requested, and the processing needed for the data. The MPDN server 104 may then utilize one or more of the client systems 108, 110 ... 112 to

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process the data from block 1302 for transmission to the requesting device. In this way, the wireless device server systems 1304 may off-load burdensome and process-intensive conversion tasks to the distributed processing system of the present invention.

It is noted the transmission of processed data to the requesting wireless device 1306 may occur in a variety of ways. For example, the processed data may be transmitted from a client system 108 to the server 104, then to the wireless device server 1304 and finally to the wireless devices 1306. Alternatively, the processed data may be transmitted from a client system to the wireless device server 1304, and then to the wireless devices 1306. Still further, the processed data may be transmitted directly from a client system to the wireless devices.

FIG. 13B provides a basic flow diagram for an embodiment of a data conversion process 1350 according to the present invention. In block 1352, a device, such as wireless devices 1306, requests unconverted, non-translated or non-processed data. In block 1354, a server for the device, such as wireless device server systems 1304, processes the data request and contacts the MPDN server 104. In addition, the content provider or server for the requested data, such as a web site content server, may contact the MPDN server 104. The wireless device server systems 1304 provide all pertinent information to the MPDN server 104, such as the type of calling device, its identification, the relevant data requested, and the conversion to take place. The MPDN server 104 then distributes the data and information concerning the requesting device to one or more client systems, such as client systems 108, 110 ... 112, in block 1356. The one or more client systems then convert, translate or otherwise process the data in block 1358. The converted, translated or processed data is then provided to the requesting device in block 1360. Again, in this way, the device servers may provide a wide range of information without having to provide itself the processing power to accomplish the conversion, translation or processing that is required to transmit or display the data on a requesting device.

As shown in FIG. 13B, the device server or the content server 1304 may communicate data and other pertinent information for a conversion directly to the client systems. For example, the MPDN server 104 may provide access to a group of client systems for data conversion purposes for given periods time (e.g., monthly client group allocations), or may provide identities of groups of client systems that may be used at the time a conversion is needed. Once the identity and allocation of client systems to a particular device server or content server is made, the device server or content server may communicate directly with the client systems. In addition, the device server or content server may

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provide directly to a requesting device the identity of the one or more client systems accomplishing the data conversion. As shown in FIG. 13B, the requesting device, therefore, may communicate directly with the client system or systems to provide pertinent information concerning the data conversion requested. The client system may then, for example, directly download the desired content and perform the desired data conversion. It is further noted that in addition to the embodiments described above with respect to FIGS. 13A and 13B, other methods for requesting, processing and providing data to and from the requesting device may be implemented with distributed processing system of the present invention, such as caching processed data for later transmission.

FIGS. 14A and 14B depict example block diagrams of file distribution and data sharing through the network fabric, according to the present invention. In particular, FIG. 14A depicts an Internet data file distribution system 1400 that relies upon client systems to provide local data distribution. FIG. 14B depicts a data file distribution system 1450 that allows for data sharing and rapid transmission of a project or data files through the distributed processing system.

Looking now to FIG. 14A, a block diagram is depicted of a distributed processing system 1400 that provides data transmission caching or other local distribution, according to the present invention. In the embodiment of FIG. 14A, server systems 104 are connected through communication link 114 to the Internet back-bone 1402. The Internet back-bone 1402 represents the very high speed connections that carry data long distances, for example, T3 or fiber optic lines that carry Internet data across the United States. A web site 1404 is connected to the Internet back-bone 1402 through communication link 1406, which represents a geographically local connection. The connection block 1410 represents a geographically remote communications link, such as a POP server, head-end machine, telephone line central office, cell site, etc. This communications block 1410 is connected to the Internet back-bone 1402 with a communications link 1408, which also represents a geographically local connection. A variety of client devices and non-client devices 1412A, 1412B, 1412C, 1412D, 1412E and 1412F may be connected below the connection block 1410. It is noted that interface 1414 represents, for example, a secondary network on which client devices 1412D, 1412E and 1412F are connected, such as a home network.

In the embodiment shown in FIG. 14A, web site 1404 may be desiring to provide content that is in high demand, over a short period of time. An example of such an event is a live Internet multimedia broadcast. For such an event, there may be a huge influx of devices trying to download the content from

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the web site 1404 over a short period of time. The web site 1404 may be unable to meet this extremely large demand, requiring the web site 1404 to shut down.

According to the present invention, the web site 1404 may off-load some or all of its data handling requirements by using the distributed processing system of the present invention for data caching. The web site 1404 may contact server systems 104 and request data caching services. The server systems 104 may then identify a local machine, such as client device 1412E, to act as a local distributor of the content for web site 1404. For example, one or more idle client devices that have been identified, as discussed above, may be utilized as local distributor client device 1412E. The local distributor client device 1412E may first download the content and pass it on to other client and non-client devices 1412B, 1412C and 1412D through communication links 1416A, 1416B and 1416C. It is noted that this caching will be aided if the client and non-client devices receiving the cached data are relatively short communication hops from local distributor client device 1412E.

This data or network caching allows data to be streamed to an end user level device, which may then pass the data on to other end user devices. Thus, the downstream communications may be limited, thereby taking the distribution burden off of the web site. For example, web site 1404 may have a large streaming video or multimedia file that is experiencing a heavy load from a given set of network devices. This data file may be cached by a machine, such as client device 1412E, that is below from a communication link 1410. Then, other devices that are also below this communication link 1410 may download the streaming video data from the client device 1412E. This caching eliminates the need to repeatedly send the same data through the same communication links to requesting devices that are located below common communication links. It is noted that the file and data distribution possibilities for this peer file access, caching and data transmission, according to the present invention, are wide and varied and should not be seen as limited to the embodiment shown in FIG. 14A.

FIG. 14B is a block diagram of a distributed processing system 1450 that provides data distribution and data sharing, according to the present invention. As with FIG. 9, FIG. 14B depicts an alternative view of a network fabric that may interconnect any of a wide variety of devices. In the embodiment shown in FIG. 14B, server systems 104 are interconnected with any number of client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G and 108H. Each of the connecting interconnects represents any of a wide variety of communication links that may exist between devices in the network fabric of the present invention. Each of the client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G

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and 108H include shared data (SD) according to the present invention. Within this interconnected fabric, block 1452 represents data or project information that is desired to be distributed. The SD blocks within each client system facilitates the distribution of this data or project information.

A client agent, as discussed above, installed on the client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G and 108H includes functionality that facilitates a number of services with respect to data transmission and sharing. First, the client agent provides a protected data storage area accessible to outside devices, which is represented by the SD block within each client system in FIG. 14B. This special storage space protects the device from outside devices accessing other storage areas on the device while allowing data to be shared and accessed by other devices and simultaneously used by the local client agent.

These shared data (SD) blocks provide mechanisms that enable a wide variety of possible interactions among the client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G and 108H. For example, the data sharing mechanism may provide a space for a cache of other device addresses attached to the network for both communication purposes as well as security purposes. The mechanism may also provide a simple indexing system that is automatically re-indexed when content is added or removed from the storage area. This indexing system may provide a mechanism for other client agents to perform discovery on the local client information and visa versa. Through information stored within this shared data, the distributed processing system of the present invention facilitates many distributed file system applications such as distributed resume posting, distributed caching, distributed advertisement serving, etc. In addition to the above, the storage block (SD) within each client system may include an interface for displaying or playing data types (such as images, audio files, video files, etc.) stored both locally and/or remotely on other client devices. This would enable simple picture sharing, for example, between remote families connected via the internet, as part of being a client system within the distributed processing system of the present invention.

In the embodiment shown in FIG. 14B, data or project 1452 is injected into the fabric through a connection to client system 108C and server systems 104. These connections represent that the information may pass first to server systems 104, or may pass first to a client system, such as client system 108C. It is noted that there are other ways that the data may be injected into the fabric. Once injected, the data 1452 may be transmitted throughout the fabric through any of a wide variety of communications, including client-to-client, server-to-client, client-to-server, client-to-non-client, non-

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client-to-client communications, and/or non-client-to-non-client communications. These communications may be based upon a variety of mechanisms, such as polling mechanisms and pre-assigned firewall ports. This technique provides a vehicle that facilitates the distribution of information to a large number of devices in a short period of time.

Applications for this data distribution are widely varied. For example, any important file that is time sensitive may be propagated to a large number of client devices, non-client devices, servers, or other connected devices, in a short amount of time. This transmission may occur quickly and efficiently once the information is injected into the distributed processing system of the present invention. Example time sensitive data files are anti-virus signature files, which when distributed through the distributed processing system of the present invention, may be transmitted through the network fabric faster than a new virus may normally proliferate.

Another application for rapid propagation of files is utilizing this technique for propagation of workloads. One example is distributed resume or job searching. In such a system, participating job seekers and participating employers may rapidly search for one another. A job seeker may inject a job request or search into the fabric that is then routed by each successive device to other devices without the need for control from the server systems 104. Similarly, an employer may inject candidate criteria into the fabric that is then routed to successive devices. The result is an extremely fast search and identification of employers and candidates.

FIG. 15 is a block diagram of an alternative representation for a distributed processing system 100, according to the present invention. Server systems 104, database systems 1546 and web interface 1554 are coupled together through communication links 1540, 1542 and 1544. The web interface 1554 includes clients subsystem 1548, task developer subsystem 1550, and advertisers subsystem 1552, and may include other subsystems as desired. The database systems 1546 include workload (WL) information 308, client capability vector information 620, and any other stored information as desired. Server systems include various modules and subsystems, including database interface 1532, web server 1536, task module and work unit manager 1530, client statistics module 1534, advertising manager 1538, task module version/phase control subsystem 1528, sweepstakes engine 1524, server control subsystem 1526, and communication interface 1522. It is noted that in the embodiment of a distributed processing system 100 as depicted in FIG. 15, the three primary operations for the server systems 104, database

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systems 1546 and web interface 1554 are directed to managing, processing and providing an interface for client systems, customer tasks, and customer advertising.

As discussed above, each client system includes a client agent that operates on the client system and manages the workloads and processes of the distributed processing system. As shown in FIG. 15, each of the client agents 270A, 270B ... 270C communicates with the server systems 104 through communication links 1516, 1518 ... 1520, respectively. As discussed above, any number of different techniques and architectures may be utilized to provide these communication links. In the embodiment as shown in FIG. 15 with respect to client agent 270A, each client agent includes a base distributed processing system component 1506 and a separate project or workload component 1504. As depicted, a communication interface 1508, a core agent module 1502, and a user interface 1510 make up the base distributed processing system component 1506. The task module 1512 and the work unit 1514 make up the separate project or workload component 1504. The task module 1512 operates on top of the core agent module 1502 to provide processing of each project work unit 1514. It is noted that different or additional modules, subsystems or components may be included within the client agent, as desired. For example, a personal computer screen saver component may be part of the base distributed processing system component 1506 or the separate project or workload component 1504.

Also as discussed above, security subsystems and interfaces may be included to provide for secure interactions between the various devices and systems of the distributed processing system 100. As depicted in FIG. 15, a security subsystem and interface 1560 is interconnected with the server systems 104, the database systems 1546, the web interface 1554, and the client agents 270A, 270B ... 270C. These interconnections are represented by lines 1566, 1564, 1562, and 1568, respectively. The security subsystem and interface 1560 operates to secure the communications and operations of the distributed processing system. This security subsystem and interface 1560 also represents a variety of potential security architectures, techniques and features that may be utilized. This security may provide, for example, authentication of devices when they send and receive transmissions, so that a sending device verifies the authenticity of the receiving device and/or the receiving device verifies the authenticity of the sending device. In addition, this security may provide for encryption of transmissions between the devices and systems of the distributed processing system. The security subsystem and interface 1560 may also be implemented in a variety of ways, including utilizing security subsystems within each device or security measures shared among multiple devices, so that security is provided for all interactions of the devices within the distributed processing system. In this way, for example,

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security measures may be set in place to make sure that no unauthorized entry is made into the programming or operations of any portion of the distributed processing system including the client agents 270A, 270B ... 270C.

In operation, client systems or end-users may utilize the clients subsystem 1548 within the web interface 1554 to register, set user preferences, check statistics, check sweepstakes entries, or accomplish any other user interface option made available, as desired. Advertising customers may utilize the advertisers subsystem 1552 within the web interface 1554 to register, add or modify banner or other advertisements, set up rules for serving advertisements, check advertising statistics (e.g., click statistics), or accomplish any other advertiser interface option made available, as desired. Customers and their respective task or project developers may utilize the task developer subsystem 1550 to access information within database systems 1546 and modules within the server systems 104, such as the version/phase control subsystem 1528, the task module and work unit manager 1530, and the workload information 308. Customers may also check project results, add new work units, check defect reports, or accomplish any other customer or developer interface option made available, as desired.

Advantageously, the customer or developer may provide the details of the project to be processed, including specific program code and algorithms that will process the data, in addition to any data to be processed. In the embodiment shown in FIG. 15, this program code takes the form of a task module 1512 within the workload, while the data takes the form of work unit 1514. These two portions make up the project or workload component 1504 of each client agent 270. For a given project, the task module 1512 will likely remain relatively constant, except for version updates, patches or phase modifications, while the work unit 1514 will likely change each time processing of the data that it represents is completed. The project or workload component 1504 runs in conjunction with the base distributed processing system component 1506. When a different customer or project is started on a given client system, the project or workload component 1504 will typically be replaced, while the base distributed processing system component 1506 will likely remain relatively constant, except for version updates, patches or other modifications made for the distributed processing system.

Information sent from the server systems 104 to the client agents 270A, 270B ... 270C may include task modules, data for work units, and advertising information. Information sent from the client agents 270A, 270B ... 270C to the server systems 104 may include user information, system information and capabilities, current task module version and phase information, and results. The database systems

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1546 may hold any relevant information desired, such as workload information (WL) 308 and client capability vectors (CV) 620. Examples of information that may be stored include user information, client system information, client platform information, task modules, phase control information, version information, work units, data, results, advertiser information, advertisement content, advertisement purchase information, advertisement rules, or any other pertinent information.

Now looking to FIGS. 16, 17A, 17B, 18A and 18B, an embodiment for security features for the distributed processing of the present invention will be described. FIG. 16 provides a representation of the distributed processing environment including security subsystems. FIGS. 17A and 17B provide block diagrams of the communication interface between client systems and the server systems. And FIGS. 18A and 18B provide detailed block diagrams of an embodiment of security measures for the server systems and the client systems.

Referring to FIG. 16, an embodiment 1600 of a distributed processing system is depicted. Server systems 104 include a security subsystem 354 through which communications to and from the server systems 104 may be made secure. Client systems 108A, 108B ... 108C and client systems 108D, 108E ... 108F represent any number of client systems that may communicate with server systems 104 or with each other. Each of the client systems 108A, 108B, 108C, 108D, 108E and 108F include a security subsystem 272A, 272B, 272C, 272D, 272E and 272F, respectively. The electronic information 1602 represents information that the server systems 104 is to communicate to client systems 108A, 108B, 108C, 108D, 108E and 108F in a secure manner, so that no unintended or intercepting recipient may understand or tamper with the electronic information 1602, and so that no third party may insert non-authorized information into the distributed processing system 1600. Although not shown, it is understood that any one of the client systems 108A, 108B, 108C, 108D, 108E and 108F may have electronic information that is to be securely sent to the server systems 104 or to any other of the client systems 108A, 108B, 108C, 108D, 108E and 108F.

Electronic information 1602 represents information that is communicated to facilitate the operations of the distributed processing system 1600. Such information includes the client agents that are downloaded to each client system, the workload applications for any given workload, and any work unit that will be processed by a client system. Electronic information 1602 may also be any type of information to be sent or received within the distributed processing system, such as text, images, audio streams, video streams, databases, spreadsheets, PDF files, Shockwave data, Flash data, applications,

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data files, chat streams, or any other information, data or data streams. In addition, electronic information may be sent by client systems 108A, 108B, 108C, 108D, 108E and 108F to the server systems 104 and/or any of the other client systems.

The Certificate Authority (CA) block 1604 within the server systems 104 represents an entity that helps to ensure validity of encryption and decryption codes. For example, within a public/private key encryption environment, a Certificate Authority may help ensure that a public key alleged to be from a particular entity is in fact legitimately from that entity. One third-party entity that performs this CA function on the Internet is Verisign, Inc. Having a third-party perform the CA function can be advantageous in a transaction or communication between non-trusted entities. For example, the sending entity provides its public key information to the third-party CA, which verifies the information and creates a certificate that includes the sending entity's public key information. This certificate may then be encrypted and signed by the third-party CA. The receiving entity may then obtain the certificate from the third-party CA and decrypt it with the third-party CA's public key. The receiving party will then have the sending party's public key and be fairly secure that it is a legitimate public key from the sending party.

As shown in FIG. 16, the CA functionality may be part of the server systems 104, such that the server systems 104 act as their own Certificate Authority with respect to client systems108A, 108B, 108C, 108D, 108E and 108F and any other devices that are part of the distributed processing system. A third-party CA is not as needed in this distributed processing environment because the server systems 104 primarily direct the operations of the distributed processing system. Thus, there is less of a need for a third-party entity to provide a CA function. It is noted that CA functionality may be provided only by the server systems 104, only by third-party CAs, or any combination of server systems 104 and third party CAs, as desired for a particular embodiment. In addition, if desired, no CA functionality could be provided so that secure communications between the server systems 104 and the devices within the distributed processing system were conducted without the use of a Certificate Authority.

FIG. 17A is a block diagram of an embodiment 1700 for a communication interface between a client system 108 and the server systems 104. In this embodiment 1700, the network is preferably the Internet. As depicted, the client system 108 includes a client agent 270 and a network browser 1702. The server systems 104 include a client agent download site 1710, from which the client system 108 may download the client agent 270 through communications 1704. The server systems 104 also include block

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1712, which represents a variety of client service functions that may be provided by the web interface for the server systems 104 through communications 1706. For example, in a public/private key security environment, a client system 108 may download from block 1712 a Certificate Authority (CA) certificate that includes the server public key. In addition, the client system 108 may login to the web page interface for the server systems 104. And the server systems 104 may generate dynamic certificates. The client system 108 may also send and receive information to application server 1714 through communications 1708, for example, to receive project work units. Finally, as depicted, database systems 1546 may send information to and receive information from the blocks 1710, 1712 and 1714 of the server systems 104 through communications 1716, 1718 and 1720. As discussed more above, database systems 1546 may include any desired information, for example, a workload database 308 and/or a capability vector database 620.

FIG. 17B is a block diagram for an Internet communication protocol structure 1750 that may be utilized for communications 1704, 1706 and 1708. As depicted in FIG. 17B, three basic application layers are utilized by each client system 108 and the server systems 104 to communicate with each other. The TCP/IP layer 1756 represents a standard Internet communication protocol that allows devices to identify and send information to each other across the Internet, as is well known to those of skill in the art. The secure network layer (SNL) 1754, such as the secure socket layer (SSL), represents a protocol that allows devices to confirm the identity of servers and the other devices with whom they communicate, as long as those servers or other devices utilize similar protocols. The application security level 1752 represents other desired security or communication protocols that are implemented by programs running on the client system 108 and/or the server systems 104.

In operation, the server systems 104 may secure the download of the client agent 270 to the client system 108 by requiring that the client system 108 download the client agent 270 from the client agent download site 1710. As part of the server authentication sequence, the download site 1710 will send back an identifier to assure users that they are indeed connected to the proper server systems 104. This identifier may be, for example, a CA certificate, but may be any other identifier, as desired. Because it is desirable to have the client agent running on as many distributed devices as possible for the distributed processing system of the present invention, user authentication may not be required to download the client agent 270 from the download site 1710.

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Once a client system 108 has downloaded and installed the client agent 270, the client system 108 will communicate with the application server 1714 to begin working within the distributed processing system. For these communications, server and client authentication may be required to help ensure security. To accomplish this authentication, for example, two-way authentication may be utilized. To provide a public/private key combination for the client agent 270, each client agent 270 that is downloaded by a client system 108 may have embedded within its code a default identifier and a default public/private key pair. Thus, the server systems 104 may use secure network protocols (such as SSL or similar schemes) to authenticate each client system 108, and each client system 108 may use compatible protocols to authenticate each server application with which it communicates. These applications, for example, may include the functionality provided by blocks 1712 and 1714, and, therefore, the communications 1706 and 1708 would utilize authentication.

As an alternative to embedding a public/private key combination and associated identifiers or certificates into the client agent 270, the public/private key pairs may be dynamically generated in block 1712. For example, at start-up, at reboot or at some desired time or event, the client system 108 may generate a new public/private key pair. When the client system 108 next communicates with the server systems 104, the client system 108 request a certificate from the server systems 104. The server systems 104 may then act as a Certificate Authority (CA) and provide a CA certificate to the client system 108. This dynamic certificate generation, therefore, allows for added security by allowing each client system 108 to have its own public/private key pair for secure network protocol communications and by having this key pair change at some desired recurring event for the client system 108, such as reboot.

The client system 108 may initiate its communication with the server systems 104 by logging on to the authentication server, which may be part of block 1712. The user may be prompted to enter a valid e-mail address and/or password, if already registered, or may be asked to register if the e-mail address and/or password are not recognized. Once registration is completed, a password may be e-mailed back to the user to provide validation of the user. If authentication is successful when a user logs into the server systems 104, the server systems 104 may provide a host-ID, and user-ID and a session key for any given communication session.

It is also desirable that once a user has successfully registered, the user may install the client agent 270 on any number of other host or user systems without needing to interact with that systems network browser, other than to set host-specific preferences. For example, when downloaded, the client

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agent 270 may take the form of a self-extracting program that installs the appropriate files to the client system 108, including the proper host and user identifications. In addition, to help ensure proper identification, the session keys may be exchanged each time the client system 108 communicates with the server systems 104. For example, the client system 108 may communicate its current session key to the server systems 104 each time it communicates with the server systems 104. The server systems 104 will then send a new session key for the client system 108 to utilize for the next session. In this way, stale identification information may be reduced. In addition to this security feature, communications may also be encrypted and decrypted with various encryption techniques, as desired.

Referring now to FIGS. 18A and 18B, one embodiment will be discussed for a security model utilizing public/private key encryption. This security model utilizes a third-party CA to provide a CA certificate for the server systems 104.

FIG. 18A is a block diagram of an embodiment 1800 for security procedures implemented by server systems 104. Electronic information1602 is to be communicated to a client system 108. This electronic information 1602 travels through four different paths that provide security information.

One path begins with the electronic information 1602 being encrypted with the server private key in block 1802. Then, in block 1830, the encrypted information is sent to client systems. This encrypted information is represented by arrow 1826.

A second path flows from block 1802 to block 1804 where a hash value is generated for the encrypted electronic information. It is noted that a hash value is a unique value that may be generated for any given electronic file based upon the contents of that file and the algorithm used to calculate the unique value. There are any number of algorithms that may be used to calculate a hash value, as would be understood by one of skill in the art. Proceeding down the second path to block 1806, the hash value generated on the server side for the encrypted electronic information (i.e., the information sent to the client system from block 1830 via 1826) is compared with a hash value 1822 from the client system 108. This hash value 1822 represents the client system's calculation of the hash value for the encrypted electronic information that the client system 108 received from the server system 104. If no tampering has occurred and the data was transmitted accurately, the client system hash value should match the server hash value. In block 1808, the server systems 104 provide an indication of the result of the hash check evaluation back to the client system 108. This pass/fail determination is indicated by arrow 1824.

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A third path begins with block 1810 where a hash value is calculated for non-encrypted electronic information 1602. This hash value is then encrypted in block 1816 with the server private key. Next, this encrypted hash value is sent to the client system 108 in block 1818. The arrow 1821 represents the encrypted hash value for the non-encrypted electronic information.

A fourth path, and the last depicted in the embodiment 1800 of FIG. 18A, flows from block 1810 to block 1812, where the hash value is partitioned into N different portions. These N different portions are preferably designated for N different client systems 108, as well as any client systems 108 receiving a redundant distribution of any one of the N different portions. In block 1814, the N different hash value portions are encrypted with the server private key. Next, the N different encrypted hash value portions are sent in block 1820 to N different client systems 108, as well as being sent to client systems 108 receiving redundant distributions of the hash value portions. The arrows 1828 represent the distribution of the N different hash value portions. It is noted that redundant distribution of the N hash value portions is desirable because, as discussed below with respect to FIG. 18B, when the hash value is reconstructed by a client system 108, it is desirable to have multiple sources for each portion in case one of the receiving client systems is not available at any given time.

Looking now to FIG. 18B, the corresponding security procedures implemented by a client system 108 are discussed with respect to embodiment 1850. Initially, in block 1854, the client system 108 receives CA certificate 1852 containing the server public key and the server identity. It is again noted that other unique identifiers may be utilized instead of CA certificates, as described above. If a CA certificate is utilized, this CA certificate may be provided from a third-party Certificate Authority (CA) or from the server systems 104 or any other desired source. In block 1856, the client system 108 verifies the accuracy of the CA certificate using the CA's public key. If this verification is not successful, the client system 108 may wait some period of time before retrying. In addition, the time period may be a random period of time. In addition, as discussed with respect to FIGS. 17A and 17B, the client system 108 will login to the server systems 104. If this authentication is not successful in this login, the client system will notify the user of the system and the server systems 104, and then wait for some period of time or a random amount of time before attempting to re-verify.

In block 1862, the client system 108 receives the encrypted information 1826. Next, the client system 108 creates a hash value for the encrypted information in block 1864. This hash value is

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preferably calculated using the same algorithm utilized by the server systems 104 in generating the hash value for the encrypted information in block 1804 of FIG. 18A. Once the client system 108 has calculated the hash value for the encrypted information, this hash value 1822 is sent to the server systems from block 1866. As discussed above, a pass/fail response 1824 is sent back by the server systems 104. This hash check evaluation is received in block 1868. If the check was a FAIL, flow passes to block 1870 where the client system 108 sends out a notice to the server systems 104 and any other client system to which it is attached that a problem has been encountered. The client system 108 then ends the current connection with the server systems 104. It is noted that the client system 108 may retry several times before moving onto block 1870, and that the reporting scheme may be modified, altered or developed as desired.

If the hash check evaluation was a PASS, flow passes to block 1872 where the electronic information is decrypted with the server public key, which was verified in block 1856. A hash value is then calculated for the electronic information 1874. Again, the hash generation algorithm is preferably the same as that used by the server systems 104 in creating the hash value in block 1810 of FIG. 18A. Next, the hash value is sent from block 1874 to block 1886, where it is compared with two other hash value calculations.

One of the other hash values comes from a path that begins with block 1858, in which the client system 108 receives the encrypted hash value 1821 for the non-encrypted information. In block 1860, the encrypted hash value is decrypted with the server public key. The hash value is then sent to block 1886.

The third hash value for block 1886 comes from a path that utilizes the N different hash portions sent out by the server systems in block 1820 of FIG. 18A. In block 1876, the client system receives a portion 1828A of the partitioned hash value 1828. In addition to one of the partitioned hash values, it is noted that the server systems 104 will also send information providing the identity and source for the N-1 other hash value portions. In block 1878, the client system 108 decrypts the portion 1828A with the server public key. Next, in block 1880, the client system 108 resolves the identity of the source for the N-1 other portions, which may be N-1 other client systems. In block 1882, the client system 108 obtains the N-1 other portions, and assembles the N partitions into a hash value for the non-encrypted electronic information in block 1884. The resulting hash value is then sent to block 1886. It is noted, as indicated above, that redundant distribution of the N portions of the partitioned hash value is desirable so that

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unavailability of one client system will not cause another client system to be unable to re-assemble the N different portions.

Once the three hash values are received in block 1886 from three different sources, they are compared to see if they match. If this check is a FAIL, flow moves to block 1888, where the client system 108 sends out a notice to the server systems 104 and any other client system to which it is attached that a problem has been encountered. The client system 108 may also inform the client systems from which it received the N-1 other portions, and the client system 108 may retry the procedures, if desired. In addition, once a client system 108 is notified of a potential problem, the client system 108 may download a special check file from the server systems 104 to make sure that the server systems have not been compromised. If still a FAIL, the client system 108 then ends the current connection with the server systems 104. If the check is a PASS, the electronic information is utilized, as represented by block 1890.

FIGS. 19 and 20 provide block diagrams for further describing the distributed processing system and environment of the present invention that allows for third parties, such as network service providers, to monitize, or gain revenue from, their respective user bases.

Looking first to FIG. 19, a block diagram is depicted for a distributed processing system 100 and environment 1900 in which network service providers are enabled to monitize their user bases. Environment 1900 includes a distributed processing system 100, a customer 152, and a third-party network service provider 1902. The customer 152 represents an entity that has a project 1912 that the customer 152 would like processed by the distributed computing system 100. In return for the processing of the project data and the results 1914 of this processing, the customer 152 will often make a payment 1916. The third-party network service provider 1902 maintains a user database 1904 that identifies its user base 1920 including users 1906A, 1906B ... 1906C.

The service provider 1902 may be, for example, an Internet business that provides any of a variety of services to users, such as Internet access, e-mail, web page hosting, domain name hosting, file sharing services or any other Internet-based service. In addition, such Internet-based services may be offered for free or low cost to users, in which case the users have historically agreed to view banner or other advertisements in return for the free or low cost service. However, as stated above, advertising revenue has been subject to diminished pricing and has become a unreliable source of revenue for many

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Internet-based companies. To facilitate the number of projects that the distributed processing system 100 can take on and the speed at which these projects can be processed and completed, it is desirable to increase the amount and capabilities of the computing resources available to the distributed processing system 100. To the extent that the users of the service provider 1902 represent a pool of underutilized resources, these users represent a potentially valuable resource to the distributed processing system 100.

According to the present invention, the service provider 1902 may realize value from its user base and thereby monitize this user base by facilitating the use by the distributed processing system 100 of computing resources related to these users. Thus, for example, in return for free services, the users may agree to have their respective computing resources utilized by the distributed processing system 100. The service provider 1902 may then provide to the distributed processing system 100 the user identifications (IDs) 1908 related to its user base in return for revenue sharing 1910. This monitizing architecture according to the present invention thereby provides a significantly advantageous avenue for service providers or other entities that control or have user bases with useful processing capabilities, such as Internet-based service providers, to generate revenue from its user base, particularly in the face of falling revenue from other sources, such as advertising revenue.

The revenue sharing 1910 may be, for example, a share of payment 1916 relative to the amount of processing toward the project 1912 that was completed through the use of the user resources 1922 made available through users 1906A, 1906B ... 1906C. It is noted that the revenue sharing 1910 may take any desired form, including but not limited to (a) upfront payments based upon attributes of the user base, such as size or processing capabilities, (b) payments based upon the number of users that become members of the distributed processing system, (c) payments based upon the types of projects processed by the user base, or (d) any other desired compensation scheme related to the value of the user base being made available by the third party.

The monitizing invention, therefore, focuses on capabilities of internet, intranet, wireless or otherwise network connected PCs, internet appliances, notebook computers, servers, storage devices, NAS (Network Attached Storage), or any other connected computing device that could provide any of a number of useful capabilities and that is part of a underutilized user base, such as user bases of Internet-based businesses that rely on advertising or any other method of monitizing their user base in exchange for a valuable service (e.g. free internet access, email, etc.). As discussed above, these useful processing capabilities span the entire range of generic computing subsystems including: Central Processing Unit(s)

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(CPUs), Digital Signal Processor(s) (DSPs), Graphics Processing Engine(s) (GPEs), Hard Drive(s) (HDs), Memory (MEM), Audio Subsystem(s) (ASs), Communications Subsystem(s) (CSs), Removable Media Types (RMs), or other Add-In/On Accessories (A/OAs) with potentially useful unused capabilities. Market creation and potential compensation for all unused capabilities can be accomplished through the massively parallel distributed software architecture of the distributed processing system 100. For example, credits (revenues) would be generated each time a unit of work is accomplished by one (or more) of the subsystems on a user's computing device via a client agent installed on the device for the purposes of managing, processing and completing units of work. The total credits/revenues generated may be, for example, dynamic depending on how many are received. Through this architecture of the present invention, significant revenues may be generated from the user base of the service provider where the service provider may have previously been unable to monitize effectively this user base.

It is further noted in more general respects that the entity 1902 may be any entity that has direct or indirect control over a group of users, such that the users resources may be offered to and utilized by the distributed processing system 100. An example of one such more general entity would be a company that has a large group of internal users that are capable of being linked to the distributed processing system 100, for example, through an intranet network of computer systems or computing devices. The computing resources related to these users may also be monitized according to the present invention.

Looking now to FIG. 20, a block diagram for an embodiment 2000 representing the components for a client agent 270 along with a representative indication of responsibility for those components. Client agent 270 includes a core agent component 1502, a project component 1504 and a user interface component 1510. As discussed above, the core agent component 1502 can provide the base distributed processing functionality for the client agent 270. The project component 1504 can provide the project-specific functionality for the client agent 270. And the user interface 1510 can provide any desired user viewable information or interaction functionality. These three general components may be modular software components such that the project component 1504, the core agent component 1502, and the user interface component 1510 may be separate software modules, if desired, that link together through appropriate APIs (Application Programming Interface). Thus, each of these components may be designed and developed independently or jointly, as desired. In effect, the core agent component 1502 can provide a backbone upon which is attached the project component 1504, the user interface component 1510, and any other desired component. Thus, when a new project or interface is desired for any given client agent 270, for example, this component may be efficiently replaced with the new

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component in a modular fashion still utilizing the core agent component 1502 as the backbone. In addition, each component may be updated and modified without requiring modification or updates to the other component software code.

Also depicted in FIG. 20 are customer 152, distributed processing system (DPS) 100 and service provider 1902, which are in communication with each other through interactions or interfaces 2012 and 2014. In this embodiment of FIG. 20, the customer 152 is represented as providing the software development and code 2002 for the project component 1504. The distributed processing system 100 is represented as providing the core agent code 2008 for the core agent component 1502. And the service provider is represented as providing at least a portion of the interface development and code 2010 for the user interface component 1510. In operation, the workloads 2004 and the results 2006 would still typically be under the control of the distributed processing system 100.

It is noted that this modular architecture facilitates the development of project software code and interface software code by entities other than the owner of the distributed processing system 100. For example, with respect to FIG. 19, an Internet-based service provider may have a user interface already designed and implemented for its user base, such as a web browser user interface for users of free Internet access services provided by such a service provider. Once the core agent component 1502 is installed on a user's computer, the existing third-party user interface may hook into the core agent component 1502, thereby making the user's resources available to the distributed processing system 100, while maintaining the user interface the user has come to expect from the service provider. Thus, the service provider 1902 may provide the user interface it desires for the service it is providing, while at the same time monitizing its user base by facilitating its users becoming part of the available resources for the distributed processing system 100.

FIG. 21 provides a block diagram for an embodiment 2100 for a distributed processing system that provides network attached storage (NAS) services, according to the present invention. Although the distributed computing, client agent, file sharing and distributed data storage functionality, as described above, provides data storage that is connected to a network, the NAS embodiment 2100 depicted in FIG. 21 is provided herein for additional explanation. In particular, standard NAS device functionality provided by typical dedicated NAS devices can be accomplished according to the present invention by utilizing unused or under-utilized resources on network-connected devices through capabilities provided by the client agent running on those devices. The resulting software-based NAS services hosted on a

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distributed computing platform, according to the present invention, thereby provide an advantage storage solution.

As with other embodiments described above, the NAS embodiment 2100 focuses on taking advantage of unused or under-utilized capabilities of Internet, intranet, wireless or otherwise network connected personal computers (PCs), internet appliances, notebook computers, servers, storage devices or any other connected computing device. Such devices have typically been put into operation for purposes entirely separate from operating as a part of a distributed processing or storage system and have a primary operational purpose that is not to provide NAS services. Through the client agent and infrastructure implementation of the present invention, such devices can provide storage capabilities that allow these devices to appear to users as dedicated NAS devices, while still being used for the purpose for which they were put into operation. For example, a large number of desktop PCs in the enterprise (Intranet) or on the Internet can each act as a NAS device by running a client agent program and NAS component that brings its resources to the network with the appearance of a dedicated NAS device or as part of an integrated system that appears as a single or dedicated NAS device. The implementation can be accomplished in a variety of ways. A relatively simple implementation is to have the devices simply mimic the functionality of stand-alone NAS devices, while a more complex implementation is to provide a storage fabric across the Intranet or Internet where hundreds or thousands of devices work cooperatively as NAS devices in conjunction with server systems that assist in controlling and managing the storage function of the NAS fabric.

Looking now to FIG. 21, the NAS embodiment 2100 includes a network 102, which as discussed above, can be any network communication fabric that provides connectivity between various machines. As shown, connected to this network 102 are a user device fabric 2102, a client device fabric 2104, and servers systems 104 and 154D. More particularly, the user device fabric 2102 may include any number of potential user devices 152A, 152B ... 152C. The client device fabric 2104 may include any number of potential client devices 108A, 108B ... 108C. It is noted that that the user devices 152A, 152B ... 152C may be configured to communicate directly to each other, the client devices 108A, 108B ... 108C may be configured to communicate directly to each other, and the user devices 152A, 152B ... 152C and the client devices 108A, 108B ... 108C may be configured to communicate directly between themselves without intervention by the server systems, if desired. The servers systems may include user server systems 154D, which have attached database systems 2112, and NAS server systems 104, which have attached NAS database systems 2108 and a centralized data location library 2110. To provide NAS

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functionality, the client devices 108A, 108B ... 108C run a client agent, as described above, that provides NAS functionality, for example, by running a NAS component as one of the projects for the distributed device. In addition, some of these NAS devices, such as NAS client devices 108A and 108B, may store distributed data location information, such as data location libraries 2106A and 2106B.

The NAS distributing computing embodiment 2100 depicted provides an environment in which a variety of different NAS configurations may be utilized, as desired. These configurations include, for example, at least three different NAS architectures that may be utilized: a stand-alone only NAS device implementation, a NAS device fabric implementation, and a server assisted implementation. It is noted that variations, combinations and hybrids of the these implementation examples may be utilized, as desired, without departing from the present invention.

First, the NAS client devices within the client device fabric 2104 can act as stand-alone NAS devices, and the user devices within the user device fabric 2102 can directly access them as such. In this first implementation, the NAS devices 108A, 108B ... 108C run client agent programs that configure the devices to be capable of mimicking dedicated stand-alone NAS devices. Each of these software-based NAS devices is self-contained, knows nothing of other software-based NAS or other NAS devices, and operates like a standard dedicated NAS device, except for the fact that the software-based NAS devices 108A, 108B ... 108C are actually non-dedicated devices that rely on spare and/or unused capabilities of the existing devices to provide NAS services. In this stand-alone only implementation, the data location libraries 2106A and 2106B would not be required to be utilized.

Second, at least some of the NAS client devices within the client device fabric 2104 include data location information or libraries that are used to provide links or directions to data distributed on the various NAS client devices 108A, 108B ... 108C. These links help provide a NAS device fabric from which user server systems 154D and user devices 152A, 152B ... 152C within the user device fabric 2102 can draw storage resources. For example, in the embodiment shown in FIG. 21, NAS client devices 108A and 108B can have data location libraries 2106A and 2106B, respectively. These libraries provide information to a user about where desired data is stored across the entire NAS client device fabric 2104, for example, by providing a distributed database index of the files and other data being stored on the myriad of software-based NAS devices. This database index, or portions thereof, can be stored within each data location library and can be organized as desired to provide direction information for users. In this NAS device fabric implementation, the NAS client devices 108A, 108B ... 108C

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provide both storage and data location functionality, thereby acting both to provide data storage services and distributed data location services. The NAS devices storing the data location information, for example, would receive storage and access requests from user devices and would direct the user devices to the distributed devices storing the requested data. This NAS device fabric implementation would again rely upon client agent programs running on the client devices and would not require the use of centralized server resources to enable the system to perform the NAS services. It is noted that not all software-based NAS devices need to act as both stores of information and location information hosts, such as NAS client device 108C, as depicted in FIG. 21.

In the third server assisted architecture, server systems 104 facilitate the NAS functionality, for example, by providing centralized management, control and support for the NAS architecture. To this end, the NAS servers systems 104 may include, for example, file storage database systems 2108 and a centralized data location library 2110. In this implementation, therefore, the NAS client devices 108A, 108B ... 108C that are running client agents which make them capable of mimicking dedicated NAS devices are combined with centralized database and server systems 104, 2108 and 2110 that provide services, such as indexing, monitoring, back-up, security and other services for the files and other data being stored on the multitude of software-based NAS devices creating the NAS fabric. Thus, the NAS server systems storing data location information in the centralized data location library 2110, for example, would receive storage and access requests from user devices and would at least in part direct the user devices to the distributed devices storing the requested data. It is noted that the server systems 104 could direct the users to the requested data using only the centralized data location library 2110 or with assistance from other resources such as the data location information stored by the NAS devices.

It is further noted, as also discussed above, that the NAS server systems 104, as with the user server systems 154D, are typically a single server machine or a relatively small group of server machines that are commonly controlled and managed, for example, as to physical location and authorized use. In contrast, the user device fabric 2102 and the client device fabric 2104 are typically a multitude of devices that do not have clear bounds. For example, with respect to Internet-connected user devices and client devices, these devices are typically not related and not commonly controlled or managed. With respect to intranet-connected user devices and client devices, there will often be more common control and management, for example, with respect to internal company computer resources. As contemplated by the present invention, once the software-based NAS functionality is implemented, any of a variety of

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user devices 152A, 152B ... 152C and/or user server systems 154D may take advantage of the software-based NAS resources made available by the distributed computing system of the present invention.

In providing NAS services, it is advantageous for the software-based NAS implementation of the present invention to remain unobtrusive to the end-user or owner of the device from a storage perspective. It is also advantageous to facilitate the full use of available storage space. To help achieve and ensure these objectives, the NAS implementation may undertake a number of controls to minimize interference with user storage operations while maximizing the storage value of the software-based NAS solution. These controls may include user or server controlled management features and may include, for example, user specified constraints, standard bit, block or file priority levels and direct bit or file priority markings. Using such storage priority controls, the present invention may maximize storage space efficiency by helping to take advantage of the storage space so that it is operated at a full level. It is noted that these storage priority controls may also be utilized for activities and operations, other than NAS services, that are being provided by a client agent program running on a distributed device.

With respect to the user specified constraints, the client agent program running on a device would recognize and adhere to user-based constraints that may be specified by the user. These constraints may be set by a user, owner, administrator, etc. for the device and may include settable parameters such as a maximum allowed percentage for use of existing storage space, a maximum number of bytes that may be used (MB, GB, TB, etc.), or a minimum amount of storage space that must be left free within the available storage. When these user-based constraints are utilized, the NAS component will recognize the constraints placed on it and adhere to the constraints, up to and including, deleting all shared storage on the device and becoming dormant.

With respect to storage priority levels, the client agent program may rely upon priority levels for bits on the storage device, blocks of data on the device, files on the device, or fragments of files on the device to determine and facilitate how data storage is managed. By using storage priority levels, any of a wide variety of schemes may be implemented for handling storage and storage conflicts and these schemes may be selected depending upon the circumstances for any given client system. In this way, when space on the device is running low, older or less important data or files can be deleted according to fixed or dynamic algorithms. For example, file or data assessment and storage management schemes could include, but are not limited to, a deletion scheme that uses an algorithm, such as one of the following:

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- Timing of storage, for example, straight first-in-first-out (FIFO), last-in-last-out (LIFO) or other time/order based algorithm.
- Usage of the files, for example, least-recently-used (LRU), most-recently-used (MRU), etc. cache schemes.
- File content, for example, content based analyses that base decisions on actual file content, such as whether the file or its data is replicated elsewhere in the system, whether the file or its data can be retrieved from other sources outside the current NAS implementation (tape back-up, Internet, etc.), whether the file is a music, video or audio file that can be retrieved from the Internet, etc.
- Duplicate data, for example, back-up set order, age, etc. for backed up files where needed space could be obtained by deleting older backup files or sets where more recent backup files or sets exist.
- Loss-robustness, for example, losing a few bits of data from an audio stream or video stream would not materially damage the retrieval of the data type.

With respect to direct bit, block or file priority marking, the files or data could include a direct marking for QoS (quality of service) levels that would allow efficient management of storage. By using such a direct marker, a file system priority level may be achieved that resembles execution thread priorities in modern operating systems that help fully utilize the processing power of a central processing unit (CPU). Thus, as each program running on a computer may have a CPU-related service level designation, each file or set of data stored on a storage device may include a storage priority level designation. The level of service provided to any given file or set of data by a control and management scheme may then be determined by the storage priority level designation for that file or set of data.

Further modifications and alternative embodiments of this invention will be apparent to those skilled in the art in view of this description. It will be recognized, therefore, that the present invention is not limited by these example arrangements. Accordingly, this description is to be construed as illustrative only and is for the purpose of teaching those skilled in the art the manner of carrying out the invention. It is to be understood that the forms of the invention herein shown and described are to be taken as the presently preferred embodiments. Various changes may be made in the shape, size and arrangement of parts. For example, equivalent elements may be substituted for those illustrated and described herein, and certain features of the invention may be utilized independently of the use of other

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features, all as would be apparent to one skilled in the art after having the benefit of this description of the invention.

EFS-Web 2.2.6 build 4.5.6.0

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Claims

What is claimed is:

1. A method of operating a distributed processing system to provide network attached storage (NAS) services, comprising:

configuring a client agent program to have a software-based NAS component and to take advantage of unused or under-utilized resources of a plurality of network-connected distributed devices put into operation for purposes distinct from operating the client agent program to provide NAS services; and

utilizing the plurality of distributed devices running the client agent to provide NAS services to network-connected user devices, the network-connected user devices recognizing at least a portion of the plurality of distributed devices as dedicated NAS devices.

2. The method of claim 1, wherein at least a portion of the plurality of network-connected distributed devices operate only as stand-alone dedicated NAS devices without knowledge of other NAS devices connected to the network.

3. The method of claim1, wherein at least one of the network-connected distributed devices stores location information for data stored by the plurality of network-connected distributed devices.

4. The method of claim 3, further comprising utilizing at least one of the distributed devices storing data location information to receive data storage and access requests from the user devices and to direct the user devices to the distributed devices storing the requested data.

5. The method of claim 4, wherein the plurality of network-connected distributed devices provide NAS services without relying upon a centralized server system.

6. The method of claim 1, further comprising managing the NAS services provided by the plurality of network-connected distributed devices at least in part utilizing at least one centralized server system.

7. The method of claim 6, wherein the server system downloads the NAS component to the plurality of network-connected distributed devices, the NAS component configured to operate as part of the client agent program already installed on the distributed devices.

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8. The method of claim 6, wherein the centralized server system stores location information for data stored by the plurality of network-connected distributed devices and at least in part directs the user devices to the distributed devices storing the requested data.

9. The method of claim 8, further comprising utilizing the server system to receive data storage and access requests from the user devices and to allocate data storage and access workloads to the plurality of distributed devices based upon individual capabilities of the plurality of distributed devices, the individual capabilities being stored in a database by the server system.

10. The method of claim 9, wherein plurality distributed devices are connected to the Internet.

11. The method of claim 1, further comprising managing storage resources for the plurality of distributed devices using a storage priority control that facilitates full use of available storage resources.

12. The method of claim 11, wherein the storage priority control comprises a parameter selectable through the client device.

13. The method of claim 11, wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion.

14. The method of claim 11, wherein the storage priority control comprises a priority marking directly given to data or files.

15. A distributed processing system providing network attached storage (NAS) services, comprising:

a client agent program configured to have a software-based NAS component and to take advantage of unused or under-utilized resources of a network-connected distributed device put into operation for purposes distinct from operating the client agent program to provide NAS services; and

a plurality of network-connected distributed devices running the client agent program to provide NAS services to network-connected user devices, the network-connected user devices recognizing at least a portion of the plurality of distributed devices as dedicated NAS devices.

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16. The distributed processing system of claim 15, wherein at least a portion of the plurality of network-connected distributed devices operate only as stand-alone dedicated NAS devices without knowledge of other NAS devices connected to the network.

17. The distributed processing system of claim 15, wherein at least one of the network-connected distributed devices stores location information for data stored by the plurality of network-connected distributed devices.

18. The distributed processing system of claim 17, wherein the distributed devices storing data location information is configured to receive data storage and access requests from the user devices and to direct the user devices to the distributed devices storing the requested data.

19. The distributed processing system of claim 18, wherein the plurality of network-connected distributed devices provide NAS services without relying upon a centralized server system.

20. The distributed processing system of claim 15, at least one centralized server system managing at least in part the NAS services provided by the plurality of network-connected distributed devices.

21. The distributed processing system of claim 20, the NAS component is configured to be downloaded from the server system to the plurality of network-connected distributed devices, the NAS component configured to operate as part of the client agent program already installed on the distributed devices.

22. The distributed processing system of claim 20, wherein the centralized server system is configured to store location information for data stored by the plurality of network-connected distributed devices and at least in part to direct the user devices to the distributed devices storing the requested data.

23. The distributed processing system of claim 22, wherein the server system is configured to receive data storage and access requests from the user devices and to allocate data storage workloads to the plurality of distributed devices based upon individual capabilities of the plurality of distributed devices, and further comprising a capabilities database connected to the server system and storing capability parameters for the plurality of distributed devices.

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24. The distributed processing system of claim 23, wherein plurality distributed devices are connected to the Internet.

25. The distributed processing system of claim 15, further comprising a storage priority control associated with the storage resources for the plurality of distributed devices, the storage priority control configured to facilitate full use of available storage resources.

26. The distributed processing system of claim 25, wherein the storage priority control comprises a parameter selectable through the client device.

27. The distributed processing system of claim 25, wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion.

28. The distributed processing system of claim 25, wherein the storage priority control comprises a priority marking directly given to data or files.

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Abstract of the Disclosure

Software-based network attached storage (NAS) services hosted on a massively distributed computing system are disclosed. More particularly, a client agent program is configured to run on the network-connected client devices that are part of the distributed computing system to provide what appears to user devices as dedicated NAS functionality, for example, through the Internet or an intranet. This NAS functionality takes advantage of unused or under-utilized resources of these distributed devices to advantageously provide NAS capabilities. In addition, storage priority controls may be utilized to facilitate the full use of available storage resources, such as user specified constraints, standard bit, block or file priority levels and direct bit, block or file priority markings.

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FIG. 1A

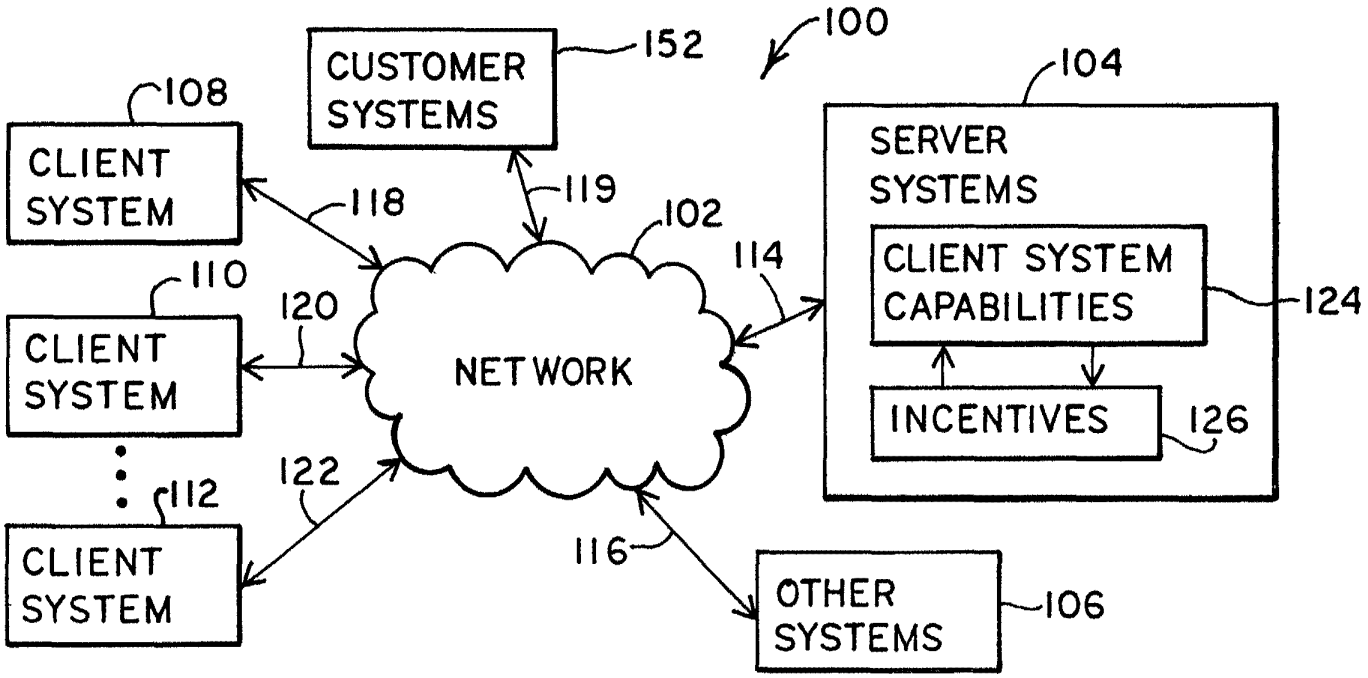
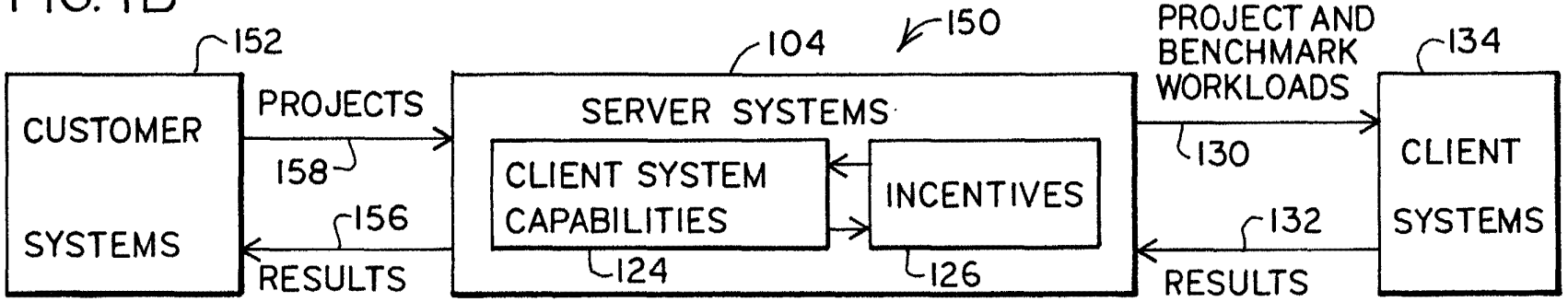

100
CUSTOMER SYSTEMS
152
104
SERVER SYSTEMS
108
CLIENT SYSTEM
118
119
102
114
CLIENT SYSTEM CAPABILITIES
124
110
120
CLIENT SYSTEM
NETWORK
INCENTIVES
126
122
112
CLIENT SYSTEM
116
OTHER SYSTEMS
106

FIG. 1B


152
CUSTOMER SYSTEMS
PROJECTS
158
156
RESULTS
104
150
SERVER SYSTEMS
CLIENT SYSTEM CAPABILITIES
124
INCENTIVES
126
PROJECT AND BENCHMARK WORKLOADS
130
132
RESULTS
134
CLIENT SYSTEMS

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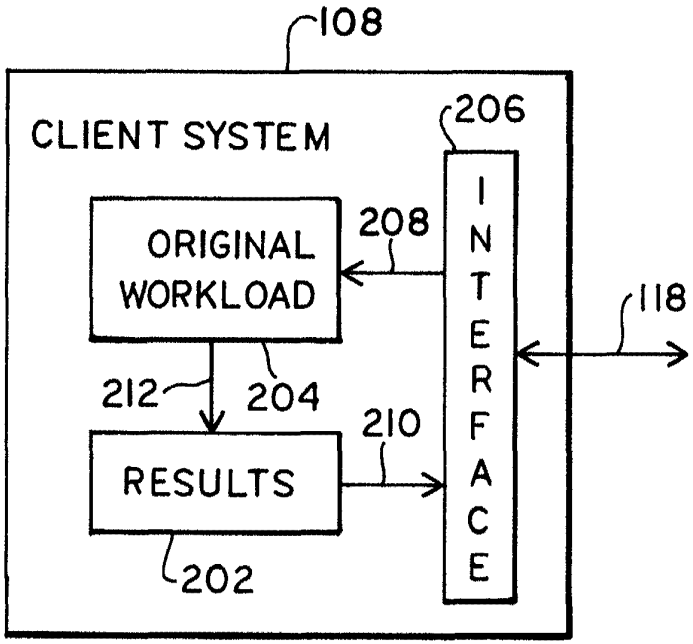


FIG. 2A

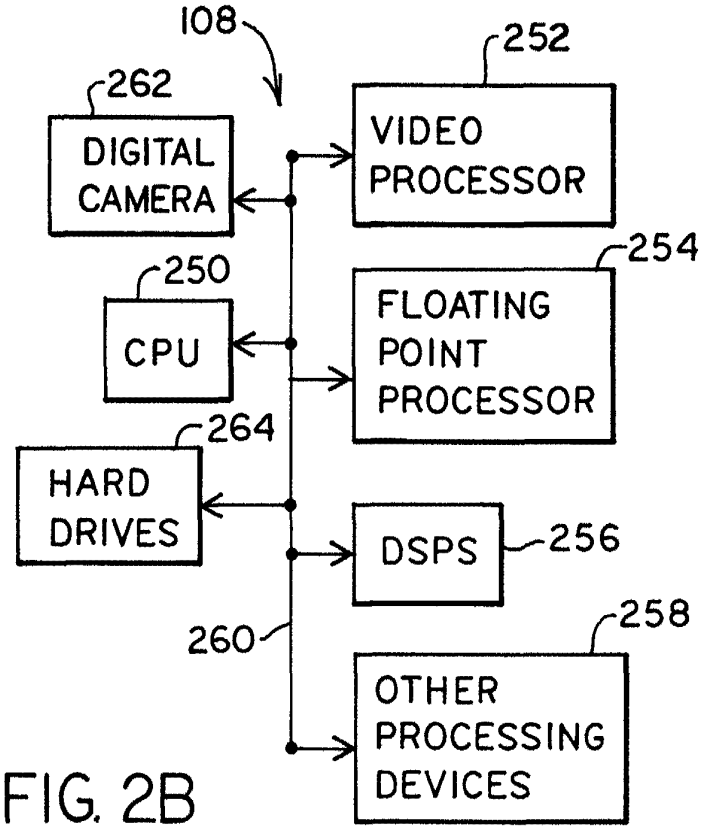


FIG. 2B

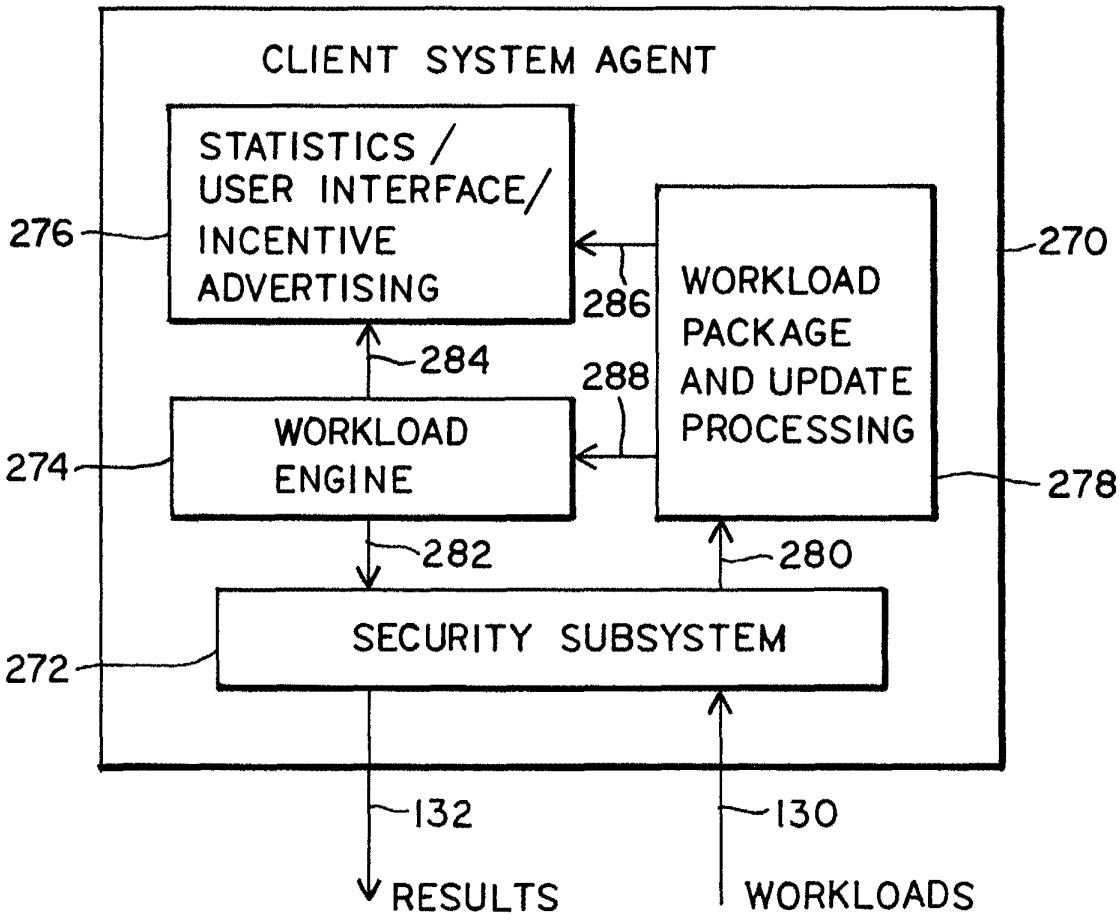

CLIENT SYSTEM AGENT
STATISTICS / USER INTERFACE/ INCENTIVE ADVERTISING
276
286
WORKLOAD PACKAGE AND UPDATE PROCESSING
270
284
288
WORKLOAD ENGINE
274
278
282
280
SECURITY SUBSYSTEM
272
132
130
RESULTS
WORKLOADS

FIG. 2C

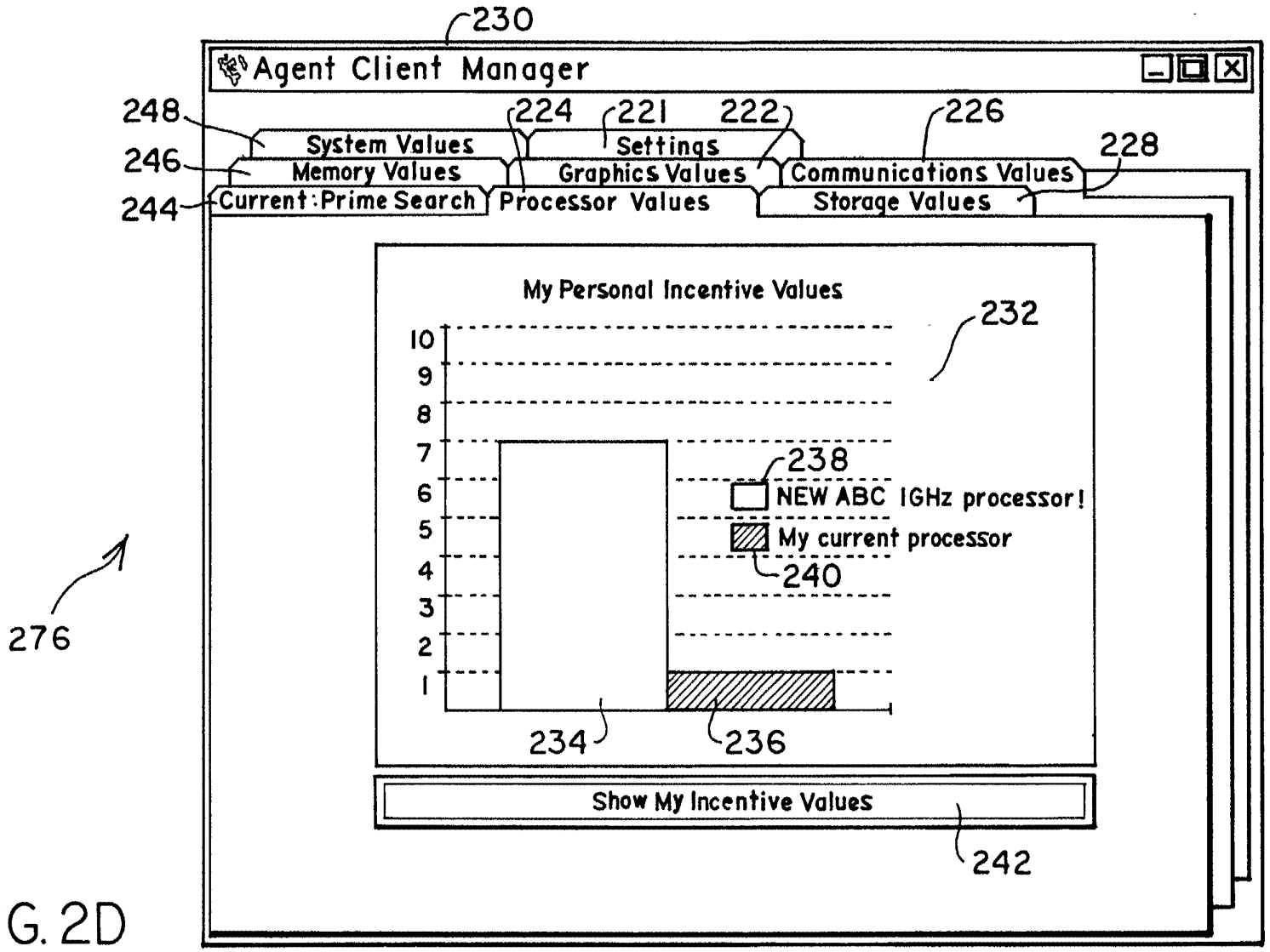

230
Agent Client Manager
248
246
244
224
221
222
226
228
System Values
Settings
Memory Values
Graphics Values
Communications Values
Current: Prime Search
Processor Values
Storage Values
My Personal Incentive Values
232
10
9
8
7
6
5
4
3
2
1
238
NEW ABC 1GHz processor!
My current processor
240
234
236
Show My Incentive Values
242
276

FIG. 2D

TOETHO" 582ESE60

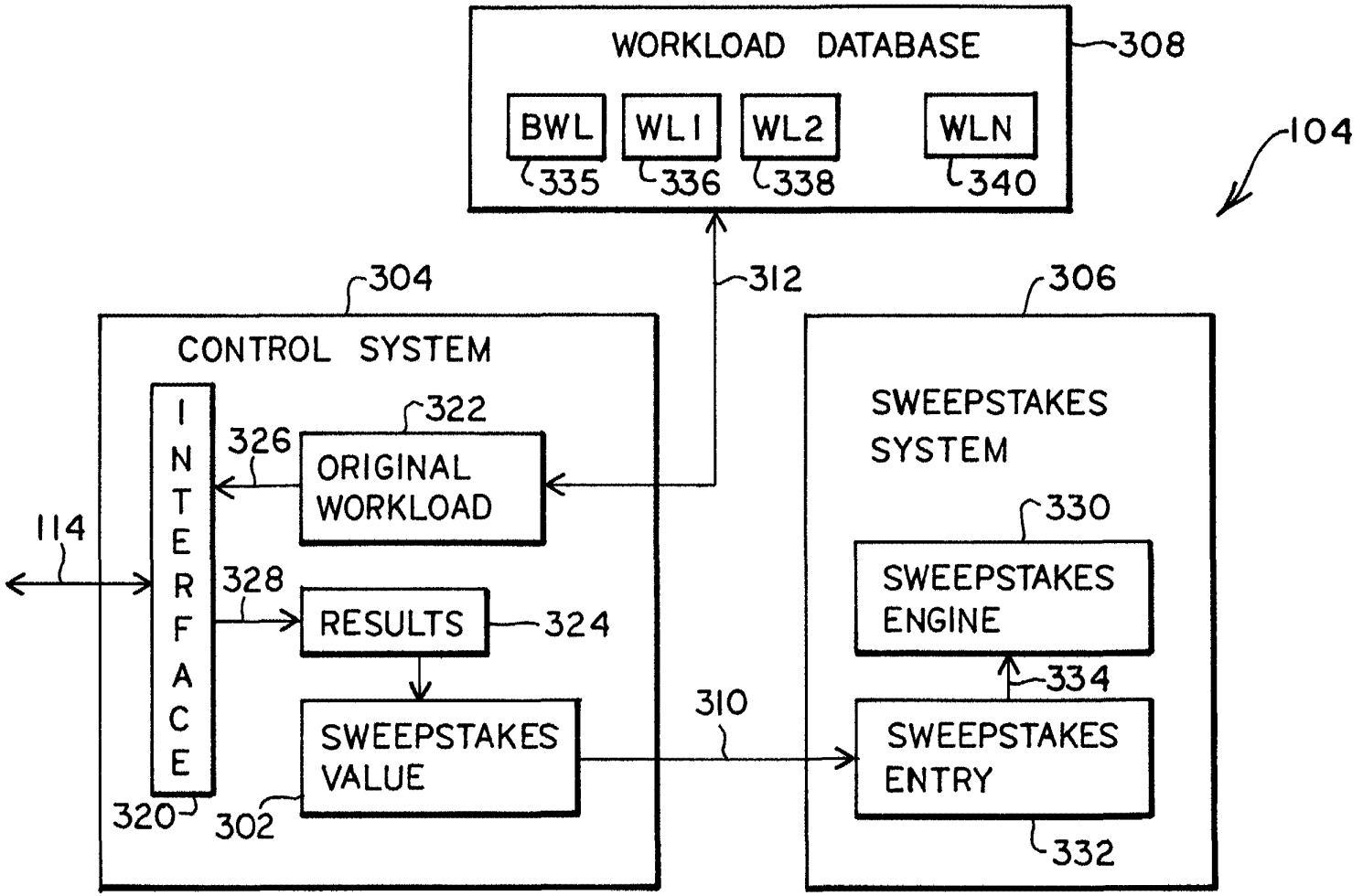


FIG. 3A

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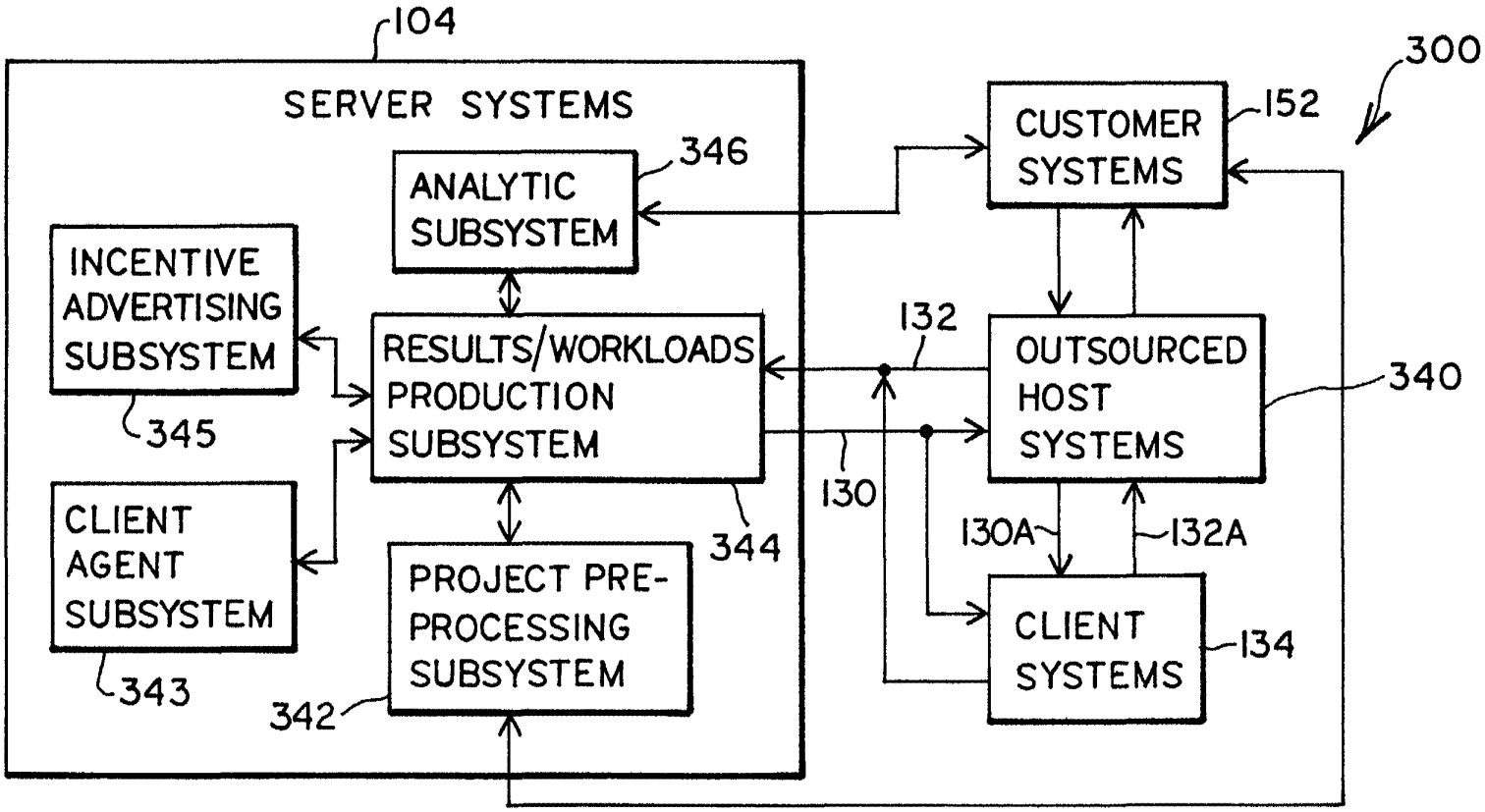


FIG. 3B

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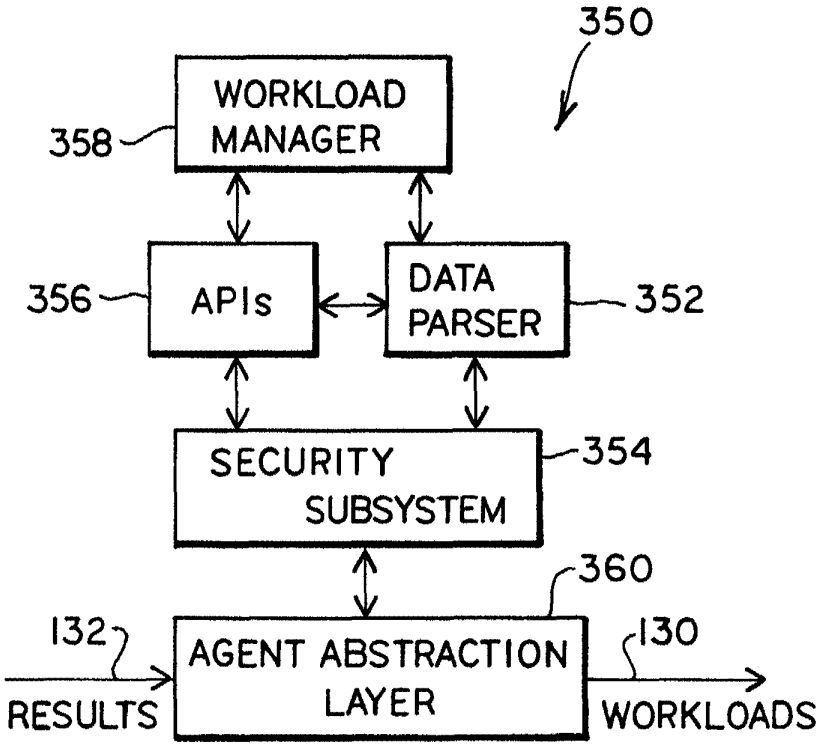


FIG. 3C

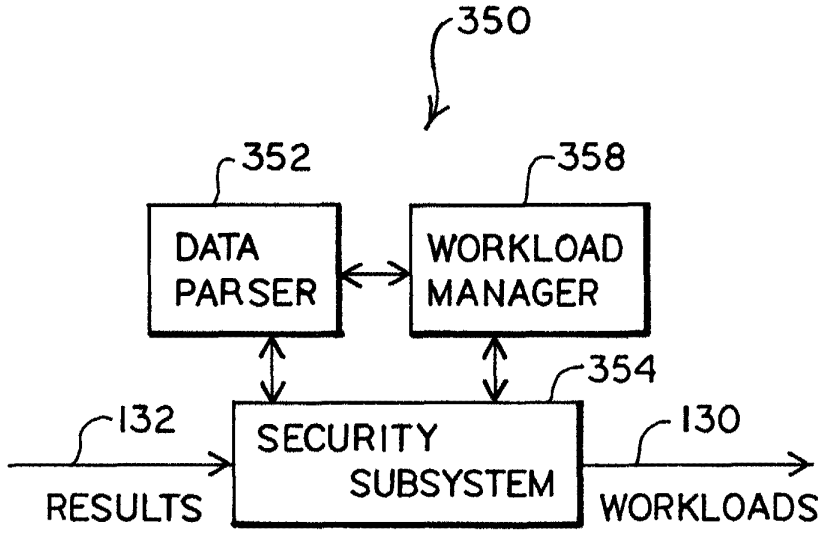


FIG. 3D

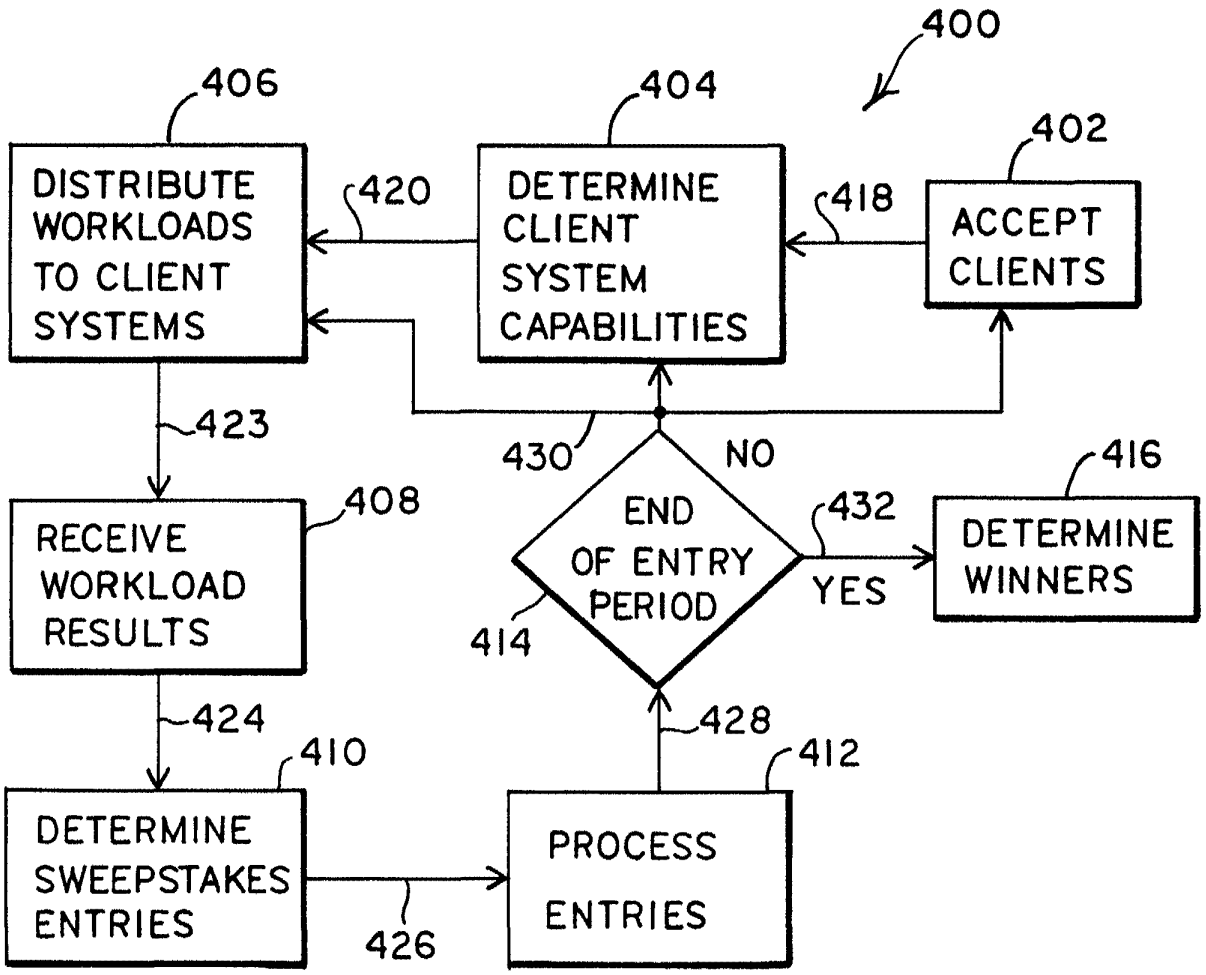

400
406
404
402
DISTRIBUTE WORKLOADS TO CLIENT SYSTEMS
420
DETERMINE CLIENT SYSTEM CAPABILITIES
418
ACCEPT CLIENTS
423
430
NO
416
408
RECEIVE WORKLOAD RESULTS
END OF ENTRY PERIOD
432
DETERMINE WINNERS
YES
414
424
428
410
412
DETERMINE SWEEPSTAKES ENTRIES
PROCESS ENTRIES
426

FIG. 4

TOETHO" 58Z4E960

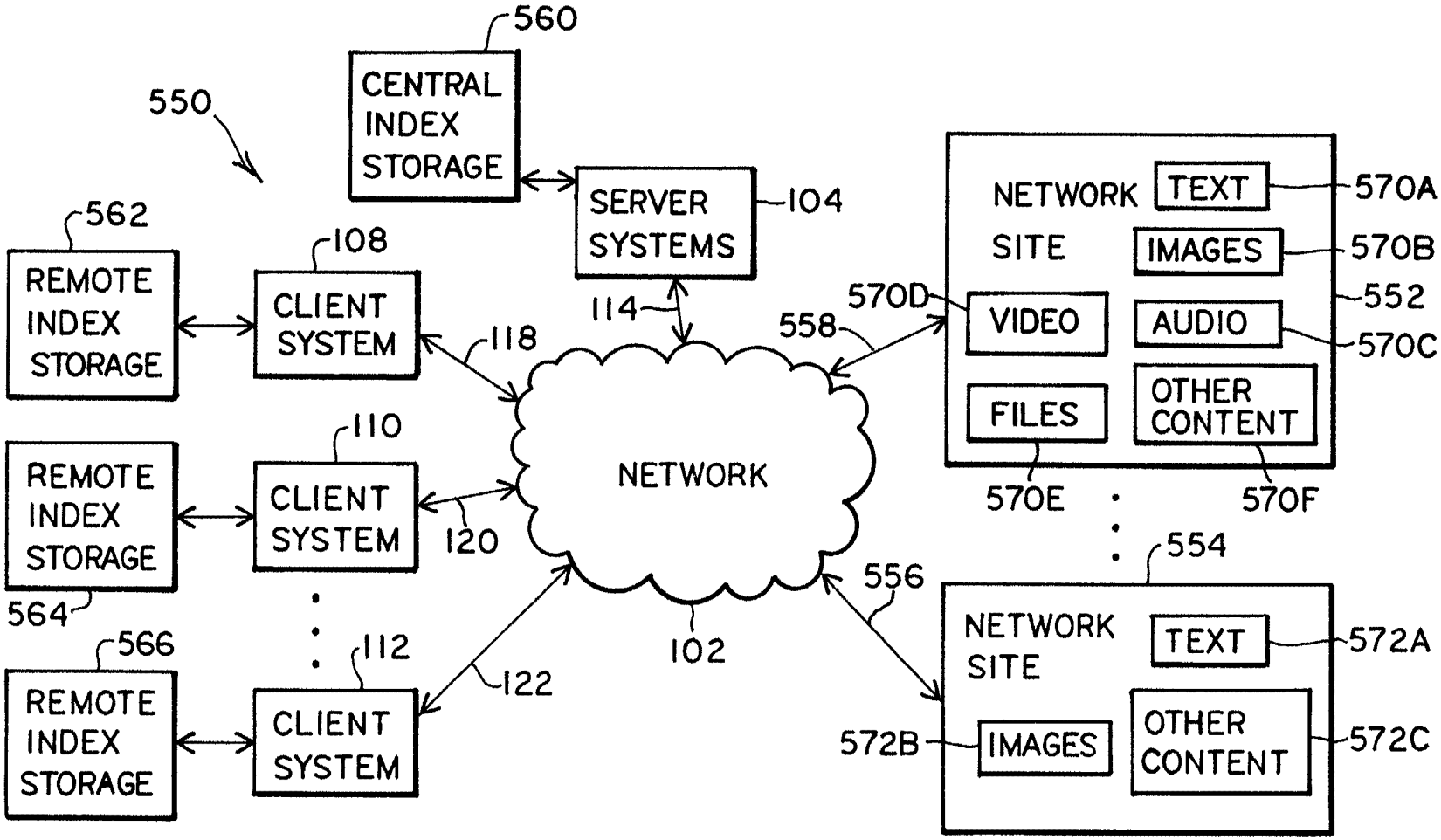


FIG. 5A

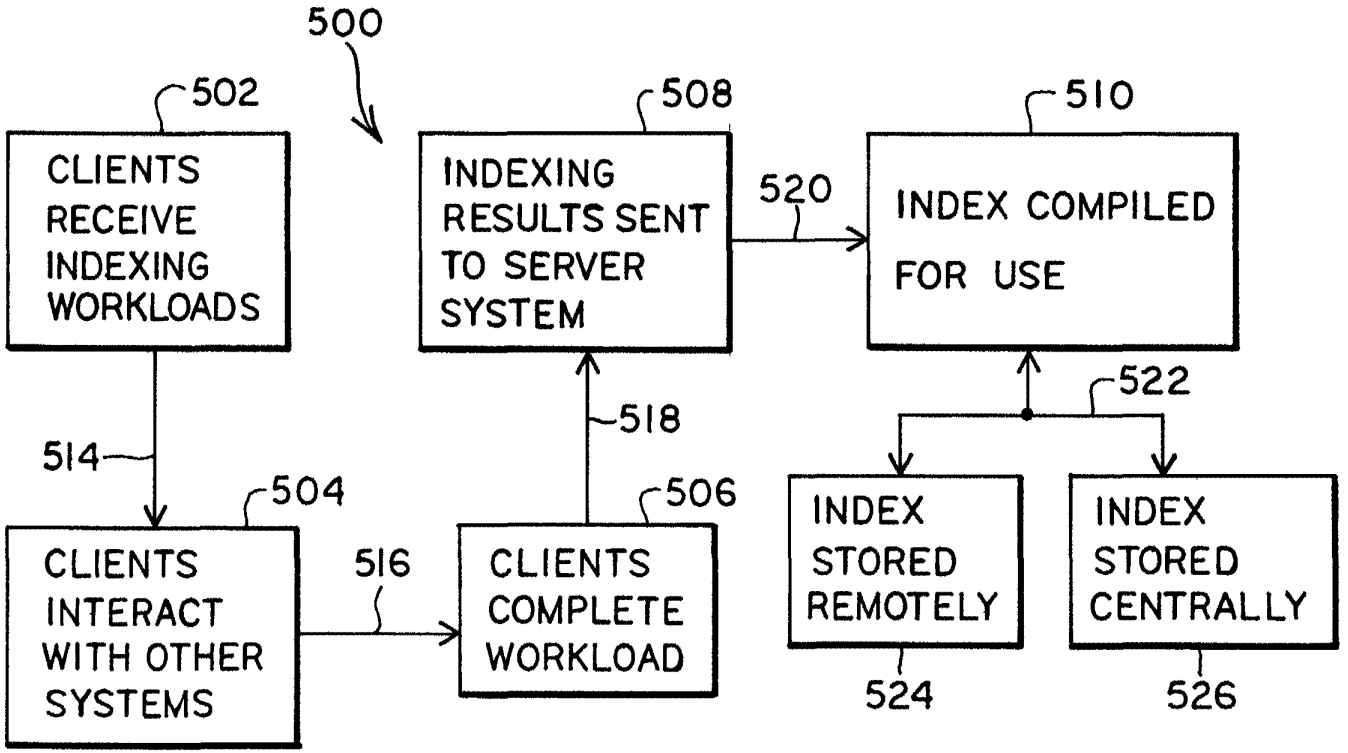

500
502
CLIENTS RECEIVE INDEXING WORKLOADS
508
INDEXING RESULTS SENT TO SERVER SYSTEM
520
510
INDEX COMPILED FOR USE
522
514
518
504
CLIENTS INTERACT WITH OTHER SYSTEMS
516
506
CLIENTS COMPLETE WORKLOAD
INDEX STORED REMOTELY
524
INDEX STORED CENTRALLY
526

FIG. 5B

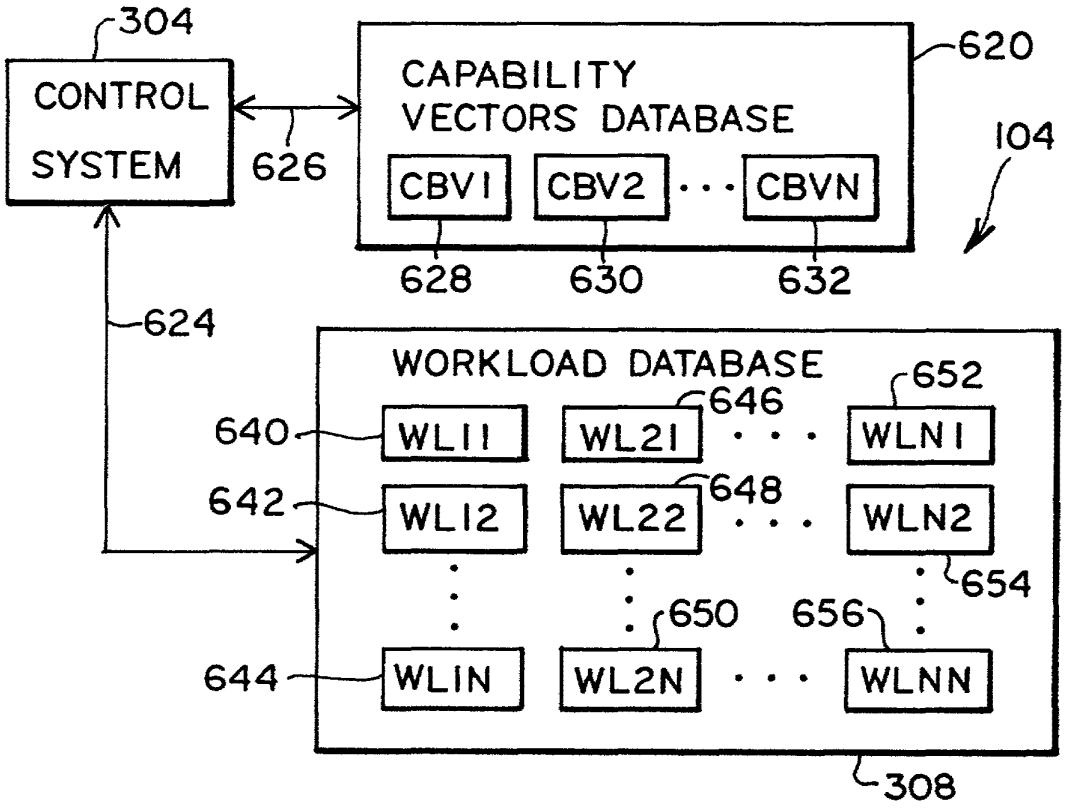

304
CONTROL SYSTEM
626
CAPABILITY VECTORS DATABASE
620
104
CBV1
CBV2
CBVN
628
630
632
624
WORKLOAD DATABASE
652
646
640
WL11
WL21
WLN1
642
WL12
WL22
648
WLN2
654
650
656
644
WLIN
WL2N
WLNN
308

FIG. 6A

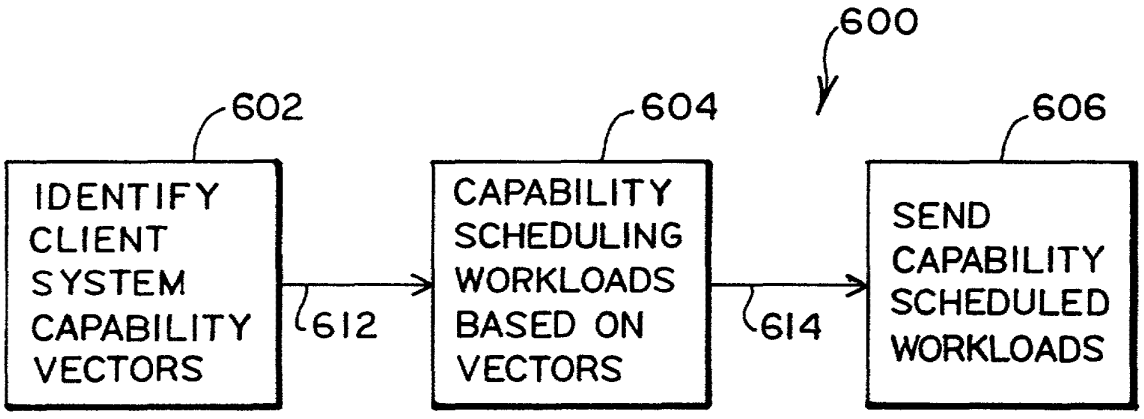

600
602
604
606
IDENTIFY CLIENT SYSTEM CAPABILITY VECTORS
612
CAPABILITY SCHEDULING WORKLOADS BASED ON VECTORS
614
SEND CAPABILITY SCHEDULED WORKLOADS

FIG. 6B

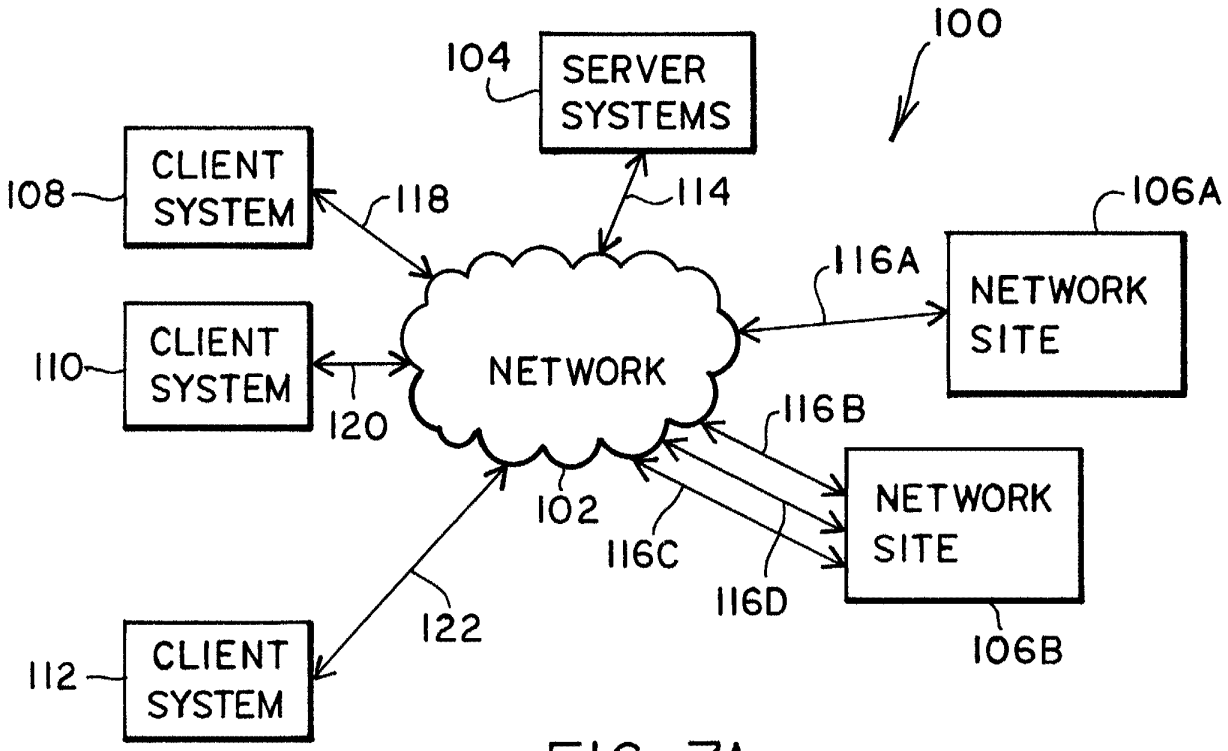

100
104
SERVER SYSTEMS
108
CLIENT SYSTEM
118
114
106A
116A
NETWORK SITE
110
CLIENT SYSTEM
NETWORK
120
116B
NETWORK SITE
102
116C
116D
122
106B
112
CLIENT SYSTEM

FIG. 7A

TOETHO" 58ZHE86D

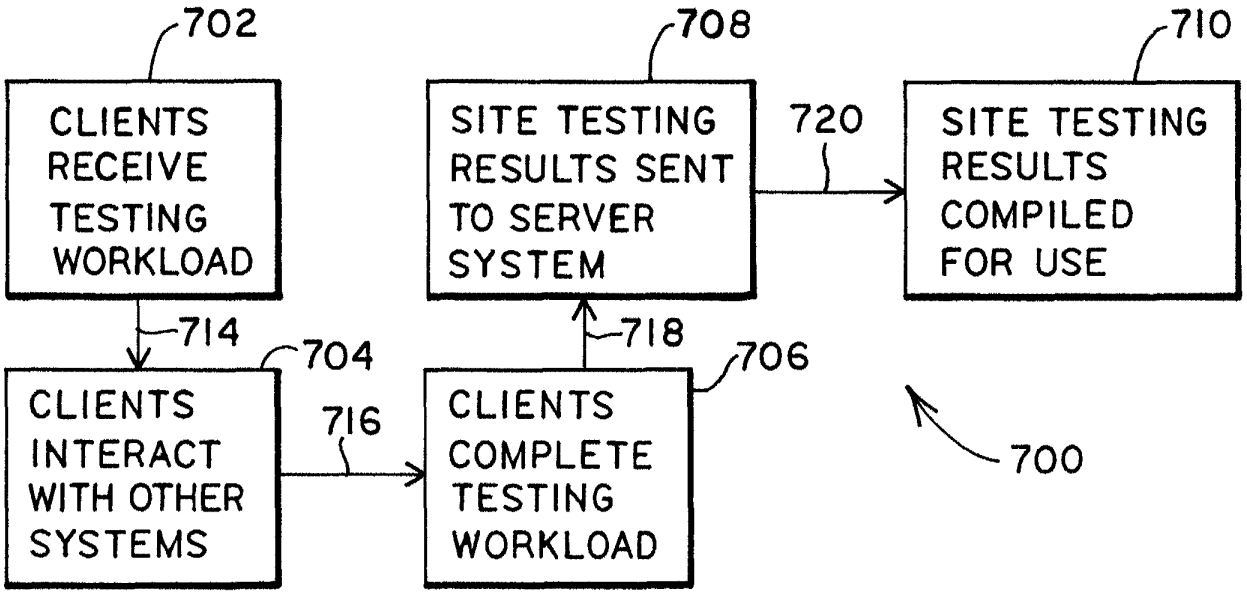


FIG. 7B

TOETHO" 58746860

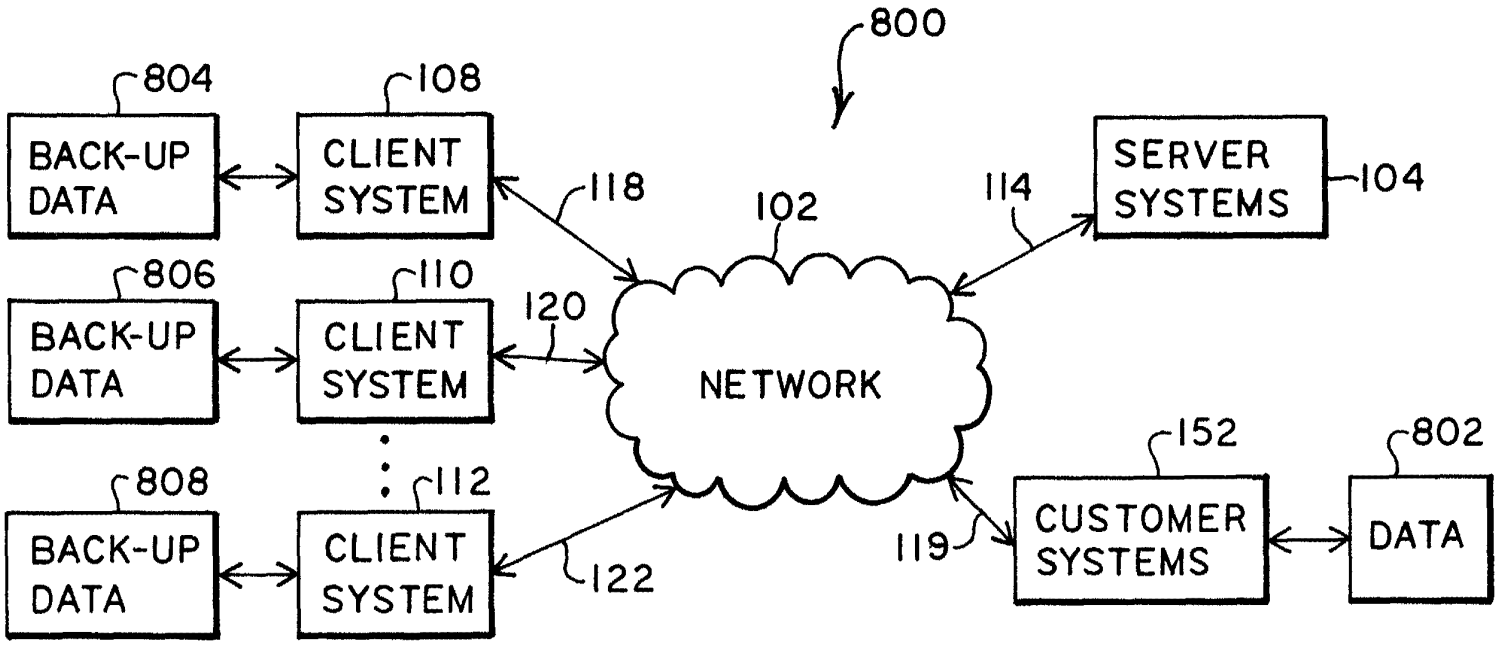


FIG. 8

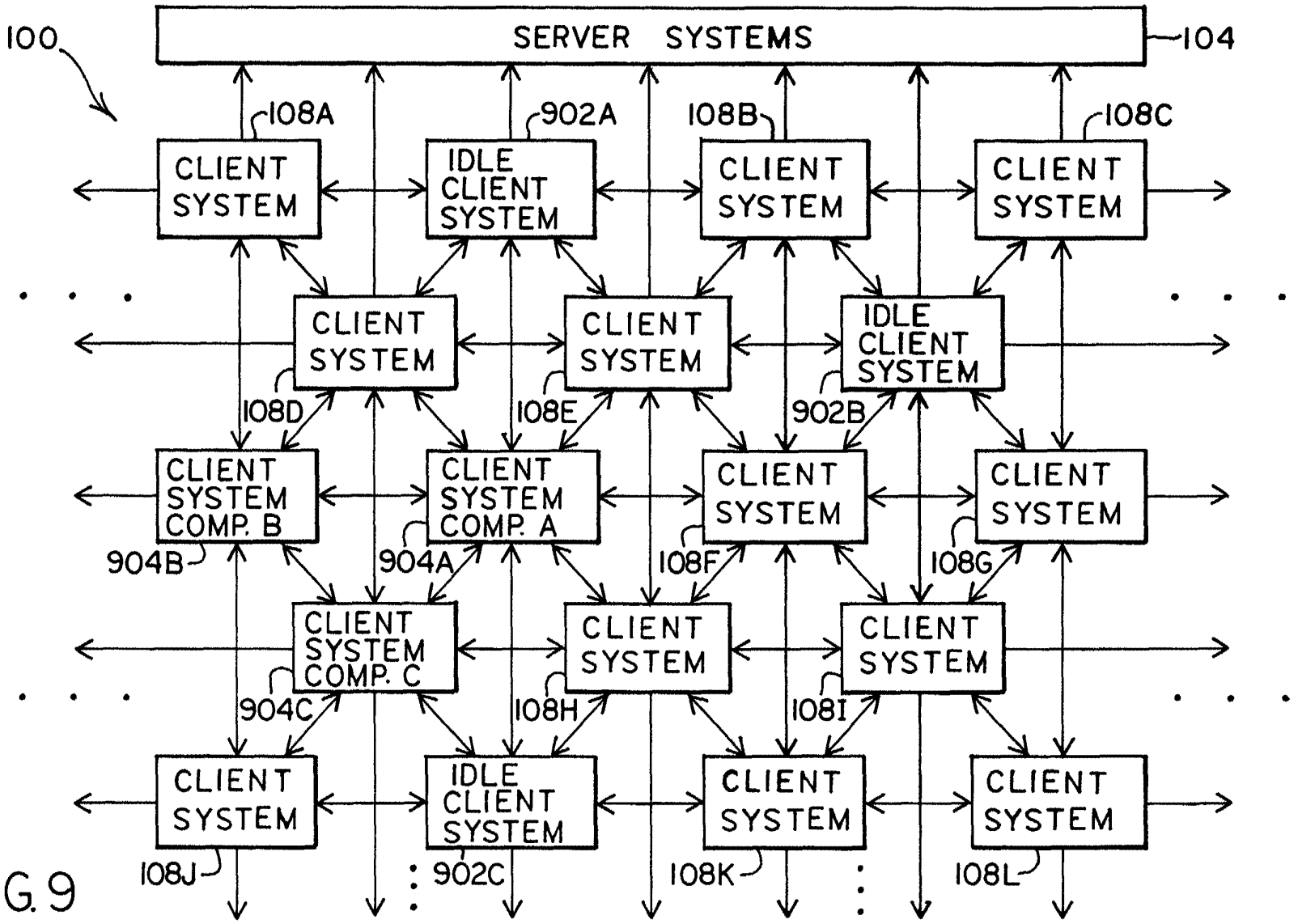

100
SERVER SYSTEMS
104
108A
902A
108B
108C
CLIENT SYSTEM
IDLE CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
IDLE CLIENT SYSTEM
108D
108E
902B
CLIENT SYSTEM COMP. B
CLIENT SYSTEM COMP. A
CLIENT SYSTEM
CLIENT SYSTEM
904B
904A
108F
108G
CLIENT SYSTEM COMP. C
CLIENT SYSTEM
CLIENT SYSTEM
904C
108H
108I
CLIENT SYSTEM
IDLE CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
108J
902C
108K
108L

FIG. 9

TOETHO" 58274E860

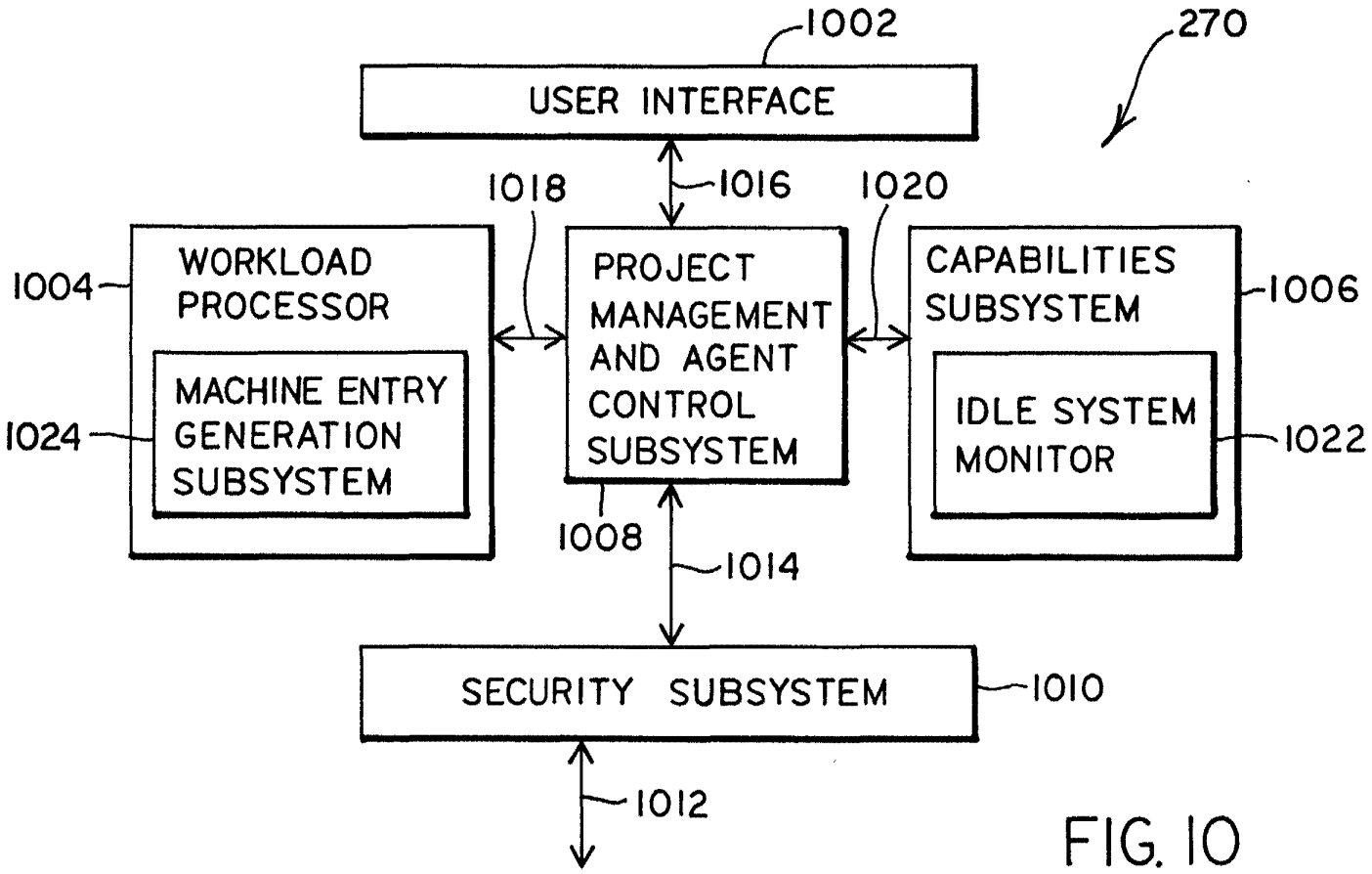


FIG. 10

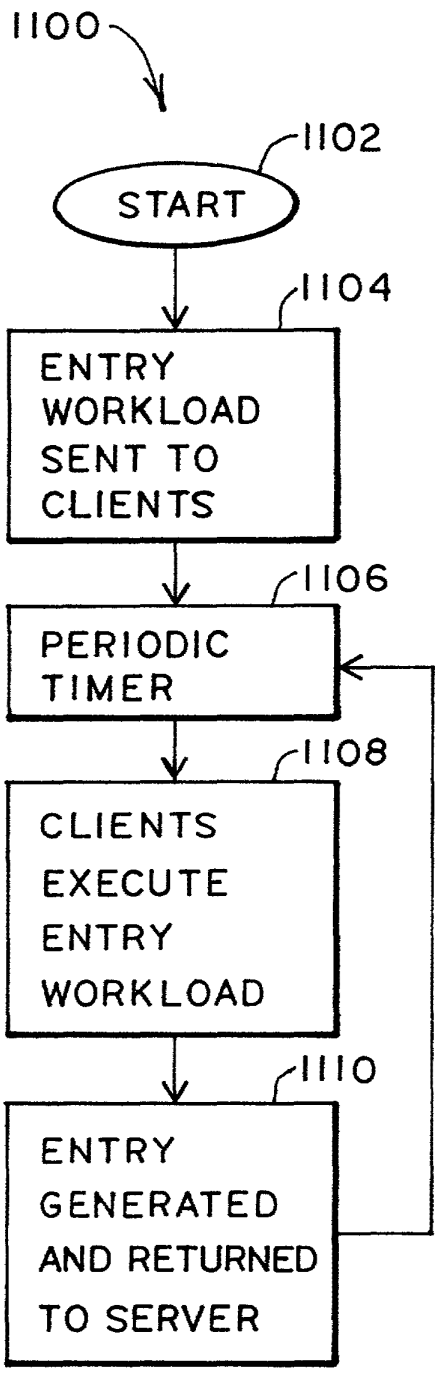


FIG. 11A

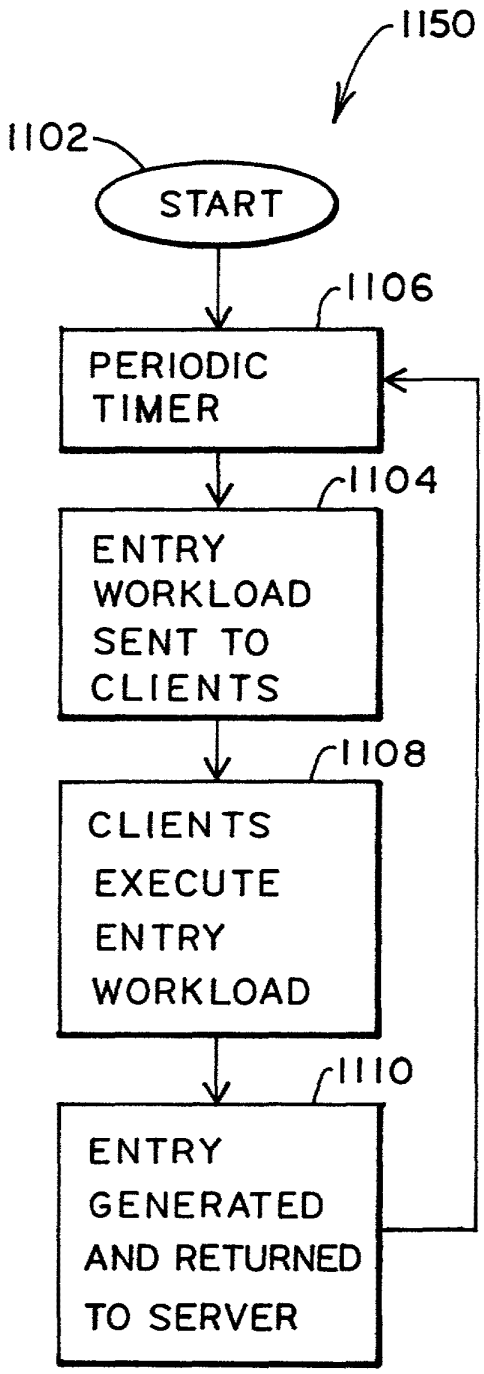


FIG. 11B

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EOE1h0" 58Z4E860

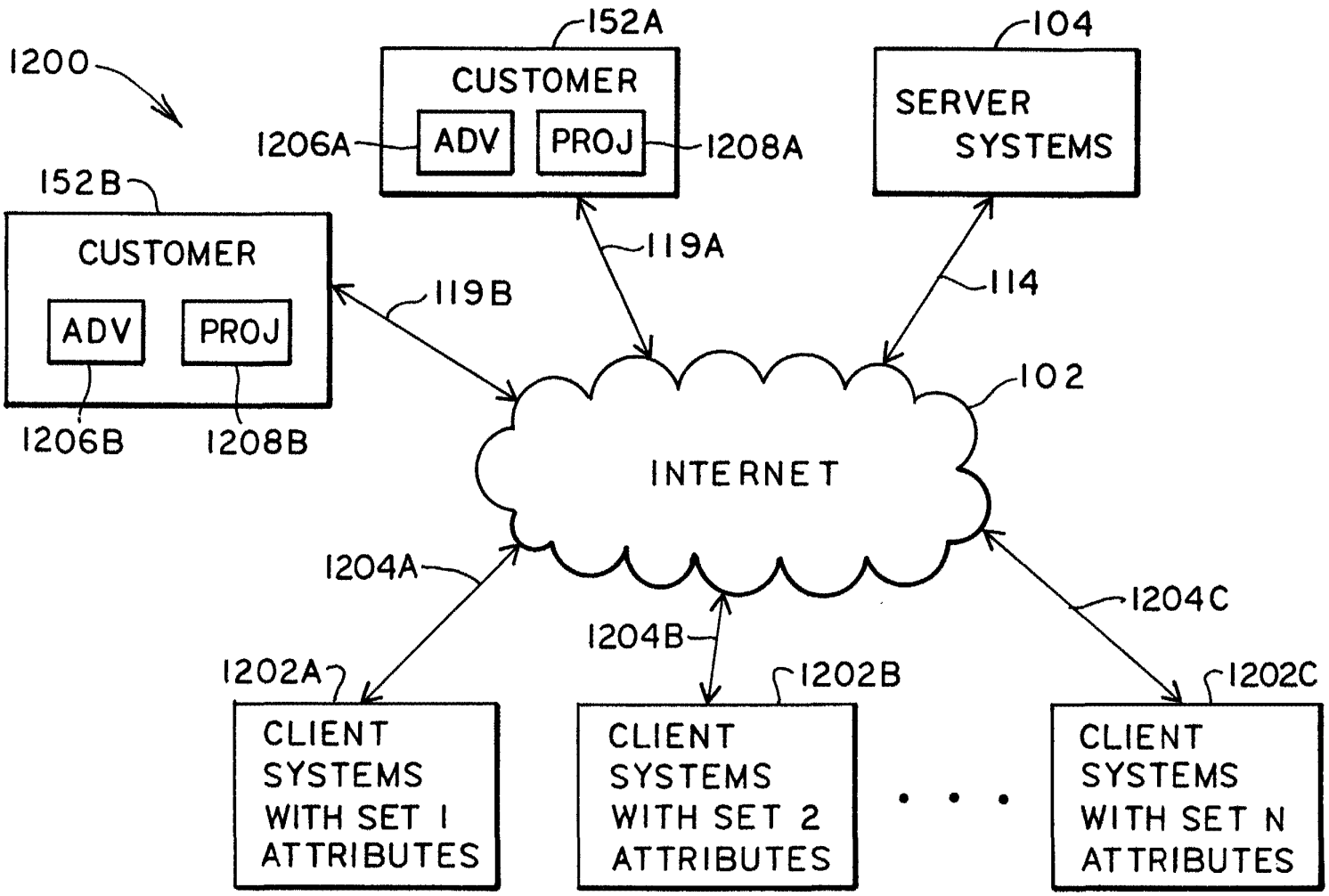


FIG. 12A

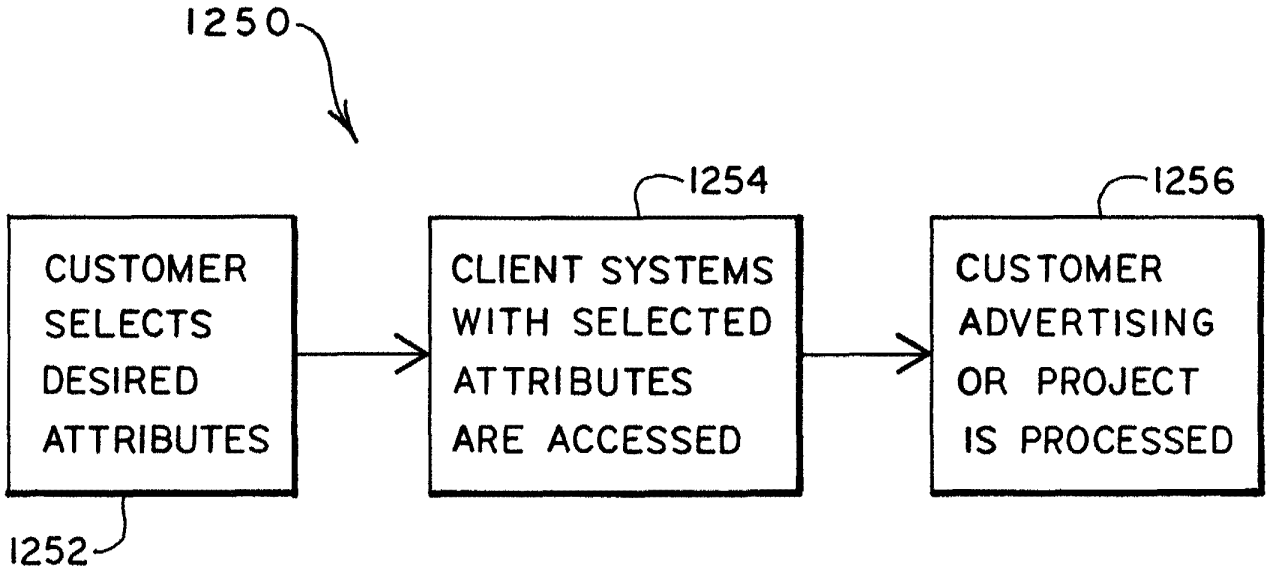

1250
1254
1256
CUSTOMER SELECTS DESIRED ATTRIBUTES
CLIENT SYSTEMS WITH SELECTED ATTRIBUTES ARE ACCESSED
CUSTOMER ADVERTISING OR PROJECT IS PROCESSED
1252

FIG. 12B

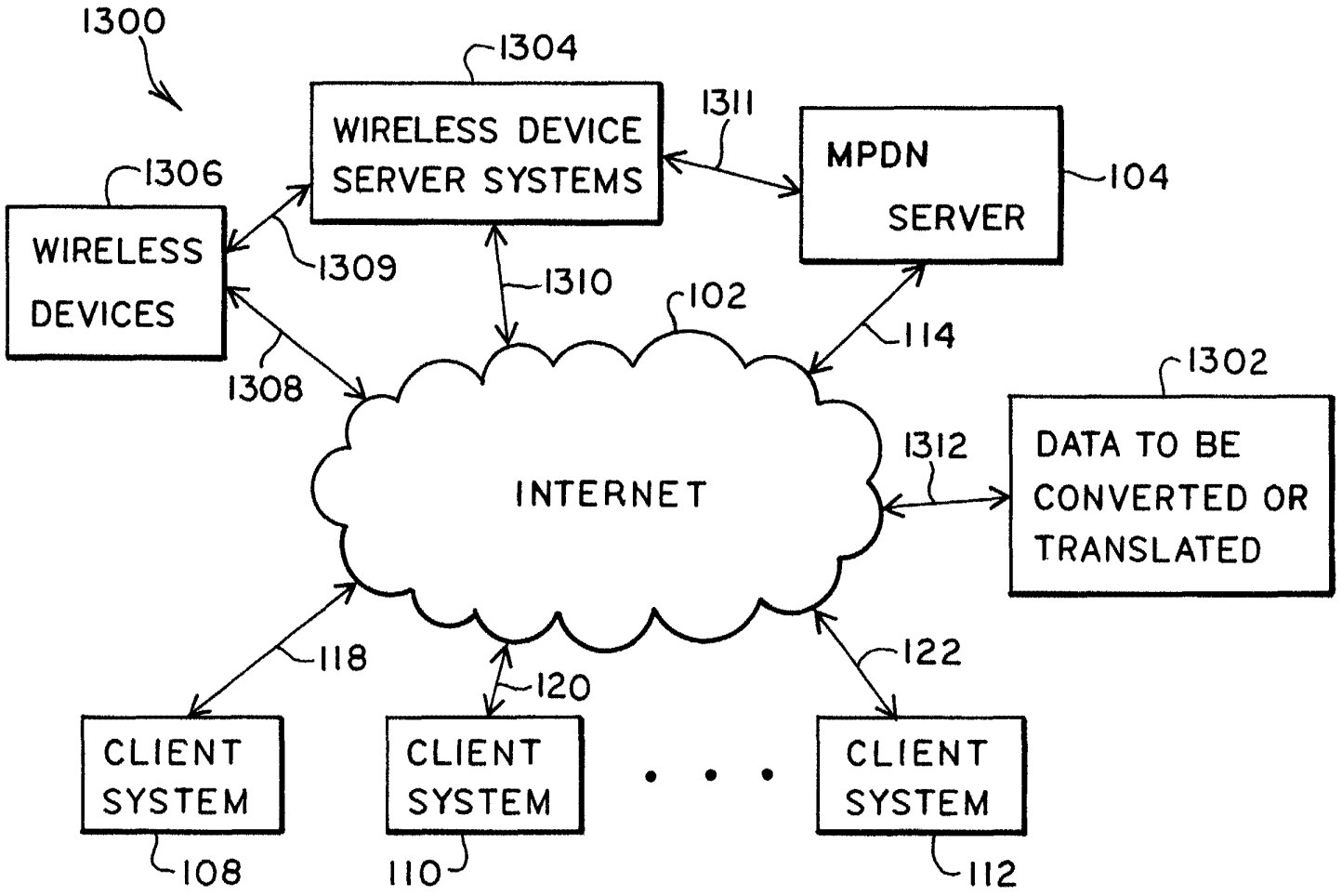

1300
1304
WIRELESS DEVICE SERVER SYSTEMS
1311
MPDN SERVER
104
1306
WIRELESS DEVICES
1309
1310
102
114
1308
1302
1312
DATA TO BE CONVERTED OR TRANSLATED
INTERNET
118
120
122
CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
108
110
112

FIG. 13A

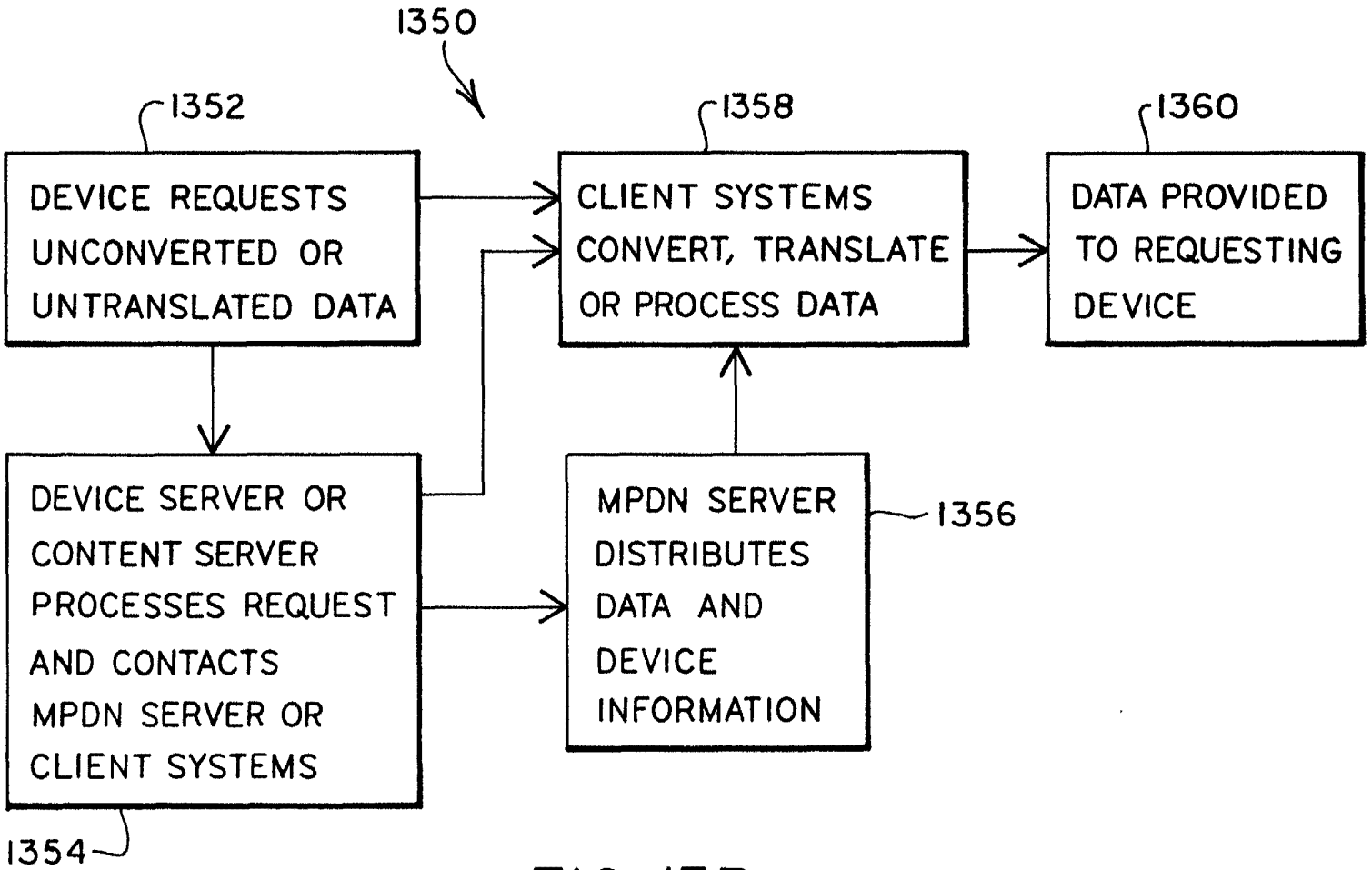

1350
1352
1358
1360
DEVICE REQUESTS UNCONVERTED OR UNTRANSLATED DATA
CLIENT SYSTEMS CONVERT, TRANSLATE OR PROCESS DATA
DATA PROVIDED TO REQUESTING DEVICE
DEVICE SERVER OR CONTENT SERVER PROCESSES REQUEST AND CONTACTS MPDN SERVER OR CLIENT SYSTEMS
MPDN SERVER DISTRIBUTES DATA AND DEVICE INFORMATION
1356
1354

FIG. 13B

TOETh0"SBZhE860

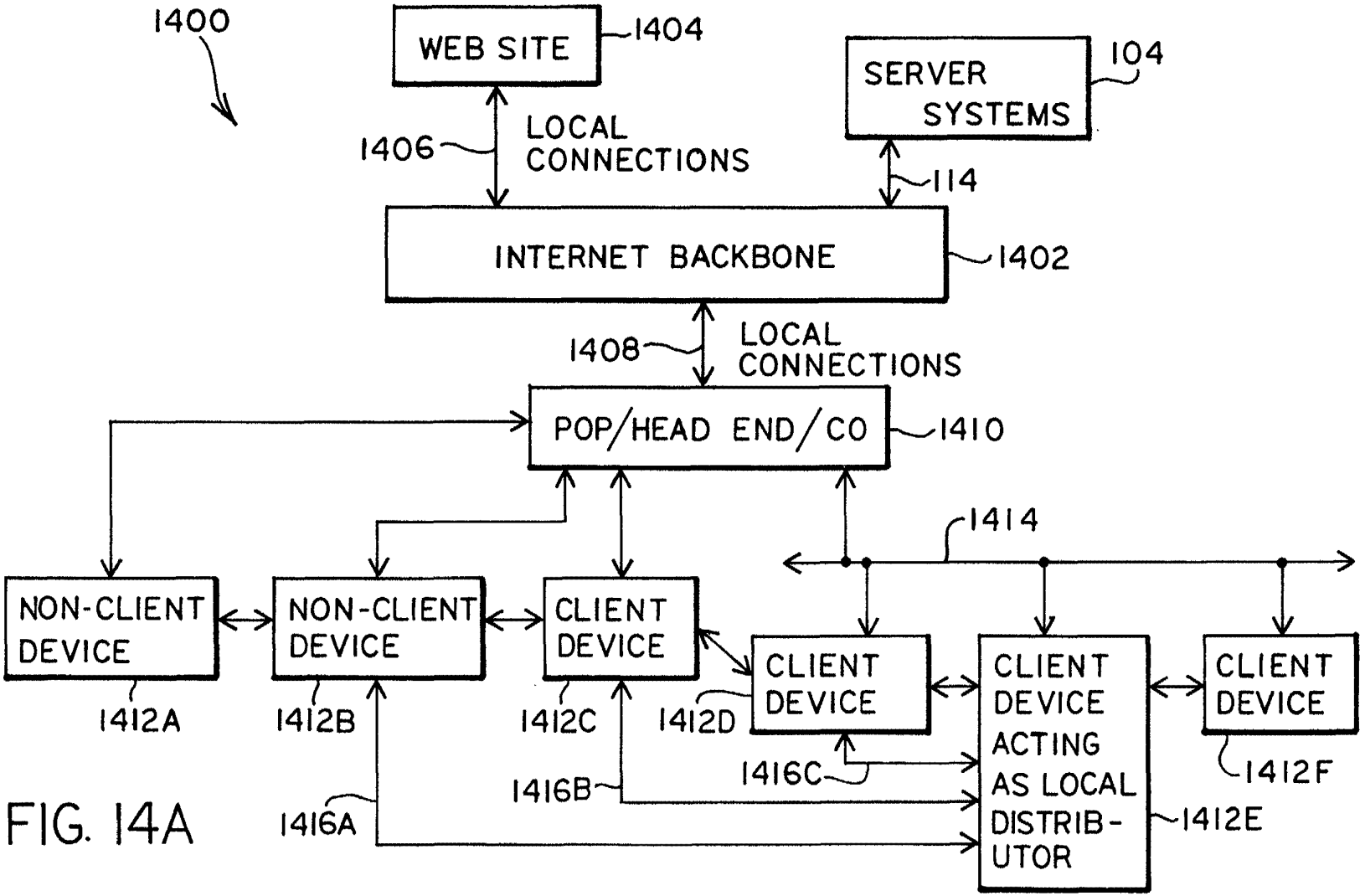


FIG. 14A

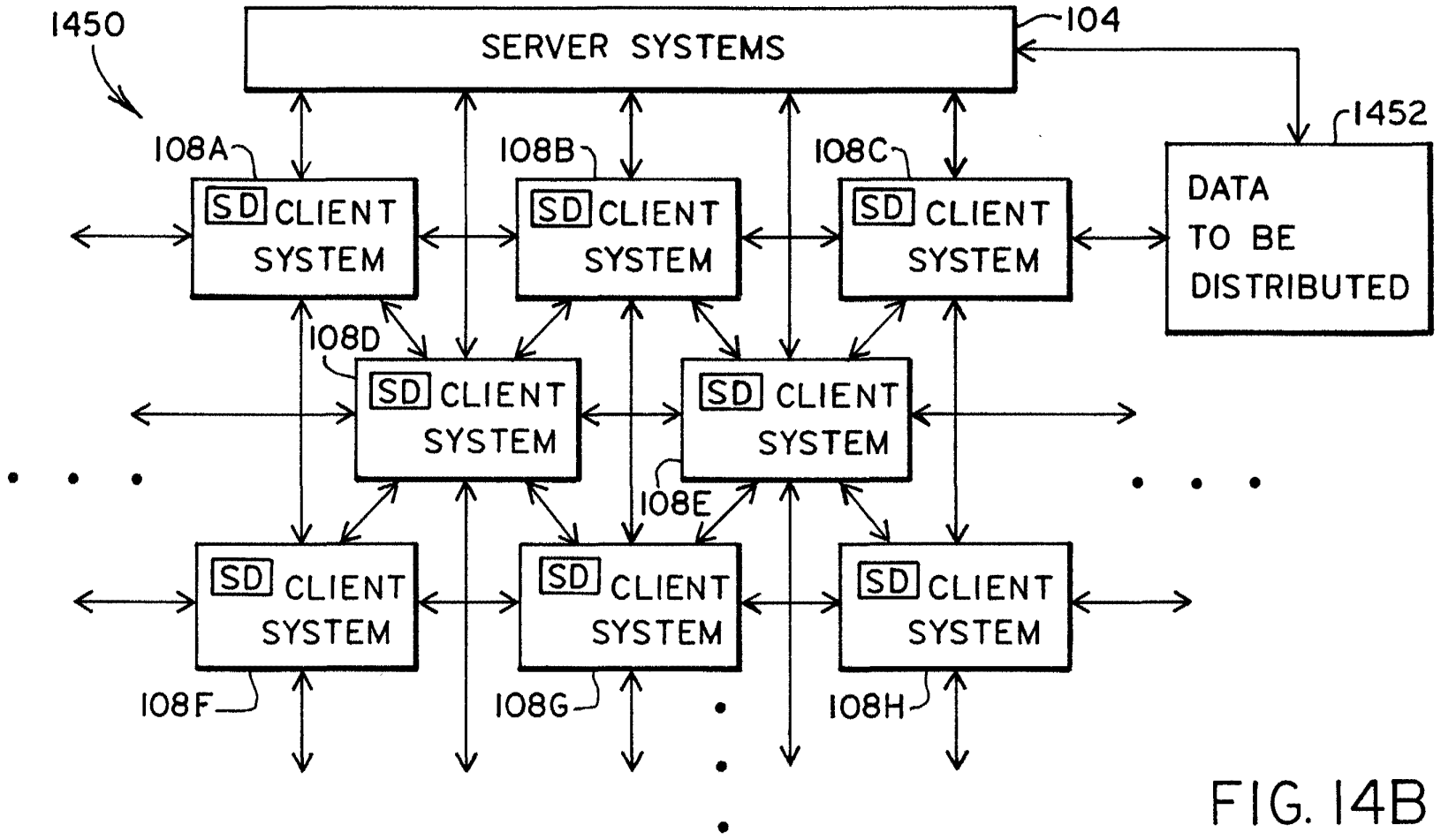

1450
SERVER SYSTEMS
104
1452
DATA TO BE DISTRIBUTED
108A
108B
108C
108D
108E
108F
108G
108H
SD CLIENT SYSTEM

FIG. 14B

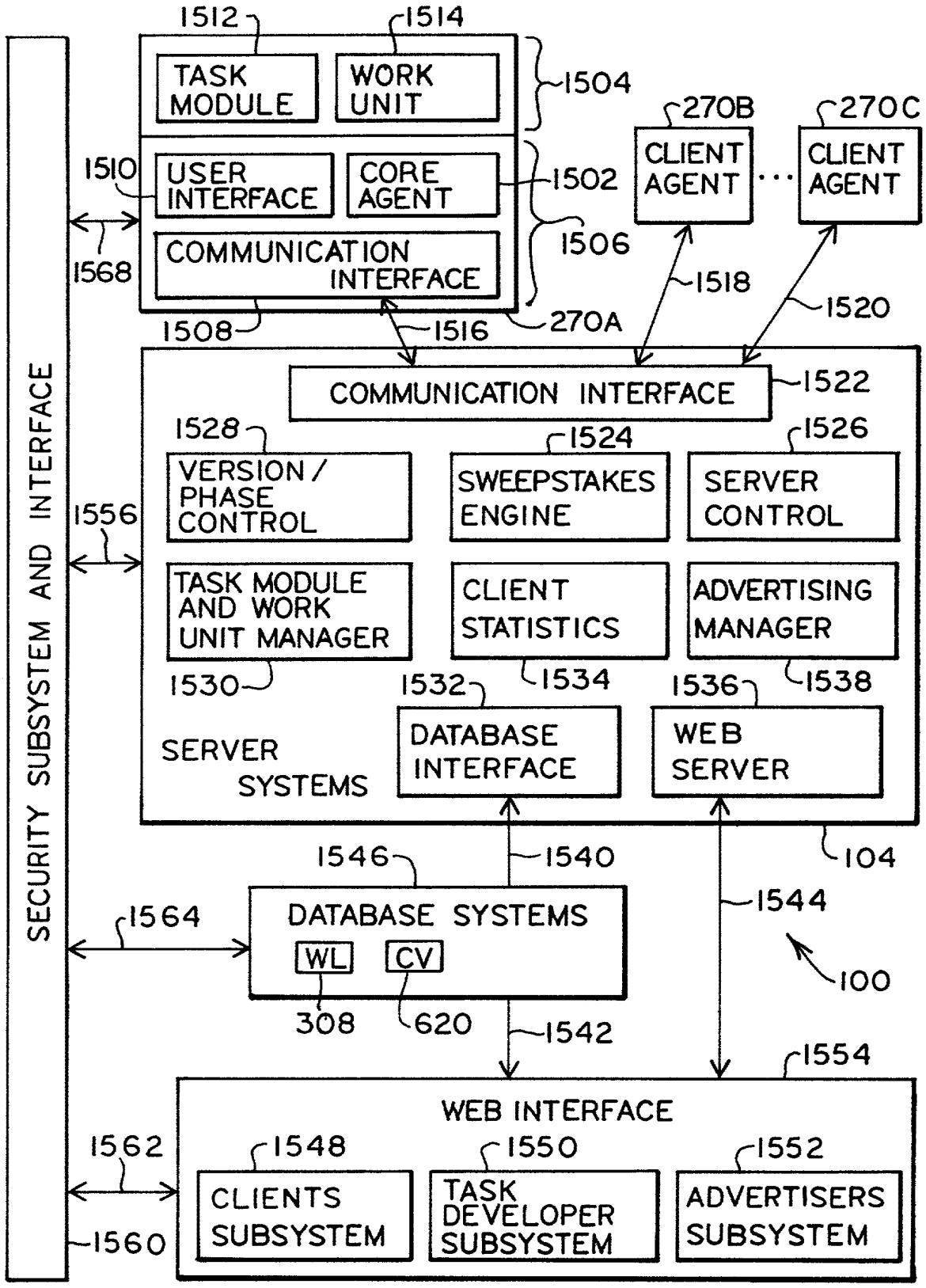

1512
1514
TASK MODULE
WORK UNIT
1504
270B
270C
CLIENT AGENT
CLIENT AGENT
1510
USER INTERFACE
CORE AGENT
1502
1506
1568
COMMUNICATION INTERFACE
1518
1520
1508
1516
270A
SECURITY SUBSYSTEM AND INTERFACE
COMMUNICATION INTERFACE
1522
1528
1524
1526
VERSION / PHASE CONTROL
SWEEPSTAKES ENGINE
SERVER CONTROL
1556
TASK MODULE AND WORK UNIT MANAGER
CLIENT STATISTICS
ADVERTISING MANAGER
1530
1532
1534
1536
1538
SERVER SYSTEMS
DATABASE INTERFACE
WEB SERVER
104
1546
1540
1544
1564
DATABASE SYSTEMS
WL
CV
100
308
620
1542
1554
WEB INTERFACE
1562
1548
1550
1552
CLIENTS SUBSYSTEM
TASK DEVELOPER SUBSYSTEM
ADVERTISERS SUBSYSTEM
1560

FIG. 15

TOETHO "5824E860

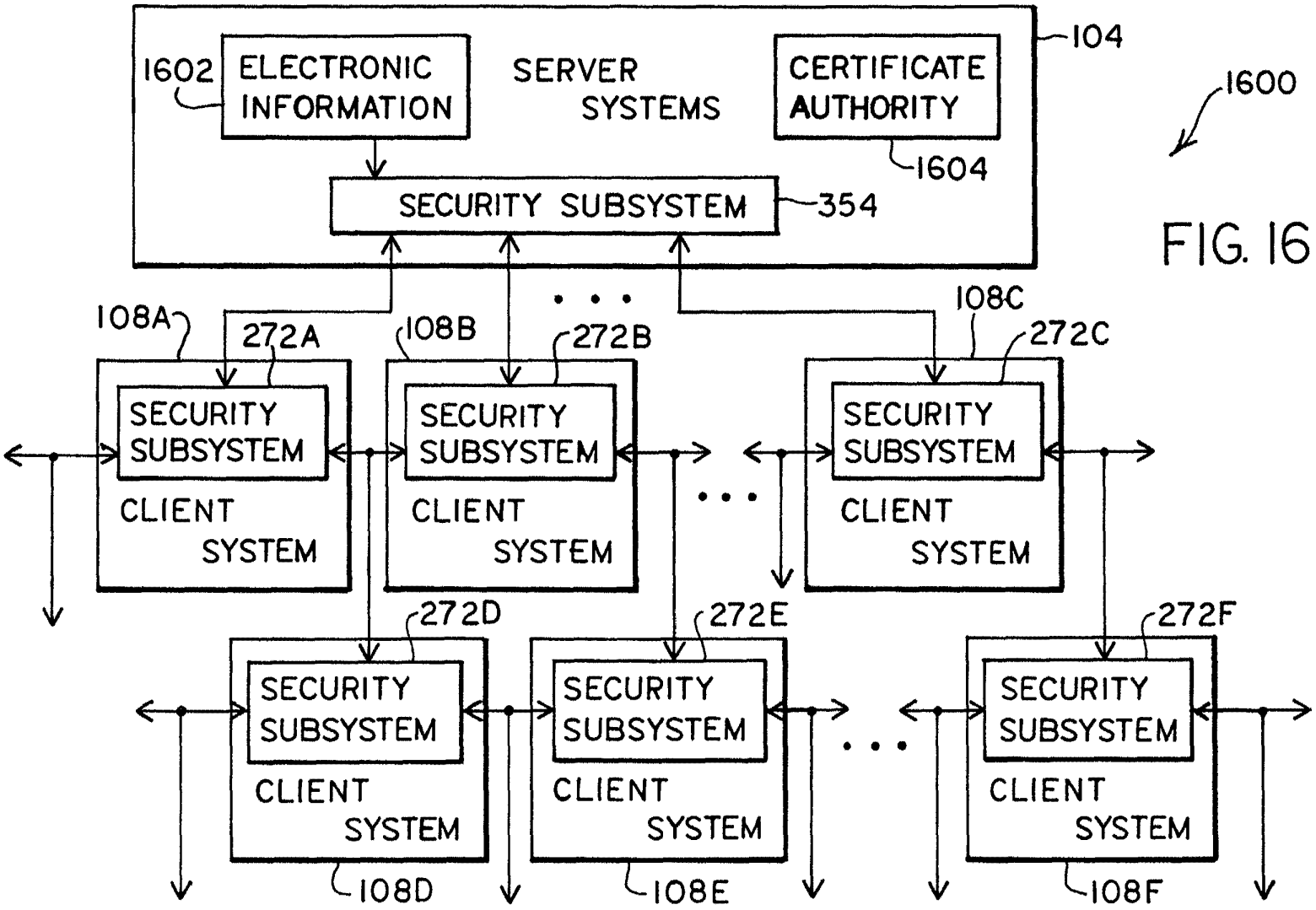


FIG. 16

TOETHO" 58ZhE860

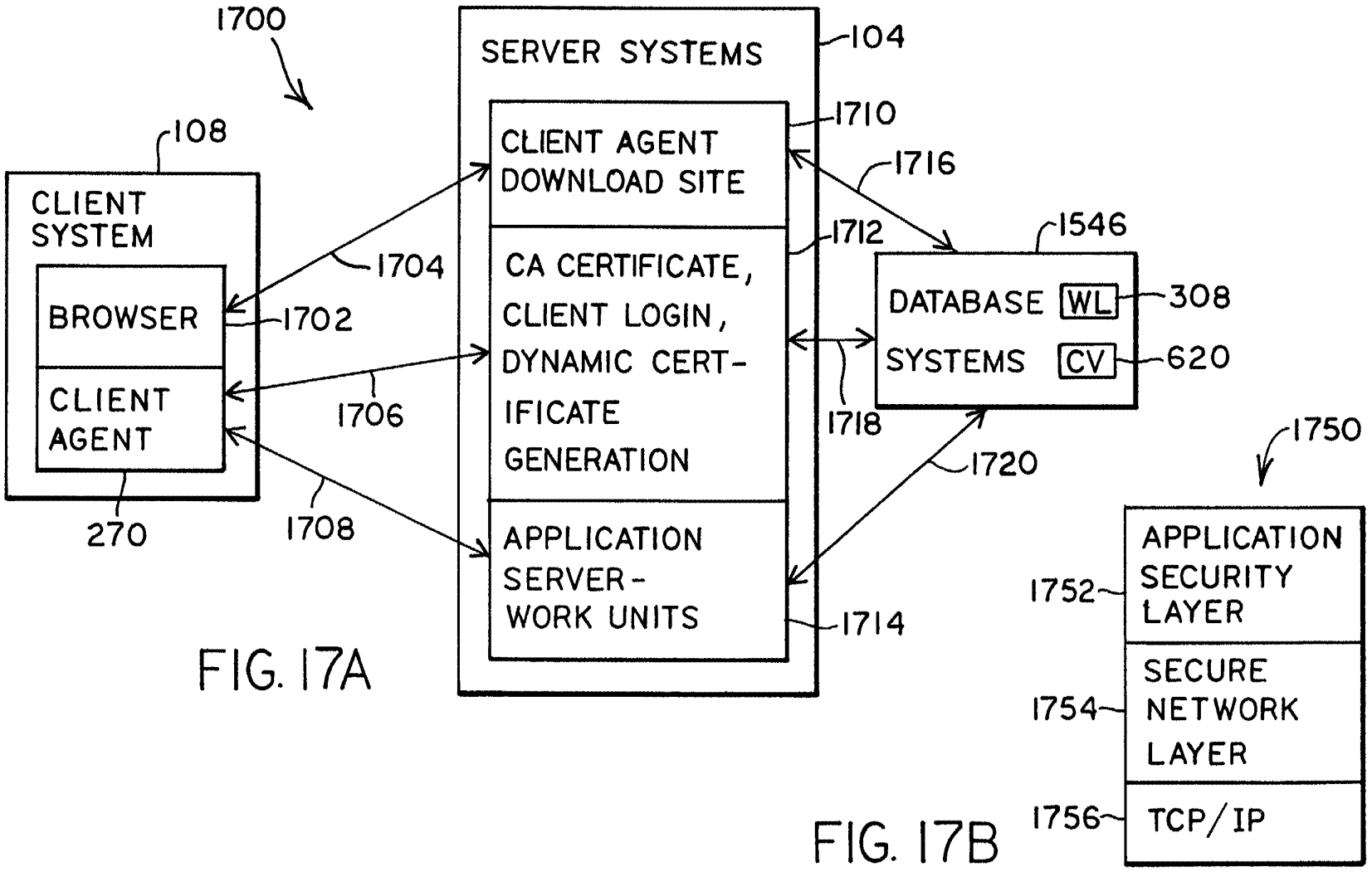


FIG. 17A

FIG. 17B

TOETHO" 5824E860

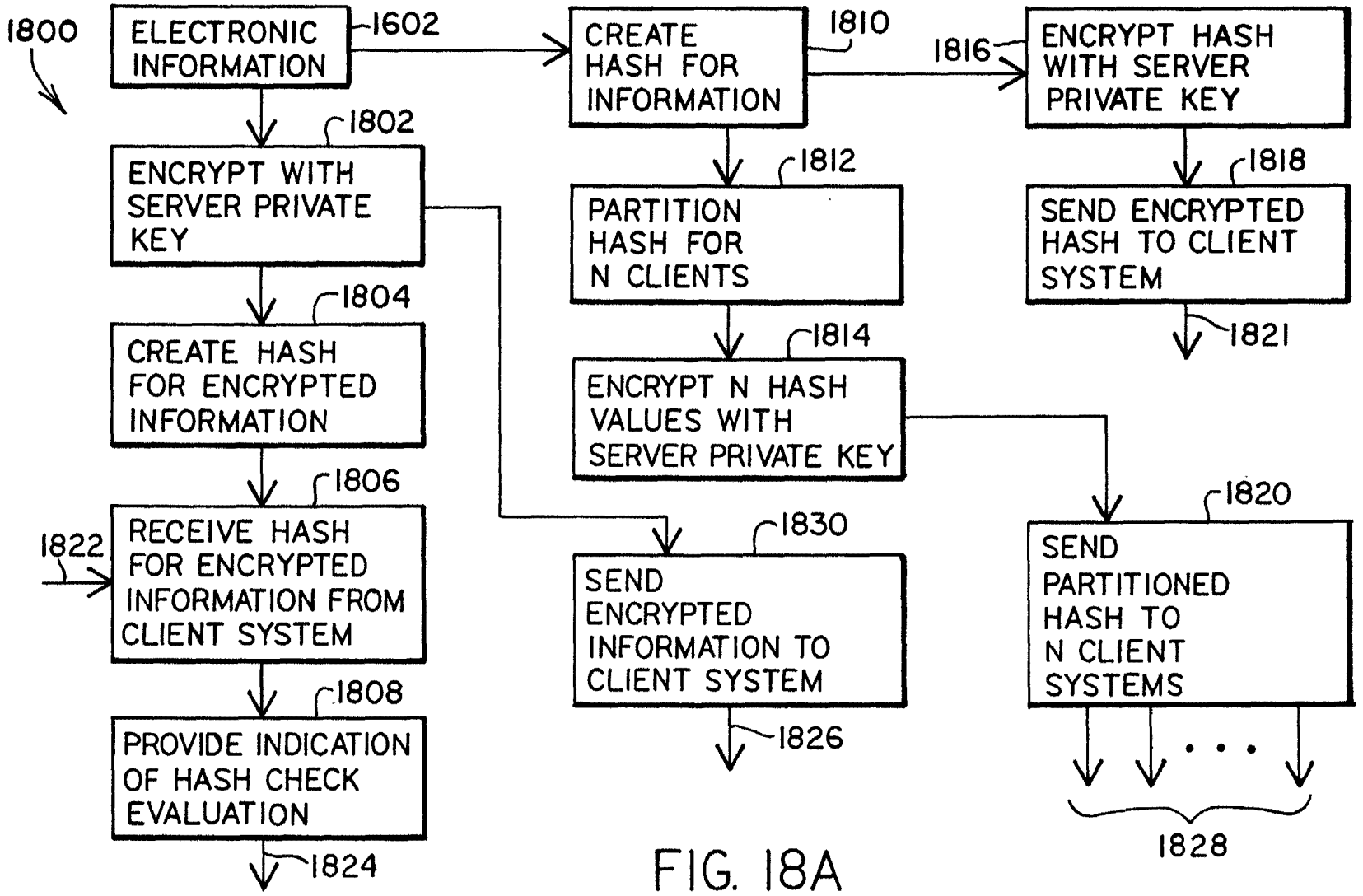


FIG. 18A

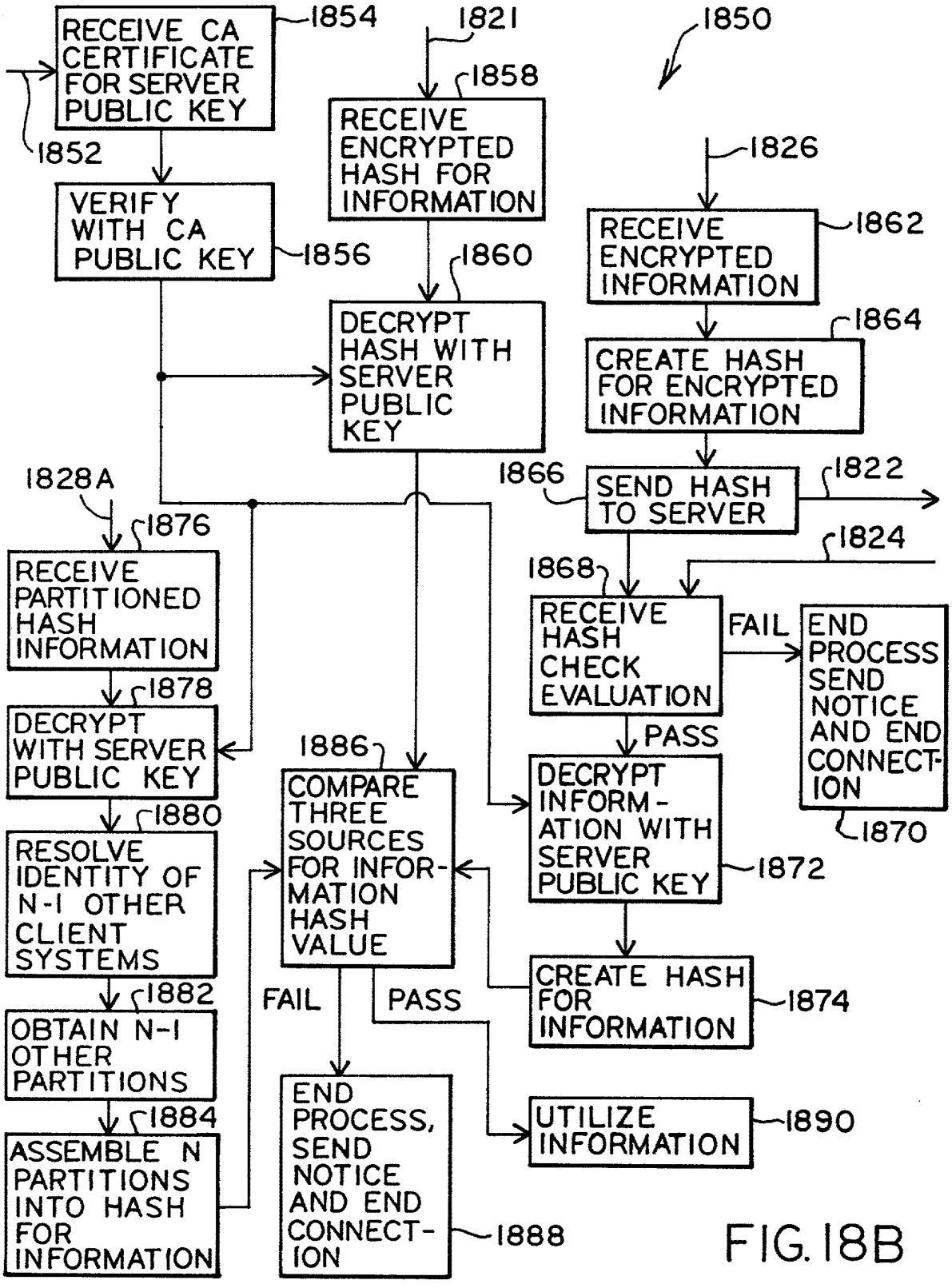


FIG. 18B

US 6,047,268

10E1h0" 587hE860

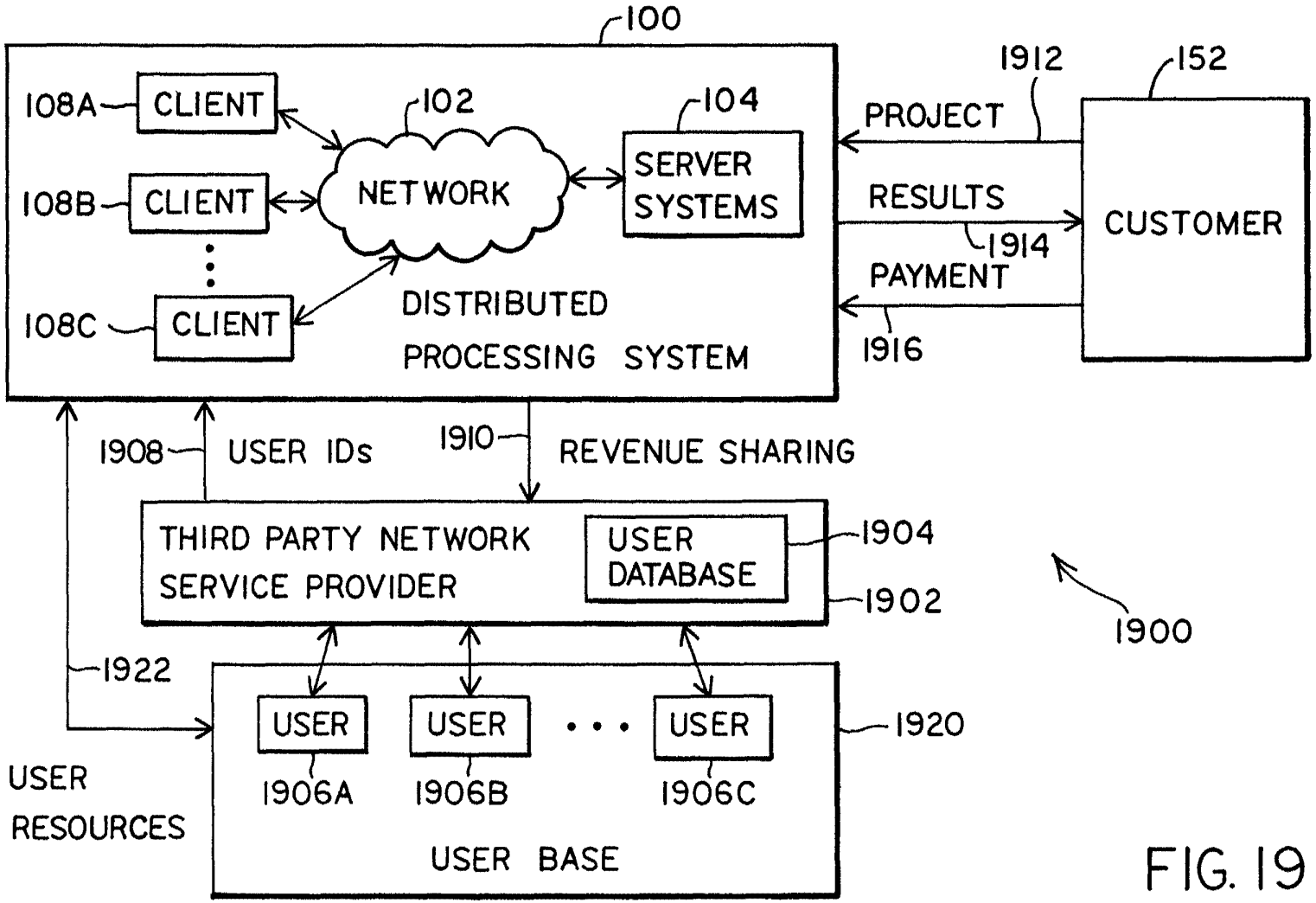


FIG. 19

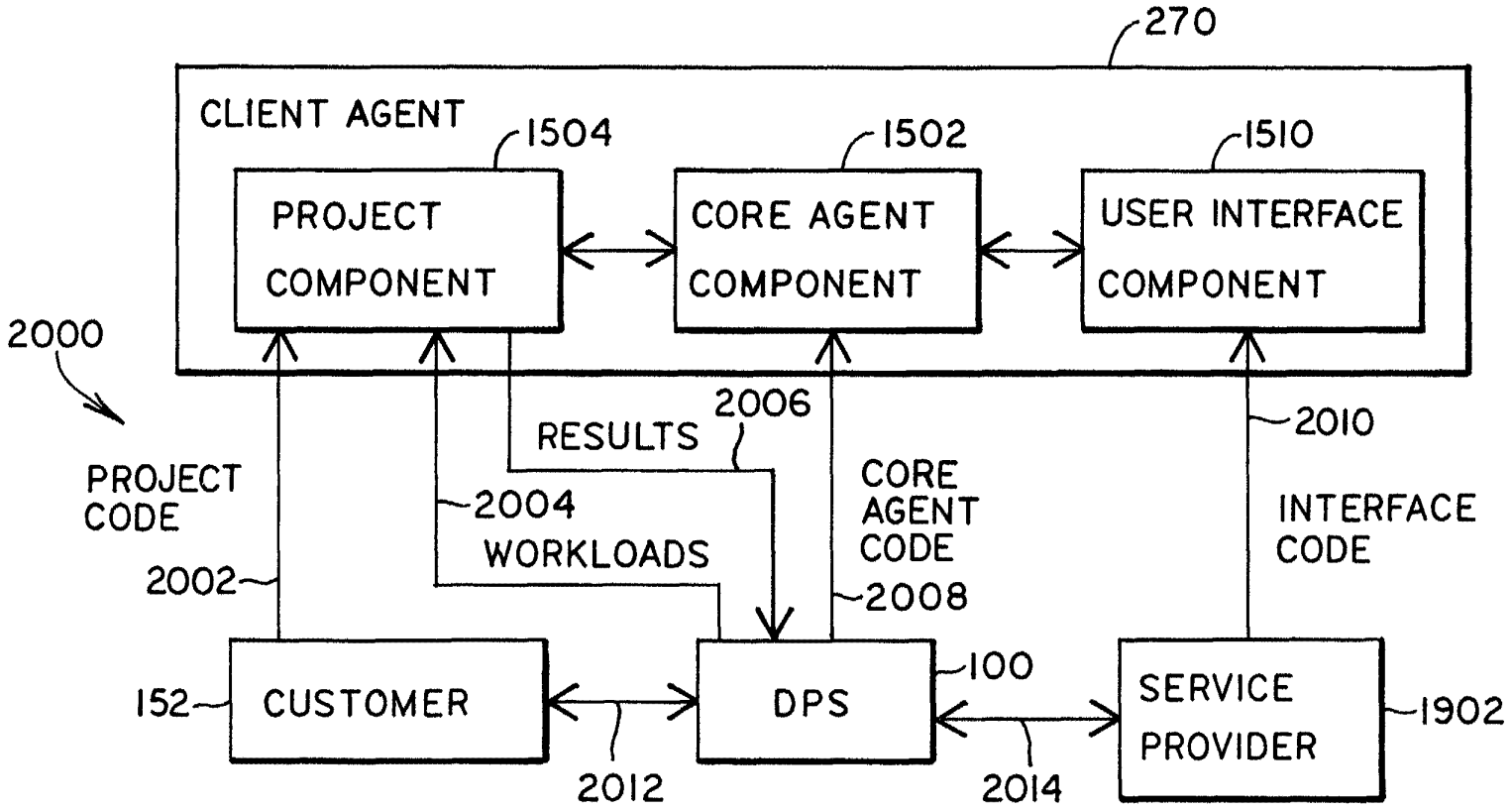

270
CLIENT AGENT
1504
1502
1510
PROJECT COMPONENT
CORE AGENT COMPONENT
USER INTERFACE COMPONENT
2000
2006
RESULTS
2010
PROJECT CODE
2004
WORKLOADS
CORE AGENT CODE
INTERFACE CODE
2002
2008
152
CUSTOMER
DPS
100
SERVICE PROVIDER
1902
2012
2014

FIG. 20

TOETh0" 58Z4hE860

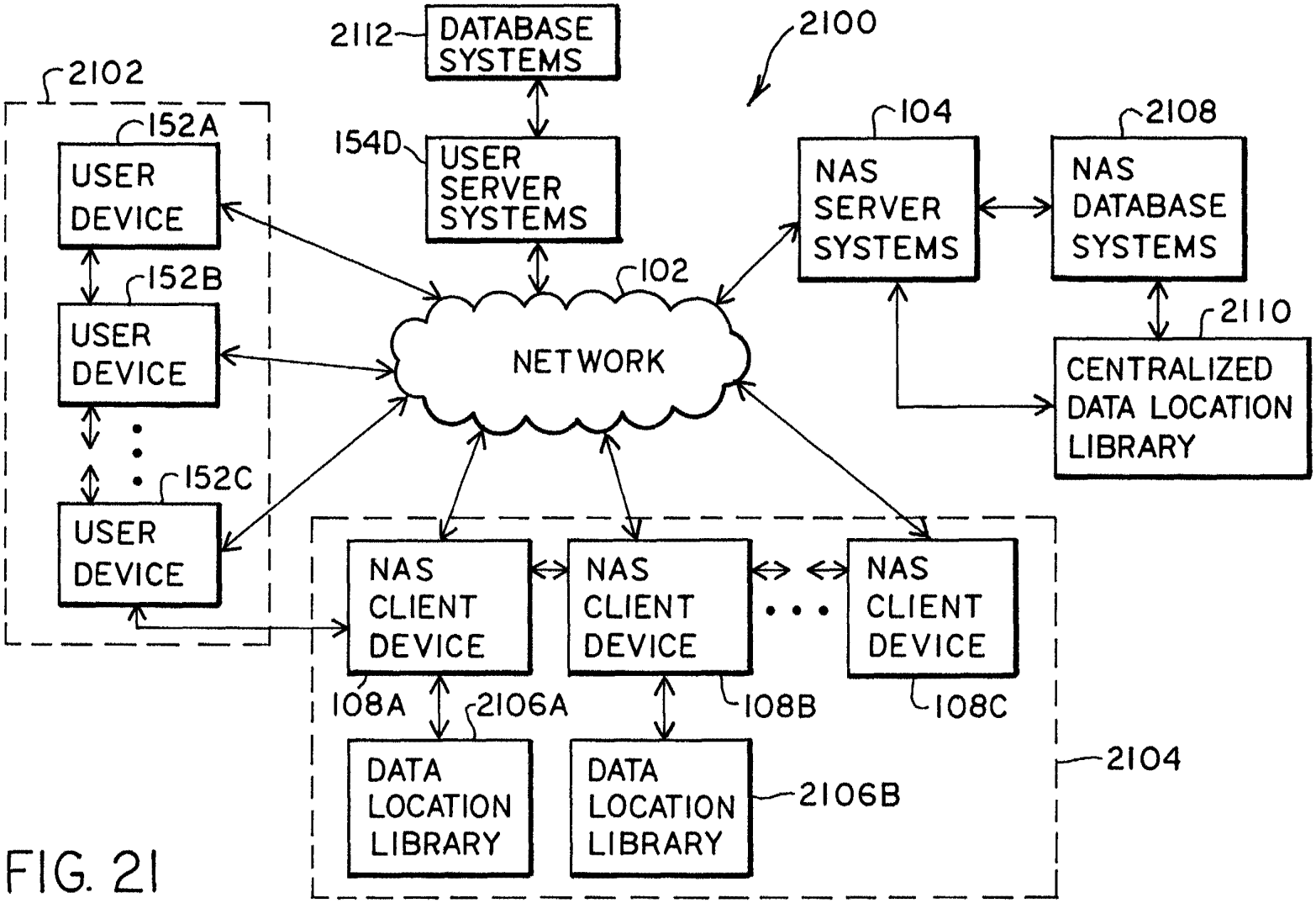


FIG. 21

Jc921 U.S. PTO
09/834785
04/13/01

Subclass	ISSUE CLASSIFICATION
Class	

Best Available Copy

PATENT NUMBER

U.S. UTILITY Patent Application

O.I.P.E.
SCANNED KS JW Q.A. RC

PATENT DATE

APPLICATION NO.	CONT/PRIOR	CLASS	SUBCLASS	ART UNIT	EXAMINER
09/834785	D	709	203	2152	Dalencourt

APPLICANTS: Edward Hubbard

TITLE: Software-based network attached storage services hosted on massively distributed parallel computing networks

PTO-2040
12/99

ISSUING CLASSIFICATION

ORIGINAL		CROSS REFERENCE(S)	
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)
INTERNATIONAL CLASSIFICATION			
			☐ Continued on Issue Slip Inside File Jacket

☐ TERMINAL DISCLAIMER	DRAWINGS			CLAIMS ALLOWED	
	Sheets Drwg.	Figs. Drwg.	Print Fig.	Total Claims	Print Claim for O.G.
☐ The term of this patent subsequent to _____ (date) has been disclaimed.	_____ (Assistant Examiner)		_____ (Date)	NOTICE OF ALLOWANCE MAILED	
☐ The term of this patent shall not extend beyond the expiration date of U.S Patent. No. _____	_____ (Primary Examiner)		_____ (Date)	ISSUE FEE	
				Amount Due	Date Paid
☐ The terminal ____months of this patent have been disclaimed.	_____ (Legal Instruments Examiner)		_____ (Date)	ISSUE BATCH NUMBER	

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(FACE)

[redacted]

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SEARCHED

Class	Sub.	Date	Exmr.
709	203	8/13/04	Y.D
	201		
	202		
	205		
	212		
	216		
719	317	8/19/04	

INTERFERENCE SEARCHED

Class	Sub.	Date	Exmr.

SEARCH NOTES
(INCLUDING SEARCH STRATEGY)

I consulted:	Date	Exmr.
WEST	8/13/04	Y.D
"	8/19/04	
"	8/30/04	

(RIGHT OUTSIDE)

IPR2025
DATABRICKS EX1002 Page 100

ISSUE SLIP STAPLE AREA (for additional cross references)

POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION	MW	12	04-11-07
O.I.P.E. CLASSIFIER			5/11
FORMALITY REVIEW	5-A	1082	06/07/01
RESPONSE FORMALITY REVIEW	SG	1077	9/12/01

INDEX OF CLAIMS

✔ ..... Rejected
= ..... Allowed
— (Through numeral)... Canceled
÷ ..... Restricted
N ..... Non-elected
I ..... Interference
A ..... Appeal
O ..... Objected

Claim	Date
Final / Original	
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Claim	Date
Final / Original	
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Claim	Date
Final / Original	
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If more than 150 claims or 10 actions staple additional sheet here

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[redacted]

TC-571 09/13/01

04-16-01

A

jc962 U.S. PTO
04/13/01

jc921 U.S. PTO
09/834785
04/13/01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	EDWARD A. HUBBARD
Filed:	APRIL 13, 2001
For:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
Serial No.:	UNKNOWN
Group Art Unit:	UNKNOWN
Examiner:	UNKNOWN
Atty Docket No.:	UNTD:021

PTO/SB/05 (08-00)

EXPRESS MAIL CERTIFICATION

NUMBER: EL703719665US

I hereby certify that this paper or fee is being deposited with the United States Postal Service "EXPRESS MAIL POST OFFICE TO ADDRESSEE" service, postage prepaid, under 37 C.F.R. 1.10 on the date indicated below and is addressed to: Assistant Commissioner of Patents, Washington, D.C. 20231.

Mary Bowen
Signature

April 13, 2001
Date of Deposit

BOX NEW APP FEE
Assistant Commissioner For Patents
Washington, D.C. 20231

Dear Sir:

Transmitted herewith for filing are:

☒ New Patent Application consisting of 70 pages and 31 sheets of Figs.

☐ Continued Prosecution Application (37 CFR §1.53(d)) -- The parent application is USSN _____ filed on _____. The prior Examiner was _____ in Group Art Unit _____.

☐ Response to Missing Parts

☐ Assignment and Recordation Cover sheet.

☐ Inventors' Declaration for Patent Application

- ☐ Information Disclosure Statement
- ☐ Petition for a _____ month extension of time
- ☐ Response to Office Action
- ☐ Preliminary Amendment
- ☒ Formal Drawings
- ☐ Informal Drawings
- ☐ Notice of Appeal
- ☐ An Appeal Brief (an original and two copies)
- ☒ Check in the amount of $427
- ☒ The Commissioner is authorized to deduct any requisite fees under 37 CFR 1.16 to 1.21 from, or deposit any credits to, Deposit Account No. 10-1205/UNTD:021.
- ☒ Postcard. Please date stamp and mail this postcard to acknowledge receipt of the enclosed documents.
- ☐ Other:

EL934763530US

UNTD:021

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DATABRICKS EX1002 Page 109

FEE CALCULATION:

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
[redacted]	Total Claims (37 CFR 1.16(e))	28- 20 =	8	x $ 18.00	$ 144.00
	Independent Claims (37 CFR 1.16(b))	2- 3 =	0	x $ 80.00	$ 0
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))			x $ 260.00	$ 0
	[redacted]			Basic Fee (37 CFR 1.16(a))	$ 710.00
	[redacted]		Total of above Calculations =		$ 854.00
	Reduction by 50% for filing by Small Entity (Note: 37 CFR 1.9, 1.27, 1.28)				$ 427.00
	Surcharge for submission of Response to Missing Parts if applicable ($130)				$ 0
	ASSIGNMENT FEE (IF FILED WITH APPLICATION)				$
				TOTAL =	$ *427.00*

The Examiner is invited to contact the undersigned at 512-347-1611 with any questions or comments, or to otherwise facilitate expeditious prosecution of the application.

Respectfully submitted,

Brian W. Peterman
Registration No. 37,908
Attorney for Applicant

O'KEEFE, EGAN & PETERMAN, L.L.P.
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, Texas 78746
512-347-1611
512-347-1615 (Fax)

UNTD:021

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DATABRICKS EX1002 Page 110

FIG. 1A

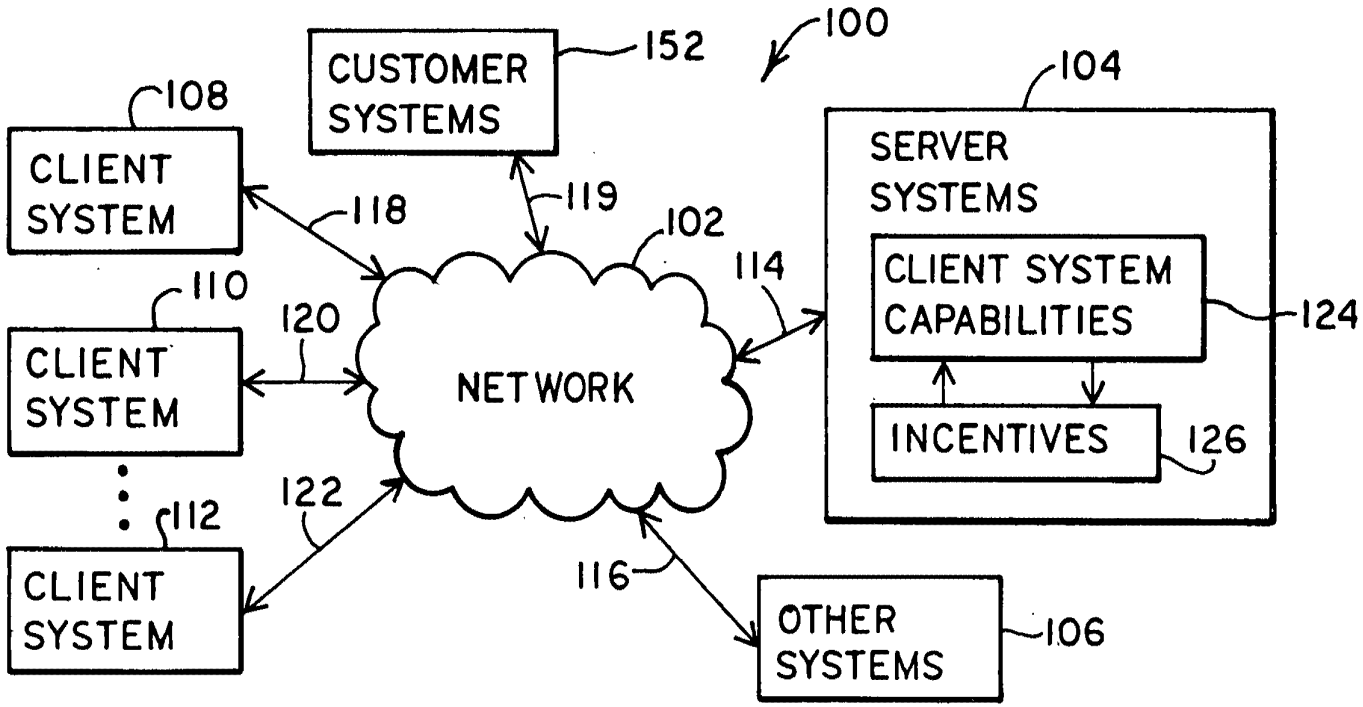
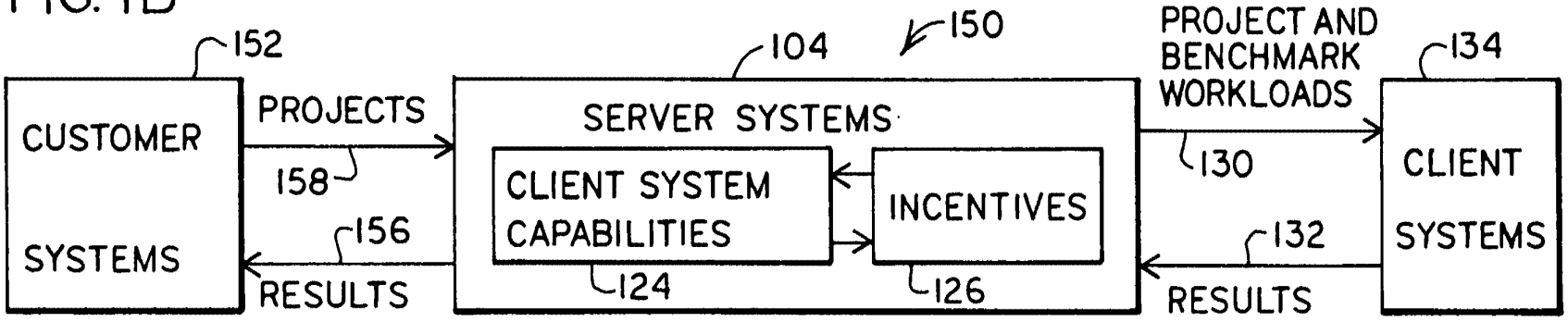

100
CUSTOMER SYSTEMS
152
104
SERVER SYSTEMS
CLIENT SYSTEM CAPABILITIES
124
INCENTIVES
126
108
CLIENT SYSTEM
110
CLIENT SYSTEM
112
CLIENT SYSTEM
118
119
102
NETWORK
114
120
122
116
OTHER SYSTEMS
106

FIG. 1B


152
CUSTOMER SYSTEMS
PROJECTS
158
156
RESULTS
104
150
SERVER SYSTEMS
CLIENT SYSTEM CAPABILITIES
124
INCENTIVES
126
PROJECT AND BENCHMARK WORKLOADS
130
132
RESULTS
134
CLIENT SYSTEMS

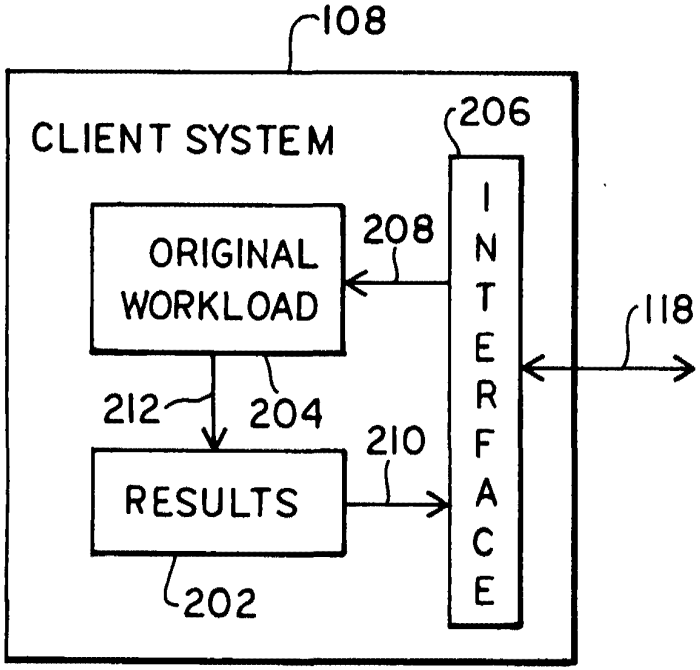

108
CLIENT SYSTEM
206
ORIGINAL WORKLOAD
208
INTERFACE
118
212
204
210
RESULTS
202

FIG. 2A

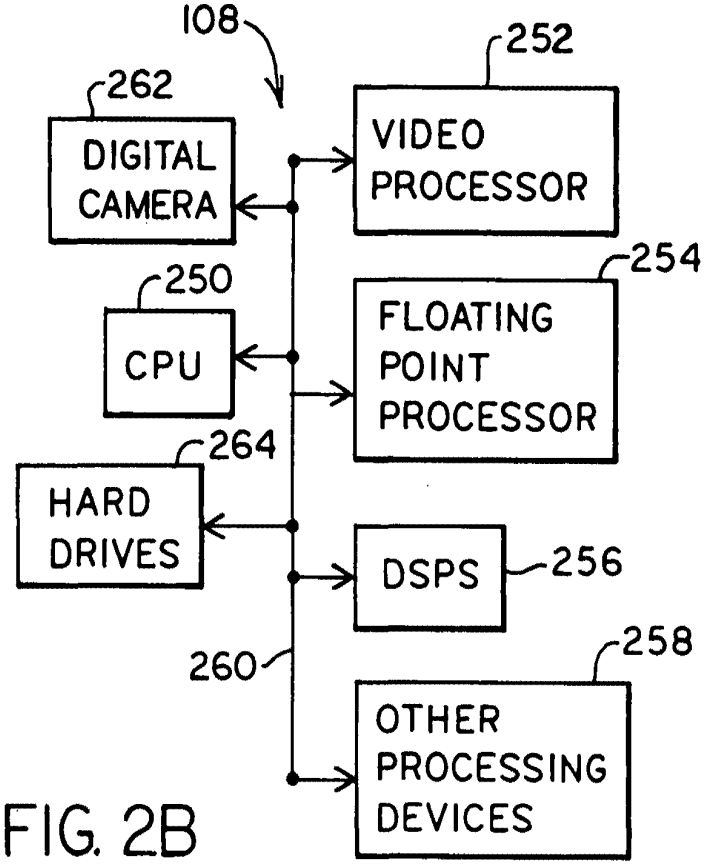

108
252
262
DIGITAL CAMERA
VIDEO PROCESSOR
254
250
CPU
FLOATING POINT PROCESSOR
264
HARD DRIVES
DSPS
256
260
258
OTHER PROCESSING DEVICES

FIG. 2B

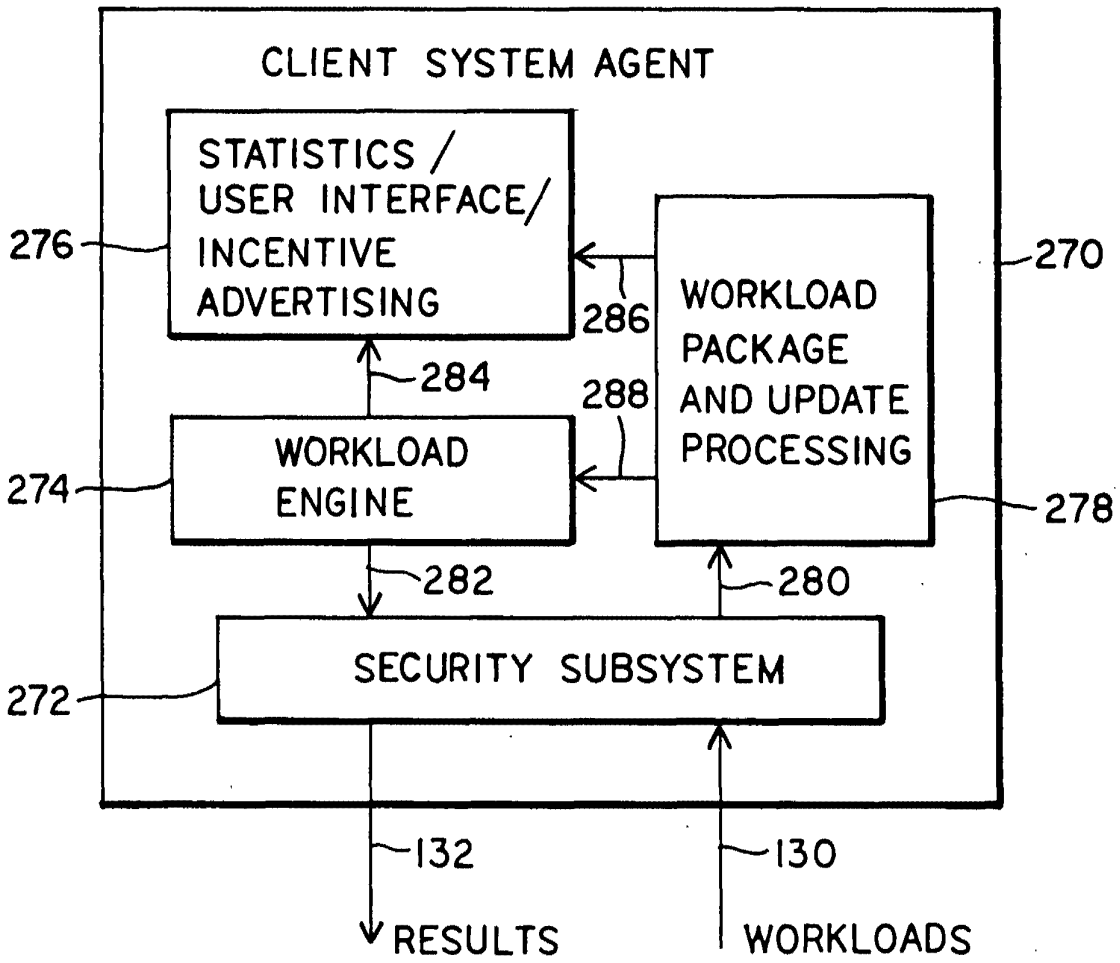

CLIENT SYSTEM AGENT
STATISTICS / USER INTERFACE/ INCENTIVE ADVERTISING
276
286
WORKLOAD PACKAGE AND UPDATE PROCESSING
270
284
288
WORKLOAD ENGINE
274
278
282
280
SECURITY SUBSYSTEM
272
132
130
RESULTS
WORKLOADS

FIG. 2C

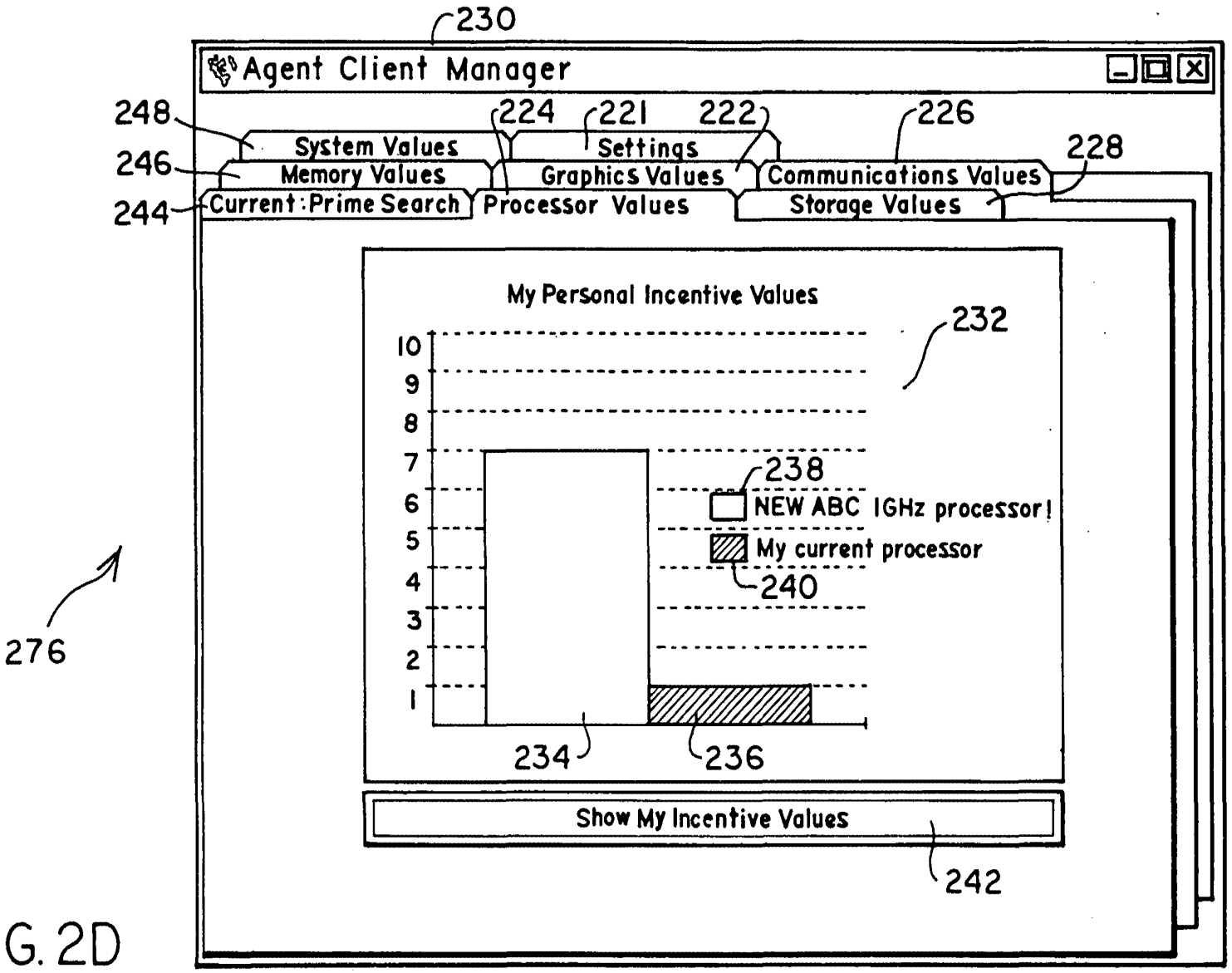

230
Agent Client Manager
248
246
244
224
221
222
226
228
System Values
Settings
Memory Values
Graphics Values
Communications Values
Current: Prime Search
Processor Values
Storage Values
My Personal Incentive Values
232
10
9
8
7
6
5
4
3
2
1
238
NEW ABC 1GHz processor!
My current processor
240
234
236
Show My Incentive Values
242
276

FIG. 2D

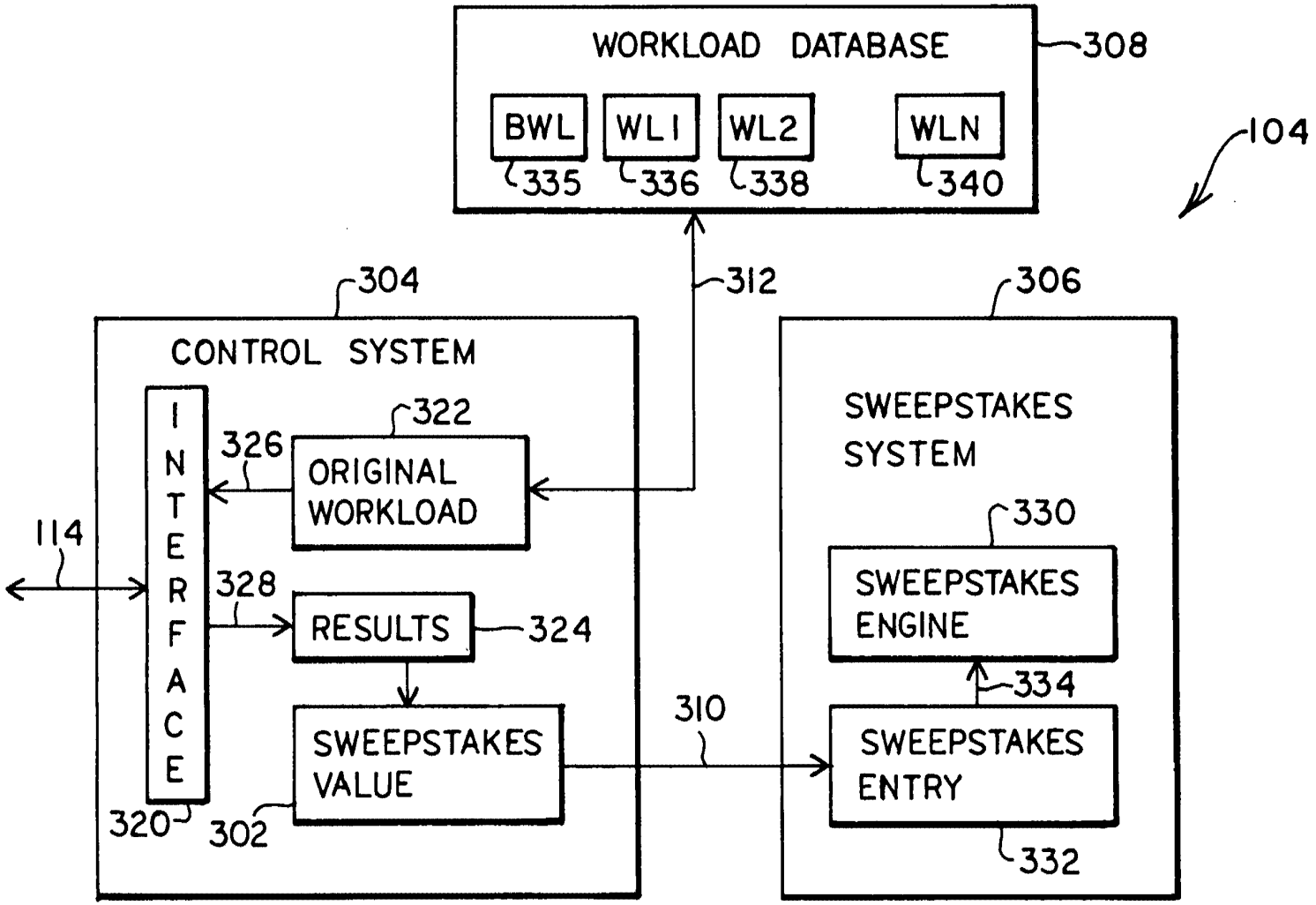

WORKLOAD DATABASE
308
BWL
335
WL1
336
WL2
338
WLN
340
104
304
312
306
CONTROL SYSTEM
SWEEPSTAKES SYSTEM
322
326
ORIGINAL WORKLOAD
330
SWEEPSTAKES ENGINE
114
INTERFACE
328
RESULTS
324
334
310
SWEEPSTAKES VALUE
SWEEPSTAKES ENTRY
320
302
332

FIG. 3A

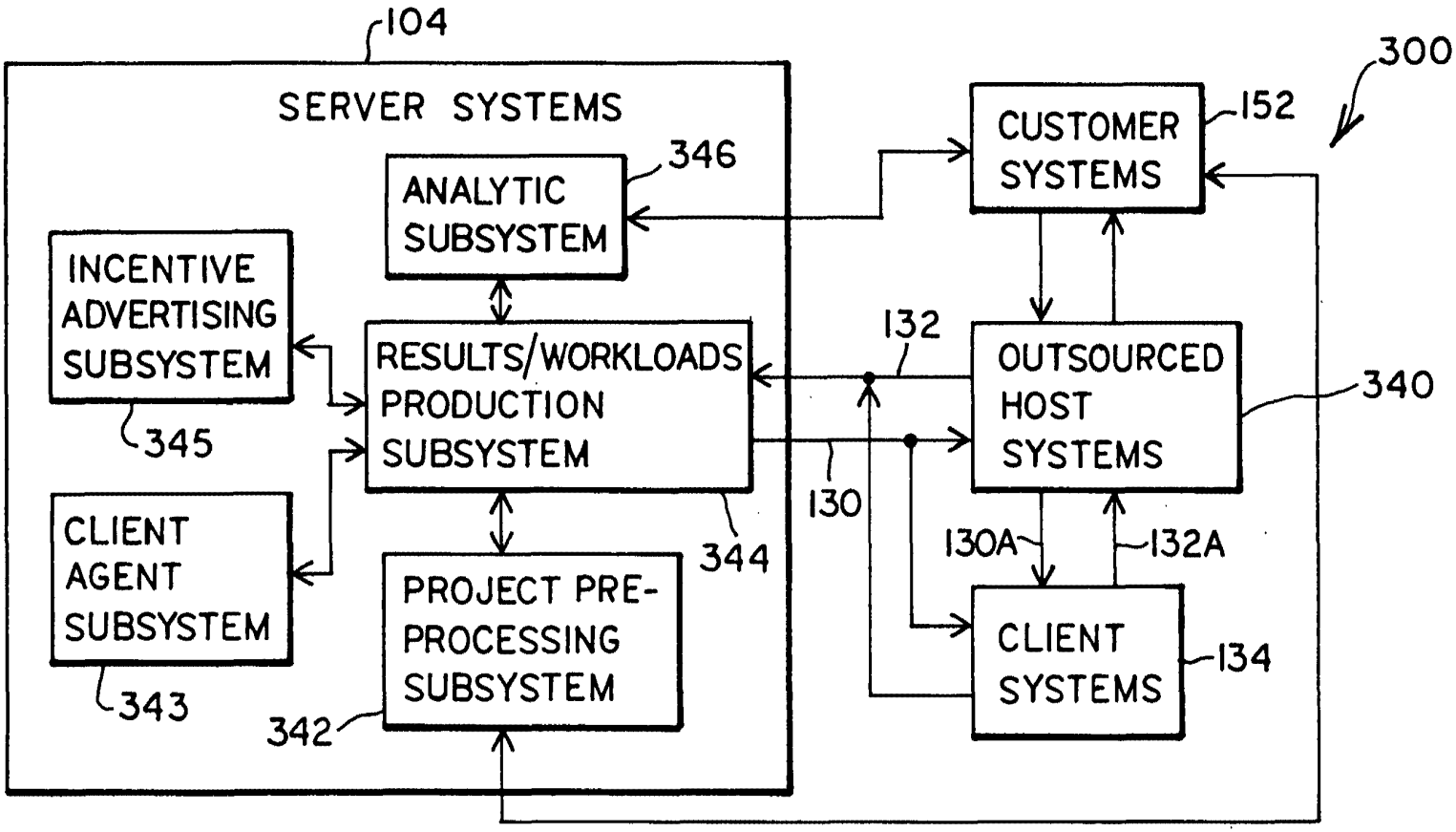

104
SERVER SYSTEMS
ANALYTIC SUBSYSTEM
346
INCENTIVE ADVERTISING SUBSYSTEM
345
RESULTS/WORKLOADS PRODUCTION SUBSYSTEM
344
CLIENT AGENT SUBSYSTEM
343
PROJECT PRE-PROCESSING SUBSYSTEM
342
300
CUSTOMER SYSTEMS
152
132
OUTSOURCED HOST SYSTEMS
340
130
130A
132A
CLIENT SYSTEMS
134

FIG. 3B

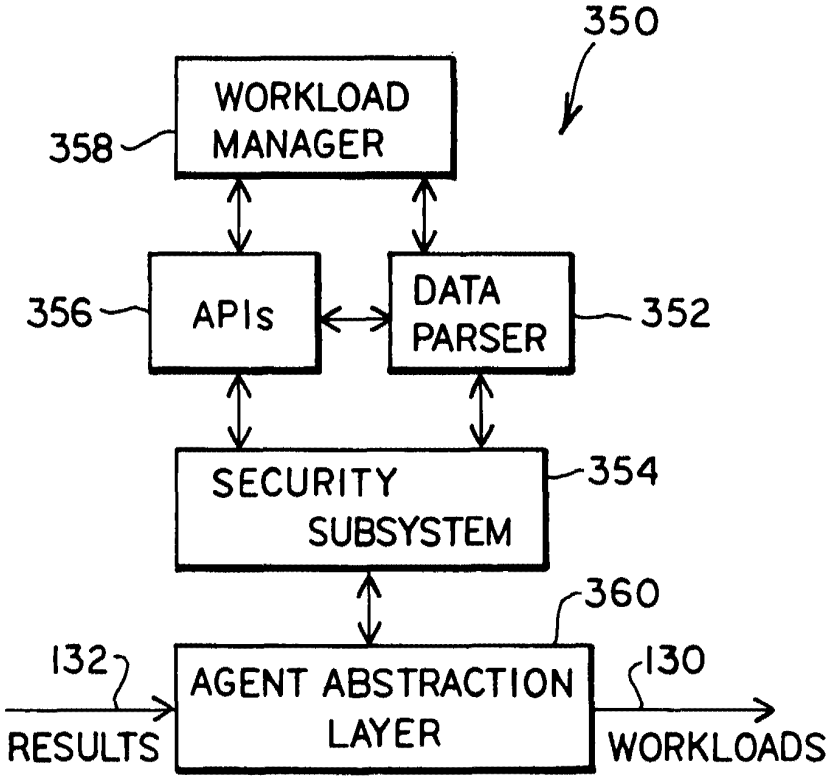

350
WORKLOAD MANAGER
358
356
APIs
DATA PARSER
352
SECURITY SUBSYSTEM
354
360
132
AGENT ABSTRACTION LAYER
130
RESULTS
WORKLOADS

FIG. 3C

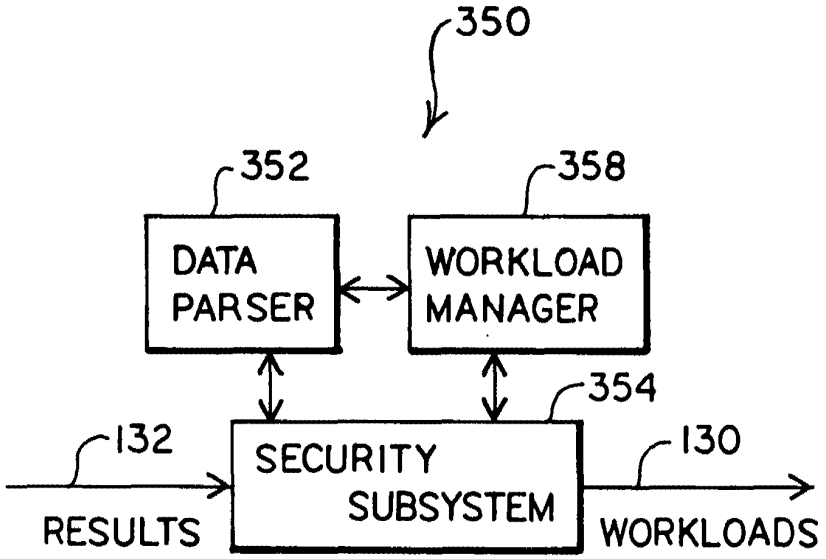

350
352
358
DATA PARSER
WORKLOAD MANAGER
354
132
SECURITY SUBSYSTEM
130
RESULTS
WORKLOADS

FIG. 3D

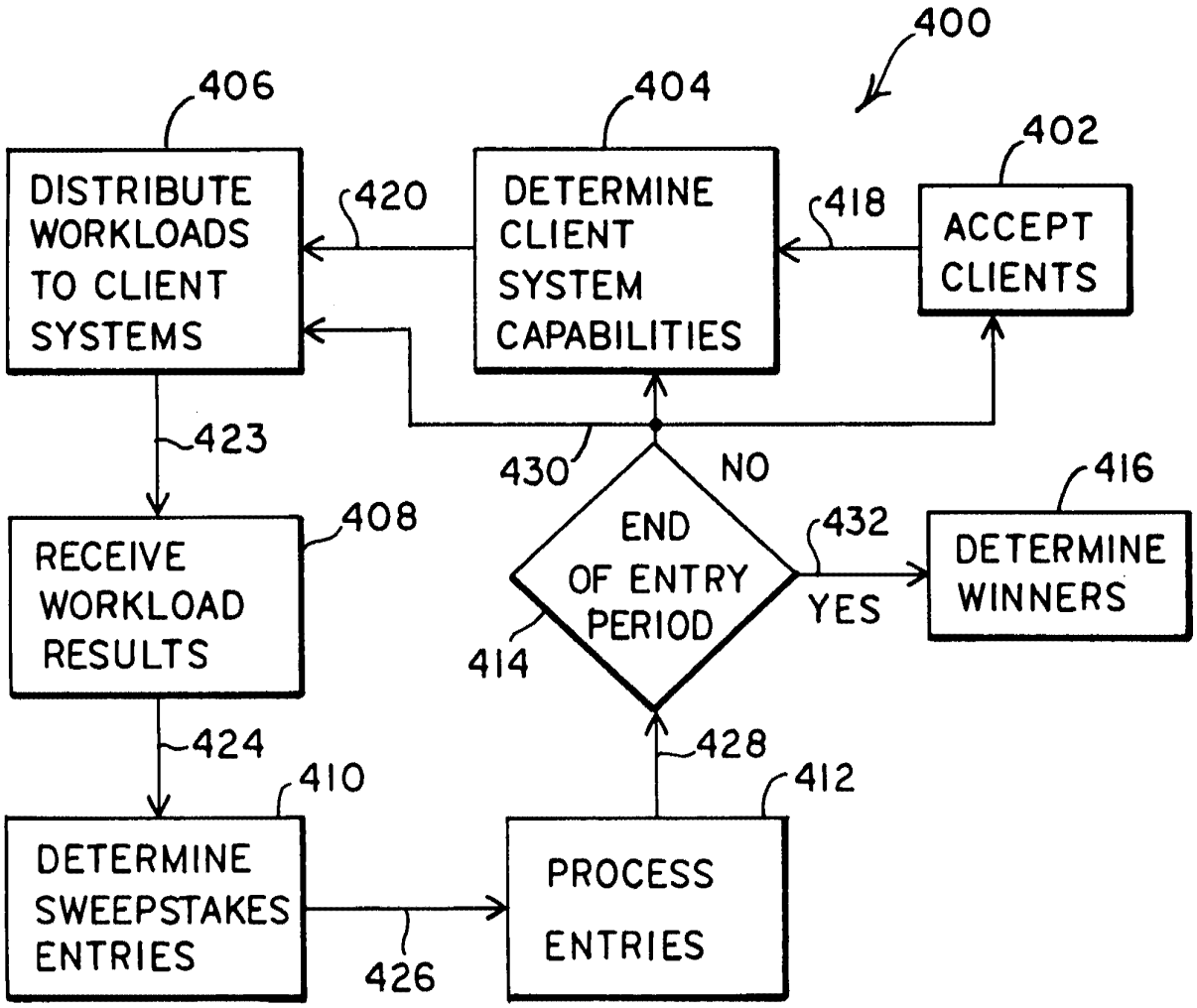

400
406
404
402
DISTRIBUTE WORKLOADS TO CLIENT SYSTEMS
420
DETERMINE CLIENT SYSTEM CAPABILITIES
418
ACCEPT CLIENTS
423
430
NO
416
408
RECEIVE WORKLOAD RESULTS
END OF ENTRY PERIOD
432
DETERMINE WINNERS
414
YES
424
428
410
412
DETERMINE SWEEPSTAKES ENTRIES
PROCESS ENTRIES
426

FIG. 4

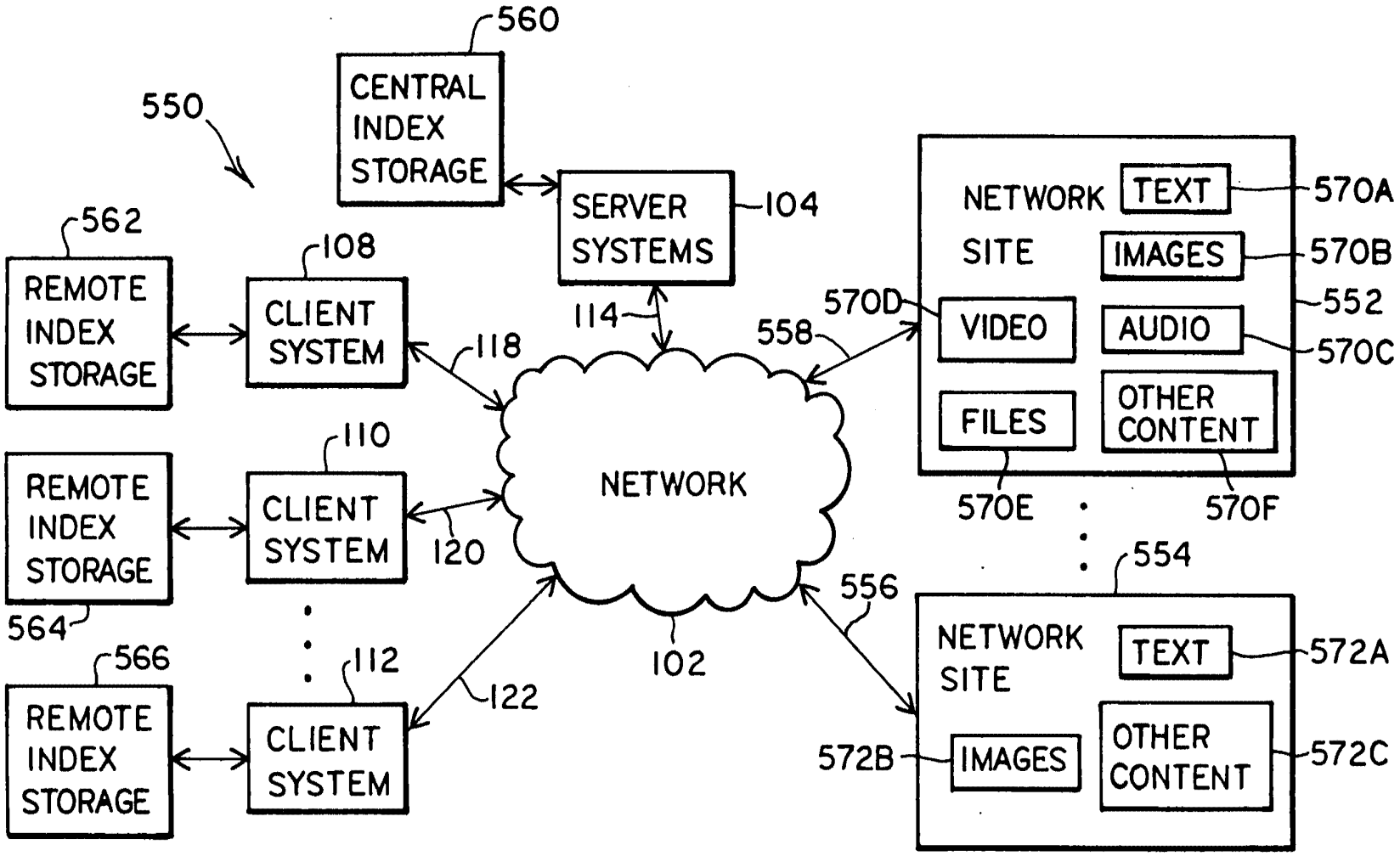

550
560
CENTRAL INDEX STORAGE
SERVER SYSTEMS
104
562
REMOTE INDEX STORAGE
108
CLIENT SYSTEM
114
118
110
REMOTE INDEX STORAGE
CLIENT SYSTEM
120
564
566
REMOTE INDEX STORAGE
112
CLIENT SYSTEM
122
NETWORK
102
558
570D
NETWORK SITE
TEXT
570A
IMAGES
570B
552
VIDEO
AUDIO
570C
FILES
OTHER CONTENT
570E
570F
554
556
NETWORK SITE
TEXT
572A
572B
IMAGES
OTHER CONTENT
572C

FIG. 5A

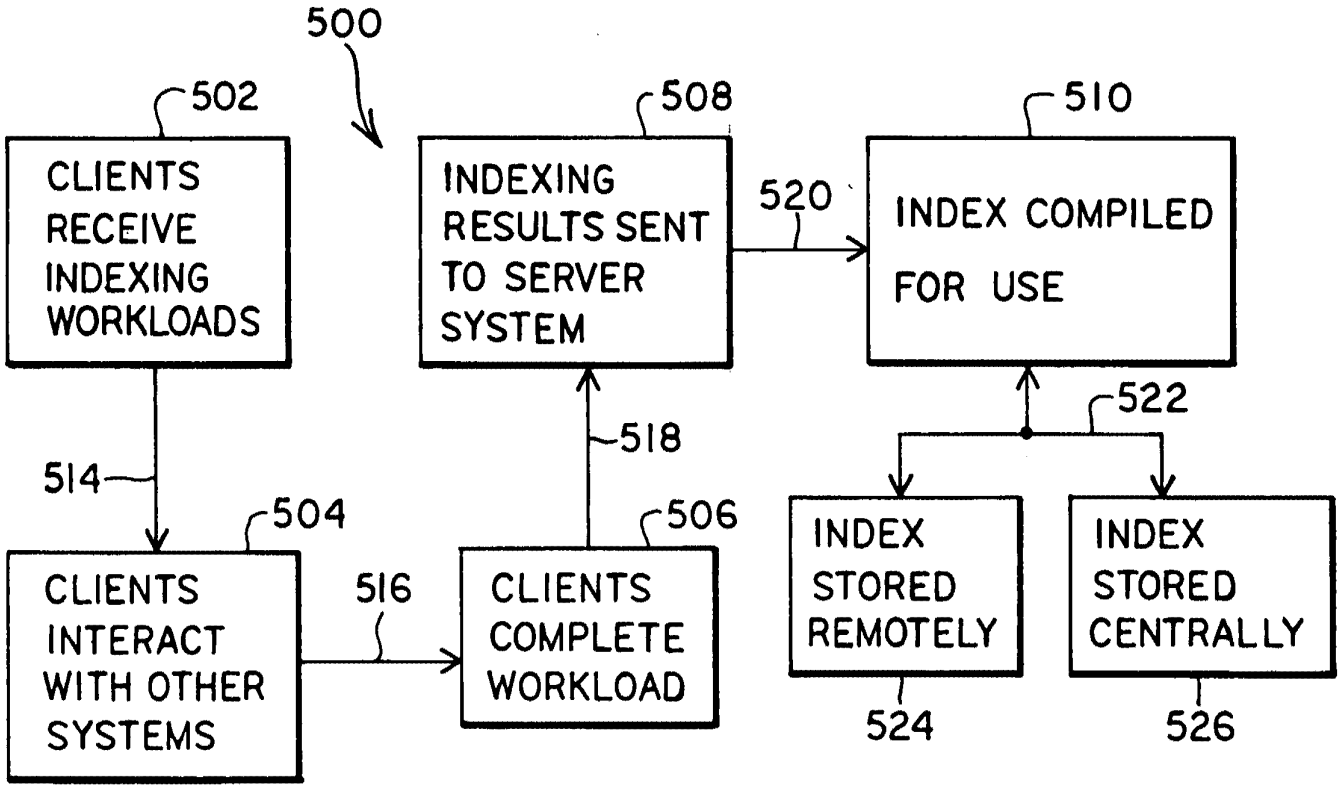

500
502
CLIENTS RECEIVE INDEXING WORKLOADS
508
INDEXING RESULTS SENT TO SERVER SYSTEM
520
510
INDEX COMPILED FOR USE
522
514
518
504
CLIENTS INTERACT WITH OTHER SYSTEMS
516
506
CLIENTS COMPLETE WORKLOAD
INDEX STORED REMOTELY
524
INDEX STORED CENTRALLY
526

FIG. 5B

TECHNOLOGY - 09854795

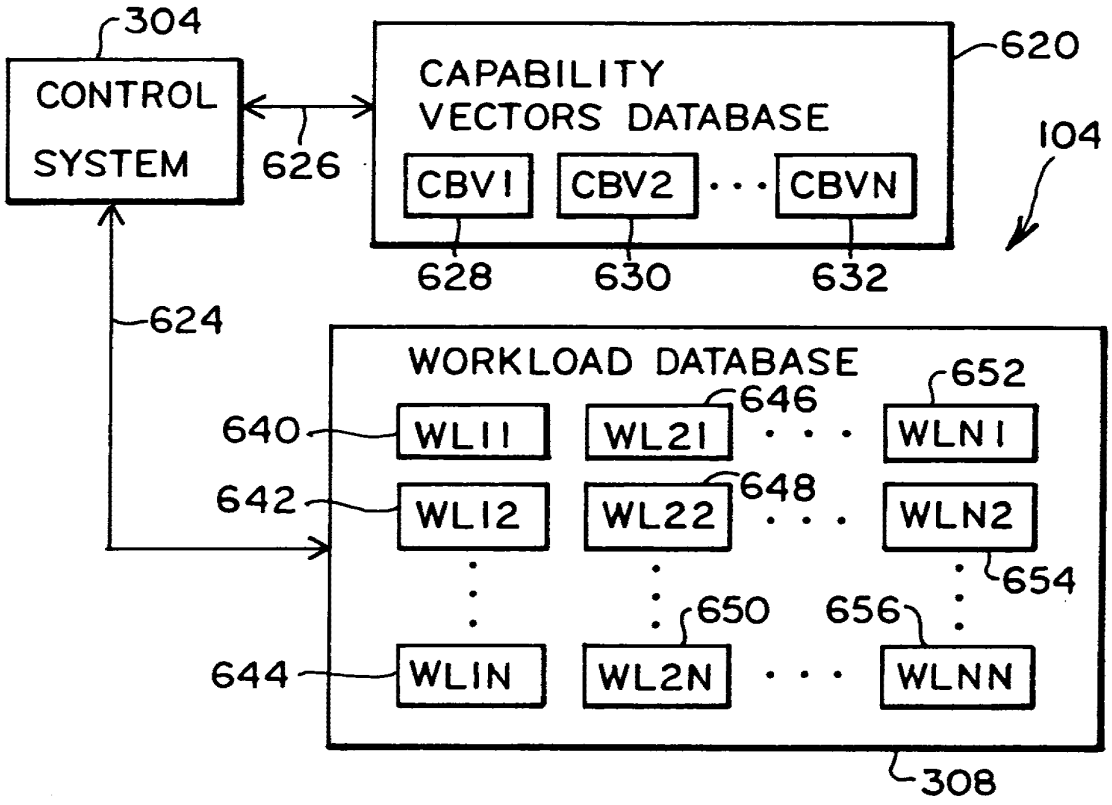


FIG. 6A

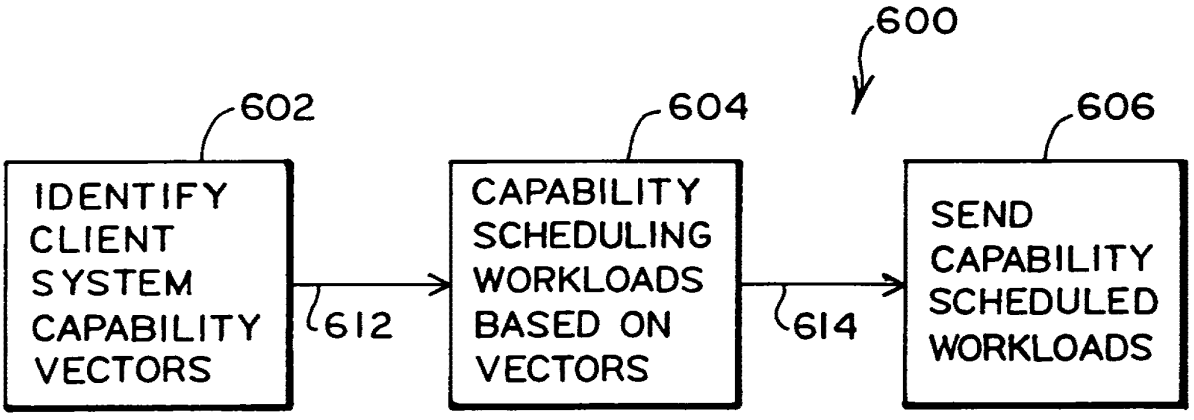


FIG. 6B

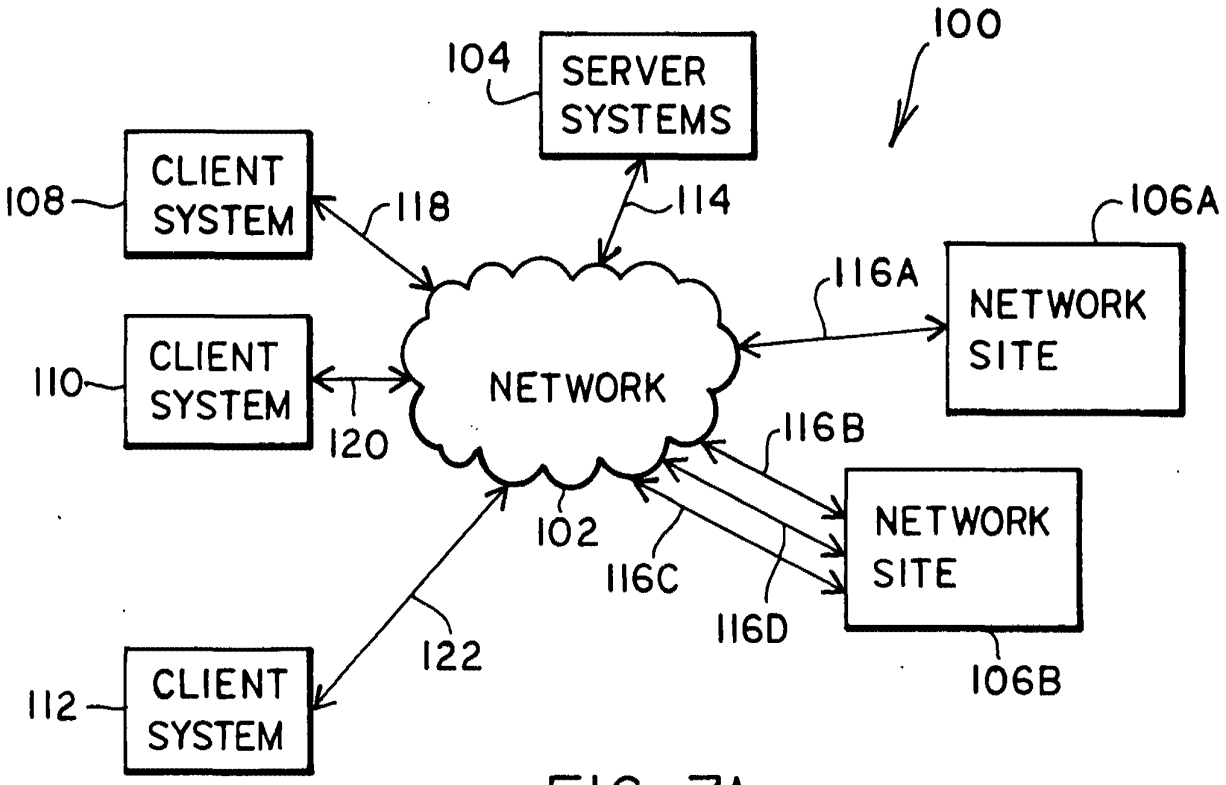

100
104
SERVER SYSTEMS
108
CLIENT SYSTEM
118
114
106A
116A
NETWORK SITE
110
CLIENT SYSTEM
NETWORK
120
116B
NETWORK SITE
102
116C
116D
122
106B
112
CLIENT SYSTEM

FIG. 7A

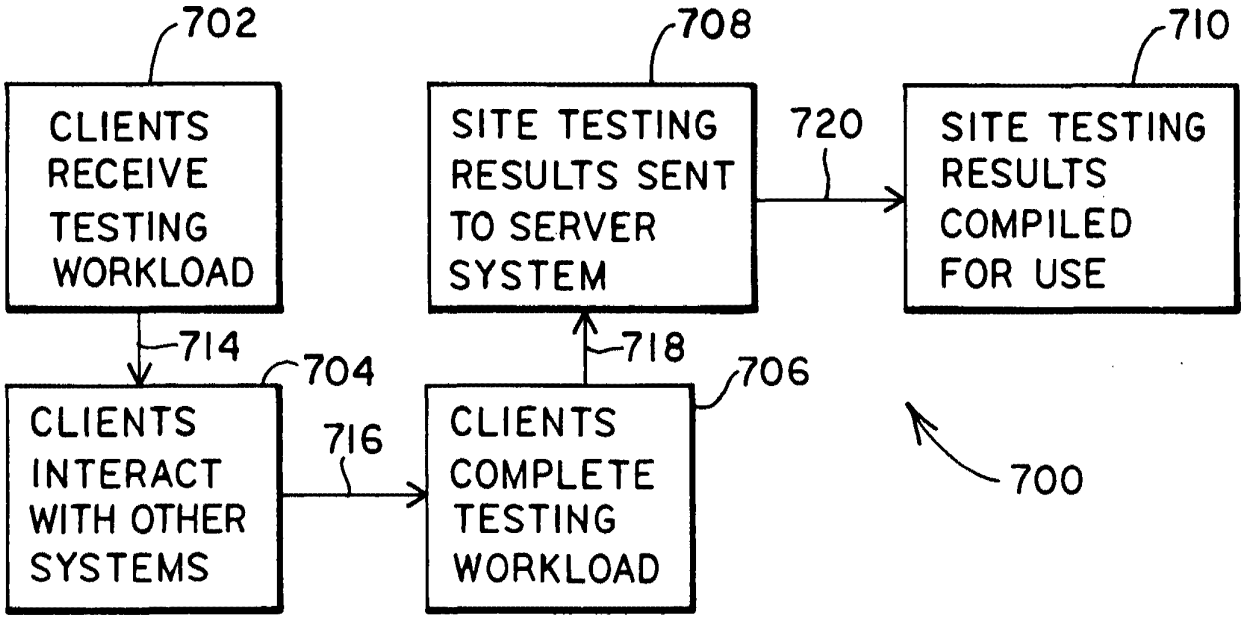

702
CLIENTS RECEIVE TESTING WORKLOAD
714
704
CLIENTS INTERACT WITH OTHER SYSTEMS
716
706
CLIENTS COMPLETE TESTING WORKLOAD
718
708
SITE TESTING RESULTS SENT TO SERVER SYSTEM
720
710
SITE TESTING RESULTS COMPILED FOR USE
700

FIG. 7B

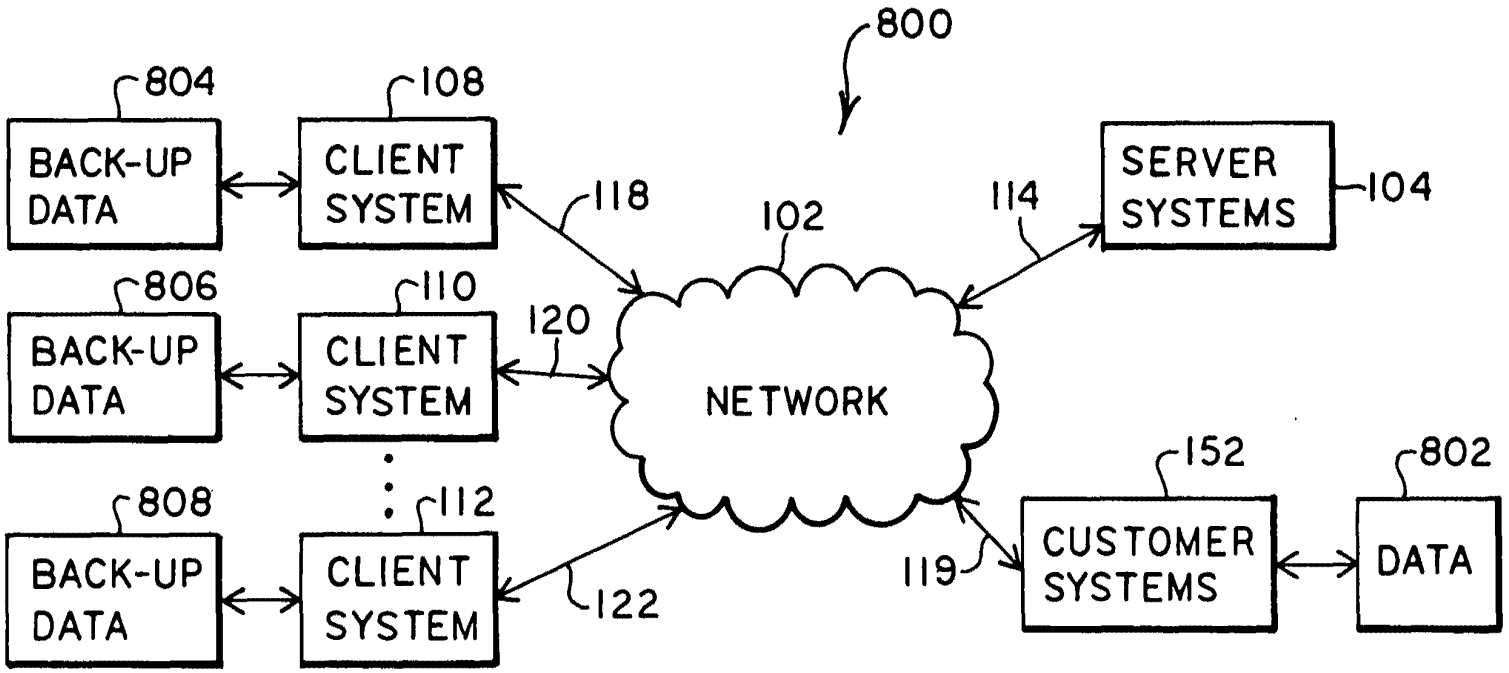

800
804
BACK-UP DATA
108
CLIENT SYSTEM
118
102
114
SERVER SYSTEMS
104
806
BACK-UP DATA
110
CLIENT SYSTEM
120
NETWORK
808
BACK-UP DATA
112
CLIENT SYSTEM
122
152
CUSTOMER SYSTEMS
119
802
DATA

FIG. 8

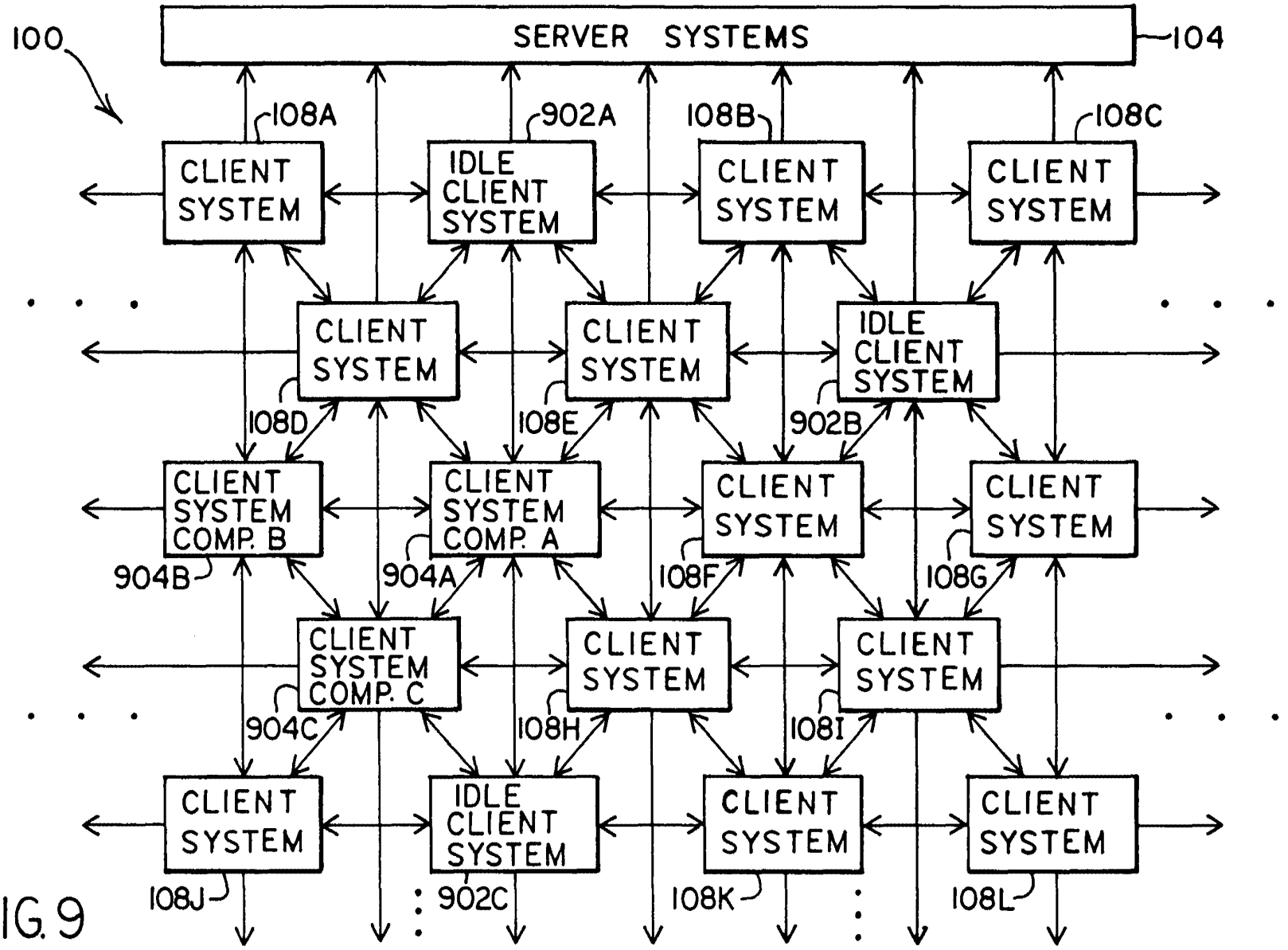

100
SERVER SYSTEMS
104
108A
902A
108B
108C
CLIENT SYSTEM
IDLE CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
IDLE CLIENT SYSTEM
108D
108E
902B
CLIENT SYSTEM COMP. B
CLIENT SYSTEM COMP. A
CLIENT SYSTEM
CLIENT SYSTEM
904B
904A
108F
108G
CLIENT SYSTEM COMP. C
CLIENT SYSTEM
CLIENT SYSTEM
904C
108H
108I
CLIENT SYSTEM
IDLE CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
108J
902C
108K
108L

FIG. 9

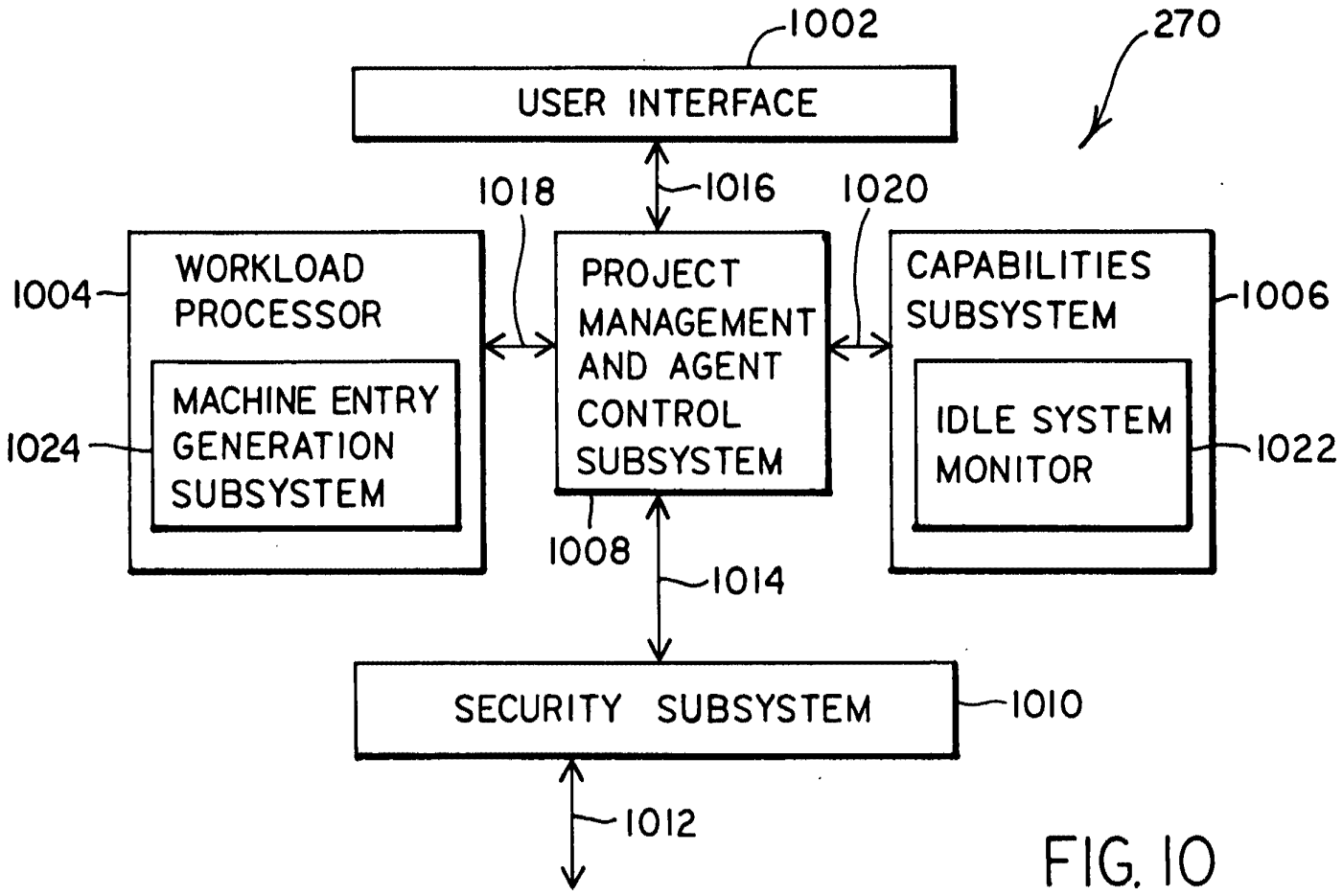

1002
270
USER INTERFACE
1018
1016
1020
1004
WORKLOAD PROCESSOR
PROJECT MANAGEMENT AND AGENT CONTROL SUBSYSTEM
CAPABILITIES SUBSYSTEM
1006
MACHINE ENTRY GENERATION SUBSYSTEM
1024
IDLE SYSTEM MONITOR
1022
1008
1014
SECURITY SUBSYSTEM
1010
1012

FIG. 10

Patent No. 6,385,643

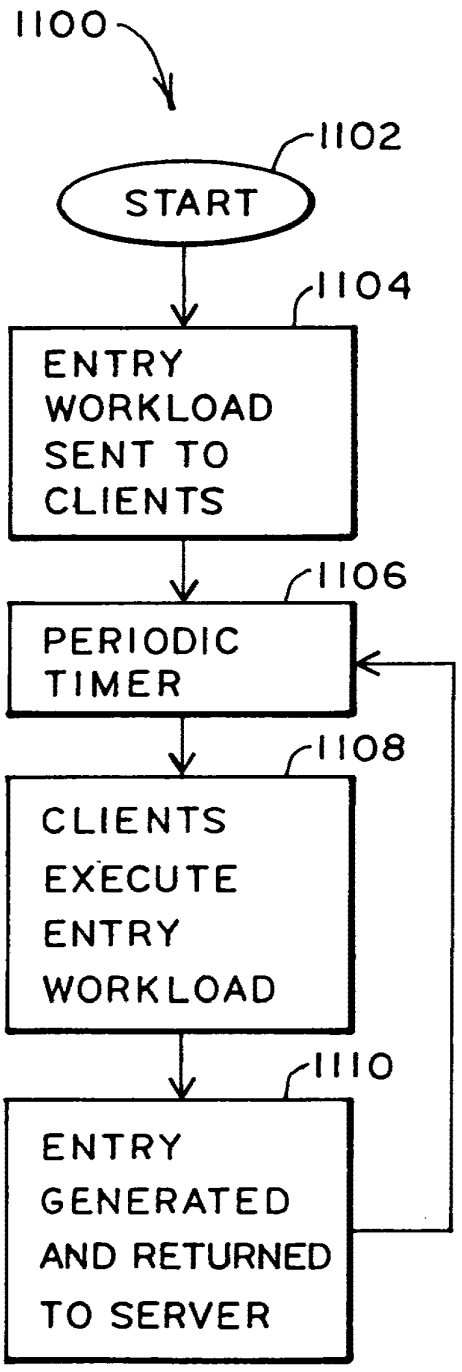


FIG. 11A

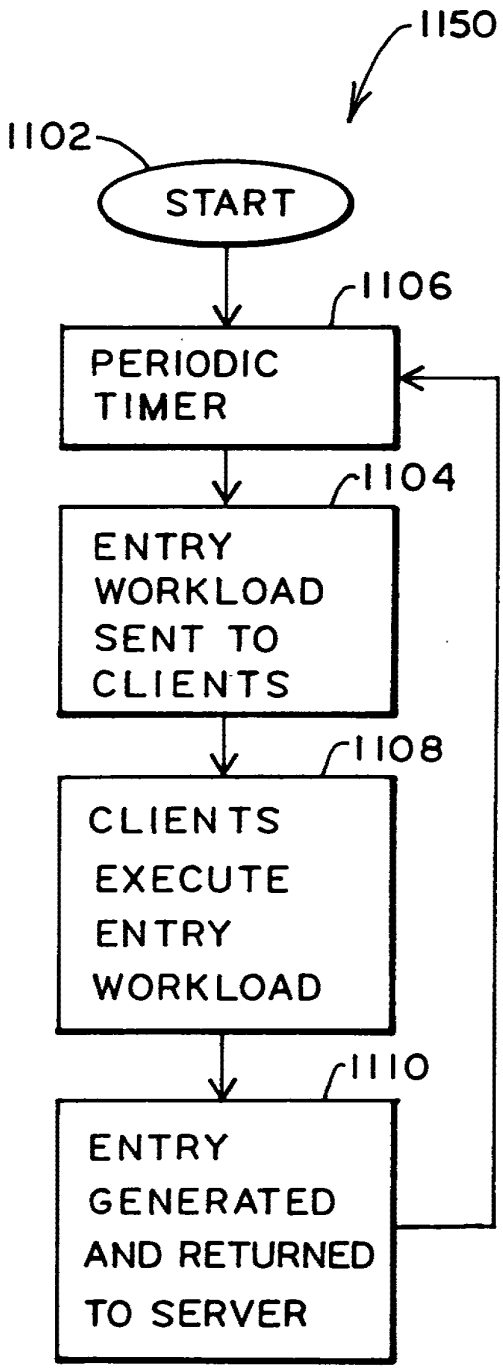


FIG. 11B

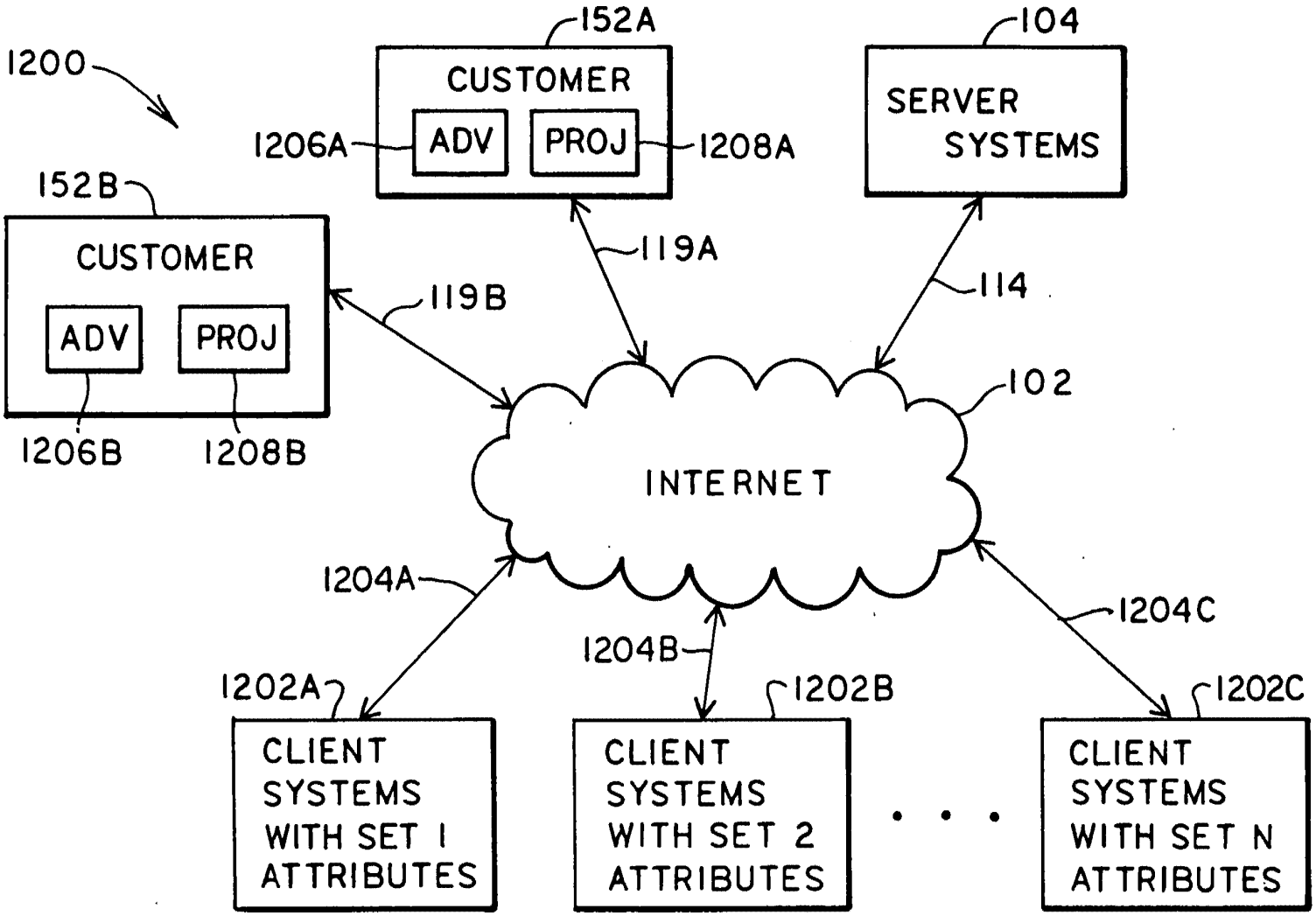

1200
152A
CUSTOMER
1206A
ADV
PROJ
1208A
104
SERVER
SYSTEMS
152B
CUSTOMER
ADV
PROJ
1206B
1208B
119A
119B
114
102
INTERNET
1204A
1204B
1204C
1202A
1202B
1202C
CLIENT SYSTEMS WITH SET 1 ATTRIBUTES
CLIENT SYSTEMS WITH SET 2 ATTRIBUTES
CLIENT SYSTEMS WITH SET N ATTRIBUTES

FIG. 12A

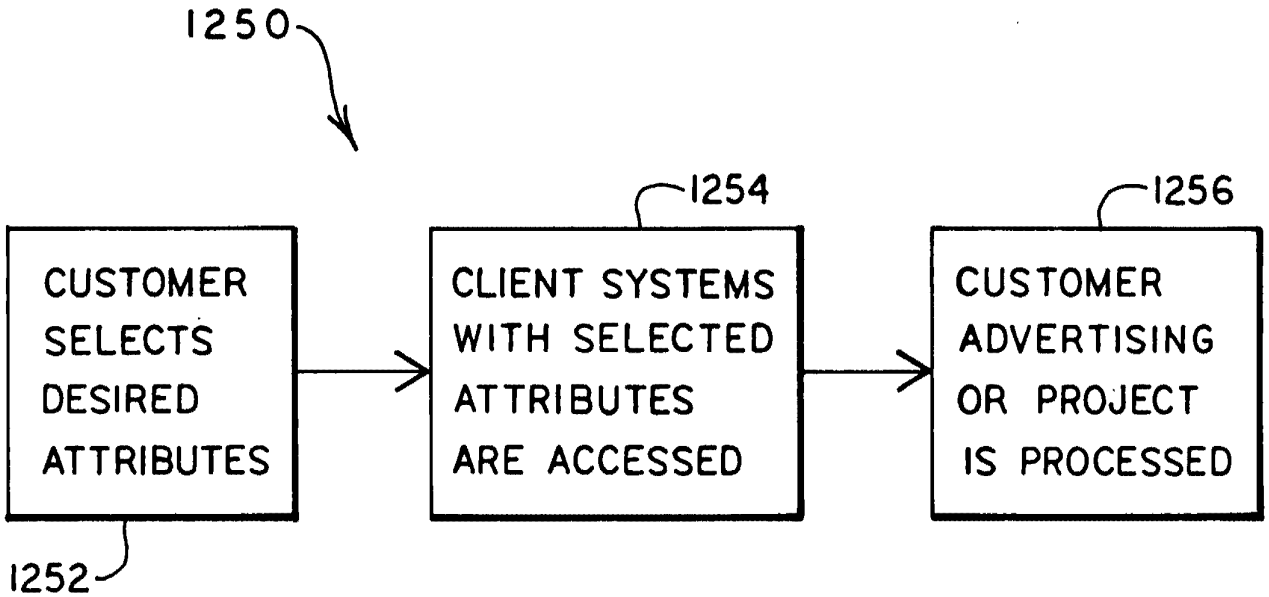

1250
1254
1256
CUSTOMER SELECTS DESIRED ATTRIBUTES
CLIENT SYSTEMS WITH SELECTED ATTRIBUTES ARE ACCESSED
CUSTOMER ADVERTISING OR PROJECT IS PROCESSED
1252

FIG. 12B

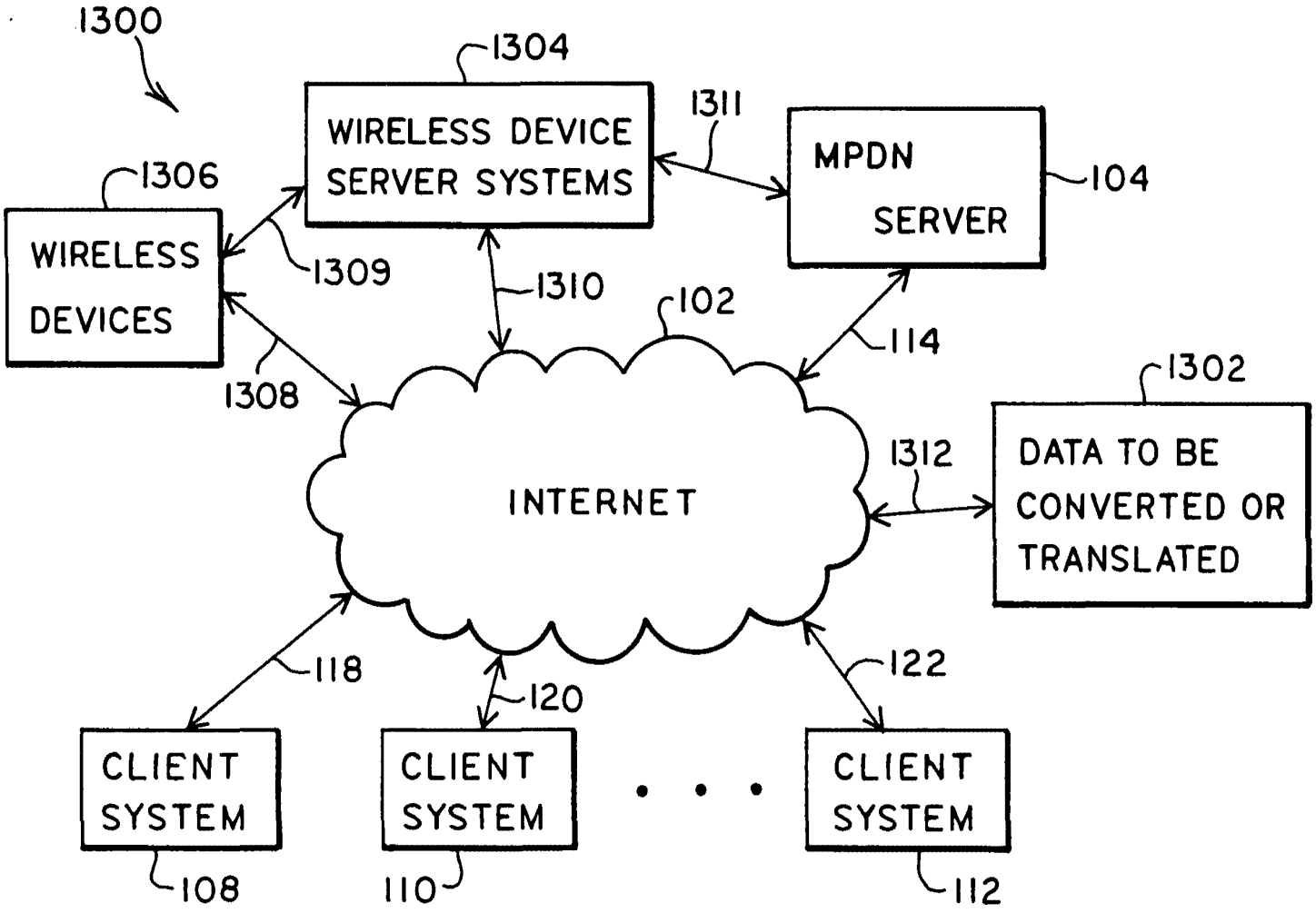

1300
1304
WIRELESS DEVICE SERVER SYSTEMS
1311
MPDN SERVER
104
1306
WIRELESS DEVICES
1309
1310
102
114
1308
1302
1312
DATA TO BE CONVERTED OR TRANSLATED
INTERNET
118
120
122
CLIENT SYSTEM
108
CLIENT SYSTEM
110
CLIENT SYSTEM
112

FIG. 13A

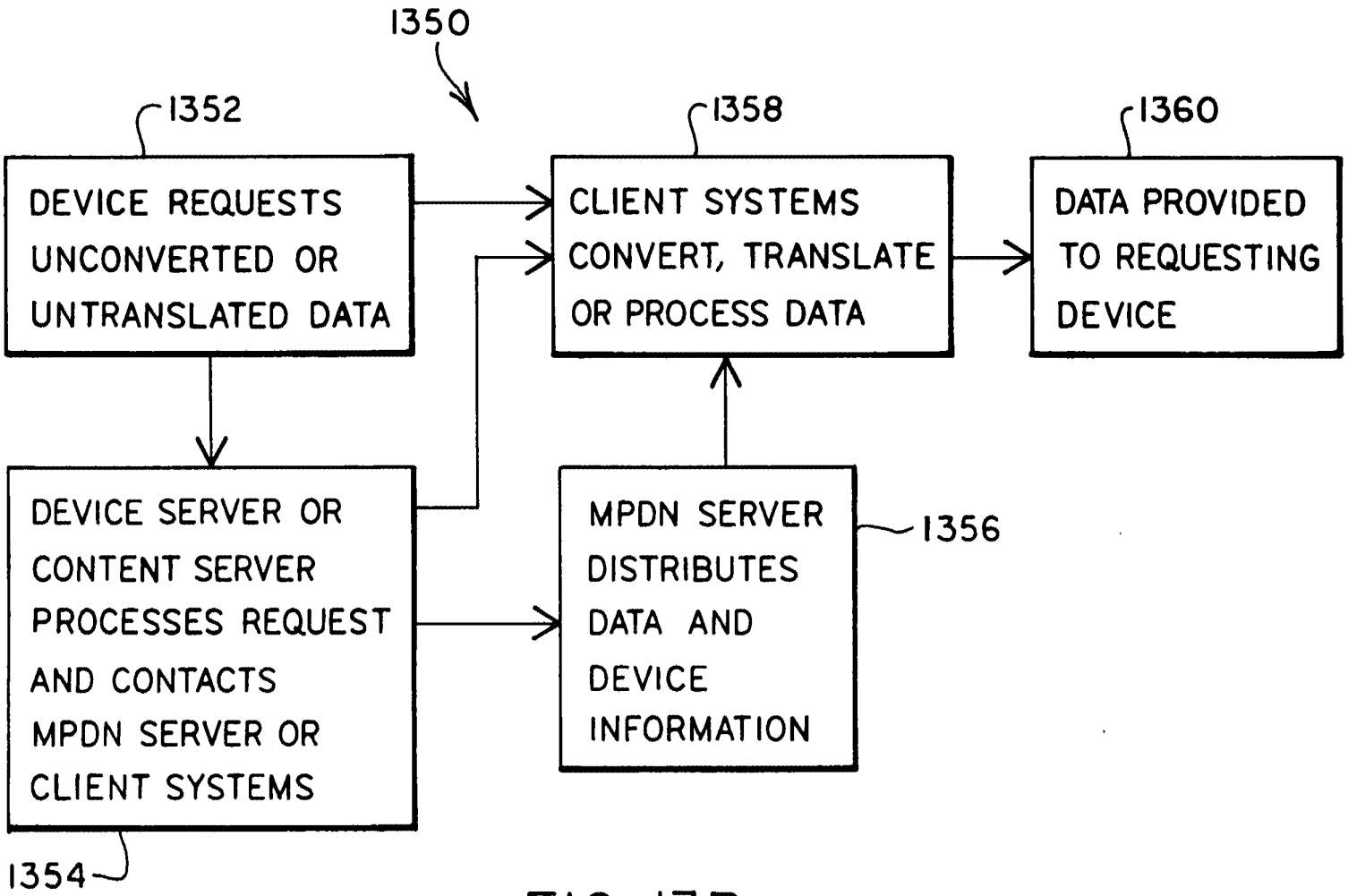

1350
1352
1358
1360
DEVICE REQUESTS UNCONVERTED OR UNTRANSLATED DATA
CLIENT SYSTEMS CONVERT, TRANSLATE OR PROCESS DATA
DATA PROVIDED TO REQUESTING DEVICE
DEVICE SERVER OR CONTENT SERVER PROCESSES REQUEST AND CONTACTS MPDN SERVER OR CLIENT SYSTEMS
MPDN SERVER DISTRIBUTES DATA AND DEVICE INFORMATION
1356
1354

FIG. 13B

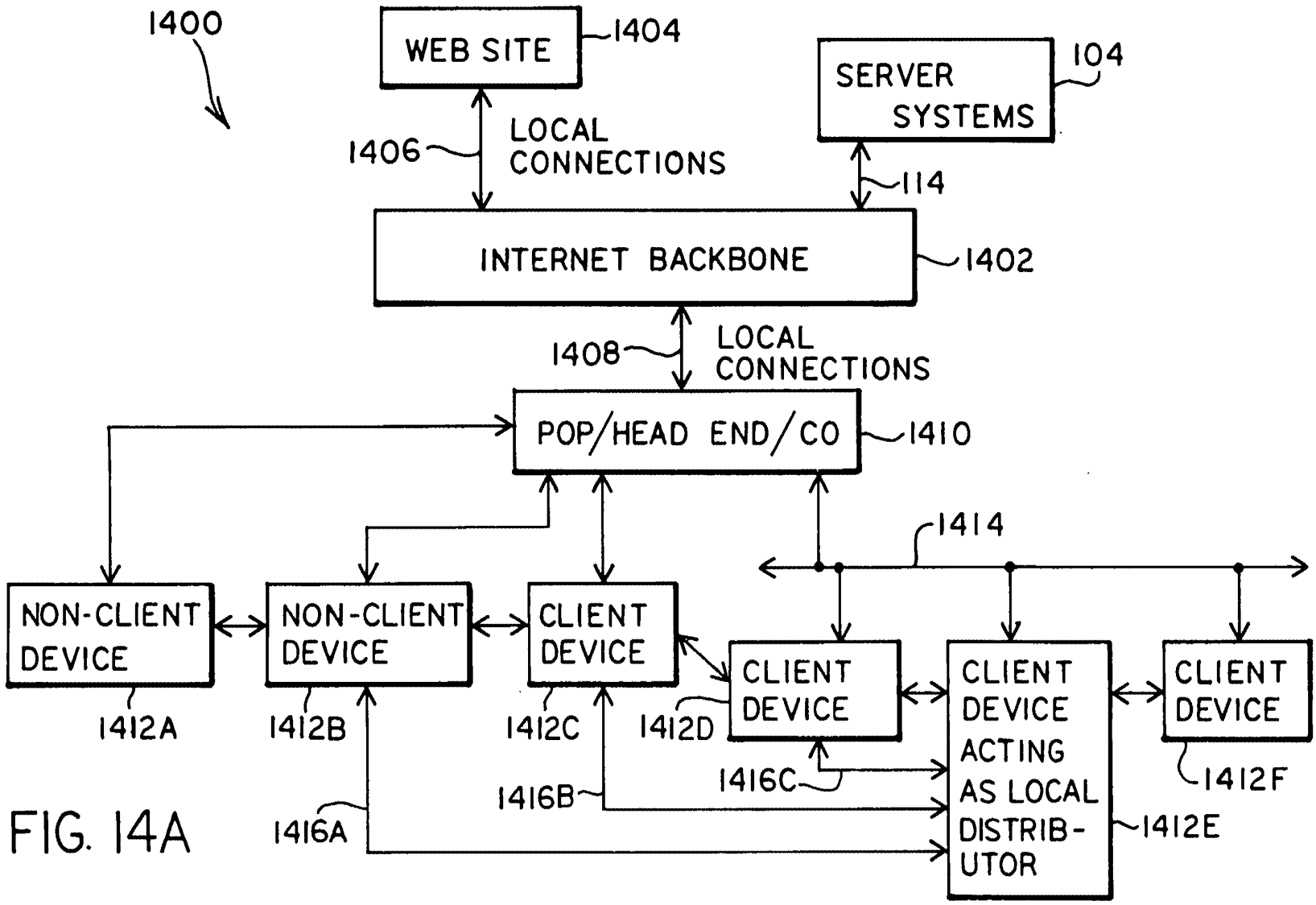

1400
WEB SITE
1404
SERVER SYSTEMS
104
1406
LOCAL CONNECTIONS
114
INTERNET BACKBONE
1402
1408
LOCAL CONNECTIONS
POP/HEAD END/CO
1410
1414
NON-CLIENT DEVICE
NON-CLIENT DEVICE
CLIENT DEVICE
CLIENT DEVICE
CLIENT DEVICE ACTING AS LOCAL DISTRIB-UTOR
CLIENT DEVICE
1412A
1412B
1412C
1412D
1412E
1412F
1416A
1416B
1416C

FIG. 14A

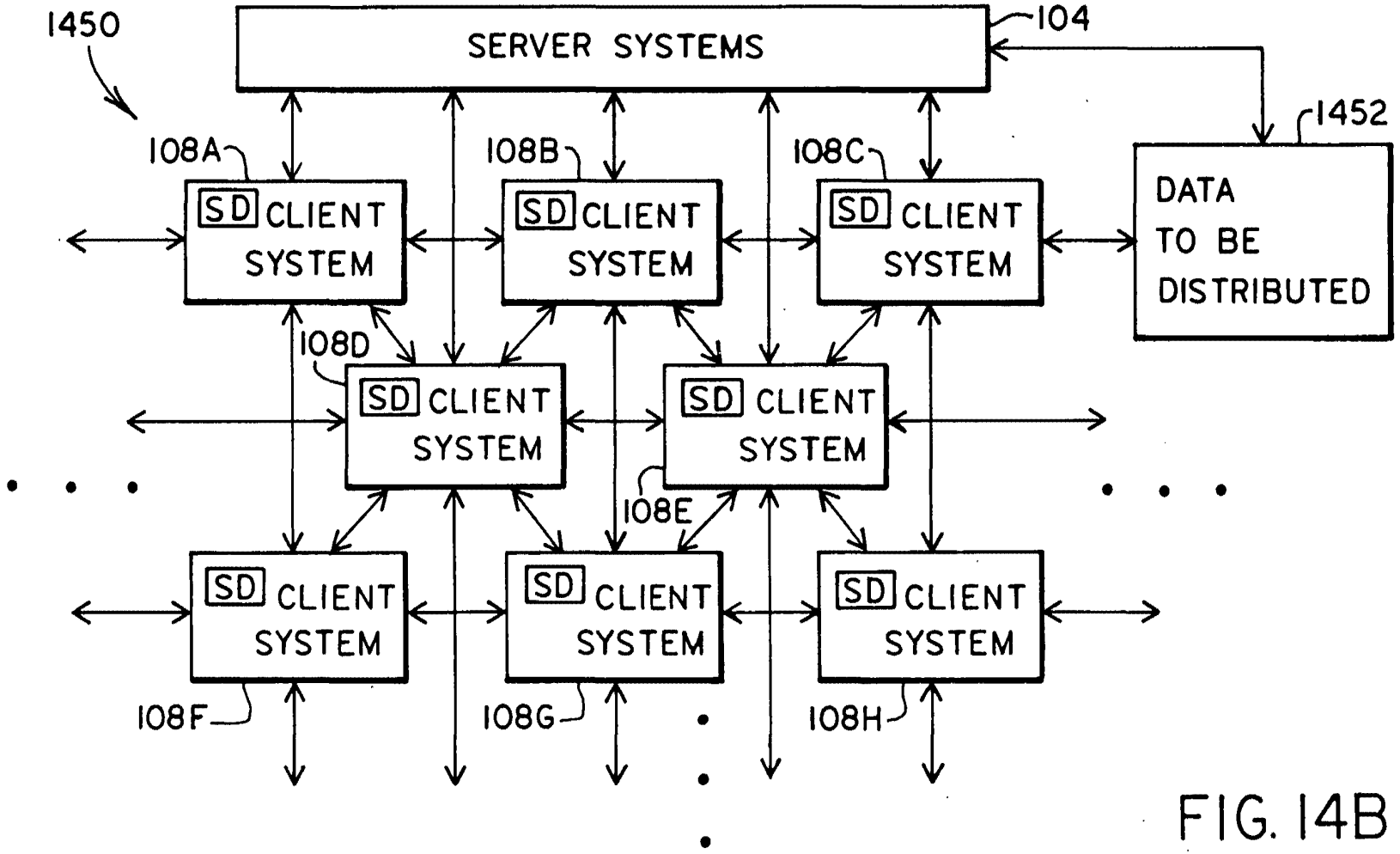

1450
SERVER SYSTEMS
104
1452
DATA TO BE DISTRIBUTED
108A
108B
108C
108D
108E
108F
108G
108H
SD CLIENT SYSTEM

FIG. 14B

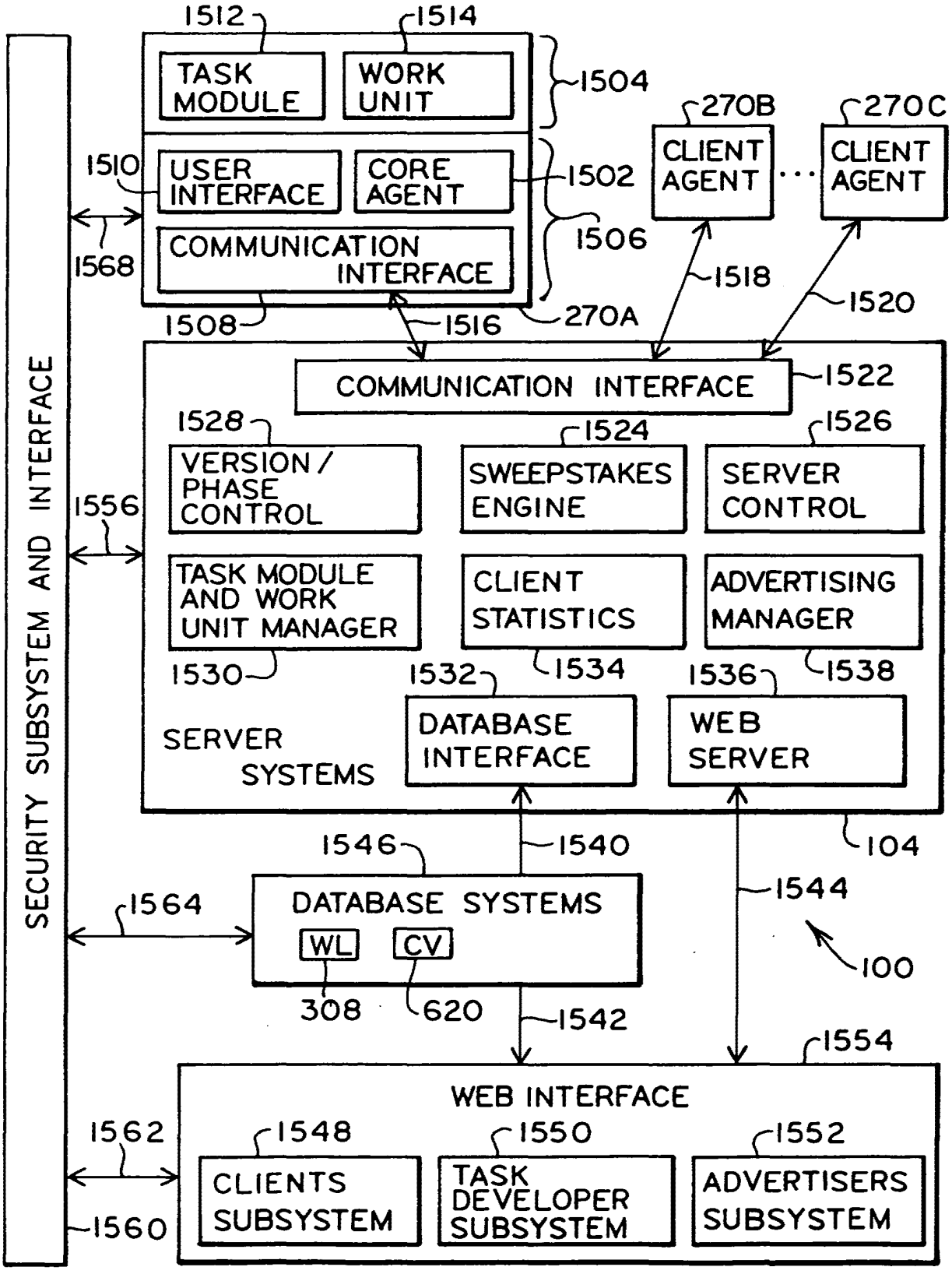


FIG. 15

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DATABRICKS EX1002 Page 134

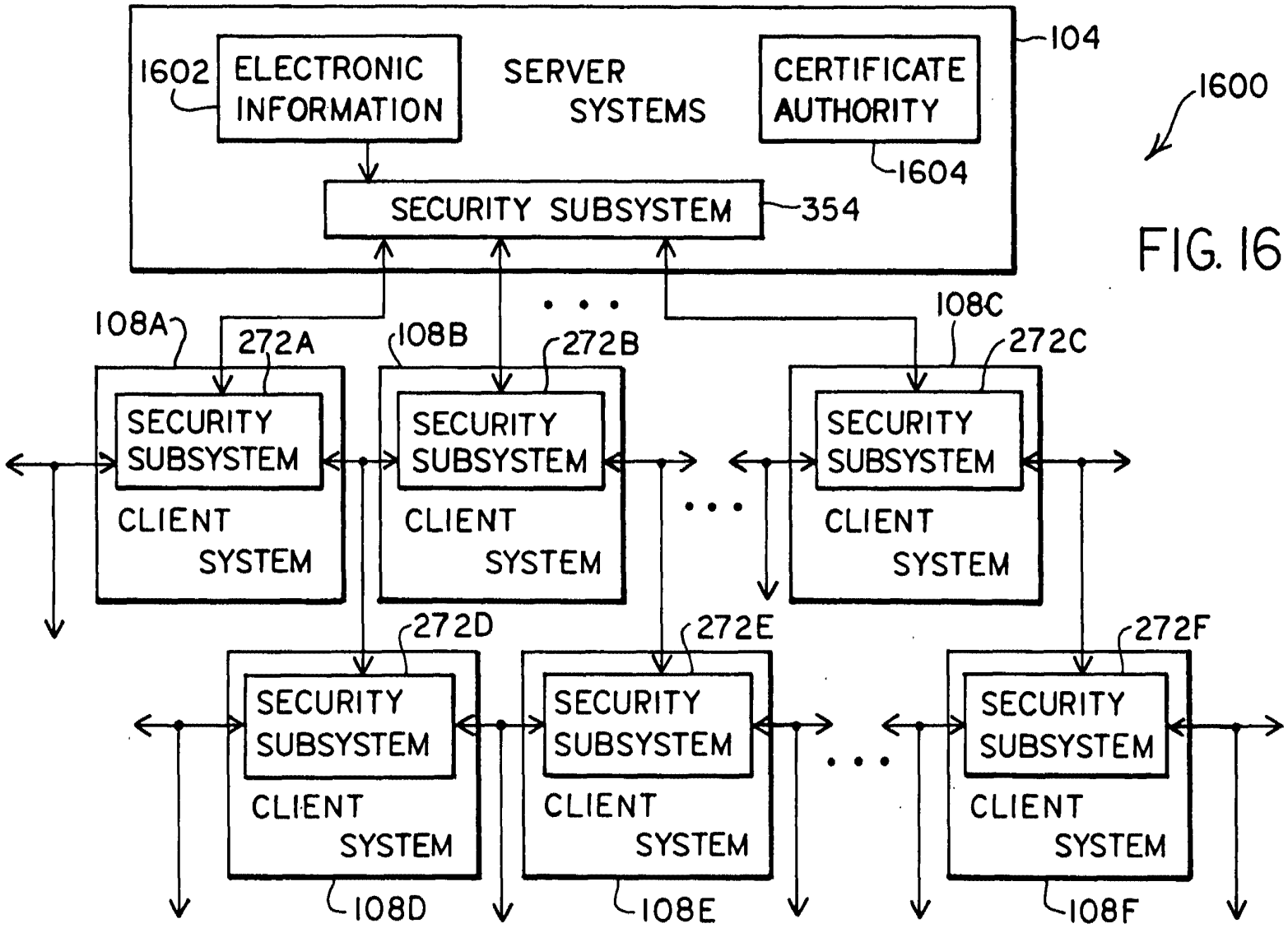

104
1602
ELECTRONIC INFORMATION
SERVER SYSTEMS
CERTIFICATE AUTHORITY
1604
1600
SECURITY SUBSYSTEM
354
108A
272A
108B
272B
108C
272C
SECURITY SUBSYSTEM
CLIENT SYSTEM
272D
272E
272F
108D
108E
108F

FIG. 16

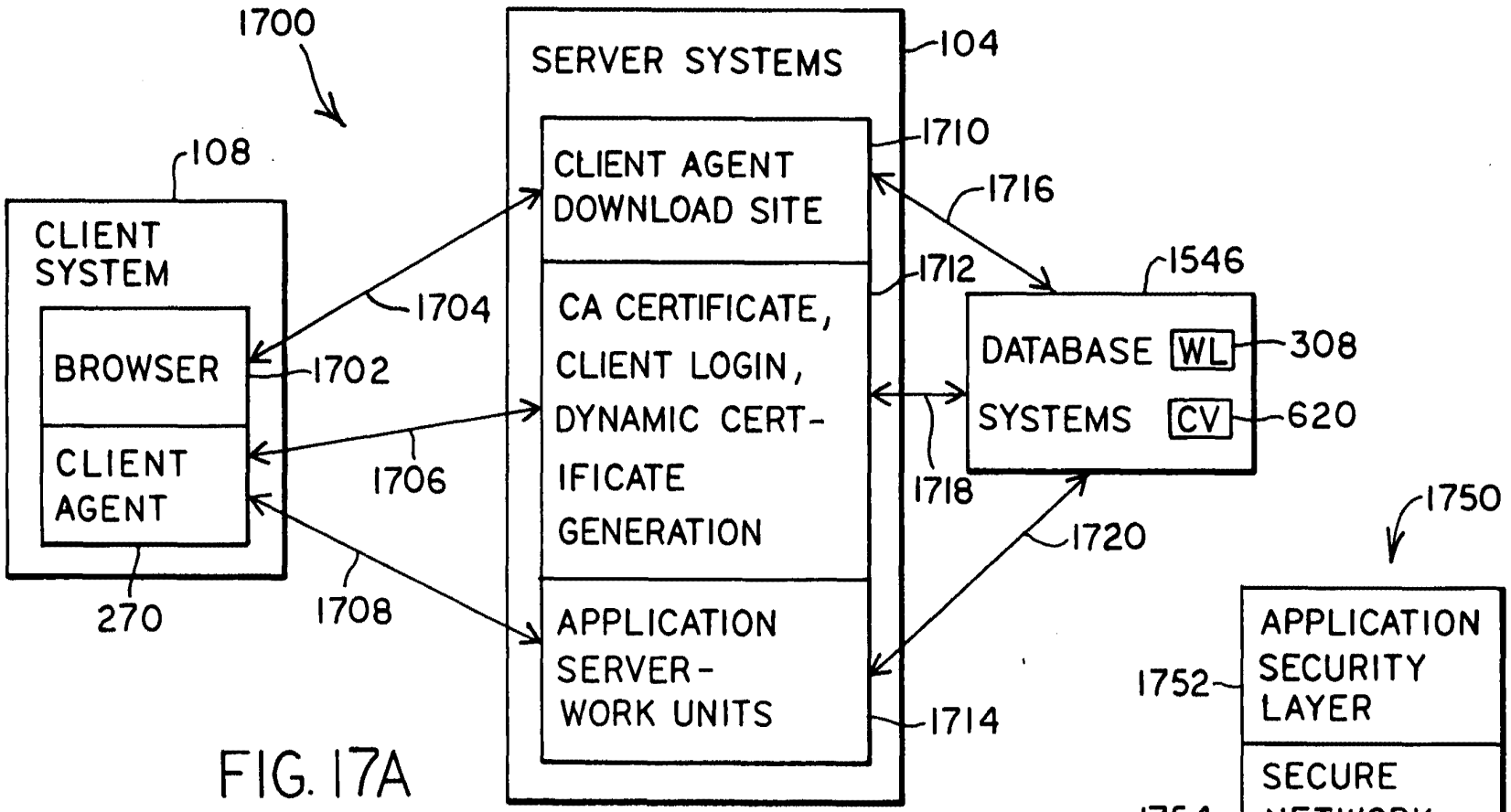


FIG. 17A

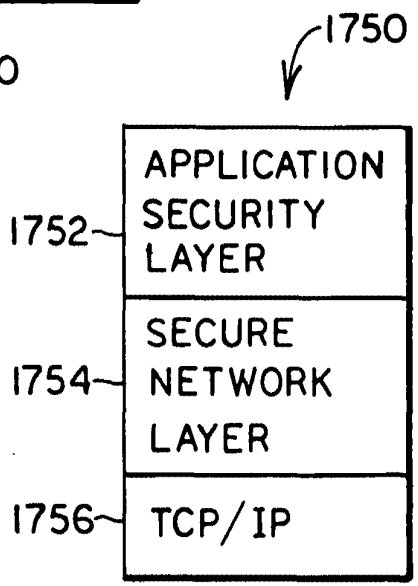


FIG. 17B

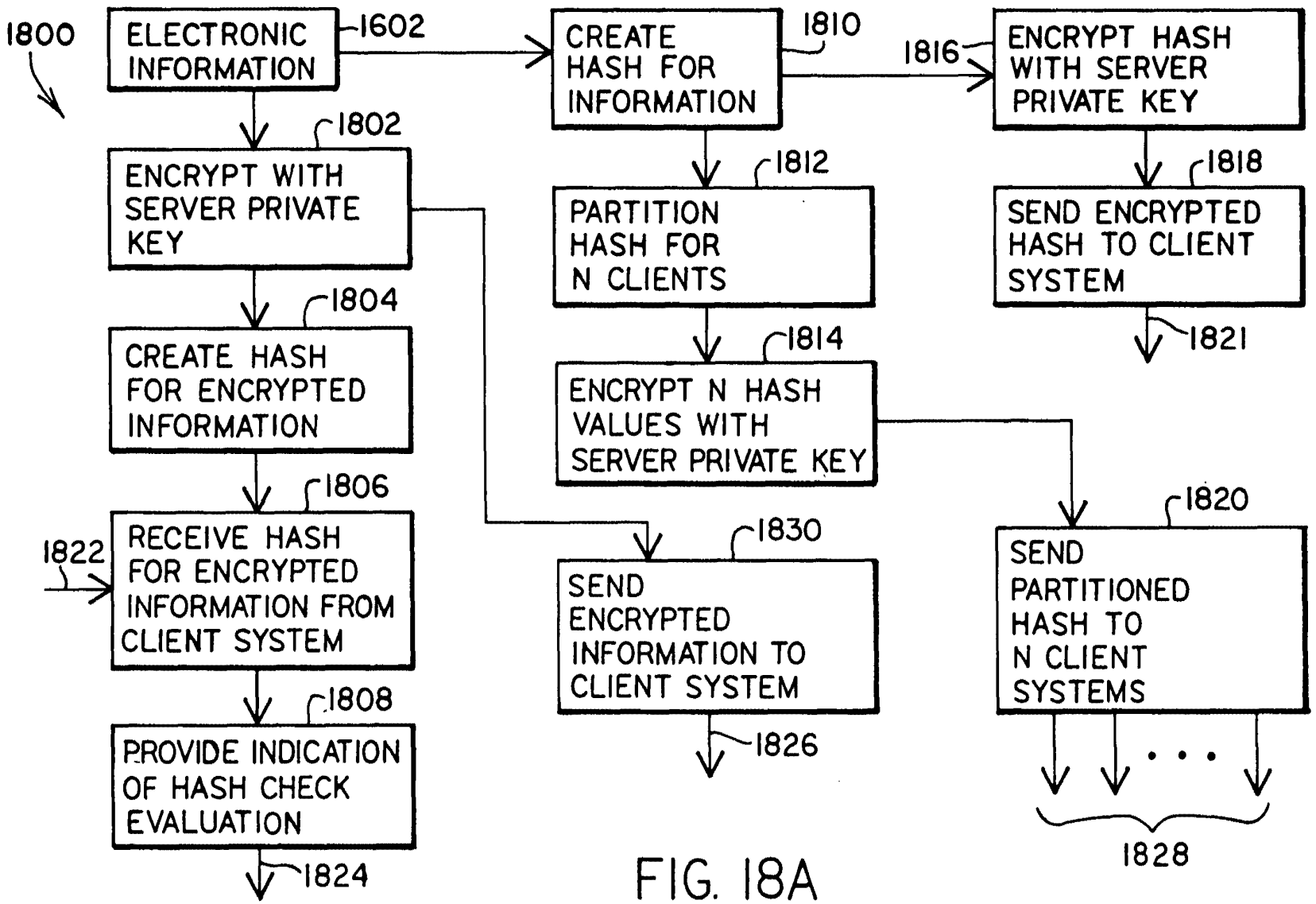

1800
ELECTRONIC INFORMATION
1602
ENCRYPT WITH SERVER PRIVATE KEY
1802
CREATE HASH FOR ENCRYPTED INFORMATION
1804
RECEIVE HASH FOR ENCRYPTED INFORMATION FROM CLIENT SYSTEM
1806
1822
PROVIDE INDICATION OF HASH CHECK EVALUATION
1808
1824
CREATE HASH FOR INFORMATION
1810
PARTITION HASH FOR N CLIENTS
1812
ENCRYPT N HASH VALUES WITH SERVER PRIVATE KEY
1814
SEND ENCRYPTED INFORMATION TO CLIENT SYSTEM
1830
1826
ENCRYPT HASH WITH SERVER PRIVATE KEY
1816
SEND ENCRYPTED HASH TO CLIENT SYSTEM
1818
1821
SEND PARTITIONED HASH TO N CLIENT SYSTEMS
1820
1828

FIG. 18A

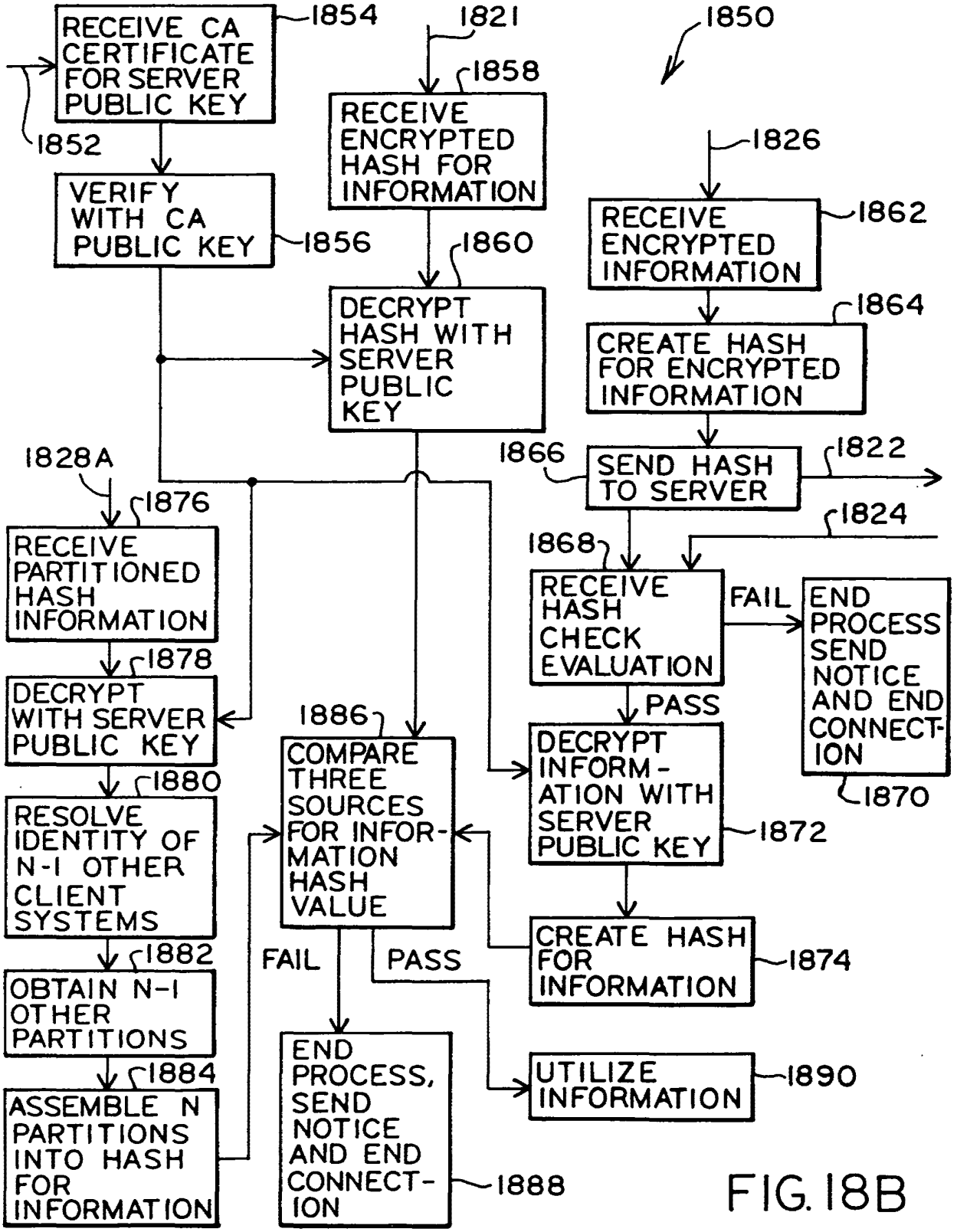


FIG. 18B

Patent: 6,938,154 B1

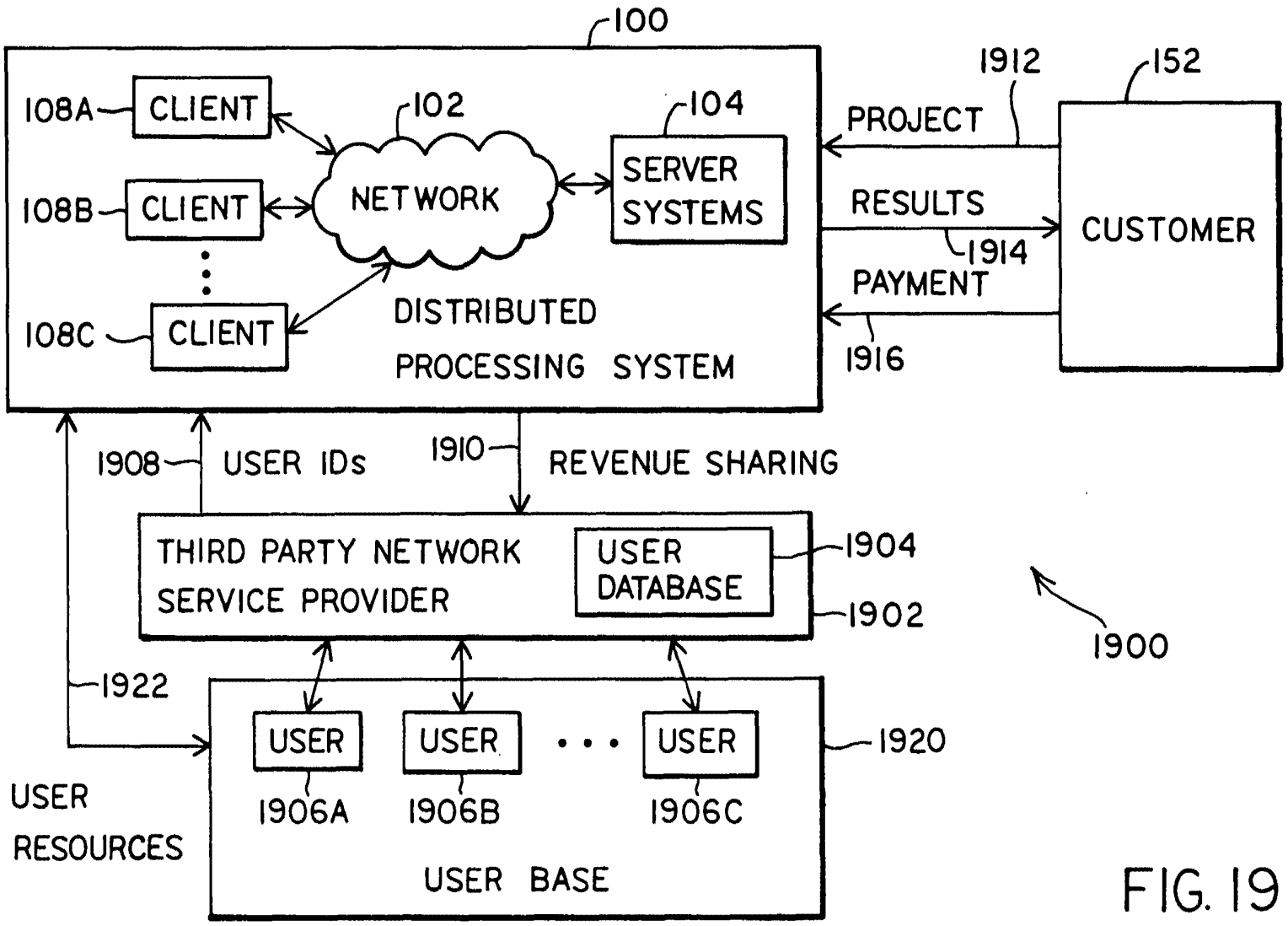

100
108A
CLIENT
102
104
NETWORK
SERVER SYSTEMS
108B
CLIENT
108C
CLIENT
DISTRIBUTED PROCESSING SYSTEM
1912
152
PROJECT
RESULTS
1914
PAYMENT
1916
CUSTOMER
1908
USER IDs
1910
REVENUE SHARING
THIRD PARTY NETWORK SERVICE PROVIDER
USER DATABASE
1904
1902
1900
1922
USER
USER
USER
1920
1906A
1906B
1906C
USER RESOURCES
USER BASE

FIG. 19

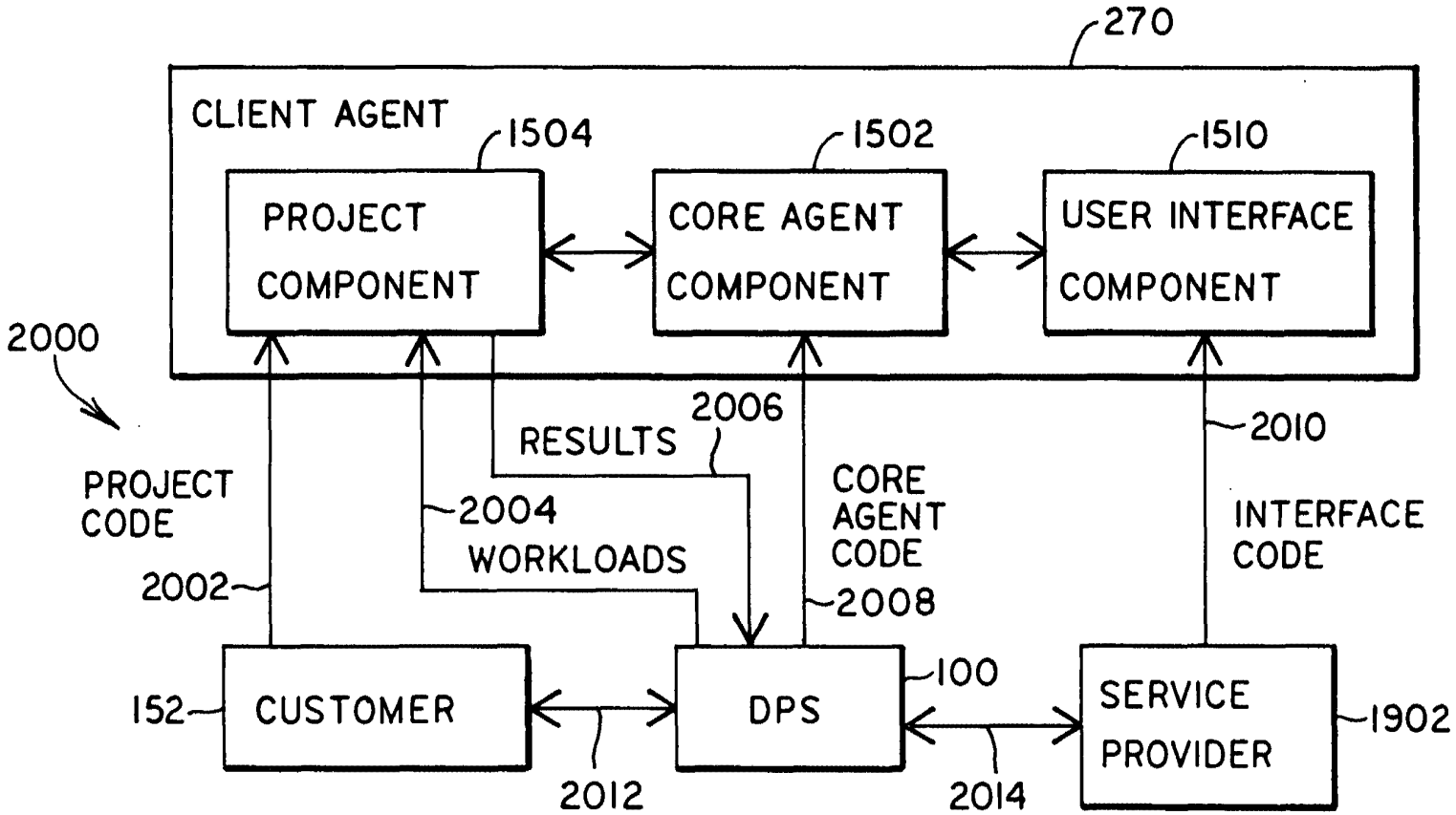

270
CLIENT AGENT
1504
1502
1510
PROJECT COMPONENT
CORE AGENT COMPONENT
USER INTERFACE COMPONENT
2000
2006
RESULTS
2010
PROJECT CODE
2004
WORKLOADS
CORE AGENT CODE
INTERFACE CODE
2002
2008
152
CUSTOMER
100
DPS
SERVICE PROVIDER
1902
2012
2014

FIG. 20

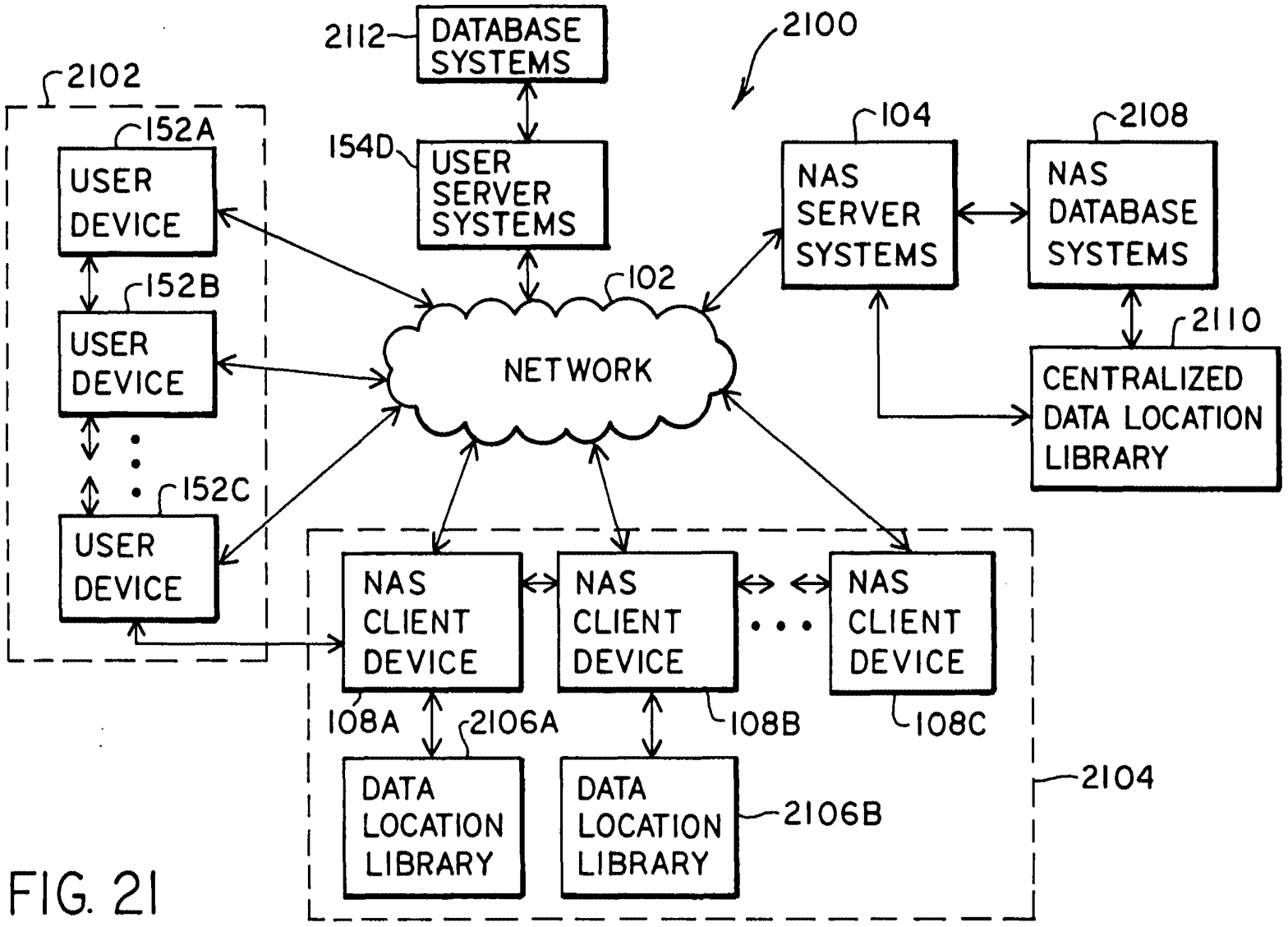

2112
DATABASE SYSTEMS
2100
2102
152A
USER DEVICE
154D
USER SERVER SYSTEMS
104
NAS SERVER SYSTEMS
2108
NAS DATABASE SYSTEMS
152B
USER DEVICE
102
NETWORK
2110
CENTRALIZED DATA LOCATION LIBRARY
152C
USER DEVICE
NAS CLIENT DEVICE
NAS CLIENT DEVICE
NAS CLIENT DEVICE
108A
2106A
108B
108C
DATA LOCATION LIBRARY
DATA LOCATION LIBRARY
2106B
2104

FIG. 21

Patent Application for

SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

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This application is a continuation-in-part application of the following co-pending applications: Application SN 09/538,543 entitled "DISTRIBUTED PARALLEL PROCESSING SYSTEM HAVING CAPABILITY-BASED INCENTIVES AND ASSOCIATED METHOD," Application SN 09/539,023 entitled "SWEEPSTAKES INCENTIVE MODEL AND ASSOCIATED SYSTEM," Application SN 09/539,448, entitled "CAPABILITY-BASED DISTRIBUTED PARALLEL PROCESING SYSTEM AND ASSOCIATED METHOD," Application SN 09/539,428 entitled "METHOD OF MANAGING DISTRIBUTED WORKLOADS AND ASSOCIATED SYSTEM," Application SN 09/539,106 entitled "NETWORK SITE TESTING METHOD AND ASSOCIATED SYSTEM," Application SN 09/538,542 entitled "NETWORK SITE CONTENT INDEXING METHOD AND ASSOCIATED SYSTEM," and Application SN 09/539,107 entitled "DISTRIBUTED BACK-UP SYSTEM AND ASSOCIATED METHOD," each of which was filed on March 30, 2000, and each of which is hereby incorporated by reference in its entirety.

This application is also a continuation-in-part application of the following co-pending applications: Application SN 09/603,740 entitled "METHOD OF MANAGING WORKLOADS AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," Application SN 09/602,789 entitled "MACHINE GENERATED SWEEPSTAKES ENTRY MODEL AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," Application SN 09/602,803 entitled "DATA SHARING AND FILE DISTRIBUTION METHOD AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," Application SN 09/602,844. entitled "DATA CONVERSION SERVICES AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," and Application SN 09/602,983 entitled "CUSTOMER SERVICES AND ADVERTISING BASED UPON DEVICE ATTRIBUTES AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," each of which was filed on June 23, 2000, and each of which is hereby incorporated by reference in its entirety.

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This application is also a continuation-in-part application of the following co-pending application: Application SN 09/648,832 entitled "SECURITY ARCHITECTURE FOR DISTRIBUTED PROCESSING SYSTEMS AND ASSOCIATED METHOD," which was filed on August 25, 2000, and which is hereby incorporated by reference in its entirety.

This application is also a continuation-in-part application of the following co-pending application: Application SN 09/794,969 entitled "SYSTEM AND METHOD FOR MONITIZING NETWORK CONNECTED USER BASES UTILIZING DISTRIBUTED PROCESSING SYSTEMS," which was filed on February 27, 2001, and which is hereby incorporated by reference in its entirety.

Technical Field of the Invention

This invention relates to distributed processing and more particularly to techniques and related methods for managing, facilitating and implementing distributed processing in a network environment.

Background

The NAS (Network Attached Storage) market is currently one of the fastest growing segments of the overall storage market. NAS devices typically take the form of stand-alone devices or systems that contain their own storage, processing, connectivity and management resources. Through these internal capabilities, the NAS device becomes a storage resource that connects to any network enabling many devices on the network to share data via the NAS device.

A NAS device is a term that is often used to refer to a specialized file server that connects to the network to provide storage capacity to network-connected users. NAS devices typically contain a slimmed-down (micro-kernel) operating system and file system. NAS devices often process only input/output (I/O) requests by supporting popular file sharing protocols such as NFS (UNIX) and SMB (DOS/Windows). NAS devices also typically use traditional LAN protocols such as Ethernet and TCP/IP to communicate over the network. Some general-purpose computers using full-blown operating systems such as Windows or UNIX are often labeled as NAS products because they can provide storage that is attached to a network. However, a pure NAS device is one built from scratch as a dedicated file I/O device. As used herein, the term "NAS device" broadly refers to a device that makes data storage resources available to network-connected user devices. A "dedicated NAS device" is a device whose primary operational purpose is for providing NAS services.

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A related term is the storage area network (SAN). "SAN" is a term that is often used to refer to a back-end network connecting storage devices to servers via peripheral channels such as SCSI, SSA, ESCON and Fibre Channel. By using a SAN, the data storage traffic is off-loaded from the primary user network, which includes the user machines and the server machines. The servers then utilize the SAN to move and store data in storage devices connected to the storage network. SAN environments are becoming increasingly popular for enterprise storage solutions.

With respect to lower cost devices that are currently marketed as dedicated NAS devices, many have common personal computer (PC) specifications such as the following: Pentium III processor, 40GB HD and a 10/100 Ethernet connection, along with other components. Considering the specifications of an average corporate desktop computer, the capabilities of these desktop computers often exceed the capabilities computers being sold as dedicated NAS devices, and these desktop computers often sit idle for significant amounts of time each day.

Summary of the Invention

The present invention provides software-based network attached storage (NAS) services that are hosted on a massively distributed computing system. More particularly, a client agent program is configured to run on the network-connected client devices that are part of the distributed computing system to provide what appears to user devices as dedicated NAS functionality, for example, through the Internet. This NAS functionality takes advantage of unused or under-utilized resources of these distributed devices to advantageously provide NAS capabilities. In addition, storage priority controls may be utilized to facilitate the full us of available storage resources, such as user specified constraints, standard bit, block or file priority levels and direct bit, block or file priority markings.

In one embodiment, the present invention is a method of operating a distributed processing system to provide network attached storage (NAS) services, including configuring a client agent program to have a software-based NAS component and to take advantage of unused or under-utilized resources of a plurality of network-connected distributed devices put into operation for purposes distinct from operating the client agent program to provide NAS services, and utilizing the plurality of distributed devices running the client agent to provide NAS services to network-connected user devices with the network-connected user devices recognizing at least a portion of the plurality of distributed devices as dedicated NAS devices. In a more detailed respect, at least a portion of the plurality of network-

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connected distributed devices may operate only as stand-alone dedicated NAS devices without knowledge of other NAS devices connected to the network. Still further, at least one of the network-connected distributed devices may store location information for data stored by the plurality of network-connected distributed devices. Still further the provided NAS services may be managed utilizing at least one centralized server system. And the server system may download the NAS component to the plurality of network-connected distributed devices with the NAS component being configured to operate as part of the client agent program already installed on the distributed devices. In yet another respect, the method of the present invention may include managing storage resources for the plurality of distributed devices using a storage priority control that facilitates full use of available storage resources. In addition, the storage priority control may include, for example, a parameter selectable through the client device, storage priority level schemes that prioritize data storage and deletion, and priority markings directly given to data or files.

In another embodiment, the present invention is a distributed processing system that provides network attached storage (NAS) services, including a client agent program and a plurality of network-connected distributed devices running the client agent program. The client agent program may be configured to have a software-based NAS component and to take advantage of unused or under-utilized resources of a network-connected distributed device put into operation for purposes distinct from operating the client agent program to provide NAS services. The plurality of network-connected distributed devices may operate to provide NAS services to network-connected user devices with the network-connected user devices recognizing at least a portion of the plurality of distributed devices as dedicated NAS devices. In more detailed respects, at least a portion of the plurality of network-connected distributed devices operate only as stand-alone dedicated NAS devices without knowledge of other NAS devices connected to the network. In addition, at least one of the network-connected distributed devices stores location information for data stored by the plurality of network-connected distributed devices. Still further, at least one centralized server system may be included to manage at least in part the NAS services provided by the plurality of network-connected distributed devices. And the NAS component may be configured to be downloaded from the server system to the plurality of network-connected distributed devices with the NAS component being configured to operate as part of the client agent program already installed on the distributed devices. In yet another embodiment, a storage priority control may be used to manage storage resources for the plurality of distributed devices with the storage priority control configured to facilitates full use of available storage resources.

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Description of the Drawings

It is noted that the appended drawings illustrate only exemplary embodiments of the invention and are, therefore, not to be considered limiting of its scope, for the invention may admit to other equally effective embodiments.

FIG. 1A is a block diagram for a distributed processing system having client capability and incentive features, according to the present invention.

FIG. 1B is a block diagram for information flow among customer systems, server systems and client systems, according to the present invention.

FIG. 2A is a block diagram for a client system, according to the present invention.

FIG. 2B is a block diagram for processing elements within a client system, according to the present invention.

FIG. 2C is a block diagram for a client system agent installed on a client system, according to the present invention.

FIG. 2D is an example user interface for a client system agent, including incentive advertising, according to the present invention.

FIG. 3A is a block diagram for server systems, according to the present invention, including a control system, a sweepstakes system and a workload database.

FIG. 3B is a block diagram for server systems, customer systems, client systems and outsourced host systems, according to the present invention.

FIG. 3C is a block diagram for a server system processor, according to the present invention.

FIG. 3D is an alternative block diagram for a server system processor, according to the present invention.

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FIG. 4 is a functional block diagram for an example sweepstakes incentive operation according to the present invention.

FIG. 5A is a block diagram for a distributed processing system for a network site indexing application, according to the present invention.

FIG. 5B is a functional block diagram for an indexing operation according to the present invention.

FIG. 6A is a block diagram for a server system according to the present invention, including a control system, a workload database, and a database of client capabilities balancing vectors.

FIG. 6B is a functional block diagram for client capabilities balancing of workloads according to the present invention.

FIG. 7A is a block diagram for a distributed processing system, according to the present invention, including example network sites on which site testing is to be conducted, such as load testing and/or quality-of-service (QoS) testing.

FIG. 7B is a functional block diagram for site-testing, according to the present invention.

FIG. 8 is a block diagram of a distributed processing system for a data backup application, according to the present invention.

FIG. 9 is a block diagram of an alternative representation of an interconnection fabric for a distributed processing system environment, according to the present invention.

FIG. 10 is a block diagram of a more detailed block diagram for a client system agent installed on a client system, according to the present invention.

FIG. 11A is a more detailed flow diagram for machine generated sweepstakes entries according to the present invention.

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FIG. 11B is an alternative detailed flow diagram for machine generated sweepstakes entries according to the present invention.

FIG. 12A is a block diagram of a distributed processing system that allows customers to select client system attributes, according to the present invention.

FIG. 12B is a block flow diagram for client system attribute selection, according to the present invention.

FIG. 13A is a block diagram of a distributed processing system that provides data conversion services, according to the present invention.

FIG. 13B is a block flow diagram for data conversion services within a distributed processing system, according to the present invention.

FIG. 14A is a block diagram of a distributed processing system that provides data transmission caching, according to the present invention.

FIG. 14B is a block diagram of a distributed processing system that provides data sharing and file distribution, according to the present invention.

FIG. 15 is a block diagram of an alternative representation for a distributed processing system, according to the present invention.

FIG. 16 is a block diagram of a representation for a distributed processing system including security subsystems, according to the present invention.

FIG. 17A is a block diagram of a client system and server systems communication interface, according to the present invention.

FIG. 17B is a block diagram of communication layers for client system and server systems communication, according to the present invention.

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FIG. 18A is a detailed block diagram for an embodiment of security activities for server systems, according to the present invention.

FIG. 18B is a detailed block diagram for an embodiment of security activities for client systems, according to the present invention.

FIG. 19 is a block diagram for a distributed processing system and environment in which network service providers are enabled to monitize their user bases.

FIG. 20 is a block diagram representing the components for a client agent along with a representative indication of responsibility for those components.

FIG. 21 is a block diagram for a network attached storage (NAS) embodiment for a distributed processing system according to the present invention.

Detailed Description of the Invention

The present invention contemplates the identification of the capabilities of distributed devices connected together through a wide variety of communication systems and networks and the aggregation of these capabilities to accomplish processing, storage, broadcasting or any other desired project objective. For example, distributed devices connected to each other through the Internet, an intranet network, a wireless network, home networks, or any other network may provide any of a number of useful capabilities to third parties once their respective capabilities are identified, organized, and managed for a desired task. These distributed devices may be connected personal computer systems (PCs), internet appliances, notebook computers, servers, storage devices, network attached storage (NAS) devices, wireless devices, hand-held devices, or any other computing device that has useful capabilities and is connected to a network in any manner. The present invention further contemplates providing an incentive, which may be based in part upon capabilities of the distributed devices, to encourage users and owners of the distributed devices to allow the capabilities of the distributed devices to be utilized in the distributed parallel processing system of the present invention.

The number of usable distributed devices contemplated by the present invention is preferably very large. Unlike a small local network environment, for example, as may be used by an Internet

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Service Provider (ISP), which may include less than 100 interconnected computers systems to perform the tasks required by the ISP, the present invention preferably utilizes a multitude of widely distributed devices to provide a massively distributed processing system. With respect to the present invention, a multitude of distributed devices refers to greater than 1,000 different distributed devices. With respect to the present invention, widely distributed devices refers to a group of interconnected devices of which at least two are physically located at least 100 miles apart. With respect to the present invention, a massively distributed processing system is one that utilizes a multitude of widely distributed devices. The Internet is an example of a interconnected system that includes a multitude of widely distributed devices. An intranet system at a large corporation is an example of an interconnected system that includes a multitude of distributed devices, and if multiple corporate sites are involved, may include a multitude of widely distributed devices. A distributed processing system according to the present invention that utilizes such a multitude of widely distributed devices, as are available on the Internet or in a large corporate intranet, is a massively distributed processing system according to the present invention.

FIG. 1A is a block diagram for a distributed parallel processing system 100 according to the present invention. The network 102 is shown having a cloud outline to indicate the unlimited and widely varying nature of the network and of attached client types. For example, the network 102 may be the Internet, an internal company intranet, a local area network (LAN), a wide area network (WAN), a wireless network, a home network or any other system that connects together multiple systems and devices. In addition, network 102 may include any of these types of connectivity systems by themselves or in combination, for example, computer systems on a company intranet connected to computer systems on the Internet.

FIG. 1A also shows client systems 108, 110 ... 112 connected to the network 102 through communication links 118, 120 ... 122, respectively. In addition, server systems 104, other systems 106, and customer systems 152 are connected to the network 102 through communication links 114, 116 and 119, respectively. The client system capabilities block 124 is a subset of the server systems 104 and represents a determination of the capabilities of the client systems 108, 110 ... 112. The incentives block 126 is also a subset of the server systems 104 and represents an incentive provided to the users or owners of the clients systems 108, 110 ... 112 for allowing capabilities of the clients systems 108, 110 ... 112 to be utilized by the distributed processing system 100. The client systems 108, 110 and 112 represent any number of systems and/or devices that may be identified, organized and utilized by the server systems

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104 to accomplish a desired task, for example, personal computer systems (PCs), internet appliances, notebook computers, servers, storage devices, network attached storage (NAS) devices, wireless devices, hand-held devices, or any other computing device that has useful capabilities and is connected to a network in any manner. The server systems 104 represent any number of processing systems that provide the function of identifying, organizing and utilizing the client systems to achieve the desired tasks.

The incentives provided by the incentives block 126 may be any desired incentive. For example, the incentive may be a sweepstakes in which entries are given to client systems 108, 110 ... 112 that are signed up to be utilized by the distributed processing system 100. Other example incentives are reward systems, such as airline frequent-flyer miles, purchase credits and vouchers, payments of money, monetary prizes, property prizes, free trips, time-share rentals, cruises, connectivity services, free or reduced cost Internet access, domain name hosting, mail accounts, participation in significant research projects, achievement of personal goals, or any other desired incentive or reward.

As indicated above, any number of other systems may also be connected to the network 102. The element 106, therefore, represents any number of a variety of other systems that may be connected to the network 102. The other systems 106 may include ISPs, web servers, university computer systems, and any other distributed device connected to the network 102, for example, personal computer systems (PCs), internet appliances, notebook computers, servers, storage devices, network attached storage (NAS) devices, wireless devices, hand-held devices, or any other connected computing device that has useful capabilities and is connected to a network in any manner. The customer systems 152 represents customers that have projects for the distributed processing system, as further described with respect to FIG. 1B. The customer systems 152 connect to the network 102 through the communication link 119.

It is noted that the communication links 114, 116, 118, 119, 120 and 122 may allow for communication to occur, if desired, between any of the systems connected to the network 102. For example, client systems 108, 110 ... 112 may communicate directly with each other in peer-to-peer type communications. It is further noted that the communication links 114, 116, 118, 119, 120 and 122 may be any desired technique for connecting into any portion of the network 102, such as, Ethernet connections, wireless connections, ISDN connections, DSL connections, modem dial-up connections, cable modem connections, fiber optic connections, direct T1 or T3 connections, routers, portal computers, as well as any other network or communication connection. It is also noted that there are any

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number of possible configurations for the connections for network 102, according to the present invention. The client system 108 may be, for example, an individual personal computer located in someone's home and may be connected to the Internet through an Internet Service Provider (ISP). Client system 108 may also be a personal computer located on an employee's desk at a company that is connected to an intranet through a network router and then connected to the Internet through a second router or portal computer. Client system 108 may further be personal computers connected to a company's intranet, and the server systems 104 may also be connected to that same intranet. In short, a wide variety of network environments are contemplated by the present invention on which a large number of potential client systems are connected.

FIG. 1B is a block diagram for information flow 150 among customer systems 152, server systems 104 and client system 134, according to the present invention. The server systems 104, as discussed above, may include any number of different subsystems or components, as desired, including client system capabilities block 124 and incentives block 126. The server systems 104 send project and benchmark workloads 130 to client systems 134. A benchmark workload refers to a standard workload that may be used to determine the relative capabilities of the client systems 134. A project workload refers to a workload for a given project that is desired to be completed. The project workload may be, for example, a workload for projects such as network site content indexing, network site testing including network site load testing and network site quality of service testing, data back-up, drug design, drug interaction research, chemical reaction studies, bioinformatics including genetic and biological analyses, human genome analyses, pair-wise comparisons including fingerprint and DNA analyses, data mining, internet hosting services, intranet hosting services, auction services, market clearing services, payment systems, bioinformatic simulations, knowledge management services, trading services, data matching services, graphics rendering, or any other desired project.

Client systems 134, as discussed above, may be any number of different systems that are connected to the server systems 104 through a network 102, such as client systems 108, 110 ... 112 in FIG. 1A. The client systems 134 send results 132 back to the server systems 104 after the client systems 134 complete processing any given workload. Depending upon the workload project, the server systems 104 may then provide results 156 to customer systems 152. The customer systems 152 may be, for example, an entity that desires a given project to be undertaken, and if so, provides the project details and data 158 to the server systems 104.

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FIG. 2A is a block diagram for an example client system 108 according to the present invention. In this simplified block diagram, an original workload 204 is received through line 208 from an interface 206. The original workload 204 represents a portion of the processing, storage or other activity required to complete the desired task for which the server system 104 is trying to accomplish. This original workload 204 is sent by the server system 104 through the network 102 and received by the client system 108 through communication link 118. The client system 108 processes the original workload 204. Following line 212, results 202 are then stored for transferring along line 210 to interface 206. Interface 206 may then communicate the results back to the server system 104 through communication line 118, or to other client systems (for example, with peering of client systems) and then through the network 102.

It is noted that the workload received by client system 108 and the processing or activity performed may depend up a variety of factors, as discussed further below. In part, this workload allocated by the server system 104 to each client system 108, 110 and 112 may depend upon the capabilities of the client system, such as the processing power, disk storage capacity, communications types, and other capabilities available from the various components of the systems within the client system 108.

The server systems 104 can select the workloads for the client system 108 and may control when these workloads are performed, through operational code (i.e., an agent) residing and installed on the client system 108. Alternatively, the owner or user of the client system 108 may determine when workloads are procured or obtained from the server systems 104, as well as when these workloads are performed, for example, by accessing the server systems 104 through the network 102. For example, the server systems 104 may download to the client system 108 upon request one or more workloads. At the same time, an agent residing on the client system 108 may operate to process the workload or multiple workloads downloaded to the client system 108. It is noted, therefore, that the agent may be simultaneously managing more than one workload for any number of projects. When the workload is complete, the agent may inform the owner or user of the client system 108 the results are ready to be communicated back. The client system 108 may then upload results to the server system 104 and download new workloads, if desired. Alternatively, these logistical and operational interactions may take place automatically through control of the agent and/or the server systems 104.

FIG. 2B is a block diagram for processing elements within a client system 108 according to the present invention. In this diagram, client system 108 is contemplated as a personal computer. In a

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personal computer, an internal bus 260 would typically have a variety of different devices connected to it. For example, a CPU 250 could be connected through the bus 260 to a video processor 252, a floating point processor 254 (often integrated within the CPU itself), and digital signal processors 256 (DSPs), such as those found on sound cards and modems. In addition, any of a variety of other processing devices 258 may be included. Furthermore, other types of devices may be connected, such as hard drives 264, which provide disk storage capabilities, and a digital camera 262.

It is noted, therefore, that the capabilities for client systems 108, 110 ... 112 may span the entire range of possible computing, processing, storage and other subsystems or devices that are connected to a system connected to the network 102. For example, these subsystems or devices may include: central processing units (CPUs), digital signal processors (DSPs), graphics processing engines (GPEs), hard drives (HDs), memory (MEM), audio subsystems (ASs), communications subsystems (CSs), removable media types (RMs), and other accessories with potentially useful unused capabilities (OAs). In short, for any given computer system connected to a network 102, there exists a variety of capabilities that may be utilized by that system to accomplish its direct tasks. At any given time, however, only a fraction of these capabilities are typically used on the client systems 108, 110 ... 112. The present invention can take advantage of these unused capabilities.

It is also noted that along with receiving the workload, the client system 108 will also receive an agent that manages the completion of the workload. This agent may be software that is customized for the particular computer system and processing capabilities of the client system 108. For example, if the client system is a personal computer as shown in FIG. 2B, the agent may be a program that operates in the background of the computer's operating system. When the agent determines that there is unused processing or other capabilities, the agent may take advantage of it. For example, if the user is using a word processing application to create a document, little processing power is being utilized by the word processing program, leaving the computer's CPU and video processor underutilized. Thus, the agent could execute commands to these processors during dead cycles. In this way, the agent may facilitate the completion of workload processing in a reduced time. In addition, this agent may be self-updating upon connecting to the server systems 104, so that the agent may be kept up to date with current software revisions and workload activities. It is also noted that the agent may manage work on multiple workloads at the same time, so that any given distributed device connected to the network 102 may be working on a plurality of workloads at any given time.

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FIG. 2C is a block diagram for an example client system agent 270. The agent 270 may include a security subsystem 272 that controls the interface of the client system 108 with the agent 270. The security subsystem 272 may help keep the workloads secure and may help to keep the client systems 108 from suffering any security problems in completing the workload. For example, the agent 272 may operate to keep viruses from attacking the client system 108 while the client system 108 is processing the workload through the operation of the agent. The security subsystem 272, therefore, may provide the interface for the workloads 130 and the results 132.

The clients system agent 270 may also include a workload engine 274, a statistics / user interface / incentive advertising block 276, and a workload package and update processing block 278. In the example shown in FIG. 2C, workloads 130 pass through the security subsystem 272 and along line 280 to the workload package and update processing block 278. In this block 278, the agent 270 may be updated by the server systems 104. Alternatively, the agent 270 may determine, when connected to the server systems 104, whether it needs to be updated and then accomplish that updating automatically. Once the workload package is processed, the workload engine 274 may receive the workload following line 288. The workload engine 274 works on the workload, ultimately completing the workload. The results or status of the workload may then be sent through the security subsystem 272 following line 282. The results 132 may then be provided back to the server systems 104.

The statistics / user interface / incentive advertising block 276 may provide workload, incentive and other statistics, as well as any other desired interface features, to the user of the client system. For example, the block 276 may show a user the expected amount of processing time it will take for the client system to complete a workload task based upon the capabilities of the system. As also shown, the block 276 may receive information following lines 286 and 284 from the workload package and update processing block 278 and from the workload engine 274. If desired, security information from the security subsystem 272 could also be displayed to the user of the client system. It is noted that the information displayed to the user of the client system may be modified and selected as desired without departing from the present invention.

With respect to incentive advertising, the block 276 may also show the user of the client system how this processing time might change depending upon various possible upgrades to the capabilities of the client system, such as a faster microprocessor, more memory, more disk storage space, etc. Furthermore, the client system capabilities may be shown correlated to the incentives provided to the

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client system for participation. Thus, the user may be provided information as to how the user's incentives would increase or change depending upon other computer systems or upgraded capabilities the user could acquire. This incentive value increase may also be tied to upgrades to particular vendor's devices. For example, if the user's device is a computer system having an ABC microprocessor, the block 276 may provide the user information as to increased incentive values based upon an upgrade to a more powerful ABC microprocessor. Similarly, if the user's device is a computer system obtained from ABC, the block 276 may provide the user information as to increased incentive values based upon an upgrade to a more powerful ABC computer system.

FIG. 2D is an example user interface 276 for a client system agent, including incentive advertising, according to the present invention. In the example shown, interface 276 is a window 230 that may be displayed on a distributed device, for example, a computer system. This window 230 displays the desired information for the agent client manager. As indicated above, this agent client manager is initially downloaded from the server systems 104 and thereafter may be updated at various times when the client system is communicating with the server systems. The interface 276, as shown, includes interface tabs 221, 222, 224, 226, 228, 244, 246 and 248. These interface tabs may be selected through the user of a pointing device or keyboard attached, for example, to a computer system graphically displaying the window 230. It is noted that the interface tabs 221, 222, 224, 226, 228, 244, 246 and 248 are only examples, and the number, arrangement and content of tabs may be modified as desired. In addition, the example user interface 276 depicted in FIG. 2D is only an example and may be modified as desired.

In FIG. 2D, the processor values interface tab 224 is the one currently selected by the user. This tab 224 (Processor Values) includes example information that may be displayed to the user. Assuming that a workload is being processed by the agent client manager, the user may select the button 242 (Show My Incentive Values) to show the user's current incentive values associated with the workload being performed. The personal incentive values chart 232 (My Personal Incentive Values) may then be displayed to the user. As shown, the incentive values are provided in a relative scale from 1 to 10. The key designation 240 represents the incentives associated with the users current central processing unit (CPU) or microprocessor.

As indicated above, this incentive information may also be tied to the specific vendor of the user's CPU, for example, ABC Company's CPU. Thus, as shown, the key designation 240 (My current

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processor) and the corresponding bar graph portion 236 represent incentives for the user's current CPU (e.g., a 166 MHz processor). The key designation 238 represents the incentives that the user is projected to have if the user were to upgrade the CPU. Again, this upgrade incentive information may be tied to the specific vendor of the user's CPU or to any other vendor, if desired. Thus, as shown, the key designation 238 (NEW ABC 1GHz processor!) and the corresponding bar graph portion 234 represent incentives for an upgrade to a new ABC CPU (e.g., a new ABC 1 GHz processor). In this manner, a user may be provided an incentive to increase the capabilities of the distributed device, and a vendor may be provided advertising so that the user is also directed to a particular upgrade.

Looking further to FIG. 2D, other similar incentive related information tabs may be provided for any desired capability of the distributed device. For example, tab 246 (Memory Values) represents information that may be provided for the memory capabilities of the distributed device. Tab 222 (Graphics Values) represents information that may be provided for the graphics capabilities of the distributed device. Tab 226 (Communications Values) represents information that may be provided for the communication capabilities of the distributed device. Tab 228 (Storage Values) represents information that may be provided for the storage capabilities of the distributed device. Tab 248 (System Values) represents information that may be provided for the system capabilities as a whole for the distributed device.

In addition to these incentive related information tabs, other tabs may be included to provide information and control for any desired features of the agent client manager. For example, the tab 244 (Current: Prime Search) represents information that may be displayed to the user about the current workload being performed by the agent client manager, for example, a search for large prime numbers. The tab 221 (Settings) represents information that may be displayed to the user about various settings for the client agent manager. In particular, the tab 221 may provide the user the ability to control any desired aspect of the operation of the agent client manager. For example, the user may be able to select a portion of the capabilities that may be utilized (e.g., a maximum of 20% of the system memory), the types of workloads that may be performed (e.g., only scientific research projects), the times when the agent may utilize system resources (e.g., only between 12 to 6 am, or only when the system is idle), or any other desired operational feature. It is noted that in addition to upgrade incentive information indicated above, the user may also be provided information as to how incentives would increase if the user allocated or changed the settings for the agent client manager.

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This user selection of operational features allows for workloads to be scheduled or balanced based upon user input and desires. These user vectors, as indicated above, would allow users to dedicate their device capabilities to specific research projects (cancer, Parkinson's disease, Internet, genetics, space science, etc.), to specific non-profit or for profit organizations (Greenpeace, Celera, etc.), educational institutions (University of Texas), a specific group of like minded users, or any other entity or endeavor. This affiliation selection allows the distributed processing system to automatically include a user's device capabilities in a pool dedicated to the chosen affiliation. Additionally, a user could choose to mix various percentages and allocations of device capabilities among multiple affiliations. It is noted that the user need not make any affiliation selection and need not allocate 100 percent of device capabilities. Rather, only a portion of the device capabilities may be allocated to a particular affiliation, leaving the remainder non-allocated and not affiliated. The capability allocation may also be a system-wide (i.e., course) allocation, such as some desired percent of overall device capabilities. The capabilities allocation may also be subsystem specific (i.e., fine) allocation, such as allocation of particular subsystem capabilities to particular affiliations.

Now looking to FIG. 3A, the server systems 104 may be one or more computer systems that operate to identify client system capabilities, organize workloads, and utilize client systems to accomplish a desired task. The server systems 104 includes a control system 304 a workload database 308, and a sweepstakes system 306, as discussed more below. The workload database 308 stores any desired project task, which may be broken up into discrete workload tasks WL1, WL2 ... WLN, as represented by elements 336, 338 ... 340. The workload database may also store one or more benchmark workloads (BWL) 335 that may be utilized to determine client system capabilities in response to a standard workload. Through line 312, the workload database 308 communicates with control system 304. Control system 304, for example, receives original workload 322 and transfers it to the interface 320 through line 326. The interface 320 then transfers the workload 322 to the network 102 through line 114. This workload 322 is ultimately received as workload 204 by client system 108, 110 or 112, as shown in FIG. 2A. The result 324 is ultimately received by the control system 304 through interface 320 and line 328.

In allocating workloads, the control system 304 may consider the capabilities of the client systems 108, 110 and 112 to which the control system 304 is sending workloads. For example, if client 108 has more processing power than client 110, the control system 304 may allocate and send more difficult or larger workloads. Thus, client 108 may receive WL1 336 and WL2 338, while client 110

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would only receive WL3. Alternatively, the workload database 308 could be organized with differing levels of processing power or capability requirements for each workload. In this way, WL1 336 may represent a greater processing or system capability requirement than WL2 338. It should be noted that workload may be a processing task, a data storage task, or tied to any other of a variety of capabilities that may be utilized on the client systems 108, 110 ... 112.

As indicated above, to encourage owners or users of client systems to allow their system capabilities to be utilized by control system 304, an incentive system may be utilized. This incentive system may be designed as desired. Incentives may be provided to the user or owner of the clients systems when the client system is signed-up to participate in the distributed processing system, when the client system completes a workload for the distributed processing system, or any other time during the process. In addition, incentives may be based upon the capabilities of the client systems, based upon a benchmark workload that provides a standardized assessment of the capabilities of the client systems, or based upon any other desired criteria.

One example use of a benchmark workload is to use the benchmark workload to determine incentive values. For example, the server systems 104 may be designed to send out a standard benchmark workload once an hour to each client system 108, 110 ... 112. If a client system is not available at that time for any reason, the workload would not be completed by the client system, and there would be no incentive value generated for that client system. In this example, the benchmark workload may be a timed work-set that would exercise each subsystem with capabilities within the client system that was desired to be measured. A more capable client system would then generate greater incentive values from executing the benchmark workload, as compared to a less capable client system. These incentive values may be utilized as desired to determine what the client system should get in return for its efforts. For example, if the incentive were a sweepstakes as discussed further below, the number of entries in the sweepstakes may be tied to the system's performance of the benchmark workload. Thus, the faster or better the client system performs the benchmark workload, the more entries the client system would receive.

In the embodiment shown in FIG. 3A, the server systems 104 includes a sweepstakes system 306 that functions with control system 304 to provide incentives for the users or owners of client systems 108, 110 and 112 to allow their system capabilities to be used by the server systems 104. The control system 304 may determine a sweepstakes entry value 302 that is sent along line 310 to the sweepstakes

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system 306. The sweepstakes system 306 may then receive sweepstakes entry 332 and provide it to the sweepstakes engine 330 through line 334. The sweepstakes engine 330 may process the entries and determine a winner, when desired. In the embodiment shown, therefore, entries to the sweepstakes may be generated each time a unit of work is accomplished by one or more of the subsystems within a client system 108, 110 or 112 via an agent installed on the device for the purposes of managing and completing units of work. The total entries for any period of time would, therefore, be dynamic depending on how many are received. Odds of winning would then be determined by the total number of entries received and the total number of entries contributable to any given entrant.

FIG. 3B is another example block diagram of a distributed processing system 300 including server systems 104, customer systems 152, client systems 134 and out-sourced host systems 340, according to the present invention. The server systems 104 may include an analytic subsystem 346, a results/workload production subsystem 344, a project pre-processing subsystem 342, a client agent subsystem 343, and an incentive advertising subsystem 345. The incentive advertising subsystem 345 may operate to provide advertising information, for example, the upgrade incentive information as discussed with respect to FIG. 2D. The client agent subsystem 343 may operate to download an agent to the client systems 134 and to update this agent at times when the server systems 104 are communicating with the client systems 134.

The customer systems 152, which represent customers that have projects that they desired to be processed by the distributed processing system, may be connected to the project pre-processing subsystem 342 to provide projects to the server systems 104. These projects are processed by the project pre-processing subsystem 342 and passed to the results/workloads production subsystem 344, which produces and sends out workloads 130 and receives back results 132. The analytic subsystem 346 then takes the results and processes them as desired. Completed project information may then be provided from the analytic system 346 to the customer systems 152. In this manner, the projects of the customer systems 152 may be processed and project results reported by the distributed processing system of the present invention.

Also, as shown, the workloads 130 and the results 132, or other tasks of the server systems 104, may be processed and handled by out-sourced host systems 340, if desired. Thus, some or all of the workloads 130 may be sent first to out-sourced host systems 340. Out-sourced host systems 340 then send workloads 130A to the client systems 134 and receive back results 132A. The out-sourced host

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systems 340 then send the results 132 back to the server systems 104. It is noted that this out-sourcing of server system tasks may be implemented as desired for any given task that the server systems 104 may have. It is further noted that, if desired, the server systems 104 may perform all of the desired functions of the server systems 104 so that no out-sourced host systems 340 would be used.

FIG. 3C is a block diagram for one embodiment of a server system processor 350, according to the present invention. An agent abstraction layer 360 may send workloads 130 and receive results 132. The security subsystem 354 may interact with the agent abstraction layer 360 and provide information to a data parser 352 and an application programming interface (APIs) block 356. The APIs block 356, the data parser 352 and a workload manager 358 may interact to accomplish the desired tasks for the server system processor 350. It is noted that for this embodiment, the API protocol could be controlled and provided to other host systems.

FIG. 3D is an alternative block diagram for a server system processor 350, according to the present invention. In this embodiment, the APIs block 356 and the agent abstraction layer 360 are not present. The data parser 352, the workload manager 358 and the security subsystem 354 interact to provide the desired server system tasks. It is noted that for this embodiment, the security subsystem is controlled and utilized for communicating with client systems.

FIG. 4 is a functional block diagram for a sweepstakes operation 400 by the system server 104 according to the present invention. In block 402, the server systems 104 may sign-up client systems in "accept clients" block 402. Following line 418, the server systems 104 identifies the capabilities of the client's computer and processing systems in the "determine client system capabilities" block 404. Control passes along line 420 to the "distribute workloads to client systems" block 406, where the server systems 104 allocates workloads to each client system 108, 110 and 112. This workload may also be an benchmark workload, as indicated above, that acts as an entry workload to determine the entries or entry values for the client system. As also indicated above, in distributing the workloads in block 406, the server system 104 may take into consideration the capabilities of the client systems to which workloads are being distributed. The client systems 108, 110 and 112 then operate to complete the workloads allocated to them. Along line 423, the server system 104 receives back workload results in "receive workload results" block 408.

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At this point, control passes along line 424 to the "determine sweepstakes entries" block 410. In this block 410, the server system 104 determines the entry value for the workload completed or for a standard benchmark or entry workload completed. This entry value may be weighted upon a variety of factors including factors such as the amount of work completed, the difficulty level of the processing required, and the accuracy of the results. It is noted that any desired weighting may be utilized. Thus, it is understood that a wide variety of considerations may be utilized to determine the entry value weighting for the sweepstakes.

Although the weighting determination is shown in block 410 in FIG. 4, the entry value may also be determined, in whole or in part, when a client system signs on to the distributed processing distributed system of the present invention. For example, if a client system has state-of-the-art CPU, video processor, DSP engine, memory, and large amounts of free disk storage space, a high entry value may be allocated to this client system up-front. In contrast, a client system that has a slow CPU, a weak video processor, no DSP engine, little memory, and little free disk storage space may be allocated a small entry value. In this way, the owners or users of the client systems may be provided immediate feedback as to the potential sweepstakes entry value of their computer systems, devices and system capabilities.

It is further noted that the entry value may take any desired form and may be, for example, a multiplier that will be used for each unit of workload completed. In this way, the owner or user will readily be cognizant that a state-of-the-art system will yield a high multiplier, where as an older system, system capability or device will yield a low multiplier. Such feedback, whether communicated to the owner or user immediately upon signing up or upon completion of each workload, will create an incentive for owners and/or users to acquire state-of-the-art systems, thereby further increasing the potential processing power of the distributed processing system of the present invention.

In addition, different workload projects may be designated with different entry values, as well. For example, some workload projects may require particular hardware or software processing systems within a client system or device. Thus, the number of client systems that are capable of performing the task would be limited. To further encourage participation by those owners or users with capable systems, the entry value for taking on particular workloads and/or systems with the desired features may be allocated higher entry values.

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Referring back to FIG. 4, control passes along line 426 to the "process entries" block 412. In this block 412, the sweepstakes entries are processed and stored as desired. Following line 428, "end of entry period" decision block 414 represents a determination of whether the time for getting entries into the sweepstakes has ended. If not, the control continues to line 430 and back to blocks 402, 404 and/or 406, depending upon what is desired. Once the entry period has ended, control flows along line 432 to "determine winners" block 416. The server system 104 then identifies from among the entries, who the winning client system or systems will be.

The entry period may be any desired time frame and may include multiple overlapping time frames, as desired. For example, winners may be determined daily for entries each day, monthly for entries within a month, and/or yearly for entries within one year. In addition, special entry periods may be generated, if desired, for example where a particularly important workload project had a short time frame in which it needed to be completed.

FIGS. 1, 2A-C, 3A-D, and 4 are directed to example embodiments for a distributed processing system according to the present invention, including a sweepstakes reward or incentive feature, as shown in the embodiments of FIG. 3A and FIG. 4.

FIGS. 6A and 6B further describe a capabilities scheduling feature, in which the server systems 104 may identify and consider any of a variety of client system capability vectors in determining how to organize, allocate and manage workloads and projects. FIGS. 5A and 5B describe a distributed processing system and workload project that accomplishes network site indexing. FIGS. 7A and 7B describe a distributed processing system and a workload project that accomplishes network site testing, such as quality of service (QoS) testing and load testing. And FIG. 8 describes a distributed processing system, preferably with respect to a corporate intranet, that accomplishes distributed data back-up.

FIG. 9 is an alternative representation for the interconnection fabric for a distributed processing system environment and describes idle client system identification and shared component client systems. FIG. 10 describes a client system agent installed on a client system. FIGS. 11A and 11B further describe machine generated sweepstakes entries. FIGS. 12A and 12B describe client capability selection features. FIGS. 13A and 13B describe data conversion services. FIG. 14A describes a distributed processing system that provides data transmission caching. FIG. 14B describes a distributed processing system that

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provides data sharing and file distribution functions. And FIG. 15 describes an alternative representation for a distributed processing system, according to the present invention.

Looking now to FIG. 5A, block diagram is depicted of a distributed processing system 550 for a network site indexing application, according to the present invention. As stated above with respect to FIG. 1A, the network 102 may be a wide variety of networks. For this network site indexing application, the network 102 may preferably be the Internet having a multitude of network sites 552 ... 554. Each network site 552 ... 554 may have a variety of different content types that may be indexed, ranging from complex sites to relatively simple sites. For example, network site 552 includes text 570A, images 570B, audio streams 570C, video streams 570D, files 570E and other content 570F. Network site 554 is less complex and includes text 572A, images 572B, and other content 572C. Both network sites 552 and 554 are connected to the network 102 through communication lines 558 and 556, respectively.

As discussed above, the server systems 104 manage workloads for the client systems 108, 110 ... 112. The client systems 108, 110 ... 112 process these workloads and produce indexing results. The resulting index may be stored at a centrally managed site, such as central index storage block 560, or may itself be distributed over the possibly millions of indexing clients 108, 110 ... 112, as shown by remote index storage blocks 562, 564 ... 566. If remote index storage is utilized, a master database content index may be stored locally, for example, in the central index storage block 560. This content index may then direct relevant searches to the distributed massively parallel engine for search queries.

Referring now to FIG. 5B, a functional block diagram is shown for a network site indexing operation 500 according to the present invention. As described in FIG. 1A with respect to other systems 106, there may be any number of computer and processing systems connected to the network 102. Any one of these others systems 106 may publish information on the network 102 for access by any other system connected to the network 102. This information to be indexed may take a wide variety of forms, including, for example, text, images, audio streams, video streams, databases, spreadsheets, PDF files, Shockwave data, Flash data, applications, data files, chat streams, or any other information, data or data streams that may be accessible on a network site. The distributed processing system of the present invention may have as a workload the task of indexing this potentially massive amount of information.

For example, where the network 102 is the Internet or a large intranet, a large amount of processing power and time is needed to create an accurate, complete and up-to-date index of the

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information. The Internet uses an IP (Internet Protocol) address protocol to direct traffic around the Internet. The IP address is the address of a computer attached to a TCP/IP (Transmission Control Protocol/Internet Protocol) network. Every system on the network must have a unique IP address. IP addresses are typically written as four sets of numbers separated by periods. The TCP/IP packet uses 32 bits to contain the IP address, which is made up of a network and host address (NETID and HOSTID). The more bits used for network address, the fewer remain for hosts. Web pages within a particular web site with a unique address may be addressed through URLs (Uniform Resource Locator) associated with that web site. In short, there is a limited, but very large, number of possible IP addresses for uniquely identifiable Internet sites that may be accessed and analyzed to generate an index of Internet sites and web pages via URLs.

The operation diagram of FIG. 5B starts with the "clients receive indexing workloads" block 502. In this block, the system server 104 provides the clients systems 108, 110 ... 112 with a workload task to index a portion of the information accessible on the network 102. For example, with the Internet, each workload may be single IP address or groups of URLs or, in some cases, large data types contained on single sites or pages. Following line 514, the "clients interact with other systems" block 504 represents the operation of the agent installed on the client systems 108, 110 ... 112 to access the network sites, according to the assigned workload, and index the information accessible on that site. This indexing may include all types of information accessible on that site, including text, audio, image, video, etc.

Next, following lines 516 and 518, the client systems 108, 110 and 112 complete the workload tasks, get the results ready for transmission, and sends those results back to the system server 104 in "clients complete workload" block 506 and "indexing results sent to server system" block 508. Control passes along line 520 to "index compiled for use" block 510 where the server system formats and/or compiles the results for use. For example, the index results may be utilized for accurate, complete and up-to-date search information for the network 102. As indicated with respect to FIG. 5A, the resulting index may be stored remotely or locally following line 522. Thus, element 524 represents remote storage of the index, and element 526 represents central storage of the index. It is noted that the index may also be stored with a mixture of central and remote storage, as desired. In addition, as indicated above, a directory or summary index for the resulting index may be generated and stored centrally, if desired. It is further noted that the summary index may be stored in any other desired fashion, for example, it may be distributed and stored on a number of client systems.

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FIG. 6A is a block diagram for a server system 104 according to the present invention, including a control system 304, a workload database 308, and a database of capability vectors 620. The workload database 308 includes a variety of sets of workload projects WL1, WL2 ... WLN. For each workload project, there may be multiple workload units. For example, workload project WL1 includes workload units WL11, WL12 ... WL1N, as represented by elements 640, 642 ... 644, respectively. Similarly, workload project WL2 includes workload units WL21, WL22 ... WL2N, as represented by elements 646, 648 ... 650, respectively workload project WLN includes workload units WLN1, WLN2 ... WLNN, as represented by elements 652, 654 ... 656, respectively.

It may be expected that different workload projects WL1, WL2 ... WLN within the workload database 308 may require widely varying processing requirements. Thus, in order to better direct resources to workload projects, the server system may access various system vectors when a client system signs up to provide processing time and other system or device capabilities to the server system. This capability scheduling helps facilitate project operation and completion. In this respect, the capability vector database 620 keeps track of any desired feature of client systems or devices in capability vectors CBV1, CBV2 ... CBVN, represented by elements 628, 630 ... 632, respectively. These capability vectors may then be utilized by the control system 304 through line 626 to capability balance workloads.

This capability scheduling according to the present invention, therefore, allows for the efficient management of the distributed processing system of the present invention. This capability scheduling and distribution will help maximize throughput, deliver timely responses for sensitive workloads, calculate redundancy factors when necessary, and in general, help optimize the distributed processing computing system of the present invention. The following TABLE 1 provides lists of capability vectors or factors that may be utilized. It is noted that this list is an example list, and any number of vectors or factors may be identified and utilized, as desired.

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TABLE 1 -- Example Client Capability Vectors or Factors

1. BIOS Support:	a. BIOS Type (brand)
b. ACPI	c. S1, S2, S3, and S4 sleep/wake states
d. D1, D2 and D3 ACPI device states	e. Remote Wake Up Via Modem
f. Remote Wake Up Via Network	g. CPU Clock control
h. Thermal Management control	i. Docked/Undocked state control
j. APM 1.2 support	k. Hotkey support
l. Resume on Alarm, Modem Ring and LAN	m. Password Protected Resume from Suspend
n. Full-On power mode	o. APM / Hardware Doze mode
p. Stand-by mode	q. Suspend to DRAM mode
r. Video Logic Power Down	s. HDD, FDD and FDC Power Down
t. Sound Chip Power Down	u. Super I/O Chip Power Down
2. CPU Support:	a. CPU Type (brand)
b. MMX instruction set	c. SIMD instruction set
d. WNI instruction set	e. 3DNow instruction set
f. Other processor dependent instruction set(s)	g. Raw integer performance
h. Raw FPU performance	i. CPU L1 data cache size
j. CPU L1 instruction cache size	k. CPU L2 cache size
l. CPU speed (MHz/GHz...)	m. System bus (MHz/GHz...) speed supported
n. Processor Serial Number	o. CPUID
3. Graphic Support	a. Graphics type (brand)
b. # of graphics engines	c. Memory capacity
d. OpenGL support	e. Direct3D/DirectX support
f. Color depth supported	g. MPEG 1/II decode assist
h. MPEG1/II encode assist	i. OS support
j. Rendering type(s) supported	k. Single-Pass Multitexturing support
l. True Color Rendering	m. Triangle Setup Engine

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n. Texture Cache	o. Bilinear/Trilinear Filtering
p. Anti-aliasing support	q. Texture Compositing
r. Texture Decompression	s. Perspectively Correct Texture Mapping
t. Mip-Mapping	u. Z-buffering and Double-buffering support
v. Bump mapping	w. Fog effects
x. Texture lighting	y. Video texture support
z. Reflection support	aa. Shadows support
4. Storage Support	a. Storage Type (brand)
b. Storage Type (fixed, removable, etc.)	c. Total storage capacity
d. Free space	e. Throughput speed
f. Seek time	g. User dedicated space for current workload
h. SMART capable	
5. System	a. System Type (brand)
b. System form factor (desktop, portable, workstation, server, etc.)	
6. Communications Support	a. Type of Connection (brand of ISP)
b. Type of Connection Device (brand of hardware)	c. Hardware device capabilities
d. Speed of connection	e. Latency of connection
f. Round trip packet time of connection	g. Number of hops on connection type
h. Automatic connection support (yes/no)	i. Dial-up only (yes/no)
j. Broadband type (brand)	k. Broadband connection type (DSL/Sat./Cable/T1/Intranet/etc.)
7. Memory	a. Type of memory error correction (none, ECC, etc.)

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b. Type of memory supported (EDO, SDRAM, RDRAM, etc.)	c. Amount of total memory
d. Amount of free memory	e. Current virtual memory size
f. Total available virtual memory size	
8. Operating System	a. Type of operating system (brand)
b. Version of operating system	c. Health of operating system
9. System application software	a. Type of software loaded and/or operating on system
b. Version of software	c. Software features enabled/disabled
d. Health of software operation	

FIG. 6B is a functional block diagram for capabilities determination and scheduling operation 600 for workloads in a distributed processing system according to the present invention. Initially, various vectors are identified for which capability information is desired in the "identify client system capability vectors" block 602. Following line 612, the server systems 104 then capability balances workloads among client systems 108, 110 and 112 based upon the capability vectors in the "capability scheduling workloads based on vectors" block 604. Then the capabilities scheduled workloads are sent to the client systems for processing in the "send capability scheduled workloads" block 606.

This capability scheduling and management based upon system related vectors allows for efficient use of resources. For example, utilizing the operating system or software vectors, workloads may be scheduled or managed so that desired hardware and software configurations are utilized. This scheduling based upon software vectors may be helpful because different software versions often have different capabilities. For example, various additional features and services are included in MICROSOFT WINDOWS '98 as compared with MICROSOFT WINDOWS '95. Any one of these additional functions or services may be desired for a particular workload that is to be hosted on a particular client system device. Software and operating system vectors also allow for customers to select a wide variety of software configurations on which the customers may desire a particular workload to be run. These varied software configurations may be helpful, for example, where software testing is

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desired. Thus, the distributed processing system of the present invention may be utilized to test new software, data files, Java programs or other software on a wide variety of hardware platforms, software platforms and software versions. For example, a Java program may be tested on a wide proliferation of JREs (Java Runtime Engines) associated with a wide variety of operating systems and machine types, such as personal computers, handheld devices, etc.

From the customer system perspective, the capability management and the capability database, as well as information concerning users of the distributed devices, provide a vehicle through which a customer may select particular hardware, software, user or other configurations, in which the customer is interested. In other words, utilizing the massively parallel distributed processing system of the present invention, a wide variety of selectable distributed device attributes, including information concerning users of the distributed devices, may be provided to a customer with respect to any project, advertising, or other information or activity a customer may have to be processed or distributed.

For example, a customer may desire to advertise certain goods or services to distributed devices that have certain attributes, such as particular device capabilities or particular characteristics for users of those distributed devices. Based upon selected attributes, a set of distributed devices may be identified for receipt of advertising messages. These messages may be displayed to a user of the distributed device through a browser, the client agent, or any other software that is executing either directly or remotely on the distributed device. Thus, a customer may target particular machine specific device or user attributes for particular advertising messages. For example, users with particular demographic information may be targeted for particular advertisements. As another example, the client agent running on client systems that are personal computers may determine systems that are suffering from numerous page faults (i.e., through tracking operating system health features such as the number of page faults). High numbers of page faults are an indication of low memory. Thus, memory manufacturers could target such systems for memory upgrade banners or advertisements.

Still further, if a customer desires to run a workload on specific device types, specific hardware platforms, specific operating systems, etc., the customer may then select these features and thereby select a subset of the distributed client systems on which to send a project workload. Such a project would be, for example, if a customer wanted to run a first set of simulations on personal computers with AMD ATHLON microprocessors and a second set of simulations on personal computers with INTEL PENTIUM III microprocessors. Alternatively, if a customer is not interested in particular configurations

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for the project, the customer may simply request any random number of distributed devices to process its project workloads.

Customer pricing levels for distributed processing may then be tied, if desired, to the level of specificity desired by a particular customer. For example, a customer may contract for a block of 10,000 random distributed devices for a base amount. The customer may later decide for an additional or different price to utilize one or more capability vectors in selecting a number of devices for processing its project. Further, a customer may request that a number of distributed devices be dedicated solely to processing its project workloads. In short, once device attributes, including device capabilities and user information, are identified, according to the present invention, any number of customer offerings may be made based upon the device attributes for the connected distributed devices. It is noted that to facilitate use of the device capabilities and user information, capability vectors and user information may be stored and organized in a database, as discussed above.

Referring now to FIG. 12A, a block diagram depicts a distributed processing system 1200 that allows customers to select client system attributes, such as device capabilities and user characteristics, according to the present invention. In this embodiment, the network 102 is depicted as the Internet to which server systems 104, customer 152A, customer 152B, and client systems 1202A, 1202B ... 1202C are connected. These systems are connected through communication links 114, 119A, 119B, 1204A, 1204B ... 1204C, respectively. As noted above, these communication links may include any of a wide variety of devices and/or communication techniques for allowing a system to interface with other connected systems.

As shown in FIG. 12A, and as discussed above, the customers 152A and 152B may desire to send information or projects, such as advertisements (ADV) 1206A and 1206B and/or projects (PROJ) 1208A and 1208B, to groups of client systems that have particular or selected capabilities. The number of different groups of client systems is as varied as the capability and user data available for those client systems. The client systems 1202A represent client systems that include a first set (Set 1) of desired attributes. The client systems 1202B represent client systems that include a second set (Set 2) of desired attributes. And the client systems 1202C represent client systems that include a Nth set (Set N) of desired attributes. Once attributes are selected, the client systems with those attributes may be accessed as desired by customers 152A and 152B. For example, customer 152A may send its advertisement to client systems 1202B. Customer 152B may send its advertisement to client systems 1202A. The project

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1208A from customer 152A may be processed by client systems 1202C. And the project 1208B from customer 152B may be processed by client systems 1202B. It is noted, therefore, that any combination of desired attributes, such as device capabilities and user characteristics, may be identified and utilized to satisfy customer objectives, whether those objectives be advertising, project processing, or some other desired objective.

FIG. 12B is a block flow diagram for client system attribute selection, according to the present invention. In the embodiment shown, process 1250 begins with the customer selecting desired attributes in block 1252. Next, client systems with selected attributes are accessed in block 1254. And, then in block 1256, the customer objective, such as advertising or project, is processed by the client system. Control of this process 1250 may be provided by the server systems 104, if desired, such that the customer interfaces with the server systems 104 to select device attributes and then the servers systems 104 access the client systems. Alternatively, the server systems 104 may simply provide the customer with a list of contact information (e.g., IP addresses) for the client systems, so that the customer may directly access the client system, for example, in providing advertisements to the users of the client systems. It is further noted that other control techniques may also be used to identify and access client systems with particular desired device capabilities, user characteristics, or other device attributes, according to the client system attribute selection method of the present invention.

FIG. 7A is a block diagram for a distributed processing system 100 according to the present invention, including example network sites 106A and 106B on which site testing is to be conducted, such as load testing and/or quality-of-service (QoS) testing. FIG. 7A is similar to FIG. 1A except that other systems 106 in FIG. 1A has been represented in the embodiment of FIG. 7A with network sites 106A and 106B. Communication line 116A between the network 102 and the network site 106A represents a interaction by one client system 108, 110 and 112. Communication lines 116B, 116C and 116D represent interactions by more than one client system 108, 110 and 112.

Site testing is typically desired to determine how a site or connected service performs under any desired set of test circumstances. With the distributed processing system of the present invention, site performance testing may be conducted using any number of real client systems 108, 110 and 112, rather than simulated activity that is currently available. Several tests that are commonly desired are site load tests and quality of service (QoS) tests. Quality of service (QoS) testing refers to testing a user's experience accessing a network site under normal usability situations. Load testing refers to testing what

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a particular network site's infrastructure can handle in user interactions. An extreme version of load testing is a denial-of-service attack, where a system or group of systems intentionally attempt to overload and shut-down a network site. Advantageously, the current invention will have actual systems testing network web sites, as opposed to simulated tests for which others in the industry are capable.

Network site 106B and the multiple interactions represented by communication lines 116B, 116C and 116D are intended to represent a load testing environment. Network site 106A and the single interaction 116A is indicative of a user interaction or QoS testing environment. It is noted that load testing, QoS testing and any other site testing may be conducted with any number of interactions from client systems desired, and the timing of those interactions may be manipulated and controlled to achieve any desired testing parameters. It is further noted that periodically new load and breakdown statistics will be provided for capacity planning.

FIG. 7B is a functional block diagram for a site-testing operation 700 according to the present invention. Initially, client systems 108, 110 and 112 receive workloads that identify testing procedures and parameters in the "clients receive testing workload" block 702. Following line 714, the client systems 108, 110 and 112 access the site being tested and perform the testing in block "clients interact with other systems" block 704. Next, following lines 716 and 718, the client systems 108, 110 and 112 complete the site testing workload tasks, get the results ready for transmission, and send those results back to the system server 104 in "clients complete testing workload" block 706 and "site testing results sent to server system" block 708. Control passes along line 720 to "site testing results compiled for use" block 710 where the server system formats and/or compiles the results for use by the network site. For example, the site testing results may be utilized determining modifications that need to be made to the network site to handle peak volume activities.

FIG. 8 is a block diagram for a distributed processing system 800 for a data back-up system application, according to the present invention. As stated above with respect to FIG. 1A, the network 102 may be a wide variety of networks, including an intranet network. Intranet networks, such as internal networks set up by corporations, are particularly suited for this application because the systems holding the data being backed-up would be owned by the same entity owning other systems with excess data storage capabilities. In this way, security would not be as great of an issue and the client system types could be better controlled. It is noted, however, that this data back-up application would be equally applicable to other networks, such as for computer systems connected through the Internet.

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Referring back to FIG. 8, client systems 108, 110 ... 112 are shown each having a back-up data blocks 804, 806 ... 808. Customer systems 152 is shown as having data 802, which is desired to be backed-up with the distributed back-up system 800. The server systems 104 manage the flow of data from the data 802 and the client systems that have extra storage space represented by back-up data blocks 804, 806 ... 808. In operation, the server systems 104 identifies client system storage capabilities. With this information, the server systems 104 can receive data for back-up from any system on the network 102. It is noted, and as indicated with respect to FIG. 1A, the client systems 108, 110 ... 112 and the customer systems 152 may communicate directly with each other in peer-to-peer type communications.

The server systems 104 may also manage the storage and transfer of data so that the data will be readily retrievable once backed-up and stored on the client systems 108, 110 ... 112. If desired, an summary index or directory of the backed-up data may be stored centrally on the server systems 104, or may be stored remotely on the client systems 108, 110 ... 112. It is also noted that the server systems 104 may also distribute data back-up workloads so that each portion of the data 802 is stored redundantly on at least two of the client systems 108, 110 ... 112. This redundancy provides added security should any one or more client systems suddenly cease to be operational.

Looking now to FIG. 9, a block diagram is depicted of an alternative representation of an interconnection fabric for a distributed processing system environment 100, according to the present invention. In this diagram and as described above, the network environment may be the Internet, an internal company intranet, a local area network (LAN), a wide area network (WAN), a wireless network, a home network, or any other system that connects together multiple systems and devices. In addition, the server systems and clients systems may be interconnected by a variety of possible connection interfaces, for example, Ethernet connections, wireless connections, ISDN connections, DSL connections, modem dial-up connections, cable modem connections, direct T1 or T3 connections, fiber optic connections, routers, portal computers, as well as any other network or communication connection. It is noted, therefore, as discussed with respect to other embodiments such as the embodiment of FIG. 1A, that systems may be coupled into an interconnected fabric in any of a variety of ways and communications can potentially occur directly or indirectly between any of the systems coupled into the fabric, as would be understood by those of skill in the art.

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Within this environment, as depicted in FIG. 9, server systems 104 are interconnected with any number of client systems, for example, client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G, 108H, 108I, 108J, 108K and 108L. In addition, these client systems may also include idle client systems 902A, 902 B, and 902C, as discussed further below. Furthermore, these client systems may include client system 904A with a component A, client system 904B with a component B, and client system 904C with a component C. It is also noted that the interconnection fabric may include any number of devices that are not client systems, in that they themselves are not providing components or processing capabilities for the distributed processing system of the present invention. Nevertheless, these devices may be considered part of the system because they may relay, interpret, process or otherwise transmit or receive information from or to client systems that are part of the distributed processing system.

Aggregation of component level resources, according to the present invention, will now be discussed. As described above, the capabilities of client systems are determined for purposes of allocating, scheduling and managing distributed processing workloads. In other words, each of the client systems may be made up of many individual subsystems with various capabilities. In some cases, it may occur that particular components on different machines may provide added value if combined or aggregated. Thus, utilizing subsystem or component level resources from a heterogeneous group of devices may be the most efficient or otherwise advantageous way of taking advantage of these resources to complete various desired tasks.

Referring now more particularly to FIG. 9, the client systems 904A, 904B and 904C may have component A, component B and component C, respectively, that are better utilized in combination. For example, client system 904A may have a fast processor, a high-speed network connection, but little available storage space. Client system 904B may have large amounts of available free storage space but little processing power. Client system 904C may also have a fast processor, but relatively little available storage space. In this example, a workload that requires both a large storage capacity and a fast processor may be efficiently completed by dedicating component level resources to various parts of the workload from different machines. Thus, the workload may be managed by having client systems 904A and 904C processing data stored on and transmitted from client system 904B. Once clients systems 904A and 904C process data, this resulting data may then be transmitted back to client system 904B for aggregation and eventual transmission back to the server systems 104. The client system 904B, therefore, essentially acts as a server for a workload subset, sending out portions of a subset workload, receiving back the processed data, and aggregating the data to build a completed workload subset.

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It is noted that any number of different components from different client systems may be aggregated, as desired. For example, for wireless devices, DSP processing and storage components could be aggregated with components from other client systems. For display devices, graphics rendering power could be aggregated. For relatively dumb machines, such as connected household appliances, vending machines, etc., slow-speed processing components could be aggregated. In short, an appropriate workload may include instructions to numerous client systems that will enable collaboration and aggregation of component level resources. Such instructions may include things, such as, where to receive input, where to send output, and ultimately which client systems return final results.

It is further noted that the control instructions may be de-centralized as well. In other words, as indicated above, client systems may communicate directly with each other, for example, in a peer-to-peer fashion. In this way, workload communications may occur directly between client systems, and workload control and management may occur through the client system agents located on client systems.

Still referring to FIG. 9, idle system determination will now be discussed. As stated above, client system capabilities are determined and utilized within the distributed processing system of the present invention. The more idle any particular client system, the more processing it is arguably able to accomplish, and the more incentives it is likely to receive. In other words, the client system capabilities may be utilized more often and more intensely if the client system is more idle. As such, it is advantageous to identify idle client systems and allocate them to more processor and time sensitive tasks. By identifying these idle client systems, resources available on the network at any given time may be more fully utilized, and otherwise idle resources may be utilized for highly intensive, real-time activities that would otherwise require dedicated devices. Examples of such real-time activities include data caching, indexing, etc. In FIG. 9, idle client systems are designated as 902A, 902B and 902C.

Identifying idle resources may be determined in any of a variety of ways. It is possible, for example, to simply look at whether a machine is not being used or has low processor utilization at any given time. This simple determination, however, may not yield an accurate picture of how idle a client system may or may not be over a given time period. More particularly, discovery methods may be implemented to identify the activity of a variety of client system components and subsystems. For example, subsystems may be monitored, such as network activity, device output activity, user input, processing activity, executing task monitoring, or mode of operation parameters (e.g., mobile or power

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management modes, stationary or powered mode). In addition, any number of other device vectors may be monitored or analyzed to determine the true usage and idleness of a client system.

The following TABLE 2 provides a list of idleness vectors or factors that may be utilized in determining the level of device usage or idleness. In particular, TABLE 2 provides two primary categories of activities to monitor or analyze for determination of how idle a client system may or may not be. These activities are user activity and device activity. By monitoring, analyzing and tracking these client system elements and activities over time, a better determination of device usage and idleness may be made. It is noted that the list provided in TABLE 2 is an example list, and any number of categories, vectors or factors may be identified and utilized, as desired, according to the present invention.

TABLE 2 -- Example Client Idleness Vectors or Factors

1. User Activity (e.g., monitor input activities, monitor output activities, monitor time elapsed since last input event and between input events, etc.)	a. keyboard input
b. mouse input	c. microphone/voice input
d. tablet input	e. pen input
f. touch screen input	g. joystick input
h. gamepad input	i. video output
j. printer output	k. any other user activity that could be utilized to classify if a device is idle
2. Device Activity (e.g., monitor utilization levels, monitor time elapsed since last device activity, monitor time between changes in device utilization levels, etc.)	a. power state (e.g., time since last power state change event)
b. mobility state (e.g., time since device last in mobile state)	c. screen saver activity or trigger (e.g., time elapsed since screensaver activity or trigger)

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d. screen output (e.g., time elapsed since last screen output, paint event or pixel change)	e. network or communication packets sent or received (e.g., time elapsed since last network or communications activity)
f. storage device activity (e.g., time elapsed since last storage device activity, such as hard drives, flash memory cards, removable drives, CD drives, DVD drives, etc.)	g. processor, DSP, microcontroller, embedded device, or other processor activity (e.g., time elapsed since last processor activity)
h. processor, DSP, microcontroller, embedded device, or other processing device utilization (e.g., change in utilization levels)	i. tasks or processes executing (e.g., time elapsed since change in number of tasks or processes executing)
j. task or process device utilization (e.g., time since change in task or process device utilization)	k. any other device activity that could be used to classify if a device is idle

As a further example of the usefulness of this determination, reference is made back to FIG. 9. Server systems 104 may have, for example, a large, intensive task that it would like to place on these idle devices. After using a number of the vectors in TABLE 2 to determine the utilization level for client systems, the server systems 104 determines that client systems 902A, 902B and 902C are idle and capable of handling significant time sensitive processing tasks. For example, idle client systems 902A, 902B and 902C may be personal computers that can act as a local internet cache for other connected devices, such as some of the other client systems depicted in FIG. 9, that are interested in a data type that benefits from a local network cache. Thus, data or content may be transmitted from a remote network site to the idle machines 902A, 902B and 902C. These idle devices 902A, 902B and 902C may then re-transmit this same data or content to other connected devices also interested in the data or content.

One example for such network caching is Internet video or multimedia broadcast events that are desired to be viewed or received by a very large number of geographically close connected devices at about the same time. In order to meet the demand of these connected devices, web sites broadcasting an event have to be able to handle a huge increase in network traffic over a short period of time. By locally

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caching the transmission to idle client systems, a web site can reduce the direct demand on its own resources. This is so because other connected devices may receive a re-transmitted broadcast, although delayed, from the idle client system. It is noted that according to the present invention idle client systems 902A, 902B and 902C may work independently or in combination. Even though idle client systems are suited for providing the caching function, it is also noted that that network caching may be accomplished using one or more client systems regardless of their respective levels of idleness.

FIG. 10 is a more detailed block diagram for a client system agent 270 installed on a client system, according to the present invention. This diagram includes a security subsystem 1010, a capabilities subsystem 1006, a workload processor 1004, a user interface 1002, and a project management and agent control subsystem 1008. The various components and subsystems may communicate with each other, for example, through lines 1012, 1014, 1016, 1018 and 1020. Externally, the client system agent 270 may communicate through its security subsystem 1010 with the other components within the client system and ultimately to other devices connected into the network fabric. It is noted that configuration of the client system agent and its operation, both internal and external, may be selected and designed, as desired.

As depicted, the capabilities subsystem 1006 includes an idle system monitor 1022, as described above, that monitors and analyzes user and device activities associated with the client system to determine the level of activity or idleness for the client system. The information determined by this idle system monitor 1022 may then be communicated externally, for example, through the security subsystem 1010 to the server systems 104. The server systems 104 may then store and analyze system idleness data from across the distributed processing system. This idleness data may become part of the capabilities database that is utilized to allocate and manage workloads and processing system resources.

Still referring to FIG. 10, the workload processor 1004 includes a machine entry generation subsystem 1024. As described above, the workload processor 1004 may send completed workloads back to server systems 104 to generate sweepstakes entries for the host client system. In this way, when the incentive is a sweepstakes, the client system may generate entries by completing workloads. The machine entry generation subsystem 1024 refers to this entry generation through workload completion. As discussed above, the workload processed to generate entries may be a project workload, an entry workload, or any other workload, as desired.

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FIGS. 11A and 11B provide more detailed flow diagrams of process embodiments for machine generated sweepstakes entries through processing of entry workloads, according to the present invention.

Looking first to FIG. 11A, an entry workload process flow 1100 is depicted that provides machine generated sweepstakes entries. Process moves from start block 1102 to block 1104 in which entry workloads are loaded on client systems. Next, process flows to block 1106 which represents a periodic timer or other timing control for entry workload processing. After this timing control, the client system executes or processes the entry workload in block 1108. In block 1110, a sweepstakes entry is thereby generated and returned to the server system 104 based upon the completion of this entry workload. Process control then may proceed back to the periodic timing block 1106, where timing control determines when the entry workload is next processed. The completed workload represents the machine generated sweepstakes entry.

FIG. 11B is an alternative entry workload process flow 1150. The process flow 1150 is similar to the process flow 1100 except that the entry workload is sent to the client system each time it is to be run. Process starts in block 1102 and passes to the periodic timer block 1106, in which the process is controlled. For example, server systems 104 may determine when it is desirable for the client systems to receive and process an entry workload. In block 1104, the entry workload is sent to the client systems. As with FIG. 11A, the client systems then execute the entry workload in block 1108, and an entry is generated and returned to the remote server systems 104 in block 1110. The process then proceeds back to the periodic timer 1106 until it is determined that another entry workload should be processed. The primary difference between process 1150 and process 1100 is that process 1150 is depicting an entry workload that is transmitted to the client system each time it is to be run.

One example utilizing the process 1150 or the process 1100 is for server systems 104 to query the client systems for entry workload processing at regular time intervals. If a distributed device returns a completed entry workload back within a selected period of time from the distribution of the entry workload, the server system may conclude that the distributed device should receive an entry because the distributed device is providing resources to the distributed processing system. In this way, the server systems 104 may determine at regular intervals whether a given client system is working on project workloads for the distributed processing system. Alternatively, the client system agent may locally control the workload processing and may, for example, cause the client system to process and generate

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entries at regular time intervals. It is noted that non-regular and varying time intervals may also be utilized and that combinations of remote and local control may also be utilized, as desired.

The timing of when a client system processes the entry workload, therefore, may be determined locally by the client system agent or remotely, for example, through commands sent by the server systems 104. In addition, periodic timing control may also be accomplished through various combinations of control routines residing locally and remotely. It is further noted that any number of different variations may be utilized to provide machine generated entries to a sweepstakes, according to the present invention. Thus, a client system may generate sweepstakes entries in any of a variety of ways and still have machine generated sweepstakes entries, according to the present invention.

FIGS. 13A and 13B describe a data conversion application 1300 for a massively parallel distributed network according the present invention. In particular, FIG. 13A is a block diagram of a distributed processing system that provides data conversion services, according to the present invention. And FIG. 13B is a block flow diagram for data conversion services within a distributed processing system, according to the present invention.

Converting file types, web pages, graphics images, etc., between device types can be a highly intensive processing task. Example devices that often need converted data are wireless devices, such as pagers and cell phones, that request Internet web page information from their respective device servers. The device server, instead of incurring the overhead of reformatting the requested data for the wireless devices, may instead distribute the requested page or data address, the device type information of the requesting device, and return address for the reformatted data. According to the present invention, the data conversion, translation or processing may be performed by a client system of the distributed processing system of the present invention. The resulting data may then be returned or provided to the original requesting device. In addition to data formatting for cell phones, language conversion, text translation and media translation services, or any other desired data conversion can also be hosted for a customer through the distributed processing system of the present invention.

It is noted that the data conversion operation contemplated by the present invention is not limited to any particular requesting device, any particular service provider, any particular type of data to be processed, any particular type of resulting processed data, or any particular data source. Thus, the data processed may include voice, text, application, image, source code, or any other data type or combination

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of data types, and the resulting processed data may also include voice, text, application, image, or any other data type or combination of data types. According to the present invention, the distributed processing system is utilized to process any data that is desired by a requesting device and that must be converted or processed before being provided to the requesting device. For example, end-user devices connected to the Internet, such as personal computers, may sign up for data conversion services through the server system so that the end-user device may request data conversion of any desired data, file, web site content, etc. Language translations and data formatting for connected wireless are just two examples of such applications for the present invention.

Looking now to the embodiment of FIG. 13A, the network 102 is depicted as the Internet, and the requesting device is one or more wireless devices 1306 connected to the Internet 102 through communication links 1308 and to the wireless device server systems 1304 through communication link 1309. The data to be converted, translated or otherwise processed is represented by block 1302 and may be, for example, content from an Internet web site that is connected to the Internet through communication link 1312. Also, as shown in FIG. 13A, a massively parallel distributed network (MPDN) server 104 is connected to the Internet 102 through communication link 114. The wireless device server systems 1304, or any other connected system that desires to off-load data conversion processing requirements (e.g., web site content servers), are connected to the Internet 102 through communication links 1310 and to the MPDN server 104 through communication links 1311. Any number of client systems 108, 110 ... 112 may also be connected to the Internet 102, through communications links 118, 120 ... 122, respectively. As also stated above, any of the connected devices may communicate with each other in any of a wide variety of communication techniques (e.g., wireless, electrical, digital, analog, light-based, etc.) and protocols (e.g., static or dynamic IP addresses), and through any number of other devices, as would be understood by one of skill in the art.

In the application contemplated by FIG. 13A, the wireless devices 1306 at times request data, for example, images or text from a web site, that must be converted, translated or otherwise processed by wireless device server systems 1304 before it can be transmitted to, and displayed on, a requesting wireless device. Instead of converting the information, the wireless device server systems 1304 may request that the MPDN server 104 accomplish the data conversion or translation. The device server systems 1304 may then provide to the MPDN server 104 any pertinent information, such as information concerning the requesting device, the nature of the data requested, and the processing needed for the data. The MPDN server 104 may then utilize one or more of the client systems 108, 110 ... 112 to

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process the data from block 1302 for transmission to the requesting device. In this way, the wireless device server systems 1304 may off-load burdensome and process-intensive conversion tasks to the distributed processing system of the present invention.

It is noted the transmission of processed data to the requesting wireless device 1306 may occur in a variety of ways. For example, the processed data may be transmitted from a client system 108 to the server 104, then to the wireless device server 1304 and finally to the wireless devices 1306. Alternatively, the processed data may be transmitted from a client system to the wireless device server 1304, and then to the wireless devices 1306. Still further, the processed data may be transmitted directly from a client system to the wireless devices.

FIG. 13B provides a basic flow diagram for an embodiment of a data conversion process 1350 according to the present invention. In block 1352, a device, such as wireless devices 1306, requests unconverted, non-translated or non-processed data. In block 1354, a server for the device, such as wireless device server systems 1304, processes the data request and contacts the MPDN server 104. In addition, the content provider or server for the requested data, such as a web site content server, may contact the MPDN server 104. The wireless device server systems 1304 provide all pertinent information to the MPDN server 104, such as the type of calling device, its identification, the relevant data requested, and the conversion to take place. The MPDN server 104 then distributes the data and information concerning the requesting device to one or more client systems, such as client systems 108, 110 ... 112, in block 1356. The one or more client systems then convert, translate or otherwise process the data in block 1358. The converted, translated or processed data is then provided to the requesting device in block 1360. Again, in this way, the device servers may provide a wide range of information without having to provide itself the processing power to accomplish the conversion, translation or processing that is required to transmit or display the data on a requesting device.

As shown in FIG. 13B, the device server or the content server 1304 may communicate data and other pertinent information for a conversion directly to the client systems. For example, the MPDN server 104 may provide access to a group of client systems for data conversion purposes for given periods time (e.g., monthly client group allocations), or may provide identities of groups of client systems that may be used at the time a conversion is needed. Once the identity and allocation of client systems to a particular device server or content server is made, the device server or content server may communicate directly with the client systems. In addition, the device server or content server may

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provide directly to a requesting device the identity of the one or more client systems accomplishing the data conversion. As shown in FIG. 13B, the requesting device, therefore, may communicate directly with the client system or systems to provide pertinent information concerning the data conversion requested. The client system may then, for example, directly download the desired content and perform the desired data conversion. It is further noted that in addition to the embodiments described above with respect to FIGS. 13A and 13B, other methods for requesting, processing and providing data to and from the requesting device may be implemented with distributed processing system of the present invention, such as caching processed data for later transmission.

FIGS. 14A and 14B depict example block diagrams of file distribution and data sharing through the network fabric, according to the present invention. In particular, FIG. 14A depicts an Internet data file distribution system 1400 that relies upon client systems to provide local data distribution. FIG. 14B depicts a data file distribution system 1450 that allows for data sharing and rapid transmission of a project or data files through the distributed processing system.

Looking now to FIG. 14A, a block diagram is depicted of a distributed processing system 1400 that provides data transmission caching or other local distribution, according to the present invention. In the embodiment of FIG. 14A, server systems 104 are connected through communication link 114 to the Internet back-bone 1402. The Internet back-bone 1402 represents the very high speed connections that carry data long distances, for example, T3 or fiber optic lines that carry Internet data across the United States. A web site 1404 is connected to the Internet back-bone 1402 through communication link 1406, which represents a geographically local connection. The connection block 1410 represents a geographically remote communications link, such as a POP server, head-end machine, telephone line central office, cell site, etc. This communications block 1410 is connected to the Internet back-bone 1402 with a communications link 1408, which also represents a geographically local connection. A variety of client devices and non-client devices 1412A, 1412B, 1412C, 1412D, 1412E and 1412F may be connected below the connection block 1410. It is noted that interface 1414 represents, for example, a secondary network on which client devices 1412D, 1412E and 1412F are connected, such as a home network.

In the embodiment shown in FIG. 14A, web site 1404 may be desiring to provide content that is in high demand, over a short period of time. An example of such an event is a live Internet multimedia broadcast. For such an event, there may be a huge influx of devices trying to download the content from

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the web site 1404 over a short period of time. The web site 1404 may be unable to meet this extremely large demand, requiring the web site 1404 to shut down.

According to the present invention, the web site 1404 may off-load some or all of its data handling requirements by using the distributed processing system of the present invention for data caching. The web site 1404 may contact server systems 104 and request data caching services. The server systems 104 may then identify a local machine, such as client device 1412E, to act as a local distributor of the content for web site 1404. For example, one or more idle client devices that have been identified, as discussed above, may be utilized as local distributor client device 1412E. The local distributor client device 1412E may first download the content and pass it on to other client and non-client devices 1412B, 1412C and 1412D through communication links 1416A, 1416B and 1416C. It is noted that this caching will be aided if the client and non-client devices receiving the cached data are relatively short communication hops from local distributor client device 1412E.

This data or network caching allows data to be streamed to an end user level device, which may then pass the data on to other end user devices. Thus, the downstream communications may be limited, thereby taking the distribution burden off of the web site. For example, web site 1404 may have a large streaming video or multimedia file that is experiencing a heavy load from a given set of network devices. This data file may be cached by a machine, such as client device 1412E, that is below from a communication link 1410. Then, other devices that are also below this communication link 1410 may download the streaming video data from the client device 1412E. This caching eliminates the need to repeatedly send the same data through the same communication links to requesting devices that are located below common communication links. It is noted that the file and data distribution possibilities for this peer file access, caching and data transmission, according to the present invention, are wide and varied and should not be seen as limited to the embodiment shown in FIG. 14A.

FIG. 14B is a block diagram of a distributed processing system 1450 that provides data distribution and data sharing, according to the present invention. As with FIG. 9, FIG. 14B depicts an alternative view of a network fabric that may interconnect any of a wide variety of devices. In the embodiment shown in FIG. 14B, server systems 104 are interconnected with any number of client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G and 108H. Each of the connecting interconnects represents any of a wide variety of communication links that may exist between devices in the network fabric of the present invention. Each of the client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G

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and 108H include shared data (SD) according to the present invention. Within this interconnected fabric, block 1452 represents data or project information that is desired to be distributed. The SD blocks within each client system facilitates the distribution of this data or project information.

A client agent, as discussed above, installed on the client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G and 108H includes functionality that facilitates a number of services with respect to data transmission and sharing. First, the client agent provides a protected data storage area accessible to outside devices, which is represented by the SD block within each client system in FIG. 14B. This special storage space protects the device from outside devices accessing other storage areas on the device while allowing data to be shared and accessed by other devices and simultaneously used by the local client agent.

These shared data (SD) blocks provide mechanisms that enable a wide variety of possible interactions among the client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G and 108H. For example, the data sharing mechanism may provide a space for a cache of other device addresses attached to the network for both communication purposes as well as security purposes. The mechanism may also provide a simple indexing system that is automatically re-indexed when content is added or removed from the storage area. This indexing system may provide a mechanism for other client agents to perform discovery on the local client information and visa versa. Through information stored within this shared data, the distributed processing system of the present invention facilitates many distributed file system applications such as distributed resume posting, distributed caching, distributed advertisement serving, etc. In addition to the above, the storage block (SD) within each client system may include an interface for displaying or playing data types (such as images, audio files, video files, etc.) stored both locally and/or remotely on other client devices. This would enable simple picture sharing, for example, between remote families connected via the internet, as part of being a client system within the distributed processing system of the present invention.

In the embodiment shown in FIG. 14B, data or project 1452 is injected into the fabric through a connection to client system 108C and server systems 104. These connections represent that the information may pass first to server systems 104, or may pass first to a client system, such as client system 108C. It is noted that there are other ways that the data may be injected into the fabric. Once injected, the data 1452 may be transmitted throughout the fabric through any of a wide variety of communications, including client-to-client, server-to-client, client-to-server, client-to-non-client, non-

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client-to-client communications, and/or non-client-to-non-client communications. These communications may be based upon a variety of mechanisms, such as polling mechanisms and pre-assigned firewall ports. This technique provides a vehicle that facilitates the distribution of information to a large number of devices in a short period of time.

Applications for this data distribution are widely varied. For example, any important file that is time sensitive may be propagated to a large number of client devices, non-client devices, servers, or other connected devices, in a short amount of time. This transmission may occur quickly and efficiently once the information is injected into the distributed processing system of the present invention. Example time sensitive data files are anti-virus signature files, which when distributed through the distributed processing system of the present invention, may be transmitted through the network fabric faster than a new virus may normally proliferate.

Another application for rapid propagation of files is utilizing this technique for propagation of workloads. One example is distributed resume or job searching. In such a system, participating job seekers and participating employers may rapidly search for one another. A job seeker may inject a job request or search into the fabric that is then routed by each successive device to other devices without the need for control from the server systems 104. Similarly, an employer may inject candidate criteria into the fabric that is then routed to successive devices. The result is an extremely fast search and identification of employers and candidates.

FIG. 15 is a block diagram of an alternative representation for a distributed processing system 100, according to the present invention. Server systems 104, database systems 1546 and web interface 1554 are coupled together through communication links 1540, 1542 and 1544. The web interface 1554 includes clients subsystem 1548, task developer subsystem 1550, and advertisers subsystem 1552, and may include other subsystems as desired. The database systems 1546 include workload (WL) information 308, client capability vector information 620, and any other stored information as desired. Server systems include various modules and subsystems, including database interface 1532, web server 1536, task module and work unit manager 1530, client statistics module 1534, advertising manager 1538, task module version/phase control subsystem 1528, sweepstakes engine 1524, server control subsystem 1526, and communication interface 1522. It is noted that in the embodiment of a distributed processing system 100 as depicted in FIG. 15, the three primary operations for the server systems 104, database

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systems 1546 and web interface 1554 are directed to managing, processing and providing an interface for client systems, customer tasks, and customer advertising.

As discussed above, each client system includes a client agent that operates on the client system and manages the workloads and processes of the distributed processing system. As shown in FIG. 15, each of the client agents 270A, 270B ... 270C communicates with the server systems 104 through communication links 1516, 1518 ... 1520, respectively. As discussed above, any number of different techniques and architectures may be utilized to provide these communication links. In the embodiment as shown in FIG. 15 with respect to client agent 270A, each client agent includes a base distributed processing system component 1506 and a separate project or workload component 1504. As depicted, a communication interface 1508, a core agent module 1502, and a user interface 1510 make up the base distributed processing system component 1506. The task module 1512 and the work unit 1514 make up the separate project or workload component 1504. The task module 1512 operates on top of the core agent module 1502 to provide processing of each project work unit 1514. It is noted that different or additional modules, subsystems or components may be included within the client agent, as desired. For example, a personal computer screen saver component may be part of the base distributed processing system component 1506 or the separate project or workload component 1504.

Also as discussed above, security subsystems and interfaces may be included to provide for secure interactions between the various devices and systems of the distributed processing system 100. As depicted in FIG. 15, a security subsystem and interface 1560 is interconnected with the server systems 104, the database systems 1546, the web interface 1554, and the client agents 270A, 270B ... 270C. These interconnections are represented by lines 1566, 1564, 1562, and 1568, respectively. The security subsystem and interface 1560 operates to secure the communications and operations of the distributed processing system. This security subsystem and interface 1560 also represents a variety of potential security architectures, techniques and features that may be utilized. This security may provide, for example, authentication of devices when they send and receive transmissions, so that a sending device verifies the authenticity of the receiving device and/or the receiving device verifies the authenticity of the sending device. In addition, this security may provide for encryption of transmissions between the devices and systems of the distributed processing system. The security subsystem and interface 1560 may also be implemented in a variety of ways, including utilizing security subsystems within each device or security measures shared among multiple devices, so that security is provided for all interactions of the devices within the distributed processing system. In this way, for example,

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security measures may be set in place to make sure that no unauthorized entry is made into the programming or operations of any portion of the distributed processing system including the client agents 270A, 270B ... 270C.

In operation, client systems or end-users may utilize the clients subsystem 1548 within the web interface 1554 to register, set user preferences, check statistics, check sweepstakes entries, or accomplish any other user interface option made available, as desired. Advertising customers may utilize the advertisers subsystem 1552 within the web interface 1554 to register, add or modify banner or other advertisements, set up rules for serving advertisements, check advertising statistics (e.g., click statistics), or accomplish any other advertiser interface option made available, as desired. Customers and their respective task or project developers may utilize the task developer subsystem 1550 to access information within database systems 1546 and modules within the server systems 104, such as the version/phase control subsystem 1528, the task module and work unit manager 1530, and the workload information 308. Customers may also check project results, add new work units, check defect reports, or accomplish any other customer or developer interface option made available, as desired.

Advantageously, the customer or developer may provide the details of the project to be processed, including specific program code and algorithms that will process the data, in addition to any data to be processed. In the embodiment shown in FIG. 15, this program code takes the form of a task module 1512 within the workload, while the data takes the form of work unit 1514. These two portions make up the project or workload component 1504 of each client agent 270. For a given project, the task module 1512 will likely remain relatively constant, except for version updates, patches or phase modifications, while the work unit 1514 will likely change each time processing of the data that it represents is completed. The project or workload component 1504 runs in conjunction with the base distributed processing system component 1506. When a different customer or project is started on a given client system, the project or workload component 1504 will typically be replaced, while the base distributed processing system component 1506 will likely remain relatively constant, except for version updates, patches or other modifications made for the distributed processing system.

Information sent from the server systems 104 to the client agents 270A, 270B ... 270C may include task modules, data for work units, and advertising information. Information sent from the client agents 270A, 270B ... 270C to the server systems 104 may include user information, system information and capabilities, current task module version and phase information, and results. The database systems

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1546 may hold any relevant information desired, such as workload information (WL) 308 and client capability vectors (CV) 620. Examples of information that may be stored include user information, client system information, client platform information, task modules, phase control information, version information, work units, data, results, advertiser information, advertisement content, advertisement purchase information, advertisement rules, or any other pertinent information.

Now looking to FIGS. 16, 17A, 17B, 18A and 18B, an embodiment for security features for the distributed processing of the present invention will be described. FIG. 16 provides a representation of the distributed processing environment including security subsystems. FIGS. 17A and 17B provide block diagrams of the communication interface between client systems and the server systems. And FIGS. 18A and 18B provide detailed block diagrams of an embodiment of security measures for the server systems and the client systems.

Referring to FIG. 16, an embodiment 1600 of a distributed processing system is depicted. Server systems 104 include a security subsystem 354 through which communications to and from the server systems 104 may be made secure. Client systems 108A, 108B ... 108C and client systems 108D, 108E ... 108F represent any number of client systems that may communicate with server systems 104 or with each other. Each of the client systems 108A, 108B, 108C, 108D, 108E and 108F include a security subsystem 272A, 272B, 272C, 272D, 272E and 272F, respectively. The electronic information 1602 represents information that the server systems 104 is to communicate to client systems 108A, 108B, 108C, 108D, 108E and 108F in a secure manner, so that no unintended or intercepting recipient may understand or tamper with the electronic information 1602, and so that no third party may insert non-authorized information into the distributed processing system 1600. Although not shown, it is understood that any one of the client systems 108A, 108B, 108C, 108D, 108E and 108F may have electronic information that is to be securely sent to the server systems 104 or to any other of the client systems 108A, 108B, 108C, 108D, 108E and 108F.

Electronic information 1602 represents information that is communicated to facilitate the operations of the distributed processing system 1600. Such information includes the client agents that are downloaded to each client system, the workload applications for any given workload, and any work unit that will be processed by a client system. Electronic information 1602 may also be any type of information to be sent or received within the distributed processing system, such as text, images, audio streams, video streams, databases, spreadsheets, PDF files, Shockwave data, Flash data, applications,

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data files, chat streams, or any other information, data or data streams. In addition, electronic information may be sent by client systems 108A, 108B, 108C, 108D, 108E and 108F to the server systems 104 and/or any of the other client systems.

The Certificate Authority (CA) block 1604 within the server systems 104 represents an entity that helps to ensure validity of encryption and decryption codes. For example, within a public/private key encryption environment, a Certificate Authority may help ensure that a public key alleged to be from a particular entity is in fact legitimately from that entity. One third-party entity that performs this CA function on the Internet is Verisign, Inc. Having a third-party perform the CA function can be advantageous in a transaction or communication between non-trusted entities. For example, the sending entity provides its public key information to the third-party CA, which verifies the information and creates a certificate that includes the sending entity's public key information. This certificate may then be encrypted and signed by the third-party CA. The receiving entity may then obtain the certificate from the third-party CA and decrypt it with the third-party CA's public key. The receiving party will then have the sending party's public key and be fairly secure that it is a legitimate public key from the sending party.

As shown in FIG. 16, the CA functionality may be part of the server systems 104, such that the server systems 104 act as their own Certificate Authority with respect to client systems108A, 108B, 108C, 108D, 108E and 108F and any other devices that are part of the distributed processing system. A third-party CA is not as needed in this distributed processing environment because the server systems 104 primarily direct the operations of the distributed processing system. Thus, there is less of a need for a third-party entity to provide a CA function. It is noted that CA functionality may be provided only by the server systems 104, only by third-party CAs, or any combination of server systems 104 and third party CAs, as desired for a particular embodiment. In addition, if desired, no CA functionality could be provided so that secure communications between the server systems 104 and the devices within the distributed processing system were conducted without the use of a Certificate Authority.

FIG. 17A is a block diagram of an embodiment 1700 for a communication interface between a client system 108 and the server systems 104. In this embodiment 1700, the network is preferably the Internet. As depicted, the client system 108 includes a client agent 270 and a network browser 1702. The server systems 104 include a client agent download site 1710, from which the client system 108 may download the client agent 270 through communications 1704. The server systems 104 also include block

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1712, which represents a variety of client service functions that may be provided by the web interface for the server systems 104 through communications 1706. For example, in a public/private key security environment, a client system 108 may download from block 1712 a Certificate Authority (CA) certificate that includes the server public key. In addition, the client system 108 may login to the web page interface for the server systems 104. And the server systems 104 may generate dynamic certificates. The client system 108 may also send and receive information to application server 1714 through communications 1708, for example, to receive project work units. Finally, as depicted, database systems 1546 may send information to and receive information from the blocks 1710, 1712 and 1714 of the server systems 104 through communications 1716, 1718 and 1720. As discussed more above, database systems 1546 may include any desired information, for example, a workload database 308 and/or a capability vector database 620.

FIG. 17B is a block diagram for an Internet communication protocol structure 1750 that may be utilized for communications 1704, 1706 and 1708. As depicted in FIG. 17B, three basic application layers are utilized by each client system 108 and the server systems 104 to communicate with each other. The TCP/IP layer 1756 represents a standard Internet communication protocol that allows devices to identify and send information to each other across the Internet, as is well known to those of skill in the art. The secure network layer (SNL) 1754, such as the secure socket layer (SSL), represents a protocol that allows devices to confirm the identity of servers and the other devices with whom they communicate, as long as those servers or other devices utilize similar protocols. The application security level 1752 represents other desired security or communication protocols that are implemented by programs running on the client system 108 and/or the server systems 104.

In operation, the server systems 104 may secure the download of the client agent 270 to the client system 108 by requiring that the client system 108 download the client agent 270 from the client agent download site 1710. As part of the server authentication sequence, the download site 1710 will send back an identifier to assure users that they are indeed connected to the proper server systems 104. This identifier may be, for example, a CA certificate, but may be any other identifier, as desired. Because it is desirable to have the client agent running on as many distributed devices as possible for the distributed processing system of the present invention, user authentication may not be required to download the client agent 270 from the download site 1710.

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Once a client system 108 has downloaded and installed the client agent 270, the client system 108 will communicate with the application server 1714 to begin working within the distributed processing system. For these communications, server and client authentication may be required to help ensure security. To accomplish this authentication, for example, two-way authentication may be utilized. To provide a public/private key combination for the client agent 270, each client agent 270 that is downloaded by a client system 108 may have embedded within its code a default identifier and a default public/private key pair. Thus, the server systems 104 may use secure network protocols (such as SSL or similar schemes) to authenticate each client system 108, and each client system 108 may use compatible protocols to authenticate each server application with which it communicates. These applications, for example, may include the functionality provided by blocks 1712 and 1714, and, therefore, the communications 1706 and 1708 would utilize authentication.

As an alternative to embedding a public/private key combination and associated identifiers or certificates into the client agent 270, the public/private key pairs may be dynamically generated in block 1712. For example, at start-up, at reboot or at some desired time or event, the client system 108 may generate a new public/private key pair. When the client system 108 next communicates with the server systems 104, the client system 108 request a certificate from the server systems 104. The server systems 104 may then act as a Certificate Authority (CA) and provide a CA certificate to the client system 108. This dynamic certificate generation, therefore, allows for added security by allowing each client system 108 to have its own public/private key pair for secure network protocol communications and by having this key pair change at some desired recurring event for the client system 108, such as reboot.

The client system 108 may initiate its communication with the server systems 104 by logging on to the authentication server, which may be part of block 1712. The user may be prompted to enter a valid e-mail address and/or password, if already registered, or may be asked to register if the e-mail address and/or password are not recognized. Once registration is completed, a password may be e-mailed back to the user to provide validation of the user. If authentication is successful when a user logs into the server systems 104, the server systems 104 may provide a host-ID, and user-ID and a session key for any given communication session.

It is also desirable that once a user has successfully registered, the user may install the client agent 270 on any number of other host or user systems without needing to interact with that systems network browser, other than to set host-specific preferences. For example, when downloaded, the client

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agent 270 may take the form of a self-extracting program that installs the appropriate files to the client system 108, including the proper host and user identifications. In addition, to help ensure proper identification, the session keys may be exchanged each time the client system 108 communicates with the server systems 104. For example, the client system 108 may communicate its current session key to the server systems 104 each time it communicates with the server systems 104. The server systems 104 will then send a new session key for the client system 108 to utilize for the next session. In this way, stale identification information may be reduced. In addition to this security feature, communications may also be encrypted and decrypted with various encryption techniques, as desired.

Referring now to FIGS. 18A and 18B, one embodiment will be discussed for a security model utilizing public/private key encryption. This security model utilizes a third-party CA to provide a CA certificate for the server systems 104.

FIG. 18A is a block diagram of an embodiment 1800 for security procedures implemented by server systems 104. Electronic information1602 is to be communicated to a client system 108. This electronic information 1602 travels through four different paths that provide security information.

One path begins with the electronic information 1602 being encrypted with the server private key in block 1802. Then, in block 1830, the encrypted information is sent to client systems. This encrypted information is represented by arrow 1826.

A second path flows from block 1802 to block 1804 where a hash value is generated for the encrypted electronic information. It is noted that a hash value is a unique value that may be generated for any given electronic file based upon the contents of that file and the algorithm used to calculate the unique value. There are any number of algorithms that may be used to calculate a hash value, as would be understood by one of skill in the art. Proceeding down the second path to block 1806, the hash value generated on the server side for the encrypted electronic information (i.e., the information sent to the client system from block 1830 via 1826) is compared with a hash value 1822 from the client system 108. This hash value 1822 represents the client system's calculation of the hash value for the encrypted electronic information that the client system 108 received from the server system 104. If no tampering has occurred and the data was transmitted accurately, the client system hash value should match the server hash value. In block 1808, the server systems 104 provide an indication of the result of the hash check evaluation back to the client system 108. This pass/fail determination is indicated by arrow 1824.

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A third path begins with block 1810 where a hash value is calculated for non-encrypted electronic information 1602. This hash value is then encrypted in block 1816 with the server private key. Next, this encrypted hash value is sent to the client system 108 in block 1818. The arrow 1821 represents the encrypted hash value for the non-encrypted electronic information.

A fourth path, and the last depicted in the embodiment 1800 of FIG. 18A, flows from block 1810 to block 1812, where the hash value is partitioned into N different portions. These N different portions are preferably designated for N different client systems 108, as well as any client systems 108 receiving a redundant distribution of any one of the N different portions. In block 1814, the N different hash value portions are encrypted with the server private key. Next, the N different encrypted hash value portions are sent in block 1820 to N different client systems 108, as well as being sent to client systems 108 receiving redundant distributions of the hash value portions. The arrows 1828 represent the distribution of the N different hash value portions. It is noted that redundant distribution of the N hash value portions is desirable because, as discussed below with respect to FIG. 18B, when the hash value is reconstructed by a client system 108, it is desirable to have multiple sources for each portion in case one of the receiving client systems is not available at any given time.

Looking now to FIG. 18B, the corresponding security procedures implemented by a client system 108 are discussed with respect to embodiment 1850. Initially, in block 1854, the client system 108 receives CA certificate 1852 containing the server public key and the server identity. It is again noted that other unique identifiers may be utilized instead of CA certificates, as described above. If a CA certificate is utilized, this CA certificate may be provided from a third-party Certificate Authority (CA) or from the server systems 104 or any other desired source. In block 1856, the client system 108 verifies the accuracy of the CA certificate using the CA's public key. If this verification is not successful, the client system 108 may wait some period of time before retrying. In addition, the time period may be a random period of time. In addition, as discussed with respect to FIGS. 17A and 17B, the client system 108 will login to the server systems 104. If this authentication is not successful in this login, the client system will notify the user of the system and the server systems 104, and then wait for some period of time or a random amount of time before attempting to re-verify.

In block 1862, the client system 108 receives the encrypted information 1826. Next, the client system 108 creates a hash value for the encrypted information in block 1864. This hash value is

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preferably calculated using the same algorithm utilized by the server systems 104 in generating the hash value for the encrypted information in block 1804 of FIG. 18A. Once the client system 108 has calculated the hash value for the encrypted information, this hash value 1822 is sent to the server systems from block 1866. As discussed above, a pass/fail response 1824 is sent back by the server systems 104. This hash check evaluation is received in block 1868. If the check was a FAIL, flow passes to block 1870 where the client system 108 sends out a notice to the server systems 104 and any other client system to which it is attached that a problem has been encountered. The client system 108 then ends the current connection with the server systems 104. It is noted that the client system 108 may retry several times before moving onto block 1870, and that the reporting scheme may be modified, altered or developed as desired.

If the hash check evaluation was a PASS, flow passes to block 1872 where the electronic information is decrypted with the server public key, which was verified in block 1856. A hash value is then calculated for the electronic information 1874. Again, the hash generation algorithm is preferably the same as that used by the server systems 104 in creating the hash value in block 1810 of FIG. 18A. Next, the hash value is sent from block 1874 to block 1886, where it is compared with two other hash value calculations.

One of the other hash values comes from a path that begins with block 1858, in which the client system 108 receives the encrypted hash value 1821 for the non-encrypted information. In block 1860, the encrypted hash value is decrypted with the server public key. The hash value is then sent to block 1886.

The third hash value for block 1886 comes from a path that utilizes the N different hash portions sent out by the server systems in block 1820 of FIG. 18A. In block 1876, the client system receives a portion 1828A of the partitioned hash value 1828. In addition to one of the partitioned hash values, it is noted that the server systems 104 will also send information providing the identity and source for the N-1 other hash value portions. In block 1878, the client system 108 decrypts the portion 1828A with the server public key. Next, in block 1880, the client system 108 resolves the identity of the source for the N-1 other portions, which may be N-1 other client systems. In block 1882, the client system 108 obtains the N-1 other portions, and assembles the N partitions into a hash value for the non-encrypted electronic information in block 1884. The resulting hash value is then sent to block 1886. It is noted, as indicated above, that redundant distribution of the N portions of the partitioned hash value is desirable so that

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unavailability of one client system will not cause another client system to be unable to re-assemble the N different portions.

Once the three hash values are received in block 1886 from three different sources, they are compared to see if they match. If this check is a FAIL, flow moves to block 1888, where the client system 108 sends out a notice to the server systems 104 and any other client system to which it is attached that a problem has been encountered. The client system 108 may also inform the client systems from which it received the N-1 other portions, and the client system 108 may retry the procedures, if desired. In addition, once a client system 108 is notified of a potential problem, the client system 108 may download a special check file from the server systems 104 to make sure that the server systems have not been compromised. If still a FAIL, the client system 108 then ends the current connection with the server systems 104. If the check is a PASS, the electronic information is utilized, as represented by block 1890.

FIGS. 19 and 20 provide block diagrams for further describing the distributed processing system and environment of the present invention that allows for third parties, such as network service providers, to monitize, or gain revenue from, their respective user bases.

Looking first to FIG. 19, a block diagram is depicted for a distributed processing system 100 and environment 1900 in which network service providers are enabled to monitize their user bases. Environment 1900 includes a distributed processing system 100, a customer 152, and a third-party network service provider 1902. The customer 152 represents an entity that has a project 1912 that the customer 152 would like processed by the distributed computing system 100. In return for the processing of the project data and the results 1914 of this processing, the customer 152 will often make a payment 1916. The third-party network service provider 1902 maintains a user database 1904 that identifies its user base 1920 including users 1906A, 1906B ... 1906C.

The service provider 1902 may be, for example, an Internet business that provides any of a variety of services to users, such as Internet access, e-mail, web page hosting, domain name hosting, file sharing services or any other Internet-based service. In addition, such Internet-based services may be offered for free or low cost to users, in which case the users have historically agreed to view banner or other advertisements in return for the free or low cost service. However, as stated above, advertising revenue has been subject to diminished pricing and has become a unreliable source of revenue for many

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Internet-based companies. To facilitate the number of projects that the distributed processing system 100 can take on and the speed at which these projects can be processed and completed, it is desirable to increase the amount and capabilities of the computing resources available to the distributed processing system 100. To the extent that the users of the service provider 1902 represent a pool of underutilized resources, these users represent a potentially valuable resource to the distributed processing system 100.

According to the present invention, the service provider 1902 may realize value from its user base and thereby monitize this user base by facilitating the use by the distributed processing system 100 of computing resources related to these users. Thus, for example, in return for free services, the users may agree to have their respective computing resources utilized by the distributed processing system 100. The service provider 1902 may then provide to the distributed processing system 100 the user identifications (IDs) 1908 related to its user base in return for revenue sharing 1910. This monitizing architecture according to the present invention thereby provides a significantly advantageous avenue for service providers or other entities that control or have user bases with useful processing capabilities, such as Internet-based service providers, to generate revenue from its user base, particularly in the face of falling revenue from other sources, such as advertising revenue.

The revenue sharing 1910 may be, for example, a share of payment 1916 relative to the amount of processing toward the project 1912 that was completed through the use of the user resources 1922 made available through users 1906A, 1906B ... 1906C. It is noted that the revenue sharing 1910 may take any desired form, including but not limited to (a) upfront payments based upon attributes of the user base, such as size or processing capabilities, (b) payments based upon the number of users that become members of the distributed processing system, (c) payments based upon the types of projects processed by the user base, or (d) any other desired compensation scheme related to the value of the user base being made available by the third party.

The monitizing invention, therefore, focuses on capabilities of internet, intranet, wireless or otherwise network connected PCs, internet appliances, notebook computers, servers, storage devices, NAS (Network Attached Storage), or any other connected computing device that could provide any of a number of useful capabilities and that is part of a underutilized user base, such as user bases of Internet-based businesses that rely on advertising or any other method of monitizing their user base in exchange for a valuable service (e.g. free internet access, email, etc.). As discussed above, these useful processing capabilities span the entire range of generic computing subsystems including: Central Processing Unit(s)

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(CPUs), Digital Signal Processor(s) (DSPs), Graphics Processing Engine(s) (GPEs), Hard Drive(s) (HDs), Memory (MEM), Audio Subsystem(s) (ASs), Communications Subsystem(s) (CSs), Removable Media Types (RMs), or other Add-In/On Accessories (A/OAs) with potentially useful unused capabilities. Market creation and potential compensation for all unused capabilities can be accomplished through the massively parallel distributed software architecture of the distributed processing system 100. For example, credits (revenues) would be generated each time a unit of work is accomplished by one (or more) of the subsystems on a user's computing device via a client agent installed on the device for the purposes of managing, processing and completing units of work. The total credits/revenues generated may be, for example, dynamic depending on how many are received. Through this architecture of the present invention, significant revenues may be generated from the user base of the service provider where the service provider may have previously been unable to monitize effectively this user base.

It is further noted in more general respects that the entity 1902 may be any entity that has direct or indirect control over a group of users, such that the users resources may be offered to and utilized by the distributed processing system 100. An example of one such more general entity would be a company that has a large group of internal users that are capable of being linked to the distributed processing system 100, for example, through an intranet network of computer systems or computing devices. The computing resources related to these users may also be monitized according to the present invention.

Looking now to FIG. 20, a block diagram for an embodiment 2000 representing the components for a client agent 270 along with a representative indication of responsibility for those components. Client agent 270 includes a core agent component 1502, a project component 1504 and a user interface component 1510. As discussed above, the core agent component 1502 can provide the base distributed processing functionality for the client agent 270. The project component 1504 can provide the project-specific functionality for the client agent 270. And the user interface 1510 can provide any desired user viewable information or interaction functionality. These three general components may be modular software components such that the project component 1504, the core agent component 1502, and the user interface component 1510 may be separate software modules, if desired, that link together through appropriate APIs (Application Programming Interface). Thus, each of these components may be designed and developed independently or jointly, as desired. In effect, the core agent component 1502 can provide a backbone upon which is attached the project component 1504, the user interface component 1510, and any other desired component. Thus, when a new project or interface is desired for any given client agent 270, for example, this component may be efficiently replaced with the new

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component in a modular fashion still utilizing the core agent component 1502 as the backbone. In addition, each component may be updated and modified without requiring modification or updates to the other component software code.

Also depicted in FIG. 20 are customer 152, distributed processing system (DPS) 100 and service provider 1902, which are in communication with each other through interactions or interfaces 2012 and 2014. In this embodiment of FIG. 20, the customer 152 is represented as providing the software development and code 2002 for the project component 1504. The distributed processing system 100 is represented as providing the core agent code 2008 for the core agent component 1502. And the service provider is represented as providing at least a portion of the interface development and code 2010 for the user interface component 1510. In operation, the workloads 2004 and the results 2006 would still typically be under the control of the distributed processing system 100.

It is noted that this modular architecture facilitates the development of project software code and interface software code by entities other than the owner of the distributed processing system 100. For example, with respect to FIG. 19, an Internet-based service provider may have a user interface already designed and implemented for its user base, such as a web browser user interface for users of free Internet access services provided by such a service provider. Once the core agent component 1502 is installed on a user's computer, the existing third-party user interface may hook into the core agent component 1502, thereby making the user's resources available to the distributed processing system 100, while maintaining the user interface the user has come to expect from the service provider. Thus, the service provider 1902 may provide the user interface it desires for the service it is providing, while at the same time monitizing its user base by facilitating its users becoming part of the available resources for the distributed processing system 100.

FIG. 21 provides a block diagram for an embodiment 2100 for a distributed processing system that provides network attached storage (NAS) services, according to the present invention. Although the distributed computing, client agent, file sharing and distributed data storage functionality, as described above, provides data storage that is connected to a network, the NAS embodiment 2100 depicted in FIG. 21 is provided herein for additional explanation. In particular, standard NAS device functionality provided by typical dedicated NAS devices can be accomplished according to the present invention by utilizing unused or under-utilized resources on network-connected devices through capabilities provided by the client agent running on those devices. The resulting software-based NAS services hosted on a

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distributed computing platform, according to the present invention, thereby provide an advantage storage solution.

As with other embodiments described above, the NAS embodiment 2100 focuses on taking advantage of unused or under-utilized capabilities of Internet, intranet, wireless or otherwise network connected personal computers (PCs), internet appliances, notebook computers, servers, storage devices or any other connected computing device. Such devices have typically been put into operation for purposes entirely separate from operating as a part of a distributed processing or storage system and have a primary operational purpose that is not to provide NAS services. Through the client agent and infrastructure implementation of the present invention, such devices can provide storage capabilities that allow these devices to appear to users as dedicated NAS devices, while still being used for the purpose for which they were put into operation. For example, a large number of desktop PCs in the enterprise (Intranet) or on the Internet can each act as a NAS device by running a client agent program and NAS component that brings its resources to the network with the appearance of a dedicated NAS device or as part of an integrated system that appears as a single or dedicated NAS device. The implementation can be accomplished in a variety of ways. A relatively simple implementation is to have the devices simply mimic the functionality of stand-alone NAS devices, while a more complex implementation is to provide a storage fabric across the Intranet or Internet where hundreds or thousands of devices work cooperatively as NAS devices in conjunction with server systems that assist in controlling and managing the storage function of the NAS fabric.

Looking now to FIG. 21, the NAS embodiment 2100 includes a network 102, which as discussed above, can be any network communication fabric that provides connectivity between various machines. As shown, connected to this network 102 are a user device fabric 2102, a client device fabric 2104, and servers systems 104 and 154D. More particularly, the user device fabric 2102 may include any number of potential user devices 152A, 152B ... 152C. The client device fabric 2104 may include any number of potential client devices 108A, 108B ... 108C. It is noted that that the user devices 152A, 152B ... 152C may be configured to communicate directly to each other, the client devices 108A, 108B ... 108C may be configured to communicate directly to each other, and the user devices 152A, 152B ... 152C and the client devices 108A, 108B ... 108C may be configured to communicate directly between themselves without intervention by the server systems, if desired. The servers systems may include user server systems 154D, which have attached database systems 2112, and NAS server systems 104, which have attached NAS database systems 2108 and a centralized data location library 2110. To provide NAS

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functionality, the client devices 108A, 108B ... 108C run a client agent, as described above, that provides NAS functionality, for example, by running a NAS component as one of the projects for the distributed device. In addition, some of these NAS devices, such as NAS client devices 108A and 108B, may store distributed data location information, such as data location libraries 2106A and 2106B.

The NAS distributing computing embodiment 2100 depicted provides an environment in which a variety of different NAS configurations may be utilized, as desired. These configurations include, for example, at least three different NAS architectures that may be utilized: a stand-alone only NAS device implementation, a NAS device fabric implementation, and a server assisted implementation. It is noted that variations, combinations and hybrids of the these implementation examples may be utilized, as desired, without departing from the present invention.

First, the NAS client devices within the client device fabric 2104 can act as stand-alone NAS devices, and the user devices within the user device fabric 2102 can directly access them as such. In this first implementation, the NAS devices 108A, 108B ... 108C run client agent programs that configure the devices to be capable of mimicking dedicated stand-alone NAS devices. Each of these software-based NAS devices is self-contained, knows nothing of other software-based NAS or other NAS devices, and operates like a standard dedicated NAS device, except for the fact that the software-based NAS devices 108A, 108B ... 108C are actually non-dedicated devices that rely on spare and/or unused capabilities of the existing devices to provide NAS services. In this stand-alone only implementation, the data location libraries 2106A and 2106B would not be required to be utilized.

Second, at least some of the NAS client devices within the client device fabric 2104 include data location information or libraries that are used to provide links or directions to data distributed on the various NAS client devices 108A, 108B ... 108C. These links help provide a NAS device fabric from which user server systems 154D and user devices 152A, 152B ... 152C within the user device fabric 2102 can draw storage resources. For example, in the embodiment shown in FIG. 21, NAS client devices 108A and 108B can have data location libraries 2106A and 2106B, respectively. These libraries provide information to a user about where desired data is stored across the entire NAS client device fabric 2104, for example, by providing a distributed database index of the files and other data being stored on the myriad of software-based NAS devices. This database index, or portions thereof, can be stored within each data location library and can be organized as desired to provide direction information for users. In this NAS device fabric implementation, the NAS client devices 108A, 108B ... 108C

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provide both storage and data location functionality, thereby acting both to provide data storage services and distributed data location services. The NAS devices storing the data location information, for example, would receive storage and access requests from user devices and would direct the user devices to the distributed devices storing the requested data. This NAS device fabric implementation would again rely upon client agent programs running on the client devices and would not require the use of centralized server resources to enable the system to perform the NAS services. It is noted that not all software-based NAS devices need to act as both stores of information and location information hosts, such as NAS client device 108C, as depicted in FIG. 21.

In the third server assisted architecture, server systems 104 facilitate the NAS functionality, for example, by providing centralized management, control and support for the NAS architecture. To this end, the NAS servers systems 104 may include, for example, file storage database systems 2108 and a centralized data location library 2110. In this implementation, therefore, the NAS client devices 108A, 108B ... 108C that are running client agents which make them capable of mimicking dedicated NAS devices are combined with centralized database and server systems 104, 2108 and 2110 that provide services, such as indexing, monitoring, back-up, security and other services for the files and other data being stored on the multitude of software-based NAS devices creating the NAS fabric. Thus, the NAS server systems storing data location information in the centralized data location library 2110, for example, would receive storage and access requests from user devices and would at least in part direct the user devices to the distributed devices storing the requested data. It is noted that the server systems 104 could direct the users to the requested data using only the centralized data location library 2110 or with assistance from other resources such as the data location information stored by the NAS devices.

It is further noted, as also discussed above, that the NAS server systems 104, as with the user server systems 154D, are typically a single server machine or a relatively small group of server machines that are commonly controlled and managed, for example, as to physical location and authorized use. In contrast, the user device fabric 2102 and the client device fabric 2104 are typically a multitude of devices that do not have clear bounds. For example, with respect to Internet-connected user devices and client devices, these devices are typically not related and not commonly controlled or managed. With respect to intranet-connected user devices and client devices, there will often be more common control and management, for example, with respect to internal company computer resources. As contemplated by the present invention, once the software-based NAS functionality is implemented, any of a variety of

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user devices 152A, 152B ... 152C and/or user server systems 154D may take advantage of the software-based NAS resources made available by the distributed computing system of the present invention.

In providing NAS services, it is advantageous for the software-based NAS implementation of the present invention to remain unobtrusive to the end-user or owner of the device from a storage perspective. It is also advantageous to facilitate the full use of available storage space. To help achieve and ensure these objectives, the NAS implementation may undertake a number of controls to minimize interference with user storage operations while maximizing the storage value of the software-based NAS solution. These controls may include user or server controlled management features and may include, for example, user specified constraints, standard bit, block or file priority levels and direct bit or file priority markings. Using such storage priority controls, the present invention may maximize storage space efficiency by helping to take advantage of the storage space so that it is operated at a full level. It is noted that these storage priority controls may also be utilized for activities and operations, other than NAS services, that are being provided by a client agent program running on a distributed device.

With respect to the user specified constraints, the client agent program running on a device would recognize and adhere to user-based constraints that may be specified by the user. These constraints may be set by a user, owner, administrator, etc. for the device and may include settable parameters such as a maximum allowed percentage for use of existing storage space, a maximum number of bytes that may be used (MB, GB, TB, etc.), or a minimum amount of storage space that must be left free within the available storage. When these user-based constraints are utilized, the NAS component will recognize the constraints placed on it and adhere to the constraints, up to and including, deleting all shared storage on the device and becoming dormant.

With respect to storage priority levels, the client agent program may rely upon priority levels for bits on the storage device, blocks of data on the device, files on the device, or fragments of files on the device to determine and facilitate how data storage is managed. By using storage priority levels, any of a wide variety of schemes may be implemented for handling storage and storage conflicts and these schemes may be selected depending upon the circumstances for any given client system. In this way, when space on the device is running low, older or less important data or files can be deleted according to fixed or dynamic algorithms. For example, file or data assessment and storage management schemes could include, but are not limited to, a deletion scheme that uses an algorithm, such as one of the following:

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- Timing of storage, for example, straight first-in-first-out (FIFO), last-in-last-out (LIFO) or other time/order based algorithm.
- Usage of the files, for example, least-recently-used (LRU), most-recently-used (MRU), etc. cache schemes.
- File content, for example, content based analyses that base decisions on actual file content, such as whether the file or its data is replicated elsewhere in the system, whether the file or its data can be retrieved from other sources outside the current NAS implementation (tape back-up, Internet, etc.), whether the file is a music, video or audio file that can be retrieved from the Internet, etc.
- Duplicate data, for example, back-up set order, age, etc. for backed up files where needed space could be obtained by deleting older backup files or sets where more recent backup files or sets exist.
- Loss-robustness, for example, losing a few bits of data from an audio stream or video stream would not materially damage the retrieval of the data type.

With respect to direct bit, block or file priority marking, the files or data could include a direct marking for QoS (quality of service) levels that would allow efficient management of storage. By using such a direct marker, a file system priority level may be achieved that resembles execution thread priorities in modern operating systems that help fully utilize the processing power of a central processing unit (CPU). Thus, as each program running on a computer may have a CPU-related service level designation, each file or set of data stored on a storage device may include a storage priority level designation. The level of service provided to any given file or set of data by a control and management scheme may then be determined by the storage priority level designation for that file or set of data.

Further modifications and alternative embodiments of this invention will be apparent to those skilled in the art in view of this description. It will be recognized, therefore, that the present invention is not limited by these example arrangements. Accordingly, this description is to be construed as illustrative only and is for the purpose of teaching those skilled in the art the manner of carrying out the invention. It is to be understood that the forms of the invention herein shown and described are to be taken as the presently preferred embodiments. Various changes may be made in the shape, size and arrangement of parts. For example, equivalent elements may be substituted for those illustrated and described herein, and certain features of the invention may be utilized independently of the use of other

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features, all as would be apparent to one skilled in the art after having the benefit of this description of the invention.

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Claims

What is claimed is:

1. A method of operating a distributed processing system to provide network attached storage (NAS) services, comprising:

configuring a client agent program to have a software-based NAS component and to take advantage of unused or under-utilized resources of a plurality of network-connected distributed devices put into operation for purposes distinct from operating the client agent program to provide NAS services; and

utilizing the plurality of distributed devices running the client agent to provide NAS services to network-connected user devices, the network-connected user devices recognizing at least a portion of the plurality of distributed devices as dedicated NAS devices.

2. The method of claim 1, wherein at least a portion of the plurality of network-connected distributed devices operate only as stand-alone dedicated NAS devices without knowledge of other NAS devices connected to the network.

3. The method of claim1, wherein at least one of the network-connected distributed devices stores location information for data stored by the plurality of network-connected distributed devices.

4. The method of claim 3, further comprising utilizing at least one of the distributed devices storing data location information to receive data storage and access requests from the user devices and to direct the user devices to the distributed devices storing the requested data.

5. The method of claim 4, wherein the plurality of network-connected distributed devices provide NAS services without relying upon a centralized server system.

6. The method of claim 1, further comprising managing the NAS services provided by the plurality of network-connected distributed devices at least in part utilizing at least one centralized server system.

7. The method of claim 6, wherein the server system downloads the NAS component to the plurality of network-connected distributed devices, the NAS component configured to operate as part of the client agent program already installed on the distributed devices.

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8. The method of claim 6, wherein the centralized server system stores location information for data stored by the plurality of network-connected distributed devices and at least in part directs the user devices to the distributed devices storing the requested data.

9. The method of claim 8, further comprising utilizing the server system to receive data storage and access requests from the user devices and to allocate data storage and access workloads to the plurality of distributed devices based upon individual capabilities of the plurality of distributed devices, the individual capabilities being stored in a database by the server system.

10. The method of claim 9, wherein plurality distributed devices are connected to the Internet.

11. The method of claim 1, further comprising managing storage resources for the plurality of distributed devices using a storage priority control that facilitates full use of available storage resources.

12. The method of claim 11, wherein the storage priority control comprises a parameter selectable through the client device.

13. The method of claim 11, wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion.

14. The method of claim 11, wherein the storage priority control comprises a priority marking directly given to data or files.

15. A distributed processing system providing network attached storage (NAS) services, comprising:

a client agent program configured to have a software-based NAS component and to take advantage of unused or under-utilized resources of a network-connected distributed device put into operation for purposes distinct from operating the client agent program to provide NAS services; and

a plurality of network-connected distributed devices running the client agent program to provide NAS services to network-connected user devices, the network-connected user devices recognizing at least a portion of the plurality of distributed devices as dedicated NAS devices.

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16. The distributed processing system of claim 15, wherein at least a portion of the plurality of network-connected distributed devices operate only as stand-alone dedicated NAS devices without knowledge of other NAS devices connected to the network.

17. The distributed processing system of claim 15, wherein at least one of the network-connected distributed devices stores location information for data stored by the plurality of network-connected distributed devices.

18. The distributed processing system of claim 17, wherein the distributed devices storing data location information is configured to receive data storage and access requests from the user devices and to direct the user devices to the distributed devices storing the requested data.

19. The distributed processing system of claim 18, wherein the plurality of network-connected distributed devices provide NAS services without relying upon a centralized server system.

20. The distributed processing system of claim 15, at least one centralized server system managing at least in part the NAS services provided by the plurality of network-connected distributed devices.

21. The distributed processing system of claim 20, the NAS component is configured to be downloaded from the server system to the plurality of network-connected distributed devices, the NAS component configured to operate as part of the client agent program already installed on the distributed devices.

22. The distributed processing system of claim 20, wherein the centralized server system is configured to store location information for data stored by the plurality of network-connected distributed devices and at least in part to direct the user devices to the distributed devices storing the requested data.

23. The distributed processing system of claim 22, wherein the server system is configured to receive data storage and access requests from the user devices and to allocate data storage workloads to the plurality of distributed devices based upon individual capabilities of the plurality of distributed devices, and further comprising a capabilities database connected to the server system and storing capability parameters for the plurality of distributed devices.

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24. The distributed processing system of claim 23, wherein plurality distributed devices are connected to the Internet.

25. The distributed processing system of claim 15, further comprising a storage priority control associated with the storage resources for the plurality of distributed devices, the storage priority control configured to facilitate full use of available storage resources.

26. The distributed processing system of claim 25, wherein the storage priority control comprises a parameter selectable through the client device.

27. The distributed processing system of claim 25, wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion.

28. The distributed processing system of claim 25, wherein the storage priority control comprises a priority marking directly given to data or files.

Doc Code: IDS.PTO.SB.05.07.14

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Abstract of the Disclosure

Software-based network attached storage (NAS) services hosted on a massively distributed computing system are disclosed. More particularly, a client agent program is configured to run on the network-connected client devices that are part of the distributed computing system to provide what appears to user devices as dedicated NAS functionality, for example, through the Internet or an intranet. This NAS functionality takes advantage of unused or under-utilized resources of these distributed devices to advantageously provide NAS capabilities. In addition, storage priority controls may be utilized to facilitate the full use of available storage resources, such as user specified constraints, standard bit, block or file priority levels and direct bit, block or file priority markings.

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UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

Bib Data Sheet

CONFIRMATION NO. 8392

SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/834,785	04/13/2001 RULE	709	~~2162~~ 2157	UNTD:021

APPLICANTS

Edward A. Hubbard, Round Rock, TX;

**** CONTINUING DATA **************************** Yes. Y.D

THIS APPLICATION IS A CIP OF 09/538,543 03/30/2000
AND A CIP OF 09/539,023 03/30/2000
AND A CIP OF 09/539,448 03/30/2000
AND A CIP OF 09/539,428 03/30/2000
AND A CIP OF 09/539,106 03/30/2000
AND A CIP OF 09/538,542 03/30/2000
AND A CIP OF 09/539,107 03/30/2000
AND A CIP OF 09/603,740 06/23/2000
AND A CIP OF 09/602,789 06/23/2000
AND A CIP OF 09/602,803 06/23/2000
AND A CIP OF 09/602,844 06/23/2000
AND A CIP OF 09/602,983 06/23/2000
AND A CIP OF 09/648,832 08/25/2000
AND A CIP OF 09/794,969 02/27/2001

**** FOREIGN APPLICATIONS ********************** None Y.D

IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** SMALL ENTITY **
** 06/07/2001

Foreign Priority claimed	STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ yes ☑ no	TX	31	28	2
35 USC 119 (a-d) conditions met ☐ yes ☑ no ☐ Met after Allowance				
Verified and Acknowledged Examiner's Signature Y.D Initials				

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TITLE

Software-based network attached storage services hosted on massively distributed parallel computing networks

FILING FEE RECEIVED	FEES: Authority has been given in Paper
492	No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:

☐ All Fees
☐ 1.16 Fees (Filing)
☐ 1.17 Fees (Processing Ext. of time)

		☐ 1.18 Fees (Issue)
		☐ Other _____
		☐ Credit

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

04/18/2001 RWOLDER1 00000003 09834785

01 FC:201	355.00 OP
02 FC:203	72.00 OP

PTO-1556
(5/87)

*U.S. GPO: 2000-468-987/39595

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2000

Application or Docket Number
09/724,799

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	59	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	59 minus 20=	* 39
INDEPENDENT CLAIMS	12 minus 3 =	* 9
MULTIPLE DEPENDENT CLAIM PRESENT		☐

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
BASIC FEE	355.00	OR	BASIC FEE	710.00
X$ 9=	351	OR	X$18=	702
X40=	360	OR	X80=	720
+135=		OR	+270=	
TOTAL	1,064	OR	TOTAL	2132

CLAIMS AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X40=		OR	X80=	
+135=		OR	+270=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

		(Column 1)		(Column 2)	(Column 3)
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X40=		OR	X80=	
+135=		OR	+270=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

		(Column 1)		(Column 2)	(Column 3)
AMENDMENT C		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total	*	Minus	**	=
	Independent	*	Minus	***	=
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X40=		OR	X80=	
+135=		OR	+270=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
***If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2000

Application or Docket Number: UNTD:021

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	28	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	28 minus 20=	* 8
INDEPENDENT CLAIMS	2 minus 3 =	* 0
MULTIPLE DEPENDENT CLAIM PRESENT		☐

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
BASIC FEE	355.00	OR	BASIC FEE	710.00
X$ 9=	72	OR	X$18=	
X40=		OR	X80=	
+135=		OR	+270=	
TOTAL	427	OR	TOTAL	

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(Column 1)		(Column 2)	(Column 3)
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X40=		OR	X80=	
+135=		OR	+270=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B

	(Column 1)		(Column 2)	(Column 3)
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X40=		OR	X80=	
+135=		OR	+270=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C

	(Column 1)		(Column 2)	(Column 3)
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X40=		OR	X80=	
+135=		OR	+270=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
***If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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DATABRICKS EX1002 Page 216
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CLAIMS ONLY

SERIAL NO.	FILING DATE
09834785	04-13-01

APPLICANT(S)

CLAIMS

	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT		*		*		*	
	IND.	DEP.	IND.	DEP.	IND.	DEP.	IND.	DEP.	IND.	DEP.	IND.	DEP.
1	1						51						
2		1					52						
3		1					53						
4		1					54						
5		1					55						
6		1					56						
7		1					57						
8		1					58						
9		1					59						
10		1					60						
11		1					61						
12		1					62						
13		1					63						
14		1					64						
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39							89						
40							90						
41							91						
42							92						
43							93						
44							94						
45							95						
46							96						
47							97						
48							98						
49							99						
50							100						
TOTAL IND.	2						TOTAL IND.						
TOTAL DEP.	26						TOTAL DEP.						
TOTAL CLAIMS	28						TOTAL CLAIMS						

* *MAY BE USED FOR ADDITIONAL CLAIMS OR ADMENDMENTS*

FORM PTO-2022 (1-98)

U.S.DEPARTMENT OF COMMERCE
Patent and Trademark Office

*U.S. Government Printing Office: 1998 - 433-214/70303

04-16-01

A

jc962 U.S. PTO
04/13/01

jc921 U.S. PTO
09/834785
04/13/01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	EDWARD A. HUBBARD
Filed:	APRIL 13, 2001
For:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
Serial No.:	UNKNOWN
Group Art Unit:	UNKNOWN
Examiner:	UNKNOWN
Atty Docket No.:	UNTD:021

PTO/SB/05 (4-98) Approved for use through 09/30/00

EXPRESS MAIL CERTIFICATION

NUMBER: EL703719665US

I hereby certify that this paper or fee is being deposited with the United States Postal Service "EXPRESS MAIL POST OFFICE TO ADDRESSEE" service, postage prepaid, under 37 C.F.R. 1.10 on the date indicated below and is addressed to: Assistant Commissioner of Patents, Washington, D.C. 20231.

Mary Bowen
Signature

April 13, 2001
Date of Deposit

BOX NEW APP FEE
Assistant Commissioner For Patents
Washington, D.C. 20231

Dear Sir:

Transmitted herewith for filing are:

☒ New Patent Application consisting of 70 pages and 31 sheets of Figs.

☐ Continued Prosecution Application (37 CFR §1.53(d)) -- The parent application is USSN _____ filed on _____. The prior Examiner was _____ in Group Art Unit _____.

☐ Response to Missing Parts

☐ Assignment and Recordation Cover sheet.

☐ Inventors' Declaration for Patent Application

- ☐ Information Disclosure Statement
- ☐ Petition for a _____ month extension of time
- ☐ Response to Office Action
- ☐ Preliminary Amendment
- ☒ Formal Drawings
- ☐ Informal Drawings
- ☐ Notice of Appeal
- ☐ An Appeal Brief (an original and two copies)
- ☒ Check in the amount of $427
- ☒ The Commissioner is authorized to deduct any requisite fees under 37 CFR 1.16 to 1.21 from, or deposit any credits to, Deposit Account No. 10-1205/UNTD:021.
- ☒ Postcard. Please date stamp and mail this postcard to acknowledge receipt of the enclosed documents.
- ☐ Other:

EL934763530US

UNTD:021

IPR2025-00716
DATABRICKS EX1002 Page 219

FEE CALCULATION:

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
[redacted]	Total Claims (37 CFR 1.16(e))	28- 20 =	8	x $ 18.00	$ 144.00
	Independent Claims (37 CFR 1.16(b))	2- 3 =	0	x $ 80.00	$ 0
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))			x $ 260.00	$ 0
	[redacted]			Basic Fee (37 CFR 1.16(a))	$ 710.00
	[redacted]		Total of above Calculations =		$ 854.00
	Reduction by 50% for filing by Small Entity (Note: 37 CFR 1.9, 1.27, 1.28)				$ 427.00
	Surcharge for submission of Response to Missing Parts if applicable ($130)				$ 0
	ASSIGNMENT FEE (IF FILED WITH APPLICATION)				$
				TOTAL =	$ *427.00*

The Examiner is invited to contact the undersigned at 512-347-1611 with any questions or comments, or to otherwise facilitate expeditious prosecution of the application.

Respectfully submitted,

Brian W. Peterman
Registration No. 37,908
Attorney for Applicant

O'KEEFE, EGAN & PETERMAN, L.L.P.
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, Texas 78746
512-347-1611
512-347-1615 (Fax)

UNTD:021

IPR2025-00716
DATABRICKS EX1002 Page 220

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
09/834,785	04/13/2001	Edward A. Hubbard	UNTD: 021

CONFIRMATION NO. 8392

FORMALITIES LETTER

OC000000006284034

O'KEEFE, EGAN & PETERMAN, L.L.P.
Building C, Suite 200
1101 Capital of Texas Highway South
Austin, TX 78746

Date Mailed: 07/11/2001

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.
  A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(e) of $65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.
- **The balance due by applicant is $ 65.**

A copy of this notice MUST be returned with the reply.

Customer Service Center
Initial Patent Examination Division (703) 308-1202

PART 3 - OFFICE COPY

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

OIPE
JUL 23 2001
PATENT & TRADEMARK OFFICE

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
09/834,785	04/13/2001	Edward A. Hubbard	UNTD: 021

CONFIRMATION NO. 8392

FORMALITIES LETTER

OC000000006284034

O'KEEFE, EGAN & PETERMAN, L.L.P.
Building C, Suite 200
1101 Capital of Texas Highway South
Austin, TX 78746

Date Mailed: 07/11/2001

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing.
  A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(e) of $65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.
- **The balance due by applicant is $ 65.**

A copy of this notice MUST be returned with the reply.

Customer Service Center
Initial Patent Examination Division (703) 308-1202
PART 2 - COPY TO BE RETURNED WITH RESPONSE

07/25/2001 JADDI1 00000085 09834785 65.00 OP
01 FC:205

IPR2025-00716
DATABRICKS EX1002 Page 222

OIPE JUL 23 2001 PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	EDWARD A. HUBBARD
Filed:	APRIL 13, 2001
For:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
Serial No.:	09/834,785
Group Art Unit:	2152
Examiner:	UNKNOWN
Atty Docket No.:	UNTD:021

Pursuant to 37 C.F.R. 1.8, I certify that this correspondence is being deposited with the U.S. Postal Service in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on the date below:

7-16-01 Marty Bauer
Date Name

BOX MISSING PARTS
Assistant Commissioner For Patents
Washington, D.C. 20231

Dear Sir:

Transmitted herewith for filing are:

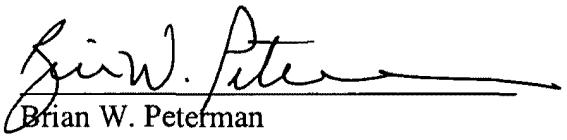
- ☐ New Patent Application consisting of __ pages
- ☐ Continued Prosecution Application (37 CFR §1.53(d)) -- The parent application is USSN _____ filed on _____. The prior Examiner was _____ in Group Art Unit _____.
- ☒ Notice to File Missing Parts - Part 2 copy
- ☒ Assignment and Recordation Cover sheet
- ☒ Inventor's Declaration
- ☐ Information Disclosure Statement
- ☐ Petition for a _____ month extension of time

- ☐ Response to Office Action
- ☐ Preliminary Amendment
- ☐ Formal Drawings (Figs , sheets)
- ☐ Informal Drawings
- ☐ Notice of Appeal
- ☐ An Appeal Brief (an original and two copies)
- ☒ Checks in the amount of $40.00 and $65.00
- ☒ The Commissioner is authorized to deduct any requisite fees under 37 CFR 1.16 to 1.21 from, or deposit any credits to, Deposit Account No. 10-1205/UNTD:021, including any concurrent or future required extension of time fees.
- ☒ Postcard. Please date stamp and mail this postcard to acknowledge receipt of the enclosed documents.
- ☒ Other: Verified Statement Claiming Small Entity Status and Election Under 37 CFR §§3.71, Statement Under 3.73 and Power of Attorney

IPR2025-00716
DATABRICKS EX1002 Page 224

The Examiner is invited to contact the undersigned at 512-347-1611 with any questions or comments, or to otherwise facilitate expeditious prosecution of the application.

Respectfully submitted,



Brian W. Peterman
Registration No. 37,908
Attorney for Applicant

O'KEEFE, EGAN & PETERMAN, L.L.P.
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, Texas 78746
512-347-1611
512-347-1615 (Fax)

IPR2025-00716
DATABRICKS EX1002 Page 225

JUL 2 3 2001 JC174 PATENT & TRADEMARK OFFICE

DECLARATION FOR PATENT APPLICATION

As an undersigned inventor, I hereby declare that:

My residence, post office address and country of citizenship are as stated directly below my name.

I believe (check one) [X] I am the original, first and sole inventor
[ ] I am a joint inventor and the below named inventors are the original and first inventors

of the subject matter which is claimed and for which a patent is sought on the invention entitled

SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

the specification of which

(check one) [ ] is attached hereto.
[X] was filed on 4/13/01,
as Application Serial No. 09/834,785,
and was amended on _____.
(if applicable)

I further declare that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office (hereinafter "the Office") all information known to me to be material to patentability of the subject matter which is claimed as defined in 37 C.F.R. §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. § 119 of any foreign application(s) for patent or inventor's certificate indicated below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

IPR2025-00716
DATABRICKS EX1002 Page 226

Prior Foreign Application(s) Number	Country	Day/Month/Year Filed	Priority Claimed Yes	No
None				

I hereby claim the benefit under 35 U.S. C. §119(e) of any United States provisional application listed below:

Provisional Application Serial No.	**Filing Date**
None	

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in 37 C.F.R. § 1.56, which became available between the filing date of the prior application and the national or PCT international filing date of this application:

Application Serial No.	**Filing Date**	**Status (patented, pending, abandoned)**
09/538,543	March 30, 2000	Pending
09/539,023	March 30, 2000	Pending
09/539,448	March 30, 2000	Pending
09/539,428	March 30, 2000	Pending
09/539,106	March 30, 2000	Pending
09/538,542	March 30, 2000	Pending
09/539,107	March 30, 2000	Pending
09/603,740	June 23, 2000	Pending
09/602,789	June 23, 2000	Pending
09/602,803	June 23, 2000	Pending
09/602,844	June 23, 2000	Pending
09/602,983	June 23, 2000	Pending
09/648,832	August 25, 2000	Pending
09/794,969	February 27, 2001	Pending

Address all telephone calls to Brian W. Peterman at telephone number (512) 347-1611.

Address all correspondence to:

Brian W. Peterman
O'KEEFE, EGAN & PETERMAN
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, TX 78746
(512) 347-1611
(512) 347-1615 (Fax)

IPR2025-00716
DATABRICKS EX1002 Page 227

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and may jeopardize the validity of the application or any patent issued thereon.

Full name of sole inventor: Edward A. Hubbard

Inventor's Signature _____ 5/1/06
Date

Residence Address: 3105 Scarlet Oak Cove, Round Rock, Texas 78664
(Including Postal Code)

Citizenship: USA

Post Office Address: Same as above
(Including Postal Code)

IPR2025-00716
DATABRICKS EX1002 Page 228

OIPE
JUL 23 2001
PATENT & TRADEMARK OFFICE

#3

VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS
(37 CRF 1.9(f) & 1.27(c)) – SMALL BUSINESS CONCERN

DOCKET NO.
UNTD:021

Applicant or Patentee: UNITED DEVICES, INC.

Application No.: 09/834,785

Title: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRBUTED PARALLEL COMPUTING NETWORKS

I hereby declare that I am:

☐ the owner of the small business concern identified below:
☒ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF SMALL BUSINESS CONCERN: UNITED DEVICES, INC.
ADDRESS OF SMALL BUSINESS CONCERN: 12675 Research Blvd.
Building A
Austin, TX 78759

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.12, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees to the United States Patent and Trademark Office, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention described in:

☐ the specification filed herewith with title as listed above.
☒ the application identified above.
☐ the patent identified above.

If the rights held by the above identified small business concern are not exclusive , each individual , concern or organization having rights in the invention must file separate verified statements averring to their status as small entities, and no rights to the invention are held by any person, other than the

IPR2025-00716
DATABRICKS EX1002 Page 229

inventor, who would not qualify as an independent inventor under 37 CRF 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization having any rights in the invention is listed below:

☒ no such person, concern or organization exists.
☐ each such person, concern or organization is listed below:

Separate verified statement is required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING: EDWARD A. HUBBARD

TITLE OF PERSON IF OTHER THAN OWNER: Chief Executive Officer

ADDRESS OF PERSON SIGNING: United Devices, Inc.
12675 Research Blvd.
Building A
Austin, TX 78759

SIGNATURE: _____ DATE: 5/1/01

IPR2025-00716
DATABRICKS EX1002 Page 230

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

OIPE JC14
JUL 2 3 2001
PATENT & TRADEMARK OFFICE

In re Application of:	EDWARD A. HUBBARD
Filed:	APRIL 13, 2001
For:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
Serial No.:	09/834,785
Group Art Unit:	UNKNOWN
Examiner:	UNKNOWN
Atty Dkt:	UNTD:021

I hereby certify that this paper or fee is being deposited with the United States Postal Service via first class postage paid mail under 37 C.F.R. 1.10 on the date indicated below and is addressed to: Assistant Commissioner of Patents, Washington, D.C. 20231.

7-16-01 Marty Bowers
Date [Name]

Assistant Commissioner For Patents
Washington, D.C. 20231

ELECTION UNDER 37 C.F.R. §§3.71, STATEMENT UNDER 3.73 AND POWER OF ATTORNEY

Sir:

The undersigned being Assignee of record of the entire interest in the above-identified application by virtue of an assignment that has been filed in the United States Patent and Trademark Office as set forth below, hereby elects, under 37 C.F.R. §3.71, to prosecute the application to the exclusion of the inventor. A statement under 37 C.F.R. 3.73(b) is also included below.

The Assignee hereby revokes any previous Powers of Attorney and appoints Robert M. O'Keefe, Reg. No. 35,630; Richard D. Egan, Reg. No. 36,788; Brian W. Peterman, Reg. No. 37,908, William W. Enders, Reg. No. 41,735, and Maximilian R. Peterson, Reg. No. 46,469, each an attorney of the firm of O'KEEFE, EGAN & PETERMAN, LLP, as its attorney for so long as they remain with such firm, with full power of substitution and revocation, to prosecute

the application, to make alterations and amendments therein, to transact all business in the Patent and Trademark Office in connection therewith, and to receive any Letters Patent, and for one year after issuance of such Letters Patent to file any request for a certificate of correction that may be deemed appropriate.

Pursuant to 37 C.F.R. §3.73, the undersigned has reviewed the evidentiary documents, specifically the Assignment to UNITED DEVICES, INC., referenced below, and certifies that to the best of my knowledge and belief, title remains in the name of the Assignee.

Please direct all communications as follows:

Brian W. Peterman
O'KEEFE, EGAN & PETERMAN, LLP
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, Texas 78746
512/347-1611
FAX 512/347-1615

ASSIGNEE:

UNITED DEVICES, INC.

By: _____
Name: Edward A. Hubbard
Title: Chief Executive Officer

Date: 5/1/01

ASSIGNMENT:

- ☒ Filed concurrently herewith
- ☐ Previously filed [date](copy enclosed)
- ☐ Previously recorded
  Date: _____
  Reel: _____
  Frame: _____

O'KEEFE, EGAN & PETERMAN, L.L.P.
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, Texas 78746
512-347-1611

GP/2152 #4 cm 02-26-2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: EDWARD A. HUBBARD

Filed: APRIL 13, 2001

For: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

OIPE JAN 08 2002 PATENT & TRADEMARK OFFICE

Serial No.: 09/834,785

Group Art Unit: 2152

Examiner: UNKNOWN

Atty Docket No.: UNTD:021

Pursuant to 37 C.F.R. 1.8, I certify that this correspondence is being deposited with the U.S. Postal Service in a first class, postage prepaid envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on the date below:

12-18-01 Marty Bowen

Date Name

RECEIVED JAN 11 2002 Technology Center 2100

INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, it is respectfully requested that this Information Disclosure Statement be entered and the document(s) listed on attached Form PTO-1449 be considered by the Examiner and made of record.

The present Information and Disclosure Statement is being filed prior to the receipt of a first Official Action reflecting an examination on the merits, and hence is believed to be timely filed in accordance with 37 C.F.R. § 1.97(b). No fees are believed to be due in connection with the filing of this Information Disclosure Statement, however, should any fees under 37 C.F.R. §§ 1.16 to 1.21 be deemed necessary for any reason relating to these materials, the Commissioner is hereby authorized to deduct said fees from Deposit Account No. 10-1205/UNTD:021.



- U.S. Serial No. 09/602,844 entitled "Data Conversion Services and Associated Distributed Processing System" (Atty Docket UNTD:012);

- U.S. Serial No. 09/602,983 entitled "Customer Services And Advertising Based Upon Device Attributes and Associated Distributed Processing System" (Atty Docket UNTD:013);

- U.S. Serial No. 09/648,832 entitled "Security Architecture For Distributed Processing Systems and Associated Method" (Atty Docket: UNTD:014);

- U.S. Serial No. 09/872,251 entitled "Massively Distributed Database System And Associated Method" (Atty Docket: UNTD:015);

- U.S. Serial No. 09/794,969 entitled "System And Method For Monitizing Network Connected User Bases Utilizing Distributed Processing Systems" (Atty Docket: UNTD:017); and

- U.S. Serial No. 09/834,785 entitled "Software-Based Network Attached Storage Services Hosted On Massively Distributed Parallel Computing Networks" (Atty Docket: UNTD:021).

A copy of the listed document(s) required by 37 C.F.R. § 1.98(a)(2) is enclosed for the convenience of the Examiner.

Applicant respectfully requests that the listed document(s) be made of record in the present case.



Respectfully submitted,

Brian W. Peterman
Reg. No. 37,908
Attorney for Applicant

O'KEEFE, EGAN & PETERMAN, LLP
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, Texas 78746
(512) 347-1611
FAX: (512) 347-1615

Enclosures

RECEIVED
JAN 11 2002
Technology Center 2100

OIPE
JAN 08 2002
PATENT & TRADEMARK OFFICE

This application is related to a number of co-pending applications. For the Examiner's information, these applications (copies enclosed), including the current application, are:

- U.S. Serial No. 09/538,543 entitled "Distributed Parallel Processing System Having Capability-Based Incentives and Associated Method" (Atty Docket: UNTD:002);

- U.S. Serial No. 09/539,023 entitled "Sweepstakes Incentive Model and Associated System" (Atty Docket: UNTD:003);

- U.S. Serial No. 09/539,448 entitled "Capability-Based Distributed Parallel Processing System and Associated Method" (Atty Docket: UNTD:004);

- U.S. Serial No. 09/539,428 entitled "Method of Managing Distributed Workloads and Associated System" (Atty Docket: UNTD:005);

- U.S. Serial No. 09/539,106 entitled "Network Site Testing Method and Associated System" (Atty Docket: UNTD:006);

- U.S. Serial No. 09/538,542 entitled "Network Site Content Indexing Method and Associated System" (Atty Docket: UNTD:007);

- U.S. Serial No. 09/539,107 entitled "Distributed Back-Up System and Associated Method" (Atty Docket: UNTD:008);

- U.S. Serial No. 09/603,740 entitled "Method of Managing Workloads and Associated Distributed Processing System" (Atty Docket: UNTD:009);

- U.S. Serial No. 09/602,789 entitled "Machine Generated Sweepstakes Entry Model and Associated Distributed Processing System" (Atty Docket UNTD:010);

- U.S. Serial No. 09/602,803 entitled "Data Sharing and File Distribution Method and Associated Distributed Processing System"(Atty Docket UNTD:011);

OIPE JC184
FEB 21 2003
PATENT & TRADEMARK OFFICE

2152
#5
SP
11-17-03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	EDWARD A. HUBBARD
Filed:	APRIL 13, 2001
For:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
Serial No.:	09/834,785
Group Art Unit:	2152
Examiner:	UNKNOWN
Atty Docket No.:	UNTD:021

RECEIVED
FEB 27 2003
Technology Center 2100

Pursuant to 37 C.F.R. 1.8, I certify that this correspondence is being deposited with the U.S. Postal Service in a first class, postage prepaid envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on the date below:

2-13-03 (Date) Olivia Ferrara (Name)

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, it is respectfully requested that this Information Disclosure Statement be entered and the documents listed on attached Form PTO-1449 be considered by the Examiner and made of record.

Copies of the listed documents required by 37 C.F.R. § 1.98(a)(2) have been previously submitted in the original parent applications, including Application Serial Number 09/539,107 entitled "Distributed Back-Up System and Associated Method," filed March 30, 2000.

In accordance with 37 C.F.R §§ 1.97(g),(h), this Information Disclosure Statement is not to be construed as a representation that a search has been made, and is not to be construed to be an admission that (a) the information cited is, or is considered to be, material to patentability as

defined in 37 C.F.R. § 1.56(b); and/or (b) that the information cited is, or is considered to be prior art.

If an appropriate check has not been enclosed, or if it is insufficient, the Commissioner is hereby authorized to deduct said fee from Deposit Account No. 10-1205.

Applicant respectfully requests that the listed documents be made of record in the present case.

Respectfully submitted,



Brian W. Peterman
Reg. No. 37,908

Attorney for Applicant

O'KEEFE EGAN & PETERMAN, LLP
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, Texas 78746
(512) 347-1611
FAX: (512) 347-1615

OIPE JC15
JUN 12 2003
PATENT & TRADEMARK OFFICE

2152

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Edward A. Hubbard

Filed: April 13, 2001

For: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

Serial No.: 09/834,785

Group Art Unit: 2152

Examiner: UNKNOWN

Atty. Dkt: UNTD:021

RECEIVED
JUN 13 2003
Technology Center 2100

12/10/03 #6

Pursuant to 37 C.F.R. 1.8, I certify that this correspondence is being deposited with the U.S. Postal Service in an envelope addressed to: Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313 on the date below:

6-10-03 KOzerara
Date Name

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313

Sir:

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, it is respectfully requested that this Information Disclosure Statement be entered and the documents listed on attached Form PTO-1449 be considered by the Examiner and made of record.

Copies of the listed documents required by 37 C.F.R. § 1.98(a)(2) have been previously submitted in a parent application.

In accordance with 37 C.F.R §§ 1.97(g),(h), this Information Disclosure Statement is not to be construed as a representation that a search has been made, and is not to be construed to be an admission that (a) the information cited is, or is considered to be, material to patentability as defined in 37 C.F.R. § 1.56(b); and/or (b) that the information cited is, or is considered to be prior art.

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DATABRICKS EX1002 Page 239

If an appropriate check has not been enclosed, or if it is insufficient, the Commissioner is hereby authorized to deduct said fee from Deposit Account No. 10-1205.

Applicant respectfully requests that the listed documents be made of record in the present case.

Respectfully submitted,



Brian W. Peterman
Reg. No. 37,908

Attorney for Applicant

O'KEEFE EGAN & PETERMAN, LLP
1101 Capital of Texas Highway South
Building C, Suite 200
Austin, Texas 78746
(512) 347-1611
FAX: (512) 347-1615

Enclosures

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DATABRICKS EX1002 Page 240

OIPE
JUN 12 2003
PATENT & TRADEMARK OFFICE
Rev 03/19/2003

2122

Attorney Docket No. MTEC-007/00US (0124.00US) **PATENT**

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on **June 9, 2003**.

By: Dolores McKay
Dolores McKay

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of THEKKATH

Serial No.: 09/844,271 Examiner: Unassigned

Confirmation No.: 1047 Art Unit: 2122

Filed: April 30, 2001

For: USER CONTROLLED TRACE RECORDS

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JUN 12 2003
Technology Center 2100

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT TRANSMITTAL

Enclosed is an Information Disclosure Statement and accompanying Form PTO/SB/08A for the above-identified patent application.

[X] In accordance with 37 C.F.R. §1.97(b), no additional fee for submission of the IDS is required.

[] In accordance with 37 C.F.R. §1.97(c), also enclosed is:

- [] the fee of $180.00 as set forth in 37 C.F.R. §1.17(p); or
- [] a statement as specified in 37 C.F.R. §1.97(e).

[] In accordance with 37 C.F.R. §1.97(d), a statement as specified in 37 C.F.R. § 1.97(e) and the fee of $180.00 as set forth in 37 C.F.R. §1.17(p) are also enclosed.

[] Check No. ___ in the amount of $___ for the total fee is attached.

[X] A return receipt postcard is also enclosed.

[] Please charge $___ to Deposit Account No. 03-3117 for the total fee. This paper is being submitted in duplicate.

IPR2025-00716
DATABRICKS EX1002 Page 241

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 03-3117.

Dated: June 9, 2003

Respectfully submitted,
COOLEY GODWARD LLP

Cooley Godward LLP
ATTN: Patent Group
Five Palo Alto Square
3000 El Camino Real
Palo Alto, CA 94306-2155
Tel: (650) 843-5000
Fax: (650) 857-0663

By: _____
Edward Van Gieson
Reg. No. 44,386

IPR2025-00716
DATABRICKS EX1002 Page 242

OIPE JC106 JUN 12 2003 PATENT & TRADEMARK OFFICE

Attorney Docket No. MTEC-007/00US (0124.00US) **PATENT**

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on **June 9, 2003**.

By: Dolores McKay
Dolores McKay

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of THEKKATH

Serial No.:	09/844,271	Examiner:	Unassigned
Confirmation No.:	1047	Art Unit:	2122
Filed:	April 30, 2001		
For:	USER CONTROLLED TRACE RECORDS		

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JUN 12 2003
Technology Center 2100

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §1.97(b)

In accordance with the duty of disclosure set forth in 37 C.F.R. §1.56, Applicant(s) hereby submits the following information in conformance with 37 C.F.R. §§1.97 and 1.98.

[X] Pursuant to 37 C.F.R. §1.98, a copy of each document cited in the attached Form PTO/SB/08 is enclosed.

[] No copies of the publications listed on the attached Form PTO/SB/08A are being provided pursuant to 37 C.F.R. §1.98(d) because the publications were previously cited by or submitted to the Office in prior Application Serial No. ___ to which the above-identified application claims priority under 35 U.S.C. §120.

[] Publication(s) ___ listed on the attached Form PTO/SB/08A were cited in a foreign search or examination report corresponding to ___ application serial no. ___ and mailed on ___.

[] Enclosed is a copy of a non-English publication(s) ___. Pursuant to §609 of the M.P.E.P., Applicant submits the attached foreign search or examination report, which cites such non-English language publication(s).

[] Enclosed is a copy of a non-English publication(s) ___. English language publication ___ (copy enclosed) claims priority from this non-English publication.

[] Enclosed is an explanation of non-English publication(s) ___ for which an English translation is not available.

[] Enclosed is an English translation of non-English publication(s) ___cited in the attached Form PTO/SB/08A.

[] Enclosed is a copy of pending patent Application Serial No. ___.

This Information Disclosure Statement is filed within any one of the following time periods:

[] within three months from the filing date of this national application other than a CPA under 37 C.F.R. § 1.53(d);

[] within three months from the date of entry of the national stage as set forth in 37 C.F.R. §1.491 in this international application;

[X] before the mailing date of a first office action on the merits; or

[] before the mailing of a first office action after the filing of a request for continued examination under 37 C.F.R. § 1.114.

It is respectfully requested that the Examiner consider the above-noted information and return an initialed copy of the attached Form PTO/SB/08A to the undersigned.

Dated: JUNE 9, 2003

Respectfully submitted,
COOLEY GODWARD LLP

Cooley Godward LLP
ATTN: Patent Group
Five Palo Alto Square
3000 El Camino Real
Palo Alto, CA 94306-2155
Tel: (650) 843-5000
Fax: (650) 857-0663

By: _____
Edward Van Gieson
Reg. No. 44,386

IPR2025-00716
DATABRICKS EX1002 Page 244

OIPE JC3
DEC 22 2003
PATENT & TRADEMARK OFFICE

2152

Please type a plus sign (+) inside this box → +

PTO/SB/81 (02-01)
Approved for use through 10/31/2002. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it display a valid OMB control number.

POWER OF ATTORNEY OR AUTHORIZATION OF AGENT

Application Number	09/834,785
Filing Date	4/13/01
First Named Inventor	Edward A. Hubbard
Title	Software Based Network
Group Art Unit	2152
Examiner Name	Not yet assigned
Attorney Docket Number	UNTD: 021 (40988-P001P9)

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TECHNOLOGY CENTER 2100

I hereby appoint:

☐ Practitioners at Customer Number ____ → *Place Customer Number Bar Code Label here*

OR

☑ Practitioner(s) named below:

Name	Registration Number
Kelly K. Kordzik	36,571
Michael P. Adams	34,763
Barry S. Newberger	41,527
Robert A. Voigt, Jr.; Richard F. Frankeny	47,159; 47,573

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Technology Center 2100

as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

Please change the correspondence address for the above-identified application to:

☐ The above-mentioned Customer Number.

OR

☑ Practitioners at Customer Number 29444 → *Place Customer Number Bar Code Label here*

OR

☐ Firm *or* Individual Name					
Address					
Address					
City		State		Zip	
Country					
Telephone		Fax			

I am the:

☐ Applicant/Inventor.

☑ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

SIGNATURE of Applicant or Assignee of Record

Name	Chris Crafford, Vice President Engineering, United Devices, Inc.
Signature	
Date	12/17/03

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☑ *Total of 1 forms are submitted.

Burden Hour Statement: This form is estimated to take 3 minutes to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

OIPE
DEC 2 2 2003
PATENT & TRADEMARK OFFICE

Please type a plus sign (+) inside this box → [+]

PTO/SB/82 (10-00)
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

REVOCATION OF POWER OF ATTORNEY OR AUTHORIZATION OF AGENT

Application Number	09/834,785
Filing Date	4/13/01
First Named Inventor	Edward A. Hubbard
Group Art Unit	2152
Examiner Name	Not yet assigned
Attorney Docket Number	UNTD: 021 (40988-P001P9)

I hereby revoke all previous powers of attorney or authorizations of agent given in the above-identified application:

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DEC 2 3 2003
Technology Center 2100

☑ A Power of Attorney or Authorization of Agent is submitted herewith.

OR

☐ Please change the correspondence address for the above-identified application to:

☐ Customer Number [ ] → *Place Customer Number Bar Code Label here*

OR

☐ Firm *or* Individual Name					
Address					
Address					
City					
Country		State		ZIP	
Telephone		Fax			

I am the:

☐ Applicant/Inventor.

☑ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

SIGNATURE of Applicant or Assignee of Record

Name	Chris Crafford, Vice President Engineering, United Devices, Inc.
Signature	
Date	12/17/03

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☑ *Total of 3 forms are submitted.

Burden Hour Statement: This form is estimated to take 3 minutes to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

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PTO/SB/96 (08-00)
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: United Devices, Inc.

Application No./Patent No.: 09/834,785 Filed/Issue Date: 4/13/01

Entitled: Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel

United Devices, Inc., a Corporation,
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

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Technology Center 2100

states that it is:

1. ☑ the assignee of the entire right, title, and interest; or
2. ☐ an assignee of less than the entire right, title and interest.
The extent (by, percentage) of its ownership interest is _____%

in the patent application/patent identified above by virtue of either:

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 012004, Frame 0544, or for which a copy thereof is attached.

OR

B. [ ] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From:_____To:_____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame_____, or for which a copy thereof is attached.

2. From:_____To:_____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame_____, or for which a copy thereof is attached.

3. From:_____To:_____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame_____, or for which a copy thereof is attached.

[ ] Additional documents in the chain of title are listed on a supplemental sheet.

[ ] Copies of assignments or other documents in the chain of title are attached.
[NOTE: A separate copy *(i.e.,* the original assignment document or a true copy of the original document) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

12/17/03
Date

Chris Crafford
Typed or printed name

Signature

Vice President Engineering, United Devices, Inc.
Title

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	UNTD:021

CONFIRMATION NO. 8392

29444
KELLY KORDZIK
WINSTEAD SECHREST & MINICK P.C.
5400 RENAISSANCE TOWER
DALLAS, TX 75270

OC000000011595424

#8

Date Mailed: 12/31/2003

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/22/2003.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

JESSICA T GAYNOR
2100 (703) 306-4141

OFFICE COPY

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	UNTD:021

CONFIRMATION NO. 8392

O'KEEFE, EGAN & PETERMAN, L.L.P.
Building C, Suite 200
1101 Capital of Texas Highway South
Austin, TX 78746

OC000000011595404

Date Mailed: 12/31/2003

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/22/2003.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

JESSICA T GAYNOR
2100 (703) 306-4141

OFFICE COPY

Refine Search

Search Results -

Terms	Documents
L10 and L11	10

Database:

US Pre-Grant Publication Full-Text Database
US Patents Full-Text Database
US OCR Full-Text Database
EPO Abstracts Database
JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

Search: L12

Refine Search

Recall Text | Clear | Interrupt

Search History

DATE: Friday, August 13, 2004 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR			
L12	l10 and L11	10	L12
L11	manag$4 adj storage adj resource$1	84	L11
L10	l1 and L9	759	L10
L9	709/$.ccls.	30495	L9
L8	centraliz$3 adj server and L6	2	L8
L7	client adj agent$1 and L6	4	L7
L6	unuse$3 and resource$1 and L5	47	L6
L5	l1 and L4	245	L5
L4	software adj base$1 and l1	245	L4
L3	configur$3 adj client adj agent$1	2	L3
L2	configur$3 adj client adj agent$1 adj program$1	2	L2
L1	network adj attach$3 adj storage or NAS	235713	L1

END OF SEARCH HISTORY

Refine Search

Search Results -

Term	Documents
@PD	29917994
(1 AND (@PD < "20000330")).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	14
(@PD<20000330 AND L1).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	14

Database:

- US Pre-Grant Publication Full-Text Database
- US Patents Full-Text Database
- US OCR Full-Text Database
- EPO Abstracts Database
- JPO Abstracts Database
- Derwent World Patents Index
- IBM Technical Disclosure Bulletins

Search: L6

Refine Search

Recall Text | Clear | Interrupt

Search History

DATE: Thursday, August 19, 2004 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR			
L6	@pd<20000330 and l1	14	L6
L5	l1 and L4	0	L5
L4	l2 and L3	40	L4
L3	provid$3 adj network adj atach$3 adj storage$1 or (nas)adj service$1	40	L3
L2	dedicat$4 adj network adj atach$3 adj storage$1 or (nas)	236075	L2
L1	(709/201,202,205,212,216.ccls. or 719/317.ccls.) and (distributed and storage).ab.	64	L1

END OF SEARCH HISTORY

Refine Search

Search Results -

Term	Documents
INTERNET	240224
INTERNETS	933
(6 AND INTERNET).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	4
(INTERNET AND L6).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	4

Database: US Pre-Grant Publication Full-Text Database; US Patents Full-Text Database; US OCR Full-Text Database; EPO Abstracts Database; JPO Abstracts Database; Derwent World Patents Index; IBM Technical Disclosure Bulletins

Search: L16

Refine Search | Recall Text | Clear | Interrupt

Search History

DATE: Monday, August 30, 2004 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR			
L16	Internet and L6	4	L16
L15	I nternet and L6	3869351	L15
L14	l6 and L13	2	L14
L13	709/$.ccls.	30701	L13
L12	709?$.ccls.	30701	L12
L11	l6 and L10	0	L11
L10	(client and agent)adj program$1	83	L10
L9	l6 and L8	0	L9
L8	instal$4 adj client adj program$1	43	L8

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DATABRICKS EX1002 Page 252

L7	instal$4 adj (client and agent)adj program$1	0	L7
L6	DOWNLOAD$3 ADJ network adj atach$3 adj storage$1 or (NAS)adj component$1	215	L6
L5	DOWNLOAD$3 ADJ network adj atach$3 adj storage$1 or (NAS)	237326	L5
L4	DOWNLOAD$3 AND L1	0	L4
L3	server$1 and L1	2	L3
L2	central$6 and L1	1	L2
L1	6601101.PN.	3	L1

END OF SEARCH HISTORY

IPR2025-00716
DATABRICKS EX1002 Page 253

UNITED STATES PATENT AND TRADEMARK OFFICE

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	UNTD:021	8392

29444 7590 09/03/2004

KELLY KORDZIK
WINSTEAD SECHREST & MINICK P.C.
5400 RENAISSANCE TOWER
DALLAS, TX 75270

EXAMINER	
DALENCOURT, YVES	
ART UNIT	**PAPER NUMBER**
2157	9

DATE MAILED: 09/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

IPR2025-00716
DATABRICKS EX1002 Page 254

Office Action Summary	Application No. 09/834,785	Applicant(s) HUBBARD, EDWARD A.	
	Examiner Yves Dalencourt	Art Unit 2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4-6*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

IPR2025-00716
DATABRICKS EX1002 Page 255

DETAILED ACTION

This office action is responsive to communication filed on 04/13/01.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Therefore, " disclosed " (page 70, line 4) is implied and should be avoided.

The disclosure is objected to because of the following informalities: It is suggested to delete one of " that " (page 60, line 27).

It is suggested to delete " the " (page 61, line 10).

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US 6,601,101; hereinafter Lee) in view of Applicant's admitted prior art (pages 2 and 3 in the specification).

Regarding claims 1 and 2, Lee teaches a method of operating a distributed processing system to provide network attached storage (NAS) services (col. 1, lines 15 – 22), which comprises the steps of configuring a client agent program to have a software-based (NAS) component and to take advantage of unused or under-utilized resources of a plurality of network-connected distributed devices put into operation for purposes distinct from operating the client agent program to provide NAS services (col. 2, lines 7 – 28; Lee discloses a network attached storage in which, disks are detached from the server and placed on the network); and utilizing the plurality of distributed devices running the client agent to provide NAS services to network-connected user devices (paragraph bridging col. 5, line 66 through col. 6, line 56).

Lee discloses a switch configured so that virtual storage devices can be cascaded. That is one or more of the plurality of storage devices coupled with the switch may be another switch configured to appear as a virtual storage device (col. 4, lines 39 – 43), but fails to explicitly teach the idea of a network-connected user devices recognizing at least a portion of the plurality of distributed devices as dedicated NAS devices as claimed.

However, Applicant's admitted prior art teaches the idea of a specialized file server that connects to the network to provide storage capacity to network-connected users (see background, pages 2 and 3).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lee's device by having a network-connected user devices recognizing at least a portion of the plurality of distributed devices as dedicated NAS devices for the purpose of increasing the overall performance of the system while reducing the total cost of ownership.

Regarding claim 3, Lee and Applicant's admitted prior art teach all the limitations in claim 1, and Lee further teaches a method of operating a distributed processing system to provide network attached storage (NAS) services, wherein at least one of the network-connected distributed devices stores location information for data stored by the plurality of network-connected distributed devices (col. 4, lines 39 - 65).

Regarding claim 4, Lee and Applicant's admitted prior art teach all the limitations in claim 3, and Lee further teaches utilizing at least one of the distributed devices storing data location information to receive data storage and access requests from the user devices and to direct the user devices to the distributed devices storing the requested data (col. 4, lines 39 - 65).

Regarding claim 5, Lee and Applicant's admitted prior art teach all the limitations in claim 4, and Lee teaches a method of operating a distributed processing system to provide network attached storage (NAS) services, wherein the plurality of network-

connected distributed devices provide NAS services without relying upon a centralized server system (col. 2, lines 38 – 47).

Regarding claim 6, Lee and Applicant's admitted prior art teach all the limitations in claim 1, and Lee further teaches a method comprising managing the NAS services provided by the plurality of network-connected distributed devices at least in part utilizing at least one centralized server system (col. 4, lines 19 – 23; Lee discloses that it is particular useful when a server is a virtual IP address for multiple devices such as NAS).

Regarding claim 7, Lee and Applicant's admitted prior art teach all the limitations in claim 6, and Lee further teaches a method, wherein the server system downloads the NAS component to the plurality of network-connected distributed devices, the NAS component configured to operate as part of the client agent program already installed on the distributed devices (col. 19, lines 37 – 50; Lee discloses a TCP handoff involves transferring TCP state information from the server to a disk).

Regarding claim 8, Lee and Applicant's admitted prior art teach all the limitations in claim 6, and Lee further teaches a method, wherein the centralized server system stores location information for data stored by the plurality of network-connected distributed devices and at least in part directs the user devices to the distributed devices storing the requested data (col. 7, lines 11 – 15; Lee discloses the first device determines that another device in the cluster is better suited to handle the client request).

Regarding claim 9, Lee and Applicant's admitted prior art teach all the limitations in claim 8, and Lee further teaches a method comprising utilizing the server system to receive data storage and access requests from the user devices and to allocate data storage and access workloads to the plurality of distributed devices based upon individual capabilities of the plurality of distributed devices, the individual capabilities being stored in a database by the server system (col. 5, lines 4 – 17; col. 7, lines 35 – 58; col. 19, lines 15 – 67; col. 20, lines 1 – 26; Lee discloses load balancing, which refers to networked devices which can share a work load, for instance two or more servers).

Regarding claim 10, Lee and Applicant's admitted prior art teach all the limitations in claim 9, and Lee further teaches a method, wherein plurality distributed devices are connected to the Internet (col. 2, lines 22 – 35; col. 4, lines 32 – 35).

Regarding claim 11, Lee and Applicant's admitted prior art teach all the limitations in claim 1, and Lee further teaches a method comprising managing storage resources for the plurality of distributed devices using a storage priority control that facilitates full use of available storage resources (col. 2, lines 7 – 19; col. 7, lines 35 – 58; Lee discloses that when the first device is a load balancing device, satisfactory measures for load balancing may include traffic through the switch, reported workload or available capacity of alternate devices, or analysis of the services being requested).

Regarding claims 12 – 14, Lee and Applicant's admitted prior art teach all the limitations in claim 11, but fails to explicitly teach a method, wherein the storage priority control comprises a parameter selectable through the client device (claim 12); wherein

the storage priority control comprises storage priority level schemes that prioritize data storage and deletion (claim 13); and wherein the storage priority control comprises a priority marking directly given to data or files (claim 14).

However, "**official notice** " is taken that the concept and advantages of having a storage priority control that comprises a parameter selectable through the client device; wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion; and wherein the storage priority control comprises a priority marking directly given to data or files are old and well known in the art.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lee and Applicant's admitted prior art by having a storage priority control that comprises a parameter selectable through the client device; wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion and wherein the storage priority control comprises a priority marking directly given to data or files for the purpose of providing higher overall multi-processing system performance efficiency.

Regarding claims 15 and 16, Lee teaches a distributed processing system providing network attached storage (NAS) services (col. 1, lines 15 – 22), which comprises a client agent program to have a software-based (NAS) component and to take advantage of unused or under-utilized resources of a plurality of network-connected distributed devices put into operation for purposes distinct from operating the client agent program to provide NAS services (col. 2, lines 7 – 28; Lee discloses a network attached storage in which, disks are detached from the server and placed on

the network); and utilizing the plurality of distributed devices running the client agent to provide NAS services to network-connected user devices (paragraph bridging col. 5, line 66 through col. 6, line 56).

Lee discloses a switch configured so that virtual storage devices can be cascaded. That is one or more of the plurality of storage devices coupled with the switch may be another switch configured to appear as a virtual storage device (col. 4, lines 39 – 43), but fails to explicitly teach the idea of a network-connected user devices recognizing at least a portion of the plurality of distributed devices as dedicated NAS devices as claimed.

However, Applicant's admitted prior art teaches the idea of a specialized file server that connects to the network to provide storage capacity to network-connected users (see background, pages 2 and 3).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lee's device by having a network-connected user devices recognizing at least a portion of the plurality of distributed devices as dedicated NAS devices for the purpose of increasing the overall performance of the system while reducing the total cost of ownership.

Regarding claim 17, Lee and Applicant's admitted prior art teach all the limitations in claim 15, and Lee further teaches a distributed processing system providing network attached storage (NAS) services, wherein at least one of the network-connected distributed devices stores location information for data stored by the plurality of network-connected distributed devices (col. 4, lines 39 - 65).

Regarding claim 18, Lee and Applicant's admitted prior art teach all the limitations in claim 17, and Lee further teaches a distributed processing system, wherein the distributed devices storing data location information to receive data storage and access requests from the user devices and to direct the user devices to the distributed devices storing the requested data (col. 4, lines 39 - 65).

Regarding claim 19, Lee and Applicant's admitted prior art teach all the limitations in claim 18, and Lee further teaches a distributed processing system, wherein the plurality of network-connected distributed devices provide NAS services without relying upon a centralized server system (col. 2, lines 38 – 47).

Regarding claim 20, Lee and Applicant's admitted prior art teach all the limitations in claim 15, and Lee further teaches a distributed processing system providing network attached storage (NAS) services, which at least in part, utilizing at least one centralized server system (col. 4, lines 19 – 23; Lee discloses that it is particular useful when a server is a virtual IP address for multiple devices such as NAS).

Regarding claim 21, Lee and Applicant's admitted prior art teach all the limitations in claim 20, and Lee further teaches a distributed processing system providing network attached storage (NAS) services, wherein the server system downloads the NAS component to the plurality of network-connected distributed devices, the NAS component configured to operate as part of the client agent program already installed on the distributed devices (col. 19, lines 37 – 50; Lee discloses a TCP handoff involves transferring TCP state information from the server to a disk).

Regarding claim 22, Lee and Applicant's admitted prior art teach all the limitations in claim 20, and Lee further teaches a distributed processing system providing network attached storage (NAS) services, wherein the centralized server system stores location information for data stored by the plurality of network-connected distributed devices and at least in part directs the user devices to the distributed devices storing the requested data (col. 7, lines 11 – 15; Lee discloses the first device determines that another device in the cluster is better suited to handle the client requested data.

Regarding claim 23, Lee and Applicant's admitted prior art teach all the limitations in claim 22, and Lee further teaches a distributed processing system providing network attached storage (NAS) services; wherein the server system is configured to receive data storage and access requests from the user devices and to allocate data storage workloads to the plurality of distributed devices based upon individual capabilities of the plurality of distributed devices, and further comprising a capabilities database connected to the server system and storing capabilities parameters for the plurality of distributed devices (col. 5, lines 4 – 17; col. 7, lines 35 – 58; col. 19, lines 15 – 67; col. 20, lines 1 – 26; Lee discloses load balancing, which refers to networked devices which can share a work load, for instance two or more servers).

Regarding claim 24, Lee and Applicant's admitted prior art teach all the limitations in claim 22, and Lee further teaches a distributed processing system

providing network attached storage (NAS) services, wherein plurality distributed devices are connected to the Internet (col. 2, lines 22 – 35; col. 4, lines 32 – 35).

Regarding claim 25, Lee and Applicant's admitted prior art teach all the limitations in claim 15, and Lee further teaches a distributed processing system providing network attached storage (NAS) services comprising a storage priority control associated with the storage resources for the plurality of distributed devices, the storage priority control configured to facilitate full use of available storage resources (col. 2, lines 7 – 19; col. 7, lines 35 – 58; Lee discloses that when the first device is a load balancing device, satisfactory measures for load balancing may include traffic through the switch, reported workload or available capacity of alternate devices, or analysis of the services being requested).

Regarding claims 26 – 28, Lee and Applicant's admitted prior art teach all the limitations in claim 11, but fails to explicitly teach a method, wherein the storage priority control comprises a parameter selectable through the client device (claim 12); wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion (claim 13); and wherein the storage priority control comprises a priority marking directly given to data or files (claim 14).

However, "**official notice** " is taken that the concept and advantages of having a storage priority control that comprises a parameter selectable through the client device; wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion; and wherein the storage priority control comprises a priority marking directly given to data or files are old and well known in the art.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lee and Applicant's admitted prior art by having a storage priority control that comprises a parameter selectable through the client device; wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion and wherein the storage priority control comprises a priority marking directly given to data or files for the purpose of providing higher overall multi-processing system performance efficiency.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bonnell et al (US Patent Number 5,655,081) discloses a system for monitoring and managing computer resources and applications across a distributed computing environment using an intelligent autonomous agent architecture.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yves Dalencourt whose telephone number is (703) 308-8547. The examiner can normally be reached on M-TH 7:30AM - 6: 30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (703) 308-7562. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Yves Dalencourt
Y. D
August 31, 2004

SALEH NAJJAR
PRIMARY EXAMINER

Notice of References Cited	Application/Control No. 09/834,785	Applicant(s)/Patent Under Reexamination HUBBARD, EDWARD A.	
	Examiner Yves Dalencourt	Art Unit 2157	Page 1 of 1

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	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
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NON-PATENT DOCUMENTS

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 1 of 2

Complete if Known	
Application Number	09/844,271
Filing Date	April 30, 2001
First Named Inventor	THEKKATH
Group Art Unit	~~2132~~ 2157
Examiner Name	Unassigned
Attorney Docket Number	MTEC-007/00US (0124.00US)

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Examiner Initials*	Cite No.[1]	U.S. Patent Document Number	U.S. Patent Document Kind Code[2] (*if known*)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 2 of 2

Complete if Known	
Application Number	09/844,271
Filing Date	April 30, 2001
First Named Inventor	THEKKATH
Group Art Unit	~~2122~~ 2157
Examiner Name	Unassigned
Attorney Docket Number	MTEC-007/00US (0124.00US)

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
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Form PTO-1449 (modified)	Atty. Docket No. UNTD:021	Serial No. 09/834,785
List of Patents and Publications for Applicant's **INFORMATION DISCLOSURE STATEMENT** (Use several sheets if necessary)	Applicant EDWARD A. HUBBARD	
	Filing Date: April 13, 2001	Group: ~~2152~~ 2157

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Examiner: Dakshesh Date **Date Considered:** 8/13/04

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Examiner: D Alesovec | **Date Considered:** 8/13/04

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U.S. Patent Documents	Foreign Patent Documents	Other Art
See Pages 1-2	N/A	See Page 3-5

Foreign Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Country	Class	Sub Class	Translation Yes/No
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	Filing Date: April 13, 2001	Group: ~~2152~~ 2157

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U.S. Patent Documents	Foreign Patent Documents	Other Art
See Pages 1-2	*N/A*	*See Page 3-5*

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	C21	Foster, et al., "Globus: A Metacomputing Infrastructure Toolkit," The International Journal of Supercomputer Applications and High Performance Computing, Vol. 11, No. 2, pp. 115-128, 1997.
	C22	Mutka, et al., "The Available Capacity of a Privately Owned Workstation Environment," Performance Evaluation 12 (1991) pp. 269-284.
	C23	Sullivan, et al., "A New Major SETI Project Based on Project Serendip Data and 100,000 Personal Computers," Astronomical and Biochemical Origins and the Search for Life in the Universe, 5th International Conference on Bioastronomy, IAU Colloquium No. 161, pp. 729-734, 1996.
Y.D	C24	Gelernter, "Domesticating Parallelism," IEEE Computer, Aug. 1986, 19(8), pp. 12-16.

Examiner: Dale Scott | **Date Considered:** 8/13/04

EXAMINER: initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form PTO-1449 (modified)	Atty. Docket No. UNTD:021	Serial No. 09/834,785
List of Patents and Publications for Applicant's **INFORMATION DISCLOSURE STATEMENT** (Use several sheets if necessary)	Applicant EDWARD A. HUBBARD	
	Filing Date: April 13, 2001	Group: ~~2152~~ 2137

U.S. Patent Documents	Foreign Patent Documents	Other Art
See Pages 1-2	*N/A*	*See Page 3-5*

OIPE JAN 08 2002 PATENT & TRADEMARK OFFICE

Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)

Exam. Init.	Ref. Des.	Citation
Y.D	C25	Goldberg, et al., "A Secure Environment for Untrusted Helper Applications-Confining the Wily Hacker," 6th USENIX Security Symposium, pp. 1-13, 1996.

Examiner: D Alencastro | **Date Considered:** 8/13/04

EXAMINER: initial if reference considered, whether or not citation is in conformance with MPEP609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

IPR2025-00716
DATABRICKS EX1002 Page 275

OIPE JC1 FEB 21 2003 PATENT & TRADEMARK OFFICE

Form PTO-1449 (modified)

List of Patents and Publications for Applicant's

INFORMATION DISCLOSURE STATEMENT

(Use several sheets if necessary)

Atty. Docket No.	Serial No.
UNTD:021	09/834,785
Applicant	
Edward A. Hubbard	
Filing Date:	**Group:**
April 13, 2001	~~2152~~ 2157

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FEB 27 2003
Technology Center 2100

U.S. Patent Documents	Foreign Patent Documents	Other Art
See Page 1	*See Page 1*	*See Page 1-2*

U.S. Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Name	Class	Sub Class	Filing Date if App.
Y.D	A44	5,893,075	4/6/99	Plainfield et al.	705	14	
	A45	5,887,143	3/23/99	Saito et al.	~~395~~ 709	~~200~~ 248	
	A46	5,768,504	6/16/98	Kells et al.	~~395~~ 713	~~187.01~~ 201	
	A47	5,842,219	11/24/98	High, Jr. et al.	707	103R	
	A48	6,374,254	4/16/02	Cochran et al.	707	102	
Y.D	A49	5,402,394	3/28/95	Turski	368	10	

Foreign Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Country	Class	Sub Class	Translation Yes/No
Y.D	B1	01/73545	4 OCT 01	WO			English
Y.D	B2	01/14961	1 MAR 01	WO			English

Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)

Exam. Init.	Ref. Des.	Citation
Y.D	C26	distributed.net: The fastest computer on Earth: Feb 08, 1999, http://web.archive.org/web/19990221230053/http://distributed
	C27	London et al., "POPCORN - A Paradigm for Global-Computing", THESIS UNIVERSITY JERUSALEM, June 1998 (1998-06)
	C28	Takagi H. et al., "Ninflet: a migratable parallel objects framework using Java", JAVA FOR HIGH-PERFORMANCE NETWORK COMPUTING, Syracuse, NY, USA, 2/1998, Vol. 10, No. 11-13, pp 1063-1078.
Y.D	C29	Waldspurger, C.A. et al., "Spawn: a distributed computational economy" IEEE TRANSACTIONS ON SOFTWARE ENGINEERING, IEEE INC., NY, US, 2/1992, Vol. 18, No. 2, pp. 103-117

Examiner: Dalenson **Date Considered:** 8/13/04

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

O-I-P-E JC37
FEB 21 2003
PATENT & TRADEMARK OFFICE

Form PTO-1449 (modified) List of Patents and Publications for Applicant's INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	Atty. Docket No. UNTD:021	Serial No. 09/834,785
	Applicant Edward A. Hubbard	
	Filing Date: April 13, 2001	Group: 2152

U.S. Patent Documents	Foreign Patent Documents	Other Art
See Page 1	*See Page 1*	*See Page 1-2*

Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)

Exam. Init.	Ref. Des.	Citation
	C30	Neary, M. O., et al., "Javelin: Parallel computing on the internet" FUTURE GENERATIONS COMPUTER SYSTEMS, ELSEVIER SCIENCE PUBLISHERS, Amsterdam, NL, 10/1999, Vol. 15, no. 5-6, pp. 661-664
	C31	Foster, Ian et al., "The Physiology of the Grid," This is a DRAFT document and continues to be revised. Version 2/17/2002
	C32	Douceur, John R. et al., "A Large-Scale Study of File-System Contents," Microsoft Research, Redmond, WA 98052, May 1999
	C33	Bolosky, William J. et al., "Feasibility of a Serverless Distributed File System Deployed on an Existing Set of Desktop PCs," Microsoft Research, Redmond, WA 98052, June 2000

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FEB 27 2003
Technology Center 2100

Examiner:	Date Considered:

EXAMINER: initial if reference considered, whether or not citation is in conformance with MPEP609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form PTO-1449 (modified)	Atty. Docket No. UNTD:021	Serial No. 09/834,785
List of Patents and Publications for Applicant's	Applicant Edward A. Hubbard	
INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	Filing Date: April 13, 2001	Group: ~~2152~~ 2157

U.S. Patent Documents	Foreign Patent Documents	Other Art
See Page 1	*See Page N/A*	*See Page 1*

OIPE JC15 JUN 12 2003 PATENT & TRADEMARK OFFICE

U.S. Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Name	Class	Sub Class	Filing Date if App.
Y.D	A58	6,418,462	7/9/02	Xu	709	201	
Y.D	A59	6,463,457	10/8/02	Armentrout et al.	709	201	

Foreign Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Country	Class	Sub Class	Translation Yes/No

Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)

Exam. Init.	Ref. Des.	Citation
Y.D	C34	Regev, Ori; Economic Oriented CPU Sharing System for the Internet; Master of Science in Computer Science thesis; Institute of Computer Science; The Hebrew University of Jerusalem; July, 1998
Y.D	C35	May, Michael; Idle Computing Resources as Micro-Currencies – Bartering CPU Time for Online Content; AACE WebNet99; Oct. 25-30, 1999
Y.D	C36	May, Michael; Distributed RC5 Decryption as a Consumer for Idle – Time Brokerage; DCW99 Workshop on Distributed Computer on the Web; June 21-23, 1999
Y.D	C37	May, Michael; Locust – A Brokerage System for Accessing Idle Resources for Web-Computing; Proceedings of the 25th Euromicro Conference; Vol. 2, pp. 466-473; September 8-10, 1999
Y.D	C38	Huberman, Bernardo A., et al.; Distributed Computation as an Economic System; Journal of Economic Perspectives; Vol. 9, No. 1; pp. 141-152; Winter 1995

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JUN 13 2003
Technology Center 2100

Examiner: DAVCOVE | **Date Considered:** 8/13/04

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

2157

OIPE JC#14 JAN 06 2005 PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Edward A. Hubbard
Serial No.:	09/834,785
Filed:	April 13, 2001
Group Art Unit:	2157
Before the Examiner:	Yves Dalencourt
Title:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

AMENDMENT UNDER 37 C.F.R. § 1.111

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action having a mailing date of September 03, 2004, having a three-month shortened statutory period for response set to expire on December 03, 2004 and extended one month to January 03, 2005 by the enclosed Petition for Extension of Time, please reconsider the claims in view of the following remarks:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Abstract begin on page 4 of this paper.

Amendments to the Claims are reflected in the listing of claims which begins on page 5 of this paper.

Remarks begin on page 9 of this paper.

CERTIFICATION UNDER 37 C.F.R. § 1.8

I hereby certify that this correspondence (along with any item referred to as being enclosed herewith) is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on January 3, 2005.

Serena Beller
Signature

Serena Beller
(Printed name of person certifying)

IN THE SPECIFICATION

Please replace the paragraph beginning on page 60, line 21 with the following:

Looking now to FIG. 21, the NAS embodiment 2100 includes a network 102, which as discussed above, can be any network communication fabric that provides connectivity between various machines. As shown, connected to this network 102 are a user device fabric 2102, a client device fabric 2104, and servers systems 104 and 154D. More particularly, the user device fabric 2102 may include any number of potential user devices 152A, 152B ... 152C. The client device fabric 2104 may include any number of potential client devices 108A, 108B ... 108C. It is noted that ~~that~~ the user devices 152A, 152B ... 152C may be configured to communicate directly to each other, the client devices 108A, 108B ... 108C may be configured to communicate directly to each other, and the user devices 152A, 152B ... 152C and the client devices 108A, 108B ... 108C may be configured to communicate directly between themselves without intervention by the server systems, if desired. The server systems may include user server systems 154D, which have attached database systems 2112, and NAS server systems 104, which have attached NAS database systems 2108 and a centralized data location library 2110. To provide NAS functionality, the client devices 108A, 108B ... 108C run a client agent, as described above, that provides NAS functionality, for example, by running a NAS component as one of the projects for the distributed device. In addition, some of these NAS devices, such as NAS client devices 108A and 108B, may store distributed data location information, such as data location libraries 2106A and 2106B.

Please replace the paragraph beginning on page 61, line 6 with the following:

The NAS distributing computing embodiment 2100 depicted provides an environment in which a variety of different NAS configurations may be utilized, as desired. These configurations include, for example, at least three different NAS architectures that may be utilized: a stand-alone only NAS device implementation, a NAS device fabric implementation, and a server assisted implementation. It is noted

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that variations, combinations and hybrids of ~~the~~ these implementation examples may be utilized, as desired, without departing from the present invention.

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IN THE ABSTRACT

Please replace the Abstract with following rewritten paragraph as suggested by the Examiner:

Software-based network attached storage (NAS) services are hosted on a massively distributed processing [[computing]] system [[are disclosed]] configured by coupling a multiplicity of distributed devices with a network, wherein each of the distributed devices are enabled to process workloads for the distributed processing system by a client agent program. More particularly, the client agent program is configured ~~to run on the network-connected client devices that are part of the distributed computing system to provide what appears to user devices as dedicated NAS functionality, for example, through the Internet or an intranet~~ with a NAS software component to enable selected distributed devices from the multiplicity of distributed devices to appear to client devices coupled to the network as dedicated NAS devices. ~~This NAS functionality takes advantage of unused or under-utilized resources of these distributed devices to advantageously provide NAS capabilities.~~ The NAS software component allocates an available amount of storage resources in the selected distributed devices to provide NAS services to the client devices. [[In addition, storage]] Storage priority controls, including user specified constraints, standard bit, block and file priority levels, and direct bit, block or file priority markings may be utilized to facilitate the full use of the available ~~storage resources, such as user specified constraints, standard bit, block or file priority levels and direct bit, block or file priority markings~~ amounts of unused storage in the selected distributed devices.

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IN THE CLAIMS

Please cancel Claims 1-28 without prejudice or disclaimer.

Please add new Claims 29-54.

1-28 (canceled)

29. (new) A method providing network attached storage (NAS) services comprising:

configuring a distributed processing system by coupling a multiplicity of distributed devices using a network, wherein each of the distributed devices is enabled by a client agent program to process workloads for the distributed processing system;

configuring the client agent program to have a software-based NAS component to assess unused or under-utilized storage resources in selected distributed devices from the multiplicity distributed devices;

generating a representation by the software-based NAS component that the selected distributed devices are each NAS devices having an available amount of storage resources selected from the unused and under-utilized storage resources; and

processing data storage and access workloads for the distributed processing system by accessing data from or storing data into portions of the available amounts of storage resources of the selected distributed devices to provide the NAS services to client devices coupled to the network.

30. (new) The method of claim 29, wherein the client agent program enables at least one of the selected distributed devices to operate as a stand-alone dedicated NAS device.

31. (new) The method of claim 29, wherein the client agent program enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

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32. (new) The method of claim 31, further comprising enabling the location distributed device to receive data storage and access requests from the client devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data.

33. (new) The method of claim 32, further comprising managing the NAS services at least in part utilizing at least one centralized server system.

34. (new) The method of claim 33, wherein the centralized server system downloads the NAS component to the client agent programs in the distributed devices.

35. (new) The method of claim 33, wherein the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data.

36. (new) The method of claim 35, further comprising utilizing the centralized server system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system.

37. (new) The method of claim 29, wherein the network is the Internet.

38. (new) The method of claim 29, further comprising managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources.

39. (new) The method of claim 38, wherein the storage priority control comprises a parameter selectable through one of the client devices.

40. (new) The method of claim 39, wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion.

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41. (new) The method of claim 39, wherein the storage priority control comprises a priority marking directly given to data or files.

42. (new) A system for providing network attached storage (NAS) services comprising:

a distributed processing system configured by coupling a multiplicity of distributed devices using a network, wherein each of the multiplicity distributed devices are enabled by a client agent program to process workloads for the distributed processing system; and

a software-based NAS component operating within each of the client agent programs, wherein the software-based NAS component assesses unused storage resources of the multiplicity distributed devices, allocates an available amount of unused storage resources in selected distributed devices from the multiplicity distributed devices, generates a representation that the selected distributed devices are each NAS devices having the available amount of storage resources, and processes data storage and access workloads in the selected distributed devices for the distributed processing system by accessing data from and storing data into portions of each of the available amounts of unused storage resources in the selected distributed devices to provide the NAS services to client devices coupled to the network.

43. (new) The system of claim 42, wherein the client agent program enables at least one of the selected distributed devices to operate as a stand-alone dedicated NAS devices.

44. (new) The system of claim 42, wherein the client agent program enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

45. (new) The system of claim 44, further comprising enabling the location distributed device to receive data storage and access requests from the client devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data.

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46. (new) The system of claim 45, further comprising managing the NAS services at least in part utilizing at least one centralized server system.

47. (new) The system of claim 46, wherein the centralized server system downloads the NAS component to the client agent programs in the distributed devices.

48. (new) The system of claim 46, wherein the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data.

49. (new) The system of claim 48, further comprising utilizing the centralized server system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system.

50. (new) The system of claim 42, wherein the network is the Internet.

51. (new) The system of claim 42, further comprising managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources.

52. (new) The system of claim 51, wherein the storage priority control comprises a parameter selectable through one of the client devices.

53. (new) The system of claim 52, wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion.

54. (new) The system of claim 52, wherein the storage priority control comprises a priority marking directly given to data or files.

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REMARKS

Claims 1-26 are canceled without prejudice or disclaimer.

Claims 29-54 are added.

Claims 29-54 are pending.

New Claims 29-54 were added to clarify the claims of the invention. Particularly the new Claims 29 and 42 were added to define the distributed processing system and its relationship to the multiplicity of distributed devices coupled with a network and enabled with a client agent program to process workloads for the distributed processing system. The support for new Claims 29-54 is found in the Detailed Description in the Specification, pages 59-65 and relative to FIG. 21.

The Specification has been amended as suggested by the Examiner to correct informalities.

A replacement Abstract was added to correct language and format errors as suggested by the Examiner.

I. REJECTION UNDER U.S.C. §103(a)

The Applicant asserts that the rejections of Claims 1-28 under *35 U.S.C. §103(a)* as being unpatentable over U.S. Patent 6,601,101 to *Lee et al.* in view of the admitted prior art of pages 2 and 3 of the Specification have been rendered moot by the cancellation of these claims.

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II. CONCLUSION

The Applicant respectfully asserts that new Claims 29-54 are fully supported in the Specification and clearly distinguish the present invention from the cited prior art and that new Claims 29-54 are in condition for allowance and request an early allowance of these claims.

Applicant respectfully requests that the Examiner call Applicant's attorney at the below listed number if the Examiner believes that such a discussion would be helpful in resolving any remaining problems.

Respectfully submitted,

WINSTEAD SECHREST & MINICK P.C.

Patent Agent and Attorney for Applicant

By: Richard F. Frankeny

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IPR2025-00716
DATABRICKS EX1002 Page 288

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	14

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Edward A. Hubbard
Art Unit	2157
Examiner Name	Yves Dalencourt
Attorney Docket Number	40988-P001P9

ENCLOSURES *(Check all that apply)*

- [✓] Fee Transmittal Form
  - [✓] Fee Attached
- [✓] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [✓] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
  - [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [✓] Other Enclosure(s) (please Identify below):

Change of Correspondence; Check

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Winstead Sechrest & Minick P.C.		
Signature	Richard F. Frankeny		
Printed name	Richard F. Frankeny		
Date	January 3, 2005	Reg. No.	47,573

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature	Serena Beller		
Typed or printed name	Serena Beller	Date	January 3, 2005

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PTO/SB/17 (10-04v2)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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FEE TRANSMITTAL for FY 2005

Effective 10/01/2004. Patent fees are subject to annual revision.

☑ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 60.00

Complete if Known	
Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Edward A. Hubbard
Examiner Name	Yves Dalencourt
Art Unit	2157
Attorney Docket No.	40988-P001P9

METHOD OF PAYMENT *(check all that apply)*

☑ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☑ Deposit Account:

Deposit Account Number: 23-2426

Deposit Account Name: Winstead Sechrest & Minick P.C.

The Director is authorized to: *(check all that apply)*

☐ Charge fee(s) indicated below ☑ Credit any overpayments

☑ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, **except for the filing fee** to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	790	2001	395	Utility filing fee	
1002	350	2002	175	Design filing fee	
1003	550	2003	275	Plant filing fee	
1004	790	2004	395	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

	Extra Claims		Fee from below	Fee Paid
Total Claims		-38** =		X =
Independent Claims		-5** =		X =
Multiple Dependent				=

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	88	2201	44	Independent claims in excess of 3
1203	300	2203	150	Multiple dependent claim, if not paid
1204	88	2204	44	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($)

***or number previously paid, if greater; For Reissues, see above*

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	430	2252	215	Extension for reply within second month	60.00
1253	980	2253	490	Extension for reply within third month	
1254	1,530	2254	765	Extension for reply within fourth month	
1255	2,080	2255	1,040	Extension for reply within fifth month	
1401	340	2401	170	Notice of Appeal	
1402	340	2402	170	Filing a brief in support of an appeal	
1403	300	2403	150	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,370	2453	685	Petition to revive - unintentional	
1501	1,370	2501	685	Utility issue fee (or reissue)	
1502	490	2502	245	Design issue fee	
1503	660	2503	330	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	790	2810	395	For each additional invention to be examined (37 CFR 1.129(b))	
1801	790	2801	395	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 60.00

SUBMITTED BY				(Complete *(if applicable)*)	
Name (Print/Type)	Richard F. Frankeny	*Registration No. (Attorney/Agent)*	47,573	*Telephone*	512.370.2872
Signature	Richard F. Frankeny			*Date*	January 3, 2005

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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OIPE JC14
JAN 06 2005
PATENT & TRADEMARK OFFICE

PTO/SB/22 (12-04)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARMENT OF COMMERCE
Under the paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless if displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) **FY 2005** *(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)*	Docket Number (Optional) 40988-P001P9
Application Number 09/834,785	Filed April 13, 2001
For Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing...	
Art Unit 2157	Examiner Yves Dalencourt

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	
☑	One month (37 CFR 1.17(a)(1))	$120	$60	$60
☐	Two months (37 CFR 1.17(a)(2))	$450	$225	$
☐	Three months (37 CFR 1.17(a)(3))	$1020	$510	$
☐	Four months (37 CFR 1.17(a)(4))	$1590	$795	$
☐	Five months (37 CFR 1.17(a)(5))	$2160	$1080	$

☐ Applicant claims small entity status. See 37 CFR 1.27.

☑ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 23-2426(40988-P001P9) . I have enclosed a duplicate copy of this sheet.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☑ attorney or agent of record. Registration Number 47,573

☐ attorney or agent under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____

Richard F. Frankeny
Signature

January 3, 2005
Date

Richard F. Frankeny
Typed or printed name

512.370.2872
Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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OIPE JC16
JAN 06 2005
PATENT & TRADEMARK OFFICE

PTO/SB/122 (09-04)
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CHANGE OF CORRESPONDENCE ADDRESS
Application

Address to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Edward A. Hubbard
Art Unit	2157
Examiner Name	Yves Dalencourt
Attorney Docket Number	40988-P001P9

Please change the Correspondence Address for the above-identified patent application to:

☐ The address associated with Customer Number: ____

OR

☑ Firm or Individual Name Winstead Sechrest & Minick P.C.

Address P.O. Box 50784

City	State	Zip
Dallas	TX	75201

Country U.S.A.

Telephone	Fax
512.370.2872	512.370.2850

This form cannot be used to change the data associated with a Customer Number. To change the data associated with an existing Customer Number use "Request for Customer Number Data Change" (PTO/SB/124).

I am the:

☐ Applicant/Inventor

☐ Assignee of record of the entire interest.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☑ Attorney or agent of record. Registration Number 47,573.

☐ Registered practitioner named in the application transmittal letter in an application without an executed oath or declaration. See 37 CFR 1.33(a)(1). Registration Number____.

Signature Richard F. Frankeny

Typed or Printed Name Richard F. Frankeny

Date	Telephone
January 3, 2005	512.370.2872

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	UNTD:021	8392

29444 7590 04/20/2005

KELLY K. KORDZIK
WINSTEAD SECHREST & MINICK P.C.
PO BOX 50784
DALLAS, TX 75201

EXAMINER	
DALENCOURT, YVES	
ART UNIT	PAPER NUMBER
2157	

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	Yves Dalencourt	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01/06/2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This office action is responsive to amendment filed on 01/06/2005.

Response to Amendment

1. The examiner has acknowledged the amended specification, the amended abstract, the cancellation of claims 1 – 28, and the submission of new claims 29 – 54.

Response to Arguments

2. Applicant's arguments with respect to claims 29 - 54 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 29 – 54 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al (US 6,601,101; hereinafter Lee).

Regarding claims 29 – 30 and 42 - 43, Lee teaches a method and system for providing network attached storage (NAS) services (col. 1, lines 15 – 22), which

comprises the steps of configuring a distributed processing system by coupling a multiplicity of distributed devices using a network, wherein each of the distributed devices is enabled by a client agent program to process workloads for the distributed processing system (col. 1, lines 24 - 41); configuring the client agent program to have a software-based (NAS) component and to access unused or under-utilized resources in selected distributed devices from the multiplicity distributed devices (col. 2, lines 7 – 28; Lee discloses a network attached storage in which, disks are detached from the server and placed on the network); generating a representation by the software-based NAS component that the selected distributed devices are each NAS devices having an available amount of storage resources selected from the unused and under-utilized storage resources (col. 2, lines 35 - 47); and processing data storage and access workloads for the distributed processing system by accessing data from or storing data into portions of the available amounts of storage resources of the selected distributed service to provide the NAS services to client devices coupled to the network (fig. 3; col. 6, line 61 through col. 7, line 58; col. 22, lines 12 - 30).

Regarding claims 31 and 44, Lee teaches the method and system of claims 29 and 42, wherein the client agent program enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices (col. 4, lines 39 - 65).

Regarding claims 32 and 45, Lee teaches the method and system of claims 31 and 44, which further comprising enabling the location distributed device to receive data storage and access requests from the client devices coupled to the network and to

direct the client devices to the selected distributed devices storing the requested data (col. 7, lines 11 – 15; Lee discloses the first device determines that another device in the cluster is better suited to handle the client request).

Regarding claims 33 and 46, Lee teaches the method and system of claims 32 and 45, which further comprising managing the NAS services at least in part utilizing at least one centralized server system (col. 4, lines 19 – 23; Lee discloses that it is particular useful when a server is a virtual IP address for multiple devices such as NAS).

Regarding claims 34 and 47, Lee teaches the method and system of claims 33 and 46, wherein the centralized server system downloads the NAS component to the client agent programs in the distributed devices (col. 19, lines 37 – 50; Lee discloses a TCP handoff involves transferring TCP state information from the server to a disk).

Regarding claims 35 and 48, Lee teaches the method and system of claims 33 and 46, wherein the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data (col. 7, lines 11 – 15; Lee discloses the first device determines that another device in the cluster is better suited to handle the client request).

Regarding claims 36 and 49, Lee teaches the method and system of claims 35 and 48, which further comprising utilizing the centralized server system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are

stored in a capabilities database coupled to the centralized server system ((col. 5, lines 4 – 17; col. 7, lines 35 – 58; col. 19, lines 15 – 67; col. 20, lines 1 – 26; Lee discloses load balancing, which refers to networked devices which can share a work load, for instance two or more servers).

Regarding claims 37 and 50, Lee teaches the method of claims 29 and 42, wherein the network is the Internet (col. 2, lines 22 – 35; col. 4, lines 32 – 35).

Regarding claims 38 and 51, Lee teaches the method of claims 29 and 42, which further comprising managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources (col. 2, lines 7 – 19; col. 7, lines 35 – 58; Lee discloses that when the first device is a load balancing device, satisfactory measures for load balancing may include traffic through the switch, reported workload or available capacity of alternate devices, or analysis of the services being requested).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 39 – 41 and 52 – 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US 6,601,101; hereinafter Lee).

Regarding claims 39 - 41, Lee substantially teaches all the limitations in claims 38 and 51, but fails to explicitly teach a method, wherein the storage priority control comprises a parameter selectable through one of the client devices (claim 39); wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion (claim 40); and wherein the storage priority control comprises a priority marking directly given to data or files (claim 41).

However, "**official notice** " is taken that the concept and advantages of having a storage priority control that comprises a parameter selectable through the client device; wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion; and wherein the storage priority control comprises a priority marking directly given to data or files are old and well known in the art.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Lee and Applicant's admitted prior art by having a storage priority control that comprises a parameter selectable through the client device; wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion and wherein the storage priority control comprises a priority marking directly given to data or files for the purpose of providing higher overall multi-processing system performance efficiency.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bonnell et al (US Patent Number 5,655,081) discloses a system for monitoring and managing computer resources and applications across a distributed computing environment using an intelligent autonomous agent architecture.

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yves Dalencourt whose telephone number is (571) 272-3998. The examiner can normally be reached on M-TH 7:30AM - 6: 00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yves Dalencourt
Y.D
April 14, 2005

ARIO ETIENNE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Index of Claims

Application/Control No.	Applicant(s)/Patent under Reexamination
09/834,785	HUBBARD, EDWARD A.
Examiner	**Art Unit**
Yves Dalencourt	2157

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
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Claim		Date								
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DATABRICKS EX1002 Page 302

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AF IFW 2157

PTO/SB/21 (09-04)
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission: 17

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Edward A. Hubbard
Art Unit	2157
Examiner Name	Yves Dalencourt
Attorney Docket Number	40988-P001P9

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☑ Amendment/Reply
  - ☑ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☑ Other Enclosure(s) (please Identify below):
  1) Return Postcard

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Winstead Sechrest & Minick P.C.		
Signature	Richard F. Frankeny		
Printed name	Richard F. Frankeny		
Date	July 18, 2005	Reg. No.	47,573

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature	Beatrice Zepeda		
Typed or printed name	Beatrice Zepeda	Date	July 18, 2005

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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OIPE SC124
JUL 2 1 2005
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Edward A. Hubbard
Serial No.:	09/834,785
Filed:	April 13, 2001
Group Art Unit:	2157
Before the Examiner:	Yves Dalencourt
Title:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

AMENDMENT UNDER 37 C.F.R. § 1.116

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action having a mailing date of April 20, 2005, having a three-month shortened statutory period for response set to expire on July 20, 2005, please reconsider the claims in view of the following remarks:

Listing of the Claims begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

CERTIFICATION UNDER 37 C.F.R. § 1.8

I hereby certify that this correspondence (along with any item referred to as being enclosed herewith) is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on July 18, 2005.

Beatrice Zepeda
Signature

Beatrice Zepeda
(Printed name of person certifying)

IN THE CLAIMS

1-28 (canceled)

29. (previously presented) A method providing network attached storage (NAS) services comprising:

configuring a distributed processing system by coupling a multiplicity of distributed devices using a network, wherein each of the distributed devices is enabled by a client agent program to process workloads for the distributed processing system;

configuring the client agent program to have a software-based NAS component to assess unused or under-utilized storage resources in selected distributed devices from the multiplicity distributed devices;

generating a representation by the software-based NAS component that the selected distributed devices are each NAS devices having an available amount of storage resources selected from the unused and under-utilized storage resources; and

processing data storage and access workloads for the distributed processing system by accessing data from or storing data into portions of the available amount of storage resources of the selected distributed devices to provide the NAS services to client devices coupled to the network.

30. (previously presented) The method of claim 29, wherein the client agent program enables at least one of the selected distributed devices to operate as a stand-alone dedicated NAS device.

31. (previously presented) The method of claim 29, wherein the client agent program enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

32. (previously presented) The method of claim 31, further comprising enabling the location distributed device to receive data storage and access requests from the client

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devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data.

33. (previously presented) The method of claim 32, further comprising managing the NAS services at least in part utilizing at least one centralized server system.

34. (previously presented) The method of claim 33, wherein the centralized server system downloads the NAS component to the client agent programs in the distributed devices.

35. (previously presented) The method of claim 33, wherein the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data.

36. (previously presented) The method of claim 35, further comprising utilizing the centralized server system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system.

37. (previously presented) The method of claim 29, wherein the network is the Internet.

38. (previously presented) The method of claim 29, further comprising managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources.

39. (previously presented) The method of claim 38, wherein the storage priority control comprises a parameter selectable through one of the client devices.

40. (previously presented) The method of claim 39, wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion.

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41. (previously presented) The method of claim 39, wherein the storage priority control comprises a priority marking directly given to data or files.

42. (previously presented) A system for providing network attached storage (NAS) services comprising:

a distributed processing system configured by coupling a multiplicity of distributed devices using a network, wherein each of the multiplicity distributed devices are enabled by a client agent program to process workloads for the distributed processing system; and

a software-based NAS component operating within each of the client agent programs, wherein the software-based NAS component assesses unused storage resources of the multiplicity distributed devices, allocates an available amount of unused storage resources in selected distributed devices from the multiplicity distributed devices, generates a representation that the selected distributed devices are each NAS devices having the available amount of storage resources, and processes data storage and access workloads in the selected distributed devices for the distributed processing system by accessing data from and storing data into portions of each of the available amounts of unused storage resources in the selected distributed devices to provide the NAS services to client devices coupled to the network.

43. (previously presented) The system of claim 42, wherein the client agent program enables at least one of the selected distributed devices to operate as a stand-alone dedicated NAS devices.

44. (previously presented) The system of claim 42, wherein the client agent program enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

45. (previously presented) The system of claim 44, further comprising enabling the location distributed device to receive data storage and access requests from the client

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devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data.

46. (previously presented) The system of claim 45, further comprising managing the NAS services at least in part utilizing at least one centralized server system.

47. (previously presented) The system of claim 46, wherein the centralized server system downloads the NAS component to the client agent programs in the distributed devices.

48. (previously presented) The system of claim 46, wherein the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data.

49. (previously presented) The system of claim 48, further comprising utilizing the centralized server system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system.

50. (previously presented) The system of claim 42, wherein the network is the Internet.

51. (previously presented) The system of claim 42, further comprising managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources.

52. (previously presented) The system of claim 51, wherein the storage priority control comprises a parameter selectable through one of the client devices.

53. (previously presented) The system of claim 52, wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion.

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54. (previously presented) The system of claim 52, wherein the storage priority control comprises a priority marking directly given to data or files.

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REMARKS

Claims 29-54 are rejected.

Claims 29-54 are pending.

The Examiner rejected Claims 29-54 under *35 U.S.C. §102(e)* as being anticipated by U.S. Patent 6,601,101 to *Lee et al.* hereafter (*Lee*), however the Examiner only specifically rejected Claims 29-38 and Claims 42-51. The Applicant assumes this was a typographical error.

I. REJECTION UNDER U.S.C. §102(e)

The Examiner rejected Claims 29-38 and Claims 42-51 under *35 U.S.C. §102(e)* as being anticipated by U.S. Patent 6,601,101 to *Lee et al.* hereafter (*Lee*).

For a reference to anticipate a claimed invention, the reference must disclose every aspect of the claimed invention. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Claims 29-30 and 42-43. Claim 29 is directed to a method providing network attached storage (NAS) services comprising four steps. In step 1, a distributed processing system is configured by coupling a multiplicity of distributed devices using a network, wherein each of the distributed devices is enabled by a client agent program to process first workloads for the distributed processing system. In step 2, the client agent program is configured to have a software-based NAS component to **assess** unused or under-utilized storage resources in selected distributed devices from the multiplicity distributed devices. In step 3, a representation by the software-based NAS component is generated that the selected distributed devices are each NAS

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devices having an available amount of storage resources selected from the unused and under-utilized storage resources. In step 4, data storage and access workloads are processed for the distributed processing system by accessing data from or storing data into portions of the available amounts of storage resources of the selected distributed devices to provide the NAS services to client devices coupled to the network.

The Applicant respectfully asserts that the Examiner, in his belief that Lee teaches the second step of the present invention, failed to see that the present invention recites the step "configuring the client agent program to have a software-based (NAS) component and to **assess** unused or under-utilized resources in the selected distributed devices." The Examiner stated that Lee teaches "configuring the client agent program to have a software-based (NAS) component and to **access** unused or under-utilized resources in the selected distributed devices." The present invention recites **assessing** (evaluate, judge, appraise) and not accessing (right of entry, admission). The present invention and the Examiner's assertion are clearly different. Therefore, the Examiner is relying upon an incorrect factual predicate in making his rejection. *In re Rouffet*, 47 U.S.P.Q. 2d 1453, 1455 (Fed. Cir. 1998).

The present invention is directed to configuring distributed devices coupled to a network (enabled by a client agent program to process workloads for the distributed processing system) and then configuring the client agent program to assess under or unutilized storage resources in the selected distributed devices from the distributed devices. Lee teaches the configuration of a network using dedicated NAS devices wherein access to the networked NAS devices is transparent to a user (the user does not need to know where his data is stored). The present invention configures a representation of NAS devices using distributed devices wherein the client agent **assesses** what unused storage resources are available in the selected distributed devices. Lee does not teach or suggest step 2) of the present invention.

Since Lee does not teach or suggest step 2) of the present invention, then Lee does not disclose every aspect of the present invention as required. Therefore, the

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Applicant asserts that the Examiner has failed to make a *prima facie* case of anticipation. Therefore, the Applicant respectfully asserts the rejection of Claim 29 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments.

Claim 30 depends from Claim 29 and contains all the limitations of Claim 29. The Examiner rejected Claims 30 using the same reasoning relative to Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 30 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 29.

Claim 42 is an apparatus claim implementing the method steps of Claim 29. The Examiner rejected Claim 42 for the same reasons as Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 42 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 29.

Claim 43 is dependent from Claim 42 and contains all the limitations as Claim 42. Claim 43 adds the same limitations to Claim 43 as Claim 30 adds to Claim 29. The Examiner rejected Claim 43 for the same reasons as Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 43 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 42 and Claim 29.

Claims 31 and 44. Claim 31 is dependent from Claim 29 and contains all the limitations as Claim 29. Claim 31 adds the limitation that at least one of the selected distributed devices is enabled by the client agent program to function as a location distributed device to store location information for data stored by the selected distributed devices. The Applicant has shown that Lee does not teach or suggest the invention of Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 31 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 29.

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Claim 44 is dependent from Claim 42 and contains all the limitations as Claim 42. Claim 44 adds the limitation that at least one of the selected distributed devices is enabled by the client agent program to function as a location distributed device to store location information for data stored by the selected distributed devices. The Applicant has shown that Lee does not teach or suggest the invention of Claim 42. Therefore, the Applicant respectfully asserts the rejection of Claim 44 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 42 and Claim 29.

Claims 32 and 45. Claim 32 is dependent from Claim 31 and contains all the limitations as Claim 31. Claim 32 adds the step of enabling the location distributed device to receive data storage and access requests from the client devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data. The Applicant has shown that Lee does not teach or suggest the invention of Claim 31. Therefore, the Applicant respectfully asserts the rejection of Claim 32 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 31 and Claim 29.

Claim 45 is dependent from Claim 44 and contains all the limitations as Claim 44. Claim 45 adds the limitation that the location distributed device is enabled to receive data storage and access requests from the client devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data. The Applicant has shown that Lee does not teach or suggest the invention of Claim 44. Therefore, the Applicant respectfully asserts the rejection of Claim 45 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 44 and Claim 29.

Claims 33 and 46. Claim 33 is dependent from Claim 32 and contains all the limitations as Claim 32. Claim 33 adds the step of managing the NAS services at least in part utilizing at least one centralized server system. The Applicant has shown that Lee does not teach or suggest the invention of Claim 32. Therefore, the

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Applicant respectfully asserts the rejection of Claim 33 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 32 and Claim 29.

Claim 46 is dependent from Claim 45 and contains all the limitations as Claim 45. Claim 46 adds the limitation that the NAS services are managed at least in part utilizing at least one centralized server system. The Applicant has shown that Lee does not teach or suggest the invention of Claim 45. Therefore, the Applicant respectfully asserts the rejection of Claim 46 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 45 and Claim 29.

Claims 34 and 47. Claim 34 is dependent from Claim 33 and contains all the limitations as Claim 33. Claim 34 adds limitation that the centralized server system downloads the NAS component to the client agent programs in the distributed devices. The Applicant has shown that Lee does not teach or suggest the invention of Claim 33. Therefore, the Applicant respectfully asserts the rejection of Claim 34 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 33 and Claim 29.

Claim 47 is dependent from Claim 46 and contains all the limitations as Claim 46. Claim 47 adds the limitation that the centralized server system downloads the NAS component to the client agent programs in the distributed devices. The Applicant has shown that Lee does not teach or suggest the invention of Claim 46. Therefore, the Applicant respectfully asserts the rejection of Claim 47 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 46 and Claim 29.

Claims 35 and 48. Claim 35 is dependent from Claim 33 and contains all the limitations as Claim 33. Claim 35 adds limitation that the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested

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data. The Applicant has shown that Lee does not teach or suggest the invention of Claim 33. Therefore, the Applicant respectfully asserts the rejection of Claim 35 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 33 and Claim 29.

Claim 48 is dependent from Claim 46 and contains all the limitations as Claim 46. Claim 48 adds the limitation that the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data. The Applicant has shown that Lee does not teach or suggest the invention of Claim 46. Therefore, the Applicant respectfully asserts the rejection of Claim 48 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 46 and Claim 29.

Claims 36 and 49. Claim 36 is dependent from Claim 35 and contains all the limitations as Claim 35. Claim 36 adds the step of utilizing the centralized server system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system. The Applicant has shown that Lee does not teach or suggest the invention of Claim 35. Therefore, the Applicant respectfully asserts the rejection of Claim 36 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 35 and Claim 29.

Claim 49 is dependent from Claim 48 and contains all the limitations as Claim 48. Claim 49 adds the limitation that the centralized server system is utilized to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server

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system. The Applicant has shown that Lee does not teach or suggest the invention of Claim 48. Therefore, the Applicant respectfully asserts the rejection of Claim 49 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 48 and Claim 29.

Claims 37 and 50. Claim 37 is dependent from Claim 29 and contains all the limitations as Claim 29. Claim 37 adds the limitation that the network is the Internet. The Applicant has shown that Lee does not teach or suggest the invention of Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 37 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 29.

Claim 50 is dependent from Claim 42 and contains all the limitations as Claim 42. Claim 50 adds the limitation that the network is the Internet. The Applicant has shown that Lee does not teach or suggest the invention of Claim 42. Therefore, the Applicant respectfully asserts the rejection of Claim 50 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 42 and Claim 29.

Claims 38 and 51. Claim 38 is dependent from Claim 29 and contains all the limitations as Claim 29. Claim 38 adds the step of managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources. The Applicant has shown that Lee does not teach or suggest the invention of Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 38 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 29.

Claim 51 is dependent from Claim 42 and contains all the limitations as Claim 42. Claim 51 adds the limitation that the storage resources are managed for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources. The Applicant has shown that Lee does not teach or suggest the invention of Claim 42. Therefore, the Applicant respectfully

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asserts the rejection of Claim 51 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 42 and Claim 29.

II. REJECTION UNDER 35 U.S.C. § 103(a)

The Examiner rejected Claims 39-41 and 52-54 under *35 U.S.C. § 103(a)* as being unpatentable over *Lee*.

To establish a *prima facie* case of obviousness, the Examiner must meet three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be some reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations.

Claims 39-41. The Examiner states that *Lee* teaches all the limitations of Claims 38 and 51. The Applicant asserts that *Lee* fails to teach the step of "configuring the client agent program to have a software-based NAS component to **assess** unused or under-utilized storage resources in selected distributed devices from the multiplicity distributed devices." in independent Claim 29. Thus, the Examiner failed to show that *Lee* teaches or suggest this step and thus fails to make a *prima facie* case of obviousness for Claim 38 that depends from Claim 29. The Examiner states that Lee fails to explicitly teach the method including the limitation of Claims 39, 40 and 41. However the Examiner takes "official notice" that the limitations of Claims 39, 40, and 41 are old and well known in the art without giving any support for this "official notice." Regardless of the "official notice", the Applicant asserts that the Examiners failure to make a *prima facie* case of obviousness for Claim 38 that depends from Claim 29 renders the "official notice" moot.

However, the Applicant reminds the Examiner that "official notice" without documentary evidence to support the Examiner's conclusion is permissible only in

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some circumstances. See MPEP 2144.03. Official notice unsupported by documentary evidence should only be taken by the Examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well known. Assertion of technical facts in areas of esoteric technology or an assertion of specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art. *In re Ahlert*, 424 F.2d at 1091, 165 USPQ at 420-421. See also *In re Grose*, 592 F.2d 1161, 1167-68, 201 USPQ 57, 63 (CCPA 1979).

The Examiner rejected Claims 52-54 or the same reasons as Claims 39-41. Therefore the Applicant asserts that the rejections of Claims 39-41 and Claims 52-54 under *35 U.S.C. § 103(a)* as being unpatentable over *Lee* are traversed by the above arguments.

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III. CONCLUSION

The Applicant has traversed the rejections of Claims 29-38 and Claims 42-51 under *35 U.S.C. § 102(e)* as being anticipated by *Lee*.

The Applicant has traversed the rejections of Claims 39-41 and 52-54 under *35 U.S.C. § 102(e)* as being unpatentable by *Lee* over the Examiners "Official Action".

The Applicant respectfully asserts that Claims 29-54 are in condition for allowance and request an early allowance of these claims.

Applicant respectfully requests that the Examiner call Applicant's attorney at the below listed number if the Examiner believes that such a discussion would be helpful in resolving any remaining problems.

Respectfully submitted,

WINSTEAD SECHREST & MINICK P.C.

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PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2000

Application or Docket Number: 09/724 799

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	39	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	26 minus 20=	* 6
INDEPENDENT CLAIMS	02 minus 3 =	* 0
MULTIPLE DEPENDENT CLAIM PRESENT		☐

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐			OR	OTHER THAN SMALL ENTITY	
RATE	FEE			RATE	FEE
BASIC FEE	355.00		OR	BASIC FEE	710.00
X$ 9=	351		OR	X$18=	702
X40=	360		OR	X80=	720
+135=			OR	+270=	
TOTAL	1,066		OR	TOTAL	2132

CLAIMS AS AMENDED - PART II

AMENDMENT A	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 26	Minus	** 59	= 0
Independent	* 2	Minus	*** 12	= 0
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

SMALL ENTITY			OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE			RATE	ADDITIONAL FEE
X$ 9=			OR	X$18=	
X40=			OR	X80=	
+135=			OR	+270=	
TOTAL ADDIT. FEE			OR	TOTAL ADDIT. FEE	

AMENDMENT B	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 26	Minus	** 59	= 0
Independent	* 2	Minus	*** 12	= 0
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE			RATE	ADDITIONAL FEE
X$ 9=			OR	X$18=	
X40=			OR	X80=	
+135=			OR	+270=	
TOTAL ADDIT. FEE			OR	TOTAL ADDIT. FEE	

AMENDMENT C	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE			RATE	ADDITIONAL FEE
X$ 9=			OR	X$18=	
X40=			OR	X80=	
+135=			OR	+270=	
TOTAL ADDIT. FEE			OR	TOTAL ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
***If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	UNTD:021	8392

29444 7590 08/16/2005

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ART UNIT	PAPER NUMBER
2157	

DATE MAILED: 08/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Advisory Action Before the Filing of an Appeal Brief	Application No. 09/834,785	Applicant(s) HUBBARD, EDWARD A.	
	Examiner Yves Dalencourt	Art Unit 2157	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 25 July 2005 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☐ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: *NONE*.
   Claim(s) objected to: *NONE*.
   Claim(s) rejected: *29-54*.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: the argued limitation of " configuring the client agent program to have a software-based NAS component to assess unused or under-utilized storage resources in selected distributed devices from the multiplicity distributed devices " is not discribed in the specification as claimed. Applicant discloses " In addition, incentives may be based upon the capabilities of the client systems, based upon a benchmark workload that provides a standardized assessment of the capabilities of the client systems, or based upon any other desired criteria. " in paragraphs [0076]. The examiner is unable to find where exactly such limitation is described in the specification.
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08 or PTO-1449) Paper No(s).
13. ☐ Other: _____.

ARIO ETIENNE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

OIPE
AUG 2 9 2005
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AF/2157
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PTO/SB/31 (09-04)
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NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Docket Number (Optional): 40988-P001P9

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on August 25, 2005

Signature: Beatrice Zepeda

Typed or printed name: Beatrice Zepeda

In re Application of: Edward A. Hubbard

Application Number	Filed
09/834,785	April 13, 2001

For: Software-Based Network Attached Storage....

Art Unit	Examiner
2157	Yves Dalencourt

Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the examiner.

The fee for this Notice of Appeal is (37 CFR 41.20(b)(1)) $ 500.00

☑ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is: $ 250.00

☑ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account. I have enclosed a duplicate copy of this sheet.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 23-2426(40988-P001P9) I have enclosed a duplicate copy of this sheet.

☑ A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

☑ attorney or agent of record. Registration number 47,573.

☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34. _____

Richard F. Frankeny
Signature

Richard F. Frankeny
Typed or printed name

512.370.2872
Telephone number

August 24, 2005
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 41.31. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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08/30/2005 NNGUYEN1 00000043 09834785

01 FC:2401 250.00 OP

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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) **FY 2005** *(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)*	Docket Number (Optional) 40988-P001P9
Application Number 09/834,785	Filed April 13, 2001
For Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing...	
Art Unit 2157	Examiner Yves Dalencourt

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	
☐	One month (37 CFR 1.17(a)(1))	$120	$60	$
☑	Two months (37 CFR 1.17(a)(2))	$450	$225	$ 225
☐	Three months (37 CFR 1.17(a)(3))	$1020	$510	$
☐	Four months (37 CFR 1.17(a)(4))	$1590	$795	$
☐	Five months (37 CFR 1.17(a)(5))	$2160	$1080	$

☑ Applicant claims small entity status. See 37 CFR 1.27.

☑ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 23-2426 (40988-P001P9) . I have enclosed a duplicate copy of this sheet.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☑ attorney or agent of record. Registration Number 47,573

☐ attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

Richard F. Frankeny — Signature

August 25, 2005 — Date

Richard F. Frankeny — Typed or printed name

512.370.2872 — Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission: 3

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Edward A. Hubbard
Art Unit	2157
Examiner Name	Yves Dalencouart
Attorney Docket Number	40988-P001P9

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☑ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☑ Other Enclosure(s) (please Identify below):
  (1) Petition For Extension of Time Under 37 CFR 1.136(a)
  (2) Return Postcard
  (3) Check in the amount of $475.00

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Winstead Sechrest & Minick P.C.		
Signature	Richard F. Frankeny		
Printed name	Richard F. Frankeny		
Date	August 24, 2005	Reg. No.	47,573

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature	Beatrice Zepeda		
Typed or printed name	Beatrice Zepeda	Date	August 25 2005

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: Edward A. Hubbard	:	Before the Examiner: Yves Dalencourt
Serial No.: 09/834,785	:	Group Art Unit: 2157
Filed: ~~April 1~~3, 2001	:	
Title: SOFTWARE BASED NETWORK ATTACHED STORAGE HOSTED ON MASSIVELY DISTRIBUTED COMPUTING NETWORKS	:	United Devices, Inc. 12675 Research, Bldg A Austin, Texas 78759

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

I. REAL PARTY-IN-INTEREST

The real party in interest is United Devices, Inc. who is the assignee of the entire right and interest in the present Application.

CERTIFICATION UNDER 37 C.F.R. § 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Mail Stop Appeal Brief-Patents, Commissioner for Patents, Alexandria, VA 22313-1450, on September 22, 2005.

Beatrice Zepeda
Signature

Beatrice Zepeda
(Printed name of person certifying)

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01 FC:2402 250.00 OP

II. RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences known to Appellants, the Appellants' legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 29-54 are pending in the Application. Claims 29-54 stand rejected.

IV. STATUS OF AMENDMENTS

No after Final amendments have been made.

V. SUMMARY OF THE INVENTION

In one embodiment a method providing network (FIG. 21, element 102) attached storage (NAS) services comprises four steps.

In step 1, a distributed processing system (FIG. 21, element 2100) is configured by coupling a multiplicity of distributed devices (FIG. 21, devices in element 2104) using a network (FIG. 21. element 102), wherein each of the distributed devices is enabled by a client agent program (operating in devices in element 2104) to process first workloads for the distributed processing system (FIG. 21, element 2100).

In step 2, the client agent program is configured to have a software-based NAS component to **assess** unused or under-utilized storage resources in selected distributed devices (NAS client devices 108A-108C) from the multiplicity distributed devices (FIG. 21, element 2104).

In step 3, a representation by the software-based NAS component is generated that the selected distributed devices are each NAS devices having an available

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amount of storage resources selected from the unused and under-utilized storage resources (identified from step 3).

In step 4, data storage and access workloads are processed for the distributed processing system by accessing data from or storing data into portions of the available amounts of storage resources of the selected distributed devices (FIG. 21, NAS client devices 108A-108C) to provide the NAS services to client devices (FIG. 21, user devices 152A-152C) coupled to the network (FIG. 21, element 102).

VI. ISSUES

1. Claims 29-38 and Claims 42-51 stand rejected under *35 U.S.C. §102(e)* as being anticipated by U.S. Patent 6,601,101 to *Lee et al.* hereafter (*Lee*).

2. Claims 39-41 and 52-54 stand rejected under *35 U.S.C. § 103(a)* as being unpatentable over *Lee*.

VII. ARGUMENT

1. Claims 29-38 and Claims 42-51 are not properly rejected under *35 U.S.C. §102(e)* as being anticipated by U.S. Patent 6,601,101 to *Lee et al.* hereafter (*Lee*).

Claims 29-30 and 42-43. Claim 29 is directed to a method providing network attached storage (NAS) services comprising four steps. In step 1, a distributed processing system is configured by coupling a multiplicity of distributed devices using a network, wherein each of the distributed devices is enabled by a client agent program to process first workloads for the distributed processing system. In step 2, the client agent program is configured to have a software-based NAS component to assess unused or under-utilized storage resources in selected distributed devices from the multiplicity distributed devices. In step 3, a representation by the software-based NAS component is generated that the selected distributed devices are each NAS

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devices having an available amount of storage resources selected from the unused and under-utilized storage resources. In step 4, data storage and access workloads are processed for the distributed processing system by accessing data from or storing data into portions of the available amounts of storage resources of the selected distributed devices to provide the NAS services to client devices coupled to the network.

The Applicant respectfully asserts that the Examiner, in his belief that Lee teaches the second step of the present invention, failed to see that the present invention recites the step "configuring the client agent program to have a software-based (NAS) component and to assess unused or under-utilized resources in the selected distributed devices." The Examiner stated that Lee teaches "configuring the client agent program to have a software-based (NAS) component and to access unused or under-utilized resources in the selected distributed devices." The present invention recites assessing (evaluate, judge, appraise) and not accessing (right of entry, admission). The present invention and the Examiner's assertion are clearly different. Therefore, the Examiner is relying upon an incorrect factual predicate in making his rejection. *In re Rouffet*, 47 U.S.P.Q. 2d 1453, 1455 (Fed. Cir. 1998).

The present invention is directed to configuring distributed devices coupled to a network (enabled by a client agent program to process workloads for the distributed processing system) and then configuring the client agent program to assess under or unutilized storage resources in the selected distributed devices from the distributed devices. Lee teaches the configuration of a network using dedicated NAS devices wherein access to the networked NAS devices is transparent to a user (the user does not need to know where his data is stored). The present invention configures a representation of NAS devices using distributed devices wherein the client agent assesses what unused storage resources are available in the selected distributed devices. Lee does not teach or suggest step 2) of the present invention.

Since Lee does not teach or suggest step 2) of the present invention, then Lee does not disclose every aspect of the present invention as required. Therefore, the

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Applicant asserts that the Examiner has failed to make a *prima facie* case of anticipation. Therefore, the Applicant respectfully asserts the rejection of Claim 29 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments.

Claim 30 depends from Claim 29 and contains all the limitations of Claim 29. The Examiner rejected Claims 30 using the same reasoning relative to Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 30 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 29.

Claim 42 is an apparatus claim implementing the method steps of Claim 29. The Examiner rejected Claim 42 for the same reasons as Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 42 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 29.

Claim 43 is dependent from Claim 42 and contains all the limitations as Claim 42. Claim 43 adds the same limitations to Claim 43 as Claim 30 adds to Claim 29. The Examiner rejected Claim 43 for the same reasons as Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 43 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 42 and Claim 29.

Claims 31 and 44. Claim 31 is dependent from Claim 29 and contains all the limitations as Claim 29. Claim 31 adds the limitation that at least one of the selected distributed devices is enabled by the client agent program to function as a location distributed device to store location information for data stored by the selected distributed devices. The Applicant has shown that Lee does not teach or suggest the invention of Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 31 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 29.

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Claim 44 is dependent from Claim 42 and contains all the limitations as Claim 42. Claim 44 adds the limitation that at least one of the selected distributed devices is enabled by the client agent program to function as a location distributed device to store location information for data stored by the selected distributed devices. The Applicant has shown that Lee does not teach or suggest the invention of Claim 42. Therefore, the Applicant respectfully asserts the rejection of Claim 44 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 42 and Claim 29.

Claims 32 and 45. Claim 32 is dependent from Claim 31 and contains all the limitations as Claim 31. Claim 32 adds the step of enabling the location distributed device to receive data storage and access requests from the client devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data. The Applicant has shown that Lee does not teach or suggest the invention of Claim 31. Therefore, the Applicant respectfully asserts the rejection of Claim 32 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 31 and Claim 29.

Claim 45 is dependent from Claim 44 and contains all the limitations as Claim 44. Claim 45 adds the limitation that the location distributed device is enabled to receive data storage and access requests from the client devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data. The Applicant has shown that Lee does not teach or suggest the invention of Claim 44. Therefore, the Applicant respectfully asserts the rejection of Claim 45 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 44 and Claim 29.

Claims 33 and 46. Claim 33 is dependent from Claim 32 and contains all the limitations as Claim 32. Claim 33 adds the step of managing the NAS services at least in part utilizing at least one centralized server system. The Applicant has shown that Lee does not teach or suggest the invention of Claim 32. Therefore, the

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Applicant respectfully asserts the rejection of Claim 33 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 32 and Claim 29.

Claim 46 is dependent from Claim 45 and contains all the limitations as Claim 45. Claim 46 adds the limitation that the NAS services are managed at least in part utilizing at least one centralized server system. The Applicant has shown that Lee does not teach or suggest the invention of Claim 45. Therefore, the Applicant respectfully asserts the rejection of Claim 46 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 45 and Claim 29.

Claims 34 and 47. Claim 34 is dependent from Claim 33 and contains all the limitations as Claim 33. Claim 34 adds limitation that the centralized server system downloads the NAS component to the client agent programs in the distributed devices. The Applicant has shown that Lee does not teach or suggest the invention of Claim 33. Therefore, the Applicant respectfully asserts the rejection of Claim 34 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 33 and Claim 29.

Claim 47 is dependent from Claim 46 and contains all the limitations as Claim 46. Claim 47 adds the limitation that the centralized server system downloads the NAS component to the client agent programs in the distributed devices. The Applicant has shown that Lee does not teach or suggest the invention of Claim 46. Therefore, the Applicant respectfully asserts the rejection of Claim 47 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 46 and Claim 29.

Claims 35 and 48. Claim 35 is dependent from Claim 33 and contains all the limitations as Claim 33. Claim 35 adds limitation that the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested

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data. The Applicant has shown that Lee does not teach or suggest the invention of Claim 33. Therefore, the Applicant respectfully asserts the rejection of Claim 35 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 33 and Claim 29.

Claim 48 is dependent from Claim 46 and contains all the limitations as Claim 46. Claim 48 adds the limitation that the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data. The Applicant has shown that Lee does not teach or suggest the invention of Claim 46. Therefore, the Applicant respectfully asserts the rejection of Claim 48 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 46 and Claim 29.

Claims 36 and 49. Claim 36 is dependent from Claim 35 and contains all the limitations as Claim 35. Claim 36 adds the step of utilizing the centralized server system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system. The Applicant has shown that Lee does not teach or suggest the invention of Claim 35. Therefore, the Applicant respectfully asserts the rejection of Claim 36 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 35 and Claim 29.

Claim 49 is dependent from Claim 48 and contains all the limitations as Claim 48. Claim 49 adds the limitation that the centralized server system is utilized to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server

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system. The Applicant has shown that Lee does not teach or suggest the invention of Claim 48. Therefore, the Applicant respectfully asserts the rejection of Claim 49 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 48 and Claim 29.

Claims 37 and 50. Claim 37 is dependent from Claim 29 and contains all the limitations as Claim 29. Claim 37 adds the limitation that the network is the Internet. The Applicant has shown that Lee does not teach or suggest the invention of Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 37 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 29.

Claim 50 is dependent from Claim 42 and contains all the limitations as Claim 42. Claim 50 adds the limitation that the network is the Internet. The Applicant has shown that Lee does not teach or suggest the invention of Claim 42. Therefore, the Applicant respectfully asserts the rejection of Claim 50 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 42 and Claim 29.

Claims 38 and 51. Claim 38 is dependent from Claim 29 and contains all the limitations as Claim 29. Claim 38 adds the step of managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources. The Applicant has shown that Lee does not teach or suggest the invention of Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 38 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 29.

Claim 51 is dependent from Claim 42 and contains all the limitations as Claim 42. Claim 51 adds the limitation that the storage resources are managed for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources. The Applicant has shown that Lee does not teach or suggest the invention of Claim 42. Therefore, the Applicant respectfully

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DATABRICKS EX1002 Page 334

asserts the rejection of Claim 51 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 42 and Claim 29.

2. Claims 39-41 and 52-54 are not properly rejected under *35 U.S.C. § 103(a)* as being unpatentable over *Lee*.

The Examiner states that *Lee* teaches all the limitations of Claims 38 and 51. The Applicant asserts that *Lee* fails to teach the step of "configuring the client agent program to have a software-based NAS component to assess unused or under-utilized storage resources in selected distributed devices from the multiplicity distributed devices." in independent Claim 29. Thus, the Examiner failed to show that *Lee* teaches or suggests this step and thus fails to make a *prima facie* case of obviousness for Claim 38 that depends from Claim 29. The Examiner states that *Lee* fails to explicitly teach the method including the limitation of Claims 39, 40 and 41. However, the Examiner takes "official notice" that the limitations of Claims 39, 40, and 41 are old and well known in the art without giving any support for this "official notice." Regardless of the "official notice", the Applicant asserts that the Examiner's failure to make a *prima facie* case of obviousness for Claim 38 that depends from Claim 29 renders the "official notice" moot.

However, the Applicant reminds the Examiner that "official notice" without documentary evidence to support the Examiner's conclusion is permissible only in some circumstances. See MPEP 2144.03. Official notice unsupported by documentary evidence should only be taken by the Examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well known. Assertion of technical facts in areas of esoteric technology or an assertion of specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art. *In re Ahlert*, 424 F.2d at 1091, 165 USPQ at 420-421. See also *In re Grose*, 592 F.2d 1161, 1167-68, 201 USPQ 57, 63 (CCPA 1979). The Applicant

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asserts that the cited limitations of Claims 39, 40, and 41 do not qualify as knowledge that is capable of instant and unquestionable demonstration as required by MPEP 2144.03.

The Examiner rejected Claims 52-54 or the same reasons as Claims 39-41. Therefore the Applicant asserts that the rejections of Claims 39-41 and Claims 52-54 under *35 U.S.C. § 103(a)* as being unpatentable over *Lee* are traversed by the above arguments.

Respectfully submitted,
WINSTEAD SECHREST & MINICK P.C.
Patent Agent and Attorney for Appellants

By: _____
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APPENDIX

29. A method providing network attached storage (NAS) services comprising:

configuring a distributed processing system by coupling a multiplicity of distributed devices using a network, wherein each of the distributed devices is enabled by a client agent program to process workloads for the distributed processing system;

configuring the client agent program to have a software-based NAS component to assess unused or under-utilized storage resources in selected distributed devices from the multiplicity distributed devices;

generating a representation by the software-based NAS component that the selected distributed devices are each NAS devices having an available amount of storage resources selected from the unused and under-utilized storage resources; and

processing data storage and access workloads for the distributed processing system by accessing data from or storing data into portions of the available amount of storage resources of the selected distributed devices to provide the NAS services to client devices coupled to the network.

30. The method of claim 29, wherein the client agent program enables at least one of the selected distributed devices to operate as a stand-alone dedicated NAS device.

31. The method of claim 29, wherein the client agent program enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

32. The method of claim 31, further comprising enabling the location distributed device to receive data storage and access requests from the client devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data.

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33. The method of claim 32, further comprising managing the NAS services at least in part utilizing at least one centralized server system.

34. The method of claim 33, wherein the centralized server system downloads the NAS component to the client agent programs in the distributed devices.

35. The method of claim 33, wherein the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data.

36. The method of claim 35, further comprising utilizing the centralized server system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system.

37. The method of claim 29, wherein the network is the Internet.

38. The method of claim 29, further comprising managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources.

39. The method of claim 38, wherein the storage priority control comprises a parameter selectable through one of the client devices.

40. The method of claim 39, wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion.

41. The method of claim 39, wherein the storage priority control comprises a priority marking directly given to data or files.

42. A system for providing network attached storage (NAS) services comprising:

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a distributed processing system configured by coupling a multiplicity of distributed devices using a network, wherein each of the multiplicity distributed devices are enabled by a client agent program to process workloads for the distributed processing system; and

a software-based NAS component operating within each of the client agent programs, wherein the software-based NAS component assesses unused storage resources of the multiplicity distributed devices, allocates an available amount of unused storage resources in selected distributed devices from the multiplicity distributed devices, generates a representation that the selected distributed devices are each NAS devices having the available amount of storage resources, and processes data storage and access workloads in the selected distributed devices for the distributed processing system by accessing data from and storing data into portions of each of the available amounts of unused storage resources in the selected distributed devices to provide the NAS services to client devices coupled to the network.

43. The system of claim 42, wherein the client agent program enables at least one of the selected distributed devices to operate as a stand-alone dedicated NAS devices.

44. The system of claim 42, wherein the client agent program enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

45. The system of claim 44, further comprising enabling the location distributed device to receive data storage and access requests from the client devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data.

46. The system of claim 45, further comprising managing the NAS services at least in part utilizing at least one centralized server system.

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47. The system of claim 46, wherein the centralized server system downloads the NAS component to the client agent programs in the distributed devices.

48. The system of claim 46, wherein the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data.

49. The system of claim 48, further comprising utilizing the centralized server system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system.

50. The system of claim 42, wherein the network is the Internet.

51. The system of claim 42, further comprising managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources.

52. The system of claim 51, wherein the storage priority control comprises a parameter selectable through one of the client devices.

53. The system of claim 52, wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion.

54. The system of claim 52, wherein the storage priority control comprises a priority marking directly given to data or files.

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OIPE IAP54 SEP 26 2005 PATENT & TRADEMARK OFFICE

AF JFW

PTO/SB/21 (09-04)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission: 17

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Edward A. Hubbard
Art Unit	2157
Examiner Name	Yves Dalencouart
Attorney Docket Number	40988-P001P9

ENCLOSURES *(Check all that apply)*

- [x] Fee Transmittal Form
  - [x] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
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- [ ] CD, Number of CD(s) _____
  - [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [x] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (please Identify below):
  (1) Return Postcard
  (2) Check in the amount of $250.00

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Winstead Sechrest & Minick P.C.		
Signature			
Printed name	Kelly K. Kordzik		
Date	September 22, 2005	Reg. No.	36,571

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature	Beatrice Zepeda		
Typed or printed name	Beatrice Zepeda	Date	September 22, 2005

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FEE TRANSMITTAL
For FY 2005

☑ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) **250.00**

Complete if Known	
Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Edward A. Hubbard
Examiner Name	Yves Dalencourt
Art Unit	2157
Attorney Docket No.	40988-P001P9

METHOD OF PAYMENT (check all that apply)

☑ Check ☐ Credit Card ☐ Money Order

☑ Deposit Account ☐ None

Deposit Account Number: 23-2426

Deposit Account Name: Winstead Sechrest & Minick P.C.

The Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below

☐ Charge fee(s) indicated below, **except for the filing fee**

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FEE CALCULATION

1. BASIC FILING FEE

Fee Description	Fee ($)	Small Entity Fee ($)	Fee Paid($)
Utility Filing Fee	790	395	
Design Filing Fee	350	175	
Plant Filing Fee	550	275	
Reissue Filing Fee	790	395	
Provisional Filing Fee	160	80	

Subtotal (1) $ _____

FEE CALCULATION (continued)

2. EXTRA CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20	50	25
Each independent claim over 3	200	100
Multiple dependent claims	360	180
For Reissues, each claim over 20 and more than in the original patent	50	25
For Reissues, each independent claim more than in the original patent	200	100

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
_____ - 20 or HP =	_____	x _____	= _____

HP = highest number of total claims paid for, if greater than 20

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
_____ - 3 or HP =	_____	x _____	= _____

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims	Fee ($)	Fee Paid ($)
	_____	_____

Subtotal (2) $ _____

3. OTHER FEES

Fee Description	Fee ($)	Small Entity Fee ($)	Fee Paid($)
1-month extension of time	120	60	
2-month extension of time	450	225	
3-month extension of time	1,020	510	
4-month extension of time	1,590	795	
5-month extension of time	2,160	1,080	
Information disclosure stmt. fee	180	180	
37 CFR 1.17(q) processing fee	50	50	
Non-English specification	130	130	
Notice of Appeal	500	250	
Filing a brief in support of appeal	500	250	250
Request for oral hearing	1,000	500	
Other: _____			

Subtotal (3) $ 250

SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 36.571	Telephone 512.370.2851
Name (Print/Type)	Kelly K. Kordzik		Date September 22, 2005

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Refine Search

Search Results -

Term	Documents
SAN	296800
SANS	3763
(15 AND SAN).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	21
(SAN AND L15).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	21

Database: US Pre-Grant Publication Full-Text Database; US Patents Full-Text Database; US OCR Full-Text Database; EPO Abstracts Database; JPO Abstracts Database; Derwent World Patents Index; IBM Technical Disclosure Bulletins

Search: L21

Refine Search | Recall Text | Clear | Interrupt

Search History

DATE: Friday, December 02, 2005 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR			
L21	san and L15	21	L21
L20	san and L16	17	L20
L19	l16 and L17	0	L19
L18	l15 and L17	0	L18
L17	provid$5 near3 storage near3 area	1832	L17
L16	location$1 and L9	50	L16
L15	location$1 and L13	52	L15
L14	l10 and L13	0	L14
L13	l7 and L12	53	L13

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DATABRICKS EX1002 Page 343

L12	709/223-226.ccls.	10651	L12
L11	l9 and L10	0	L11
L10	(determin$5 or provid$5)near3 storage near4 location	3201	L10
L9	l7 and L8	51	L9
L8	711/$.ccls.	27149	L8
L7	perform$5 near3 request$1 and L6	353	L7
L6	l4 and L5	1007	L6
L5	l1 and l2	229636	L5
L4	forward$5 near3 request$1 and L3	1923	L4
L3	allocat$5 near3 resource$1	26147	L3
L2	(control$4 or manag$3 or instruction$1 or command$1 or configur$3) adj (data or information)	320878	L2
L1	storage or (disk or tape) near4 drive$1 or memory or raid	3446989	L1

END OF SEARCH HISTORY

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DATABRICKS EX1002 Page 344

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	UNTD:021	8392

29444 7590 12/16/2005

KELLY K. KORDZIK
WINSTEAD SECHREST & MINICK P.C.
PO BOX 50784
DALLAS, TX 75201

EXAMINER	
DALENCOURT, YVES	
ART UNIT	**PAPER NUMBER**
2157	

DATE MAILED: 12/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	Yves Dalencourt	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

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DATABRICKS EX1002 Page 346

DETAILED ACTION

In view of the Appeal Brief filed 09/26/2005, PROSECUTION IS HEREBY REOPENED. New grounds of rejection set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

Claim Objections

Claim 42 is objected to because of the following informalities: It is suggested to delete " – " (claim 42, line 12). Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 29 and 42 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 29 and 42, the limitation of "configuring the client agent program to have a software-based (NAS) component and to assess unused or under-utilized resources in selected distributed devices from the multiplicity distributed devices " is not discribed in the specification as claimed. Applicant discloses " In addition, incentives may be based upon the capabilities of the client systems, based upon a benchmark workload that provides a standardized assessment of the capabilities of the client systems, or based upon any other desired criteria. " in paragraphs [0076]. The examiner is unable to find where exactly such limitation is described in the specification. Therefore, one skilled in the art would not how to make and/or use the invention as claimed.

Claims 30 – 41 and 43 – 54 are necessarily rejected as being dependent upon the rejection of claims 29 and 42.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

> invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 29 - 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US 6,601,101; hereinafter Lee) in view of Richter et al (US 2002/0194251 a1).

Regarding claims 29 – 30 and 42 - 43, Lee teaches a method and system for providing network attached storage (NAS) services (col. 1, lines 15 – 22), which comprises the steps of configuring a distributed processing system by coupling a multiplicity of distributed devices using a network, wherein each of the distributed devices is enabled by a client agent program to process workloads for the distributed processing system (col. 1, lines 24 - 41); generating a representation by the software-based NAS component that the selected distributed devices are each NAS devices having an available amount of storage resources selected from the unused and under-utilized storage resources (col. 2, lines 35 - 47); and processing data storage and access workloads for the distributed processing system by accessing data from or storing data into portions of the available amounts of storage resources of the selected distributed service to provide the NAS services to client devices coupled to the network (fig. 3; col. 6, line 61 through col. 7, line 58; col. 22, lines 12 - 30).

Lee teaches substantially all the limitations in claims 29 and 42, but fails to specifically teach the step of configuring the client agent program to have a software-based (NAS) component and to assess unused or under-utilized resources in selected distributed devices from the multiplicity distributed devices.

However, Richter teaches, in the same field of endeavor, systems and methods for resource usage accounting in information management environments, which

comprises teach the step of configuring the client agent program to have a software-based (NAS) component and to assess unused or under-utilized resources in selected distributed devices from the multiplicity distributed devices (paragraphs [0023], [0380], [0385]-[0387).

Thus, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to modify the teachings of Lee by incorporating the step of configuring the client agent program to have a software-based (NAS) component and to assess unused or under-utilized resources in selected distributed devices from the multiplicity distributed devices as evidenced by Richter for the purpose of tracking resource utilization in a network attached storage, thereby avoiding over/under utilization of one or more resources within the information management environment.

Regarding claims 31 and 44, Lee and Richter teach all the limitations in claims 29 and 42, and Lee further teaches that the client agent program enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices (col. 4, lines 39 - 65).

Regarding claims 32 and 45, Lee and Richter teach all the limitations in claims 31 and 44, and Lee further teaches the method and system of enabling the location distributed device to receive data storage and access requests from the client devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data (col. 7, lines 11 – 15; Lee discloses the first device

determines that another device in the cluster is better suited to handle the client request).

Regarding claims 33 and 46, Lee and Richter teach all the limitations in claims 31 and 44, and Lee further teaches the method and system of managing the NAS services at least in part utilizing at least one centralized server system (col. 4, lines 19 – 23; Lee discloses that it is particular useful when a server is a virtual IP address for multiple devices such as NAS).

Regarding claims 34 and 47, Lee and Richter teach all the limitations in claims 31 and 44, and Lee further teaches the method and system, wherein the centralized server system downloads the NAS component to the client agent programs in the distributed devices (col. 19, lines 37 – 50; Lee discloses a TCP handoff involves transferring TCP state information from the server to a disk).

Regarding claims 35 and 48 Lee and Richter teach all the limitations in claims 33 and 46, and Lee further teaches the method and system, wherein the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data (col. 7, lines 11 – 15; Lee discloses the first device determines that another device in the cluster is better suited to handle the client request).

Regarding claims 36 and 49, Lee teaches the method and system of claims 35 and 48, which further comprising utilizing the centralized server system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual

capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system ((col. 5, lines 4 – 17; col. 7, lines 35 – 58; col. 19, lines 15 – 67; col. 20, lines 1 – 26; Lee discloses load balancing, which refers to networked devices which can share a work load, for instance two or more servers).

Regarding claims 37 and 50, Lee teaches the method of claims 29 and 42, wherein the network is the Internet (col. 2, lines 22 – 35; col. 4, lines 32 – 35).

Regarding claims 38 and 51, Lee and Richter teach all the limitations in claims 31 and 44, and Lee further teaches the method and system, which further comprising managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources (col. 2, lines 7 – 19; col. 7, lines 35 – 58; Lee discloses that when the first device is a load balancing device, satisfactory measures for load balancing may include traffic through the switch, reported workload or available capacity of alternate devices, or analysis of the services being requested).

Regarding claims 39 – 41 and 52 - 54, Lee and Richter teach all the limitations in claims 29 and 42, and Richter further teaches the method and system, wherein the storage priority control comprises a parameter selectable through one of the client devices (paragraphs [0035], [0127], [0261], and [0367]); wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion (paragraphs [0035], [0127], [0261], and [0367]); and wherein the storage priority control

comprises a priority marking directly given to data or files (paragraphs [0035], [0127], [0261], and [0367]).

Thus, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to modify the teachings of Lee by incorporating the steps recited above for the purpose of employing deterministic information management, thereby providing higher overall multi-processing system performance efficiency

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Collins et al (US 20020188733) discloses a method and apparatus to manage transactions at a network storage device.

Clark et al (US Patent Number 4,987,533) discloses a method of managing data in a data storage hierarchy and a data storage hierarchy therefor with removal of the least recently mounted medium.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yves Dalencourt whose telephone number is (571) 272-3998. The examiner can normally be reached on M-TH 7:30AM - 6: 00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yves Dalencourt

December 2, 2005

Notice of References Cited	Application/Control No. 09/834,785	Applicant(s)/Patent Under Reexamination HUBBARD, EDWARD A.	
	Examiner Yves Dalencourt	Art Unit 2157	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2002/0194251	12-2002	Richter et al.	718/105
*	B	US-2002/0188733	12-2002	Collins et al.	709/229
*	C	US-4,987,533	01-1991	Clark et al.	707/204
	D	US-			
	E	US-			
	F	US-			
	G	US-			
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	J	US-			
	K	US-			
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes

Application/Control No.	Applicant(s)/Patent under Reexamination
09/834,785	HUBBARD, EDWARD A.
Examiner	**Art Unit**
Yves Dalencourt	2157

SEARCHED			
Class	Subclass	Date	Examiner
709	201	12/2/2005	YD
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707	204		
718	105		

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
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Index of Claims

Application/Control No.	Applicant(s)/Patent under Reexamination
09/834,785	HUBBARD, EDWARD A.
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Yves Dalencourt	2157

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
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OIPE IAP78 APR 18 2006 PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Edward A. Hubbard
Serial No.:	09/834,785
Filed:	April 13, 2001
Group Art Unit:	2157
Before the Examiner:	Yves Dalencourt
Title:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

AMENDMENT UNDER 37 C.F.R. § 1.116

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action having a mailing date of December 16, 2005 having a three-month shortened statutory period for response set to expire on March 16, 2006, and extended by a one month extension to April 16, 2006 by the petition and fee filed herewith, please reconsider the rejections of the claims in view of the following remark:

Listing of the Claims begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

CERTIFICATION UNDER 37 C.F.R. § 1.8

I hereby certify that this correspondence (along with any item referred to as being enclosed herewith) is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on 4-13, 2006.

Toni Stanley
Signature

Toni Stanley
(Printed name of person certifying)

IN THE CLAIMS

1-28 (canceled)

29. (previously presented) A method providing network attached storage (NAS) services comprising:

configuring a distributed processing system by coupling a multiplicity of distributed devices using a network, wherein each of the distributed devices is enabled by a client agent program to process workloads for the distributed processing system;

configuring the client agent program to have a software-based NAS component to assess unused or under-utilized storage resources in selected distributed devices from the multiplicity distributed devices;

generating a representation by the software-based NAS component that the selected distributed devices are each NAS devices having an available amount of storage resources selected from the unused and under-utilized storage resources; and

processing data storage and access workloads for the distributed processing system by accessing data from or storing data into portions of the available amount of storage resources of the selected distributed devices to provide the NAS services to client devices coupled to the network.

30. (previously presented) The method of claim 29, wherein the client agent program enables at least one of the selected distributed devices to operate as a stand-alone dedicated NAS device.

31. (previously presented) The method of claim 29, wherein the client agent program enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

32. (previously presented) The method of claim 31, further comprising enabling the location distributed device to receive data storage and access requests from the client

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devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data.

33. (previously presented) The method of claim 32, further comprising managing the NAS services at least in part utilizing at least one centralized server system.

34. (previously presented) The method of claim 33, wherein the centralized server system downloads the NAS component to the client agent programs in the distributed devices.

35. (previously presented) The method of claim 33, wherein the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data.

36. (previously presented) The method of claim 35, further comprising utilizing the centralized server system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system.

37. (previously presented) The method of claim 29, wherein the network is the Internet.

38. (previously presented) The method of claim 29, further comprising managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources.

39. (previously presented) The method of claim 38, wherein the storage priority control comprises a parameter selectable through one of the client devices.

40. (previously presented) The method of claim 39, wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion.

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41. (previously presented) The method of claim 39, wherein the storage priority control comprises a priority marking directly given to data or files.

42. (currently amended) A system for providing network attached storage (NAS) services comprising:

a distributed processing system configured by coupling a multiplicity of distributed devices using a network, wherein each of the multiplicity distributed devices are enabled by a client agent program to process workloads for the distributed processing system; and

a software-based NAS component operating within each of the client agent programs, wherein the software-based NAS component assesses unused storage resources of the multiplicity distributed devices, allocates an available amount of unused storage resources in selected distributed devices from the multiplicity distributed devices, generates a representation that the selected distributed devices are each NAS devices having the available amount of storage resources, and processes data storage and access workloads in the selected distributed devices[[-for]] for the distributed processing system by accessing data from and storing data into portions of each of the available amounts of unused storage resources in the selected distributed devices to provide the NAS services to client devices coupled to the network.

43. (previously presented) The system of claim 42, wherein the client agent program enables at least one of the selected distributed devices to operate as a stand-alone dedicated NAS devices.

44. (previously presented) The system of claim 42, wherein the client agent program enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

45. (previously presented) The system of claim 44, further comprising enabling the location distributed device to receive data storage and access requests from the client

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devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data.

46. (previously presented) The system of claim 45, further comprising managing the NAS services at least in part utilizing at least one centralized server system.

47. (previously presented) The system of claim 46, wherein the centralized server system downloads the NAS component to the client agent programs in the distributed devices.

48. (previously presented) The system of claim 46, wherein the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data.

49. (previously presented) The system of claim 48, further comprising utilizing the centralized server system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system.

50. (previously presented) The system of claim 42, wherein the network is the Internet.

51. (previously presented) The system of claim 42, further comprising managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources.

52. (previously presented) The system of claim 51, wherein the storage priority control comprises a parameter selectable through one of the client devices.

53. (previously presented) The system of claim 52, wherein the storage priority control comprises storage priority level schemes that prioritize data storage and deletion.

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54. (previously presented) The system of claim 52, wherein the storage priority control comprises a priority marking directly given to data or files.

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REMARKS

Claims 29-54 are rejected.

Claims 29-54 are pending.

Claim 42 was amended to correct an informality.

The Applicants respectfully assert that the amendments to Claim 42 and incorporated by reference in any claims depending there from, are not narrowing amendments made for a reason related to the statutory requirements for a patent that will give rise to prosecution history estoppel. *See Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 122 S. Ct. 1831, 1839-40, 62 U.S.P.Q.2d 1705, 1711-12 (2002); 234 F.3d 555, 566, 56 U.S.P.Q.2d 1865, 1870 (Fed. Cir. 2001).

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I. REJECTION UNDER 35 U.S.C. §112

The Examiner states that Claims 29 and 42 are rejected under *35 U.S.C. §112*, first paragraph as failing to comply with the written description requirement. The Examiner states that the limitation "configuring the client agent program to have a software-based NAS component to assess unused or under-utilized storage resources in selected distributed devices from the multiplicity distributed devices" is not described in the specification as claimed."

In the Specification, page 61, lines 13-21 is described how the distributed devices 108A-108C (See FIG. 21) "run client agent programs that configure the devices to be capable of mimicking dedicated stand-alone NAS devices. Each of these software-based NAS devices 108A-108C are actually non-dedicated devices that rely on spare and/or unused capabilities of the existing devices to provide NAS services." Since the client agent programs configure the devices to mimic NAS devices by relying on spare and/or unused capabilities of the existing devices, then it follows that the client agent programs must be capable of assessing what capabilities are spare and/or unused (unused or under utilized). The Applicant, therefore, asserts that even though the word "assess" was not specifically recited in this passage, it would have been obvious to one of ordinary skill in the art that the client agent programs must assess unused or under utilized capabilities for it to be able to configure the devices to mimic stand-alone NAS devices using their spare and/or unused capabilities. Assess means to judge, evaluate or appraise and is a descriptive term that describes the function of the client agent program used to configure a software-based NAS device using devices with spare and/or unused capabilities.

The specification, page 63, lines 16-33, further describes user specified constraints adhered to by the client agent program. These constraints may include settable parameters such as maximum allowable percentage of the devices existing storage space. The client agent program must assess storage space available with respect to these constraints. Also described is storage priority levels for handling

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storage and storage conflicts. When space is running low (assessment by client agent program) older and less important data or files may be deleted according to algorithms. Further recited are "file and data assessment and storage management schemes by the client agent program that may include but are not limited to" listed algorithms.

Claims 30-41 and 43-54 are rejected as being dependent from rejected Claims 29 and 42.

Therefore, the Applicant asserts that the assessment and the functionality of assessment by the client agent program is described in the specification. Therefore the Applicant asserts that the rejections of Claims 29-54 under *35 U.S.C. §112* are traversed by the above arguments and evidence from the specification of the present invention.

II. REJECTION UNDER 35 U.S.C. §103(a)

The Examiner rejected Claims 29-38 and Claims 42-51 under *35 U.S.C. §102(e)* as being unpatentable over U.S. Patent 6,601,101 to *Lee et al.* hereafter (*Lee*) in view of published U.S. Patent application U.S. 2002/0194251 a1 to *Richter et al.* hereafter (*Richter*).

To establish a *prima facie* case of obviousness, the Examiner must meet three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be some reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations.

Claims 29-30 and 42-43. Claim 29 is directed to a method providing network attached storage (NAS) services comprising four steps. In step 1, a distributed processing system is configured by coupling a multiplicity of distributed devices using a network, wherein each of the distributed devices is enabled by a client agent

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program to process first workloads for the distributed processing system. In step 2, the client agent program is configured to have a software-based NAS component to assess unused or under-utilized storage resources in selected distributed devices from the multiplicity distributed devices.

The Examiner admits that *Lee* does not teach step 2 of Claim 29. The invention of *Lee* is directed to providing "transparent" access to network attached storage devices. *Lee* is not directed to configuring a distributed processing system by coupling a multiplicity of distributed devices with a network and enabling each of the distributed devices with a client agent program to process workloads for the distributed processing system. *Lee* only recognizes that more and more representations of single devices actually comprise multiple networked connected devices (clusters) that function as a single device from a user interface perspective. *Lee* describes how access to such a device may be made transparent to a user and devices within the cluster may be added or subtracted without affecting the user interface. While *Lee* discusses NAS devices, *Lee* does not teach or suggest that each of his distributed devices are configured with client agent software to appear as a NAS device. *Lee* describes a different paradigm; he has a cluster of storage devices and he is concerned with how to make this cluster appear as a single storage device while keeping the ability to add or subtract devices in the cluster without affecting the user. *Lee* is not configuring a distributed processing system using distributed devices as recited in Claim 29. *Lee* does not enable his distributed devices with a client agent software so the distributed devices can process workloads for the distributed processing system. Further, there is no teaching or suggestion by *Lee* that his methods or system may be modified to arrive at the distributed processing system of Claim 29.

The Examiner cites *Richter* as teaching step 2 of Claim 29. *Richter* discloses systems and methods for the deterministic management of information, such as management of the delivery of content across a network that utilizes computing systems such as servers, switches and/or routers. *Richter* does not teach or suggest

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the concept of a client agent program having a NAS based component and assessing unused or under utilized resources in selected distributed devices as recited in Claim 29. To support his argument, the Examiner cites *Richter* paragraphs 0023, 0380, and 0385-0387. In paragraph 0023, *Richter* states that the "disclosed systems and methods may be implemented to achieve system level admission control via resource utilization assessment and prediction using an overload and policy finite state machine module that is also be capable of working with other system modules. Nowhere paragraph 0023 does *Richter* teach or suggest step 2 of Claim 29. In paragraph 0380, *Richter* discusses one implementation of his overload protection policy. In paragraphs 0385-0387, *Richter* discusses how his "resource usage accounting may be performed to track resource utilization for each individual subsystem or processing engine implemented by a requested information management task" and how his "overload and policy finite state machine module" may be implemented. Nowhere in these recitations does *Richter* teach or suggest the concept of a client agent program having a NAS based component and assessing unused or under utilized resources in selected distributed devices as recited in Claim 29.

Lee teaches how to make transparent access to a cluster system configured to look like a single device. *Richter* teaches system and method for resource usage accounting in information management. The Examiner admits that *Lee* does not teach all of the steps in Claim 29. The Applicant has shown that *Richter* does not teach or suggest the concept of a client agent program having a NAS based component and assessing unused or under utilized resources in selected distributed devices. Further, the Examiner has shown no motivation to combine the teachings of *Lee* and *Richter* save his statement that they are "in the same field of endeavor." The Applicant asserts that this is not true; *Lee* teaches transparent access to a cluster system configured to look like a single device and *Richter* teaches system and method for resource usage accounting in information management. Clearly, no one of

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ordinary skill in the art would think to combine these two references to arrive at the invention of Claim 29.

Therefore, the Applicant respectfully asserts the rejection of Claim 29 under *35 U.S.C. §103(a)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments.

Claim 30 depends from Claim 29 and contains all the limitations of Claim 29. The Examiner rejected Claims 30 using the same reasoning relative to Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 30 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claim 29.

Claim 42 is an apparatus claim implementing the method steps of Claim 29. The Examiner rejected Claim 42 for the same reasons as Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 42 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claim 29.

Claim 43 is dependent from Claim 42 and contains all the limitations as Claim 42. Claim 43 adds the same limitations to Claim 43 as Claim 30 adds to Claim 29. The Examiner rejected Claim 43 for the same reasons as Claim 29.

Therefore, the Applicant respectfully asserts the rejection of Claim 43 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claims 29 and 42.

Claims 31 and 44. Claim 31 is dependent from Claim 29 and contains all the limitations as Claim 29. The Applicant has shown that *Lee* and *Richter*, singly or in combination, do not teach or suggest the invention of Claim 29. Claim 31 adds the limitation that at least one of the selected distributed devices is enabled by the client agent program to function as a location distributed device to store location information for data stored by the selected distributed devices. The Examiner states

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that *Lee* teaches the limitation of Claim 31 and cites *Lee*, column 4, lines 39-65. The Examiner admitted that *Lee* does not teach or suggest the client agent program of Claim 29, therefore *Lee* cannot teach additional features of the client agent program.

Therefore, the Applicant respectfully asserts the rejection of Claim 31 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claims 29.

Claim 44 is dependent from Claim 42 and contains all the limitations as Claim 42. Claim 44 adds the limitation that at least one of the selected distributed devices is enabled by the client agent program to function as a location distributed device to store location information for data stored by the selected distributed devices. The Applicant has shown that *Lee* and *Richter*, singly or in combination, do not teach or suggest the invention of Claim 42.

Therefore, the Applicant respectfully asserts the rejection of Claim 44 under *35 U.S.C. §102(e)* as being anticipated by *Lee* is traversed by the above arguments and for the same reasons as Claim 42 and Claim 29.

Claims 32 and 45. Claim 32 is dependent from Claim 31 and contains all the limitations as Claim 31. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 31. Claim 32 adds the step of enabling the location distributed device to receive data storage and access requests from the client devices coupled to the network and to direct the client devices to the selected distributed devices storing the requested data.

Therefore, the Applicant respectfully asserts the rejection of Claim 32 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claims 29 and 31.

Claim 45 is dependent from Claim 44 and contains all the limitations as Claim 44. Claim 45 adds the limitation that the location distributed device is enabled to receive data storage and access requests from the client devices coupled to the

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network and to direct the client devices to the selected distributed devices storing the requested data. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 44. Therefore, the Applicant respectfully asserts the rejection of Claim 45 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claims 42 and 44.

Claims 33 and 46. Claim 33 is dependent from Claim 32 and contains all the limitations as Claim 32. Claim 33 adds the step of managing the NAS services at least in part utilizing at least one centralized server system. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 32. Therefore, the Applicant respectfully asserts the rejection of Claim 33 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claims 29 and 32.

Claim 46 is dependent from Claim 45 and contains all the limitations as Claim 45. Claim 46 adds the limitation that the NAS services are managed at least in part utilizing at least one centralized server system. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 45. Therefore, the Applicant respectfully asserts the rejection of Claim 46 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claims 42 and 45.

Claims 34 and 47. Claim 34 is dependent from Claim 33 and contains all the limitations as Claim 33. Claim 34 adds limitation that the centralized server system downloads the NAS component to the client agent programs in the distributed devices. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 33. Therefore, the Applicant respectfully asserts the rejection of Claim 34 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claims 29 and 33.

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Claim 47 is dependent from Claim 46 and contains all the limitations as Claim 46. Claim 47 adds the limitation that the centralized server system downloads the NAS component to the client agent programs in the distributed devices. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 46. Therefore, the Applicant respectfully asserts the rejection of Claim 47 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claims 42 and 46.

Claims 35 and 48. Claim 35 is dependent from Claim 33 and contains all the limitations as Claim 33. Claim 35 adds limitation that the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 33. Therefore, the Applicant respectfully asserts the rejection of Claim 35 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claims 29 and 33.

Claim 48 is dependent from Claim 46 and contains all the limitations as Claim 46. Claim 48 adds the limitation that the centralized server system stores location information for data stored in the selected distributed devices and at least in part directs the client devices to the distributed devices storing the requested data. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 46. Therefore, the Applicant respectfully asserts the rejection of Claim 48 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claims 42 and 46.

Claims 36 and 49. Claim 36 is dependent from Claim 35 and contains all the limitations as Claim 35. Claim 36 adds the step of utilizing the centralized server

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system to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 35. Therefore, the Applicant respectfully asserts the rejection of Claim 36 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claims 29 and 35.

Claim 49 is dependent from Claim 48 and contains all the limitations as Claim 48. Claim 49 adds the limitation that the centralized server system is utilized to receive data storage and access requests from the client devices and to route data storage and access workloads to the selected distributed devices based in part upon individual capabilities of the selected distributed devices, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 48. Therefore, the Applicant respectfully asserts the rejection of Claim 49 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claims 42 and 48.

Claims 37 and 50. Claim 37 is dependent from Claim 29 and contains all the limitations as Claim 29. Claim 37 adds the limitation that the network is the Internet. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 37 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claim 29.

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Claim 50 is dependent from Claim 42 and contains all the limitations as Claim 42. Claim 50 adds the limitation that the network is the Internet. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 42. Therefore, the Applicant respectfully asserts the rejection of Claim 50 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claim 42.

Claims 38 and 51. Claim 38 is dependent from Claim 29 and contains all the limitations as Claim 29. Claim 38 adds the step of managing storage resources for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 29. Therefore, the Applicant respectfully asserts the rejection of Claim 38 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claim 29.

Claim 51 is dependent from Claim 42 and contains all the limitations as Claim 42. Claim 51 adds the limitation that the storage resources are managed for the selected distributed devices using a storage priority control that facilitates full use of the available amounts of storage resources. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 42. Therefore, the Applicant respectfully asserts the rejection of Claim 51 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claim 42.

Claims 39-41 and Claims 52-54. Claim 39 is dependent from Claim 38 and contains all the limitations as Claim 38. Claim 39 adds the limitation that the storage priority control comprises a parameter selectable through one of the client devices. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 29 and thus Claim 39 that depends from Claim 29. The Examiner states that Richter teaches the limitation of Claim 39 and cites four

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paragraphs of Richter without specifically pointing out where Richter teaches the limitation of storage priority control recited in Claim 39. Therefore the Applicant asserts that the Examiner has failed to make a prima facie case of obviousness for rejecting Claim 39. Therefore, the Applicant respectfully asserts the rejection of Claim 39 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claim 29.

Claim 52 is dependent from Claim 51 and contains all the limitations as Claim 51. Claim 52 adds the same limitation to Claim 51 that Claim 39 adds to Claim 38. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 39. The Examiner rejected Claim 52 for the same reasons as Claim 39. Therefore, the Applicant respectfully asserts the rejection of Claim 52 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claim 39.

Claim 40 is dependent from Claim 39 and contains all the limitations as Claim 39. Claim 40 adds the limitation that the storage priority control comprises storage priority level schemes that prioritize data storage and deletion. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 39. The Examiner states that Richter teaches the limitation of Claim 40 and cites four paragraphs of Richter without specifically pointing out where Richter teaches the limitation of storage priority control recited in Claim 40. Therefore the Applicant asserts that the Examiner has failed to make a prima facie case of obviousness for rejecting Claim 40. Therefore, the Applicant respectfully asserts the rejection of Claim 40 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claim 39.

Claim 53 is dependent from Claim 52 and contains all the limitations as Claim 52. Claim 53 adds the same limitation to Claim 52 that Claim 40 adds to Claim 39. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach

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or suggest the invention of Claim 40. The Examiner rejected Claim 53 for the same reasons as Claim 40. Therefore, the Applicant respectfully asserts the rejection of Claim 53 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claim 40.

Claim 41 is dependent from Claim 39 and contains all the limitations as Claim 39. Claim 41 adds the limitation that the storage priority control comprises a priority marking directly given to data or files. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 39. The Examiner states that Richter teaches the limitation of Claim 41 and cites four paragraphs of Richter without specifically pointing out where Richter teaches the limitation of storage priority control recited in Claim 41. Therefore the Applicant asserts that the Examiner has failed to make a prima facie case of obviousness for rejecting Claim 41. Therefore, the Applicant respectfully asserts the rejection of Claim 41 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claim 39.

Claim 54 is dependent from Claim 52 and contains all the limitations as Claim 52. Claim 54 adds the same limitation to Claim 52 that Claim 41 adds to Claim 39. The Applicant has shown that *Lee* and *Richter*, singly or in combination do not teach or suggest the invention of Claim 41. The Examiner rejected Claim 54 for the same reasons as Claim 41. Therefore, the Applicant respectfully asserts the rejection of Claim 54 under *35 U.S.C. §103(b)* as being unpatentable over *Lee* in view of *Richter* is traversed by the above arguments and for the same reasons as Claim 41.

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III. CONCLUSION

The Applicant has traversed the rejections of Claims 29-54 under *35 U.S.C. § 112* first paragraph as failing to comply with the written description requirement.

The Applicant has traversed the rejections of Claims 29-54 under *35 U.S.C. § 103(a)* as being unpatentable over *Lee* in view of *Richter*.

The Applicant respectfully asserts that Claims 29-54 are in condition for allowance and request an early allowance of these claims.

Applicant respectfully requests that the Examiner call Applicant's attorney at the below listed number if the Examiner believes that such a discussion would be helpful in resolving any remaining problems.

Respectfully submitted,

WINSTEAD SECHREST & MINICK P.C.

Patent Agent and Attorney for Applicant

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Application Number	09/834,785
Filing Date	04/13/2001
First Named Inventor	Edward A. Hubbard
Art Unit	2157
Examiner Name	Yves Dalencourt
Attorney Docket Number	40988-P001P9

ENCLOSURES *(Check all that apply)*

- [x] Fee Transmittal Form
  - [x] Fee Attached
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  - [x] After Final
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Signature	Richard F. Frankeny		
Printed name	Richard F. Frankeny		
Date	04/13/2006	Reg. No.	47,573

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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2005 *(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)*	Docket Number (Optional) 40988-P001P9
Application Number 09/834,785	Filed April 13, 2001
For Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing...	
Art Unit 2157	Examiner Yves Dalencourt

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

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☑ Applicant claims small entity status. See 37 CFR 1.27.

☑ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

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☐ assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☑ attorney or agent of record. Registration Number 47,573

☐ attorney or agent under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____

Richard F. Frankeny
Signature

04/13/2006
Date

Richard F. Frankeny
Typed or printed name

512.370.2872
Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

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(ACCESS$5 NEAR3 (UNUSE$3 OR UNDER NEAR3 UTILIZ$3) NEAR3 STORAGE NEAR3 RESOURCE$1).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	0

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L11	l4 and L9	4945	L11
L10	l3 and L9	3839	L10
L9	l1 and l2	32985	L9
L8	(709/201,202,205,212,216.ccls. or 719/317.ccls.) and (distribut$3 and storage)	2922	L8
L7	(process$3 and access$3) near3 workload$1 and client near3 agent near3 program$1	4	L7
L6	(process$3 and access$3) near3 workload$1 same client near3 agent near3 program$1	0	L6
L5	perform$3 near3 request$1	31718	L5

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L4	(control$3 or manag$3 or instruction$1 or command$1 or configur$3)adj (data or information)	337880	L4
L3	(control$3 or manag$3 or instruction$1 or command$1 or configur$3)adj (data or infomation)	227726	L3
L2	dedicat$3 near3 network near3 attach$3 near3 storage$1 or (nas)	493982	L2
L1	(storage or disk$1 or tape$1) near3 driver$1 or memory or raid	1872309	L1

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ART UNIT	PAPER NUMBER
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DATE MAILED: 07/25/2006

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	UNTD:021	8392

TITLE OF INVENTION: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1400	$300	$0	$1700	10/25/2006

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	UNTD:021	8392

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APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1400	$300	$0	$1700	10/25/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
DALENCOURT, YVES	2157	709-203000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____ 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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DATABRICKS EX1002 Page 386

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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Address: COMMISSIONER FOR PATENTS
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	UNTD:021	8392

29444 7590 07/25/2006

WINSTEAD SECHREST & MINICK P.C.
PO BOX 50784
DALLAS, TX 75201

EXAMINER	
DALENCOURT, YVES	
ART UNIT	PAPER NUMBER
2157	

DATE MAILED: 07/25/2006

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 706 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 706 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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DATABRICKS EX1002 Page 387

Notice of Allowability	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	Yves Dalencourt	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment filed on 04/18/2006*.

2. ☒ The allowed claim(s) is/are *29-54*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Dslencourt
Primary Examiner

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DATABRICKS EX1002 Page 388

Issue Classification	Application/Control No.	Applicant(s)/Patent under Reexamination
	09/834,785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	Yves Dalencourt	2157

ISSUE CLASSIFICATION

ORIGINAL CLASS	ORIGINAL SUBCLASS	CLASS	CROSS REFERENCE(S) SUBCLASS (ONE SUBCLASS PER BLOCK)						
709	203	709	201	202	205	212	223	226	229
INTERNATIONAL CLASSIFICATION		719	317						
G 0 6 F	15/16								
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	/								

(Assistant Examiner) (Date)

(Legal Instruments Examiner) (Date) 7-12-06

YVES DALENCOURT 07/09/06

(Primary Examiner) (Date)

Total Claims Allowed: 26

O.G. Print Claim(s)	O.G. Print Fig.
1	19

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1	3	31		61		91		121		151		181
	2	4	32		62		92		122		152		182
	3	5	33		63		93		123		153		183
	4	6	34		64		94		124		154		184
	5	7	35		65		95		125		155		185
	6	8	36		66		96		126		156		186
	7	9	37		67		97		127		157		187
	8	10	38		68		98		128		158		188
	9	11	39		69		99		129		159		189
	10	12	40		70		100		130		160		190
	11	13	41		71		101		131		161		191
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	16	18	46		76		106		136		166		196
	17	19	47		77		107		137		167		197
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1	29		59		89		119		149		179		209
2	30		60		90		120		150		180		210

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Search Notes

Application/Control No.	Applicant(s)/Patent under Reexamination	
09/834,785	HUBBARD, EDWARD A.	
Examiner	**Art Unit**	
Yves Dalencourt	2157	

SEARCHED			
Class	Subclass	Date	Examiner

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner
WEST (updated text search)		7/9/2006	YD

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
WEST (updated text search)	6/10/2006	YD
WEST (updated text search)	7/8/2006	YD
IEEE Xplore	7/9/2006	YD

Index of Claims

Application/Control No.	Applicant(s)/Patent under Reexamination
09/834,785	HUBBARD, EDWARD A.
Examiner	**Art Unit**
Yves Dalencourt	2157

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

Claim		Date
Final	Original	7/9/06
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Claim		Date
Final	Original	7/9/06
23	51	=
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Claim		Date
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Patent Application for

SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

Inventors: Edward A. Hubbard

This application is a continuation-in-part application of the following co-pending applications: Application SN 09/538,543 entitled "DISTRIBUTED PARALLEL PROCESSING SYSTEM HAVING CAPABILITY-BASED INCENTIVES AND ASSOCIATED METHOD," Application SN 09/539,023 entitled "SWEEPSTAKES INCENTIVE MODEL AND ASSOCIATED SYSTEM," Application SN 09/539,448, entitled "CAPABILITY-BASED DISTRIBUTED PARALLEL PROCESING SYSTEM AND ASSOCIATED METHOD," Application SN 09/539,428 entitled "METHOD OF MANAGING DISTRIBUTED WORKLOADS AND ASSOCIATED SYSTEM," Application SN 09/539,106 entitled "NETWORK SITE TESTING METHOD AND ASSOCIATED SYSTEM," Application SN 09/538,542 entitled "NETWORK SITE CONTENT INDEXING METHOD AND ASSOCIATED SYSTEM," and Application SN 09/539,107 entitled "DISTRIBUTED BACK-UP SYSTEM AND ASSOCIATED METHOD," each of which was filed on March 30, 2000, and each of which is hereby incorporated by reference in its entirety.

This application is also a continuation-in-part application of the following co-pending applications: Application SN 09/603,740 entitled "METHOD OF MANAGING WORKLOADS AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," Application SN 09/602,789 entitled "MACHINE GENERATED SWEEPSTAKES ENTRY MODEL AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," Application SN 09/602,803 entitled "DATA SHARING AND FILE DISTRIBUTION METHOD AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," Application SN 09/602,844. entitled "DATA CONVERSION SERVICES AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," and Application SN 09/602,983 entitled "CUSTOMER SERVICES AND ADVERTISING BASED UPON DEVICE ATTRIBUTES AND ASSOCIATED DISTRIBUTED PROCESSING SYSTEM," each of which was filed on June 23, 2000, and each of which is hereby incorporated by reference in its entirety.

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DATABRICKS EX1002 Page 392

This application is also a continuation-in-part application of the following co-pending application: Application SN 09/648,832 entitled "SECURITY ARCHITECTURE FOR DISTRIBUTED PROCESSING SYSTEMS AND ASSOCIATED METHOD," which was filed on August 25, 2000, and which is hereby incorporated by reference in its entirety.

This application is also a continuation-in-part application of the following co-pending application: Application SN 09/794,969 entitled "SYSTEM AND METHOD FOR MONITIZING NETWORK CONNECTED USER BASES UTILIZING DISTRIBUTED PROCESSING SYSTEMS," which was filed on February 27, 2001, and which is hereby incorporated by reference in its entirety.

Technical Field of the Invention

This invention relates to distributed processing and more particularly to techniques and related methods for managing, facilitating and implementing distributed processing in a network environment.

Background

The NAS (Network Attached Storage) market is currently one of the fastest growing segments of the overall storage market. NAS devices typically take the form of stand-alone devices or systems that contain their own storage, processing, connectivity and management resources. Through these internal capabilities, the NAS device becomes a storage resource that connects to any network enabling many devices on the network to share data via the NAS device.

A NAS device is a term that is often used to refer to a specialized file server that connects to the network to provide storage capacity to network-connected users. NAS devices typically contain a slimmed-down (micro-kernel) operating system and file system. NAS devices often process only input/output (I/O) requests by supporting popular file sharing protocols such as NFS (UNIX) and SMB (DOS/Windows). NAS devices also typically use traditional LAN protocols such as Ethernet and TCP/IP to communicate over the network. Some general-purpose computers using full-blown operating systems such as Windows or UNIX are often labeled as NAS products because they can provide storage that is attached to a network. However, a pure NAS device is one built from scratch as a dedicated file I/O device. As used herein, the term "NAS device" broadly refers to a device that makes data storage resources available to network-connected user devices. A "dedicated NAS device" is a device whose primary operational purpose is for providing NAS services.

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IN THE SPECIFICATION

JDK 8/31

Please replace the paragraph beginning on page 60, line 22 with the following:

Looking now to FIG. 21, the NAS embodiment 2100 includes a network 102, which as discussed above, can be any network communication fabric that provides connectivity between various machines. As shown, connected to this network 102 are a user device fabric 2102, a client device fabric 2104, and servers systems 104 and 154D. More particularly, the user device fabric 2102 may include any number of potential user devices 152A, 152B ... 152C. The client device fabric 2104 may include any number of potential client devices 108A, 108B ... 108C. It is noted that ~~that~~ the user devices 152A, 152B ... 152C may be configured to communicate directly to each other, the client devices 108A, 108B ... 108C may be configured to communicate directly to each other, and the user devices 152A, 152B ... 152C and the client devices 108A, 108B ... 108C may be configured to communicate directly between themselves without intervention by the server systems, if desired. The server systems may include user server systems 154D, which have attached database systems 2112, and NAS server systems 104, which have attached NAS database systems 2108 and a centralized data location library 2110. To provide NAS functionality, the client devices 108A, 108B ... 108C run a client agent, as described above, that provides NAS functionality, for example, by running a NAS component as one of the projects for the distributed device. In addition, some of these NAS devices, such as NAS client devices 108A and 108B, may store distributed data location information, such as data location libraries 2106A and 2106B.

Please replace the paragraph beginning on page 61, line 6 with the following:

The NAS distributing computing embodiment 2100 depicted provides an environment in which a variety of different NAS configurations may be utilized, as desired. These configurations include, for example, at least three different NAS architectures that may be utilized: a stand-alone only NAS device implementation, a NAS device fabric implementation, and a server assisted implementation. It is noted

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DATABRICKS EX1002 Page 394

Form PTO-1449 (modified)	Atty. Docket No. UNTD:021	Serial No. 09/834,785
List of Patents and Publications for Applicant's INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	Applicant Edward A. Hubbard	
	Filing Date: April 13, 2001	Group: ~~2152~~ 2157

OIPE JC1550 JUN 12 2003 PATENT & TRADEMARK OFFICE

U.S. Patent Documents	Foreign Patent Documents	Other Art
See Page 1	*See Page N/A*	*See Page 1*

U.S. Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Name	Class	Sub Class	Filing Date if App.
Y.D	A58	6,418,462	7/9/02	Xu	709	201	
Y.D	A59	6,463,457	10/8/02	Armentrout et al.	709	201	

Foreign Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Country	Class	Sub Class	Translation Yes/No

Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)

Exam. Init.	Ref. Des.	Citation
Y.D	C34	Regev, Ori; Economic Oriented CPU Sharing System for the Internet; Master of Science in Computer Science thesis; Institute of Computer Science; The Hebrew University of Jerusalem; July, 1998
Y.D	C35	May, Michael; Idle Computing Resources as Micro-Currencies – Bartering CPU Time for Online Content; AACE WebNet99; Oct. 25-30, 1999
Y.D	C36	May, Michael; Distributed RC5 Decryption as a Consumer for Idle – Time Brokerage; DCW99 Workshop on Distributed Computer on the Web; June 21-23, 1999
Y.D	C37	May, Michael; Locust – A Brokerage System for Accessing Idle Resources for Web-Computing; Proceedings of the 25th Euromicro Conference; Vol. 2, pp. 466-473; September 8-10, 1999
Y.D	C38	Huberman, Bernardo A., et al.; Distributed Computation as an Economic System; Journal of Economic Perspectives; Vol. 9, No. 1; pp. 141-152; Winter 1995

RECEIVED
JUN 13 2003
Technology Center 2100

Examiner: D. Alcover	Date Considered: 8/13/04

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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DATABRICKS EX1002 Page 395

OIPE
JUN 12 2003
PATENT & TRADEMARK OFFICE

Please type a plus sign (+) inside this box → [+]

PTO/SB/08A (08-00)

Substitute for form 1449B/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 2 of 2

Complete if Known	
Application Number	09/844,271
Filing Date	April 30, 2001
First Named Inventor	THEKKATH
Group Art Unit	~~2122~~ 2157
Examiner Name	Unassigned
Attorney Docket Number	MTEC-007/00US (0124.00US)

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
Y.D	C1	MIPS64 5Kc™ Processor Core Datasheet, Revision 1.7.4, pp1-40, December 14, 1999	
	C2	MIPS64 5Kc™ Processor Core Datasheet, Revision 1.7.5, pp1-40, August 11, 2000	
	C3	MIPS64 5Kc™ Processor Core Datasheet, Revision 2.0, pp1-44, August 28, 2000	
	C4	MIPS64™ 5Kf™ Processor Core Datasheet, Revision 00.11, pp1-44, March 30, 2001	
Y.D	C5	MIPS64 5Kc™ Processor Core Software User's Manual, Revision 2.2, pp1-580, August 11, 2000	

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JUN 12 2003
Technology Center 2100

Examiner Signature		Date Considered	8/13/04

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] Unique citation designation number.
[2] Applicant is to place a check mark here if English language Translation attached.

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DATABRICKS EX1002 Page 396

OIPE
FEB 21 2003
PATENT & TRADEMARK OFFICE

Form PTO-1449 (modified)

List of Patents and Publications for Applicant's

INFORMATION DISCLOSURE STATEMENT

(Use several sheets if necessary)

Atty. Docket No.	Serial No.
UNTD:021	09/834,785
Applicant	
Edward A. Hubbard	
Filing Date:	**Group:**
April 13, 2001	~~2152~~ 2157

RECEIVED
FEB 27 2003
Technology Center 2100

U.S. Patent Documents	Foreign Patent Documents	Other Art
See Page 1	*See Page 1*	*See Page 1-2*

U.S. Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Name	Class	Sub Class	Filing Date if App.
Y.D	A44	5,893,075	4/6/99	Plainfield et al.	705	14	
	A45	5,887,143	3/23/99	Saito et al.	~~395~~ 709	~~200~~ 248	
	A46	5,768,504	6/16/98	Kells et al.	~~395~~ 713	~~187.01~~ 201	
	A47	5,842,219	11/24/98	High, Jr. et al.	707	103R	
	A48	6,374,254	4/16/02	Cochran et al.	707	102	
Y.D	A49	5,402,394	3/28/95	Turski	368	10	

Foreign Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Country	Class	Sub Class	Translation Yes/No
Y.D	B1	01/73545	4 OCT 01	WO			English
Y.D	B2	01/14961	1 MAR 01	WO			English

Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)

Exam. Init.	Ref. Des.	Citation
Y.D	C26	distributed.net: The fastest computer on Earth: Feb 08, 1999, http://web.archive.org/web/19990221230053/http://distributed
	C27	London et al., "POPCORN - A Paradigm for Global-Computing", THESIS UNIVERSITY JERUSALEM, June 1998 (1998-06)
	C28	Takagi H. et al., "Ninflet: a migratable parallel objects framework using Java", JAVA FOR HIGH-PERFORMANCE NETWORK COMPUTING, Syracuse, NY, USA, 2/1998, Vol. 10, No. 11-13, pp 1063-1078.
Y.D	C29	Waldspurger, C.A. et al., "Spawn: a distributed computational economy" IEEE TRANSACTIONS ON SOFTWARE ENGINEERING, IEEE INC., NY, US, 2/1992, Vol. 18, No. 2, pp. 103-117

Examiner: Dale Rowan | **Date Considered:** 8/13/04

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Information Disclosure Statement — PTO-1449 (Modified)

O-I P-E JC
FEB 21 2003
PATENT & TRADEMARK OFFICE

Form PTO-1449 (modified)

List of Patents and Publications for Applicant's

INFORMATION DISCLOSURE STATEMENT

(Use several sheets if necessary)

Atty. Docket No.	Serial No.
UNTD:021	09/834,785
Applicant	
Edward A. Hubbard	
Filing Date:	**Group:**
April 13, 2001	2152

U.S. Patent Documents	Foreign Patent Documents	Other Art
See Page 1	*See Page 1*	*See Page 1-2*

Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)

Exam. Init.	Ref. Des.	Citation
Y.D	C30	Neary, M. O., et al., "Javelin: Parallel computing on the internet" FUTURE GENERATIONS COMPUTER SYSTEMS, ELSEVIER SCIENCE PUBLISHERS, Amsterdam, NL, 10/1999, Vol. 15, no. 5-6, pp. 661-664
Y.D	C31	Foster, Ian et al., "The Physiology of the Grid," This is a DRAFT document and continues to be revised. Version 2/17/2002
Y.D	C32	Douceur, John R. et al., "A Large-Scale Study of File-System Contents," Microsoft Research, Redmond, WA 98052, May 1999
Y.D	C33	Bolosky, William J. et al., "Feasibility of a Serverless Distributed File System Deployed on an Existing Set of Desktop PCs," Microsoft Research, Redmond, WA 98052, June 2000

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Technology Center 2100

Examiner: Dalexova | **Date Considered:** 8/13/04

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

IPR2025-00716
DATABRICKS EX1002 Page 398

Form PTO-1449 (modified)	Atty. Docket No. UNTD:021	Serial No. 09/834,785
List of Patents and Publications for Applicant's INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	Applicant EDWARD A. HUBBARD	
	Filing Date: April 13, 2001	Group: ~~2152~~ 2157

OIPE JAN 08 2002 PATENT & TRADEMARK OFFICE

U.S. Patent Documents	Foreign Patent Documents	Other Art
See Pages 1-2	*N/A*	*See Page 3-5*

U.S. Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Name	Class	Sub Class	Filing Date if App.
Y.D	A1	4,669,730	06/02/87	Small	~~273~~	~~138~~	
	A2	4,815,741	03/28/89	Small	273	138	
	A3	5,056,019	10/08/91	Schultz et al.	364	405	
	A4	5,332,218	07/26/94	Lucey	273	138	
	A5	5,483,444	01/09/96	Heintzeman et al.	364	401	
	A6	5,598,566	01/28/97	Pascucci et al.	395	750	
	A7	5,703,949	12/30/97	Rosen	380	21	
	A8	5,802,062	09/01/98	Gehani et al.	370	465	
	A9	5,815,793	09/29/98	Ferguson	455	311	
	A10	5,826,265	10/20/98	Van Huben et al.	707	8	
	A11	5,862,325	01/19/99	Reed et al.	395	200.31	
	A12	5,884,072	03/16/99	Rasmussen	395	600	
	A13	5,909,540	06/01/99	Carter et al.	395	182.02	
	A14	5,916,024	06/29/99	Von Kohorn	463	40	
	A15	5,918,229	06/29/99	Davis et al	707	10	
	A16	5,921,865	07/13/99	Scagnelli et al.	463	17	
	A17	5,937,192	08/10/99	Martin	395	705	
	A18	5,958,010	09/28/99	Agarwal et al.	709	224	
	A19	5,966,451	10/12/99	Utsumi	380	49	
	A20	5,970,469	10/19/99	Scroggie et al.	705	14	
	A21	5,970,477	10/19/99	Roden	705	32	
	A22	5,987,506	11/16/99	Carter et al.	709	233	
Y.D	A23	6,003,065	12/14/99	Yan et al.	~~709~~	~~201~~	

Examiner: Dakeisha Date **Date Considered:** 8/13/04

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

IPR2025-00716
DATABRICKS EX1002 Page 399

Form PTO-1449 (modified)	Atty. Docket No. UNTD:021	Serial No. 09/834,785
List of Patents and Publications for Applicant's	Applicant EDWARD A. HUBBARD	
INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	Filing Date: April 13, 2001	Group: ~~2152~~ 2157

U.S. Patent Documents	Foreign Patent Documents	Other Art
See Pages 1-2	*N/A*	*See Page 3-5*

OIPE JAN 0 8 2002 PATENT & TRADEMARK OFFICE

U.S. Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Name	Class	Sub Class	Filing Date if App.
Y.D	A24	6,009,455	12/28/99	Doyle	709	201	
	A25	6,014,634	01/11/00	Scroggie et al.	705	14	
	A26	6,024,640	02/15/00	Walker et al.	463	17	
	A27	6,026,474	02/15/00	Carter et al.	711	202	
	A28	6,052,785	04/18/00	Lin et al.	713	201	
	A29	6,058,393	05/02/00	Meier et al.	707	10	
	A30	6,061,660	05/09/00	Eggleston et al.	705	14	
	A31	6,070,190	05/30/00	Reps et al.	709	224	
	A32	6,094,654	07/25/00	Van Huben et al.	707	8	
	A33	6,112,225	08/29/00	Kraft et al.	709	202	
	A34	6,112,304	08/29/00	Clawson	713	156	
	A35	6,112,181	08/29/00	Shear et al.	705	1	
	A36	6,115,713	09/05/00	Pascucci et al.	707	10	
	A37	6,148,335	11/14/00	Haggard et al.	709	224	
	A38	6,148,377	11/14/00	Carter et al.	711	147	
	A39	6,151,684	11/21/00	Alexander et al.	714	4	
	A40	5,964,832	10/12/99	Kisor	709	202	
	A41	5,655,081	08/05/97	Bonnell et al.	395	200.32	
	A42	5,978,594	11/02/99	Bonnell et al.	395	837	
Y.D	A43	5,740,549	04/14/98	Reilly et al.	705	14	

Examiner: D Alexander	Date Considered: 8/13/04

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

IPR2025-00716
DATABRICKS EX1002 Page 400

Form PTO-1449 (modified)	Atty. Docket No. UNTD:021	Serial No. 09/834,785
List of Patents and Publications for Applicant's INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	Applicant EDWARD A. HUBBARD	
	Filing Date: April 13, 2001	Group: ~~2152~~ 2157

U.S. Patent Documents	Foreign Patent Documents	Other Art
See Pages 1-2	*N/A*	*See Page 3-5*

OIPE JAN 0 8 2002 PATENT & TRADEMARK OFFICE

Foreign Patent Documents

Exam. Init.	Ref. Des.	Document Number	Date	Country	Class	Sub Class	Translation Yes/No
	B1						

Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)

Exam. Init.	Ref. Des.	Citation
Y.L	C1	Brian Hayes, "Computing Science: Collective Wisdom," *American Scientist*, March-April 1998
	C2	Steve Lawrence, et al., "Accessibility of information on the web," *Nature*, Vol. 400, pp. 107-109, July 1999
	C3	Steve Lawrence, et al., "Searching the World Wide Web," *Science*, Vol. 280, pp. 98-100, April 3, 1998
	C4	Steve Lawrence, et al., "Context and Page Analysis for Improved Web Search," *IEEE Internet Computing*, pp. 38-46, July-August 1998
	C5	Vasken Bohossian, et al., "Computing in the RAIN: A Reliable Array of Independent Nodes," California Institute of Technology, September 24, 1999
	C6	"A White Paper: The Economic Impacts of Unacceptable Web-Site Download Speeds," Zona Research, Inc., pp. 1-17, April 1999
	C7	Peter J. Sevcik, "The World-Wide-Wait Status Report," *Northeast Consulting Resources, Inc.*, Global Internet-Performance Conference, October 14, 1999
	C8	"White Paper: Max, and the Objective Measurement of Web Sites," WebCriteria, Version 1.00, pp. 1-11, March 12, 1999
	C9	Renu Tewari, et al., "Design Considerations for Distributed Caching on the Internet," pp. 1-13, May 1999
	C10	"Measuring and Improving Your E-Commerce Web Site Performance with Keynote Perspective," Keynote Systems, pp. 1-15, March 29, 2000
Y.L	C11	Sullivan, et al., "A New Major SETI Project Based On Project Serendip Data and 100,000 Personal Computers," Proc of the Fifth Intl Conf on Bioastronomy IAU Colloq No. 161, pp. 729-734, 1997

Examiner: Dale M Shaw	Date Considered: 8/12/04

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

IPR2025-00716
DATABRICKS EX1002 Page 401

Form PTO-1449 (modified)	Atty. Docket No. UNTD:021	Serial No. 09/834,785
List of Patents and Publications for Applicant's INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	Applicant EDWARD A. HUBBARD	
	Filing Date: April 13, 2001	Group: ~~2152~~ 2157

U.S. Patent Documents	Foreign Patent Documents	Other Art
See Pages 1-2	*N/A*	*See Page 3-5*

OIPE JAN 08 2002 PATENT & TRADEMARK OFFICE

Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)

Exam. Init.	Ref. Des.	Citation
Y.D	C12	Caronni, et al., "How Exhausting is Exhaustive Search?" RSA Laboratories' CryptoBytes, Vol. 2, No. 3, pp. 2-6, Jan-Mar 1997.
	C13	Bricker, et al., "Condor Technical Summary," Computer Sciences Dept., University of Wisconsin, Version 4.1b, pp.1-10, Jan. 28, 1992.
	C14	Fields, "Hunting for Wasted Computing Power-New Software for Computing Networks Puts Idle PC's to Work," 1993 Research Sampler, University of Wisconsin, pp. 1-5, 1993.
	C15	Anderson, et al., "SETI@home: Internet Distributed Computing for SETI," A New Era in Bioastronomy, ASP Conference Series, Vol. 213, pp. 511-517, 2000.
	C16	Bowyer, et al., "Twenty Years of Serendip, the Berkeley SETI Effort: Past Results and Future Plans," Astronomical and Biochemical Origins and the Search for Life in the Universe, pp. 667-676, 1997.
	C17	Litzkow, et al., "Condor - A Hunter of Idle Workstations," The 8th International Conf. on Distributed Computing Systems, pp.104-111, 1988.
	C18	Hamidzadeh, et al., "Dynamic Scheduling Techniques for Heterogeneous Computing Systems," Concurrency: Practice and Experience, Vol. 7(7), pp. 633-652, 1995.
	C19	Grimshaw, et al., "The Legion Vision of a Worldwide Virtual Computer," Communications of the ACM, Vol. 40, No. 1, pp. 39-45, 1997.
	C20	Catlett, et al., "Metacomputing," Communications of the ACM, Vol. 35, No. 6, pp. 44-52, 1992.
	C21	Foster, et al., "Globus: A Metacomputing Infrastructure Toolkit," The International Journal of Supercomputer Applications and High Performance Computing, Vol. 11, No. 2, pp. 115-128, 1997.
	C22	Mutka, et al., "The Available Capacity of a Privately Owned Workstation Environment," Performance Evaluation 12 (1991) pp. 269-284.
	C23	Sullivan, et al., "A New Major SETI Project Based on Project Serendip Data and 100,000 Personal Computers," Astronomical and Biochemical Origins and the Search for Life in the Universe, 5th International Conference on Bioastronomy, IAU Colloquium No. 161, pp. 729-734, 1996.
Y.D	C24	Gelernter, "Domesticating Parallelism," IEEE Computer, Aug. 1986, 19(8), pp. 12-16.

Examiner: Dalewood | **Date Considered:** 8/13/04

EXAMINER: initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

IPR2025-00716
DATABRICKS EX1002 Page 402

Form PTO-1449 (modified)	Atty. Docket No. UNTD:021	Serial No. 09/834,785
List of Patents and Publications for Applicant's INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	Applicant EDWARD A. HUBBARD	
	Filing Date: April 13, 2001	Group: ~~2152~~ 2137

U.S. Patent Documents	Foreign Patent Documents	Other Art
See Pages 1-2	*N/A*	*See Page 3-5*

OIPE JAN 08 2002 PATENT & TRADEMARK OFFICE

Other Art (Including Author, Title, Date, Pertinent Pages, Etc.)

Exam. Init.	Ref. Des.	Citation
Y.D	C25	Goldberg, et al., "A Secure Environment for Untrusted Helper Applications-Confining the Wily Hacker," 6th USENIX Security Symposium, pp. 1-13, 1996.

Examiner: Dalewcox	Date Considered: 8/13/04

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

IPR2025-00716
DATABRICKS EX1002 Page 403

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	UNTD:021	8392

29444 7590 12/26/2006
WINSTEAD SECHREST & MINICK P.C.
PO BOX 50784
DALLAS, TX 75201

EXAMINER	
DALENCOURT, YVES	
ART UNIT	**PAPER NUMBER**
2157	

MAIL DATE	DELIVERY MODE
12/26/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

Notice of Abandonment	Application No.	Applicant(s)	
	09/834,785	Edward A. Hubbard	
	Examiner	Art Unit	
	DALENCOURT, YVES	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

This application is abandoned in view of:

1. ☐ Applicant's failure to timely file a proper reply to the Office letter mailed on _____.
   (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply (including a total extension of time of _____ month(s)) which expired on _____.
   (b) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection.
   (A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
   (c) ☐ A reply was received on _____ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
   (d) ☐ No reply has been received.

2. ☒ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
   (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
   (b) ☐ The submitted fee of $_____ is insufficient. A balance of $_____ is due.
   The issue fee required by 37 CFR 1.18 is $_____. The publication fee, if required by 37 CFR 1.18(d), is $_____.
   (c) ☒ The issue fee and publication fee, if applicable, has not been received.

3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
   (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.
   (b) ☐ No corrected drawings have been received.

4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.

5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.

6. ☐ The decision by the Board of Patent Appeals and Interference rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.

7. ☐ The reason(s) below:

AG

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

PART B – FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
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CURRENT CORRESPONDENCE ADDRESS (Note: Legibly mark-up with any corrections or use Block 1)

29444 7590 07/25/2006

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~~Dallas, TX 75201~~

FISH & RICHARDSON P.C.
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(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	22265-011001	8392

TITLE OF INVENTION: **SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS**

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$700	$300	$1000	10/25/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
DALENCOURT, Y.	2152	709-203000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

[X] Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

[ ] "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1. **Fish & Richardson P.C.**
2. **Kelly K. Kordzik**
3. **Richard F. Frankeny**

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the USPTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE (CITY and STATE OR COUNTRY)

United Devices, Inc. **Austin, Texas**

Please check the appropriate assignee category or categories (will not be printed on the patent): [ ] individual [X] corporation or other private group entity [ ] government

4a. The following fee(s) are enclosed:
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[ ] A check in the amount of the fee(s) is enclosed.
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[X] The Director is hereby authorized to charge the required fee(s), or credit any overpayment, to Deposit Account Number 06-1050 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
[X] a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. [ ] b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant, a registered agent or, or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

(Authorized Signature) _____ (Date) 2-23-07

Typed or Printed Name Kelly K. Kordzik Registration No. 36,571

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.
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IPR2025-00716
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CHANGE OF CORRESPONDENCE ADDRESS
Application

Address to:
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P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Edward A. Hubbard
Art Unit	2152
Examiner Name	Y. Dalencourt
Attorney Docket Number	22265-011001

Please change the Correspondence Address for the above-identified application to:

☒ The address associated with Customer Number: **26201**

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☐ **Firm or Individual Name** Fish & Richardson P.C.
Kelly K. Kordzik

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☐ Assignee of record of the entire interest.
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☒ Attorney or agent of record. Registration Number 36,571

☐ Registered practitioner named in the application transmittal letter in an application without an executed oath or declaration. See 37 CFR 1.33(a)(1). Registration Number 36,571

Signature

Typed or Printed Name Kelly K. Kordzik

Date 3/23/07 Telephone 512.226.8148

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☒ *Total of 1 forms are submitted.

90212005.doc

Electronic Patent Application Fee Transmittal

Application Number:	09834785
Filing Date:	13-Apr-2001
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Filer:	Kelly K. Kordzik/viola ange
Attorney Docket Number:	UNTD:021

Filed as Small Entity

Utility Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
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Petition:				
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Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	2501	1	700	700
Publ. Fee- early, voluntary, or normal	1504	1	300	300

IPR2025-00716
DATABRICKS EX1002 Page 408

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1000**

Electronic Acknowledgement Receipt

EFS ID:	1540011
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	29444
Filer:	Kelly K. Kordzik/Susan Williams
Filer Authorized By:	Kelly K. Kordzik
Attorney Docket Number:	UNTD:021
Receipt Date:	23-FEB-2007
Filing Date:	13-APR-2001
Time Stamp:	17:13:53
Application Type:	Utility

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	$1000
RAM confirmation Number	672
Deposit Account	061050

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)

1		22265_011001_petition.pdf	2173965	yes	8
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Petition for review by the Technology Center SPRE.		1	2	
	Examination support document		3	8	
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	22265_011001_issue_fee.pdf	2174087	no	1
Warnings:					
Information:					
3	Issue Fee Payment (PTO-85B)	22265_011001_issue_fee_dup.pdf	2174087	no	1
Warnings:					
Information:					
4	Change of Address	22265_011001_change_address.pdf	2174087	no	1
Warnings:					
Information:					
5	Fee Worksheet (PTO-06)	fee-info.pdf	8358	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	8704584		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: Edward A. Hubbard	Art Unit	: 2152
Serial No.	: 09/834,785	Examiner	: Dalencourt, Yves
Filed	: April 13, 2001	Conf. No.	: 8392
Title	: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS		

MAIL STOP PETITIONS
Attention: Tech Center 2152
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION TO WITHDRAW HOLDING OF ABANDONMENT

Under 37 CFR §§1.8(b) and 1.181(a), applicant hereby petitions to withdraw the Notice of Abandonment mailed December 26, 2006 (copy enclosed). The application was abandoned because the Patent and Trademark Office records indicate that the issue fee was not paid. The Notice of Allowance and Fee(s) Due was not received by the Attorney of Record.

The Notice of Abandonment was issued on December 26, 2007; this Petition is being timely filed prior to the February 26, 2007 two month due date.

1. The undersigned Attorney of Record states that the Notice of Allowance and Fee(s) Due was not received by the practitioner.

2. A search of the file jacket and docket records indicates that the Office communication was not received.

3. Attached as Exhibit A is a docket sheet dated April 28, 2006 showing that the Response to Supplemental Examiner's Answer was filed on April 13, 2006

4. Attached as Exhibit B is a docket sheet dated January 5, 2007 showing receipt and docketing of the Notice of Abandonment and confirming that the Notice of Allowance was not received.

5. The address to which the Notice of Allowance and Fee(s) Due was sent was an effective address for Winstead Sechrest & Minick at the time the document was mailed.

6. After transfer of this file to Fish & Richardson P.C., a copy of the Notice of Allowance and Fee(s) Due was retrieved from the public PAIR system.

7. Attached hereto is the Issue Fee Payment.

8. Attached hereto is a Change of Correspondence Address signed by the Attorney of Record.

Applicant hereby submits that the Notice of Allowance and Fee(s) Due was not received by the Attorney of Record. Pursuant to MPEP 711.03(c)(1)(A), all requirements for this Petition to Withdraw Holding of Abandonment have been met. Accordingly, Applicant requests that the Abandonment of this application be withdrawn. In order to expedite the issuance of this patent, Applicant has herewith paid the issue fee.

Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: Feb. 23, 2007

Kelly K. Kordzik
Reg. No. 36,571

Fish & Richardson P.C.
1717 Main Street
Suite 5000
Dallas, Texas 75201
Telephone: 512.226.8148
Facsimile: 877.769.7945

90211975.doc

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	UNTD-021	8392

23448 7590 12/26/2006
WINSTEAD SECHREST & MINICK P.C.
PO BOX 50784
DALLAS, TX 75201

EXAMINER
BALEKDJIAN, VICE

ART UNIT	PAPER NUMBER
2152	

MAIL DATE	DELIVERY MODE
12/26/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

IPR2025-00716
DATABRICKS EX1002 Page 415

Notice of Abandonment	Application No.	Applicant(s)	
	09/834,785	Edward A. Hubbard	
	Examiner	Art Unit	
	DALENCOURT, YVES	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

This application is abandoned in view of:

1. ☐ Applicant's failure to timely file a proper reply to the Office letter mailed on _____.
   (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply (including a total extension of time of _____ month(s)) which expired on _____.
   (b) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection.
   (A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
   (c) ☐ A reply was received on _____, but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
   (d) ☐ No reply has been received.

2. ☒ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
   (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
   (b) ☐ The submitted fee of $_____ is insufficient. A balance of $_____ is due.
   The issue fee required by 37 CFR 1.18 is $_____. The publication fee, if required by 37 CFR 1.18(d), is $_____.
   (c) ☒ The issue fee and publication fee, if applicable, has not been received.

3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
   (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.
   (b) ☐ No corrected drawings have been received.

4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.

5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.

6. ☐ The decision by the Board of Patent Appeals and Interference rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.

7. ☐ The reason(s) below:

AG

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

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DATABRICKS EX1002 Page 416

WINSTEAD

Patent: 40988/P001P9, United States, Regular, National, Continuation-In-Part

Patent Data

Docket Number	40988/P001P9	Attorney	Kelly K. Kordzik
Country	United States	Attorney 2	Richard Frankeny
Case Type	Regular	Attorney 3	
Relation Type	Continuation-In-Part	Agent	
Filing Type	National	Agent Ref No	
Filing Number		Client/Division	United Devices, Inc.
Status	Filed	Owner/Proprietor	United Devices, Inc.
Sub Status		Previous Owner	
Sub Status Date		Client Reference1	UNTD: 021
First Filing Date	3/30/2000	Client Reference2	UNTD: 031
Parent Country	United States	CPA Reference	
Parent Number	09/538543	Ind. Claims\Designs	2
Parent Filing Date	3/30/2000	Total Claims	28
Parent Grant Date		TotalClasses	
Application Number	09/834785	ConfirmationNumber	8392
Application Date	4/13/2001	Deed Date	5/1/2001
Publication Number		Recordal Date	7/23/2001
Publication Date		Reel/Frame	012004/0544
Patent Number		Effective Date	5/1/2001
Grant Date		File Location	Austin
Tax Base Date		Historic Date	
Next Tax Date		Assigned	Assignment Recorded
Expiration Date		Convention Type	

Title

Software Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks

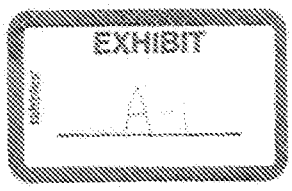
Description

Supplemental IDS filed on 02/13/03, 06/10/03

Other Case-Related Information

Actions

Action	Action Due Date	Deadline Date	Completed Date	Action Notes	Responsible Atty #2	Responsible Atty #3
No Foreign Filing	4/13/2001		4/13/2001			
Notice Of Missing Parts Mail D	7/11/2001		7/16/2001			
Additional Document Due	7/11/2001		7/11/2001	Filing Receipt		
Assignment	7/16/2001		7/16/2001			
IDS Filed	12/18/2001		12/18/2001	Supplemental IDS filed on 02/13/03, 06/10/03		
Power of Attorney	8/15/2003		8/15/2003	PC dated 8/18/03 rec'd 8/25/03		
Additional Document Due	4/6/2004		12/10/2003	Status Inq. Resp. from PTO; Status Req. filed 10/6/03 PC dated 10/08/03 rec'd 10/20/03; Resp. states will be 15 months from this date before OA is rec'd		
Additional Document Due	9/18/2004		12/31/2003	Not. of Accept of POA filed 12/18/03; PC dated 12/23/03 rec'd 1/2/04		
1st Office Action	9/3/2004		9/3/2004			
Response first OA - 1st	1/3/2005		1/3/2005	PC dated 1/6/05 rec'd 1/11/05		



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DATABRICKS EX1002 Page 417

extension

Final Rejection Mail Date	4/29/2005	4/29/2005		
Response to provoke advisory a	6/29/2005	7/18/2005	Claims 29-54 rejected	
Final rejection due	7/29/2005	7/18/2005		
Appeal due	7/29/2005	7/18/2005	PC dated 7/21/05 recd 7/27/05	
Final rejection - 1st extensio	8/29/2005	8/29/2005		Richard Frankeny
Appeal due - 1st extension	8/29/2005	8/29/2005	NOT FILED	Richard Frankeny
Notice of Appeal	8/25/2005	8/25/2005		Richard Frankeny
Final rejection - 2nd extensio	9/29/2005	8/25/2005	6/16/2005-Advisory Action	Richard Frankeny
Appeal due - 2nd extension	9/29/2005	8/25/2005	PC dated 8/29/05 rec'd 9/9/05	Richard Frankeny
Appeal Brief	10/25/2005	9/22/2005	PC stamped 9/26/05; recd 10/3/05.	Richard Frankeny
Supplemental examiner's answer	12/16/2005	12/16/2005		
Supplemental reply brief	2/16/2006	2/16/2006	NOT FILED.	Richard Frankeny
Resp Supp Examiner's Answer	3/16/2006	3/16/2006	EXTENDED.	Richard Frankeny
Additional Document Due	3/22/2006	12/16/2005	Examiner's Answer.	Richard Frankeny
Resp Supp Examiner's Answer - 1st Ext	4/16/2006	4/13/2006	PC stamped 4/18/06; rcvd 4/28/06.	Richard Frankeny
Resp Supp Examiner's Answer - 2nd ext	5/16/2006	4/13/2006		Richard Frankeny
Resp Supp Examiner's Answer - final deadline	6/16/2006	4/13/2006		Richard Frankeny
Status Check/ Follow Up	10/13/2006		Resp to Suppl Examiner's Answer filed; awtg OA.	Richard Frankeny

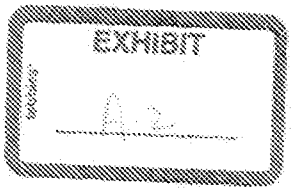
Inventors

Assignment Date	Inventor
	Hubbard, Edward A.

CreateUser: SC
CreateDate: 8/13/2003

UpdateUser: IP_KT
UpdateDate: 4/28/2006

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IPR2025-00716
DATABRICKS EX1002 Page 418

WINSTEAD Patent: 40988/P001P9, United States, Regular, National, Continuation-In-Part

Patent Data

Docket Number	40988/P001P9	Attorney	**Richard Frankeny**
Country	United States	Attorney 2	Robert A. Voigt, Jr.
Case Type	Regular	Attorney 3	
Relation Type	Continuation-In-Part	Agent	
Filing Type	National	Agent Ref No	
Filing Number		Client/Division	United Devices, Inc.
Status	**Filed**	Owner/Proprietor	United Devices, Inc.
Sub Status		Previous Owner	
Sub Status Date		Client Reference1	UNTD: 021
First Filing Date	3/30/2000	Client Reference2	UNTD: 021
Parent Country	United States	CPA Reference	
Parent Number	09/538543	Ind. Claims\Designs	3
Parent Filing Date	3/30/2000	Total Claims	28
Parent Grant Date		TotalClasses	
Application Number	09/834783	ConfirmationNumber	8392
Application Date	4/13/2001	Deed Date	5/1/2001
Publication Number		Recordal Date	7/23/2001
Publication Date		Reel/Frame	012004/0544
Patent Number		Effective Date	5/1/2001
Grant Date		File Location	Austin
Tax Base Date		Historic Date	
Next Tax Date		Assigned	Assignment Recorded
Expiration Date		Convention Type	

Title

Software Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks

Description

Supplemental IDS filed on 02/13/03, 06/10/03

Other Case-Related Information

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No Foreign Filing	4/13/2003		4/13/2001			
Notice Of Missing Parts Mail D	7/11/2001		7/16/2001			
Additional Document Due	7/11/2001		7/11/2001	Filing Receipt		
Assignment	7/16/2001		7/16/2001			
IDS Filed	12/18/2001		12/18/2001	Supplemental IDS filed on 02/13/03, 06/10/03		
Power of Attorney	8/15/2003		8/15/2003	PC dated 8/18/03 rec'd 8/25/03		
Additional Document Due	4/6/2004		12/10/2003	Status Inq. Resp. from PTO; Status Req. filed 10/6/03 PC dated 10/08/03 rec'd 10/20/03; Resp. states will be 15 months from this date before OA is rec'd		
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EXHIBIT

IPR2025-00716
DATABRICKS EX1002 Page 419

			12/22/03 rec'd 1/2/04	
1st Office Action	9/3/2004	9/3/2004		
Response first OA - 1st extension	1/3/2005	1/3/2005	PC dated 1/6/05 rec'd 1/11/05	
Final Rejection Mail Date	4/20/2005	4/20/2005		
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Appeal due - 1st extension	8/20/2005	8/29/2005	NOT FILED	Richard Frankeny
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Final rejection - 2nd extensio	9/20/2005	8/25/2005	8/16/2005-Advisory Action	Richard Frankeny
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Supplemental reply brief	2/15/2006	2/16/2006	NOT FILED.	Richard Frankeny
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Resp Supp Examiner's Answer - 2nd ext	5/16/2006	4/13/2006		Richard Frankeny
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Status Check/ Follow Up	10/13/2006	12/26/2006	12/26/06 - Not of Abandonment recd for failure to pay issue fee; NOA issued on 7/25/06 not recd in docketing. Resp to Supp! Examiner's Answer filed; awtg DA.	Robert A. Voigt, Jr.
Notice of abandonment	12/26/2006	12/26/2006	Failure to pay issue Fee.	
Petition to Revive Due	2/26/2007			

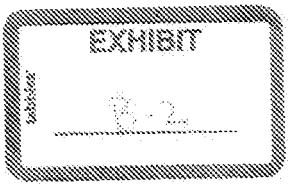
Assignment Data Inventor

Hubbard, Edward A.

CreateUser: SC
CreateDate: 8/13/2003

UpdateUser: IP_RT
UpdateDate: 1/5/2007

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IPR2025-00716
DATABRICKS EX1002 Page 420

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 08/28/2012

BPOWELL ADJ #00000004 Mailroom Dt: 02/23/2007
Seq No: 672 Sales Acctg Dt: 02/26/2007 061050 09834785
01 FC : 2501 700.00 CR

Electronic Acknowledgement Receipt

EFS ID:	3075650
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	29444
Filer:	Kelly K. Kordzik/Joe Farrell
Filer Authorized By:	Kelly K. Kordzik
Attorney Docket Number:	UNTD:021
Receipt Date:	31-MAR-2008
Filing Date:	13-APR-2001
Time Stamp:	11:23:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	22265-011001_reqtowithdraw_kob.pdf	209248 92fb827ae353ecb351f45b8955e2c754a6af33b4	no	2

Warnings:	
Information:	

Total Files Size (in bytes):	209248

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National Stage of an International Application under 35 U.S.C. 371
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New International Application Filed with the USPTO as a Receiving Office
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT

AND CHANGE OF CORRESPONDENCE ADDRESS

Please withdraw me as attorney or agent for the patent applications as provided in the attached Schedule of Patents, and

☐ all the attorneys/agents of record.

☐ the attorneys/agents (with registration numbers) listed on the attached paper(s), or

☒ the attorneys/agents associated with Customer Number 26201

The reason for this request is: termination of client representation

☒ Change the correspondence address and direct all future correspondence to:

Univa UD
9737 Great Hills Trail
Suite 300
Austin, Texas 78759

Respectfully submitted,

Date: March 26, 2008

Kelly K. Kordzik
Reg No. 36,571

Fish & Richardson P.C.
One Congress Plaza
Suite 810
111 Congress Avenue
Austin, TX 78701
Telephone: (512) 472-5070
Facsimile: (512) 320-8935

SCHEDULE OF PATENTS

Docket No.	Serial No.	Filing Date
22265-004002	10/766,972	1/29/2004
22265-010001	09/794,969	2/27/2001
22265-011001	09/834,785	4/13/2001
22265-014002	11/773,929	7/5/2007
22265-016001	10/687,210	10/16/2003

PTO/SB/80 (01-06)
Approved for use through 12/31/2008. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 75671

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 75671

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Niration Network Group, L.L.C.
2711 Centerville Road, Suite 400
Wilmington, DE 19808

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	Jeff Kern	Date	5/8/2008
Name	Jeff Kern	Telephone	
Title	Authorized Person for Niration Network Group, L.L.C.		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/96 (04-07)
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Niration Network Group, L.L.C.

Application No./Patent No.: 09/834,785 Filed/Issue Date: April 13, 2001

Entitled: Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks

Niration Network Group, L.L.C., a Corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. [✓] the assignee of the entire right, title, and interest; or

2. [ ] an assignee of less than the entire right, title and interest
(The extent (by percentage) of its ownership interest is _____%)

in the patent application/patent identified above by virtue of either:

A. [ ] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

OR

B. [✓] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Edward A. Hubbard To: United Devices, Inc.
The document was recorded in the United States Patent and Trademark Office at
Reel 012004, Frame 0544, or for which a copy thereof is attached.

2. From: United Devices, Inc. To: Univa Corporation
The document was recorded in the United States Patent and Trademark Office at
Reel 020353, Frame 0187, or for which a copy thereof is attached.

3. From: UD Liquidation Inc., F/K/A United Device To: Univa Corporation
The document was recorded in the United States Patent and Trademark Office at
Reel 020593, Frame 0650, or for which a copy thereof is attached.

[✓] Additional documents in the chain of title are listed on a supplemental sheet.

[ ] As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Mark K. Colby — 19 May 08
Signature — Date
Michael K. Colby — 509-755-7254
Printed or Typed Name — Telephone Number
Attorney of Record, Reg. 45816
Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Continuation: Chain of title

4. From: Univa Corporation (AKA United Devices) To: Niration Network Group, L.L.C.
The document was recorded in the United States Patent and Trademark Office at Reel 020831, Frame 0104.

Electronic Acknowledgement Receipt

EFS ID:	3328506
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	29444
Filer:	William Breen/danielle moya
Filer Authorized By:	William Breen
Attorney Docket Number:	UNTD:021
Receipt Date:	20-MAY-2008
Filing Date:	13-APR-2001
Time Stamp:	12:37:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	NING0008.pdf	210734 5fb4428063e7ec99d2dfc9f7cdb1cc6b3a71ca81	no	3

Warnings:	
Information:	

Total Files Size (in bytes):	210734

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	UNTD:021

CONFIRMATION NO. 8392

POA ACCEPTANCE LETTER

75671
Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Ave, Suite 424
Spokane, WA 99201

OC000000030312050

Date Mailed: 06/09/2008

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/20/2008.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/snguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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DATABRICKS EX1002 Page 431

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	UNTD:021

CONFIRMATION NO. 8392

29444
WINSTEAD SECHREST & MINICK P.C.
PO BOX 50784
DALLAS, TX 75201

POWER OF ATTORNEY NOTICE

OC000000030312005

Date Mailed: 06/09/2008

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/20/2008.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/snguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IPR2025-00716
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UNITED STATES PATENT AND TRADEMARK OFFICE

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www.uspto.gov

Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Ave, Suite 424
Spokane WA 99201

COPY MAILED

AUG 22 2008

In re Application of :
Edward A. Hubbard :
Application No.: 09/834785 : DECISION ON
Filing or 371(c) Date: 04/13/2001 : PETITION
Attorney Docket Number: NING0008 :

This is a decision in response to the petition to withdraw holding of abandonment, filed February 23, 2007. The petition is properly treated as a petition to withdraw the holding of abandonment based upon failure to receive an Office action under 37 CFR 1.181. The delay in treating this petition is regretted.

This Petition is hereby **dismissed**.

Any further petition must be submitted within TWO (2) MONTHS from the mail date of this decision. Extensions of time under 37 CFR 1.136(a) are permitted. Any reconsideration request should include a cover letter entitled "Renewed Petition under [insert the applicable code section]." This is **not** final agency action within the meaning of 5 U.S.C. § 704.

The above-identified application became abandoned for failure to timely and properly reply to the Notice of Allowance and Issue Fee Due (Notice"), mailed July 25, 2006. The Notice set a three (3) month period for reply. No extensions of time were available. No reply having been received, the application became abandoned on October 26, 2006. A Notice of Abandonment was mailed December 26, 2006.

Petition under 37 CFR 1.181

Petitioner herein, the law firm of Fish & Richardson, files the present petition and asserts that the Notice was never received. In support of this assertion, Petitioner states that a search of the physical file and docket records indicate that the Notice was not received. Petitioner also files a copy of a docket record from the law firm of Winstead Sechrest & Minick, the attorneys of record at the time the Notice was mailed. A review of the copy of the docket records from Winstead Sechrest & Minick indicate that the Notice was not received. No statement from anyone at the law firm of Winstead Sechrest & Minick, attesting to a search of the file jacket and docket records has been conducted, or that the search of the physical file and docket records indicate that the Notice was not receive, has been filed.

It is also noted that the law firm of Fish & Richardson are no longer the attorneys of record in the application.

Applicable Law, Rules and MPEP

The MPEP 711.03(c)A, Petition To Withdraw Holding of Abandonment Based on Failure To Receive Office Action, provides

> In Delgar v. Schulyer, 172 USPQ 513 (D.D.C. 1971), the court decided that the Office should mail a new Notice of Allowance in view of the evidence presented in support of the contention that the applicant's representative did not receive the original Notice of Allowance. Under the reasoning of Delgar, an allegation that an Office action was never received may be considered in a petition to withdraw the holding of abandonment. If adequately supported, the Office may grant the petition to withdraw the holding of abandonment and remail the Office action. That is, the reasoning of Delgar is applicable regardless of whether an application is held abandoned for failure to timely pay the issue fee (35 U.S.C. 151) or for failure to prosecute (35 U.S.C. 133). To minimize costs and burdens to practitioners and the Office, the Office has modified the showing required to establish nonreceipt of an Office action. The showing required to establish nonreceipt of an Office communication must include a statement from the practitioner describing the system used for recording an Office action received at the correspondence address of record with the USPTO. The statement should establish that the docketing system is sufficiently reliable. It is expected that the record would include, but not be limited to, the application number, attorney docket number, the mail date of the Office action and the due date for the response. Practitioner must state that the Office action was not received at the correspondence address of record, and that a search of the practitioner's record(s), including any file jacket or the equivalent, and the application contents, indicates that the Office action was not received. A copy of the record(s) used by the practitioner where the non-received Office action would have been entered had it been received is required. A copy of the practitioner's record(s) required to show non-receipt of the Office action should include the master docket for the firm. That is, if a three month period for reply was set in the nonreceived Office action, a copy of the master docket report showing all replies docketed for a date three months from the mail date of the nonreceived Office action must be submitted as documentary proof of nonreceipt of the Office action. If no such master docket exists, the practitioner should so state and provide other evidence such as, but not limited to, the following: the application file jacket; incoming mail log; calendar; reminder system; or the individual docket record for the application in question. The showing outlined above may not be sufficient if there are circumstances that point to a conclusion that the Office action may have been lost after receipt rather than a conclusion that the Office action was lost in the mail (e.g., if the practitioner has a history of not receiving Office actions). (Emphasis supplied)

MPEP 711.03(c)

Analysis

Applicant has failed to demonstrate that the Notice was not received. In support of the petition, Petitioner states that a search of the physical file and docket records indicate that the Notice was not received; however, Petitioner was not the practitioner of record at the time the Notice was mailed. The law firm of Winstead Sechrest & Minick, were the attorneys of record at the time the Notice was mailed, and a copy of the docket records from Winstead Sechrest & Minick was filed; however, no statement from anyone at the law firm of Winstead Sechrest & Minick, attesting to non-receipt of the Notice, or attesting to a search of the file jacket and docket records, or that the search of the physical file and docket records indicate that the Notice was not receive, has been filed. Moreover, no copy of the master docket for the firm of Winstead Sechrest & Minick has been filed. A copy of the master docket record showing all replies docketed for a date three (3) months from the mail date of the Notice is required.

The petition is dismissed without prejudice. Applicant should file a Request for Reconsideration of Petition and include the necessary statement(s), copies of docket records and/or file jacket.

Further correspondence with respect to this matter should be addressed as follows:

By mail: Director for Patents
PO Box 1450
Alexandria, VA 22313-1450

By FAX: (571) 273-8300
Attn: Office of Petitions

By hand: Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Telephone inquiries concerning this matter should be directed to the undersigned at (571) 272-3232.

/Derek L. Woods/
Derek L. Woods
Attorney
Office of Petitions

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 09/834,785
Filing Date 04/13/2001
Confirmation No. 8392
Applicant ..... Niration Network Group, L.L.C.
Inventorship ..... Edward Hubbard, et al.
Group Art Unit 2157
Examiner ..... Dalencourt, Yves
Attorney's Docket No. NING0008
Title: Software-based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks

RENEWED PETITION UNDER 37 CFR 1.137

To: Director for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

From: Jeffrey Valley (Tel. 509-755-7236; Fax 509-755-7252)
Sadler, Breen, Morasch & Colby, p.s.
422 W. Riverside Avenue, Suite 424
Spokane, WA 99201

Under 37 CFR 1.137(e)(1), applicant respectfully requests reconsideration of the Office's decision to dismiss the applicant's petition under 37 CFR 1.181(a) to withdraw its holding of abandonment.

In the Decision on Petition, dated August 22, 2008, the Office dismissed applicant's petition because a statement was not received from the law firm of Winstead, Sechrest & Minick attesting that a search of the file jacket and docket records was conducted or that the physical files and docket records indicated that the Notice of allowance was not received.

Applicant submits that Patent Attorney Robert A. Voigt Jr., of the law firm Winstead, Sechrest & Minick, attests to the following:

1. The undersigned Attorney of Record at the time of abandonment states that the Notice of Allowance and Fee(s) Due were not received by the

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DATABRICKS EX1002 Page 436

practitioner at the correspondence address of record.

2. A search of the file jacket and docket records indicates that the Office's communication was not received.

3. Attached as "Exhibit B" is a docket record dated January 5, 2007 for the application in question. The docket record shows that the Notice of Abandonment was received and docketed, and confirms that the Notice of Allowance, mailed on July 25, 2006, was not received. Please note that the law firm of Winstead, Sechrest & Minick maintains individual docket records for each docketed item, and does not maintain a "Master Docket" for all its docketed items. Accordingly, "Exhibit B", the individual docket record for the application in question, is being submitted as evidence that the Notice of Allowance was not received.

Applicant submits that Notice of Allowance and Fee(s) due were not received by the Attorney of Record at the time of abandonment, and pursuant to MPEP 711.03(c)(I)(A) all the requirements for this Petition to Withdraw Holding of Abandonment have been met.

Accordingly, applicant respectfully requests that the abandonment of this application be withdrawn.

Respectfully submitted,

Date: 9/18/08

Robert A. Voigt Jr.
Winstead, ~~Sechrest & Minick~~ P.C. RU
Reg. No. 47,159

Dated: 9/18/08

Jeffrey Valley
Sadler, Breen, Morasch & Colby p.s.
Reg. No. 50,653
(509) 755-7236

IPR2025-00716
DATABRICKS EX1002 Page 437

PTO/SB/17 (10-07)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2008

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 0

Complete if Known	
Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Edward Hubbard et.al
Examiner Name	Yves Dalencourt
Art Unit	2157
Attorney Docket No.	NING0008

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☑ Deposit Account Deposit Account Number: 50-4143 Deposit Account Name: Sadler, Breen, Morasch & Colby

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☑ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☑ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	310	155	510	255	210	105	
Design	210	105	100	50	130	65	
Plant	210	105	310	155	160	80	
Reissue	310	155	510	255	620	310	
Provisional	210	105	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	210	105
Multiple dependent claims	370	185

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
0 - 20 or HP =	0 x	50.00 =	0.00

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
0 - 3 or HP =	0 x	210.00 =	0.00

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims Fee ($)	Fee Paid ($)
0.00	0.00

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $260 ($130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
- 100 =	/ 50 =	(round up to a whole number) x	=	

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge):	

SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 50653	Telephone 509-755-7262
Name (Print/Type)	Jeff Valley		Date 09/18/2008

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	3968663
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	75671
Filer:	William Breen/Travis Henderson
Filer Authorized By:	William Breen
Attorney Docket Number:	NING0008
Receipt Date:	18-SEP-2008
Filing Date:	13-APR-2001
Time Stamp:	18:51:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition for review by the Office of Petitions.	SignedPetitionReviewDocumentforfiling.pdf	67631 4162e391b62135a3307fb896ac28b621510c01e2	no	2

Warnings:	
Information:	

IPR2025-00716
DATABRICKS EX1002 Page 439

2	Fee Worksheet (PTO-06)	FeeTransmittal.pdf	56747 26fa90a03b7f2b4e1975431683be17a2715d3007	no	1

Warnings:	
Information:	
Total Files Size (in bytes):	124378

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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www.uspto.gov

Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Ave, Suite 424
Spokane WA 99201

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OCT 3 1 2008

OFFICE OF PETITIONS

In re Application of	:	
Edward A. Hubbard	:	
Application No.: 09/834785	:	DECISION ON
Filing or 371(c) Date: 04/13/2001	:	PETITION
Attorney Docket Number: NING0008	:	

This is a decision in response to the renewed petition under 37 CFR 1.137, filed September 18, 2008. The petition is properly treated as a renewed petition to withdraw the holding of abandonment based upon failure to receive an Office action under 37 CFR 1.181.

This Petition is hereby **dismissed**.

Any further petition must be submitted within TWO (2) MONTHS from the mail date of this decision. Extensions of time under 37 CFR 1.136(a) are permitted. Any reconsideration request should include a cover letter entitled "Renewed Petition under [insert the applicable code section]." This is **not** final agency action within the meaning of 5 U.S.C. § 704.

The above-identified application became abandoned for failure to timely and properly reply to the Notice of Allowance and Issue Fee Due (Notice"), mailed July 25, 2006. The Notice set a three (3) month period for reply. No extensions of time were available. No reply having been received, the application became abandoned on October 26, 2006. A Notice of Abandonment was mailed December 26, 2006.

February 23, 2007 Petition under 37 CFR 1.181

Petitioner, the law firm of Fish & Richardson, filed a petition on February 23, 2007 and asserted that the Notice was never received. In support of this assertion, Petitioner stated that a search of the physical file and docket records indicated that the Notice was not received. Petitioner also filed a copy of a docket record from the law firm of Winstead Sechrest & Minick, the attorneys of record at the time the Notice was mailed. A review of the copy of the docket records from Winstead Sechrest & Minick indicated that the Notice was not received. No statement from anyone at the law firm of Winstead Sechrest & Minick, attesting to a search of the file jacket and docket records has been conducted, or that the search of the physical file and docket records indicate that the Notice was not receive, was filed.

It was also noted that the law firm of Fish & Richardson were no longer the attorneys of record in the application.

August 22, 2008 Decision dismissing petition

The petition was dismissed in a Decision mailed August 22, 2008. The Decision dismissing the petition noted that no statement from anyone at the law firm of Winstead Sechrest & Minick, attesting to non-receipt of the Notice, or attesting to a search of the file jacket and docket records, or that the search of the physical file and docket records indicate that the Notice was not receive, was filed. Moreover, no copy of the master docket for the firm of Winstead Sechrest & Minick was filed. A statement from a person with knowledge of the docketing system at the law firm of Winstead Sechrest & Minick, attesting to non-receipt of the Notice, or attesting to a search of the file jacket and docket records, or that the search of the physical file and docket records indicate that the Notice was not receive, was required. Also, a copy of the master docket record showing all replies docketed for a date three (3) months from the mail date of the Notice was required.

The present renewed petition

Applicant files the present renewed petition, co-executed by Robert A. Voigt Jr., of the law firm of Winstead Sechrest & Minick, asserting that the law firm of Winstead Sechrest & Minick does not maintain a Master Docket for all its docketed items. Applicant refers to Exhibit "B", the individual docket record for the application in question.

Applicable Law, Rules and MPEP

The MPEP 711.03(c)A, Petition To Withdraw Holding of Abandonment Based on Failure To Receive Office Action, provides

> In Delgar v. Schulyer, 172 USPQ 513 (D.D.C. 1971), the court decided that the Office should mail a new Notice of Allowance in view of the evidence presented in support of the contention that the applicant's representative did not receive the original Notice of Allowance. Under the reasoning of Delgar, an allegation that an Office action was never received may be considered in a petition to withdraw the holding of abandonment. If adequately supported, the Office may grant the petition to withdraw the holding of abandonment and remail the Office action. That is, the reasoning of Delgar is applicable regardless of whether an application is held abandoned for failure to timely pay the issue fee (35 U.S.C. 151) or for failure to prosecute (35 U.S.C. 133). To minimize costs and burdens to practitioners and the Office, the Office has modified the showing required to establish nonreceipt of an Office action. The showing required to establish nonreceipt of an Office communication must include a statement from the practitioner describing the system used for recording an Office action received at the correspondence address of record with the USPTO. The statement should establish that the docketing system is sufficiently reliable. It is expected that the record would include, but not be limited to, the application number, attorney docket number, the mail date of the Office action and the due date for the

> response. Practitioner must state that the Office action was not received at the correspondence address of record, and that a search of the practitioner's record(s), including any file jacket or the equivalent, and the application contents, indicates that the Office action was not received. A copy of the record(s) used by the practitioner where the non-received Office action would have been entered had it been received is required. A copy of the practitioner's record(s) required to show non-receipt of the Office action should include the master docket for the firm. That is, if a three month period for reply was set in the nonreceived Office action, a copy of the master docket report showing all replies docketed for a date three months from the mail date of the nonreceived Office action must be submitted as documentary proof of nonreceipt of the Office action. If no such master docket exists, the practitioner should so state and provide other evidence such as, but not limited to, the following: the application file jacket; incoming mail log; calendar; reminder system; or the individual docket record for the application in question. The showing outlined above may not be sufficient if there are circumstances that point to a conclusion that the Office action may have been lost after receipt rather than a conclusion that the Office action was lost in the mail (e.g., if the practitioner has a history of not receiving Office actions). (Emphasis supplied)

MPEP 711.03(c)

Analysis

Applicant asserts that the law firm of Winstead Sechrest & Minick does not maintain a Master Docket for all its docketed items. In view of this assertion, and the unavailability o a copy of the master docket record, the Office is unable to account for the situation where the Office action may have been received and mis-docketed. Further to this, it is noted that the law firm of Winstead Sechrest & Minick uses a post office box for receipt of correcpondence from this Office. Accordingly, as noted in the Decision dismissing the petition mailed August 22, 2008, a statement from the practitioner describing the system used for recording an Office action received at the correspondence address of record with the USPTO, is required. The statement should establish that the docketing system is sufficiently reliable. The statement should address the process whereby correspondence from this Office and received at the post office box is entered into the relevant application files. Petitioner is reminded that the showing outlined above may not be sufficient if there are circumstances that point to a conclusion that the Office action may have been lost after receipt rather than a conclusion that the Office action was lost in the mail.

The petition is dismissed without prejudice. Applicant should file a Request for Reconsideration of Petition and include the necessary statement(s), copies of docket records and/or file jacket.

Further correspondence with respect to this matter should be addressed as follows:

By mail: Director for Patents
PO Box 1450
Alexandria, VA 22313-1450

By FAX: (571) 273-8300
Attn: Office of Petitions

By hand: Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Telephone inquiries concerning this matter should be directed to the undersigned at (571) 272-3232.

/Derek L. Woods/
Derek L. Woods
Attorney
Office of Petitions

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 09/834,785
Filing Date 04/13/2001
Confirmation No. 8392
Applicant ..... Niration Network Group, L.L.C.
Inventorship ..... Edward Hubbard, et al.
Group Art Unit 2157
Examiner ..... Dalencourt, Yves
Attorney's Docket No. NING0008
Title: Software-based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks

RENEWED PETITION UNDER 37 CFR 1.137

To: Director for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

From: Jeffrey Valley (Tel. 509-755-7236; Fax 509-755-7252)
Sadler, Breen, Morasch & Colby, p.s.
422 W. Riverside Avenue, Suite 424
Spokane, WA 99201

Under 37 CFR 1.137(e)(1), applicant respectfully requests reconsideration of the Office's decision to dismiss the applicant's petition under 37 CFR 1.181(a) to withdraw its holding of abandonment.

In the Decision on Petition, dated October 31, 2008, the Office dismissed applicant's petition because a statement was not received from the practitioner describing the system used for recording an Office Action received at the correspondence address of record with the USPTO. The statement should establish that the docketing system is sufficiently reliable.

Applicant submits that Patent Attorney Robert A. Voigt Jr., of the law firm Winstead, Sechrest & Minick, attests to the following:

1. The undersigned Attorney of Record at the time of abandonment states that the Notice of Allowance and Fee(s) Due were not received by the

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DATABRICKS EX1002 Page 445

practitioner at the correspondence address of record.

2. A search of the file jacket and docket records indicates that the Office's communication was not received.

3. Attached as "Exhibit B" is a docket record dated January 5, 2007 for the application in question. The docket record shows that the Notice of Abandonment was received and docketed, and confirms that the Notice of Allowance, mailed on July 25, 2006, was not received. Please note that the law firm of Winstead, Sechrest & Minick maintains individual docket records for each docketed item, and does not maintain a "Master Docket" for all its docketed items. Accordingly, "Exhibit B", the individual docket record for the application in question, is being submitted as evidence that the Notice of Allowance was not received.

4. The following is a description of the system used to record an Office Action received at the correspondence address of record with the USPTO.

All correspondence from the USPTO is received at Winstead PC's P.O. Box in Dallas, Texas by Ms. Ramie Thach. Ms. Thach has 6 years experience in docketing and has docketed all of Winstead's USPTO correspondence for the past 3 years. Once a piece of correspondence is received from the USPTO, Ms. Thach personally enters the information into "IP Master" which manages all of the firms docketing. Specifically, Ms. Thach enters the application number, attorney docket number, mailing date of the Office Action, and the due date for the response. In addition, Ms. Thach sends both weekly and monthly docketing reports to the appropriate attorneys.

During the past 3 years that Ms. Thach has managed Winstead's docketing system she is not aware of any USPTO correspondence that has been lost or misplaced. Accordingly, the Applicant respectfully submits that Winstead's docketing system is extremely reliable.

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Applicant submits that Notice of Allowance and Fee(s) due were not received by the Attorney of Record at the time of abandonment, and pursuant to MPEP 711.03(c)(I)(A) all the requirements for this Petition to Withdraw Holding of Abandonment have been met.

Accordingly, applicant respectfully requests that the abandonment of this application be withdrawn.

Respectfully submitted,

Date: December 19, 2008

Robert A. Voigt Jr.
Winstead, Sechrest & Minick
Reg. No. 47,159

Dated: 12/29/2008

Jeffrey Valley
Sadler, Breen, Morasch & Colby p.s.
Reg. No. 50,653
(509) 755-7236

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DATABRICKS EX1002 Page 447

PTO/SB/17 (10-07)
Approved for use through 06/30/2010. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995 no persons are required to respond to a collection of information unless it displays a valid OMB control number

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2008

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 0

Complete If Known	
Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Edward Hubbard et.al
Examiner Name	Yves Dalencourt
Art Unit	2157
Attorney Docket No.	NING0008

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☑ Deposit Account Deposit Account Number: 50-4143 Deposit Account Name: Sadler, Breen, Morasch & Colby

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☑ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☑ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	310	155	510	255	210	105	
Design	210	105	100	50	130	65	
Plant	210	105	310	155	160	80	
Reissue	310	155	510	255	620	310	
Provisional	210	105	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	210	105
Multiple dependent claims	370	185

Total Claims		Extra Claims		Fee ($)		Fee Paid ($)
0	- 20 or HP =	0	x	50.00	=	0.00

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims		Extra Claims		Fee ($)		Fee Paid ($)
0	- 3 or HP =	0	x	210.00	=	0.00

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims Fee ($)	Fee Paid ($)
0.00	0.00

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $260 ($130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof		Fee ($)		Fee Paid ($)
	- 100 =		/ 50 =		(round up to a whole number) x		=	

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge):	

SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 50653	Telephone 509-755-7262
Name (Print/Type)	Jeff Valley		Date 09/18/2008

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	4526506
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	75671
Filer:	David Anthony Morasch/Travis Ryan Henderson
Filer Authorized By:	David Anthony Morasch
Attorney Docket Number:	NING0008
Receipt Date:	29-DEC-2008
Filing Date:	13-APR-2001
Time Stamp:	12:56:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition for review by the Office of Petitions.	NING0008Petition.pdf	91908 52338304cef0451a18d9540076efbb983821b4de	no	3

Warnings:	
Information:	

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DATABRICKS EX1002 Page 449

2	Fee Worksheet (PTO-06)	NING0008FeeTrans.pdf	57841 12a9f72955301ea4f558b5bb568d172754f60c61	no	1

Warnings:	
Information:	
Total Files Size (in bytes):	149749

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	4560658
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	75671
Filer:	Kelly K. Kordzik/Kimberly Brown
Filer Authorized By:	Kelly K. Kordzik
Attorney Docket Number:	NING0008
Receipt Date:	06-JAN-2009
Filing Date:	13-APR-2001
Time Stamp:	12:22:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	22265-0001001_withdraw_req.pdf	206074 d5fbc791db556434e482e1108262330af6d7b9ab	no	2

Warnings:	
Information:	

IPR2025-00716
DATABRICKS EX1002 Page 451

Total Files Size (in bytes):	206074

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT

AND CHANGE OF CORRESPONDENCE ADDRESS

Please withdraw me as attorney or agent for the patent applications as provided in the attached Schedule of Patents, and

☐ all the attorneys/agents of record.

☐ the attorneys/agents (with registration numbers) listed on the attached paper(s), or

☒ the attorneys/agents associated with Customer Number 26201

The reason for this request is: all files have been returned to the client at their request and representation of this client by Fish & Richardson has been terminated.

☒ Change the correspondence address and direct all future correspondence to:

Univa UD
9737 Great Hills Trail
Suite 300
Austin, Texas 78759

Respectfully submitted,

Date: Jan. 6, 2008

Kelly K. Kordzik
Reg No. 36,571

Fish & Richardson P.C.
One Congress Plaza
Suite 810
111 Congress Avenue
Austin, TX 78701
Telephone: (512) 472-5070
Facsimile: (512) 320-8935

SCHEDULE OF PATENTS

Docket No.	Serial No.	Filing Date
22265-004002	10/766,972	1/29/2004
22265-010001	09/794,969	2/27/2001
22265-011001	09/834,785	4/13/2001
22265-014002	11/773,929	7/5/2007
22265-016001	10/687,210	10/16/2003

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Ave, Suite 424
Spokane WA 99201

COPY MAILED

FEB 0 9 2009

OFFICE OF PETITIONS

In re Application of	:	
Edward A. Hubbard	:	
Application No.: 09/834785	:	DECISION ON
Filing or 371(c) Date: 04/13/2001	:	PETITION
Attorney Docket Number: NING0008	:	

This is a decision in response to the renewed petition under 37 CFR 1.137, filed December 29, 2008. The petition is properly treated as a renewed petition to withdraw the holding of abandonment based upon failure to receive an Office action under 37 CFR 1.181.

This Petition is hereby **granted**.

The above-identified application became abandoned for failure to timely and properly reply to the Notice of Allowance and Issue Fee Due (Notice"), mailed July 25, 2006. The Notice set a three (3) month period for reply. No extensions of time were available. No reply having been received, the application became abandoned on October 26, 2006. A Notice of Abandonment was mailed December 26, 2006.

With the prior and present renewed petitions, Applicant has demonstrated non-receipt of the Notice by a preponderance of the evidence.

In view of the foregoing, the petition is granted. The holding of abandonment is hereby withdrawn.

No petition fee has been charged and none is due.

The application will be referred to Technology Center Art Unit 2157 for re-mailing of the Notice of Allowance and Issue Fee Due and Notice of Allowability and for re-starting the period for reply.

Telephone inquiries concerning this matter should be directed to the undersigned at (571) 272-3232.

/Derek L. Woods/
Derek L. Woods
Attorney
Office of Petitions

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	NING0008

CONFIRMATION NO. 8392

26201
FISH & RICHARDSON P.C.
P.O BOX 1022
Minneapolis, MN 55440-1022

POA ACCEPTANCE LETTER

OC000000034687898

Date Mailed: 03/04/2009

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/06/2009.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/bdharrison/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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DATABRICKS EX1002 Page 456

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	NING0008

CONFIRMATION NO. 8392

POWER OF ATTORNEY NOTICE

75671
Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Ave, Suite 424
Spokane, WA 99201

OC000000034687869

Date Mailed: 03/04/2009

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/06/2009.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/bdharrison/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IPR2025-00716
DATABRICKS EX1002 Page 457

PTO/SB/80 (01-06)
Approved for use through 12/31/2008. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 75671

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 75671

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Niration Network Group, L.L.C.
2711 Centerville Road, Suite 400
Wilmington, DE 19808

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	Jeff Kern	Date	5/8/2008
Name	Jeff Kern	Telephone	
Title	Authorized Person for Niration Network Group, L.L.C.		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/96 (04-07)
Approved for use through 09/30/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Niration Network Group, L.L.C.

Application No./Patent No.: 09/834,785 Filed/Issue Date: April 13, 2001

Entitled: Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks

Niration Network Group, L.L.C., a Corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. [✓] the assignee of the entire right, title, and interest; or

2. [ ] an assignee of less than the entire right, title and interest
(The extent (by percentage) of its ownership interest is _____%)

in the patent application/patent identified above by virtue of either:

A. [ ] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

OR

B. [✓] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Edward A. Hubbard To: United Devices, Inc.
The document was recorded in the United States Patent and Trademark Office at
Reel 012004, Frame 0544, or for which a copy thereof is attached.

2. From: United Devices, Inc. To: Univa Corporation
The document was recorded in the United States Patent and Trademark Office at
Reel 020353, Frame 0187, or for which a copy thereof is attached.

3. From: UD Liquidation Inc., F/K/A United Device To: Univa Corporation
The document was recorded in the United States Patent and Trademark Office at
Reel 020593, Frame 0650, or for which a copy thereof is attached.

[✓] Additional documents in the chain of title are listed on a supplemental sheet.

[ ] As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Michael K. Colby — 19 May 08
Signature — Date

Michael K. Colby — 509-755-7254
Printed or Typed Name — Telephone Number

Attorney of Record, Reg. 45816
Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Continuation: Chain of title

4. From: Univa Corporation (AKA United Devices) To: Niration Network Group, L.L.C.
The document was recorded in the United States Patent and Trademark Office at Reel 020831, Frame 0104.

Electronic Acknowledgement Receipt

EFS ID:	5180210
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	26201
Filer:	William Breen/Kenneth Linder
Filer Authorized By:	William Breen
Attorney Docket Number:	NING0008
Receipt Date:	20-APR-2009
Filing Date:	13-APR-2001
Time Stamp:	12:27:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		NING0008POA.pdf	209113 d4fd40a822fe501e25f2dff714ed5455b74edcbc	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Power of Attorney	1	1
	Assignee showing of ownership per 37 CFR 3.73(b).	2	3
Warnings:			
Information:			
	Total Files Size (in bytes):	209113	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	NING0008

CONFIRMATION NO. 8392

POA ACCEPTANCE LETTER

75671
Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Ave, Suite 424
Spokane, WA 99201

OC000000035640020

Date Mailed: 05/01/2009

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/20/2009.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/lvongxay/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IPR2025-00716
DATABRICKS EX1002 Page 463

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	NING0008

CONFIRMATION NO. 8392

POWER OF ATTORNEY NOTICE

26201
FISH & RICHARDSON P.C.
P.O BOX 1022
Minneapolis, MN 55440-1022

OC000000035640001

Date Mailed: 05/01/2009

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/20/2009.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/lvongxay/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IPR2025-00716
DATABRICKS EX1002 Page 464

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

CORRECTED
NOTICE OF ALLOWANCE AND FEE(S) DUE

75671 7590 07/15/2009

Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Ave, Suite 424
Spokane, WA 99201

EXAMINER	
DALENCOURT, YVES	
ART UNIT	PAPER NUMBER
2457	

DATE MAILED: 07/15/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	NING0008	8392

TITLE OF INVENTION: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$0	$0	$1510	10/15/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

IPR2025-00716
DATABRICKS EX1002 Page 465

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

75671 7590 07/15/2009

Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Ave, Suite 424
Spokane, WA 99201

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	NING0008	8392

TITLE OF INVENTION: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$0	$0	$1510	10/15/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
DALENCOURT, YVES	2457	709-203000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____ 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

IPR2025-00716
DATABRICKS EX1002 Page 466

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	NING0008	8392

75671 7590 07/15/2009

Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Ave, Suite 424
Spokane, WA 99201

EXAMINER	
DALENCOURT, YVES	
ART UNIT	PAPER NUMBER
2457	

DATE MAILED: 07/15/2009

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 706 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 706 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

IPR2025-00716
DATABRICKS EX1002 Page 467

Notice of Allowability	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	Yves Dalencourt	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment filed on 04/18/2006*.

2. ☒ The allowed claim(s) is/are *29-54*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Dalencourt
Primary Examiner

IPR2025-00716
DATABRICKS EX1002 Page 468

PTO/SB/30 (12-08)
Approved for use through 01/31/2009. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward A.
Art Unit	2157
Examiner Name	Dalencourt, Yves
Attorney Docket Number	NING0008

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

   a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

      i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

      ii. ☐ Other _____

   b. ☑ Enclosed

      i. ☑ Amendment/Reply

      ii. ☐ Affidavit(s)/ Declaration(s)

      iii. ☑ Information Disclosure Statement (IDS)

      iv. ☐ Other _____

2. Miscellaneous

   a. ☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

   b. ☐ Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

   a. ☑ The Director is hereby authorized to charge the following fees, any underpayment of fees, or credit any overpayments, to Deposit Account No. 50-4143.

      i. ☐ RCE fee required under 37 CFR 1.17(e)

      ii. ☐ Extension of time fee (37 CFR 1.136 and 1.17)

      iii. ☐ Other _____

   b. ☐ Check in the amount of $ _____ enclosed

   c. ☑ Payment by credit card (Form PTO-2038 enclosed)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature	/Nathan Grebasch/	Date	10/07/2009
Name (Print/Type)	Nathan T. Grebasch	Registration No.	48,600

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature	Filed via EFS Website		
Name (Print/Type)		Date	

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Patent Application Fee Transmittal

Application Number:	09834785
Filing Date:	13-Apr-2001
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Filer:	David Anthony Morasch/Travis R Henderson
Attorney Docket Number:	NING0008

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
		Total in USD ($)		**810**

Electronic Acknowledgement Receipt

EFS ID:	6230077
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	75671
Filer:	David Anthony Morasch/Travis R Henderson
Filer Authorized By:	David Anthony Morasch
Attorney Docket Number:	NING0008
Receipt Date:	08-OCT-2009
Filing Date:	13-APR-2001
Time Stamp:	17:13:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$810
RAM confirmation Number	3558
Deposit Account	504143
Authorized User	SADLER,LANCE R.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		NING0008SupplementalAmendment.pdf	117951 c65820c5181f7a9211b618279f707550ac049309	yes	11

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment Submitted/Entered with Filing of CPA/RCE	1	1
	Claims	2	10
	Applicant Arguments/Remarks Made in an Amendment	11	11

Warnings:

Information:

2		NING0008IDS.pdf	203847 cd9670da1c11d0b9a1878767c01024cceeabffbd	yes	6

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Filed (SB/08)	3	6

Warnings:

Information:

3	NPL Documents	Distributednet.pdf	104175 275eb970823bf6103995f2959923fd5f911ff678	no	3

Warnings:

Information:

4	Foreign Reference	EP0883313A2.pdf	648851 157afcf3edb1e5f98f43a88e1691996c66f4cb10	no	13

Warnings:

Information:

5	NPL Documents	GIMPS.pdf	89009 b479d55e38eddbc7091141215961a7c53ecf895b	no	3

Warnings:					
Information:					
6	NPL Documents	Ninflet.pdf	755099 31d8901db71249c046f539aa90b0f25fcdd8964e	no	16
Warnings:					
Information:					
7	NPL Documents	NPLShmulik.pdf	866080 17649e024b085f61c3322ce9762da5667ca242a4	no	94
Warnings:					
Information:					
8	NPL Documents	ParabonComputation.pdf	54368 ac3756475090fbf8a471c2acc61f4fad6b613644	no	2
Warnings:					
Information:					
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Information:					
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Warnings:					
Information:					
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Warnings:					
Information:					
13	Foreign Reference	WO0114961.pdf	2506918 1bca57cbc3a82e3754aae9eade87036555c0ab02	no	61
Warnings:					
Information:					
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Warnings:					
Information:					
15	Request for Continued Examination (RCE)	NING0008RCE.pdf	59070 02d3cd2c1eb37f7a2a3cf60db86627cdab57ea4b	no	1
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
16	Fee Worksheet (PTO-875)	fee-info.pdf	31052 243f5ea8747ceac0ad544c5c160fd6fbf96f9144	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	11372799		

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 09/834,785
Filing Date 4/13/2001
Confirmation No. 8392
Applicant..... Niration Network Group, L.L.C.
Inventorship ..... Hubbard
Group Art Unit..... 2157
Examiner ..... Dalencourt, Y.
Attorney Docket No. NING0008
Title: Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks

SUPPLEMENTAL AMENDMENT AND REMARKS

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

From: Nathan Grebasch (Tel. 509-755-7267; Fax 509-755-7252)
Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Avenue, Suite 424
Spokane, WA 99201

Customer No. 75671

Entry of the enclosed amendments are respectfully requested.

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DATABRICKS EX1002 Page 476

IN THE CLAIMS

Claims pending:

- At time of the Action: 29-54
- After this Response: 29-65

Canceled or Withdrawn claims: 1-28
Amended claims: 29-40 and 42-53
New claims: 54-65

This listing of claims replaces all prior versions and listings:

1. - 28. canceled.

29. (currently amended) A computer-implemented method ~~providing network attached storage (NAS) services~~ comprising:

configuring a distributed processing system ~~by coupling~~ of a multiplicity of distributed devices ~~using~~ coupled by a network, wherein each ~~of the~~ said distributed ~~devices~~ device has ~~is enabled by~~ a client agent ~~program~~ operable to process ~~workloads~~ a workload for the distributed processing system,[[;]]

~~configuring~~ wherein the client agent for a particular said distributed device ~~program to have~~ has a software-based network attached storage (NAS) ~~NAS~~ component configured to assess unused or under-utilized storage resources in selected distributed devices ~~from~~ of the multiplicity of distributed devices;

~~generating a representation by~~ representing with the software-based NAS component that the selected distributed devices ~~are~~ each comprise a NAS ~~devices~~ device having an available amount of storage resources ~~selected from~~ related to the unused and under-utilized storage resources for the selected distributed devices; and

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processing one or more of data storage ~~and~~ or access workloads for the distributed processing system by accessing data from or storing data into at least a portion ~~portions~~ of the available amount of storage resources ~~of the selected distributed devices~~ to provide ~~the~~ NAS ~~services~~ service to a client ~~devices~~ device coupled to the network.

30. (currently amended) The method of claim 29, wherein the client agent for the particular said distributed device ~~program~~ enables at least one of the selected distributed devices to ~~operate~~ function as a stand-alone dedicated NAS device.

31. (currently amended) The method of claim 29, wherein the client agent ~~program~~ for the particular said distributed device enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

32. (currently amended) The method of claim 31, ~~further comprising enabling~~ wherein the location distributed device is further configured to receive ~~data storage and~~ an access ~~requests~~ request from the client ~~devices coupled to the network~~ device and ~~to~~ direct the client ~~devices to~~ device to data requested on at least one of the selected distributed devices ~~storing the requested data~~.

33. (currently amended) The method of claim 32, further comprising managing ~~the~~ NAS ~~services~~ service for said distributed devices at least in part utilizing ~~at least one~~ a centralized server ~~system~~.

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34. (currently amended) The method of claim 33, wherein the centralized server ~~system downloads~~ is further configured to enable download of the NAS component to ~~the client agent programs in~~ the selected distributed devices.

35. (currently amended) The method of claim 33, ~~wherein~~ further comprising storing with the centralized server ~~system stores~~ location information for the data stored in the selected distributed devices ~~and at least in part directs the client devices to the distributed devices storing the requested data~~.

36. (currently amended) The method of claim 35, further comprising utilizing the centralized server ~~system~~ to receive ~~data storage and access requests from the client devices~~ and ~~to~~ route the data for storage ~~and access workloads~~ to the selected distributed devices based ~~in part~~ upon individual capabilities of the selected distributed devices indicated in a capabilities database~~, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system~~.

37. (currently amended) The method of claim 29, wherein the network ~~is~~ comprises the Internet.

38. (currently amended) The method of claim 29, further comprising managing storage resources for the selected distributed devices ~~using~~ with a storage priority control that facilitates ~~full~~ use of the available ~~amounts~~ amount of storage resources for the selected distributed devices.

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39. (currently amended) The method of claim 38, wherein the storage priority control comprises a parameter selectable ~~through~~ by ~~one of~~ the client ~~devices~~device.

40. (currently amended) The method of claim 39, wherein the storage priority control comprises storage priority level schemes that prioritize one or more of ~~data~~ storage ~~and~~ or deletion of data.

41. (previously presented) The method of claim 39, wherein the storage priority control comprises a priority marking directly given to data or files.

42. (currently amended) A system ~~for providing network attached storage (NAS) services~~ comprising:

~~a distributed processing system configured by coupling~~ a multiplicity of distributed devices ~~using~~ configured to be coupled by a network, wherein each ~~of the multiplicity~~ said distributed ~~devices are enabled by~~ device includes a client agent ~~program~~ to process workloads for the distributed processing system,~~; and~~ each client agent including:

a software-based network attached storage (NAS) ~~NAS~~ component ~~operating within each of the client agent programs, wherein the software-based NAS component assesses~~ configured to:

assess unused storage resources of ~~the multiplicity~~ said distributed devices~~;~~[[,]]

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~~allocates~~ allocate an available amount of unused storage resources in selected distributed devices of the multiplicity of distributed devices~~from the multiplicity distributed devices,~~;

~~generates a representation~~ represent that the selected distributed devices ~~are~~ each comprise a NAS ~~devices~~ device having the available amount of storage resources;[[,]] and

~~processes~~ process data storage and access workloads ~~in the selected distributed devices for the distributed processing system~~ by accessing data from and storing data into portions of each of the available amounts of unused storage resources in the selected distributed devices to provide ~~the~~ NAS ~~services~~ service to a client device~~devices coupled to the network~~.

43. (currently amended) The system of claim 42, wherein ~~the~~ each client agent ~~program~~ is configured to enable ~~enables~~ at least one of the selected distributed devices to ~~operate~~ function as a stand-alone dedicated NAS ~~devices~~device.

44. (currently amended) The system of claim 42, wherein the client agent ~~program~~ is configured to enable ~~enables~~ at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

45. (currently amended) The system of claim 44, ~~further comprising enabling~~ wherein the location distributed device is configured to receive ~~data storage and~~ an access ~~requests~~ request from the client ~~devices coupled to the network~~ device and ~~to~~

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direct the client ~~devices~~ device to the data stored on the selected distributed devices that was requested ~~storing the requested data~~.

46. (currently amended) The system of claim 45, wherein the system is further configured to manage ~~comprising managing~~ the NAS ~~services~~ service for said distributed devices at least in part utilizing ~~at least one~~ a centralized server system.

47. (currently amended) The system of claim 46, wherein the centralized server system is further configured to enable download of ~~downloads~~ the NAS component ~~to the client agent programs in~~ to the selected distributed devices.

48. (currently amended) The system of claim 46, wherein the centralized server system is configured to store ~~stores~~ location information for the data stored in the selected distributed devices ~~and at least in part directs the client devices to the distributed devices storing the requested data~~.

49. (currently amended) The system of claim 48, wherein ~~further comprising utilizing~~ the centralized server system is configured to receive data storage and access requests from the client ~~devices~~ device and ~~to~~ route a data storage workload ~~and access workloads~~ to the selected distributed devices based ~~in part~~ upon individual capabilities of the selected distributed devices indicated in a capabilities database~~, wherein the individual capabilities are stored in a capabilities database coupled to the centralized server system~~.

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50. (currently amended) The system of claim 42, wherein the network ~~is~~ comprises the Internet.

51. (currently amended) The system of claim 42, further comprising ~~managing~~ a storage priority control configured to facilitate use of the available amount of storage resources for the selected distributed devices ~~using a storage priority control that facilitates full use of the available amounts of storage resources~~.

52. (currently amended) The system of claim 51, wherein the storage priority control comprises a parameter selectable ~~through one of~~ by the client ~~devices~~device.

53. (currently amended) The system of claim 52, wherein the storage priority control comprises storage priority level schemes that prioritize one or more of ~~data~~ storage ~~and~~ or deletion of data.

54. (previously presented) The system of claim 52, wherein the storage priority control comprises a priority marking directly given to data or files.

55. (new) A computer-implemented method comprising:

allocating data for storage among selected devices of a multiplicity of devices that are each independent and available on a network, wherein each of the multiplicity of devices have a software agent that is usable to control storage resources that are unused or underused for that device; and

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representing, using one of said software agents, that the selected devices individually comprise a network attached storage (NAS) device with storage capacity equal to a total of the unused or underused storage resource.

56. (new) The computer-implemented method of claim 55, wherein the allocating is performed by a server.

57. (new) The computer-implemented method of claim 55, wherein the allocating and representing are performed by one of the multiplicity of devices.

58. (new) The computer-implemented method of claim 55, wherein the allocating is performed in accordance with capability vectors calculated for each of the selected devices.

59. (new) The computer-implemented method of claim 55, further comprising:

identifying whether the storage resources for a particular device, of the selected devices, are idle, and

performing the allocating so a greater portion of the data for storage is sent to the particular device if the storage resources for the particular device are idle, wherein the greater portion is greater than a portion of the data that would be allocated to the particular device if the storage resources for the particular device were not idle.

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60. (new) The computer-implemented method of claim 55, wherein the allocating and representing are performed by at least one of the multiplicity of devices via interaction with other devices on a peer-to-peer basis

61. (new) A computer-implemented method comprising:

downloading to one or more selected devices, included in a multiplicity of devices, a network attached storage (NAS) component and a portion of a storage workload for storage in memory that is unused or under-utilized; and

representing to a client device, coupled to the multiplicity of devices by a network, that each selected device is a dedicated NAS device.

62. (new) The computer-implemented method of claim 61, further comprising storing location information in a database that is usable to indicate locations in memory the portion of the storage workload is stored.

63. (new) The computer-implemented method of claim 61, wherein the computer-implemented method is performed by a central server coupled to the network.

64. (new) The computer-implemented method of claim 61, wherein the computer-implemented method is performed by a particular device of the multiplicity of devices.

65. (new) The computer-implemented method of claim 61, wherein the network comprises the Internet.

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DATABRICKS EX1002 Page 485

REMARKS

Claims 29-40 and 42-53 are amended without prejudice or disclaimer. Claims 55-65 are new. Claims 29-65 remain pending in the application for consideration. In view of the following remarks, Applicant respectfully requests reconsideration and allowance of the subject application. Support for the amendments and new claims may be found throughout the specification and in-particularly at page 3, lines 16-32; page 4, lines 2-5; page 12, lines 18-19; page 13, lines 19-20; page 17, lines 30-31; page 35, lines 26-33; and FIGS. 1A and 4.

Conclusion

All of the claims are in a condition for allowance. Accordingly, Applicant respectfully requests that the Office issue a Notice of Allowability. If the Office's next anticipated action is to be anything other than issuance of a Notice of Allowability, Applicant respectfully requests a telephone call for the purpose of scheduling an interview.

Respectfully submitted,

Dated: 10/7/09

By: /Nathan Grebasch/
Nathan Grebasch
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(509) 755-7267

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DATABRICKS EX1002 Page 486

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Edward A. Hubbard et al.	Examiner:	Yves Dalencourt
Serial No.:	09/834,785	Group Art Unit:	2157
Filed:	April 13, 2001	Docket:	NING0008
Title:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS		

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq*., the referenced materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicants respectfully request that this Supplemental Information Disclosure Statement be entered and the documents listed on the attached Form 1449 be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicants request that a copy of the 1449 form, initialed as being considered by the Examiner, be returned to the Applicants with the next official communication.

Pursuant to 37 C.F.R. §1.97(b), it is believed that no fee or statement is required with the Supplemental Information Disclosure Statement. However, if an Office Action on the merits has been mailed, the Commissioner is hereby authorized to charge the required fees to Deposit Account No. 50-4143 in order to have this Supplemental Information Disclosure Statement considered.

Pursuant to 37 C.F.R. 1.98(a)(2), Applicant believes that copies of cited U.S. Patents and Published Applications are no longer required to be provided to the Office. Notification of this change was provided in the United States Patent and Trademark Office OG Notices dated October 12, 2004. Thus, Applicant has not included copies of any US Patents or Published Applications cited with this submission. Should the Office require copies to be provided, Applicant respectfully requests that notice of such requirement be directed to Applicant's below-signed representative. Applicant acknowledges the requirement to submit copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R. 1.98(a)(2).

The Applicant hereby makes the following additional information of record in the above identified applicaton.

Serial Numbers:

09/538,542	10/687,210	12/352,533	12/390,992
09/239,106	09/872,251	12/360,926	12/396,780
09/602,983	09/794,969	12/361,824	

Respectfully submitted,

EDWARD A. HUBBARD ET AL.

By their Representatives,

Date October 8, 2009 By /Nathan Grebasch/
Nathan T. Grebasch
Reg. No. 48,600

PTO/SB/08a(04-07)
Approved for use through 7/31/2006. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	2157
Examiner Name	Dalencourt, Yves

Sheet	1	of	4	Attorney Docket No: NING0008

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EXAMINER **DATE CONSIDERED**

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

	Complete if Known
Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	2157
Examiner Name	Dalencourt, Yves

Sheet	2	of	4	Attorney Docket No: NING0008

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Filing Date If Appropriate
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EXAMINER **DATE CONSIDERED**

PTO/SB/08a(04-07)
Approved for use through 7/31/2006. OMB 0651-0031
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	2157
Examiner Name	Dalencourt, Yves

Sheet	3	of	4	Attorney Docket No: NING0008

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Filing Date If Appropriate
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EXAMINER **DATE CONSIDERED**

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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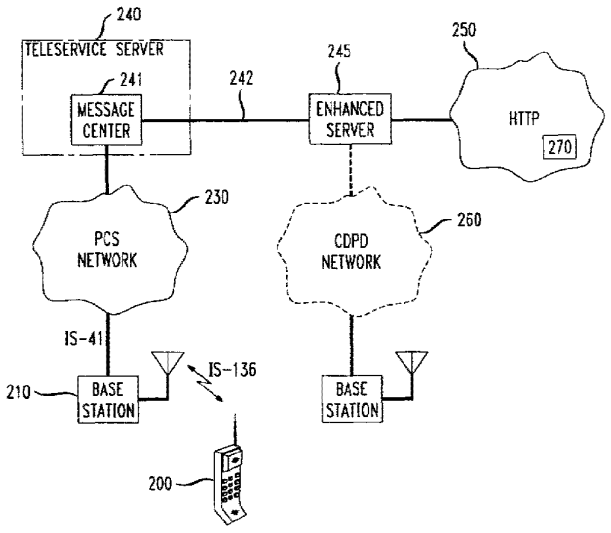
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(54) Method and system for exchanging Internet data with a mobile station

(57) A teleservice server in a wireless network provides an interface between a mobile station and an Internet protocol network thereby facilitating data transfers between these elements. The server translates datagrams from the IP network into a format suitable for transmission over a wireless network that provides voice communication capabilities. The server also translates data messages received from the mobile station over the wireless network into appropriate transmission in the IP network.

FIG. 2



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Description

BACKGROUND OF THE INVENTION

The present invention is directed to a method and system for providing communication with a mobile station. More particularly, the present invention is directed to a method and system for transferring data from an Internet Protocol (IP) network to a mobile station on a non-IP network.

The demand for data communication capabilities continues to grow. Individuals seek more and more ways to access available data or to transmit data. An example of the continued growth of this industry is the explosion in Internet and in particular, the World Wide Web. Communications over this medium take place in what is commonly referred to as the HyperText Transfer Protocol (HTTP) or Internet Protocol (IP). An example of data communication configurations which allow a user to interact with the Internet are shown in FIGS. 1A and B.

In FIG. 1A a user at, for example computer terminal, such as a PC, 10, is connected via a modem 11 to a public switch telephone network (PSTN) 15. Somewhere in that PSTN resides an access provider 20. The access provider provides a datalink 25 to the Internet, here shown as HTTP NETWORK. Typically, software referred to as a "browser" is loaded on the computer 10 and permits data communication with other data sources located in the Network 30, an example of which is the Internet. Examples of such browsers include Netscape's Navigator and Microsoft's Internet Explorer. The computer 10 and the data resources in Internet 30 communicate in an open language referred to as the hypertext mark-up language (HTML). While this configuration is very useful to the user, it has some limitations in that to be able to access information from the Internet the user must have a computer, such as a PC or laptop, for example, with them to be able to communicate with the Internet. Furthermore, it requires a wired connection to the PSTN to provide access to the Internet. This somewhat limits a user's ability to access the Internet.

FIG. 1B represents one proposed attempt at providing a wireless connection from a user to the Internet. In this circumstance the user has a wireless communication device 100 that communicates over the air with a base station 110. The base station is part of a wireless data network referred to as the cellular digital packet data (CDPD) network 120. A special server 130 acts as an interface between the Internet 140 and the CDPD network. An example of the communication device 100 is the AT&T PocketNet phone. In the PocketNet configuration the phone transmits information via a wireless IP network, the CDPD. The server, 130 is a software platform created by Unwired Planet. The software platform uses an open language called the hand-held device mark-up language, or HDML, to interactively display information on a hand-held device such as the PocketNet phone. The PocketNet phone browser and server applications support HDML. To access information or transmit a message, the user manipulates the phone browser's menu-based user interface with the phone keypad. Requests for information are routed through the wireless IP network and the wire line Internet to be processed at the server on which the application resides. The browser then displays the results of the query. There is, however, one limitation in the PocketNet application, namely that the phone can only receive data or interact with the Internet when the phone is in a data-only mode since communications over the CDPD are strictly data communications. The PocketNet configuration does not permit interaction with the data network or receipt of data while in a voice mode or in an idle mode.

It would be advantageous if a network could provide data communications to a hand-held device whereby the communications could take place while the device is either in an idle mode or in a voice mode.

Another wireless communications protocol known as IS-136, TIA/EIA/IS-136.1-A October 1996; TIA/EIA/IS-136.2 October 1990, herein incorporated by reference, provides a cellular phone with the capability of receiving short messages while in an idle mode or in a voice mode. However, messages are generated by a message center which provides appropriately formatted data to comply with the IS-136 protocol. The hand-held device does not communicate with an Internet data communication network.

SUMMARY OF THE INVENTION

The present invention provides a method and system which enhances a user's capability of communicating with an Internet-like network using a hand-held device. More specifically, the present invention permits the user to communicate with a data network while either in an idle mode or while in a voice mode.

In one embodiment of the present invention, a request to transfer data from an IP network to the mobile station is received; then it is determined whether the mobile station is registered in a first network. If the mobile station is so registered then the data is adapted to be transferred for transport via a teleservice provided in the first network and then the adapted data is transferred to the mobile station.

In one, more particular, embodiment of the present invention the mobile station is registered on an IS-136 network. The IP network informs a server of a desire to transfer a datagram to the mobile station. If the mobile station is registered in the network then the datagram is translated into an R-Data message in the IS-136 protocol and the R-Data message is transferred to the mobile station.

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In a further embodiment of the present invention the mobile station may generate a request and that request for data will be translated into an appropriate format suitable for the IP network. In response to this request the IP network will send data back and the data will be translated into a format consistent with the teleservice network to which the mobile station is connected.

In a still further embodiment the request from the mobile station constitutes an R-Data message to a teleservices server and the data request is translated to a format suitable for the IP network. The IP network then sends a datagram in response to the request and the teleservices server translates the datagram to an R-Data message in the IS-136 protocol. The R-Data message is then transferred to the mobile station.

The transfer of data between the mobile station and the IP network can take place while in the idle mode or in the voice mode.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. 1A and 1B illustrate block diagrams of prior art data communication configurations.

FIG. 2 illustrates a block diagram representation of a data communication configuration in accordance with an embodiment of the present invention.

FIG. 3 illustrates a block diagram representation of the enhanced server of the embodiment illustrated in FIG. 2.

FIG. 4 is another schematic representation of an embodiment of the present invention.

FIG. 5 illustrates a data flow in a transfer of data from a data network to a mobile station in accordance with an embodiment of the present invention.

FIG. 6 illustrates a data flow for a transfer of data from a mobile station to an IP network in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION

In accordance with an embodiment of the present invention a mobile station can receive communications from or communicate data requests to an Internet protocol network while in an idle or a voice mode. A block diagram representation of an embodiment of the present invention is illustrated in FIG. 2.

In this embodiment a user has a mobile station 200, shown here as a hand held device, which may be a cellular phone which is capable of operating under the IS-136 protocol. The cellular phone has wireless communications with a base station 210 using that protocol. The base station is part of a wireless network which may be the PCS (Personal Communications Services) network or any other wireless network. The base station communicates with the network over a protocol referred to as IS-41. Such a PCS network exists and is already known. The IP network, here shown as cloud 250 labeled HTTP Network (referring to Hypertext Transfer Protocol) can communicate with a handheld or mobile station on PCS network 230 via its coupling to an Enhanced Server 245 which is in turn coupled to a Teleservice Server 240. The Enhanced Server can identify a request from the HTTP for a transfer of data to a hand held device. The Enhanced Server then signals the Teleservice Server via communication line 242. A message center 241, which may constitute a part of the Teleservice Server 240, can receive the data from the Enhanced Server 245. The message center then translates the data into a format for relaying the data to the handheld device in accordance with the status of the mobile station. In particular, if the mobile station is registered with a Teleservice Server but in an idle mode then the message center can transfer data via the PCS network and base station 210 to the mobile station 200, the data being properly formatted in the IS-136 protocol. A web browser which operates in an open language (e.g., HDML hand held device mark-up language), allows for the display of information on the mobile station. If the mobile station is idle this information is translated over a digital control channel (DCCH). Alternatively, if the hand held device is already in the voice mode, then the hand held device is operating on a voice channel but the messages can be properly formatted so as to be interleaved with the voice communications on the digital traffic channel and thus permit a transfer of data to the mobile unit. Again, at that stage the browswer language will control how the transfer data is displayed on the mobile station.

At this point data transfers from the IP network to the mobile station have been described. However, the data transfer could originate at the mobile station instead. This transfer could constitute a data request generated by a user operating the handheld device 200. In those circumstances the mobile station's HDML operation recognizes a user input or data request from the mobile station to the Internet protocol and transfers the request to the Enhanced Server. The server then takes the data request and transfers it to the IP network.

In a further enhancement to the data communication system, the Enhanced Server also has the ability of implementing the known wireless IP service. That is, the Enhanced Server can communicate data between the IP network 250 and a handheld device or mobile station which communicates via the CDPD network 260 in a manner similar to that already described above with respect to the prior art. In that embodiment the enhanced server must be able to recognize the network to which the mobile station is presently registered and then must appropriately route the data

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information from the HTTP network to the mobile station in accordance with the network to which it is registered.

A block diagram of an enhanced server for use in the communication configuration of FIG. 2 is illustrated in FIG. 3. In this enhanced server 245 there are at least four basic elements, a proxy 340, a dual messenger, 330, a wireless IP handler 320, and an R-Data message handler, 310. The dual messenger receives a notification from the data network of a message for the handheld device. The messenger then determines the network to which the hand held device is connected and registered. The messenger, having identified the location of the station then manages the delivery of data via the network to which the station is registered. This is different from known IP handling networks in that dual messenger 330 must first locate the mobile station before sending a message or notification to the mobile station.

The proxy 340 forms the information interface to the IP network. The proxy can request notification information from the dual messenger to obtain the application on the IP network which desires to transfer information. The identity of the application is typically a URL (universal resource locator) that is contained in notification information transmitted to the dual messenger by the application on the IP network. The proxy also then receives the data from the application and then transfers it to the mobile station via either the R-Data message handler 310 or the wireless IP handler 320.

The wireless IP handler operates like the wireless IP interface of the prior art shown in FIG. 1A.

The R-Data message handler has the function of locating the mobile station and delivering message notifications using the R-Data teleservice available over the IS-136 protocol.

An example of the operation of the communication network elements of FIG. 2 and FIG. 3 in the context of data transfer is provided to clarify the understanding of these elements. In this example, application 270 in the IP network desires to send a message to the mobile station 200. The application first posts a notification request to the dual messenger 330. The dual messenger 330 passes the notification request together with an identifier of the mobile station such as the mobile identification number (MIN), to the R-Data message handler 310. The R-Data message handler 310 then generates a query to the teleservice server 240 to determine if the target mobile station is present on the IS-136 system. The teleservice server then interrogates a home location register (HLR) associated with the identified target mobile station. (The HLR is not shown in the drawing figures.) It is assumed for this example that the target station 200 is registered in the PCS network 230. Therefore, the HLR identifies to the teleservice server 240 that the phone is registered on the network. The R-Data message handler then verifies that a paging rate has not been exceeded and requests that the proxy obtain the notification data from the application via the IP network. The proxy 340 obtains from the dual messenger the identifier (in this case URL) of the application and generates a request for the data from the application and transmits that request over the IP network. When the application returns the data to the proxy 340, the proxy delivers that data to the R-Data message handler 310 which in turn, sends the data to the teleservice server and in particular, the message center in that server. The teleservice server in turn delivers the notification and information to a mobile switching center. The MSC then delivers the data to the mobile station 200 via the base station 240 and a wireless communication consistent with the IS-136 protocol. The data is transferred in an R-Data message or messages transferred over the wireless channel. Having described the general operations of the enhanced server and the teleservices server, the following provides a more detailed description of the data transfer operations which are conducted.

The IS-136 protocol permits certain teleservices, generally referred to as over-the-air teleservices, which are additional services involving data transfers over the wireless communication channel. An example of one such teleservice is described in co-pending application serial no. 08/728,275 entitled A Method and Apparatus for Over-the-Air Programming of Telecommunication Services.

Delivery of message notifications and message data to IS-136 mobile stations requires the development of a new IS-136 teleservice. The teleservice proposed is a general UDP transport teleservice (or GUTT). This teleservice transports UDP datagrams User Datagram Protocol, Request for Comments (RFC) 768, J. Postel from an application in the IP network to the appropriate application in the mobile station, namely the browser operating in the mobile station. The general UDP transport teleservice is sent over the IS-41 network. In particular, it is sent over in part of a short message service deliver point-to-point (SMDPP) message in that protocol. Specifically, the information is sent in the short message service Bearer Data of such a message. The teleservice server encapsulates the incoming data from the R-Data message handler into the appropriate GUTT format and packages it into an IS-41 SMDPP transport message. The teleservice server then routes this transport message to the mobile switching center (MSC) that serves the mobile station as identified by the information in the mobile station's HLR. The message is transferred to the MSC using standard IS-41C short message service delivery procedures. The MSC then performs the interworking from the IS-41 SMDPP to the IS-136 R-Data on-the-air interface. A more detailed description of the operation of the transport service is now provided in connection with two situations, one where the mobile station is registered in the network and one mobile station at the time of message notification is not registered or not available.

In the circumstance where the station is presently registered in a serving system, the home system of the mobile station includes a home location register which stores information about the location of the mobile switching center that is servicing the station. A dual messenger will receive a notification request from an application and pass the request to the R-Data message handler (RDMH) along with mobile station identifiers such as an electronic serial number

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(ESN) and/or a mobile identification number (MIN). The RDMH in turn sends a request to the teleservice server specifying the identification of the mobile station and inquiring whether the station is available. The teleservice server (TS) interrogates the HLR which provides a response that the station is available. In that circumstance, the TS advises the RDMH that the station is available. The RDMH then returns a delivery request to the TS that contains the mobile station identifier and the data that is to be delivered to the mobile station. The teleservice server includes a message handler application that receives the delivery request from the RDMH. Once the TS determines that it has valid address information for the identified mobile station the TS packages the data into a GUTT message and encapsulates it into a short message deliver point-to-point (SMDPP) message. The server then sends the SMDPP message to the serving MSC identified by the HLR. The serving MSC receives the SMDPP message and identifies that the request is for a mobile station that it is currently serving. The MSC then sends an IS-136 SPACH notification of R-Data in the SPACH channel. The mobile station receives the SPACH notification and responds with a SPACH confirmation on the reverse channel or RACH. The MSC, upon receipt of confirmation signal encapsulates the GUTT message in an IS-136 R-Data message on the SPACH. The MS receives the R-Data and processes the data. If the data is acceptable the mobile station sends an R-Data accept message. The mobile station then sends the received data to the browser in the mobile station.

It may so happen that at the time that the application in the IP network desires to send information to the mobile station the mobile station is not available for teleservice delivery. At that time then, after the RDMH has requested the availability of the mobile station, the HLR will identify the mobile station as "not available". The HLR will also set a flag to notify the teleservice server when the mobile station becomes available. At some time later, the mobile station registers with a serving MSC. The serving MSC then provides information to the HLR to identify the MSC with which the mobile station is currently registered. The HLR, due to the set flag, then notifies the teleservice server of the availability of the mobile station. The teleservice server in turn notifies the RDMH of the availability of the mobile station. The message transfer operation then continues as described above with respect to a station detected to be available.

FIG. 4 provides another block diagram representation of an embodiment of the present invention showing protocol levels associated with the respective elements in the data network. The mobile station 400 has a display 401 and a keypad 402 which can interact with a browser capable of operating with the appropriate mark-up language. The browser interfaces with the R-Data messages which are received in the IS-136 protocol with which the mobile station communicates with the PCS network. A mobile switching center (MSC) 404 communicates with the mobile station 400 over the IS-136 protocol and can transfer the R-Data messages within that protocol. The MSC 404 creates the R-Data messages from the short message data point-to-point (SMDPP) messages which it receives over the IS-41 protocol from the teleservice server 245. The teleservice server 245 translates data from a server such as web server 420 from an Internet Protocol (IP) to an SMDPP message that includes the data in a form usable by the mobile station. The server is connected to the Internet and employs the HTML.

Referring back to FIG. 2, the preceding description has focused on the transfer of data or communication of data between the mobile station over the PCS network. However, the enhanced server may recognize or determine that the mobile station is not registered on the PSC network but is instead registered on the CDPD network. In that circumstance, the enhanced server will transfer information from the proxy to the wireless IP handler in the enhanced server (see FIG. 3) and the data can be transferred over the CDPD network to a mobile station registered on that network. Thus, the enhanced server has the capability of recognizing that an addressed or targeted mobile station is registered on one of multiple networks and can appropriately format the IP data so as to transfer the data to the mobile station.

FIGS. 5 and 6 relate to implementations of messages in the GUTT teleservice. One message relates to mobile terminated messages and another relates to mobile originated messages.

The first message is a UDP deliver message that is a mobile-terminated message used for delivery of a UDP datagram to a mobile station. The user data in the UDP datagram is binary data, which may have a specific application encoding that is transparent to the teleservice. The format of the UDP delivered message is as follows:

Information Element	Usage	Length (Bits)	Type
Protocol Discriminator	Identifies the version of the GUTT protocol.	2	M
Message Type	Specifies the type of message.	6	M
Message Reference	Reference number assigned by the TS for the teleservice message.	16	M
Remaining Length	Remaining length of UDP Deliver message following this IE.	16	M

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(continued)

Information Element	Usage	Length (Bits)	Type
UDP Header: Source -Port	Source Application Port	64	M
Destination Port	Destination Application Port		
Length	Total octets in UDP header and data		
Checksum	Checksum to validate contents of the UDP		
	message		
User Data	UDP data	0-*	M

FIG. 5 illustrates a mapping of the UDP deliver message from R-Data and SMDPP. In the IS-41 protocol the data is placed in the SMS bearer data, SMSTID fields. In the R-Data message in the IS-136 protocol at the mobile switching station this information is placed in the R-Data unit. FIG. 5 shows how the R-Data unit is broken out to include the data portion HL PDU and it is into this portion that the UDP deliver information is inserted. The UDP deliver information includes a description type as well as a UDP header and data which includes the IP data originally transmitted by the IP network.

The second GUTT message is the UDP submit message which is a mobile-originated message used for delivery of a UDP datagram to the network. The user data in the UDP datagram is binary data which may have specific application and coding that is transparent to the teleservice. The format of the UDP submit message is as follows:

Information Element	Usage	Length (Bits)	Type
Protocol Discriminator	Identifies the version of the GUTT protocol.	2	M
Message Type	Specifies the type of message.	6	M
Message Reference	Reference number assigned by the MS for the teleservice message.	16	M
Remaining Length	Remaining length of UDP Deliver message following this IE	16	M
UDP Header:		64	M
Source Port	Source Application Port		
Destination Port	Destination Application Port		
Length	Total octets in UDP header and data		
Checksum	Checksum to validate contents of the UDP message		
User Data	UDP Data	0-*	M

FIG. 6 shows a mapping of the UDP deliver from R-Data and SMDPP. This mapping is something of a reverse representation of the flow of data in FIG. 5 where a datagram is created by the mobile and placed into an R-Data unit consistent with the IS-136 protocol. This R-Data unit is included in the R-Data transmitted from the mobile to the mobile switching center over the air. The MSC extracts information from the R-Data to be placed into the appropriate IS-41 SMDPP message format.

In accordance with the present invention, the mobile station is able to communicate with an IP network without need for an Internet protocol handler. It is able to communicate without having to rely on a dedicated data network such as the CDPD nor does it rely a dedicated data channel for communication. Instead, the present invention provides that data can be transmitted to the mobile station over a teleservice which permits the data to be interleaved with voice information if the mobile station is in a voice mode or simply transferred over a control channel if the mobile station is in an idler mode consistent with the operations of the mobile station in the IS-136 protocol. As a result, the mobile station has more flexibility in its interaction with the IP network. The IP network is able to transfer information to the mobile station under a broader set of circumstances than is available in either of the prior art configurations illustrated in FIGS. 1A and 1B.

While the above embodiment has focused on a translation of data from an Internet protocol network to the IS-136 protocol it should be recognized that the present invention is equally applicable to other exchanges of data between data networks and mobile stations where the data format in the first network is different from the data format in the

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network to which the mobile station is connected. More specifically, it is possible that the present invention could be applied to provide mobile stations with access to data on wide area networks or intra-nets as opposed to the Internet. Furthermore, the present invention is not specifically limited to the IS-136 protocol, but is applicable in any protocol which permits messaging to the mobile station, especially where such messaging can be interleaved with voice mode operation or can be transmitted over some control channel while the mobile station is in an idle mode.

Claims

1. A method for communicating data to a mobile station, the method comprising the steps of:

   receiving a request to transfer data from an IP network to a mobile station;
   determining whether said mobile station is registered in a first network;
   if said mobile station is registered in the first network adapting the data to be transferred for transport via a teleservice provided in said first network; and
   transferring said adapted data to said mobile station.

2. A method of interfacing a mobile station and an Internet Protocol Network, the method comprising the steps of:

   receiving notification of intended transfer of data to the mobile station; and
   identifying from a group of networks that network to which the mobile station is registered;
   wherein when the mobile station is registered with a first network,
   adapting data from the IP network to comply with a protocol for a teleservice on the first network; and
   transferring the adapted data to the mobile station via the teleservice.

3. A method of communicating a datagram from an Internet protocol (IP) network to a mobile station, the method comprising the steps of:

   receiving a notification from the IP network to transfer a datagram to the mobile station;
   determining whether the mobile station is registered on an IS-136 network;
   if the mobile station is registered on an IS-136 network translating the datagram to an R-Data message in the IS-136 protocol; and
   transferring the R-Data message to the mobile station.

4. A method of interfacing communications between an internet protocol (IP) network and a mobile station, the method comprising the steps of:

   receiving a request for data from the mobile station via a teleservice on a first network;
   transforming said request to a format suitable for the IP network;
   transmitting the transformed request to the IP network;
   receiving a datagram from the IP network in response to said request;
   adapting said datagram to comply with a protocol associated with said teleservice; and
   transferring said datagram to the mobile station via said teleservice on the first network.

5. A method of interfacing communications between an internet protocol (IP) network and a mobile station, the method comprising the steps of:

   receiving a data request over an IS-136 network from a mobile station;
   transforming said data request to a format suitable for the IP network;
   receiving a datagram from the IP network in response to said request;
   translating the datagram to an R-Data message in the IS-136 protocol; and
   transferring the R-Data message to the mobile station.

6. A method of interfacing an internet protocol network and a mobile station connected in a voice call over a wireless communication channel comprising the steps of:

   receiving a notification from the IP network to transfer a datagram to the mobile station;
   determining the mobile station to be registered and connected on a voice call;

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transforming a received datagram into a format to be interleaved with the voice call; and
interleaving said transformed datagram with the voice call over the wireless communication channel.

7. A system for providing datagram communications between a mobile station and an internet protocol (IP) network, the system comprising:

a message notification receiver coupled to the IP network;
a message handler, coupled to said message notification receiver and detecting whether the mobile station is registered in a first network in response to a signal from said receiver;
a data receiver, coupled to the message notification receiver and the message handler and receiving data from the IP network; and
a protocol transformer that adapts the data received from the IP network to a protocol for messaging in the first network.

8. A system for providing datagram communications between an internet protocol (IP) network a mobile station on an IS-136 network, the system comprising:

a message notification receiver coupled to the IP network;
a message handler, coupled to said message notification receiver and interrogating the IS-136 network whether the mobile station is registered;
a data receiver, coupled to said message notification receiver and the message handler and receiving datagrams from the IP network; and
a protocol transformer coupled to said message handler and receiving the datagrams, said transformer adapting said datagrams to an R-Data message in the IS-136 protocol.

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FIG. 1A

PRIOR ART

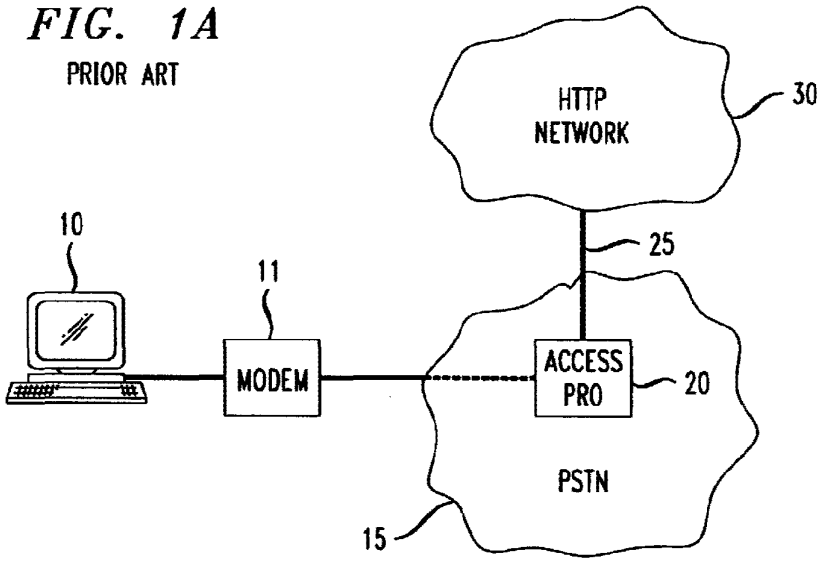
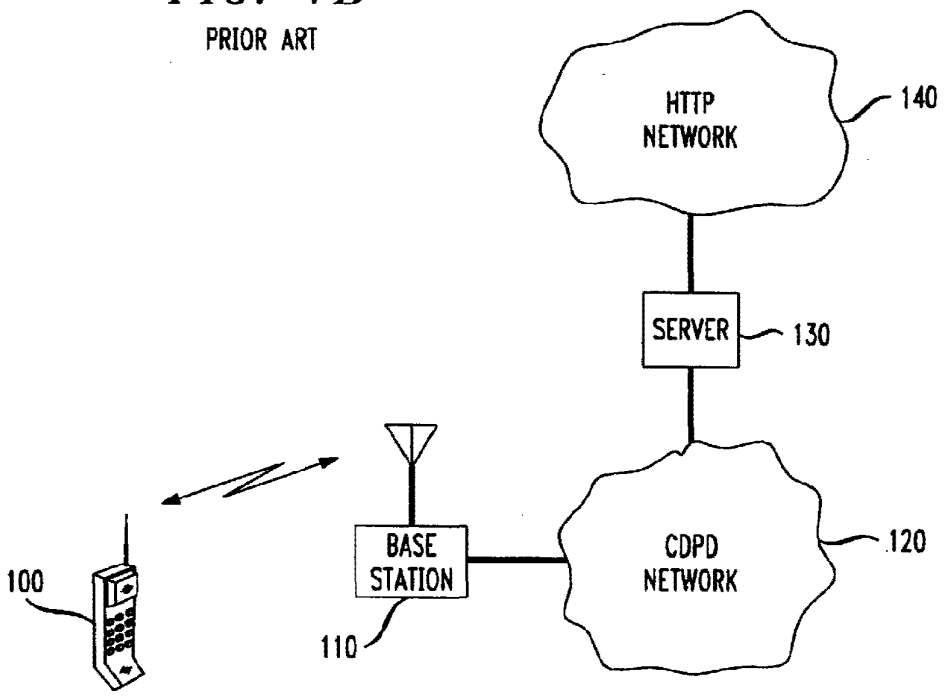


FIG. 1B

PRIOR ART



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FIG. 2

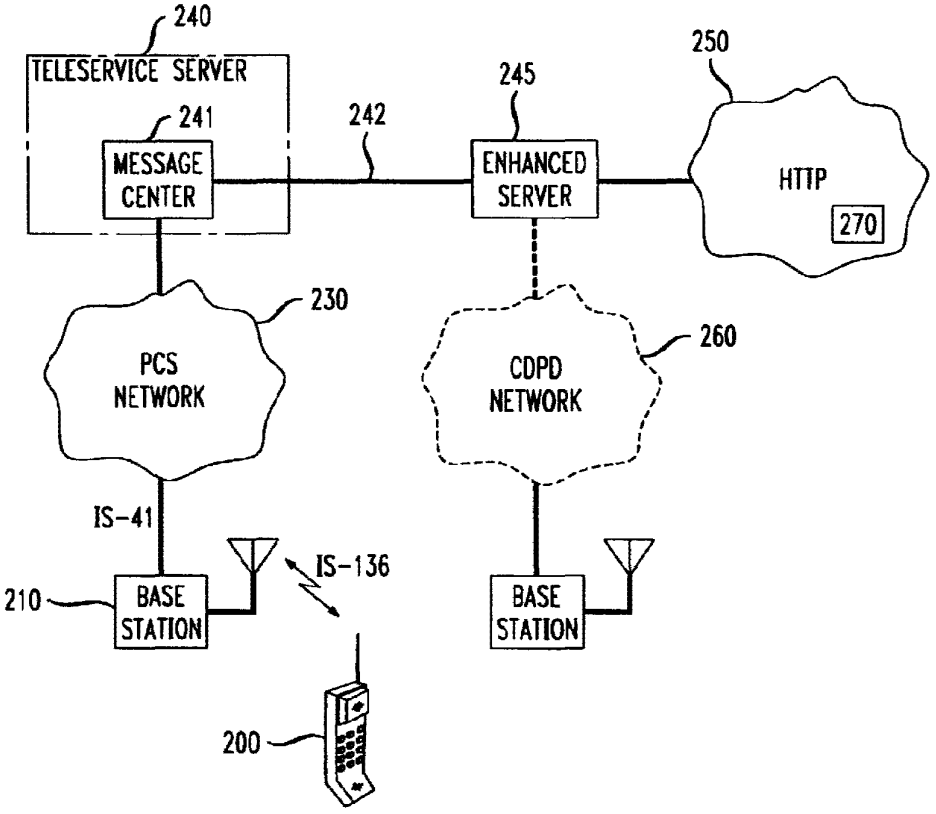
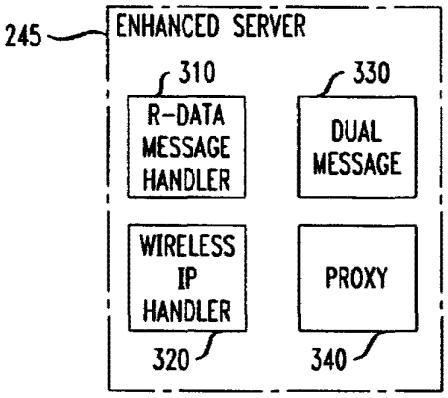
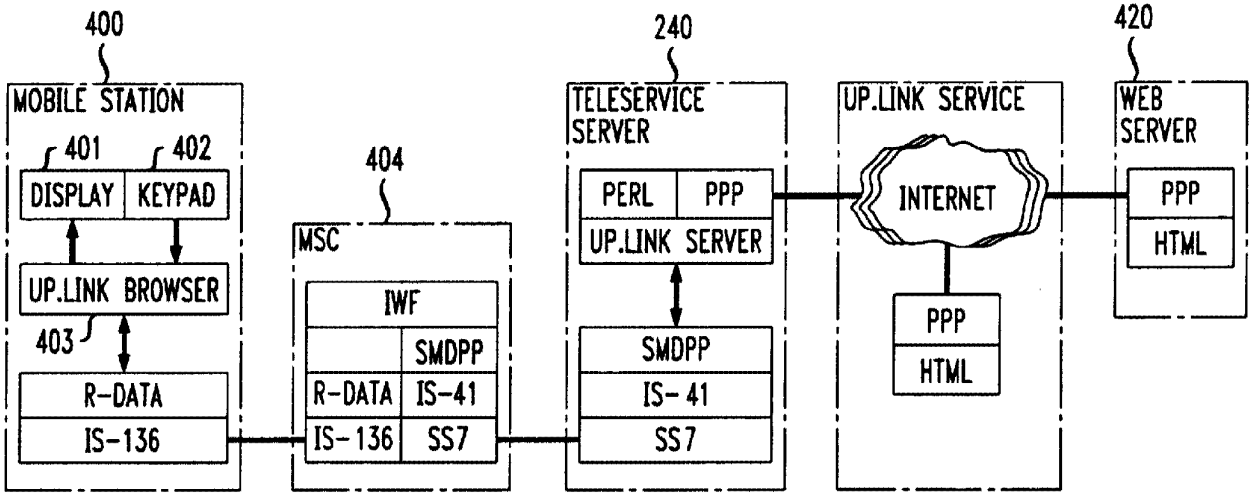


FIG. 3



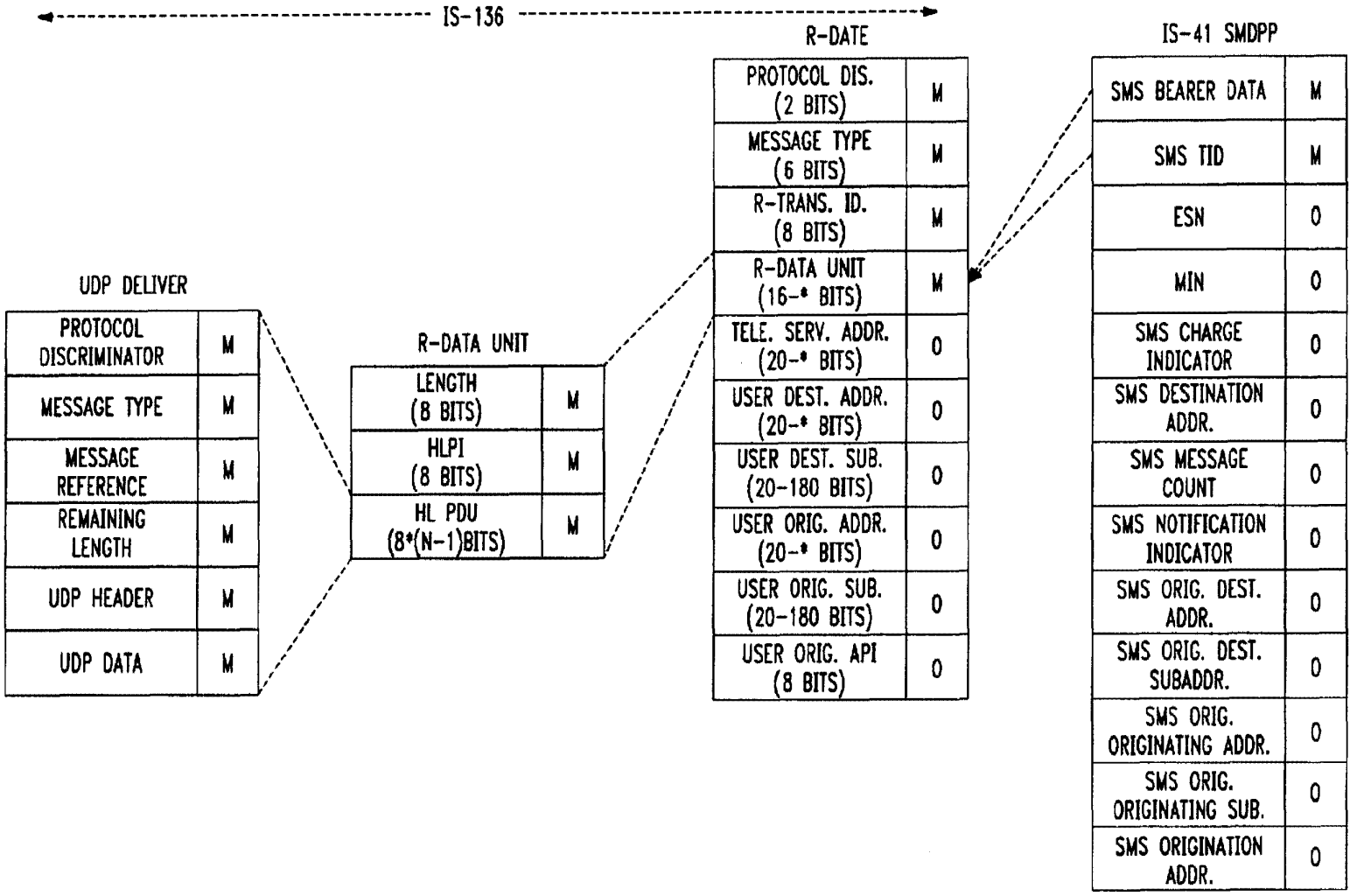
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FIG. 4



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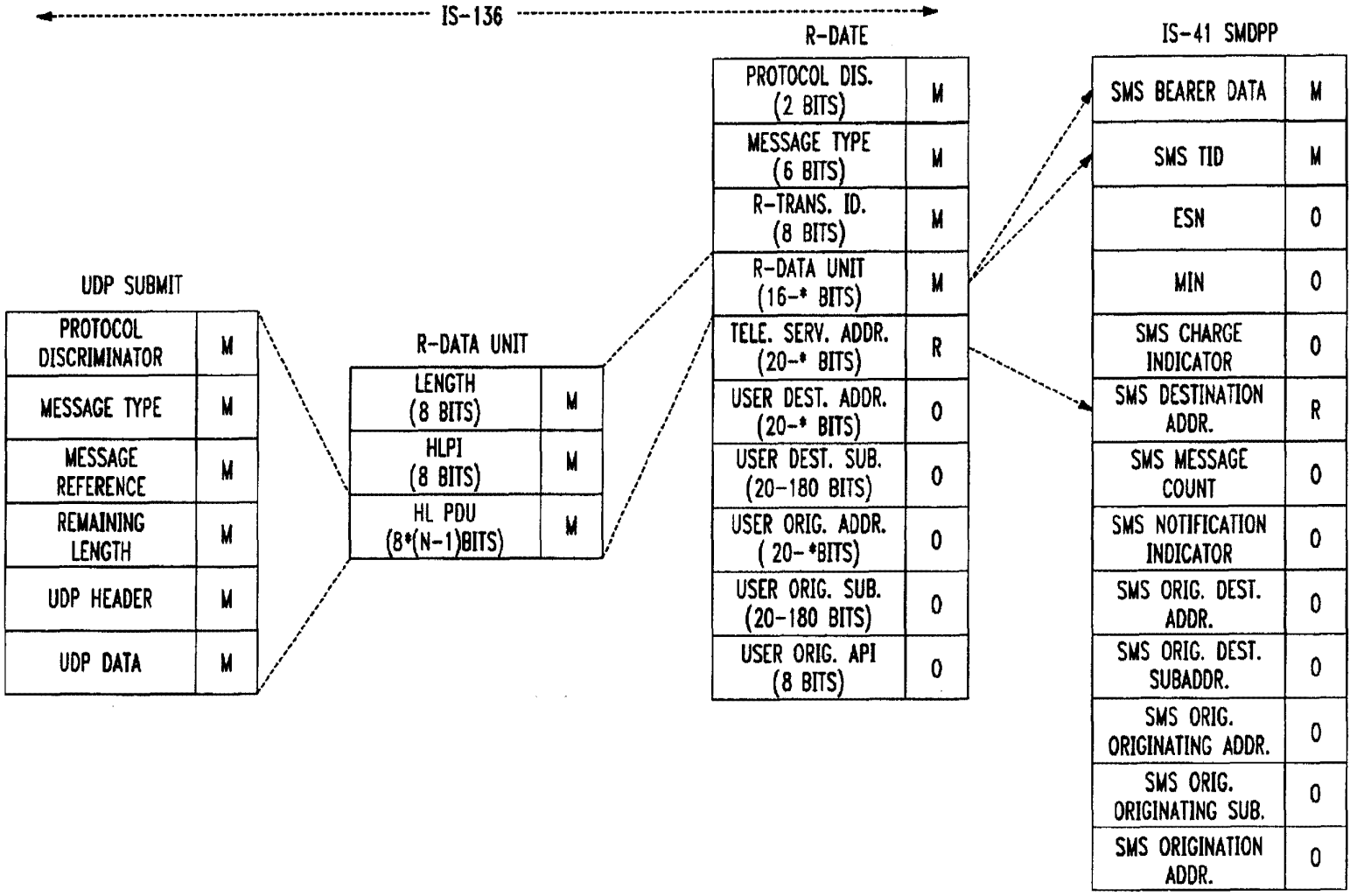
FIG. 5



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FIG. 6



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SYSTEM AND METHOD FOR THE ESTABLISHMENT AND UTILIZATION OF NETWORKED IDLE COMPUTATIONAL PROCESSING POWER

Abstract:

Abstract of WO 0114961

(A2) A distributed computing platform using the idle computational processing power of a plurality of provider computers is disclosed. At least one networked server collects tasks from client computers, schedules and distributes the tasks to networked provider computers, and collects and returns results to client computers. A client API forms tasks and collects results. A compute engine operates on the provider computers to communicate with the server and execute tasks using idle computational power.

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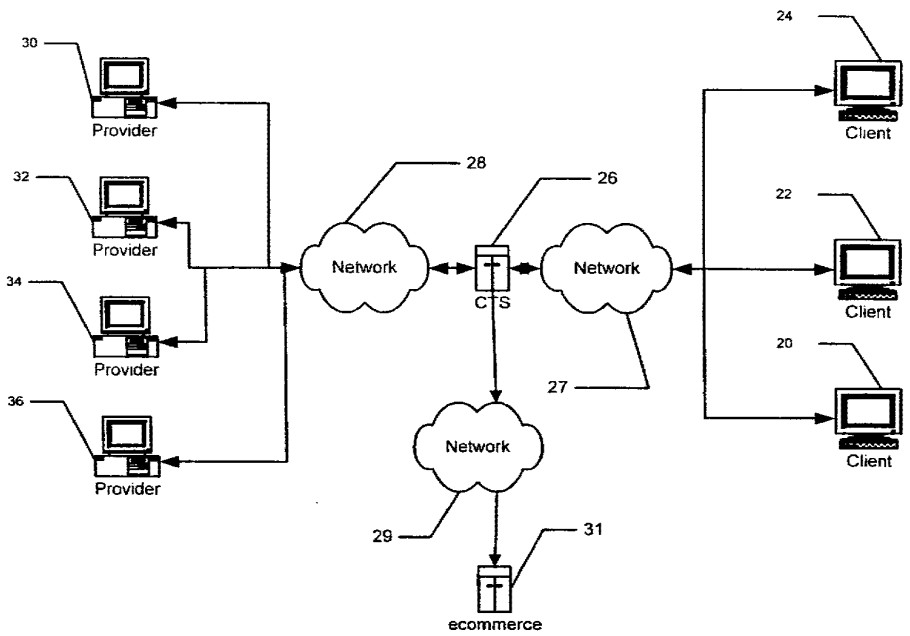
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[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR THE ESTABLISHMENT AND UTILIZATION OF NETWORKED IDLE COMPUTATIONAL PROCESSING POWER



(57) Abstract: A distributed computing platform using the idle computational processing power of a plurality of provider computers is disclosed. At least one networked server collects tasks from client computers, schedules and distributes the tasks to networked provider computers, and collects and returns results to client computers. A client API forms tasks and collects results. A compute engine operates on the provider computers to communicate with the server and execute tasks using idle computational power.

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Title of Invention: System and Method for the Establishment and Utilization of Networked Idle Computational Processing Power

Field of the Invention:

This invention relates generally to computer use over a network to form a distributed computing platform. More specifically the present invention is a system and method for use of idle time of computers that are connected to a network by users requiring significant computing power without the need for a large scale dedicated processing unit.

Background of the Invention:

When a computer is operating, but not actively performing computations for someone, it is said to be *idle.* Because of their incredible speed, modern computers are idle most of the time, not only when they are running screen savers, but *even when they are being used.* For instance, a fast typist working at top speed in a word processor uses only a fraction of the available computational capacity of a desktop PC. Although the time between a typist's keystrokes seems immeasurably small to humans, it is an eternity when measured in computer time - an eternity filled with unproductive *idle computation.* Because of this gross underutilization, it is estimated that well over 95% of the world's computational capacity presently goes to waste.

Summary of the Invention

The present invention is drawn to organization and use of the idle processing power of general-purpose computers to form a distributed computing platform.

It is therefore an objective of the present invention to provide large amounts of computational power to users without the users having to purchase a large computer for such purposes.

It is a further objective of the present invention to harness the idle computational power of many computers and make that power available to clients on an as needed basis.

It is yet another objective of the present invention to allow those who provide computers to be used to have complete access to their computers whenever desired without interruption of personal use.

It is still another objective of the present invention to provide computational power without regard to any specific schedule of computer non-use.

It is yet another objective of the present invention to allow clients who require computational power to specify the characteristics of the power they require.

It is still another objective of the present invention to charge clients that need computational power based upon the power and other characteristics specified by the client.

It is a further objective of the present invention to permit the client to specify the reliability of the computational power required by the client

It is yet another objective of the present invention to allow a provider of a computer to be used in the present invention to specify the amount of RAM and disk space the provider wished to devote to use by others.

It is still another objective of the present invention to push content of various types to providers during the time that providers are supplying excess computational power to tasks of the present invention.

It is yet another objective of the present invention to provide security to both the client and the provider during the running of tasks on providers.

It is still another objective of the present invention to insure that a client cannot access the computational resources of the provider beyond that which is required to run the clients tasks.

It is a further objective of the present invention to permit clients to specify checkpoints in the running of client tasks so that interrupted tasks can be resumed without significant the loss of work.

It is still another objective of the present invention to charge clients for the use of computational power in a flexible way based upon the amount of power to be used and the reliability of the power to be used.

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It is yet another objective of the present invention to allow clients to create a virtual cluster of machines of client-definable computational power to run client tasks.

It is thus an overall goal of the present invention to utilize this heretofore underutilized computer power in a novel way as a distributed computing platform to meet the needs of users who require vast computing power but who may not have the financial wherewithal to purchase or lease large mainframe computers or other supercomputing solutions.

Just as email service providers deliver email from one user to another, a business running the system and method of the present invention will disseminate the tasks of a client's distributed computer program to multiple providers for remote execution. As the remote providers complete tasks, the providers will deliver results back to the originating client. As part of the present invention, an intermediary server delivers *computation* from providers to clients.

The Internet infrastructure to facilitate the distributed processing of the present invention requires three components:

1) Client software applications for requesting and submitting distributed processing requests and jobs. This is accomplished through a client API that allows client jobs to be coded as independent tasks. The underlying task model, while complex, is hidden from the user.;
2) Provider software called a compute engine (CE) for managing the launch and execution of tasks delivered from the intermediary server. The CE runs unobtrusively and securely on the provider's computer. It processes tasks when the computer is idle and returns results to the server when the provider computer connects to the network which, for example, and without limitation may be the Internet; and
3) A centralized task server for exchanging tasks and results between participants. The centralized task server (CTS) comprises a three-tiered architecture as more fully set forth below and is redundant, fault tolerant and scalable as traffic and clients increase. A task scheduler in the CTS matches power requested to available provider computer resources.

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For purposes of this application, the client is the individual or organization that is requesting the data processing services of the present invention. The provider constitutes the plurality of individuals or organizations having excess processor capacity that are offering that capacity to the system of the present invention to process requests from clients.

The flow of the present invention is as follows:

1. Using the client software from their desktop, clients launch their distributed programs, the tasks of which are transported to the centralized task server.
2. Client tasks are pooled at the centralized task server and allocated to provider computers based on a scheduling algorithm that takes into account the characteristics of the provider computer (e.g., processor speed, disk space, amount of RAM, communication speed, percentage of time the provider computer is on-line; percentage of time the provider computer is in use). The CE on the provider computer periodically contacts the server of the present invention to retrieve task assignments or other control messages. Such contact occurs periodically and opportunistically (whenever a network connection is present, for example, when a provider computer has dialed into the Internet) and not just when idle computational power is detected. The invention also allows for an auto-dial capability where the provider computer can specify intervals when the CE can connect to the server. Multiple tasks can be assigned to a CE at a given time. This is done to increase the probability that the CE will always have tasks to execute.
3. When a provider computer's CE detects that its host computer is idle, it executes tasks that were retrieved from the centralized task server.
4. The results of completed tasks are saved locally. When a connection to the centralized task server exists, statuses of current tasks, and results of previously executed tasks are sent to the centralized server of the present invention.
5. Results are pooled by the centralized task server until the originating client can connect to the server and retrieve them. Note that a special case of this is the case when the client is connected as the job is running. In this case, the client sees the results in "real time".

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In this fashion, from a client's perspective, the present invention represents a gigantic virtual computer or distributed computing platform, ideally suited for performing large-scale parallel *distributed computation*, a function that was formerly the exclusive domain of traditional "chips-and-solder" supercomputers. The present invention, however, will perform such computations at a fraction of the cost and on an as-needed basis.

The business model associated with the present invention is to create a new market for idle computation power. A business running the apparatus and method of the present invention will purchase the idle computational power of millions of *providers* (individual computer owners), and deliver that idle computational power as a single entity to *clients* (technologists seeking ultra-high-performance computation).

Presently, idle computation has no value whatsoever because the market for computation is inseparable from the market for computers. Users have no means of buying, for example, larger amounts of times on disparate computers to execute a job when the user needs it and not just when a specific computer is available.

With the present invention, however, immense value can be created by a computational intermediary in the same way that financial engineers create value by constructing derivative financial instruments. In effect, the present invention *strips* excess computational capacity from provider computers, *bundles it* into quantities suitable for large-scale parallel computations, and *delivers* it to clients on an as needed basis. Providers benefit by selling a heretofore-wasted resource. Clients benefit because they can inexpensively purchase just the quantity of computation needed, thereby avoiding the normally huge fixed costs associated with purchasing a supercomputer.

The business model of the present invention creates and intermediates the new market in idle computation.

Finally, an applications research and development group will add value by utilizing its superior knowledge of distributed processing to solve high-payoff computational problems. Such a team will spur demand in two ways: First, its purchases of idle computation will stimulate market activity; second, the success of applications and research group will demonstrate to prospective clients the power and cost-effectiveness of idle time processing.

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Brief Description of the Figures

Figure 1 illustrates an architecture of one embodiment of the present invention

Figure 2 illustrates a flow of work over one embodiment of the present invention..

Figure 3 illustrates one embodiment of the CE architecture of the present invention.

Figures 4A and **4B** illustrate a normal execution scenario for tasks.

Figure 5 illustrates an overall architecture of a server of the present invention.

Figure 6 illustrates a determination of processing time of virtual nodes.

Figure 7 illustrates communications paths of the present invention.

Figure 8 illustrates expected time for completion of a task probability.

Detailed Description of the Invention

The present invention is a system and method for allowing those people who own personal computers or larger computers, (hereinafter "providers") to offer unused and excess computational power on their "provider computers" to people who have need for large computational power for their computing tasks. These people are known as "clients."

Referring now to **Figure 1**, the architecture of the present invention is illustrated. The present invention basically comprises three major components: a client application that has been developed within a client development environment; a centralized task server (CTS) **26**; and a compute engine (CE).

In the context of this description a client application is an application program, developed within the client development environment that is part of this invention, which solves a problem utilizing the system that constitutes this invention. The typical problem such an application solves is an extremely computation intensive problem that is amenable to decomposition into a large number of independent tasks (this is not intended as a limitation). The client development environment consists of a runtime API which defines how tasks interact with their environment, a client API which allows a client application to manage the execution of jobs consisting of a very large number of tasks, and a set of tools that support the monitoring and control of very large jobs.

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A centralized task server (CTS) **26** intermediates the needs of client applications and the power of the provider computers **30-36** to meet the needs of clients for computational power. Clients make requests via client computers **20-24** and by virtue of a client application programming interface (Client API) that allows the client to specify the amount of computing power desired, the individual rating of computers that will execute the client's job (e.g., 2 gigaflops or GF [Flops = Floating point operations per second]), how much memory and disk space will be necessary and other parameters essential to running the client's job. The CTS receives tasks from clients and assigns them to one or more providers based the characteristics of the available providers and the job characteristics specified by the client. When providers return results, the CTS forwards these back to the client application.

Each provider computer has a resident compute engine (CE) that receives and executes the various tasks that are assigned to it by the CTS. The CE runs client tasks and manages the use of idle computation power of the provider computer. The CE returns intermediate and final results to the CTS that then forwards them back to the client application.

Communication between the client application, CTS, and CE is governed by a communication protocol unique to the present invention. At a high level of abstraction, separate message and data channels exist. The message channel is a bi-directional channel between clients and the server that is used to pass high-level messages that facilitate distributed processing. The data channel is a channel used to pass large blocks of data called data elements and executable elements. Executable elements are blocks code developed by clients or a third-party. This code represents tasks or portions of tasks. Data elements are blocks of data that are either input to or output of client tasks. High-level messages transmitted on the message channel contain references to data and executable elements. These items are separately transferred on the data channel on an as needed basis.

The details of the client development environment, CTS, CE, and protocol the protocol that these components use to communicate will be covered in subsequent sections.

Referring first to **Figure 2** the general flow of the present invention is illustrated. Clients **10**, that is, those entities desiring execution of computationally intensive tasks, launch

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client software that submits jobs consisting of multiple tasks. Although only one box is shown, it is anticipated that there will be many clients that have such computationally intensive jobs on or about the same time. Thus more than one client will be requesting such services.

The centralized task server (CTS) takes all incoming tasks and pools them in some priority order. The CTS validates each task (checks that all required executable and data elements are in place) and assigns it to one or more CEs, based on information on available provider computers and their characteristics. The software of the CTS will be able to size the available computational power to the tasks that are pooled thus assigning the tasks the appropriate amount of available computational power.

Periodically, and depending on when a network connection is present, the CE contacts the CTS to see if there are any messages for it. These messages could be task assignments or other control messages. The CE then retrieves tasks from the CTS so that, to the degree possible, the tasks are readily available for execution whenever idle computing power is available. When a CE receives a task assignment from the CTS, it downloads the data and executable elements required to run that task. The task is then put in the "prepared" state. Each CE constantly monitors its processor state and when the processor is idle it launches the "next" prepared task. The task selected to run is a function of the arrival time of the task, the task state, and the task priority. If a task is received that has a higher priority than the currently running task, the current task is preempted (halted and results saved) and the new task is executed.

Once tasks are executed, task results are returned 10 to the CTS. The CTS journals all work done by provider computer CE's on behalf of clients. This journal is then used as the basis for adjustments to client and provider computer accounts on a periodic basis using known accounting methods. These accounts are the basis for client billing and provider payment.

As mentioned above, clients develop applications using the client development environment that is part of this invention. The client development environment consists of a runtime API which defines how tasks interact with their environment, a client API which

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allows a client application to manage the execution of jobs consisting of a very large number of tasks, and a set of tools that support the monitoring and control of very large jobs. These are described in more detail below.

The runtime API defines the environment in which client task run. The runtime API consists of a set of function calls that the client task will exercise during execution to interact with its environment. This API contains calls that the task can use to:

- Obtain access to the initialization parameters for the task.
- Obtain access to data elements needed to perform its function.
- Perform a checkpoint so that if the task is interrupted, it can restart at the checkpoint and therefore reduce the loss of work.
- Send interim and final results back to the server.

In addition, the API defines entry points that allow the environment to control the task. These include:

- Start a task (note that restarting a task is a special case of starting a task).
- Stop (suspend) a task.
- Request a checkpoint.
- Request a status.
- Terminate a task.

This is not an exhaustive list of functions and is only illustrative of what can be accomplished via the runtime API.

There can be multiple implementations of this API which allow the task to run in multiple environments. The two most important implementations for the purpose of this invention are the implementation in the CE and the run local implementation included in the client development environment. The CE implementation allows the task to run in the CE on a provider's box (regardless of platform). The run local implementation allows clients to execute tasks on their local client machine. This enables debugging and testing before the job is distributed. However, the client could elect to run an entire job (or a certain number or percent of tasks) locally.

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The client API is used to develop an application to control the execution of a job running on the present invention. The client API broadly supports job definition, job launch, job monitoring, and job control.

Job definition involves the creation of the job, setting job properties (e.g., requested power, deadline, maximum cost, scheduling hints), creating its data/executable elements and its tasks, and associating data/executable elements with tasks. The client has the option of providing certain limits to the job being submitted. For example, a client can limit the job to a certain dollar expenditure or amount power applied.

Job launch involves launching the tasks that constitute a job.

Job monitoring involves the selective monitoring of a job. The data available included both status and statistics. The client API allows the client to attach to a job or a specific task and monitor all or a subset of the results being returned by the job or task. Tasks can return interim and final results via the runtime API. Certain default patterns are set by the system concerning when interim results are to be obtained although the client can change these parameters as well as explicitly request results for executing jobs.

Job control functions include starting, removing, stopping, and resuming jobs and tasks.

The client API of the invention supports jobs of arbitrary size. A "fire and forget" event model allows clients to launch jobs much larger than the client machine would otherwise be capable of tracking simultaneously. This is accomplished by programmatically ensuring that clients monitor only task results, not the tasks themselves. This approach serializes the receipt of task results such that a limited size computer can "drive" an arbitrarily large job.

The invention also includes general-purpose tools, developed using the Client API, for monitoring jobs. Jobs can be monitored whether they run locally (at the client's node) or remotely (on a provider computer node). The client display is updated periodically (the periodicity is configurable). The display for the client is designed to keep the client fully informed at all times regarding the job submitted. As such it includes dollars spent, number of tasks running, number of completed tasks, number of task that are executing, the number of task delivered to the CTS, the total work accomplished, the amount of work done per task

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(percentage), the work done on completed tasks, and the time spent per completed task. These statistics are illustrative only. Other statistics may also be gathered as desired by the client. The information that is monitored is displayed in both graphic and text form.

These tools can also be used to support other general-purpose functions such as starting and stopping individual tasks or jobs, removing individual tasks or jobs, etc.

Referring to **Figure 3**, one embodiment of the CE architecture of the present invention is illustrated. The CE is the software unit that resides on a provider computer and accomplishes the timely and secure execution of client tasks. The CE **84** manages the interface between the provider computer and the server of the present invention, monitors the state of the provider computer's machine, schedules the execution of tasks on the provider computer, and manages all communication with the server of the present invention. For example, the CE **84** receives tasks from the CTS, posts results to the server, provides status of tasks and receives messages to remove, suspend or resume tasks.

The CE 84 can be configured to execute tasks continuously, albeit at low priority (so as not to interfere with a provider's normal use of their computer), or to start execution of tasks when a provider's computer is idle (i.e., not being interactively used) and stop execution immediately upon provider interaction with their computer. In this way, the CE is designed to be unobtrusive to the provider.

CE **84** communications with the server and execution of tasks occur independently. For example, even if a provider is actively using their computer, the CE communicates with the server, provided a network connection is available (e.g., when a provider has dialed into the Internet). In so doing, the CE receives elements that are placed in the task queue **86** to be executed whenever possible. Thus, obtaining and staging of client tasks takes place at a time independent from the execution of those tasks. Making CE communications independent from CE task execution adds to the efficiency of the overall system.

The CE also includes a dialing scheduler that can be preset by the provider to dial out to the server of the present invention at configurable intervals and only during preset periods. Thus, for example, the provider can direct the dialer to dial out to the server every ten minutes, but only between the hours of 2 a.m. to 4 a.m.

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The entire CE resides on the provider computer, which as noted earlier, can be any form of computer having excess capacity. For example, but not intended as a limitation, provider computers that run the Windows® operating system, the Macintosh® operating system, the Linux® operating systems and others are all candidates for use with the present invention.

Various security measures are taken in executing tasks using the present invention. The CE uses a virtual machine **78** to execute client tasks **82**. Examples of virtual machines, but not intended as a limitation, include the Java Virtual Machine and the C# Virtual Machine. Throughout most of the remainder of the discussion we refer to the CE virtual machine as the Java Virtual Machine or JVM **78**.

Security restrictions on the virtual machine prevent client tasks from accessing resources on the provider machine directly. For example, within the CE, the virtual machine is altered such that only encrypted tasks provided by the server can be executed. This both protects tasks when stored on disk and ensures that the CE executes only valid tasks. Further, the system has the option of encrypting everything that is written to disk both in the provider computer and on the server.

Referring to **Figures 4A** and **4B**, a normal execution scenario for tasks is illustrated.

It is important to note that the CE **84** a highly capable application. It has the ability to run tasks constantly at low priority so that a provider's normal use of the computer is unimpeded; alternatively, it can actuate in much the same way that a screen saver actuates, executing tasks only when a provider is not using their computer. In practice, the CE will exercise a small window that will be visually perceptible by the user of a particular computer of the present invention. When the computer is idle for a configurable period of time, the CE window will "pop up" with the cursor within the CE window. Alternatively, if the user so desires, the application window can also simply be illustrated with an actual screensaver, but the description below assumes the CE window is an application window.

The CE window activity is independent from the execution of tasks, but can be synchronized with such so as to provide, among other things, status information about the execution of the current task. Various buttons and areas within this CE window will be

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accessible to the user such that accounts can be accessed, amount of time associated with use of the users computer can be determined.

The graphic window of the CE is displayed for the provider when the CE detects the host computer is idle. Its presence indicates to the provider that the system is processing, or is ready to process tasks in the queue, and has a number of functions. The window can show the state of processing, that is whether tasks are being processed at a particular moment or not. Further, within the window are located various other buttons that may be clicked to determine the status of the provider's account. In addition, advertising or other messages may be presented in the CE window, which will allow a user to proceed to a particular website to view further information concerning the messages. Thus, the CE window can operate in the nature of a browser.

The size and placement of the CE window during "pop up" is configurable by the user. When the CE window is displayed, the system seizes control of the cursor and locates it at any configurable spot within the CE window. Thus the cursor can be placed in a spot where messages are to be displayed or in a location to actuate any functionality that is available to the provider while the CE is operating, such as the quick disappearance of the display window as described above.

The user can also confine the CE to a system tray if desired. In this case, the icon or panel in the tray can be used to indicate, among other things, engine status, the arrival of new display content or upgrade packages, or Internet connectivity status. Alternatively, the CE can be configured and executed as a "daemon" having only a command-line user interface.

The CE also supports the dynamic display of marketing content in the CE window to the provider computer. The server notifies the CE when new content is available and where it can be downloaded.

In the event that the user desires to use the computer for purposes other than to run elements of the present invention, the user will simply type a key or cause the cursor to be moved outside the CE window. As soon as this occurs, the CE will shut down all of the processing of the present invention in an orderly fashion. Alternatively, the CE can be configured to execute tasks constantly, albeit at low priority, in which case the CE window

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can be made to disappear as described above, yet tasks will continue execution at lower priority.

If the user would like to interact with the window, then a single click anywhere on the window will cause it to enter a new state where it will not automatically disappear. This contributes to the ease of use of the CE. This state is exited when the user closes the window or after a period of inactivity.

As noted above, there are a series of execution steps when a CE is running on a user's computer. For example, and referring to **Figures 4A** and **4B** at the outset, the CE obtains a task message from the server **90**. The executable elements from the element server are written to the disk of the computer. However, before writing any items to disk, the disk management logic within the CE ensures that any such storage will not cause the CE to exceed its storage space budget **92**.

The CE then writes out the task policy file that establishes the permissions for the Runtime **80**, and the task to be run **82**. This task policy ensures that the client task can neither access the provider computer's disk or the network. The runtime policy gives the runtime module **80** access to data elements need to run the task (if any) and authorizes the runtime module **80** to connect back to the Core Engine. The CE then launches the virtual machine (JVM) **96** and executes the Runtime **80**. The path of the policy file, the security manager, the maximum size to be used based upon the CE's memory budget, and the class path including all executable elements, are passed to the JVM **96**. The class name for the task and the CE communications port are also passed as parameters to the runtime module **80**.

The JVM then launches the Runtime main module **98**. This runs in a protection domain that allows the Runtime to open a network connection to the CE and to read executable and data elements from the disk. The JVM opens a server socket, connects to the CE port passed in on the command line, and sends a message containing its server port **100**.

The CE then connects to the JVM's server port. This results in two connections between the CE and the JVM, i.e., a CE to runtime channel, and a runtime to CE channel **102**. The runtime requests the parameters for the task over the runtime to CE channel **104** and the CE returns those parameters in response over the CE to runtime channel.

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The runtime then requests the data elements for the task **106** over the runtime to CE channel, and the CE returns them in response over the CE to runtime channel.

The runtime then establishes a task context that the task uses to communicate with the runtime system **108**.

The runtime establishes and begins the client task **110**. The executable elements for this task having been provided to the runtime via the class path provided for the JVM when the JVM was started. The client task then runs in a separate protection domain that prevents it from accessing the network or the disk. This protection domain is established through the permissions granted to the task in the task policy file.

The client task interacts with the runtime through the task context object established for it by the runtime **112**. The runtime calls run with the client tasks privileges when possible. If the runtime needs to perform an operation requiring additional privileges, i.e., accessing a particular data element, the runtime executes a privilege block that takes on the minimum privilege for the minimum amount of time required to complete the operation.

The client interacts with the runtime to get task parameters and to access task elements **114**. As an optional step, when the client task can send out temporary results using the set status call to the runtime **116**, these results are passed to the CE over the runtime to CE channel. The CE then sends these interim results in the form of a task status to the server.

As an additional option, when the client task can create a task checkpoint using the checkpoint call to the runtime **118**, the checkpoint is passed to the CE over the runtime to CE channel. The CE serializes the checkpoint to disk so it is available in case a task restart is required.

When finished, the client task does a set status runtime call **120** with the final results and exits. The results are passed through the CE over the runtime to CE channel. The CE then sends these results in the form of a task status message to the server. After the CE sends a final task status noting that the task is complete **120**, the space that is consumed by the task definition and related data can be reclaimed for use in running other tasks.

Once the task completes **122**, the runtime closes down its connections and exits.

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As noted above, the CE is a very flexible program that does not impair the ordinary use of the computer in any way. For example, when the user moves the mouse cursor outside of the CE window, the CE sends a shut down request to the Runtime. If the JVM does not shut down in seconds, the JVM is automatically stopped. When the Runtime receives a shut down request, it calls the clients task stop method. The client is allowed to send a set status and create a checkpoint before exiting. This reduces the loss of work and allows the program to restart at the checkpoint when processing resumes later. If the client task supports checkpointing, the runtime sends the checkpoint back to the CE on the runtime to CE channel. If a checkpoint is received, the CE writes it to disk. Once the client task exits, the runtime closes its connections and exits.

If the CE has been configured to execute tasks intermittently based on user interaction (versus continuously), then when the CE detects that the PC has been idle for a configurable period of time, and thus is available to run a task, it checks its queue for a paused task, and restarts the task from the last checkpoint which was previously stored on disk, using the same mechanism used to start the task at the outset. If there was no paused task, the next task in the queue is run.

It should be noted that the CE functionality, while used in the present invention, could also be used in other fashions. This would, for example, allow particular programs to be run within a given office, thereby utilizing the full power that is available on all PCs within an office location. Again, processing occurs whenever the computer is idle and ceases whenever the individual PC user desires to use the PC for specific purposes.

The centralized task server (CTS) intermediates tasks submitted by a client application time and the CEs on providers' computers that have excess computational capacity to run those tasks. The CTS registers clients, accepts tasks for execution, distributes those tasks to computers, receives results back from the provider computers, conveys results to the client computers, charges clients for the computational work performed and pays providers for the use of their computers.

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One of the most critical functions of the CTS is task scheduling. Part of the scheduling process is to provide clients of the present invention, who desire to obtain the aggregate computational power, with the desired amount of processing power on demand.

The server of the present invention loads tasks onto a single provider computer based in such a way as to match computer capability with task requirements. As tasks are completed, and through the communications channel between the provider computer and the server, additional tasks are fed to the provider computer for execution. All new tasks are placed in a task execution queue on the provider's computer for subsequent execution. To provide maximal control of the execution of tasks on a provider's computer, the CE supports the concept of task priorities and task preemption (tasks can preempt executing tasks of lower priority). These features allow the server to more effectively utilize available provider computer resources.

In order for the server of the present invention to correctly characterize the provider's computer, the server also collects usage and performance histories (profiles) from the provider computer concerning a wide variety of parameters. For example, the server collects Internet connectivity patterns and processor availability patterns during the course of any 24-hour period, weekly period, monthly period, etc. The processing power of the processor itself is also important since certain clients may request higher or lower processing power depending on relative cost and timeliness tradeoffs.

To fulfill its function, the task scheduler must fulfill the following requirements: The task scheduler gets jobs and associated tasks from clients. It must then take those tasks and distribute them to various provider computers for execution. It must also record the fact that it has assigned a particular task to a particular provider computer.

The task scheduler passes both interim and final results to the client and records the amount of work performed to an on-line ledger. It then credits a provider's account with the amount of time that the provider computer actually performed on the specific task. This allows the provider to be paid by the computational work that it has contributed to a particular job. (By definition, time multiplied by the power of the provider computer equals work performed.)

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The task scheduler also logs completed work in a client's account noting the amount of work performed so that an appropriate billing can be passed on to the general ledger module for billing to the client.

Cancellation of tasks or jobs (collections of tasks) from a client is also processed by the task scheduler. It accepts any job cancellation from the client and insures that appropriate communication is sent throughout the system of the present invention canceling a particular job.

When a client job is completed, the task scheduler automatically provides e-mail or other automated notification to the client that the job is complete.

Results that are received by the task scheduler are archived if the client has not retrieved those results. From time to time the task scheduler deletes unclaimed information from the data archive.

Since clients pay for the computational power they use, the task scheduler periodically checks the on-line ledger to determine if a client has exceeded an account limit. If so, the task scheduler notifies the client and, if necessary, cancels all jobs for the client until such time as the account is brought current.

In the event that a particular provider computer that is working on a particular task does not respond for a pre-set period of time, the task scheduler moves the task to another provider computer. Thus, it must be able to detect unresponsive CEs on provider computers. Depending upon the time constraints and priority of tasks involved, the task scheduler also can elect, through its software, to launch redundant tasks to different provider computers to insure timely completion of any particular task.

The CTS is also tasked with delivering the appropriate amount of compute power for a client task, not more or less, for a given client. Since charges for the client are made in part based upon the compute power delivered, this assembly of provider computers and delivery of computational power must be accurate.

In order to assure responsiveness to clients, the task scheduler also balances data processing loads among the various provider computers based upon the capabilities of the

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provider computer and the bandwidth that is available to provide elements and tasks to provider computers.

The CTS collects statistics regarding provider computer capabilities. This is critical for both assigning payment to a provider and a debit notice to the client. It is also important that the CTS know at all times the capability of the provider computers.

As noted above, the CTS may send the same tasks to more than one provider computer. This helps the CTS be assured that the computations that are performed by the assigned provider computers are correct. Since results from provider computers should be the same for the same task (unless randomization is integral to the calculation of the task), any differences in response are noted by the CTS and resolved. This assures the client that answers are accurate.

The CTS takes explicit measures to protect the intellectual property inherent in a task. To accomplish this, the CTS obfuscates executable elements and data elements to remove contextual clues to the code's intended purpose. Furthermore, the CTS also removes from tasks all traces of client identity. Thus, unless specifically intended otherwise by the CTS, a provider has no means of knowing the clients for whom elements are executed nor their domain of inquiry.

To characterize and assess the capabilities of provider computers, in order to perform task scheduling effectively, the CTS executes certain benchmark tasks on provider computers. Also, various test tasks with known results are sent to the provider computer to ensure that results returned by the provider computer are accurate. Unexpected results from a provider can be used to identify attempts to submit fraudulent results or otherwise tamper with the normal execution of the system of the present invention.

In operation, the present invention allows the client to specify job and task parameters via the client interface. Using the client interface, the Client selects desired attributes of nodes in a virtual cluster. These attributes include, but are not limited to, CPU speed (in GF), memory, available disk space, intermittent or constant connectivity, bandwidth (in Kbps), number of nodes, and reliability (as measured by consistency of results). The client also

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provides information on his job: estimated work per task (in GF-Hours), incoming data (in MB), outgoing data (in MB).

To deliver a virtual cluster with the desired attributes, the CTS may construct virtual nodes (one or more nodes operating on the same task so as to improve the expected time-to-completion of a given task). Virtual nodes are discussed in more detail elsewhere in the document.

After the client defines the tasks to be executed, they are provided to the central server of the present invention for "launching," i.e., the placement of the task in a queue for scheduling and ultimate distribution to provider computers. For billing and compensation purposes, a task is "launched" when it is scheduled. In this way, the latency from a task sitting in queue is attributed to the provider computer and so considered part of the provider computer's intermittent "unavailability".

The system of the present invention records the time at which each task is launched to the first provider computer in a virtual node. The system also records the time at which the first completed task is returned from a virtual node. At any point in time, the amount of power running through the virtual cluster is the sum of the powers of the virtual nodes running.

The system constantly monitors virtual nodes for possible failure. Failure is defined as an absence of communication from a configurable number of provider computers in a virtual node for a configurable amount of time. When a virtual node fails, the task assigned to it is re-launched on another (perhaps faster) virtual node.

Below we describe a novel pricing model and task scheduling model for use with the system of the present invention, but neither is intended as a limitation.

At any point in time, the client can be billed. The client charge is the price per hour (based on power running through the cluster) for each hour (or portion thereof) since the last billing. For example, and referring to **figure 6**, the determination of running time on providers' computers is illustrated. In the example, each virtual node in the cluster operates at 0.1 GF. The client is charged an hourly rate for running tasks based upon the power, P, running through the client's account at each 15-minute increment. The price per hour for computation is:

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$$\text{Price per hour for computation} = 4.5 + 0.296P^{1.155}$$

where 4.5, 0.296 and 1.155 are configurable constants.

The client is charged an additional amount per GB for data transferred through each of the four communications paths, **150**, **152**, **154**, and **156** of the present invention as illustrated in **Figure 7**. The communications paths **150**, **152**, and **154** represent duplicated data and are a function of the degree of reliability the client achieves. Of the dashed arrows, only one will be executed, and so the client will be charged for only one of these paths.

The client is also charged for data transfer during the course of executing the particular tasks of the client. For example, let d_i be the quantity (in GB) of data transferred from the client to the server. Let d_o be the quantity of data transferred from the server to the client. Given that some of the data will be duplicated for processing by virtual nodes comprised of more than one provider computer, the client's total data transfer charge is given by the following:

$$\text{Total Cost of Data Transfer} = g\left(d_i + d_o\right)\left(\frac{\ln\left(1-r\right)}{\ln\left(1-\pi\right)}+1\right)$$

where g is the transfer cost per leg per GB, r is the requested node reliability, and π is the average provider computer reliability.

Requested node reliability r can be defined for a virtual node of CPU speed C and bandwidth B as the probability of the virtual node completing a task in no more time than the time it would take a fully idle, constantly connected computer with CPU speed C and bandwidth B to complete the task.

Average provider computer reliability π is defined as the probability of the provider's frequency of contact not diminishing, in the near term, from the provider's historic average.

The client is also charged an hourly premium for requesting reliability greater than a set baseline reliability. The charge per hour is:

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$$\text{Price per hour for premium reliability} = kCN\left(\frac{\ln(1-r)}{\ln(1-R)} - 1\right)$$

where k is the baseline price per MHz-hour (provider computer price per hour for the ideal machine), C is the CPU speed requested of the virtual nodes, N is the number of virtual nodes running, r is the requested reliability, and R is the baseline reliability.

Provider Payments and Task Scheduling (Simplified Version)

As clients are charged for provider computers' time, so must the providers be paid for the computer time they provide. For each provider computer, a CPU availability rating, a_c, is constructed along with a bandwidth availability rating, a_b. These ratings measure the average availability of the provider computers' CPU and bandwidth over time. Unlike in the full version of the task scheduling model (described below), these ratings are single values versus vectors.

To measure availability, the system of the present invention records transitions of CPU and bandwidth (between "available" and "unavailable") over time. Defining each minute of availability as having value 1 and each minute of unavailability as having value 0, the system takes the moving average of these values over the past seven days to obtain average availabilities for CPU and bandwidth.

For each provider computer, the system next measures CPU speed, C, and bandwidth, B (through benchmark tasks). These measures are periodically updated to ensure that the system has knowledge of the full availability of the provider computer's system.

The client may provide estimates of the work w, data in d_i, and data out, d_o associated with the task. If the client does not specify these measures, the system uses the averages for a sampling of tasks.

The system then computes the expected time-to-completion for the task as using the following formula:

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$$\text{Expected Time-to-Completion} = T_E = \frac{w}{Ca_c} + \frac{d_i + d_o}{Ba_b}$$

As noted earlier the client specifies the CPU speed, C_v, bandwidth, B_v, and reliability, r, of a virtual node. If reliability is not specified, the system of the present sets a default value for the baseline reliability R. The client may select a greater, but not lesser, reliability.

The system then computes the implied "requested" time-to-completion for the task as:

$$\text{Requested Time-to-Completion} = T_R = \frac{w}{C_v} + \frac{d_i + d_o}{B_v}$$

The subset of provider computers that satisfy the following criteria are considered "candidate provider computers":

- The provider computer is not working on a paying job.
- When the client specifies w, d_i, and d_o, the provider computer has (approximately) $T_E = T_R$.
- When the client does not specify w, d_i, and d_o, the provider computer has (approximately) $a_cC = C_v$ and $a_bB = B_v$.

Taking provider computers' CPU's and CPU availabilities as fixed, candidate provider computers have expected bandwidths (bandwidth multiplied by bandwidth availability) that satisfy the following equation:

$$Ba_b = Ca_c \frac{(d_i + d_o)C_v B_v}{wB_v(Ca_c - C_v) + (d_i + d_o)Ca_c C_v}$$

For each candidate provider computer, the system calculates the weighted average availability, π, as:

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$$\pi = \frac{a_c \frac{\overline{w}}{C} + a_b \frac{\overline{d_i + d_o}}{B}}{\frac{\overline{w}}{C} + \frac{\overline{d_i + d_o}}{B}}$$

where the bars indicate the average over a sampling of tasks.

Selecting randomly from the candidate provider computers, the system arbitrarily groups the provider computers into virtual nodes such that the probability of the virtual node returning the task in, at most, T_R equals r. Specifically, the system randomly picks provider computers from the subset and groups them into virtual nodes such that, for reliability r, and N nodes, each with weighted availability π_i,

$$r = 1 - \prod_{i=1}^{N} (1 - \pi_i)$$

It is important to note that the value of N that satisfies the equation may be non-integer. In this case, the server will launch a different number of duplications of each task such that the average number of duplications per task equals N.

The system launches the task simultaneously on all the provider computers that comprise a virtual node. As noted earlier the task is "launched" when it is scheduled. When the first provider computer returns the completed task or when the client cancels the task, all duplicate tasks on remaining provider computers are cancelled. We define "cancelled" as the placing of a "remove task" command in the queue. A particular provider computer's task is considered concluded when the first of the following occurs:

- The provider computer receives notice that the task has been cancelled.
- L hours pass since the task was cancelled.

For each provider computer, the system computes the time that elapsed between the launching of the task and the conclusion of the task. The amount of work the provider computer completed is estimated as the time that elapsed multiplied by the provider

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computer's power rating. Note that, effectively, the provider is being paid for time, not work. However, because the provider computer's power rating is a function of the provider computer's availability, the rate of payment the provider receives is a function of the average work per unit time the provider computer completes over time.

Providers are paid a fixed amount per unit time. The system established a target annual payment per MHz-hour, k, and a baseline reliability, R. A provider computer with a weighted average availability of π and CPU of C is paid $\frac{kC\ln(1-\pi)}{\ln(1-R)}$ per hour. This assumes that the provider computer is working over the whole interval from launch to conclusion of the task.

Provider Payments and Task Scheduling (Full Version)

As part of establishing a given provider computer as a viable source of computing power for the system, for each provider computer, the system constructs a CPU signature and a bandwidth signature. These signatures show the probabilities of the provider computer's CPU and bandwidth being available for a fixed time interval over time. For example:

Beginning of Time Interval	Pr(CPU available)	Pr(Bandwidth available)
1	30%	0%
2	40%	10%
3	50%	20%
4	40%	30%

The number of intervals should be enough to cover a reasonable circadian "cycle" (e.g. 1 week). The signature should be updated periodically.

For each provider computer, the system measures CPU speed by sending to the provider computer certain benchmark tasks that have known response times. The bandwidth is also measured. As noted earlier, these measures are periodically updated.

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The system then combines the signatures with CPU speed and bandwidth to construct a profile matrix. The profile matrix shows the probabilities of the provider computer completing a task of given work, input data, output data, and time of launch within certain time lengths. Example: The tree below shows all possible paths of success and failure of a provider computer working toward completion of a task. Each step down in the tree represents a time increment. Left branches represent failures to work. Right branches represent successes toward work. Probabilities are associated with each branch based on the CPU and bandwidth signatures. The expected time-to-completion is the sum of the products of the probabilities of reaching each terminal node and the times required to reach the nodes. This concept is illustrated in **Figure 8**.

The client specifies the CPU speed and bandwidth of a virtual node. The system finds all provider computers that have an expected time-to-completion equal to the time-to-completion for a fully available node with the specified CPU speed and bandwidth. Call this time-to-completion the "desired time-to-completion".

The system of the present invention arbitrarily groups these provider computers into virtual nodes such that the probability of the virtual node returning the task in the desired time-to-completion equals some fixed value.

The system then launches the task simultaneously on all the provider computers comprising the virtual node. When the first provider computer returns the completed task, the duplicate tasks on the remaining provider computers are cancelled.

The system computes the work each provider computer performed from the time the tasks were launched until the first task was returned. We calculate work as the number of hours the provider computer worked multiplied by the provider computer's power rating.

Providers are paid a fixed amount per unit work. Payment is made on a per GHz-hour rate, T, and a target reliability r. A provider computer with an average (based on average task attributes and over all time intervals) availability of π is paid $\frac{T\ln(1-\pi)}{\ln(1-r)}$ per GHz-hour.

Referring now to **Figure 5**, the overall architecture of the server of the present invention is illustrated. It should be noted at the outset that while single modules may be

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described, multiple instances of each such module may, in fact, be present in the architecture in order to allow for scalability to larger operations, to increase reliability so that no single point of failure exists in the system, or to have multiple instances of the entire server located at different physical locations to allow for redundancy and insurance against failure.

The server comprises a registration servlet **50**, which accepts registration requests over the network **28** from clients and providers who wish to participate on the system. Registration information is sent by the registration servlet to the registration manager **52** for processing.

The registration manager **52** receives appropriate information from the registration servlet **50** and assigns the client/provider computer to a database. The registration manager then generates a certificate and returns the certificate in the response to the client/provider computer. The provider computer certificate includes the provider public key, the provider-id (which is a hash of the provider public key), and the provider database ID. The client certificate comprises the client/user public key, which then acts as the client/user ID, the client ID, and the provider computer database ID.

The provider servlet **56** accepts various messages from providers as will be discussed more fully below, and routes them to the appropriate provider manager **58**. Further, the provider servlet **56** returns responses from the provider manager to the various provider over the network **28**. The web server of the present invention encrypts and decrypts requests, authenticates requests, routes them to the appropriate servlet, encrypts and returns responses. The provider servlet accepts GET and POST messages from providers. (These messages will be more fully explained below).

Provider manager **58** manages the interaction of the system of the present invention with the various providers. The provider manager receives and routes requests from other internal server components such as the client manager **68**, the task scheduler **64**, and the database server **54**. All administrative information and processing that relates to providers is managed by the provider manager **58**.

The element servlet **60** is used as the point where data elements and code are exchanged between clients and providers over the network. Elements are executables, or

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portions of executables that are to be run on provider processors. Elements are uploaded to the element servlet that then stores them on the file server. When a CE receives a task assignment from the CTS, the CE downloads the required elements for that task from the element servlet. File server **62** stores data and executable elements that are to be exchanged between clients and providers. Client servlet **66** accepts various messages from clients and routes them to the appropriate client manager **68**. Client servlet **66** receives responses from client manager **68** and returns the response to the client. Since responses to and from clients proceed over network **28**, the client servlet is invoked by a web server that is responsible for encryption, decryption, and authentication.

The client servlet also manages sessions with a client. This is accomplished by the client servlet assigning a cookie to the particular client for the particular session. If a request is received from a registered client and the request comes without a cookie, a new session cookie is created and sent to the client by the client servlet. In this fashion, individual sessions can be identified and managed.

Client manager **68** is responsible for managing requests to and from clients. Client manager **68** maintains a valid message channel for each client session. When the channel is established, the client servlet accepts GET and POST requests and forwards them to the appropriate CM. The client manager uses business routines within the client manager to handle POST requests. Depending on the type of requests, such processing may involve interaction with the database server **54**, the task scheduler **64**, and/or the provider manager **58**. A GET request is handled by the client manager **68** by returning the appropriate message from the client output queue (explained below).

Task scheduler **64** manages the assignment of tasks to providers. The task scheduler is responsible for tracking the states of the various providers, that is, whether the providers are currently processing tasks, whether the providers are available, and, without limitation, whether the provider has the appropriate processing power to process the specific tasks that may be necessary. The task scheduler **64** receives messages from client manager **68** and provider manager **58** regarding any changes in the status of clients and providers. When tasks are assigned to specific providers, the client manager keeps a record of such task assignments

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in the database **54**. Various algorithms present in the task scheduler ensure that appropriate tasks are assigned to the appropriate providers given priority of tasking and other prioritizing data.

Database server **54** stores information on clients and providers. To accomplish this task, the database server **54** comprises an account database relating to providers and revenue accumulated by providers, a client database relating to the identity and contact information for clients, job and task information, and a provider database relating to providers and identification and contact information for providers. Such information, while shown as being located on a single database server **54** can also be located on multiple servers to so that the system can be scaled up to handle many more users as well as ensure privacy and security of the information.

The web manager **70** intermediates access between the account section of the web site and the database. The web manager **70** supports the web based registration, update of registration and account information, and retrieval of account-specific and system-wide statistics.

Monitoring and control module **72** comprises a set of utilities that support the overall management of the system of the present invention. The monitoring and control functionality **72** provides graphical user interfaces for system operators to monitor the health of the overall system. The monitoring and control functionality **72** polls all servers for health information in the form of name-value pairs that contains status information and related attributes to all of the servers. In this fashion, the monitoring and control **72** can keep track of the health of the entire system. The monitoring and control module can also respond to asynchronous notification of system events from servers.

Log server **74** contributes to the health of the overall system by collecting debug and error log data. Any errors that are encountered throughout the system whether they are in clients, providers, or any of the servers of the system are collected in the log server for subsequent analysis and debugging where necessary.

As noted above, while single instances of the various modules have been indicated in **Figure 5**, this architecture is not meant as a limitation. Additional instances of any given

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component may be added to response to increases in demand from clients or increases in the inventory of providers. For example, database server **54** comprises information on clients and providers and is partitioned into two databases, one for a client database, and one for a provider database. These databases can run on a single server or on dedicated servers. As the number of clients and providers increases, additional databases can be added.

Client servlet **66** and provider servlet **56** are stateless, therefore allowing additional components to be easily added to increase capacity. When a client request comes in over network **28**, the requests are allocated among available client servlets to increase the response. The same holds true for the provider servlet **60**, thus allowing responses to and from providers to be rapidly responded to.

Element servlet **60** is also stateless, thereby allowing additional components to be easily added to increase capacity as well. Thus, a large number of element servlets may potentially exist which store elements on a given file server. Clients and providers allocate their requests and elements across the element servlets.

File server **62** will store large amounts of client data. Additional servers can be added to the system to increase this capacity. Thus, it is within the scope of the present invention to have multiple file servers **62**.

Provider manager **58** and client manager **68** can also be augmented by additional client and provider managers respectively. Each client is assigned to a specific client manager. This is accomplished by assigning clients to groups, with the group subsequently being assigned to a client manager. For example, client manager 1 may handle groups 0-49, and client manager 2 may handle groups 50-99. When a new client manager is added, clients are reallocated among the various client managers in order to ensure the most efficient flow of messages among the elements of the system.

Task scheduler **64** can quickly become a bottleneck when multiple clients and providers begin to grow. If this is the case, additional task schedulers can be added to manage a subset of tasks flowing to and from a provider. Again, tasks and providers can be assigned to groups with groups being subsequently assigned to specific task schedulers. Again, as task schedulers are added, a real allocation of tasks and providers among the various schedulers is

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accomplished in order to even the workflow and ensure the most efficient functioning of the system of the present invention.

In a similar fashion, web manager **70** can be augmented by additional instances of web managers with requests being allocated among the various web managers. The monitoring and control module **72** can also be represented by multiple instances of the monitoring and control function. There can also be multiple instances of the log server **74**. However, there must be close coordination among the various log servers so that any trends and errors can be detected and corrected.

Registration servlet **50** can also be augmented by additional components. Clients and providers are assigned across the various instances of registration servlets.

The task scheduler **64** maintains an in-memory model of the state of all of the providers (i.e. the provider profiles) and any tasks that it manages. Information to establish the task scheduler is initially retrieved from database **54**. It is thereafter updated as messages are received from the provider manager regarding status of efforts of the various providers, and from the client manger, which forwards relevant messages from clients to the task scheduler.

The task scheduler also requests additional information about providers by cuing a get task message (for retrieving task status) or a get cache contents for obtaining the cache contents of the server for the provider. The task scheduler comprises various scheduling algorithms. This task scheduler makes initial assignments of tasks to providers and migrates tasks from one provider to another if necessary. When the task scheduler schedules a new task, it records the assignment of the task and the provider to which it is assigned in the task database **54**. It further queues a task message to the provider. When migrating a task, the task scheduler removes the task from the current provider by cuing a remove task message, assigning the partially completed task to a new provider via a task message. All such operations are reported in the task database.

The element servlet is the entity that stores data elements that are to be assigned to providers for processing. Clients upload their data elements to the element servlet **60**. The element servlet authenticates the client as one that is permitted to store elements in the file

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server **62**. If the client is authenticated, the element servlet **60** stores the object in a physical location on the file server **62** and notifies the client manager **68** that the object has been uploaded. The client manager 68 in the client database **54** then records this information.

Client computers download elements to the element manager. The element manager **60** registers the fact that this has occurred to the client manager **68**.

The notification that is provided by the element servlet to the client manager **68** includes the client ID, a locator for the data element, and the physical location of the data element.

When a provider needs an element, it makes a request to the element servlet **60** over the Internet **28**. The element servlet **60** authenticates the provider, decrypts the ticket that the provider offers to the element servlet, compares the ID of the provider making the request with the provider ID and the ticket. If the ID's match and the ticket has not expired, the element servlet **60** looks up the element on the file server **62** and returns it to the provider for execution.

When the client terminates a particular job, all of the elements associated with that job are marked as deleted. Deleted elements are removed from the file server **62** and from the database **54**.

Communication within the system of the present invention among the CE, the CTS, and the client is governed by a communication protocol unique to the present invention. At the high level, separate message and data channels exist. Messages between the CE and the server occur over the message channel while executable and data elements go over the data channel. Executable and data elements are referenced from messages passed over the message channel.

The message channel is implemented above a low-level protocol that is part of this invention. The low-level protocol supports the secure and reliable transmission of messages between system components (CE, client, CTS).

The protocol is secure because it is built on Secure HTTP (HTTP over SSL). The invention uses SSL to both provide confidentiality (encryption) of transmitted data and to authenticate the parties at each end of the connection. Providers and client applications can

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only access the server if they have a legitimate certificate. In fact, the server uses a hash of the client's public key as a client identifier.

The protocol is reliable because it incorporates sequence numbers, acknowledgement, and retransmission. Combined, these protect against dropped messages, out-of-order processing of messages, and the processing of duplicate messages.

It is worth noting, the low level protocol provides the abstraction of a bi-directional communication channel between components even though it is implemented on top of HTTP that has a request-response model. A bi-directional model is simulated by having the client periodically "poll" the server for messages. This poll is done on an exponential decay to limit the amount of traffic generated by polling. If the CTS does not respond to a particular GET message, perhaps because of heavy CTS load, subsequent GET messages are sent ever more infrequently, according to an exponential decay, until some limit periodicity is achieved. In this manner, heavy CTS can be automatically mitigated through less frequent CE GET requests.

The maximum polling rate is present each time the client and server exchange a high level message. The two basic operations in the low level protocol are the "GET" and the "POST", both of which are initiated by the client. The POST operation sends a new message (or set of messages) to the server. The GET is a poll operation to get any message (or set of messages) that the server may have enqueued for the client. Since the low-level protocol is based on HTTP it takes advantage of that protocol's features for multipart messages and different message encodings (e.g., for compression). Further, multipart messages can be sent in order to maximize communication efficiency. All messages are also subject to data compression to limit the volume of data being transmitted and to conserve bandwidth.

The low-level protocol also supports the concept of session. Sessions are implemented using cookies and provide for the resetting of a communication channel in the event that synchronization is lost.

The following is a listing of high level message types used by the present invention in its communications protocol. This list is illustrative in nature. Other message types can be added to the present invention as the need arises. As noted above, a series of messages are

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transmitted between the system and various elements. These messages are characterized as Client-to-Server messages, Server-to-Provider messages, Provider-to-Server messages and Server-to-Client messages.

Client–to-Server Messages

GetConfig:

This message is sent when a particular client wants to reestablish its configuration. A GetConfig message causes the CTS to send a Config message to the client.

Task:

The client uses this message to send the server a task to be executed.

ClientProfile:

The client sends this message on startup and whenever client settings change.

CreateJob:

Create a new job.

Stop:

Stop execution of a job or task.

Resume:

Resume execution of a stopped job or task.

RemoveJob:

Remove (cancel) a job.

GetJobProperties:

Requests a JobProperties message.

GetContents:

Requests a Contents message.

GetExecutableElement:

Request that an ExecutableElement message be sent describing a particular executable element.

GetDataElement:

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Request that a DataElement message be sent describing a particular data element

RemoveExecutableElement:

Request the removal of the named executable element.

RemoveDataElement:

Request the removal of the named data element.

Attach:

Attach to a particular task or job. The attach message is used to subscribe to receive status updates on the identified task or job.

GetTask:

Request that the identified task be checkpointed. The checkpoint is returned to the client in a Task message.

GetTaskStatus:

Requests the status of a particular task. The server will send a TaskStatus message in response.

RemoveTask:

Requests the removal of the named task.

ExecutableElement:

Register an executable element with the server. The actual executable element data must be downloaded over the data channel.

DataElement:

Register a data element with the server. The actual data element data must be downloaded over the data channel.

CloseSession:

Close current session.

Error:

Report an error condition.

ExternalDelivery:

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Alert the recipient that a message is waiting at a specified URL.

Heartbeat:

Alert the recipient that the sending entity is still active.

Server-to-Provider messages

Task:

Assigns a task to a provider.

GetTaskStatus:

Requests a task status for a particular task. Provider responds with a TaskStatus message.

GetTask:

Requests a checkpoint for a particular task. The provider responds with a Task message containing the checkpoint.

Config:

Sent to change the providers server-controlled configuration settings.

GetContents:

Request contents of providers message queue.

WorkSummary:

Send current node statistics to CE for display to the user.

GetCacheContents:

Request contents of provider's cache. Provider responds with a CacheContents message.

DisplayContent:

Send new display content to CE.

Upgrade:

Send a software upgrade to CE.

Error:

Report an error condition.

ExternalDelivery:

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Alert the recipient that a message is waiting at a specified URL.

Provider-to-Server messages

NodeStatus:

Reports a change in the status of the provider node.

NodeProfile:

Reports profile information for node (e.g., machine type, available disk, available memory, connection speed, operating system type).

GetConfig:

Request that the server send a Config message to set the providers server-controlled configuration settings.

CacheContents:

Reports the contents of the providers element cache. This information is useful in task scheduling.

Contents:

Reports the contents of the task queue.

Task Status:

Reports the status of a task. There can be both intermediate and final task statuses. Intermediate task statuses may contain partial results. Final task statuses contain the results of the task. Task statuses are also used to report errors in the execution of a task.

Task: The provider sends the task message out in response to a GetTask message from the provider. In this case, the Task message is a checkpoint of the state of the identified task.

Error:

Report an error condition.

ExternalDelivery:

Alert the recipient that a message is waiting at a specified URL.

Heartbeat:

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Alert the recipient that the sending entity is still active.

Server-to-Client messages

Task:

The server sends the task message out in response to a GetTask message from the client. In this case, the Task message is a checkpoint of the state of the identified task.

Task Status:

Reports the status of a task. This could be generated in response to a task status from the provider, in response to a GetStatus from the client, or due to an internal server condition.

Config:

Sent to change the clients server-controlled configuration settings.

JobProperties:

Report current job properties.

Contents:

Return contents of job or client global area.

ExecutableElement:

Return information on a specific executable element. Sent in response to a GetExecutableElement message.

DataElement:

Return information on a specific data element. Sent in response to a GetDataElement message.

Error:

Report an error condition.

ExternalDelivery:

Alert the recipient that a message is waiting at a specified URL.

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The present invention can also be employed in other manners, such as a method of marketing computers by offering incentives to computer customers that agree to operate a compute engine (CE) on the computers and having the CE utilize idle computational processing power on the computers. Incentives can include, but are not limited to free computer use, free ISP service, discounted computer sales price, discount computer lease price, a sales rebate, periodic rebates, and usage fees. The CE can also be utilized to deliver "pushed" content, such as advertising, to these computer customers via a display window of said computer's graphic interface or via said computer's sound output.

A system and method for the establishment and utilization of networked idle computational processing power has been illustrated. It will be appreciated by those skilled in the art that other variations in, for example, the calculation of power, and the methods for compensating providers can be accomplished without departing from the scope of the invention as disclosed.

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We Claim:

1. A system for using computer excess computational power comprising:

at least one client computer adapted to create programs for execution;

a network connected to the client computer;

a central task server (CTS) connected to the network, adapted to receive the programs from the client;

a plurality of provider computers for providing excess computational power connected to the CTS via network and adapted to receive the programs from the CTS, the CTS thereby providing computational power upon demand to the at least one client computer.

2. The system for using excess computational power of claim 1 wherein the at least one client computer further comprises:

a client application programming interface (API) for allowing the client computer to specify the compute capacity needed in the form of a virtual cluster in which the programs are to be run.

3. The system for using excess computational power of claim 2 wherein the parameters to be specified are at least computer power, disk space required, and reliability of the computer power.

4. The system for using excess computational power of claim 2 wherein the at least one client computer further comprises a run time interface, the run time interface further comprising a set of function calls used by the client computer for getting parameters from the run time environment, for getting data elements, for querying the CTS for task status, and for performing checkpointing at various places in the program.

5. The system for using excess computational power of claim 4 wherein the run time interface further comprises instructions for creating jobs.

6. The system for using excess computational power of claim 5 wherein the run time interface further comprises instructions for creating tasks within jobs.

7. The system for using excess computational power of claim 5 wherein the run time interface further comprises instructions for querying against the status of jobs.

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8. The system for using excess computational power of claim 5 wherein the run time interface further comprises instructions for attaching the client computer of a job in progress and for checking on the status of a job while the job is in progress.

9. The system for using excess computational power of claim 1 wherein the CTS further comprises instructions for charging the at least one client for computational power used during the execution of the programs.

10. The system for using excess computational power of claim 9 wherein the charging of the client is made when the task is launched.

11. The system for using excess computational power of claim 10 wherein a task is launched when it is scheduled by the CTS to be run by at least one provider computer.

12. The system for using excess computational power of claim 1 wherein the CTS further comprises instructions for monitoring a virtual node specified by the client for failure.

13. The system for using excess computational power of claim 9 wherein charging of clients is based upon the sum of the power of the provider computers running the client tasks.

14. The system for using excess computational power of claim 9 wherein the CTS further comprises instructions for making payments to providers based upon the available computational power the provider's computer.

15. The system for using excess computational power of claim 14 wherein the available computational power is a function of CPU availability, CPU speed and bandwidth availability.

16. The system for using excess computational power of claim 15 wherein CPU speed is measured by running benchmark tests of the CPU periodically.

17. The system for using excess computational power of claim 1 wherein each of the plurality of provider computer further comprises a general purpose compute engine (CE) for executing programs sent from the central server.

18. The system for using excess computational power of claim 17 wherein the CE further comprises instructions for allowing an owner of the provider computer to set the availability parameters of the provider computer.

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19. The system for using excess computational power of claim 18 wherein the availability parameters comprise the amount of RAM available for the programs, the amount of disk space available for the programs and the times during the day, if any, that the provider computer is available to execute the programs.

20. The system for using excess computational power of claim 18 wherein the CE further comprises instructions for opening a widow on the provider computer when the programs are being run.

21. The system for using excess computational power of claim 18 wherein the CE further comprises instructions for displaying content from the central server in the window.

22. The system for using excess computational power of claim 18 wherein the CE further comprises instructions for executing the programs only when excess computational power is detected on the provider computer.

23. The system for using excess computational power of claim 9 wherein the amount charged to the client I based on the following formula:

Price per hour for computation $= 4.5 + 0.296P^{1.155}$,

where P is the sum of all of the power in active nodes being used by the CTS to fulfill the computational requirements specified by the client.

24. The system for using excess computational power of claim 23 wherein the client is also charged for data transfer during the course of executing the particular tasks of the client based upon the following formula:

$$\text{Total Cost of Data Transfer} = g\left(d_i + d_o\right)\left(\frac{\ln\left(1-r\right)}{\ln\left(1-\pi\right)}+1\right) ,$$

where d_i in the quantity (in GB) of data transferred from the client to the server, d_o is the quantity of data transferred from the server to the client, where g is the transfer cost per communication path among the client computer, the provider computer and the CTS per GB, r is a requested node reliability, and π is an average provider computer reliability.

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25. The system for using excess computational power of claim 24 wherein the client is also charged an hourly premium for requesting reliability greater than a set baseline reliability given by the formula:

$$\text{Price per hour for premium reliability} = kCN\left(\frac{\ln(1-r)}{\ln(1-R)}-1\right)$$

where k is a baseline price per MHz-hour, C is the CPU speed requested of a virtual node requested by the client, N is the number of virtual nodes running, r is the requested reliability, and R is the baseline reliability.

26. The system for using excess computational power of claim 1 wherein the owners of the provider computers are paid a fixed amount per unit work for providing excess computational power according to the following formula:

$\frac{T\ln(1-\pi)}{\ln(1-r)}$ per GHz-hour, where

T is a rate, π is an average availability, and r is a target reliability.

27. A method for using computer excess computational power comprising:

adapting at least one client computer to create programs for execution;

connecting the client computer to a network;

connecting a central task server (CTS) to the network, wherein said CTS is adapted to receive the programs from the client;

connecting a plurality of provider computers for providing excess computational power to the network and adapting said provider computers to receive the programs from the central server, the plurality of provider computers providing computational power upon demand.

28. The method for using excess computational power of claim 27 further comprising supplying the at least one client computer with a client application programming interface (API) for allowing the client computer to specify the parameters under which the programs are to be run.

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29. The method for using excess computational power of claim 28 wherein the parameters to be specified are at least computer power, disk space required, and reliability of the computer power.

30. The method for using excess computational power of claim 28, further comprising providing the at least one client computer with a run time interface, the run time interface including a set of function calls used by the client computer for getting parameters from the run time environment, for getting data elements, for querying the CTS for task status, and for performing checkpointing at various places in the program.

31. The method for using excess computational power of claim 30, further comprising providing the run time interface with instructions for creating jobs.

32. The method for using excess computational power of claim 31, further comprising providing the run time interface with instructions for creating tasks within jobs.

33. The method for using excess computational power of claim 31, further comprising providing the run time interface with instructions for querying against the status of jobs.

34. The method for using excess computational power of claim 31, further comprising providing the run time interface with instructions for attaching the client computer of a job in progress and for checking on the status of a job while the job is in progress.

35. The method for using excess computational power of claim 27, further comprising providing the CTS with instructions for charging the at least one client for excess computational power used during the execution of the programs.

36. The method for using excess computational power of claim 35 wherein the charging of the client is made when the task is launched.

37. The method for using excess computational power of claim 36 including launching a task when it is scheduled by the CTS to be run by at least one provider computer.

38. The method for using excess computational power of claim 27, further comprising providing the CTS with instructions for monitoring a virtual node specified by the client for failure.

39. The method for using excess computational power of claim 35 wherein charging of clients is based upon the sum of the power of the provider computers running the client tasks.

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40. The method for using excess computational power of claim 35, further comprising providing the CTS with instructions for making payments to providers based upon the available computational power the provider's computer.

41. The method for using excess computational power of claim 40 wherein the available computational power is determined as a function of CPU availability, CPU speed and bandwidth availability.

42. The method for using excess computational power of claim 41 wherein CPU speed is measured by running benchmark tests of the CPU periodically.

43. The method for using excess computational power of claim 27, further comprising providing each of the plurality of provider computer with a general purpose compute engine (CE) for executing programs sent from the central server.

44. The method for using excess computational power of claim 43, further comprising providing the CE with instructions for allowing an owner of the provider computer to set the availability parameters of the provider computer.

45. The method for using excess computational power of claim 44 wherein the availability parameters comprise the amount of RAM available for the programs, the amount of disk space available for the programs and the times during the day, if any, that the provider computer is available to execute the programs.

46. The method for using excess computational power of claim 44, further comprising providing the CE with instructions for opening a widow on the provider computer when the programs are being run.

47. The method for using excess computational power of claim 44, further comprising providing the CE with instructions for displaying content from the central server in the window.

48. The method for using excess computational power of claim 44, further comprising providing the CE with instructions for executing the programs only when excess computational power is detected on the provider computer.

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49. The method for using excess computational power of claim 35 wherein the amount charged to the client I is computed based on the following formula:

Price per hour for computation $= 4.5 + 0.296P^{1.155}$,

where P is the power of the computer in Mhz.

50. The method for using excess computational power of claim 49, further comprising charging the client for data transfer during the course of executing the particular tasks of the client based upon the following formula:

$$\text{Total Cost of Data Transfer} = g(d_i + d_o)\left(\frac{\ln(1-r)}{\ln(1-\pi)} + 1\right) ,$$

where d_i in the quantity (in GB) of data transferred from the client to the server, d_o is the quantity of data transferred from the server to the client, where g is the transfer cost per communication path among the client computer, the provider computer and the CTS per GB, r is a requested node reliability, and π is an average provider computer reliability.

51. The method for using excess computational power of claim 50, further comprising charging the client an hourly premium for requesting reliability greater than a set baseline reliability given by the formula:

$$\text{Price per hour for premium reliability} = kCN\left(\frac{\ln(1-r)}{\ln(1-R)} - 1\right)$$

where k is a baseline price per MHz-hour, C is the CPU speed requested of a virtual node requested by the client, N is the number of virtual nodes running, r is the requested reliability, and R is the baseline reliability.

52. The method for using excess computational power of claim 27, further comprising paying the owners of the provider computers a fixed amount per unit work for providing excess computational power according to the following formula:

$\frac{T\ln(1-\pi)}{\ln(1-r)}$ per GHz-hour, where

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T is a rate, π is an average availability, and r is a target reliability.

53. A method for the establishment and utilization of networked idle computational processing power comprising:

loading a client API on to client computers to allow client jobs to be broken into independent tasks.

loading compute engine (CE) software onto provider computers to execute tasks using idle computational processing power of said provider computers and using a centralized task server (CTS) that is at least intermittently networked to said client computers at any time selected by said clients and intermittently connected to provider computers to exchange tasks and results.

54. The method of claim 53, wherein said CE runs unobtrusively and securely on the provider computer.

55. The method of claim 53, wherein a task scheduler in said CTS matches computational power requested by clients to provider resources.

56. The method of claim 53, wherein CE operates the provider computer to periodically contact the CTS to retrieve tasks and control messages and/or send results.

57. The method of claim 53, wherein the client API periodically contacts the CTS to retrieve results.

58. The method of claim 53, wherein the CE displays a graphic window when running tasks to display processing and status information.

59. The method of claim 58, further comprising display of advertising on other targeted messages by the CE graphic window.

60. The method of claim 58, wherein the window can be made to disappear based on configurable mouse coordinates.

61. A system for the established and utilization of networked idle computational processing power comprising:

at least one client computer with a client API that allows client jobs to be broken into independent tasks;

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at least one provider computer operating compute engine (CE) software that executes tasks to produce results when said provider computer processor is idle

at least one centralized task server (CTS) at least intermittently connected to said client at any time of said client's choosing and at least intermittently connected to provider computers to exchange tasks and results.

62. The system of claim 61, wherein said CTS comprises redundant, fault tolerant and scalable architecture.

63. A method of marketing computers, comprising:

offering incentives to computer customers that agree to operate a compute engine (CE) on said computers; and

having said CE utilize idle computational processing power on said computers to perform tasks requested by an intermediary that markets said idle computational processing power.

64. The method of marketing computers of claim 63, wherein said incentives are selected from the group consisting of free computer use, free ISP service, discounted computer sales price, discount computer lease price, a sales rebate, periodic rebates, and usage fees.

65. The method of marketing computers of claim 63, wherein said CE is also utilized to deliver content to said computer customers via a display window of said computer's graphic interface or via said computer's sound output.

66. The method of marketing computers of claim 65, wherein said content is advertising.

67. A method of creating and intermediating a market for idle computational processing power comprising:

aggregating computational tasks from clients;

distributing tasks to provider computers for execution using idle computational processing power of said provider computers;

collecting results from said provider computers and delivering said results to said clients;

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charging said clients a fee; and

compensating said providers.

68. The method of creating and intermediating a market for idle computational processing power of claim 67 wherein API software on client computers provides tasks and compute engine (CE) software on said provider computers executes said tasks and provides said results.

69. The system of claim 61, further comprising a communication protocol for governing communication between the API, CTS, and CE, said protocol having separate message and data channels; wherein the message channel is a bi-directional channel between clients and the server that is used to pass high-level messages that facilitate distributed processing and the data channel is a channel used to pass large blocks of data elements and executable elements.

70. The system of claim 61, wherein the client API supports jobs of arbitrary size by being programmed to monitor only task results.

71. The system of claim 61, further comprising a runtime API which defines how tasks interact with their environment.

72. The system of claim 61, wherein the client API contains an interface for task checkpointing.

73. The system of claim 61, wherein the CE supports the queuing of tasks, task prioritization, and preemption of tasks based on priority.

74. The system of claim 61, wherein the CTS and CE together record computer CPU and communications line signatures.

75. The system of claim 74, wherein the signatures are historical usage patterns for use in task scheduling.

76. The system of claim 61, further comprising system-wide secure communications, client anonymity, and obfuscation of client code.

77. The system of claim 61, further comprising means for pricing jobs and scheduling tasks based on delivering clients a virtual cluster comprised of virtual nodes, said

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virtual nodes implemented by launching the same task to multiple, complementary nodes that together provide a given expected level of power and reliability.

78. The system of claim 69, wherein the CE

79. A general-purpose compute engine (CE) for execution of distributed tasks using the excess computational capacity of provider machines comprising:

compute engine software having a virtual machine for executing tasks; and

means for orchestrating the execution of tasks via said virtual machine in a manner that keeps said provider machine substantially insulated from client tasks.

80. The general-purpose compute engine of claim 79, wherein the CE is configured to run from the group consisting of constantly and only when said provider computer is idle.

81. The system for using excess computational power of claim 13 wherein the client is charged and enhanced rate for power used above a set threshold.

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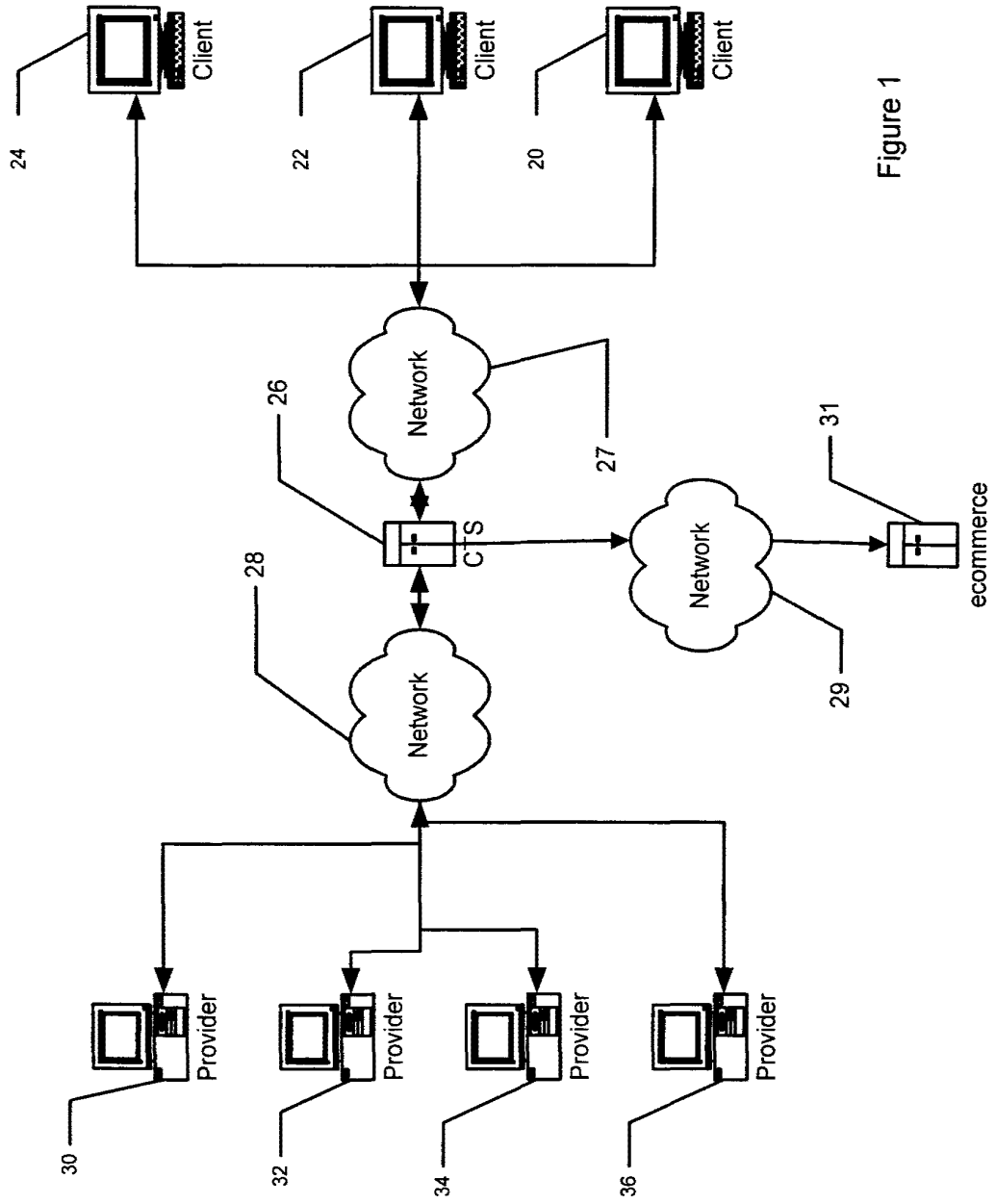

Client
Client
Client
24
22
20
Network
26
27
CTS
28
Network
Network
31
ecommerce
29
Provider
Provider
Provider
Provider
30
32
34
36

Figure 1

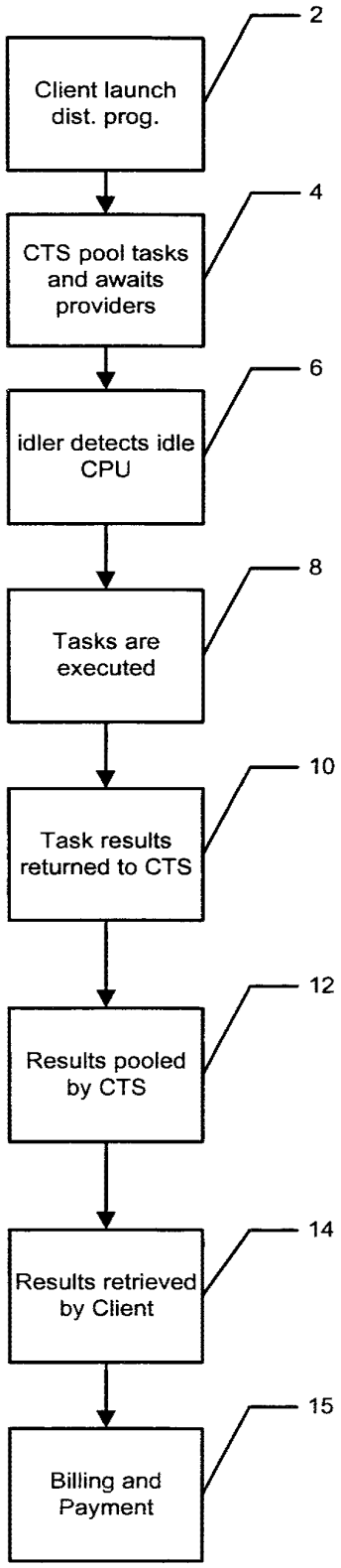
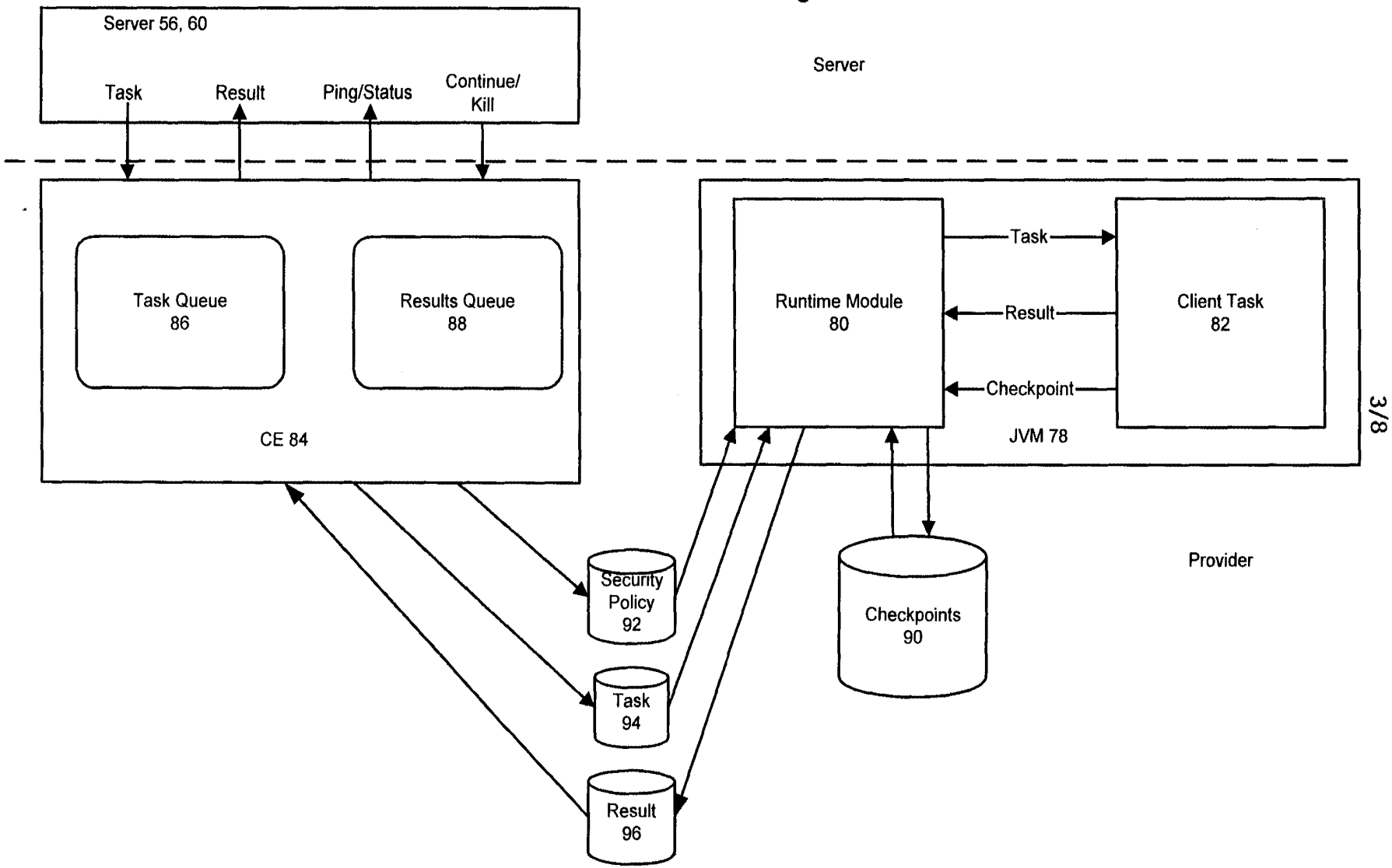

Client launch dist. prog.
2
CTS pool tasks and awaits providers
4
idler detects idle CPU
6
Tasks are executed
8
Task results returned to CTS
10
Results pooled by CTS
12
Results retrieved by Client
14
Billing and Payment
15

Figure 2

Figure 3


Server 56, 60
Task
Result
Ping/Status
Continue/
Kill
Server
Task Queue
86
Results Queue
88
CE 84
Runtime Module
80
Task
Result
Checkpoint
Client Task
82
JVM 78
Provider
Security
Policy
92
Task
94
Result
96
Checkpoints
90

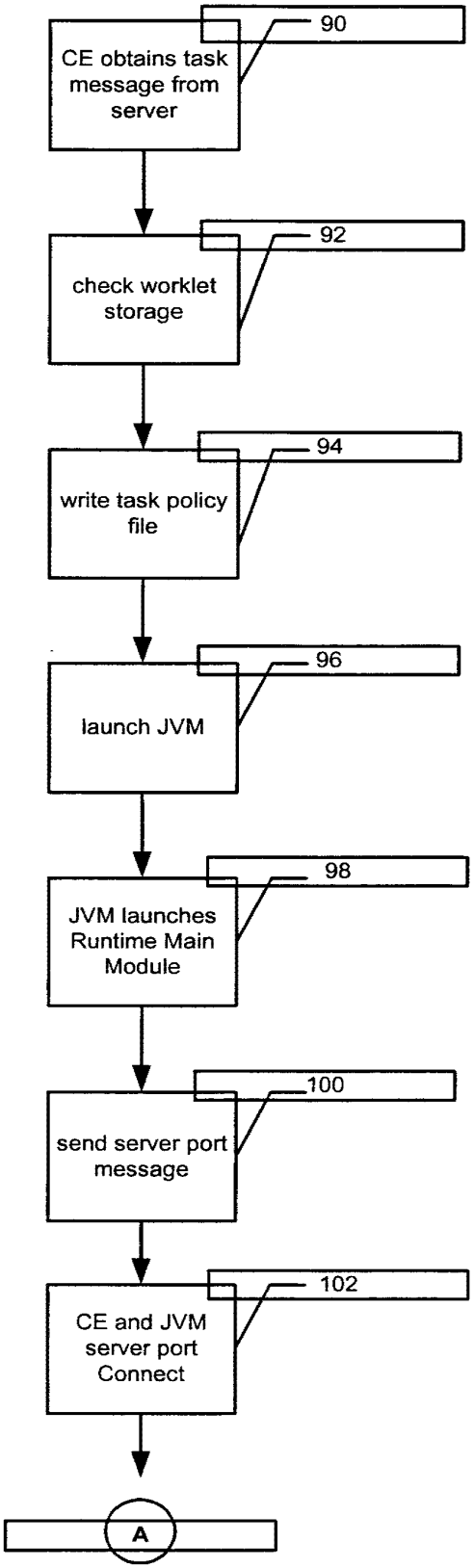

90
CE obtains task message from server
92
check worklet storage
94
write task policy file
96
launch JVM
98
JVM launches Runtime Main Module
100
send server port message
102
CE and JVM server port Connect
A

Figure 4A

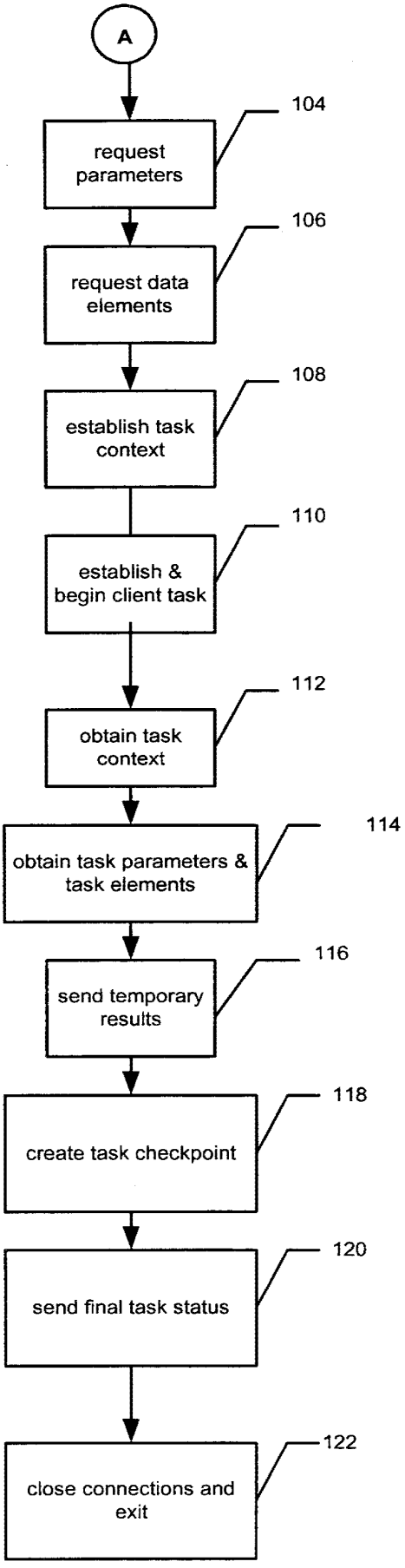

A
request parameters
104
request data elements
106
establish task context
108
establish & begin client task
110
obtain task context
112
obtain task parameters & task elements
114
send temporary results
116
create task checkpoint
118
send final task status
120
close connections and exit
122

Figure 4B

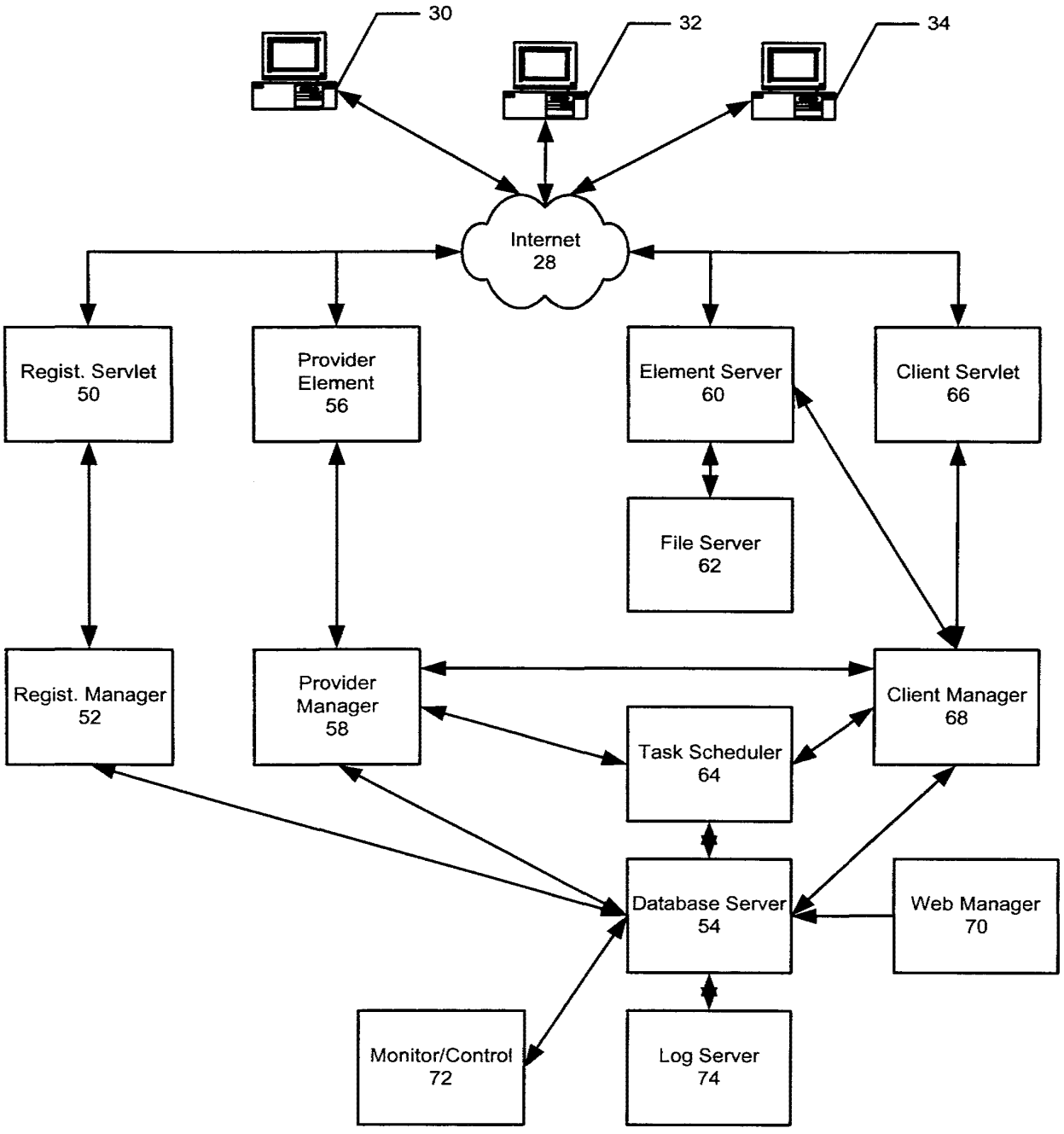
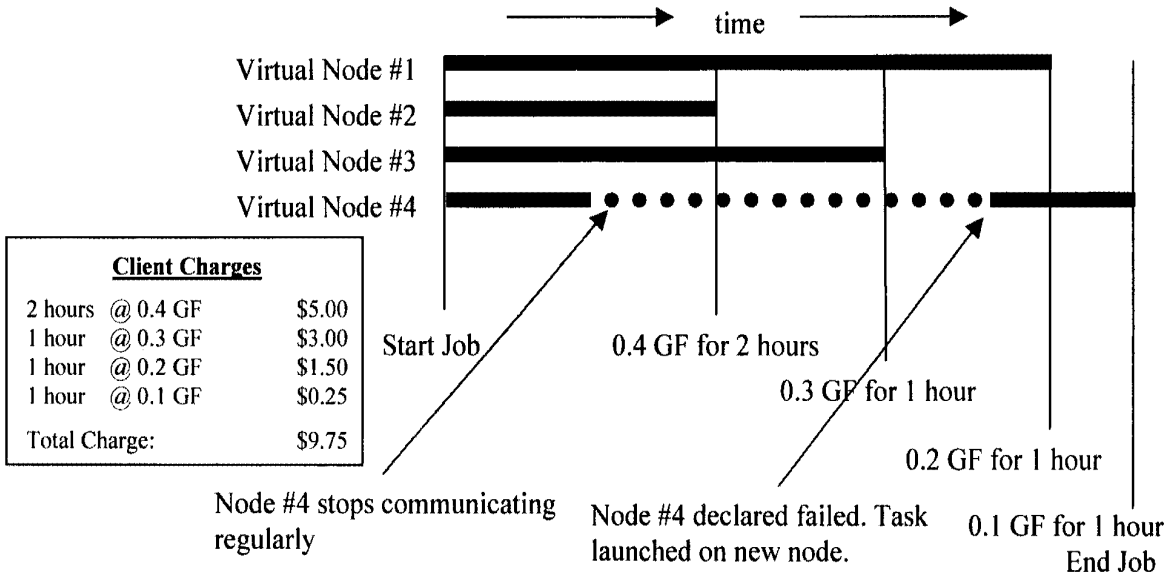

30
32
34
Internet
28
Regist. Servlet
50
Provider
Element
56
Element Server
60
Client Servlet
66
File Server
62
Regist. Manager
52
Provider
Manager
58
Client Manager
68
Task Scheduler
64
Database Server
54
Web Manager
70
Monitor/Control
72
Log Server
74

Figure 5

Figure 6


time
Virtual Node #1
Virtual Node #2
Virtual Node #3
Virtual Node #4
Client Charges
2 hours @ 0.4 GF $5.00
1 hour @ 0.3 GF $3.00
1 hour @ 0.2 GF $1.50
1 hour @ 0.1 GF $0.25
Total Charge: $9.75
Start Job
0.4 GF for 2 hours
0.3 GF for 1 hour
0.2 GF for 1 hour
Node #4 stops communicating regularly
Node #4 declared failed. Task launched on new node.
0.1 GF for 1 hour
End Job

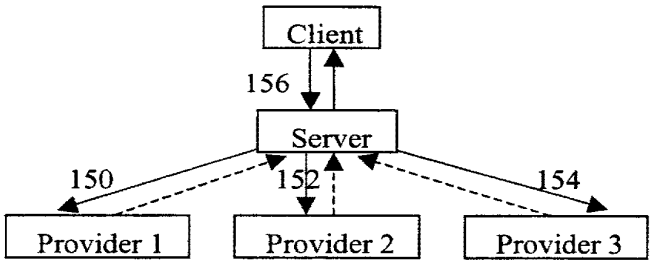


Figure 7

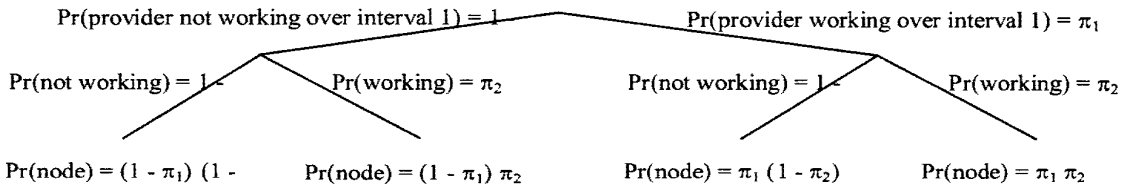


Figure 8

WO0173545

Publication Title:

MASSIVELY DISTRIBUTED PROCESSING SYSTEM AND ASSOCIATED METHODS

Abstract:

Abstract of WO 0173545

(A2) A massively distributed processing system and associated methods are disclosed that provide a processing architecture for utilizing a multitude of widely distributed devices to process distributed project workloads. To provide the processing infrastructure, a client agent program, which may include a system component and a separate project component, operates on the distributed devices to process workloads. For different projects, different project components may be provided to run on the base system component. In addition, a device capabilities database and an incentive database can be used by the server system to facilitate operations and encourage participation by client systems. Other databases may also be utilized to enhance system operations and functionality.; And a wide variety of applications are possible, including network site testing, network site indexing, distributed data back-up, file sharing, data catching, data conversion, and scientific research, as well as many other distributed projects.

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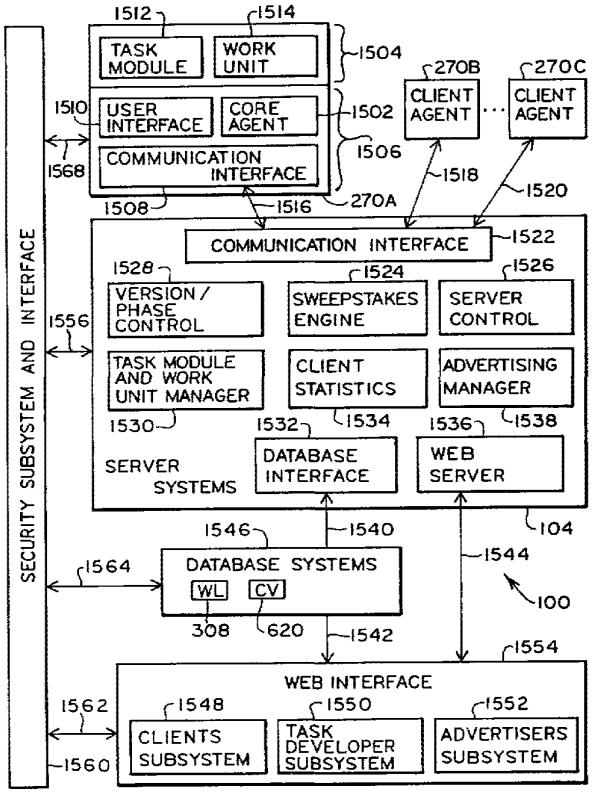
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(54) Title: MASSIVELY DISTRIBUTED PROCESSING SYSTEM AND ASSOCIATED METHODS



(57) Abstract: A massively distributed processing system and associated methods are disclosed that provide a processing architecture for utilizing a multitude of widely distributed devices to process distributed project workloads. To provide the processing infrastructure, a client agent program, which may include a system component and a separate project component, operates on the distributed devices to process workloads. For different projects, different project components may be provided to run on the base system component. In addition, a device capabilities database and an incentive database can be used by the server system to facilitate operations and encourage participation by client systems. Other databases may also be utilized to enhance system operations and functionality. And a wide variety of applications are possible, including network site testing, network site indexing, distributed data back-up, file sharing, data catching, data conversion, and scientific research, as well as many other distributed projects.

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MASSIVELY DISTRIBUTED PROCESSING SYSTEM AND ASSOCIATED METHODS

Inventors: Edward A. Hubbard and Sriram S. Mandyam

Technical Field of the Invention

This invention relates to distributing processing and more particularly to techniques and related methods for managing, facilitating and implementing distributed processing in a network environment.

Background

Prior processing systems have included the technique of multiple users within a company sharing processing time available on a mainframe or central processing system. Using small segments of mainframe processing time, departments within the company would often incur costs associated with using the processing time, which in turn was billed back to each department from the central information technology (IT) organization for the company. In other instances, a company could pay for and utilize processing time made available by third-party companies who possessed an over-capacity of mainframe processing power. These third-party companies would, in effect, create a market for the mainframe processing time that went unused by the internal organizations of that third-party company.

Prior processing techniques have also included distributed processing projects that have utilized the Internet or World Wide Web. These distributed processing research projects have used personal computers (PCs) connected to the Internet to provide processing power to accomplish research project goals. Research project goals have been, for example, identifying large prime numbers, analyzing radio telescope data, and analyzing code keys in an encryption deciphering contest.

One example of a distributed processing project on the Internet is a research project housed at the University of California at Berkeley to analyze sky recording data gathered by SETI (the Search for Extraterrestrial Intelligence). This sky recording data has been gathered for some time from the large Arecibo Radio Telescope in Puerto Rico. The processing power

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needed to analyze these data recordings was very large. At the peak of SETI's capture activities, SETI had accumulated over 100,000 years of signals to process, as measured by the compute power necessary to process all the signals. To analyze this data, software was developed that could be downloaded to Internet connected PCs so that these PCs could process small slices of these sky recordings. In under a year, this project, called SETI@home (URL in March 2000 - www.setiathome.ssl.berkeley.edu) has completely processed this backlog of data and is now returning to the sky recording dataset for further processing tasks. This massively parallel distributed system has a processing throughput of over 10 TFLOPs (terraFLOPS or 10^{12} floating point operations per second) running on about 1.8 million Internet connected machines.

Another example of a distributed processing technique was developed and implemented by Distributed.net (URL in March 2000 -- www.distributed.net) to compete in encryption breaking contests. Distributed.net created and distributed a client software program which may be downloaded by client systems connected to the Internet. This client software then acts as part of a large distributed processing system specifically designed to break encrypted messages on the Internet. Using this processing technique, Distributed.net has won encryption breaking contests sponsored by RSA Labs, which is an Internet security company. In these contests, RSA Labs has offered a monetary prize to the winner of the encryption contest. In organizing its efforts, Distributed.net has offered a share of this monetary prize to the client system that actually breaks the encryption code. In addition, Distributed.net keeps track of overall project statistics, as well as statistics concerning the efforts of its client systems through individual and team rankings by amount of processing completed.

Entropia.com (URL in March 2000 – www.entropia.com) has utilized an Internet distributed processing system to compete in contests directed to identifying the largest prime number. Entropia.com also offers its computing power to other research projects. Users may sign on to be part of the distributed processing for free. For the largest prime number contest, Entropia.com, like Distributed.net, offers a monetary prize to the Internet connected PC that comes up with the first prime number achieved in a new order of magnitude. For other research projects, the incentive is simply to be a part of the research project.

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Another distributing processing web site is provided by Process Tree Network (URL in March 2000 -- www.processtree.com). This web site is attempting to sign-up Internet connected computer systems to provide processing power for paying projects. For a project, each partner system, when connected to the Internet, will have client software that downloads a job unit and processes that job unit. The incentive offered by the Process Tree Network are "micro-payments" for the amount of work completed by any given system. These micro-payments are apparently small amounts of some total project value based upon the amount of the project completed by the given system through the jobs it has processed. In addition, each partner is given a bonus percentage of payments made to persons they sign-up as new partners.

In completely unrelated Internet activities outside the distributed processing arena, there have been a number of sites that have utilized a sweepstakes model as an incentive for consumer behavior. One of the most popular (as of March 2000) sweepstakes sites is IWON.COM (URL as of March 2000 -- www.iwon.com). IWON.COM is a standard Internet search and content portal that provides an incentive to users by giving them entries to a sweepstakes when the users use the portal. The more the users use the portal, the more entries the user generates, up to a limit, for example, up to 100/day. At the end of each day, IWON.COM chooses a $10,000 winner from among the entries. At the end of each month, IWON.COM chooses a $1,000,000 winner. And, at the end of an overall sweeps period, IWON.COM plans to draw a single winner for a $10,000,000 grand prize. IWON.COM has created this sweepstakes model to introduce an Internet portal in late 1999 and make it a web site that has as a comparable number of people using it as does Internet portals that have existed for many years, such as, for example, Yahoo.com (URL in March 2000 – www.yahoo.com).

These prior distributed processing systems are narrowly focused on limited project activities and do not provide an efficient architecture for utilizing a distributed processing system to take full advantage of distributed resources, managing those resources, and applying those resources to solve a wide variety of distributed processing projects and problems.

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Summary of the Invention

The present invention provides a massively distributed processing system and associated methods that utilize an advantageous processing architecture for utilizing a multitude of widely distributed devices to process distributed workloads for distributed processing projects. To provide the infrastructure processing power for the distributed processing system, a client agent program, including a system component with a core agent module and a separate project component with at least one task module, is configured to operate on the distributed devices and to process project workloads. For each different distributed project, different project components or task modules may be provided by a server system to the distributed devices to run on the core agent module or system component. In addition, a capabilities database can be used by a server system to schedule workloads based upon the capabilities of the distributed devices. And an incentive database can be used by a server system to store incentive values representing potential prizes or compensation to the distributed devices for participating in the distributed processing system. Other databases can also be utilized to enhance or further add to system operations and functionality. Furthermore, a wide variety of applications are possible utilizing the distributed processing system of the present invention, including network site testing, network site indexing, distributed data back-up, file sharing, data caching, data conversion, and scientific research, as well as many other distributed projects.

Description of the Drawings

It is noted that the appended drawings illustrate only exemplary embodiments of the invention and are, therefore, not to be considered limiting of its scope, for the invention may admit to other equally effective embodiments.

FIG. 1A is a block diagram for a distributed processing system having client capability and incentive features, according to the present invention.

FIG. 1B is a block diagram for information flow among customer systems, server systems and client systems, according to the present invention.

FIG. 2A is a block diagram for a client system, according to the present invention.

FIG. 2B is a block diagram for processing elements within a client system, according to the present invention.

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FIG. 2C is a block diagram for a client system agent installed on a client system, according to the present invention.

FIG. 2D is an example user interface for a client system agent, including incentive advertising, according to the present invention.

FIG. 3A is a block diagram for server systems, according to the present invention, including a control system, a sweepstakes system and a workload database.

FIG. 3B is a block diagram for server systems, customer systems, client systems and outsourced host systems, according to the present invention.

FIG. 3C is a block diagram for a server system processor, according to the present invention.

FIG. 3D is an alternative block diagram for a server system processor, according to the present invention.

FIG. 4 is a functional block diagram for an example sweepstakes incentive operation according to the present invention.

FIG. 5A is a block diagram for a distributed processing system for a network site indexing application, according to the present invention.

FIG. 5B is a functional block diagram for an indexing operation according to the present invention.

FIG. 6A is a block diagram for a server system according to the present invention, including a control system, a workload database, and a database of client capabilities balancing vectors.

FIG. 6B is a functional block diagram for client capabilities balancing of workloads according to the present invention.

FIG. 7A is a block diagram for a distributed processing system, according to the present invention, including example network sites on which site testing is to be conducted, such as load testing and/or quality-of-service (QoS) testing.

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FIG. 7B is a functional block diagram for site-testing, according to the present invention.

FIG. 8 is a block diagram of a distributed processing system for a data backup application, according to the present invention.

FIG. 9 is a block diagram of an alternative representation of an interconnection fabric for a distributed processing system environment, according to the present invention.

FIG. 10 is a block diagram of a more detailed block diagram for a client system agent installed on a client system, according to the present invention.

FIG. 11A is a more detailed flow diagram for machine generated sweepstakes entries according to the present invention.

FIG. 11B is an alternative detailed flow diagram for machine generated sweepstakes entries according to the present invention.

FIG. 12A is a block diagram of a distributed processing system that allows customers to select client system attributes, according to the present invention.

FIG. 12B is a block flow diagram for client system attribute selection, according to the present invention.

FIG. 13A is a block diagram of a distributed processing system that provides data conversion services, according to the present invention.

FIG. 13B is a block flow diagram for data conversion services within a distributed processing system, according to the present invention.

FIG. 14A is a block diagram of a distributed processing system that provides data transmission caching, according to the present invention.

FIG. 14B is a block diagram of a distributed processing system that provides data sharing and file distribution, according to the present invention.

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FIG. 15 is a block diagram of an alternative representation for a distributed processing system, according to the present invention.

FIG. 16 is a block diagram of a representation for a distributed processing system including security subsystems, according to the present invention.

FIG. 17A is a block diagram of a client system and server systems communication interface, according to the present invention.

FIG. 17B is a block diagram of communication layers for client system and server systems communication, according to the present invention.

FIG. 18A is a detailed block diagram for an embodiment of security activities for server systems, according to the present invention.

FIG. 18B is a detailed block diagram for an embodiment of security activities for client systems, according to the present invention.

FIG. 19 is a block diagram for a distributed processing system and environment in which network service providers are enabled to monitize their user bases.

FIG. 20 is a block diagram representing the components for a client agent along with a representative indication of responsibility for those components.

Detailed Description of the Invention

The present invention contemplates the identification of the capabilities of distributed devices connected together through a wide variety of communication systems and networks and the aggregation of these capabilities to accomplish processing, storage, broadcasting or any other desired project objective. For example, distributed devices connected to each other through the Internet, an intranet network, a wireless network, home networks, or any other network may provide any of a number of useful capabilities to third parties once their respective capabilities are identified, organized, and managed for a desired task. These distributed devices may be connected personal computer systems (PCs), internet appliances, notebook computers, servers, storage devices, network attached storage (NAS) devices, wireless devices, hand-held devices, or any other computing device

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that has useful capabilities and is connected to a network in any manner. The present invention further contemplates providing an incentive, which may be based in part upon capabilities of the distributed devices, to encourage users and owners of the distributed devices to allow the capabilities of the distributed devices to be utilized in the distributed parallel processing system of the present invention.

The number of usable distributed devices contemplated by the present invention is preferably very large. Unlike a small local network environment, for example, as may be used by an Internet Service Provider (ISP), which may include less than 100 interconnected computers systems to perform the tasks required by the ISP, the present invention preferably utilizes a multitude of widely distributed devices to provide a massively distributed processing system. With respect to the present invention, a multitude of distributed devices refers to greater than 1,000 different distributed devices. With respect to the present invention, widely distributed devices refers to a group of interconnected devices of which at least two are physically located at least 100 miles apart. With respect to the present invention, a massively distributed processing system is one that utilizes a multitude of widely distributed devices. The Internet is an example of a interconnected system that includes a multitude of widely distributed devices. An intranet system at a large corporation is an example of an interconnected system that includes a multitude of distributed devices, and if multiple corporate sites are involved, may include a multitude of widely distributed devices. A distributed processing system according to the present invention that utilizes such a multitude of widely distributed devices, as are available on the Internet or in a large corporate intranet, is a massively distributed processing system according to the present invention.

FIG. 1A is a block diagram for a distributed parallel processing system 100 according to the present invention. The network 102 is shown having a cloud outline to indicate the unlimited and widely varying nature of the network and of attached client types. For example, the network 102 may be the Internet, an internal company intranet, a local area network (LAN), a wide area network (WAN), a wireless network, a home network or any other system that connects together multiple systems and devices. In addition, network 102 may include any of these types of connectivity systems by themselves or in combination, for example, computer systems on a company intranet connected to computer systems on the Internet.

FIG. 1A also shows client systems 108, 110 ... 112 connected to the network 102 through communication links 118, 120 ... 122, respectively. In addition, server systems 104, other systems 106, and customer systems 152 are connected to the network 102 through communication links 114,

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116 and 119, respectively. The client system capabilities block 124 is a subset of the server systems 104 and represents a determination of the capabilities of the client systems 108, 110 ... 112. The incentives block 126 is also a subset of the server systems 104 and represents an incentive provided to the users or owners of the clients systems 108, 110 ... 112 for allowing capabilities of the clients systems 108, 110 ... 112 to be utilized by the distributed processing system 100. The client systems 108, 110 and 112 represent any number of systems and/or devices that may be identified, organized and utilized by the server systems 104 to accomplish a desired task, for example, personal computer systems (PCs), internet appliances, notebook computers, servers, storage devices, network attached storage (NAS) devices, wireless devices, hand-held devices, or any other computing device that has useful capabilities and is connected to a network in any manner. The server systems 104 represent any number of processing systems that provide the function of identifying, organizing and utilizing the client systems to achieve the desired tasks.

The incentives provided by the incentives block 126 may be any desired incentive. For example, the incentive may be a sweepstakes in which entries are given to client systems 108, 110 ... 112 that are signed up to be utilized by the distributed processing system 100. Other example incentives are reward systems, such as airline frequent-flyer miles, purchase credits and vouchers, payments of money, monetary prizes, property prizes, free trips, time-share rentals, cruises, connectivity services, free or reduced cost Internet access, domain name hosting, mail accounts, participation in significant research projects, achievement of personal goals, or any other desired incentive or reward.

As indicated above, any number of other systems may also be connected to the network 102. The element 106, therefore, represents any number of a variety of other systems that may be connected to the network 102. The other systems 106 may include ISPs, web servers, university computer systems, and any other distributed device connected to the network 102, for example, personal computer systems (PCs), internet appliances, notebook computers, servers, storage devices, network attached storage (NAS) devices, wireless devices, hand-held devices, or any other connected computing device that has useful capabilities and is connected to a network in any manner. The customer systems 152 represents customers that have projects for the distributed processing system, as further described with respect to FIG. 1B. The customer systems 152 connect to the network 102 through the communication link 119.

It is noted that the communication links 114, 116, 118, 119, 120 and 122 may allow for communication to occur, if desired, between any of the systems connected to the network 102. For

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example, client systems 108, 110 ... 112 may communicate directly with each other in peer-to-peer type communications. It is further noted that the communication links 114, 116, 118, 119, 120 and 122 may be any desired technique for connecting into any portion of the network 102, such as, Ethernet connections, wireless connections, ISDN connections, DSL connections, modem dial-up connections, cable modem connections, fiber optic connections, direct T1 or T3 connections, routers, portal computers, as well as any other network or communication connection. It is also noted that there are any number of possible configurations for the connections for network 102, according to the present invention. The client system 108 may be, for example, an individual personal computer located in someone's home and may be connected to the Internet through an Internet Service Provider (ISP). Client system 108 may also be a personal computer located on an employee's desk at a company that is connected to an intranet through a network router and then connected to the Internet through a second router or portal computer. Client system 108 may further be personal computers connected to a company's intranet, and the server systems 104 may also be connected to that same intranet. In short, a wide variety of network environments are contemplated by the present invention on which a large number of potential client systems are connected.

FIG. 1B is a block diagram for information flow 150 among customer systems 152, server systems 104 and client system 134, according to the present invention. The server systems 104, as discussed above, may include any number of different subsystems or components, as desired, including client system capabilities block 124 and incentives block 126. The server systems 104 send project and benchmark workloads 130 to client systems 134. A benchmark workload refers to a standard workload that may be used to determine the relative capabilities of the client systems 134. A project workload refers to a workload for a given project that is desired to be completed. The project workload may be, for example, a workload for projects such as network site content indexing, network site testing including network site load testing and network site quality of service testing, data back-up, drug design, drug interaction research, chemical reaction studies, bioinformatics including genetic and biological analyses, human genome analyses, pair-wise comparisons including fingerprint and DNA analyses, data mining, internet hosting services, intranet hosting services, auction services, market clearing services, payment systems, bioinformatic simulations, knowledge management services, trading services, data matching services, graphics rendering, or any other desired project.

Client systems 134, as discussed above, may be any number of different systems that are connected to the server systems 104 through a network 102, such as client systems 108, 110 ... 112 in FIG. 1A. The client systems 134 send results 132 back to the server systems 104 after the client

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systems 134 complete processing any given workload. Depending upon the workload project, the server systems 104 may then provide results 156 to customer systems 152. The customer systems 152 may be, for example, an entity that desires a given project to be undertaken, and if so, provides the project details and data 158 to the server systems 104.

FIG. 2A is a block diagram for an example client system 108 according to the present invention. In this simplified block diagram, an original workload 204 is received through line 208 from an interface 206. The original workload 204 represents a portion of the processing, storage or other activity required to complete the desired task for which the server system 104 is trying to accomplish. This original workload 204 is sent by the server system 104 through the network 102 and received by the client system 108 through communication link 118. The client system 108 processes the original workload 204. Following line 212, results 202 are then stored for transferring along line 210 to interface 206. Interface 206 may then communicate the results back to the server system 104 through communication line 118, or to other client systems (for example, with peering of client systems) and then through the network 102.

It is noted that the workload received by client system 108 and the processing or activity performed may depend up a variety of factors, as discussed further below. In part, this workload allocated by the server system 104 to each client system 108, 110 and 112 may depend upon the capabilities of the client system, such as the processing power, disk storage capacity, communications types, and other capabilities available from the various components of the systems within the client system 108.

The server systems 104 can select the workloads for the client system 108 and may control when these workloads are performed, through operational code (i.e., an agent) residing and installed on the client system 108. Alternatively, the owner or user of the client system 108 may determine when workloads are procured or obtained from the server systems 104, as well as when these workloads are performed, for example, by accessing the server systems 104 through the network 102. For example, the server systems 104 may download to the client system 108 upon request one or more workloads. At the same time, an agent residing on the client system 108 may operate to process the workload or multiple workloads downloaded to the client system 108. It is noted, therefore, that the agent may be simultaneously managing more than one workload for any number of projects. When the workload is complete, the agent may inform the owner or user of the client system 108 the results are ready to be communicated back. The client system 108 may then upload results to the server system 104 and download new workloads, if desired. Alternatively, these

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logistical and operational interactions may take place automatically through control of the agent and/or the server systems 104.

FIG. 2B is a block diagram for processing elements within a client system 108 according to the present invention. In this diagram, client system 108 is contemplated as a personal computer. In a personal computer, an internal bus 260 would typically have a variety of different devices connected to it. For example, a CPU 250 could be connected through the bus 260 to a video processor 252, a floating point processor 254 (often integrated within the CPU itself), and digital signal processors 256 (DSPs), such as those found on sound cards and modems. In addition, any of a variety of other processing devices 258 may be included. Furthermore, other types of devices may be connected, such as hard drives 264, which provide disk storage capabilities, and a digital camera 262.

It is noted, therefore, that the capabilities for client systems 108, 110 ... 112 may span the entire range of possible computing, processing, storage and other subsystems or devices that are connected to a system connected to the network 102. For example, these subsystems or devices may include: central processing units (CPUs), digital signal processors (DSPs), graphics processing engines (GPEs), hard drives (HDs), memory (MEM), audio subsystems (ASs), communications subsystems (CSs), removable media types (RMs), and other accessories with potentially useful unused capabilities (OAs). In short, for any given computer system connected to a network 102, there exists a variety of capabilities that may be utilized by that system to accomplish its direct tasks. At any given time, however, only a fraction of these capabilities are typically used on the client systems 108, 110 ... 112. The present invention can take advantage of these unused capabilities.

It is also noted that along with receiving the workload, the client system 108 will also receive an agent that manages the completion of the workload. This agent may be software that is customized for the particular computer system and processing capabilities of the client system 108. For example, if the client system is a personal computer as shown in FIG. 2B, the agent may be a program that operates in the background of the computer's operating system. When the agent determines that there is unused processing or other capabilities, the agent may take advantage of it. For example, if the user is using a word processing application to create a document, little processing power is being utilized by the word processing program, leaving the computer's CPU and video processor underutilized. Thus, the agent could execute commands to these processors during dead cycles. In this way, the agent may facilitate the completion of workload processing in a reduced time. In addition, this agent may be self-updating upon connecting to the server systems 104, so that the agent may be kept up to date with current software revisions and workload activities. It is also

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noted that the agent may manage work on multiple workloads at the same time, so that any given distributed device connected to the network 102 may be working on a plurality of workloads at any given time.

FIG. 2C is a block diagram for an example client system agent 270. The agent 270 may include a security subsystem 272 that controls the interface of the client system 108 with the agent 270. The security subsystem 272 may help keep the workloads secure and may help to keep the client systems 108 from suffering any security problems in completing the workload. For example, the agent 272 may operate to keep viruses from attacking the client system 108 while the client system 108 is processing the workload through the operation of the agent. The security subsystem 272, therefore, may provide the interface for the workloads 130 and the results 132.

The clients system agent 270 may also include a workload engine 274, a statistics / user interface / incentive advertising block 276, and a workload package and update processing block 278. In the example shown in FIG. 2C, workloads 130 pass through the security subsystem 272 and along line 280 to the workload package and update processing block 278. In this block 278, the agent 270 may be updated by the server systems 104. Alternatively, the agent 270 may determine, when connected to the server systems 104, whether it needs to be updated and then accomplish that updating automatically. Once the workload package is processed, the workload engine 274 may receive the workload following line 288. The workload engine 274 works on the workload, ultimately completing the workload. The results or status of the workload may then be sent through the security subsystem 272 following line 282. The results 132 may then be provided back to the server systems 104.

The statistics / user interface / incentive advertising block 276 may provide workload, incentive and other statistics, as well as any other desired interface features, to the user of the client system. For example, the block 276 may show a user the expected amount of processing time it will take for the client system to complete a workload task based upon the capabilities of the system. As also shown, the block 276 may receive information following lines 286 and 284 from the workload package and update processing block 278 and from the workload engine 274. If desired, security information from the security subsystem 272 could also be displayed to the user of the client system. It is noted that the information displayed to the user of the client system may be modified and selected as desired without departing from the present invention.

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With respect to incentive advertising, the block 276 may also show the user of the client system how this processing time might change depending upon various possible upgrades to the capabilities of the client system, such as a faster microprocessor, more memory, more disk storage space, etc. Furthermore, the client system capabilities may be shown correlated to the incentives provided to the client system for participation. Thus, the user may be provided information as to how the user's incentives would increase or change depending upon other computer systems or upgraded capabilities the user could acquire. This incentive value increase may also be tied to upgrades to particular vendor's devices. For example, if the user's device is a computer system having an ABC microprocessor, the block 276 may provide the user information as to increased incentive values based upon an upgrade to a more powerful ABC microprocessor. Similarly, if the user's device is a computer system obtained from ABC, the block 276 may provide the user information as to increased incentive values based upon an upgrade to a more powerful ABC computer system.

FIG. 2D is a an example user interface 276 for a client system agent, including incentive advertising, according to the present invention. In the example shown, interface 276 is a window 230 that may be displayed on a distributed device, for example, a computer system. This window 230 displays the desired information for the agent client manager. As indicated above, this agent client manager is initially downloaded from the server systems 104 and thereafter may be updated at various times when the client system is communicating with the server systems. The interface 276, as shown, includes interface tabs 221, 222, 224, 226, 228, 244, 246 and 248. These interface tabs may be selected through the user of a pointing device or keyboard attached, for example, to a computer system graphically displaying the window 230. It is noted that the interface tabs 221, 222, 224, 226, 228, 244, 246 and 248 are only examples, and the number, arrangement and content of tabs may be modified as desired. In addition, the example user interface 276 depicted in FIG. 2D is only an example and may be modified as desired.

In FIG. 2D, the processor values interface tab 224 is the one currently selected by the user. This tab 224 (Processor Values) includes example information that may be displayed to the user. Assuming that a workload is being processed by the agent client manager, the user may select the button 242 (Show My Incentive Values) to show the user's current incentive values associated with the workload being performed. The personal incentive values chart 232 (My Personal Incentive Values) may then be displayed to the user. As shown, the incentive values are provided in a relative scale from 1 to 10. The key designation 240 represents the incentives associated with the users current central processing unit (CPU) or microprocessor.

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As indicated above, this incentive information may also be tied to the specific vendor of the user's CPU, for example, ABC Company's CPU. Thus, as shown, the key designation 240 (My current processor) and the corresponding bar graph portion 236 represent incentives for the user's current CPU (e.g., a 166 MHz processor). The key designation 238 represents the incentives that the user is projected to have if the user were to upgrade the CPU. Again, this upgrade incentive information may be tied to the specific vendor of the user's CPU or to any other vendor, if desired. Thus, as shown, the key designation 238 (NEW ABC 1GHz processor!) and the corresponding bar graph portion 234 represent incentives for an upgrade to a new ABC CPU (e.g., a new ABC 1 GHz processor). In this manner, a user may be provided an incentive to increase the capabilities of the distributed device, and a vendor may be provided advertising so that the user is also directed to a particular upgrade.

Looking further to FIG. 2D, other similar incentive related information tabs may be provided for any desired capability of the distributed device. For example, tab 246 (Memory Values) represents information that may be provided for the memory capabilities of the distributed device. Tab 222 (Graphics Values) represents information that may be provided for the graphics capabilities of the distributed device. Tab 226 (Communications Values) represents information that may be provided for the communication capabilities of the distributed device. Tab 228 (Storage Values) represents information that may be provided for the storage capabilities of the distributed device. Tab 248 (System Values) represents information that may be provided for the system capabilities as a whole for the distributed device.

In addition to these incentive related information tabs, other tabs may be included to provide information and control for any desired features of the agent client manager. For example, the tab 244 (Current: Prime Search) represents information that may be displayed to the user about the current workload being performed by the agent client manager, for example, a search for large prime numbers. The tab 221 (Settings) represents information that may be displayed to the user about various settings for the client agent manager. In particular, the tab 221 may provide the user the ability to control any desired aspect of the operation of the agent client manager. For example, the user may be able to select a portion of the capabilities that may be utilized (e.g., a maximum of 20% of the system memory), the types of workloads that may be performed (e.g., only scientific research projects), the times when the agent may utilize system resources (e.g., only between 12 to 6 am, or only when the system is idle), or any other desired operational feature. It is noted that in addition to upgrade incentive information indicated above, the user may also be provided information as to how incentives would increase if the user allocated or changed the settings for the agent client manager.

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This user selection of operational features allows for workloads to be scheduled or balanced based upon user input and desires. These user vectors, as indicated above, would allow users to dedicate their device capabilities to specific research projects (cancer, Parkinson's disease, Internet, genetics, space science, etc.), to specific non-profit or for profit organizations (Greenpeace, Celera, etc.), educational institutions (University of Texas), a specific group of like minded users, or any other entity or endeavor. This affiliation selection allows the distributed processing system to automatically include a user's device capabilities in a pool dedicated to the chosen affiliation. Additionally, a user could choose to mix various percentages and allocations of device capabilities among multiple affiliations. It is noted that the user need not make any affiliation selection and need not allocate 100 percent of device capabilities. Rather, only a portion of the device capabilities may be allocated to a particular affiliation, leaving the remainder non-allocated and not affiliated. The capability allocation may also be a system-wide (i.e., course) allocation, such as some desired percent of overall device capabilities. The capabilities allocation may also be subsystem specific (i.e., fine) allocation, such as allocation of particular subsystem capabilities to particular affiliations.

Now looking to FIG. 3A, the server systems 104 may be one or more computer systems that operate to identify client system capabilities, organize workloads, and utilize client systems to accomplish a desired task. The server systems 104 includes a control system 304 a workload database 308, and a sweepstakes system 306, as discussed more below. The workload database 308 stores any desired project task, which may be broken up into discrete workload tasks WL1, WL2 ... WLN, as represented by elements 336, 338 ... 340. The workload database may also store one or more benchmark workloads (BWL) 335 that may be utilized to determine client system capabilities in response to a standard workload. Through line 312, the workload database 308 communicates with control system 304. Control system 304, for example, receives original workload 322 and transfers it to the interface 320 through line 326. The interface 320 then transfers the workload 322 to the network 102 through line 114. This workload 322 is ultimately received as workload 204 by client system 108, 110 or 112, as shown in FIG. 2A. The result 324 is ultimately received by the control system 304 through interface 320 and line 328.

In allocating workloads, the control system 304 may consider the capabilities of the client systems 108, 110 and 112 to which the control system 304 is sending workloads. For example, if client 108 has more processing power than client 110, the control system 304 may allocate and send more difficult or larger workloads. Thus, client 108 may receive WL1 336 and WL2 338, while client 110 would only receive WL3. Alternatively, the workload database 308 could be organized

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with differing levels of processing power or capability requirements for each workload. In this way, WL1 336 may represent a greater processing or system capability requirement than WL2 338. It should be noted that workload may be a processing task, a data storage task, or tied to any other of a variety of capabilities that may be utilized on the client systems 108, 110 ... 112.

As indicated above, to encourage owners or users of client systems to allow their system capabilities to be utilized by control system 304, an incentive system may be utilized. This incentive system may be designed as desired. Incentives may be provided to the user or owner of the clients systems when the client system is signed-up to participate in the distributed processing system, when the client system completes a workload for the distributed processing system, or any other time during the process. In addition, incentives may be based upon the capabilities of the client systems, based upon a benchmark workload that provides a standardized assessment of the capabilities of the client systems, or based upon any other desired criteria.

One example use of a benchmark workload is to use the benchmark workload to determine incentive values. For example, the server systems 104 may be designed to send out a standard benchmark workload once an hour to each client system 108, 110 ... 112. If a client system is not available at that time for any reason, the workload would not be completed by the client system, and there would be no incentive value generated for that client system. In this example, the benchmark workload may be a timed work-set that would exercise each subsystem with capabilities within the client system that was desired to be measured. A more capable client system would then generate greater incentive values from executing the benchmark workload, as compared to a less capable client system. These incentive values may be utilized as desired to determine what the client system should get in return for its efforts. For example, if the incentive were a sweepstakes as discussed further below, the number of entries in the sweepstakes may be tied to the system's performance of the benchmark workload. Thus, the faster or better the client system performs the benchmark workload, the more entries the client system would receive.

In the embodiment shown in FIG. 3A, the server systems 104 includes a sweepstakes system 306 that functions with control system 304 to provide incentives for the users or owners of client systems 108, 110 and 112 to allow their system capabilities to be used by the server systems 104. The control system 304 may determine a sweepstakes entry value 302 that is sent along line 310 to the sweepstakes system 306. The sweepstakes system 306 may then receive sweepstakes entry 332 and provide it to the sweepstakes engine 330 through line 334. The sweepstakes engine 330 may process the entries and determine a winner, when desired. In the embodiment shown, therefore,

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entries to the sweepstakes may be generated each time a unit of work is accomplished by one or more of the subsystems within a client system 108, 110 or 112 via an agent installed on the device for the purposes of managing and completing units of work. The total entries for any period of time would, therefore, be dynamic depending on how many are received. Odds of winning would then be determined by the total number of entries received and the total number of entries contributable to any given entrant.

FIG. 3B is another example block diagram of a distributed processing system 300 including server systems 104, customer systems 152, client systems 134 and out-sourced host systems 340, according to the present invention. The server systems 104 may include an analytic subsystem 346, a results/workload production subsystem 344, a project pre-processing subsystem 342, a client agent subsystem 343, and an incentive advertising subsystem 345. The incentive advertising subsystem 345 may operate to provide advertising information, for example, the upgrade incentive information as discussed with respect to FIG. 2D. The client agent subsystem 343 may operate to download an agent to the client systems 134 and to update this agent at times when the server systems 104 are communicating with the client systems 134.

The customer systems 152, which represent customers that have projects that they desired to be processed by the distributed processing system, may be connected to the project pre-processing subsystem 342 to provide projects to the server systems 104. These projects are processed by the project pre-processing subsystem 342 and passed to the results/workloads production subsystem 344, which produces and sends out workloads 130 and receives back results 132. The analytic subsystem 346 then takes the results and processes them as desired. Completed project information may then be provided from the analytic system 346 to the customer systems 152. In this manner, the projects of the customer systems 152 may be processed and project results reported by the distributed processing system of the present invention.

Also, as shown, the workloads 130 and the results 132, or other tasks of the server systems 104, may be processed and handled by out-sourced host systems 340, if desired. Thus, some or all of the workloads 130 may be sent first to out-sourced host systems 340. Out-sourced host systems 340 then send workloads 130A to the client systems 134 and receive back results 132A. The out-sourced host systems 340 then send the results 132 back to the server systems 104. It is noted that this out-sourcing of server system tasks may be implemented as desired for any given task that the server systems 104 may have. It is further noted that, if desired, the server systems 104 may perform all of

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the desired functions of the server systems 104 so that no out-sourced host systems 340 would be used.

FIG. 3C is a block diagram for one embodiment of a server system processor 350, according to the present invention. An agent abstraction layer 360 may send workloads 130 and receive results 132. The security subsystem 354 may interact with the agent abstraction layer 360 and provide information to a data parser 352 and an application programming interface (APIs) block 356. The APIs block 356, the data parser 352 and a workload manager 358 may interact to accomplish the desired tasks for the server system processor 350. It is noted that for this embodiment, the API protocol could be controlled and provided to other host systems.

FIG. 3D is an alternative block diagram for a server system processor 350, according to the present invention. In this embodiment, the APIs block 356 and the agent abstraction layer 360 are not present. The data parser 352, the workload manager 358 and the security subsystem 354 interact to provide the desired server system tasks. It is noted that for this embodiment, the security subsystem is controlled and utilized for communicating with client systems.

FIG. 4 is a functional block diagram for a sweepstakes operation 400 by the system server 104 according to the present invention. In block 402, the server systems 104 may sign-up client systems in "accept clients" block 402. Following line 418, the server systems 104 identifies the capabilities of the client's computer and processing systems in the "determine client system capabilities" block 404. Control passes along line 420 to the "distribute workloads to client systems" block 406, where the server systems 104 allocates workloads to each client system 108, 110 and 112. This workload may also be an benchmark workload, as indicated above, that acts as an entry workload to determine the entries or entry values for the client system. As also indicated above, in distributing the workloads in block 406, the server system 104 may take into consideration the capabilities of the client systems to which workloads are being distributed. The client systems 108, 110 and 112 then operate to complete the workloads allocated to them. Along line 423, the server system 104 receives back workload results in "receive workload results" block 408.

At this point, control passes along line 424 to the "determine sweepstakes entries" block 410. In this block 410, the server system 104 determines the entry value for the workload completed or for a standard benchmark or entry workload completed. This entry value may be weighted upon a variety of factors including factors such as the amount of work completed, the difficulty level of the processing required, and the accuracy of the results. It is noted that any desired weighting may be

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utilized. Thus, it is understood that a wide variety of considerations may be utilized to determine the entry value weighting for the sweepstakes.

Although the weighting determination is shown in block 410 in FIG. 4, the entry value may also be determined, in whole or in part, when a client system signs on to the distributed processing distributed system of the present invention. For example, if a client system has state-of-the-art CPU, video processor, DSP engine, memory, and large amounts of free disk storage space, a high entry value may be allocated to this client system up-front. In contrast, a client system that has a slow CPU, a weak video processor, no DSP engine, little memory, and little free disk storage space may be allocated a small entry value. In this way, the owners or users of the client systems may be provided immediate feedback as to the potential sweepstakes entry value of their computer systems, devices and system capabilities.

It is further noted that the entry value may take any desired form and may be, for example, a multiplier that will be used for each unit of workload completed. In this way, the owner or user will readily be cognizant that a state-of-the-art system will yield a high multiplier, where as an older system, system capability or device will yield a low multiplier. Such feedback, whether communicated to the owner or user immediately upon signing up or upon completion of each workload, will create an incentive for owners and/or users to acquire state-of-the-art systems, thereby further increasing the potential processing power of the distributed processing system of the present invention.

In addition, different workload projects may be designated with different entry values, as well. For example, some workload projects may require particular hardware or software processing systems within a client system or device. Thus, the number of client systems that are capable of performing the task would be limited. To further encourage participation by those owners or users with capable systems, the entry value for taking on particular workloads and/or systems with the desired features may be allocated higher entry values.

Referring back to FIG. 4, control passes along line 426 to the "process entries" block 412. In this block 412, the sweepstakes entries are processed and stored as desired. Following line 428, "end of entry period" decision block 414 represents a determination of whether the time for getting entries into the sweepstakes has ended. If not, the control continues to line 430 and back to blocks 402, 404 and/or 406, depending upon what is desired. Once the entry period has ended, control flows along

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line 432 to "determine winners" block 416. The server system 104 then identifies from among the entries, who the winning client system or systems will be.

The entry period may be any desired time frame and may include multiple overlapping time frames, as desired. For example, winners may be determined daily for entries each day, monthly for entries within a month, and/or yearly for entries within one year. In addition, special entry periods may be generated, if desired, for example where a particularly important workload project had a short time frame in which it needed to be completed.

FIGS. 1, 2A-C, 3A-D, and 4 are directed to example embodiments for a distributed processing system according to the present invention, including a sweepstakes reward or incentive feature, as shown in the embodiments of FIG. 3A and FIG. 4.

FIGS. 6A and 6B further describe a capabilities scheduling feature, in which the server systems 104 may identify and consider any of a variety of client system capability vectors in determining how to organize, allocate and manage workloads and projects. FIGS. 5A and 5B describe a distributed processing system and workload project that accomplishes network site indexing. FIGS. 7A and 7B describe a distributed processing system and a workload project that accomplishes network site testing, such as quality of service (QoS) testing and load testing. And FIG. 8 describes a distributed processing system, preferably with respect to a corporate intranet, that accomplishes distributed data back-up.

FIG. 9 is an alternative representation for the interconnection fabric for a distributed processing system environment and describes idle client system identification and shared component client systems. FIG. 10 describes a client system agent installed on a client system. FIGS. 11A and 11B further describe machine generated sweepstakes entries. FIGS. 12A and 12B describe client capability selection features. FIGS. 13A and 13B describe data conversion services. FIG. 14A describes a distributed processing system that provides data transmission caching. FIG. 14B describes a distributed processing system that provides data sharing and file distribution functions. And FIG. 15 describes an alternative representation for a distributed processing system, according to the present invention.

Looking now to FIG. 5A, block diagram is depicted of a distributed processing system 550 for a network site indexing application, according to the present invention. As stated above with respect to FIG. 1A, the network 102 may be a wide variety of networks. For this network site

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indexing application, the network 102 may preferably be the Internet having a multitude of network sites 552 ... 554. Each network site 552 ... 554 may have a variety of different content types that may be indexed, ranging from complex sites to relatively simple sites. For example, network site 552 includes text 570A, images 570B, audio streams 570C, video streams 570D, files 570E and other content 570F. Network site 554 is less complex and includes text 572A, images 572B, and other content 572C. Both network sites 552 and 554 are connected to the network 102 through communication lines 558 and 556, respectively.

As discussed above, the server systems 104 manage workloads for the client systems 108, 110 ... 112. The client systems 108, 110 ... 112 process these workloads and produce indexing results. The resulting index may be stored at a centrally managed site, such as central index storage block 560, or may itself be distributed over the possibly millions of indexing clients 108, 110 ... 112, as shown by remote index storage blocks 562, 564 ... 566. If remote index storage is utilized, a master database content index may be stored locally, for example, in the central index storage block 560. This content index may then direct relevant searches to the distributed massively parallel engine for search queries.

Referring now to FIG. 5B, a functional block diagram is shown for a network site indexing operation 500 according to the present invention. As described in FIG. 1A with respect to other systems 106, there may be any number of computer and processing systems connected to the network 102. Any one of these others systems 106 may publish information on the network 102 for access by any other system connected to the network 102. This information to be indexed may take a wide variety of forms, including, for example, text, images, audio streams, video streams, databases, spreadsheets, PDF files, Shockwave data, Flash data, applications, data files, chat streams, or any other information, data or data streams that may be accessible on a network site. The distributed processing system of the present invention may have as a workload the task of indexing this potentially massive amount of information.

For example, where the network 102 is the Internet or a large intranet, a large amount of processing power and time is needed to create an accurate, complete and up-to-date index of the information. The Internet uses an IP (Internet Protocol) address protocol to direct traffic around the Internet. The IP address is the address of a computer attached to a TCP/IP (Transmission Control Protocol/Internet Protocol) network. Every system on the network must have a unique IP address. IP addresses are typically written as four sets of numbers separated by periods. The TCP/IP packet uses 32 bits to contain the IP address, which is made up of a network and host address (NETID and

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HOSTID). The more bits used for network address, the fewer remain for hosts. Web pages within a particular web site with a unique address may be addressed through URLs (Uniform Resource Locator) associated with that web site. In short, there is a limited, but very large, number of possible IP addresses for uniquely identifiable Internet sites that may be accessed and analyzed to generate an index of Internet sites and web pages via URLs.

The operation diagram of FIG. 5B starts with the "clients receive indexing workloads" block 502. In this block, the system server 104 provides the clients systems 108, 110 ... 112 with a workload task to index a portion of the information accessible on the network 102. For example, with the Internet, each workload may be single IP address or groups of URLs or, in some cases, large data types contained on single sites or pages. Following line 514, the "clients interact with other systems" block 504 represents the operation of the agent installed on the client systems 108, 110 ... 112 to access the network sites, according to the assigned workload, and index the information accessible on that site. This indexing may include all types of information accessible on that site, including text, audio, image, video, etc.

Next, following lines 516 and 518, the client systems 108, 110 and 112 complete the workload tasks, get the results ready for transmission, and sends those results back to the system server 104 in "clients complete workload" block 506 and "indexing results sent to server system" block 508. Control passes along line 520 to "index compiled for use" block 510 where the server system formats and/or compiles the results for use. For example, the index results may be utilized for accurate, complete and up-to-date search information for the network 102. As indicated with respect to FIG. 5A, the resulting index may be stored remotely or locally following line 522. Thus, element 524 represents remote storage of the index, and element 526 represents central storage of the index. It is noted that the index may also be stored with a mixture of central and remote storage, as desired. In addition, as indicated above, a directory or summary index for the resulting index may be generated and stored centrally, if desired. It is further noted that the summary index may be stored in any other desired fashion, for example, it may be distributed and stored on a number of client systems.

FIG. 6A is a block diagram for a server system 104 according to the present invention, including a control system 304, a workload database 308, and a database of capability vectors 620. The workload database 308 includes a variety of sets of workload projects WL1, WL2 ... WLN. For each workload project, there may be multiple workload units. For example, workload project WL1 includes workload units WL11, WL12 ... WL1N, as represented by elements 640, 642 ... 644,

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respectively. Similarly, workload project WL2 includes workload units WL21, WL22 ... WL2N, as represented by elements 646, 648 ... 650, respectively workload project WLN includes workload units WLN1, WLN2 ... WLNN, as represented by elements 652, 654 ... 656, respectively.

It may be expected that different workload projects WL1, WL2 ... WLN within the workload database 308 may require widely varying processing requirements. Thus, in order to better direct resources to workload projects, the server system may access various system vectors when a client system signs up to provide processing time and other system or device capabilities to the server system. This capability scheduling helps facilitate project operation and completion. In this respect, the capability vector database 620 keeps track of any desired feature of client systems or devices in capability vectors CBV1, CBV2 ... CBVN, represented by elements 628, 630 ... 632, respectively. These capability vectors may then be utilized by the control system 304 through line 626 to capability balance workloads.

This capability scheduling according to the present invention, therefore, allows for the efficient management of the distributed processing system of the present invention. This capability scheduling and distribution will help maximize throughput, deliver timely responses for sensitive workloads, calculate redundancy factors when necessary, and in general, help optimize the distributed processing computing system of the present invention. The following TABLE 1 provides lists of capability vectors or factors that may be utilized. It is noted that this list is an example list, and any number of vectors or factors may be identified and utilized, as desired.

TABLE 1 -- Example Client Capability Vectors or Factors

1. BIOS Support:	a. BIOS Type (brand)
b. ACPI	c. S1, S2, S3, and S4 sleep/wake states
d. D1, D2 and D3 ACPI device states	e. Remote Wake Up Via Modem
f. Remote Wake Up Via Network	g. CPU Clock control
h. Thermal Management control	i. Docked/Undocked state control
j. APM 1.2 support	k. Hotkey support
l. Resume on Alarm, Modem Ring and LAN	m. Password Protected Resume from Suspend
n. Full-On power mode	o. APM / Hardware Doze mode
p. Stand-by mode	q. Suspend to DRAM mode
r. Video Logic Power Down	s. HDD, FDD and FDC Power Down

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t. Sound Chip Power Down	u. Super I/O Chip Power Down
2. CPU Support:	a. CPU Type (brand)
b. MMX instruction set	c. SIMD instruction set
d. WNI instruction set	e. 3DNow instruction set
f. Other processor dependent instruction set(s)	g. Raw integer performance
h. Raw FPU performance	i. CPU L1 data cache size
j. CPU L1 instruction cache size	k. CPU L2 cache size
l. CPU speed (MHz/GHz...)	m. System bus (MHz/GHz...) speed supported
n. Processor Serial Number	o. CPUID
3. Graphic Support	a. Graphics type (brand)
b. # of graphics engines	c. Memory capacity
d. OpenGL support	e. Direct3D/DirectX support
f. Color depth supported	g. MPEG 1/II decode assist
h. MPEG1/II encode assist	i. OS support
j. Rendering type(s) supported	k. Single-Pass Multitexturing support
l. True Color Rendering	m. Triangle Setup Engine
n. Texture Cache	o. Bilinear/Trilinear Filtering
p. Anti-aliasing support	q. Texture Compositing
r. Texture Decompression	s. Perspectively Correct Texture Mapping
t. Mip-Mapping	u. Z-buffering and Double-buffering support
v. Bump mapping	w. Fog effects
x. Texture lighting	y. Video texture support
z. Reflection support	aa. Shadows support
4. Storage Support	a. Storage Type (brand)
b. Storage Type (fixed, removable, etc.)	c. Total storage capacity
d. Free space	e. Throughput speed

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f. Seek time	g. User dedicated space for current workload
h. SMART capable	
5. System	a. System Type (brand)
b. System form factor (desktop, portable, workstation, server, etc.)	
6. Communications Support	a. Type of Connection (brand of ISP)
b. Type of Connection Device (brand of hardware)	c. Hardware device capabilities
d. Speed of connection	e. Latency of connection
f. Round trip packet time of connection	g. Number of hops on connection type
h. Automatic connection support (yes/no)	i. Dial-up only (yes/no)
j. Broadband type (brand)	k. Broadband connection type (DSL/Sat./Cable/T1/Intranet/etc.)
7. Memory	a. Type of memory error correction (none, ECC, etc.)
b. Type of memory supported (EDO, SDRAM, RDRAM, etc.)	c. Amount of total memory
d. Amount of free memory	e. Current virtual memory size
f. Total available virtual memory size	
8. Operating System	a. Type of operating system (brand)
b. Version of operating system	c. Health of operating system
9. System application software	a. Type of software loaded and/or operating on system
b. Version of software	c. Software features enabled/disabled
d. Health of software operation	

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FIG. 6B is a functional block diagram for capabilities determination and scheduling operation 600 for workloads in a distributed processing system according to the present invention. Initially, various vectors are identified for which capability information is desired in the "identify client system capability vectors" block 602. Following line 612, the server systems 104 then capability balances workloads among client systems 108, 110 and 112 based upon the capability vectors in the "capability scheduling workloads based on vectors" block 604. Then the capabilities scheduled workloads are sent to the client systems for processing in the "send capability scheduled workloads" block 606.

This capability scheduling and management based upon system related vectors allows for efficient use of resources. For example, utilizing the operating system or software vectors, workloads may be scheduled or managed so that desired hardware and software configurations are utilized. This scheduling based upon software vectors may be helpful because different software versions often have different capabilities. For example, various additional features and services are included in MICROSOFT WINDOWS '98 as compared with MICROSOFT WINDOWS '95. Any one of these additional functions or services may be desired for a particular workload that is to be hosted on a particular client system device. Software and operating system vectors also allow for customers to select a wide variety of software configurations on which the customers may desire a particular workload to be run. These varied software configurations may be helpful, for example, where software testing is desired. Thus, the distributed processing system of the present invention may be utilized to test new software, data files, Java programs or other software on a wide variety of hardware platforms, software platforms and software versions. For example, a Java program may be tested on a wide proliferation of JREs (Java Runtime Engines) associated with a wide variety of operating systems and machine types, such as personal computers, handheld devices, etc.

From the customer system perspective, the capability management and the capability database, as well as information concerning users of the distributed devices, provide a vehicle through which a customer may select particular hardware, software, user or other configurations, in which the customer is interested. In other words, utilizing the massively parallel distributed processing system of the present invention, a wide variety of selectable distributed device attributes, including information concerning users of the distributed devices, may be provided to a customer with respect to any project, advertising, or other information or activity a customer may have to be processed or distributed.

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For example, a customer may desire to advertise certain goods or services to distributed devices that have certain attributes, such as particular device capabilities or particular characteristics for users of those distributed devices. Based upon selected attributes, a set of distributed devices may be identified for receipt of advertising messages. These messages may be displayed to a user of the distributed device through a browser, the client agent, or any other software that is executing either directly or remotely on the distributed device. Thus, a customer may target particular machine specific device or user attributes for particular advertising messages. For example, users with particular demographic information may be targeted for particular advertisements. As another example, the client agent running on client systems that are personal computers may determine systems that are suffering from numerous page faults (i.e., through tracking operating system health features such as the number of page faults). High numbers of page faults are an indication of low memory. Thus, memory manufacturers could target such systems for memory upgrade banners or advertisements.

Still further, if a customer desires to run a workload on specific device types, specific hardware platforms, specific operating systems, etc., the customer may then select these features and thereby select a subset of the distributed client systems on which to send a project workload. Such a project would be, for example, if a customer wanted to run a first set of simulations on personal computers with AMD ATHLON microprocessors and a second set of simulations on personal computers with INTEL PENTIUM III microprocessors. Alternatively, if a customer is not interested in particular configurations for the project, the customer may simply request any random number of distributed devices to process its project workloads.

Customer pricing levels for distributed processing may then be tied, if desired, to the level of specificity desired by a particular customer. For example, a customer may contract for a block of 10,000 random distributed devices for a base amount. The customer may later decide for an additional or different price to utilize one or more capability vectors in selecting a number of devices for processing its project. Further, a customer may request that a number of distributed devices be dedicated solely to processing its project workloads. In short, once device attributes, including device capabilities and user information, are identified, according to the present invention, any number of customer offerings may be made based upon the device attributes for the connected distributed devices. It is noted that to facilitate use of the device capabilities and user information, capability vectors and user information may be stored and organized in a database, as discussed above.

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Referring now to FIG. 12A, a block diagram depicts a distributed processing system 1200 that allows customers to select client system attributes, such as device capabilities and user characteristics, according to the present invention. In this embodiment, the network 102 is depicted as the Internet to which server systems 104, customer 152A, customer 152B, and client systems 1202A, 1202B ... 1202C are connected. These systems are connected through communication links 114, 119A, 119B, 1204A, 1204B ... 1204C, respectively. As noted above, these communication links may include any of a wide variety of devices and/or communication techniques for allowing a system to interface with other connected systems.

As shown in FIG. 12A, and as discussed above, the customers 152A and 152B may desire to send information or projects, such as advertisements (ADV) 1206A and 1206B and/or projects (PROJ) 1208A and 1208B, to groups of client systems that have particular or selected capabilities. The number of different groups of client systems is as varied as the capability and user data available for those client systems. The client systems 1202A represent client systems that include a first set (Set 1) of desired attributes. The client systems 1202B represent client systems that include a second set (Set 2) of desired attributes. And the client systems 1202C represent client systems that include a Nth set (Set N) of desired attributes. Once attributes are selected, the client systems with those attributes may be accessed as desired by customers 152A and 152B. For example, customer 152A may send its advertisement to client systems 1202B. Customer 152B may send its advertisement to client systems 1202A. The project 1208A from customer 152A may be processed by client systems 1202C. And the project 1208B from customer 152B may be processed by client systems 1202B. It is noted, therefore, that any combination of desired attributes, such as device capabilities and user characteristics, may be identified and utilized to satisfy customer objectives, whether those objectives be advertising, project processing, or some other desired objective.

FIG. 12B is a block flow diagram for client system attribute selection, according to the present invention. In the embodiment shown, process 1250 begins with the customer selecting desired attributes in block 1252. Next, client systems with selected attributes are accessed in block 1254. And, then in block 1256, the customer objective, such as advertising or project, is processed by the client system. Control of this process 1250 may be provided by the server systems 104, if desired, such that the customer interfaces with the server systems 104 to select device attributes and then the servers systems 104 access the client systems. Alternatively, the server systems 104 may simply provide the customer with a list of contact information (e.g., IP addresses) for the client systems, so that the customer may directly access the client system, for example, in providing advertisements to the users of the client systems. It is further noted that other control techniques may

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also be used to identify and access client systems with particular desired device capabilities, user characteristics, or other device attributes, according to the client system attribute selection method of the present invention.

FIG. 7A is a block diagram for a distributed processing system 100 according to the present invention, including example network sites 106A and 106B on which site testing is to be conducted, such as load testing and/or quality-of-service (QoS) testing. FIG. 7A is similar to FIG. 1A except that other systems 106 in FIG. 1A has been represented in the embodiment of FIG. 7A with network sites 106A and 106B. Communication line 116A between the network 102 and the network site 106A represents a interaction by one client system 108, 110 and 112. Communication lines 116B, 116C and 116D represent interactions by more than one client system 108, 110 and 112.

Site testing is typically desired to determine how a site or connected service performs under any desired set of test circumstances. With the distributed processing system of the present invention, site performance testing may be conducted using any number of real client systems 108, 110 and 112, rather than simulated activity that is currently available. Several tests that are commonly desired are site load tests and quality of service (QoS) tests. Quality of service (QoS) testing refers to testing a user's experience accessing a network site under normal usability situations. Load testing refers to testing what a particular network site's infrastructure can handle in user interactions. An extreme version of load testing is a denial-of-service attack, where a system or group of systems intentionally attempt to overload and shut-down a network site. Advantageously, the current invention will have actual systems testing network web sites, as opposed to simulated tests for which others in the industry are capable.

Network site 106B and the multiple interactions represented by communication lines 116B, 116C and 116D are intended to represent a load testing environment. Network site 106A and the single interaction 116A is indicative of a user interaction or QoS testing environment. It is noted that load testing, QoS testing and any other site testing may be conducted with any number of interactions from client systems desired, and the timing of those interactions may be manipulated and controlled to achieve any desired testing parameters. It is further noted that periodically new load and breakdown statistics will be provided for capacity planning.

FIG. 7B is a functional block diagram for a site-testing operation 700 according to the present invention. Initially, client systems 108, 110 and 112 receive workloads that identify testing procedures and parameters in the "clients receive testing workload" block 702. Following line 714,

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the client systems 108, 110 and 112 access the site being tested and perform the testing in block "clients interact with other systems" block 704. Next, following lines 716 and 718, the client systems 108, 110 and 112 complete the site testing workload tasks, get the results ready for transmission, and send those results back to the system server 104 in "clients complete testing workload" block 706 and "site testing results sent to server system" block 708. Control passes along line 720 to "site testing results compiled for use" block 710 where the server system formats and/or compiles the results for use by the network site. For example, the site testing results may be utilized determining modifications that need to be made to the network site to handle peak volume activities.

FIG. 8 is a block diagram for a distributed processing system 800 for a data back-up system application, according to the present invention. As stated above with respect to FIG. 1A, the network 102 may be a wide variety of networks, including an intranet network. Intranet networks, such as internal networks set up by corporations, are particularly suited for this application because the systems holding the data being backed-up would be owned by the same entity owning other systems with excess data storage capabilities. In this way, security would not be as great of an issue and the client system types could be better controlled. It is noted, however, that this data back-up application would be equally applicable to other networks, such as for computer systems connected through the Internet.

Referring back to FIG. 8, client systems 108, 110 ... 112 are shown each having a back-up data blocks 804, 806 ... 808. Customer systems 152 is shown as having data 802, which is desired to be backed-up with the distributed back-up system 800. The server systems 104 manage the flow of data from the data 802 and the client systems that have extra storage space represented by back-up data blocks 804, 806 ... 808. In operation, the server systems 104 identifies client system storage capabilities. With this information, the server systems 104 can receive data for back-up from any system on the network 102. It is noted, and as indicated with respect to FIG. 1A, the client systems 108, 110 ... 112 and the customer systems 152 may communicate directly with each other in peer-to-peer type communications.

The server systems 104 may also manage the storage and transfer of data so that the data will be readily retrievable once backed-up and stored on the client systems 108, 110 ... 112. If desired, an summary index or directory of the backed-up data may be stored centrally on the server systems 104, or may be stored remotely on the client systems 108, 110 ... 112. It is also noted that the server systems 104 may also distribute data back-up workloads so that each portion of the data 802 is stored

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redundantly on at least two of the client systems 108, 110 ... 112. This redundancy provides added security should any one or more client systems suddenly cease to be operational.

Looking now to FIG. 9, a block diagram is depicted of an alternative representation of an interconnection fabric for a distributed processing system environment 100, according to the present invention. In this diagram and as described above, the network environment may be the Internet, an internal company intranet, a local area network (LAN), a wide area network (WAN), a wireless network, a home network, or any other system that connects together multiple systems and devices. In addition, the server systems and clients systems may be interconnected by a variety of possible connection interfaces, for example, Ethernet connections, wireless connections, ISDN connections, DSL connections, modem dial-up connections, cable modem connections, direct T1 or T3 connections, fiber optic connections, routers, portal computers, as well as any other network or communication connection. It is noted, therefore, as discussed with respect to other embodiments such as the embodiment of FIG. 1A, that systems may be coupled into an interconnected fabric in any of a variety of ways and communications can potentially occur directly or indirectly between any of the systems coupled into the fabric, as would be understood by those of skill in the art.

Within this environment, as depicted in FIG. 9, server systems 104 are interconnected with any number of client systems, for example, client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G, 108H, 108I, 108J, 108K and 108L. In addition, these client systems may also include idle client systems 902A, 902 B, and 902C, as discussed further below. Furthermore, these client systems may include client system 904A with a component A, client system 904B with a component B, and client system 904C with a component C. It is also noted that the interconnection fabric may include any number of devices that are not client systems, in that they themselves are not providing components or processing capabilities for the distributed processing system of the present invention. Nevertheless, these devices may be considered part of the system because they may relay, interpret, process or otherwise transmit or receive information from or to client systems that are part of the distributed processing system.

Aggregation of component level resources, according to the present invention, will now be discussed. As described above, the capabilities of client systems are determined for purposes of allocating, scheduling and managing distributed processing workloads. In other words, each of the client systems may be made up of many individual subsystems with various capabilities. In some cases, it may occur that particular components on different machines may provide added value if combined or aggregated. Thus, utilizing subsystem or component level resources from a heterogeneous group of

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devices may be the most efficient or otherwise advantageous way of taking advantage of these resources to complete various desired tasks.

Referring now more particularly to FIG. 9, the client systems 904A, 904B and 904C may have component A, component B and component C, respectively, that are better utilized in combination. For example, client system 904A may have a fast processor, a high-speed network connection, but little available storage space. Client system 904B may have large amounts of available free storage space but little processing power. Client system 904C may also have a fast processor, but relatively little available storage space. In this example, a workload that requires both a large storage capacity and a fast processor may be efficiently completed by dedicating component level resources to various parts of the workload from different machines. Thus, the workload may be managed by having client systems 904A and 904C processing data stored on and transmitted from client system 904B. Once clients systems 904A and 904C process data, this resulting data may then be transmitted back to client system 904B for aggregation and eventual transmission back to the server systems 104. The client system 904B, therefore, essentially acts as a server for a workload subset, sending out portions of a subset workload, receiving back the processed data, and aggregating the data to build a completed workload subset.

It is noted that any number of different components from different client systems may be aggregated, as desired. For example, for wireless devices, DSP processing and storage components could be aggregated with components from other client systems. For display devices, graphics rendering power could be aggregated. For relatively dumb machines, such as connected household appliances, vending machines, etc., slow-speed processing components could be aggregated. In short, an appropriate workload may include instructions to numerous client systems that will enable collaboration and aggregation of component level resources. Such instructions may include things, such as, where to receive input, where to send output, and ultimately which client systems return final results.

It is further noted that the control instructions may be de-centralized as well. In other words, as indicated above, client systems may communicate directly with each other, for example, in a peer-to-peer fashion. In this way, workload communications may occur directly between client systems, and workload control and management may occur through the client system agents located on client systems.

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Still referring to FIG. 9, idle system determination will now be discussed. As stated above, client system capabilities are determined and utilized within the distributed processing system of the present invention. The more idle any particular client system, the more processing it is arguably able to accomplish, and the more incentives it is likely to receive. In other words, the client system capabilities may be utilized more often and more intensely if the client system is more idle. As such, it is advantageous to identify idle client systems and allocate them to more processor and time sensitive tasks. By identifying these idle client systems, resources available on the network at any given time may be more fully utilized, and otherwise idle resources may be utilized for highly intensive, real-time activities that would otherwise require dedicated devices. Examples of such real-time activities include data caching, indexing, etc. In FIG. 9, idle client systems are designated as 902A, 902B and 902C.

Identifying idle resources may be determined in any of a variety of ways. It is possible, for example, to simply look at whether a machine is not being used or has low processor utilization at any given time. This simple determination, however, may not yield an accurate picture of how idle a client system may or may not be over a given time period. More particularly, discovery methods may be implemented to identify the activity of a variety of client system components and subsystems. For example, subsystems may be monitored, such as network activity, device output activity, user input, processing activity, executing task monitoring, or mode of operation parameters (e.g., mobile or power management modes, stationary or powered mode). In addition, any number of other device vectors may be monitored or analyzed to determine the true usage and idleness of a client system.

The following TABLE 2 provides a list of idleness vectors or factors that may be utilized in determining the level of device usage or idleness. In particular, TABLE 2 provides two primary categories of activities to monitor or analyze for determination of how idle a client system may or may not be. These activities are user activity and device activity. By monitoring, analyzing and tracking these client system elements and activities over time, a better determination of device usage and idleness may be made. It is noted that the list provided in TABLE 2 is an example list, and any number of categories, vectors or factors may be identified and utilized, as desired, according to the present invention.

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TABLE 2 -- Example Client Idleness Vectors or Factors

1. User Activity (e.g., monitor input activities, monitor output activities, monitor time elapsed since last input event and between input events, etc.)	a. keyboard input
b. mouse input	c. microphone/voice input
d. tablet input	e. pen input
f. touch screen input	g. joystick input
h. gamepad input	i. video output
j. printer output	k. any other user activity that could be utilized to classify if a device is idle
2. Device Activity (e.g., monitor utilization levels, monitor time elapsed since last device activity, monitor time between changes in device utilization levels, etc.)	a. power state (e.g., time since last power state change event)
b. mobility state (e.g., time since device last in mobile state)	c. screen saver activity or trigger (e.g., time elapsed since screensaver activity or trigger)
d. screen output (e.g., time elapsed since last screen output, paint event or pixel change)	e. network or communication packets sent or received (e.g., time elapsed since last network or communications activity)
f. storage device activity (e.g., time elapsed since last storage device activity, such as hard drives, flash memory cards, removable drives, CD drives, DVD drives, etc.)	g. processor, DSP, microcontroller, embedded device, or other processor activity (e.g., time elapsed since last processor activity)
h. processor, DSP, microcontroller, embedded device, or other processing device utilization (e.g., change in utilization levels)	i. tasks or processes executing (e.g., time elapsed since change in number of tasks or processes executing)
j. task or process device utilization (e.g., time since change in task or process device utilization)	k. any other device activity that could be used to classify if a device is idle

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As a further example of the usefulness of this determination, reference is made back to FIG. 9. Server systems 104 may have, for example, a large, intensive task that it would like to place on these idle devices. After using a number of the vectors in TABLE 2 to determine the utilization level for client systems, the server systems 104 determines that client systems 902A, 902B and 902C are idle and capable of handling significant time sensitive processing tasks. For example, idle client systems 902A, 902B and 902C may be personal computers that can act as a local internet cache for other connected devices, such as some of the other client systems depicted in FIG. 9, that are interested in a data type that benefits from a local network cache. Thus, data or content may be transmitted from a remote network site to the idle machines 902A, 902B and 902C. These idle devices 902A, 902B and 902C may then re-transmit this same data or content to other connected devices also interested in the data or content.

One example for such network caching is Internet video or multimedia broadcast events that are desired to be viewed or received by a very large number of geographically close connected devices at about the same time. In order to meet the demand of these connected devices, web sites broadcasting an event have to be able to handle a huge increase in network traffic over a short period of time. By locally caching the transmission to idle client systems, a web site can reduce the direct demand on its own resources. This is so because other connected devices may receive a re-transmitted broadcast, although delayed, from the idle client system. It is noted that according to the present invention idle client systems 902A, 902B and 902C may work independently or in combination. Even though idle client systems are suited for providing the caching function, it is also noted that that network caching may be accomplished using one or more client systems regardless of their respective levels of idleness.

FIG. 10 is a more detailed block diagram for a client system agent 270 installed on a client system, according to the present invention. This diagram includes a security subsystem 1010, a capabilities subsystem 1006, a workload processor 1004, a user interface 1002, and a project management and agent control subsystem 1008. The various components and subsystems may communicate with each other, for example, through lines 1012, 1014, 1016, 1018 and 1020. Externally, the client system agent 270 may communicate through its security subsystem 1010 with the other components within the client system and ultimately to other devices connected into the network fabric. It is noted that configuration of the client system agent and its operation, both internal and external, may be selected and designed, as desired.

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As depicted, the capabilities subsystem 1006 includes an idle system monitor 1022, as described above, that monitors and analyzes user and device activities associated with the client system to determine the level of activity or idleness for the client system. The information determined by this idle system monitor 1022 may then be communicated externally, for example, through the security subsystem 1010 to the server systems 104. The server systems 104 may then store and analyze system idleness data from across the distributed processing system. This idleness data may become part of the capabilities database that is utilized to allocate and manage workloads and processing system resources.

Still referring to FIG. 10, the workload processor 1004 includes a machine entry generation subsystem 1024. As described above, the workload processor 1004 may send completed workloads back to server systems 104 to generate sweepstakes entries for the host client system. In this way, when the incentive is a sweepstakes, the client system may generate entries by completing workloads. The machine entry generation subsystem 1024 refers to this entry generation through workload completion. As discussed above, the workload processed to generate entries may be a project workload, an entry workload, or any other workload, as desired.

FIGS. 11A and 11B provide more detailed flow diagrams of process embodiments for machine generated sweepstakes entries through processing of entry workloads, according to the present invention.

Looking first to FIG. 11A, an entry workload process flow 1100 is depicted that provides machine generated sweepstakes entries. Process moves from start block 1102 to block 1104 in which entry workloads are loaded on client systems. Next, process flows to block 1106 which represents a periodic timer or other timing control for entry workload processing. After this timing control, the client system executes or processes the entry workload in block 1108. In block 1110, a sweepstakes entry is thereby generated and returned to the server system 104 based upon the completion of this entry workload. Process control then may proceed back to the periodic timing block 1106, where timing control determines when the entry workload is next processed. The completed workload represents the machine generated sweepstakes entry.

FIG. 11B is an alternative entry workload process flow 1150. The process flow 1150 is similar to the process flow 1100 except that the entry workload is sent to the client system each time it is to be run. Process starts in block 1102 and passes to the periodic timer block 1106, in which the process is controlled. For example, server systems 104 may determine when it is desirable for the

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client systems to receive and process an entry workload. In block 1104, the entry workload is sent to the client systems. As with FIG. 11A, the client systems then execute the entry workload in block 1108, and an entry is generated and returned to the remote server systems 104 in block 1110. The process then proceeds back to the periodic timer 1106 until it is determined that another entry workload should be processed. The primary difference between process 1150 and process 1100 is that process 1150 is depicting an entry workload that is transmitted to the client system each time it is to be run.

One example utilizing the process 1150 or the process 1100 is for server systems 104 to query the client systems for entry workload processing at regular time intervals. If a distributed device returns a completed entry workload back within a selected period of time from the distribution of the entry workload, the server system may conclude that the distributed device should receive an entry because the distributed device is providing resources to the distributed processing system. In this way, the server systems 104 may determine at regular intervals whether a given client system is working on project workloads for the distributed processing system. Alternatively, the client system agent may locally control the workload processing and may, for example, cause the client system to process and generate entries at regular time intervals. It is noted that non-regular and varying time intervals may also be utilized and that combinations of remote and local control may also be utilized, as desired.

The timing of when a client system processes the entry workload, therefore, may be determined locally by the client system agent or remotely, for example, through commands sent by the server systems 104. In addition, periodic timing control may also be accomplished through various combinations of control routines residing locally and remotely. It is further noted that any number of different variations may be utilized to provide machine generated entries to a sweepstakes, according to the present invention. Thus, a client system may generate sweepstakes entries in any of a variety of ways and still have machine generated sweepstakes entries, according to the present invention.

FIGS. 13A and 13B describe a data conversion application 1300 for a massively parallel distributed network according the present invention. In particular, FIG. 13A is a block diagram of a distributed processing system that provides data conversion services, according to the present invention. And FIG. 13B is a block flow diagram for data conversion services within a distributed processing system, according to the present invention.

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Converting file types, web pages, graphics images, etc., between device types can be a highly intensive processing task. Example devices that often need converted data are wireless devices, such as pagers and cell phones, that request Internet web page information from their respective device servers. The device server, instead of incurring the overhead of reformatting the requested data for the wireless devices, may instead distribute the requested page or data address, the device type information of the requesting device, and return address for the reformatted data. According to the present invention, the data conversion, translation or processing may be performed by a client system of the distributed processing system of the present invention. The resulting data may then be returned or provided to the original requesting device. In addition to data formatting for cell phones, language conversion, text translation and media translation services, or any other desired data conversion can also be hosted for a customer through the distributed processing system of the present invention.

It is noted that the data conversion operation contemplated by the present invention is not limited to any particular requesting device, any particular service provider, any particular type of data to be processed, any particular type of resulting processed data, or any particular data source. Thus, the data processed may include voice, text, application, image, source code, or any other data type or combination of data types, and the resulting processed data may also include voice, text, application, image, or any other data type or combination of data types. According to the present invention, the distributed processing system is utilized to process any data that is desired by a requesting device and that must be converted or processed before being provided to the requesting device. For example, end-user devices connected to the Internet, such as personal computers, may sign up for data conversion services through the server system so that the end-user device may request data conversion of any desired data, file, web site content, etc. Language translations and data formatting for connected wireless are just two examples of such applications for the present invention.

Looking now to the embodiment of FIG. 13A, the network 102 is depicted as the Internet, and the requesting device is one or more wireless devices 1306 connected to the Internet 102 through communication links 1308 and to the wireless device server systems 1304 through communication link 1309. The data to be converted, translated or otherwise processed is represented by block 1302 and may be, for example, content from an Internet web site that is connected to the Internet through communication link 1312. Also, as shown in FIG. 13A, a massively parallel distributed network (MPDN) server 104 is connected to the Internet 102 through communication link 114. The wireless device server systems 1304, or any other connected system that desires to off-load data conversion processing requirements (e.g., web site content servers), are connected to the Internet 102 through

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communication links 1310 and to the MPDN server 104 through communication links 1311. Any number of client systems 108, 110 ... 112 may also be connected to the Internet 102, through communications links 118, 120 ... 122, respectively. As also stated above, any of the connected devices may communicate with each other in any of a wide variety of communication techniques (e.g., wireless, electrical, digital, analog, light-based, etc.) and protocols (e.g., static or dynamic IP addresses), and through any number of other devices, as would be understood by one of skill in the art.

In the application contemplated by FIG. 13A, the wireless devices 1306 at times request data, for example, images or text from a web site, that must be converted, translated or otherwise processed by wireless device server systems 1304 before it can be transmitted to, and displayed on, a requesting wireless device. Instead of converting the information, the wireless device servers systems 1304 may request that the MPDN server 104 accomplish the data conversion or translation. The device server systems 1304 may then provide to the MPDN server 104 any pertinent information, such as information concerning the requesting device, the nature of the data requested, and the processing needed for the data. The MPDN server 104 may then utilize one or more of the client systems 108, 110 ... 112 to process the data from block 1302 for transmission to the requesting device. In this way, the wireless device server systems 1304 may off-load burdensome and process-intensive conversion tasks to the distributed processing system of the present invention.

It is noted the transmission of processed data to the requesting wireless device 1306 may occur in a variety of ways. For example, the processed data may be transmitted from a client system 108 to the server 104, then to the wireless device server 1304 and finally to the wireless devices 1306. Alternatively, the processed data may be transmitted from a client system to the wireless device server 1304, and then to the wireless devices 1306. Still further, the processed data may be transmitted directly from a client system to the wireless devices.

FIG. 13B provides a basic flow diagram for an embodiment of a data conversion process 1350 according to the present invention. In block 1352, a device, such as wireless devices 1306, requests unconverted, non-translated or non-processed data. In block 1354, a server for the device, such as wireless device server systems 1304, processes the data request and contacts the MPDN server 104. In addition, the content provider or server for the requested data, such as a web site content server, may contact the MPDN server 104. The wireless device server systems 1304 provide all pertinent information to the MPDN server 104, such as the type of calling device, its identification, the relevant data requested, and the conversion to take place. The MPDN server 104

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then distributes the data and information concerning the requesting device to one or more client systems, such as client systems 108, 110 ... 112, in block 1356. The one or more client systems then convert, translate or otherwise process the data in block 1358. The converted, translated or processed data is then provided to the requesting device in block 1360. Again, in this way, the device servers may provide a wide range of information without having to provide itself the processing power to accomplish the conversion, translation or processing that is required to transmit or display the data on a requesting device.

As shown in FIG. 13B, the device server or the content server 1304 may communicate data and other pertinent information for a conversion directly to the client systems. For example, the MPDN server 104 may provide access to a group of client systems for data conversion purposes for given periods time (e.g., monthly client group allocations), or may provide identities of groups of client systems that may be used at the time a conversion is needed. Once the identity and allocation of client systems to a particular device server or content server is made, the device server or content server may communicate directly with the client systems. In addition, the device server or content server may provide directly to a requesting device the identity of the one or more client systems accomplishing the data conversion. As shown in FIG. 13B, the requesting device, therefore, may communicate directly with the client system or systems to provide pertinent information concerning the data conversion requested. The client system may then, for example, directly download the desired content and perform the desired data conversion. It is further noted that in addition to the embodiments described above with respect to FIGS. 13A and 13B, other methods for requesting, processing and providing data to and from the requesting device may be implemented with distributed processing system of the present invention, such as caching processed data for later transmission.

FIGS. 14A and 14B depict example block diagrams of file distribution and data sharing through the network fabric, according to the present invention. In particular, FIG. 14A depicts an Internet data file distribution system 1400 that relies upon client systems to provide local data distribution. FIG. 14B depicts a data file distribution system 1450 that allows for data sharing and rapid transmission of a project or data files through the distributed processing system.

Looking now to FIG. 14A, a block diagram is depicted of a distributed processing system 1400 that provides data transmission caching or other local distribution, according to the present invention. In the embodiment of FIG. 14A, server systems 104 are connected through communication link 114 to the Internet backbone 1402. The Internet backbone 1402 represents the

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very high speed connections that carry data long distances, for example, T3 or fiber optic lines that carry Internet data across the United States. A web site 1404 is connected to the Internet backbone 1402 through communication link 1406, which represents a geographically local connection. The connection block 1410 represents a geographically remote communications link, such as a POP server, head-end machine, telephone line central office, cell site, etc. This communications block 1410 is connected to the Internet backbone 1402 with a communications link 1408, which also represents a geographically local connection. A variety of client devices and non-client devices 1412A, 1412B, 1412C, 1412D, 1412E and 1412F may be connected below the connection block 1410. It is noted that interface 1414 represents, for example, a secondary network on which client devices 1412D, 1412E and 1412F are connected, such as a home network.

In the embodiment shown in FIG. 14A, web site 1404 may be desiring to provide content that is in high demand, over a short period of time. An example of such an event is a live Internet multimedia broadcast. For such an event, there may be a huge influx of devices trying to download the content from the web site 1404 over a short period of time. The web site 1404 may be unable to meet this extremely large demand, requiring the web site 1404 to shut down.

According to the present invention, the web site 1404 may off-load some or all of its data handling requirements by using the distributed processing system of the present invention for data caching. The web site 1404 may contact server systems 104 and request data caching services. The server systems 104 may then identify a local machine, such as client device 1412E, to act as a local distributor of the content for web site 1404. For example, one or more idle client devices that have been identified, as discussed above, may be utilized as local distributor client device 1412E. The local distributor client device 1412E may first download the content and pass it on to other client and non-client devices 1412B, 1412C and 1412D through communication links 1416A, 1416B and 1416C. It is noted that this caching will be aided if the client and non-client devices receiving the cached data are relatively short communication hops from local distributor client device 1412E.

This data or network caching allows data to be streamed to an end user level device, which may then pass the data on to other end user devices. Thus, the downstream communications may be limited, thereby taking the distribution burden off of the web site. For example, web site 1404 may have a large streaming video or multimedia file that is experiencing a heavy load from a given set of network devices. This data file may be cached by a machine, such as client device 1412E, that is below from a communication link 1410. Then, other devices that are also below this communication link 1410 may download the streaming video data from the client device 1412E. This caching

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eliminates the need to repeatedly send the same data through the same communication links to requesting devices that are located below common communication links. It is noted that the file and data distribution possibilities for this peer file access, caching and data transmission, according to the present invention, are wide and varied and should not be seen as limited to the embodiment shown in FIG. 14A.

FIG. 14B is a block diagram of a distributed processing system 1450 that provides data distribution and data sharing, according to the present invention. As with FIG. 9, FIG. 14B depicts an alternative view of a network fabric that may interconnect any of a wide variety of devices. In the embodiment shown in FIG. 14B, server systems 104 are interconnected with any number of client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G and 108H. Each of the connecting interconnects represents any of a wide variety of communication links that may exist between devices in the network fabric of the present invention. Each of the client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G and 108H include shared data (SD) according to the present invention. Within this interconnected fabric, block 1452 represents data or project information that is desired to be distributed. The SD blocks within each client system facilitates the distribution of this data or project information.

A client agent, as discussed above, installed on the client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G and 108H includes functionality that facilitates a number of services with respect to data transmission and sharing. First, the client agent provides a protected data storage area accessible to outside devices, which is represented by the SD block within each client system in FIG. 14B. This special storage space protects the device from outside devices accessing other storage areas on the device while allowing data to be shared and accessed by other devices and simultaneously used by the local client agent.

These shared data (SD) blocks provide mechanisms that enable a wide variety of possible interactions among the client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G and 108H. For example, the data sharing mechanism may provide a space for a cache of other device addresses attached to the network for both communication purposes as well as security purposes. The mechanism may also provide a simple indexing system that is automatically re-indexed when content is added or removed from the storage area. This indexing system may provide a mechanism for other client agents to perform discovery on the local client information and visa versa. Through information stored within this shared data, the distributed processing system of the present invention facilitates many distributed file system applications such as distributed resume posting, distributed

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caching, distributed advertisement serving, etc. In addition to the above, the storage block (SD) within each client system may include an interface for displaying or playing data types (such as images, audio files, video files, etc.) stored both locally and/or remotely on other client devices. This would enable simple picture sharing, for example, between remote families connected via the internet, as part of being a client system within the distributed processing system of the present invention.

In the embodiment shown in FIG. 14B, data or project 1452 is injected into the fabric through a connection to client system 108C and server systems 104. These connections represent that the information may pass first to server systems 104, or may pass first to a client system, such as client system 108C. It is noted that there are other ways that the data may be injected into the fabric. Once injected, the data 1452 may be transmitted throughout the fabric through any of a wide variety of communications, including client-to-client, server-to-client, client-to-server, client-to-non-client, non-client-to-client communications, and/or non-client-to-non-client communications. These communications may be based upon a variety of mechanisms, such as polling mechanisms and pre-assigned firewall ports. This technique provides a vehicle that facilitates the distribution of information to a large number of devices in a short period of time.

Applications for this data distribution are widely varied. For example, any important file that is time sensitive may be propagated to a large number of client devices, non-client devices, servers, or other connected devices, in a short amount of time. This transmission may occur quickly and efficiently once the information is injected into the distributed processing system of the present invention. Example time sensitive data files are anti-virus signature files, which when distributed through the distributed processing system of the present invention, may be transmitted through the network fabric faster than a new virus may normally proliferate.

Another application for rapid propagation of files is utilizing this technique for propagation of workloads. One example is distributed resume or job searching. In such a system, participating job seekers and participating employers may rapidly search for one another. A job seeker may inject a job request or search into the fabric that is then routed by each successive device to other devices without the need for control from the server systems 104. Similarly, an employer may inject candidate criteria into the fabric that is then routed to successive devices. The result is an extremely fast search and identification of employers and candidates.

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FIG. 15 is a block diagram of an alternative representation for a distributed processing system 100, according to the present invention. Server systems 104, database systems 1546 and web interface 1554 are coupled together through communication links 1540, 1542 and 1544. The web interface 1554 includes clients subsystem 1548, task developer subsystem 1550, and advertisers subsystem 1552, and may include other subsystems as desired. The database systems 1546 include workload (WL) information 308, client capability vector information 620, and any other stored information as desired. Server systems include various modules and subsystems, including database interface 1532, web server 1536, task module and work unit manager 1530, client statistics module 1534, advertising manager 1538, task module version/phase control subsystem 1528, sweepstakes engine 1524, server control subsystem 1526, and communication interface 1522. It is noted that in the embodiment of a distributed processing system 100 as depicted in FIG. 15, the three primary operations for the server systems 104, database systems 1546 and web interface 1554 are directed to managing, processing and providing an interface for client systems, customer tasks, and customer advertising.

As discussed above, each client system includes a client agent that operates on the client system and manages the workloads and processes of the distributed processing system. As shown in FIG. 15, each of the client agents 270A, 270B ... 270C communicates with the server systems 104 through communication links 1516, 1518 ... 1520, respectively. As discussed above, any number of different techniques and architectures may be utilized to provide these communication links. In the embodiment as shown in FIG. 15 with respect to client agent 270A, each client agent includes a base distributed processing system component 1506 and a separate project or workload component 1504. As depicted, a communication interface 1508, a core agent module 1502, and a user interface 1510 make up the base distributed processing system component 1506. The task module 1512 and the work unit 1514 make up the separate project or workload component 1504. The task module 1512 operates on top of the core agent module 1502 to provide processing of each project work unit 1514. It is noted that different or additional modules, subsystems or components may be included within the client agent, as desired. For example, a personal computer screen saver component may be part of the base distributed processing system component 1506 or the separate project or workload component 1504.

Also as discussed above, security subsystems and interfaces may be included to provide for secure interactions between the various devices and systems of the distributed processing system 100. As depicted in FIG. 15, a security subsystem and interface 1560 is interconnected with the server systems 104, the database systems 1546, the web interface 1554, and the client agents 270A, 270B ...

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270C. These interconnections are represented by lines 1566, 1564, 1562, and 1568, respectively. The security subsystem and interface 1560 operates to secure the communications and operations of the distributed processing system. This security subsystem and interface 1560 also represents a variety of potential security architectures, techniques and features that may be utilized. This security may provide, for example, authentication of devices when they send and receive transmissions, so that a sending device verifies the authenticity of the receiving device and/or the receiving device verifies the authenticity of the sending device. In addition, this security may provide for encryption of transmissions between the devices and systems of the distributed processing system. The security subsystem and interface 1560 may also be implemented in a variety of ways, including utilizing security subsystems within each device or security measures shared among multiple devices, so that security is provided for all interactions of the devices within the distributed processing system. In this way, for example, security measures may be set in place to make sure that no unauthorized entry is made into the programming or operations of any portion of the distributed processing system including the client agents 270A, 270B ... 270C.

In operation, client systems or end-users may utilize the clients subsystem 1548 within the web interface 1554 to register, set user preferences, check statistics, check sweepstakes entries, or accomplish any other user interface option made available, as desired. Advertising customers may utilize the advertisers subsystem 1552 within the web interface 1554 to register, add or modify banner or other advertisements, set up rules for serving advertisements, check advertising statistics (e.g., click statistics), or accomplish any other advertiser interface option made available, as desired. Customers and their respective task or project developers may utilize the task developer subsystem 1550 to access information within database systems 1546 and modules within the server systems 104, such as the version/phase control subsystem 1528, the task module and work unit manager 1530, and the workload information 308. Customers may also check project results, add new work units, check defect reports, or accomplish any other customer or developer interface option made available, as desired.

Advantageously, the customer or developer may provide the details of the project to be processed, including specific program code and algorithms that will process the data, in addition to any data to be processed. In the embodiment shown in FIG. 15, this program code takes the form of a task module 1512 within the workload, while the data takes the form of work unit 1514. These two portions make up the project or workload component 1504 of each client agent 270. For a given project, the task module 1512 will likely remain relatively constant, except for version updates, patches or phase modifications, while the work unit 1514 will likely change each time processing of

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the data that it represents is completed. The project or workload component 1504 runs in conjunction with the base distributed processing system component 1506. When a different customer or project is started on a given client system, the project or workload component 1504 will typically be replaced, while the base distributed processing system component 1506 will likely remain relatively constant, except for version updates, patches or other modifications made for the distributed processing system.

Information sent from the server systems 104 to the client agents 270A, 270B ... 270C may include task modules, data for work units, and advertising information. Information sent from the client agents 270A, 270B ... 270C to the server systems 104 may include user information, system information and capabilities, current task module version and phase information, and results. The database systems 1546 may hold any relevant information desired, such as workload information (WL) 308 and client capability vectors (CV) 620. Examples of information that may be stored include user information, client system information, client platform information, task modules, phase control information, version information, work units, data, results, advertiser information, advertisement content, advertisement purchase information, advertisement rules, or any other pertinent information.

Now looking to FIGS. 16, 17A, 17B, 18A and 18B, an embodiment for security features for the distributed processing of the present invention will be described. FIG. 16 provides a representation of the distributed processing environment including security subsystems. FIGS. 17A and 17B provide block diagrams of the communication interface between client systems and the server systems. And FIGS. 18A and 18B provide detailed block diagrams of an embodiment of security measures for the server systems and the client systems.

Referring to FIG. 16, an embodiment 1600 of a distributed processing system is depicted. Server systems 104 include a security subsystem 354 through which communications to and from the server systems 104 may be made secure. Client systems 108A, 108B ... 108C and client systems 108D, 108E ... 108F represent any number of client systems that may communicate with server systems 104 or with each other. Each of the client systems 108A, 108B, 108C, 108D, 108E and 108F include a security subsystem 272A, 272B, 272C, 272D, 272E and 272F, respectively. The electronic information 1602 represents information that the server systems 104 is to communicate to client systems 108A, 108B, 108C, 108D, 108E and 108F in a secure manner, so that no unintended or intercepting recipient may understand or tamper with the electronic information 1602, and so that no third party may insert non-authorized information into the distributed processing system 1600.

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Although not shown, it is understood that any one of the client systems 108A, 108B, 108C, 108D, 108E and 108F may have electronic information that is to be securely sent to the server systems 104 or to any other of the client systems 108A, 108B, 108C, 108D, 108E and 108F.

Electronic information 1602 represents information that is communicated to facilitate the operations of the distributed processing system 1600. Such information includes the client agents that are downloaded to each client system, the workload applications for any given workload, and any work unit that will be processed by a client system. Electronic information 1602 may also be any type of information to be sent or received within the distributed processing system, such as text, images, audio streams, video streams, databases, spreadsheets, PDF files, Shockwave data, Flash data, applications, data files, chat streams, or any other information, data or data streams. In addition, electronic information may be sent by client systems 108A, 108B, 108C, 108D, 108E and 108F to the server systems 104 and/or any of the other client systems.

The Certificate Authority (CA) block 1604 within the server systems 104 represents an entity that helps to ensure validity of encryption and decryption codes. For example, within a public/private key encryption environment, a Certificate Authority may help ensure that a public key alleged to be from a particular entity is in fact legitimately from that entity. One third-party entity that performs this CA function on the Internet is Verisign, Inc. Having a third-party perform the CA function can be advantageous in a transaction or communication between non-trusted entities. For example, the sending entity provides its public key information to the third-party CA, which verifies the information and creates a certificate that includes the sending entity's public key information. This certificate may then be encrypted and signed by the third-party CA. The receiving entity may then obtain the certificate from the third-party CA and decrypt it with the third-party CA's public key. The receiving party will then have the sending party's public key and be fairly secure that it is a legitimate public key from the sending party.

As shown in FIG. 16, the CA functionality may be part of the server systems 104, such that the server systems 104 act as their own Certificate Authority with respect to client systems108A, 108B, 108C, 108D, 108E and 108F and any other devices that are part of the distributed processing system. A third-party CA is not as needed in this distributed processing environment because the server systems 104 primarily direct the operations of the distributed processing system. Thus, there is less of a need for a third-party entity to provide a CA function. It is noted that CA functionality may be provided only by the server systems 104, only by third-party CAs, or any combination of server systems 104 and third party CAs, as desired for a particular embodiment. In addition, if

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desired, no CA functionality could be provided so that secure communications between the server systems 104 and the devices within the distributed processing system were conducted without the use of a Certificate Authority.

FIG. 17A is a block diagram of an embodiment 1700 for a communication interface between a client system 108 and the server systems 104. In this embodiment 1700, the network is preferably the Internet. As depicted, the client system 108 includes a client agent 270 and a network browser 1702. The server systems 104 include a client agent download site 1710, from which the client system 108 may download the client agent 270 through communications 1704. The server systems 104 also include block 1712, which represents a variety of client service functions that may be provided by the web interface for the server systems 104 through communications 1706. For example, in a public/private key security environment, a client system 108 may download from block 1712 a Certificate Authority (CA) certificate that includes the server public key. In addition, the client system 108 may login to the web page interface for the server systems 104. And the server systems 104 may generate dynamic certificates. The client system 108 may also send and receive information to application server 1714 through communications 1708, for example, to receive project work units. Finally, as depicted, database systems 1546 may send information to and receive information from the blocks 1710, 1712 and 1714 of the server systems 104 through communications 1716, 1718 and 1720. As discussed more above, database systems 1546 may include any desired information, for example, a workload database 308 and/or a capability vector database 620.

FIG. 17B is a block diagram for an Internet communication protocol structure 1750 that may be utilized for communications 1704, 1706 and 1708. As depicted in FIG. 17B, three basic application layers are utilized by each client system 108 and the server systems 104 to communicate with each other. The TCP/IP layer 1756 represents a standard Internet communication protocol that allows devices to identify and send information to each other across the Internet, as is well known to those of skill in the art. The secure network layer (SNL) 1754, such as the secure socket layer (SSL), represents a protocol that allows devices to confirm the identity of servers and the other devices with whom they communicate, as long as those servers or other devices utilize similar protocols. The application security level 1752 represents other desired security or communication protocols that are implemented by programs running on the client system 108 and/or the server systems 104.

In operation, the server systems 104 may secure the download of the client agent 270 to the client system 108 by requiring that the client system 108 download the client agent 270 from the client agent download site 1710. As part of the server authentication sequence, the download site

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1710 will send back an identifier to assure users that they are indeed connected to the proper server systems 104. This identifier may be, for example, a CA certificate, but may be any other identifier, as desired. Because it is desirable to have the client agent running on as many distributed devices as possible for the distributed processing system of the present invention, user authentication may not be required to download the client agent 270 from the download site 1710.

Once a client system 108 has downloaded and installed the client agent 270, the client system 108 will communicate with the application server 1714 to begin working within the distributed processing system. For these communications, server and client authentication may be required to help ensure security. To accomplish this authentication, for example, two-way authentication may be utilized. To provide a public/private key combination for the client agent 270, each client agent 270 that is downloaded by a client system 108 may have embedded within its code a default identifier and a default public/private key pair. Thus, the server systems 104 may use secure network protocols (such as SSL or similar schemes) to authenticate each client system 108, and each client system 108 may use compatible protocols to authenticate each server application with which it communicates. These applications, for example, may include the functionality provided by blocks 1712 and 1714, and, therefore, the communications 1706 and 1708 would utilize authentication.

As an alternative to embedding a public/private key combination and associated identifiers or certificates into the client agent 270, the public/private key pairs may be dynamically generated in block 1712. For example, at start-up, at reboot or at some desired time or event, the client system 108 may generate a new public/private key pair. When the client system 108 next communicates with the server systems 104, the client system 108 request a certificate from the server systems 104. The server systems 104 may then act as a Certificate Authority (CA) and provide a CA certificate to the client system 108. This dynamic certificate generation, therefore, allows for added security by allowing each client system 108 to have its own public/private key pair for secure network protocol communications and by having this key pair change at some desired recurring event for the client system 108, such as reboot.

The client system 108 may initiate its communication with the server systems 104 by logging on to the authentication server, which may be part of block 1712. The user may be prompted to enter a valid e-mail address and/or password, if already registered, or may be asked to register if the e-mail address and/or password are not recognized. Once registration is completed, a password may be e-mailed back to the user to provide validation of the user. If authentication is successful when a user

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logs into the server systems 104, the server systems 104 may provide a host-ID, and user-ID and a session key for any given communication session.

It is also desirable that once a user has successfully registered, the user may install the client agent 270 on any number of other host or user systems without needing to interact with that systems network browser, other than to set host-specific preferences. For example, when downloaded, the client agent 270 may take the form of a self-extracting program that installs the appropriate files to the client system 108, including the proper host and user identifications. In addition, to help ensure proper identification, the session keys may be exchanged each time the client system 108 communicates with the server systems 104. For example, the client system 108 may communicate its current session key to the server systems 104 each time it communicates with the server systems 104. The server systems 104 will then send a new session key for the client system 108 to utilize for the next session. In this way, stale identification information may be reduced. In addition to this security feature, communications may also be encrypted and decrypted with various encryption techniques, as desired.

Referring now to FIGS. 18A and 18B, one embodiment will be discussed for a security model utilizing public/private key encryption. This security model utilizes a third-party CA to provide a CA certificate for the server systems 104.

FIG. 18A is a block diagram of an embodiment 1800 for security procedures implemented by server systems 104. Electronic information1602 is to be communicated to a client system 108. This electronic information 1602 travels through four different paths that provide security information.

One path begins with the electronic information 1602 being encrypted with the server private key in block 1802. Then, in block 1830, the encrypted information is sent to client systems. This encrypted information is represented by arrow 1826.

A second path flows from block 1802 to block 1804 where a hash value is generated for the encrypted electronic information. It is noted that a hash value is a unique value that may be generated for any given electronic file based upon the contents of that file and the algorithm used to calculate the unique value. There are any number of algorithms that may be used to calculate a hash value, as would be understood by one of skill in the art. Proceeding down the second path to block 1806, the hash value generated on the server side for the encrypted electronic information (i.e., the information sent to the client system from block 1830 via 1826) is compared with a hash value 1822

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from the client system 108. This hash value 1822 represents the client system's calculation of the hash value for the encrypted electronic information that the client system 108 received from the server system 104. If no tampering has occurred and the data was transmitted accurately, the client system hash value should match the server hash value. In block 1808, the server systems 104 provide an indication of the result of the hash check evaluation back to the client system 108. This pass/fail determination is indicated by arrow 1824.

A third path begins with block 1810 where a hash value is calculated for non-encrypted electronic information 1602. This hash value is then encrypted in block 1816 with the server private key. Next, this encrypted hash value is sent to the client system 108 in block 1818. The arrow 1821 represents the encrypted hash value for the non-encrypted electronic information.

A fourth path, and the last depicted in the embodiment 1800 of FIG. 18A, flows from block 1810 to block 1812, where the hash value is partitioned into N different portions. These N different portions are preferably designated for N different client systems 108, as well as any client systems 108 receiving a redundant distribution of any one of the N different portions. In block 1814, the N different hash value portions are encrypted with the server private key. Next, the N different encrypted hash value portions are sent in block 1820 to N different client systems 108, as well as being sent to client systems 108 receiving redundant distributions of the hash value portions. The arrows 1828 represent the distribution of the N different hash value portions. It is noted that redundant distribution of the N hash value portions is desirable because, as discussed below with respect to FIG. 18B, when the hash value is reconstructed by a client system 108, it is desirable to have multiple sources for each portion in case one of the receiving client systems is not available at any given time.

Looking now to FIG. 18B, the corresponding security procedures implemented by a client system 108 are discussed with respect to embodiment 1850. Initially, in block 1854, the client system 108 receives CA certificate 1852 containing the server public key and the server identity. It is again noted that other unique identifiers may be utilized instead of CA certificates, as described above. If a CA certificate is utilized, this CA certificate may be provided from a third-party Certificate Authority (CA) or from the server systems 104 or any other desired source. In block 1856, the client system 108 verifies the accuracy of the CA certificate using the CA's public key. If this verification is not successful, the client system 108 may wait some period of time before retrying. In addition, the time period may be a random period of time. In addition, as discussed with respect to FIGS. 17A and 17B, the client system 108 will login to the server systems 104. If this

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authentication is not successful in this login, the client system will notify the user of the system and the server systems 104, and then wait for some period of time or a random amount of time before attempting to re-verify.

In block 1862, the client system 108 receives the encrypted information 1826. Next, the client system 108 creates a hash value for the encrypted information in block 1864. This hash value is preferably calculated using the same algorithm utilized by the server systems 104 in generating the hash value for the encrypted information in block 1804 of FIG. 18A. Once the client system 108 has calculated the hash value for the encrypted information, this hash value 1822 is sent to the server systems from block 1866. As discussed above, a pass/fail response 1824 is sent back by the server systems 104. This hash check evaluation is received in block 1868. If the check was a FAIL, flow passes to block 1870 where the client system 108 sends out a notice to the server systems 104 and any other client system to which it is attached that a problem has been encountered. The client system 108 then ends the current connection with the server systems 104. It is noted that the client system 108 may retry several times before moving onto block 1870, and that the reporting scheme may be modified, altered or developed as desired.

If the hash check evaluation was a PASS, flow passes to block 1872 where the electronic information is decrypted with the server public key, which was verified in block 1856. A hash value is then calculated for the electronic information 1874. Again, the hash generation algorithm is preferably the same as that used by the server systems 104 in creating the hash value in block 1810 of FIG. 18A. Next, the hash value is sent from block 1874 to block 1886, where it is compared with two other hash value calculations.

One of the other hash values comes from a path that begins with block 1858, in which the client system 108 receives the encrypted hash value 1821 for the non-encrypted information. In block 1860, the encrypted hash value is decrypted with the server public key. The hash value is then sent to block 1886.

The third hash value for block 1886 comes from a path that utilizes the N different hash portions sent out by the server systems in block 1820 of FIG. 18A. In block 1876, the client system receives a portion 1828A of the partitioned hash value 1828. In addition to one of the partitioned hash values, it is noted that the server systems 104 will also send information providing the identity and source for the N-1 other hash value portions. In block 1878, the client system 108 decrypts the portion 1828A with the server public key. Next, in block 1880, the client system 108 resolves the

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identity of the source for the N-1 other portions, which may be N-1 other client systems. In block 1882, the client system 108 obtains the N-1 other portions, and assembles the N partitions into a hash value for the non-encrypted electronic information in block 1884. The resulting hash value is then sent to block 1886. It is noted, as indicated above, that redundant distribution of the N portions of the partitioned hash value is desirable so that unavailability of one client system will not cause another client system to be unable to re-assemble the N different portions.

Once the three hash values are received in block 1886 from three different sources, they are compared to see if they match. If this check is a FAIL, flow moves to block 1888, where the client system 108 sends out a notice to the server systems 104 and any other client system to which it is attached that a problem has been encountered. The client system 108 may also inform the client systems from which it received the N-1 other portions, and the client system 108 may retry the procedures, if desired. In addition, once a client system 108 is notified of a potential problem, the client system 108 may download a special check file from the server systems 104 to make sure that the server systems have not been compromised. If still a FAIL, the client system 108 then ends the current connection with the server systems 104. If the check is a PASS, the electronic information is utilized, as represented by block 1890.

FIGS. 19 and 20 provide block diagrams for further describing the distributed processing system and environment of the present invention that allows for third parties, such as network service providers, to monitize, or gain revenue from, their respective user bases.

Looking first to to FIG. 19, a block diagram is depicted for a distributed processing system 100 and environment 1900 in which network service providers are enabled to monitize their user bases. Environment 1900 includes a distributed processing system 100, a customer 152, and a third-party network service provider 1902. The customer 152 represents an entity that has a project 1912 that the customer 152 would like processed by the distributed computing system 100. In return for the processing of the project data and the results 1914 of this processing, the customer 152 will often make a payment 1916. The third-party network service provider 1902 maintains a user database 1904 that identifies its user base 1920 including users 1906A, 1906B ... 1906C.

The service provider 1902 may be, for example, an Internet business that provides any of a variety of services to users, such as Internet access, e-mail, web page hosting, domain name hosting, file sharing services or any other Internet-based service. In addition, such Internet-based services may be offered for free or low cost to users, in which case the users have historically agreed to view

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banner or other advertisements in return for the free or low cost service. However, as stated above, advertising revenue has been subject to diminished pricing and has become a unreliable source of revenue for many Internet-based companies. To facilitate the number of projects that the distributed processing system 100 can take on and the speed at which these projects can be processed and completed, it is desirable to increase the amount and capabilities of the computing resources available to the distributed processing system 100. To the extent that the users of the service provider 1902 represent a pool of underutilized resources, these users represent a potentially valuable resource to the distributed processing system 100.

According to the present invention, the service provider 1902 may realize value from its user base and thereby monitize this user base by facilitating the use by the distributed processing system 100 of computing resources related to these users. Thus, for example, in return for free services, the users may agree to have their respective computing resources utilized by the distributed processing system 100. The service provider 1902 may then provide to the distributed processing system 100 the user identifications (IDs) 1908 related to its user base in return for revenue sharing 1910. This monitizing architecture according to the present invention thereby provides a significantly advantageous avenue for service providers or other entities that control or have user bases with useful processing capabilities, such as Internet-based service providers, to generate revenue from its user base, particularly in the face of falling revenue from other sources, such as advertising revenue.

The revenue sharing 1910 may be, for example, a share of payment 1916 relative to the amount of processing toward the project 1912 that was completed through the use of the user resources 1922 made available through users 1906A, 1906B ... 1906C. It is noted that the revenue sharing 1910 may take any desired form, including but not limited to (a) upfront payments based upon attributes of the user base, such as size or processing capabilities, (b) payments based upon the number of users that become members of the distributed processing system, (c) payments based upon the types of projects processed by the user base, or (d) any other desired compensation scheme related to the value of the user base being made available by the third party.

The monitizing invention, therefore, focuses on capabilities of internet, intranet, wireless or otherwise network connected PCs, internet appliances, notebook computers, servers, storage devices, NAS (Network Attached Storage), or any other connected computing device that could provide any of a number of useful capabilities and that is part of a underutilized user base, such as user bases of Internet-based businesses that rely on advertising or any other method of monitizing their user base in exchange for a valuable service (e.g. free internet access, email, etc.). As discussed above, these

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useful processing capabilities span the entire range of generic computing subsystems including: Central Processing Unit(s) (CPUs), Digital Signal Processor(s) (DSPs), Graphics Processing Engine(s) (GPEs), Hard Drive(s) (HDs), Memory (MEM), Audio Subsystem(s) (ASs), Communications Subsystem(s) (CSs), Removable Media Types (RMs), or other Add-In/On Accessories (A/OAs) with potentially useful unused capabilities. Market creation and potential compensation for all unused capabilities can be accomplished through the massively parallel distributed software architecture of the distributed processing system 100. For example, credits (revenues) would be generated each time a unit of work is accomplished by one (or more) of the subsystems on a user's computing device via a client agent installed on the device for the purposes of managing, processing and completing units of work. The total credits/revenues generated may be, for example, dynamic depending on how many are received. Through this architecture of the present invention, significant revenues may be generated from the user base of the service provider where the service provider may have previously been unable to monitize effectively this user base.

It is further noted in more general respects that the entity 1902 may be any entity that has direct or indirect control over a group of users, such that the users resources may be offered to and utilized by the distributed processing system 100. An example of one such more general entity would be a company that has a large group of internal users that are capable of being linked to the distributed processing system 100, for example, through an intranet network of computer systems or computing devices. The computing resources related to these users may also be monitized according to the present invention.

Looking now to FIG. 20, a block diagram for an embodiment 2000 representing the components for a client agent 270 along with a representative indication of responsibility for those components. Client agent 270 includes a core agent component 1502, a project component 1504 and a user interface component 1510. As discussed above, the core agent component 1502 can provide the base distributed processing functionality for the client agent 270. The project component 1504 can provide the project-specific functionality for the client agent 270. And the user interface 1510 can provide any desired user viewable information or interaction functionality. These three general components may be modular software components such that the project component 1504, the core agent component 1502, and the user interface component 1510 may be separate software modules, if desired, that link together through appropriate APIs (Application Programming Interface). Thus, each of these components may be designed and developed independently or jointly, as desired. In effect, the core agent component 1502 can provide a backbone upon which is attached the project component 1504, the user interface component 1510, and any other desired component. Thus, when

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a new project or interface is desired for any given client agent 270, for example, this component may be efficiently replaced with the new component in a modular fashion still utilizing the core agent component 1502 as the backbone. In addition, each component may be updated and modified without requiring modification or updates to the other component software code.

Also depicted in FIG. 20 are customer 152, distributed processing system (DPS) 100 and service provider 1902, which are in communication with each other through interactions or interfaces 2012 and 2014. In this embodiment of FIG. 20, the customer 152 is represented as providing the software development and code 2002 for the project component 1504. The distributed processing system 100 is represented as providing the core agent code 2008 for the core agent component 1502. And the service provider is represented as providing at least a portion of the interface development and code 2010 for the user interface component 1510. In operation, the workloads 2004 and the results 2006 would still typically be under the control of the distributed processing system 100.

It is noted that this modular architecture facilitates the development of project software code and interface software code by entities other than the owner of the distributed processing system 100. For example, with respect to FIG. 19, an Internet-based service provider may have a user interface already designed and implemented for its user base, such as a web browser user interface for users of free Internet access services provided by such a service provider. Once the core agent component 1502 is installed on a user's computer, the existing third-party user interface may hook into the core agent component 1502, thereby making the user's resources available to the distributed processing system 100, while maintaining the user interface the user has come to expect from the service provider. Thus, the service provider 1902 may provide the user interface it desires for the service it is providing, while at the same time monitizing its user base by facilitating its users becoming part of the available resources for the distributed processing system 100.

Further modifications and alternative embodiments of this invention will be apparent to those skilled in the art in view of this description. It will be recognized, therefore, that the present invention is not limited by these example arrangements. Accordingly, this description is to be construed as illustrative only and is for the purpose of teaching those skilled in the art the manner of carrying out the invention. It is to be understood that the forms of the invention herein shown and described are to be taken as the presently preferred embodiments. Various changes may be made in the shape, size and arrangement of parts. For example, equivalent elements may be substituted for those illustrated and described herein, and certain features of the invention may be utilized

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independently of the use of other features, all as would be apparent to one skilled in the art after having the benefit of this description of the invention.

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Claims

What is claimed is:

1. A massively distributed processing system, comprising:
at least one server system coupled to a network; and
a client agent program configured to operate on a multitude of widely distributed devices coupled to the network, the client agent program comprising:
a processing system component comprising a core agent module, the core agent module being configured to operate with any of a plurality of different task modules; and
a separate project component comprising at least one project task module, each task module being configured to run on top of the core agent module and to process distributed project workloads for at least one distributed processing project;
the server system being configured to provide the components of the client agent program to the distributed devices and to provide distributed workloads to the distributed devices.

2. The massively distributed processing system of claim 1, wherein the project component of the agent program includes a plurality of different task modules.

3. The massively distributed processing system of claim 2, wherein the network comprises the Internet.

4. The system of claim 1, further comprising:
a capability database coupled to the server system, the capability database storing workload capability factors for the distributed devices; and
an incentive database coupled to the server system, the incentive database storing incentive values for the distributed devices, the server system utilizing the workload capability factors to determine the incentive values for the distributed devices.

5. The system of claim 4, wherein the incentive values are based upon the workload completed by the distributed devices.

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6. The system of claim 4, wherein the incentive values are based upon the workload capabilities of the distributed devices.

7. The system of claim 1, further comprising:

a capability database coupled to the server system, the capability database storing workload capability factors associated with the distributed devices; and

a sweepstakes database coupled to the server system, the sweepstakes database storing entries associated with the distributed devices.

8. The system of claim 7, wherein the server system utilizes the workload capacity factors to determine entry values for the plurality of distributed devices.

9. The system of claim 7, wherein the entry values are based upon the workload completed by the distributed devices.

10. The system of claim 7, wherein the entry values are based upon the workload capabilities of the distributed devices.

11. The system of claim 7, wherein workload capability factors for the distributed devices are determined by a benchmark workload.

12. The system of claim 1, further comprising a capability database coupled to the server system, the capability database storing workload capability factors associated with the distributed devices.

13. The system of claim 12, wherein the workload capability factor for the distributed devices represents the workload actually performed by the distributed device.

14. The system of claim 12, wherein the workload capability factor for the distributed devices is determined by a benchmark workload.

15. The system of claim 12, wherein the workload capability factor for the distributed devices is determined by the workload capabilities of the distributed devices.

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16. The system of claim 1, further comprising a capabilities database storing workload capabilities for the distributed devices, the server system utilizing the workload capabilities to schedule a distribution of workloads to the distributed devices.

17. The system of claim 16, wherein the workload capabilities are represented by a set of capability vectors for the distributed devices.

19. The system of claim 16, wherein the vectors comprise BIOS support capabilities, CPU support capabilities, graphic support capabilities, storage capabilities, communication support capabilities, memory capabilities, or operating system capabilities.

20. The system of claim 16, wherein workloads are allocated in at least part based upon workload requirements and the workload capabilities of the distributed devices.

21. The system of claim 16, wherein the workload capabilities for the distributed devices are determined by a benchmark workload.

22. The system of claim 1, further comprising a workload database coupled to the server system storing workloads for network site testing, the server system scheduling the site testing workloads for the distributed devices to test content delivery for a network site.

23. The system of claim 22, wherein the site testing is quality of service testing, load testing or denial of service testing.

24. The system of claim 22, further comprising a capabilities database coupled to the server system storing workload capabilities for a plurality of the distributed devices, the server system utilizing the workload capabilities to schedule site testing workloads for the distributed devices.

25. The system of claim 22, wherein the incentive value is based at least in part upon the workload capability of the distributed devices.

26. The system of claim 1, further comprising a workload database coupled to the server system storing workloads for network site content indexing, the server system distributing the indexing workloads for the distributed devices to index content delivered by network sites.

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27. The system of claim 26, further comprising a resulting index stored at least in part on the server system.

28. The system of claim 26, further comprising a resulting index stored at least in part on a plurality of the distributed devices.

29. The system of claim 26, further comprising a capabilities database coupled to the server system storing workload capabilities for a plurality of the distributed devices, the server system utilizing the workload capabilities to schedule indexing workloads for the distributed devices.

30. The system of claim 26, further comprising an incentive database coupled to the server system storing incentive values for a plurality of the distributed devices, the incentive values being provided to couple the distributed devices to the server system through the network so that the distributed devices are capable of performing a portion of the indexing workload.

31. The system of claim 1, further comprising a workload database coupled to the server system storing workloads for data back-up, the server system scheduling the data back-up workloads for the distributed devices to back-up data coupled to the network.

32. The system of claim 31, wherein the back-up data workloads include redundant workloads so that any given portion of the back-up data is stored on at least two different computer systems.

33. The system of claim 31, further comprising a capabilities database coupled to the server system storing workload capabilities for a plurality of the distributed devices, the server system utilizing the workload capabilities to schedule data back-up workloads for the distributed devices.

34. The system of claim 31, further comprising an incentive database coupled to the server system storing incentive values for a plurality of the distributed devices, the incentive values being provided to couple the distributed devices to the server system through the network so that the distributed devices are capable of performing a portion of the data back-up workload.

35. The system of claim 1, further comprising a database coupled to the server system, the database storing user selected operating parameters for the distributed devices, the user selected operating parameters being utilized to schedule project workloads for the distributed devices.

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36. The system of claim 35, wherein the operating parameter comprises an affiliation indication.

37. The system of claim 35, wherein the operating parameter comprises a project type indication.

38. The system of claim 35, wherein the operating parameter further comprises a percentage indication that allocates processing capabilities of a distributed device between selected projects.

39. The system of claim 1, further comprising a database coupled to the server system and storing idleness vector data for a plurality of the distributed devices, the server system utilizing the idleness vector data to identify relatively idle distributed devices and to schedule a distribution of workloads to the distributed devices based at least in part upon the idleness identification.

40. The system of claim 39, wherein process intensive workloads are scheduled to idle distributed devices based upon the idleness identification.

41. The system of claim 1, further comprising a database coupled to the server system and storing capability data for a plurality of the distributed devices, the server system utilizing the capability data to aggregate capabilities from at least two distributed devices.

42. The system of claim 41, wherein a storage device on a server distributed device and a processing device on a second distributed device are aggregated capabilities.

43. The system of claim 1, further comprising a sweepstakes database coupled to the server system, the sweepstakes database storing machine generated entries associated with the distributed devices.

44. The system of claim 43, wherein the machine generated entry comprises results from an entry workload sent from the server system to the distributed devices at regular time intervals.

45. The system of claim 43, wherein the client agent is configured to send to the server system the machine generated entries.

46. The system of claim 1, wherein a plurality of the distributed devices have information stored in shared data storage, the distributed devices allowing client agent programs on other distributed devices to access the shared data storage on the distributed devices.

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47. The system of claim 46, wherein the information stored comprises information to facilitate communication between multiple distributed devices.

48. The system of claim 46, wherein the information stored comprises information to facilitate processing of workloads by the distributed devices.

49. The system of claim 1, wherein a plurality of the distributed devices have stored information that facilitates data distribution by the client agent programs.

50. The system of claim 49, wherein the information stored comprises information to facilitate distribution of time sensitive data.

51. The system of claim 49, wherein the information stored on each distributed device comprises communication addresses of other distributed devices, the communication addresses allowing for rapid peer-to-peer communications.

52. The system of claim 49, wherein the distributed workloads comprise data caching workloads, and wherein the information stored comprises cached data to be retransmitted to other distributed devices.

53. The system of claim 1, further comprising a database storing capability vectors for a plurality of the distributed devices, and wherein the server system is configured to utilize at least one capability vector to identify at least one distributed device to accomplish a data conversion task in response to a data conversion request from a requesting device.

54. The system of claim 53, wherein the data conversion task comprises language translation or reformatting content of a network site.

55. The system of claim 1, further comprising a database storing attribute information for the distributed devices, the server system utilizing at least one device attribute to identify a subset of the distributed devices.

56. The system of claim 55, wherein a project workload is distributed to the subset of distributed devices.

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57. The system of claim 55, wherein the attributes comprise information concerning users of the distributed devices and wherein the utilized attribute comprises user information.

58. The system of claim 57, wherein an advertisement is distributed to the identified subset of distributed devices.

59. The system of claim 55, wherein the utilized device attribute comprises an attribute selected by a customer.

60. The system of claim 1, further comprising a security subsystem within the server system having as an output at least one partitionable security measure for electronic information that is being provided to at least one distributed device, the partitionable security measure being distributed to multiple distributed devices and having to be reconstructed by at least one distributed device to confirm the security measure.

61. The system of claim 60, wherein the security measure comprises generating a hash value for the electronic information and wherein the hash value is partitioned into N portions and distributed to N different distributed devices, including the distributed devices that are receiving the electronic information.

62. The system of claim 60, wherein the electronic information comprises a project workload.

63. The system of claim 1, wherein a portion of the plurality of distributed devices comprise devices associated with users from a third-party user base and wherein project revenue from processing customer project workloads is shared with the third-party in relation to resources of the utilized third-party user base.

64. The system of claim 62, wherein the client agent further comprises a user interface component.

65. The system of claim 64, wherein the project component software is owned by the customer, the core agent component software is owned by the owner of the distributed processing system, and the user interface component is owned by the third party.

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FIG. 1A

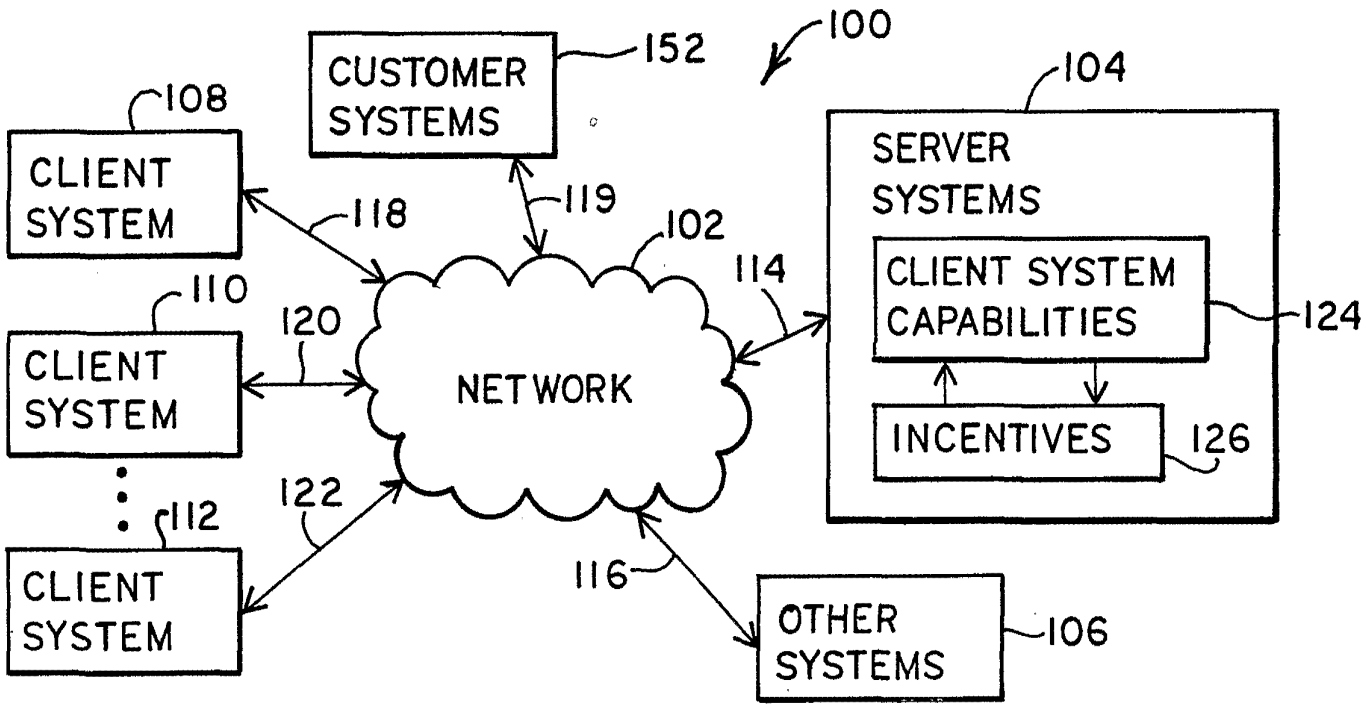
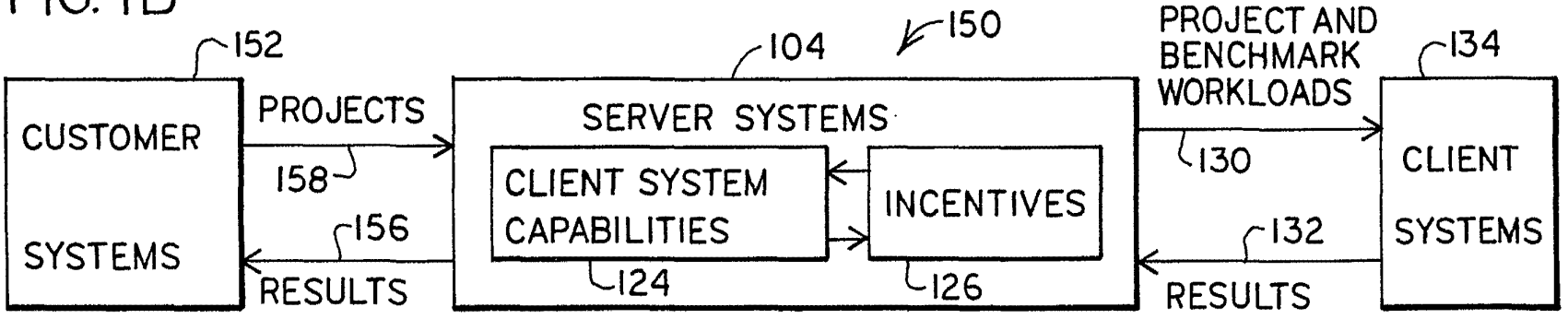

100
CUSTOMER SYSTEMS
152
104
SERVER SYSTEMS
108
CLIENT SYSTEM
118
119
102
114
CLIENT SYSTEM CAPABILITIES
124
110
120
CLIENT SYSTEM
NETWORK
INCENTIVES
126
122
112
CLIENT SYSTEM
116
OTHER SYSTEMS
106

FIG. 1B


152
CUSTOMER SYSTEMS
PROJECTS
158
156
RESULTS
104
150
SERVER SYSTEMS
CLIENT SYSTEM CAPABILITIES
124
INCENTIVES
126
PROJECT AND BENCHMARK WORKLOADS
130
132
RESULTS
134
CLIENT SYSTEMS

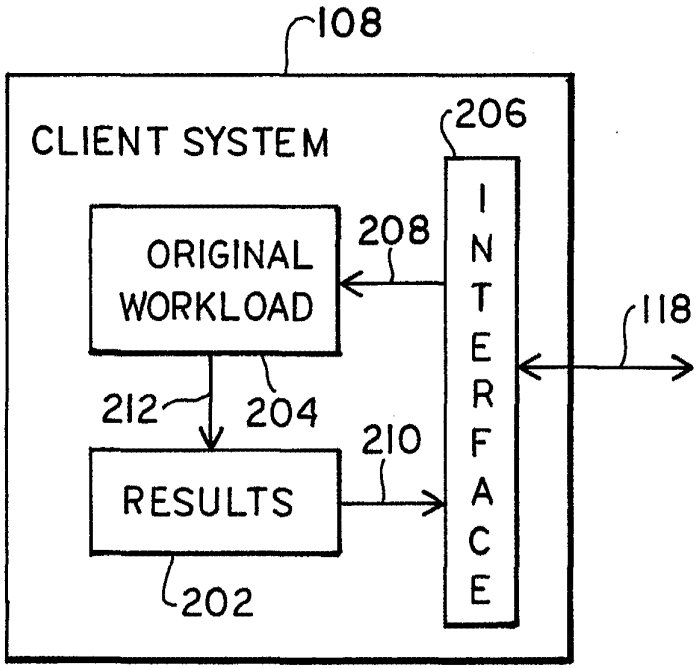

108
CLIENT SYSTEM
206
INTERFACE
ORIGINAL WORKLOAD
208
118
212
204
210
RESULTS
202

FIG. 2A

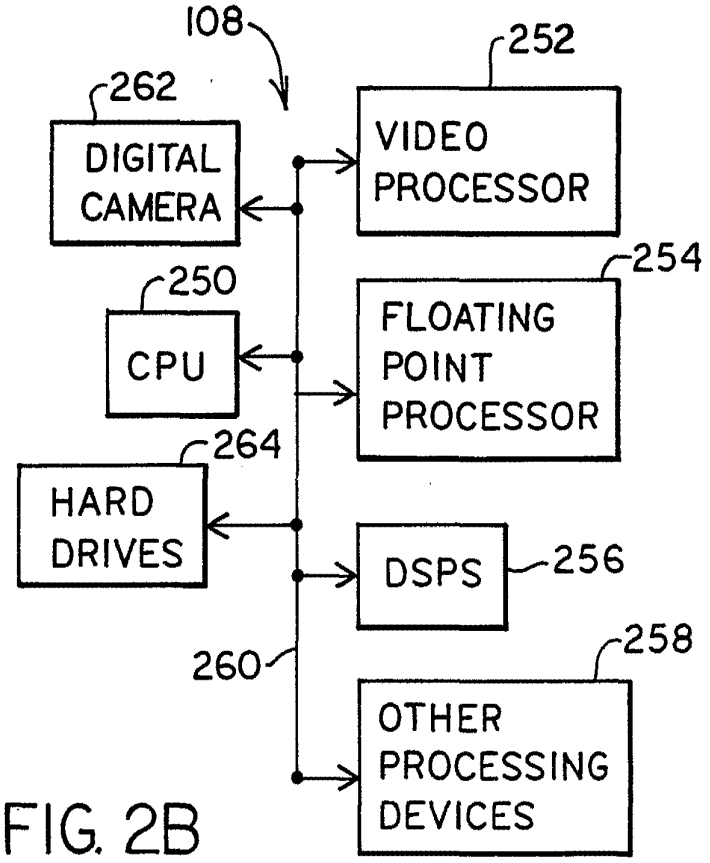

108
252
262
DIGITAL CAMERA
VIDEO PROCESSOR
254
250
CPU
FLOATING POINT PROCESSOR
264
HARD DRIVES
DSPS
256
260
258
OTHER PROCESSING DEVICES

FIG. 2B

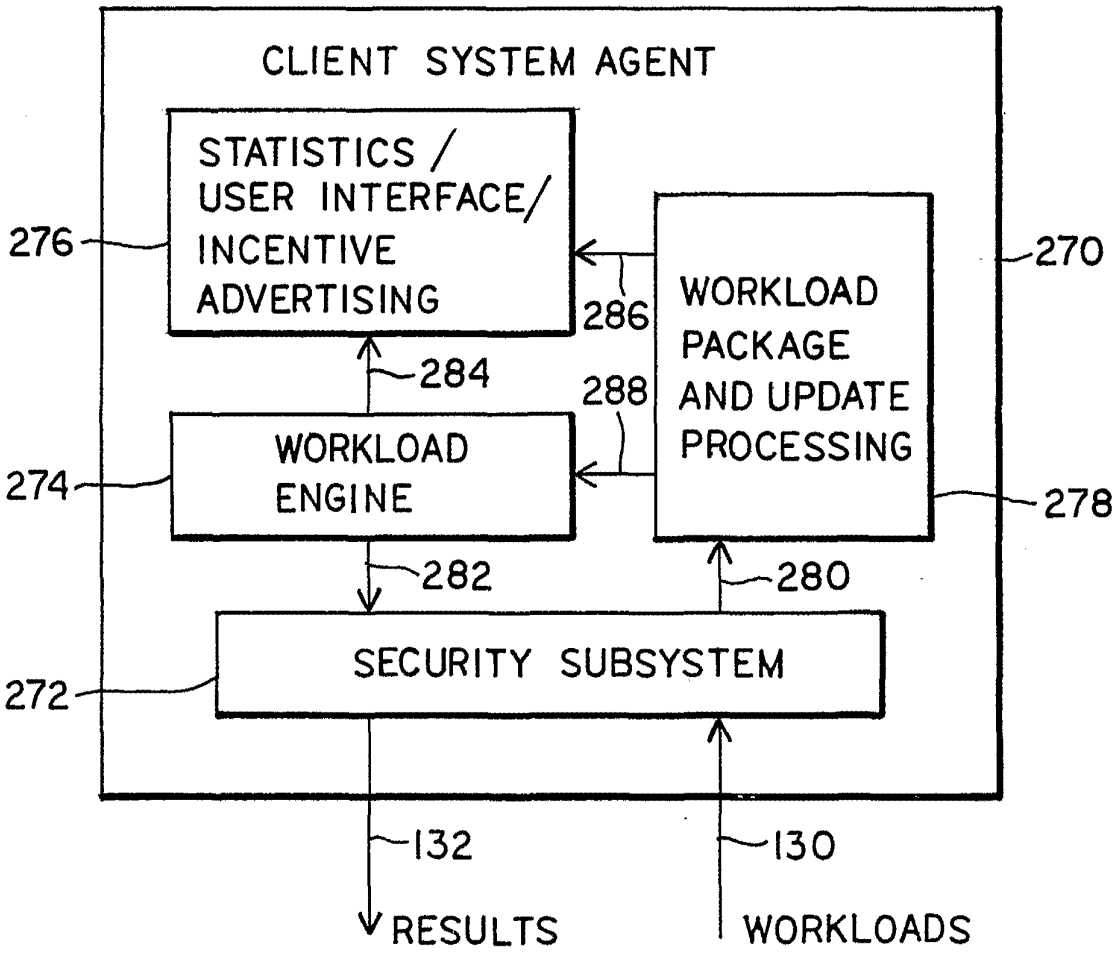

CLIENT SYSTEM AGENT
STATISTICS / USER INTERFACE/ INCENTIVE ADVERTISING
276
286
WORKLOAD PACKAGE AND UPDATE PROCESSING
270
284
288
WORKLOAD ENGINE
274
278
282
280
SECURITY SUBSYSTEM
272
132
130
RESULTS
WORKLOADS

FIG. 2C

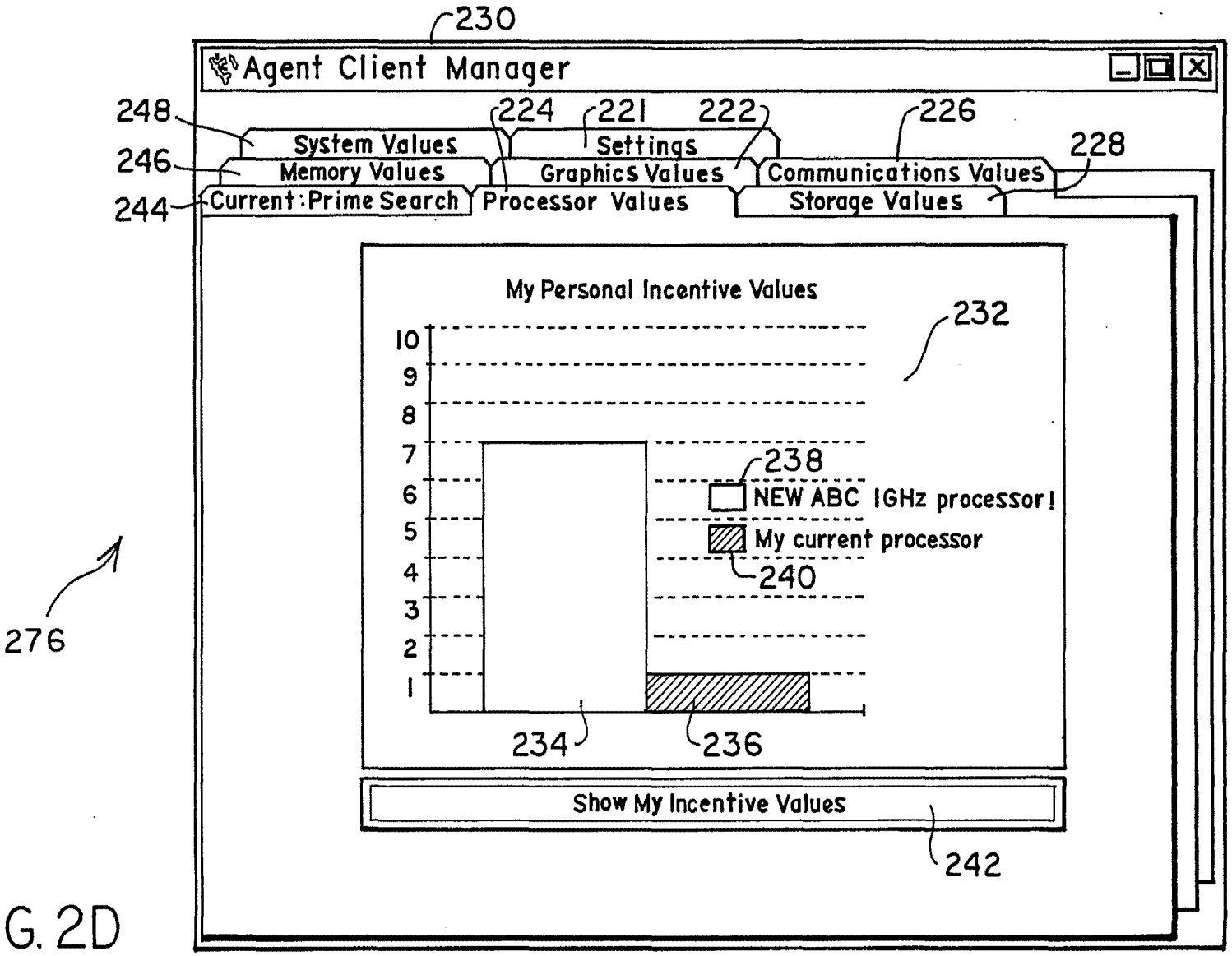

230
Agent Client Manager
248
246
244
224
221
222
226
228
System Values
Settings
Memory Values
Graphics Values
Communications Values
Current:Prime Search
Processor Values
Storage Values
My Personal Incentive Values
232
10
9
8
7
6
5
4
3
2
1
238
NEW ABC 1GHz processor!
My current processor
240
234
236
Show My Incentive Values
242
276

FIG. 2D

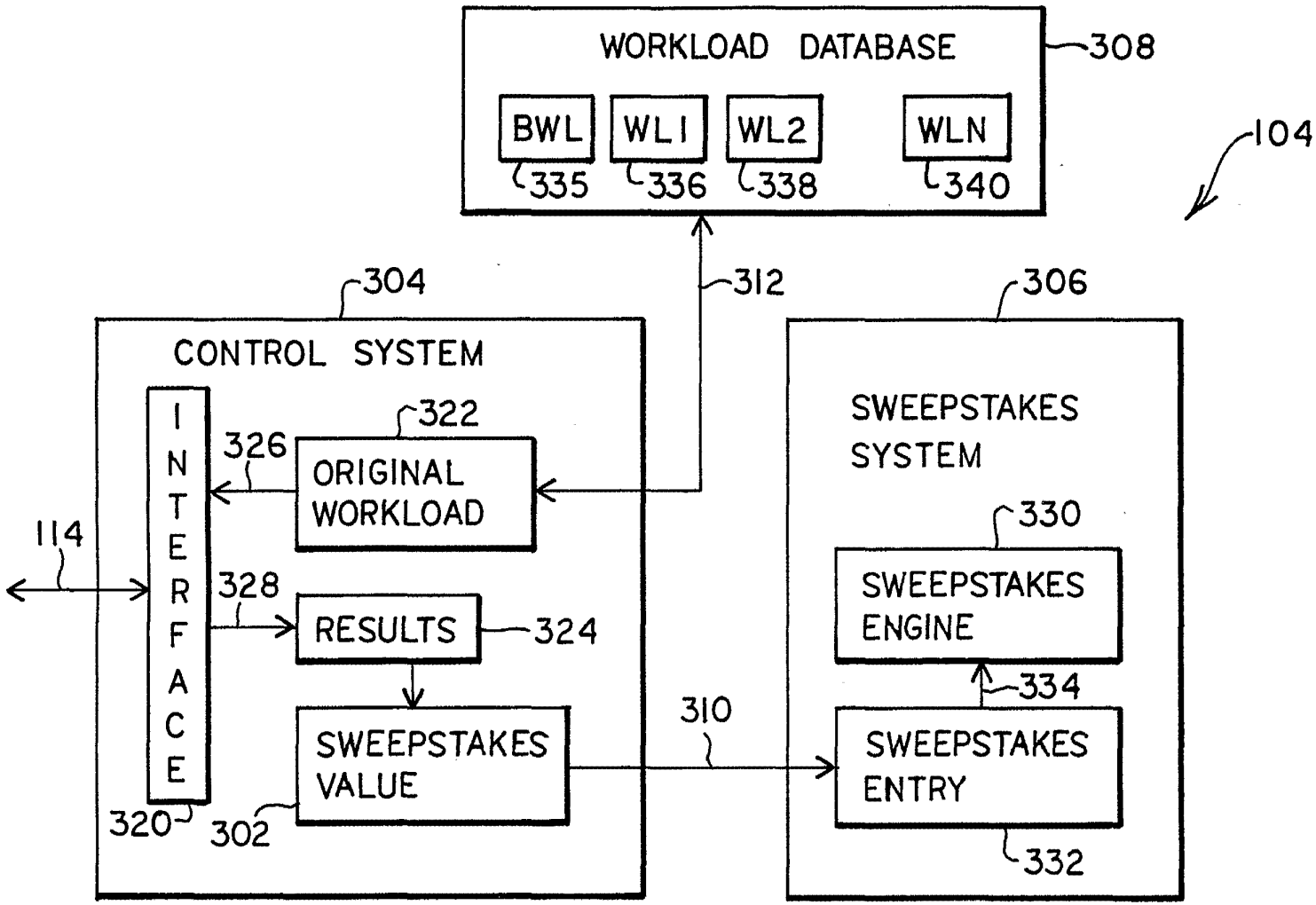

WORKLOAD DATABASE
308
BWL
335
WL1
336
WL2
338
WLN
340
104
304
CONTROL SYSTEM
312
306
SWEEPSTAKES SYSTEM
322
326
ORIGINAL WORKLOAD
330
SWEEPSTAKES ENGINE
114
INTERFACE
328
RESULTS
324
334
310
SWEEPSTAKES VALUE
SWEEPSTAKES ENTRY
320
302
332

FIG. 3A

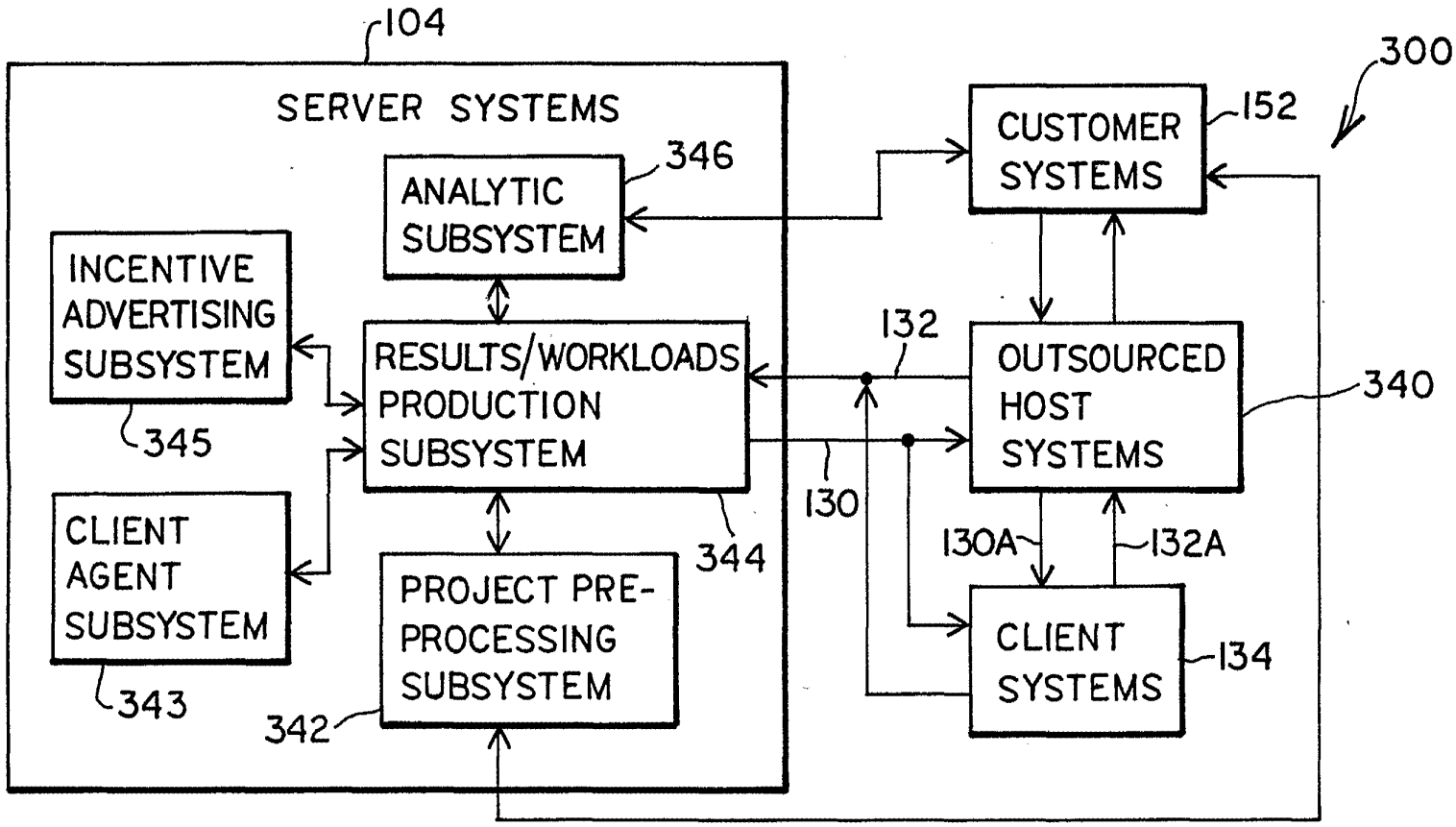

104
SERVER SYSTEMS
ANALYTIC SUBSYSTEM
346
INCENTIVE ADVERTISING SUBSYSTEM
345
RESULTS/WORKLOADS PRODUCTION SUBSYSTEM
344
CLIENT AGENT SUBSYSTEM
343
PROJECT PRE-PROCESSING SUBSYSTEM
342
300
CUSTOMER SYSTEMS
152
132
OUTSOURCED HOST SYSTEMS
340
130
130A
132A
CLIENT SYSTEMS
134

FIG. 3B

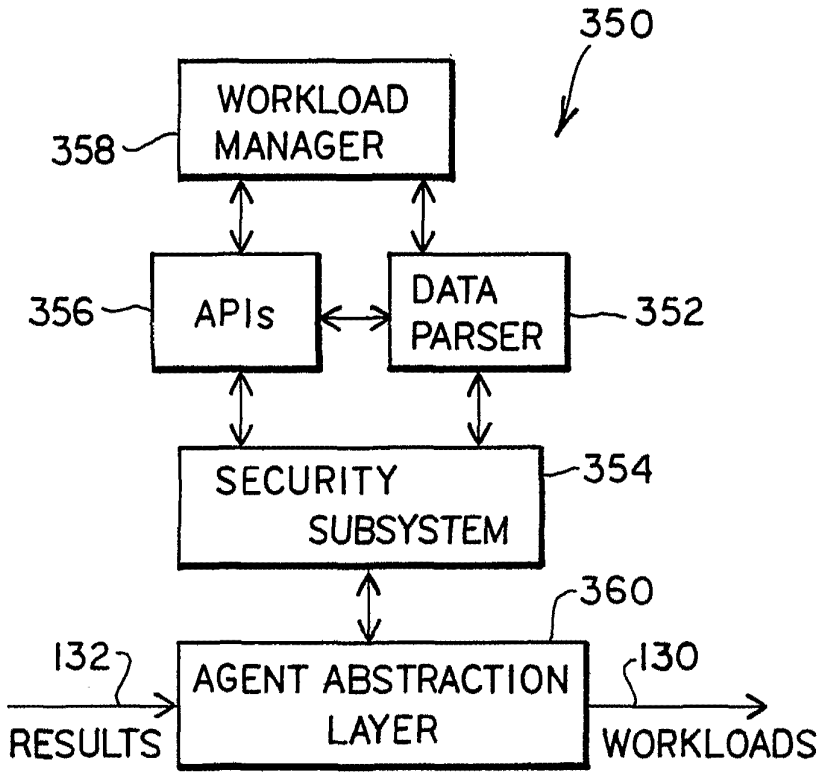

350
WORKLOAD MANAGER
358
APIs
356
DATA PARSER
352
SECURITY SUBSYSTEM
354
AGENT ABSTRACTION LAYER
360
132
RESULTS
130
WORKLOADS

FIG. 3C

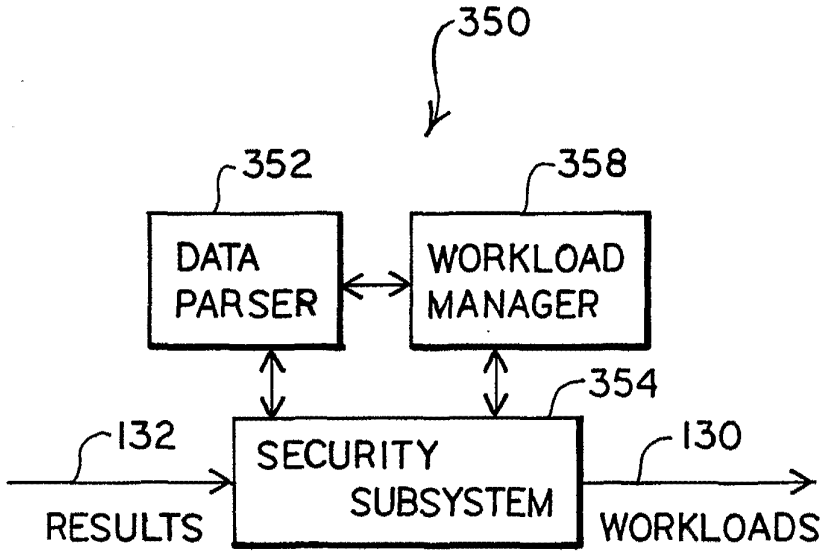

350
352
DATA PARSER
358
WORKLOAD MANAGER
354
132
RESULTS
SECURITY SUBSYSTEM
130
WORKLOADS

FIG. 3D

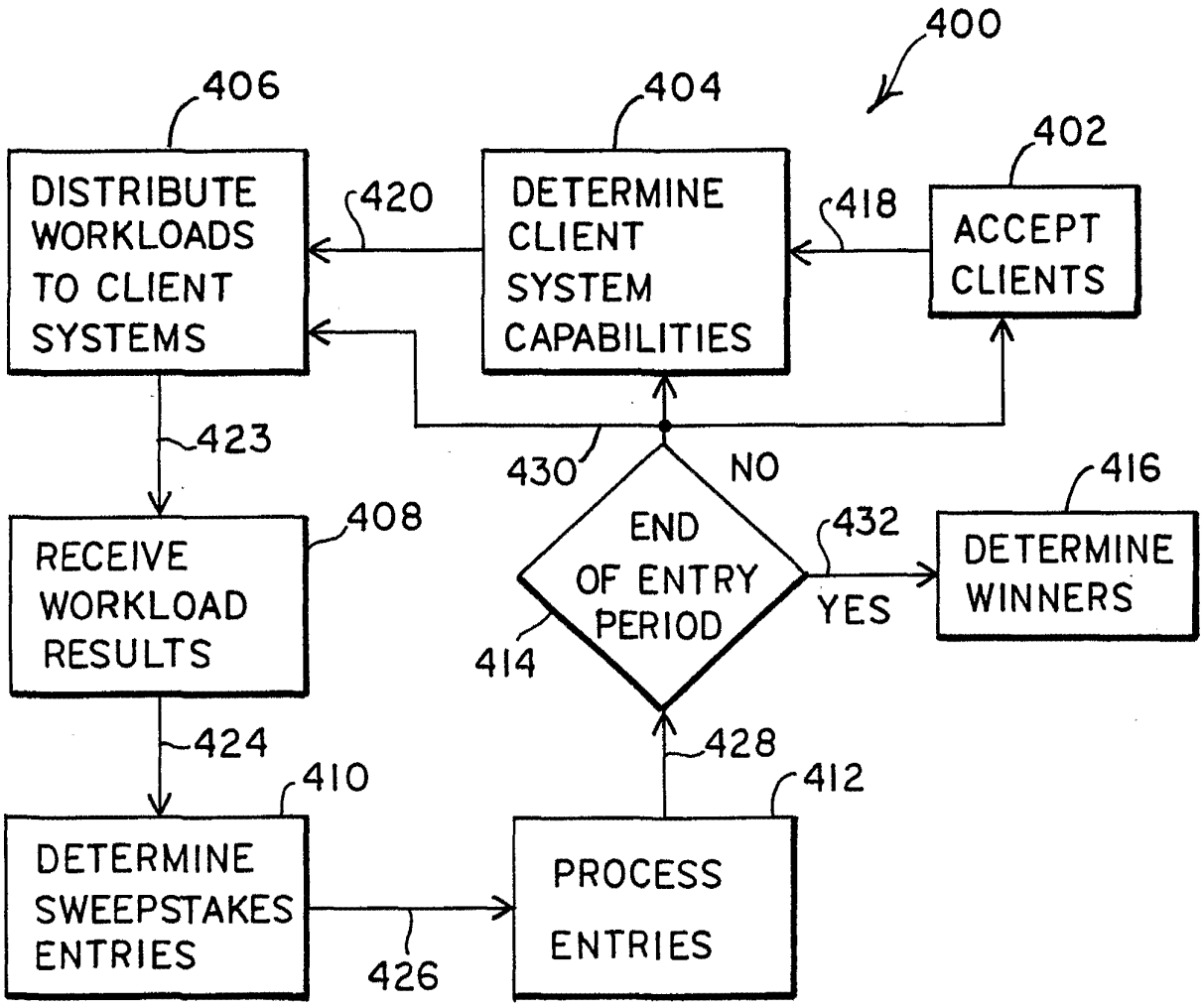

400
406
404
402
DISTRIBUTE WORKLOADS TO CLIENT SYSTEMS
420
DETERMINE CLIENT SYSTEM CAPABILITIES
418
ACCEPT CLIENTS
423
430
NO
416
408
RECEIVE WORKLOAD RESULTS
END OF ENTRY PERIOD
432
DETERMINE WINNERS
YES
414
424
428
410
412
DETERMINE SWEEPSTAKES ENTRIES
PROCESS ENTRIES
426

FIG. 4

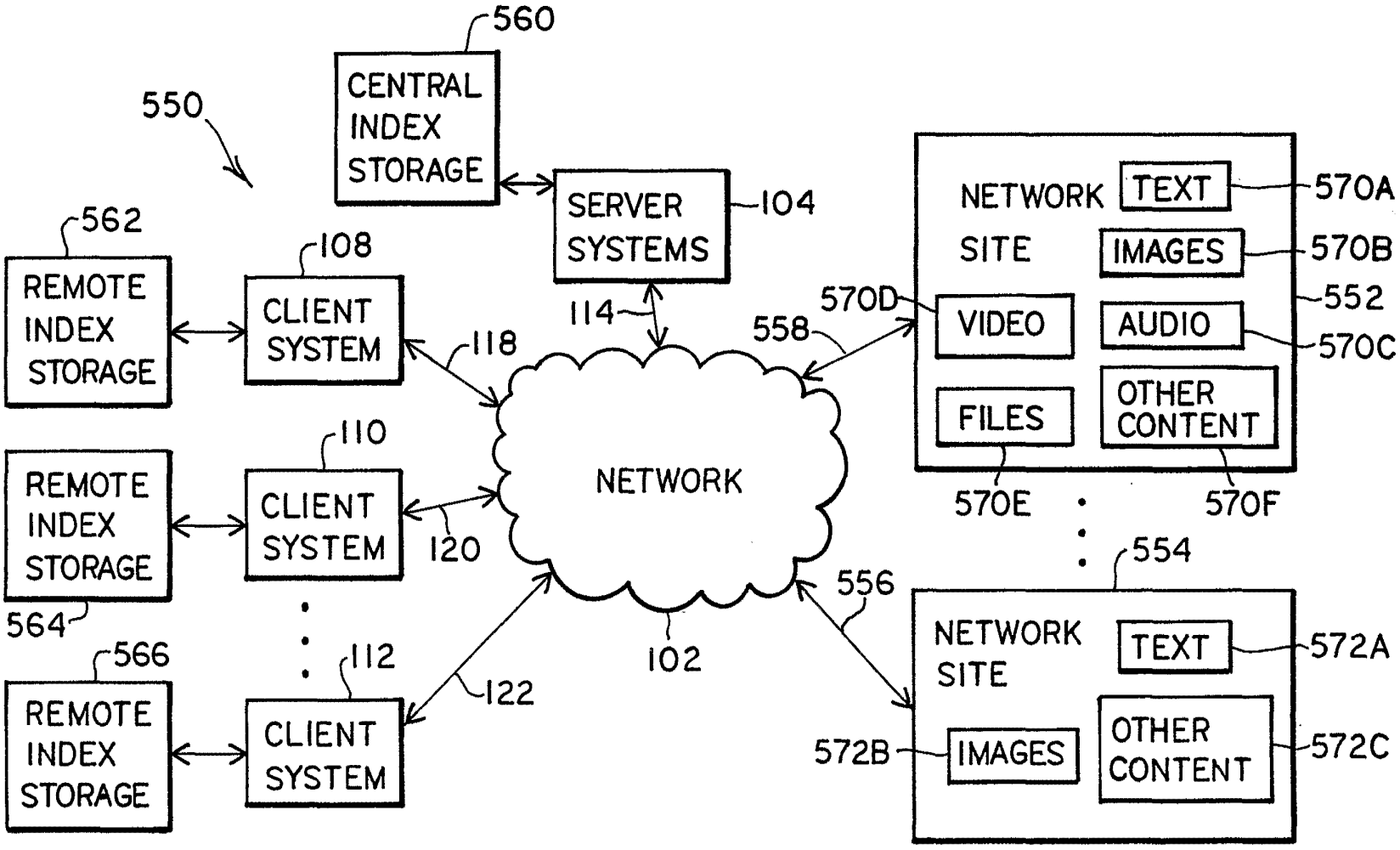

550
560
CENTRAL INDEX STORAGE
SERVER SYSTEMS
104
562
REMOTE INDEX STORAGE
108
CLIENT SYSTEM
114
118
NETWORK
558
570D
NETWORK SITE
TEXT
570A
IMAGES
570B
552
VIDEO
AUDIO
570C
FILES
OTHER CONTENT
570E
570F
110
REMOTE INDEX STORAGE
CLIENT SYSTEM
120
564
554
556
566
REMOTE INDEX STORAGE
112
CLIENT SYSTEM
122
102
NETWORK SITE
TEXT
572A
572B
IMAGES
OTHER CONTENT
572C

FIG. 5A

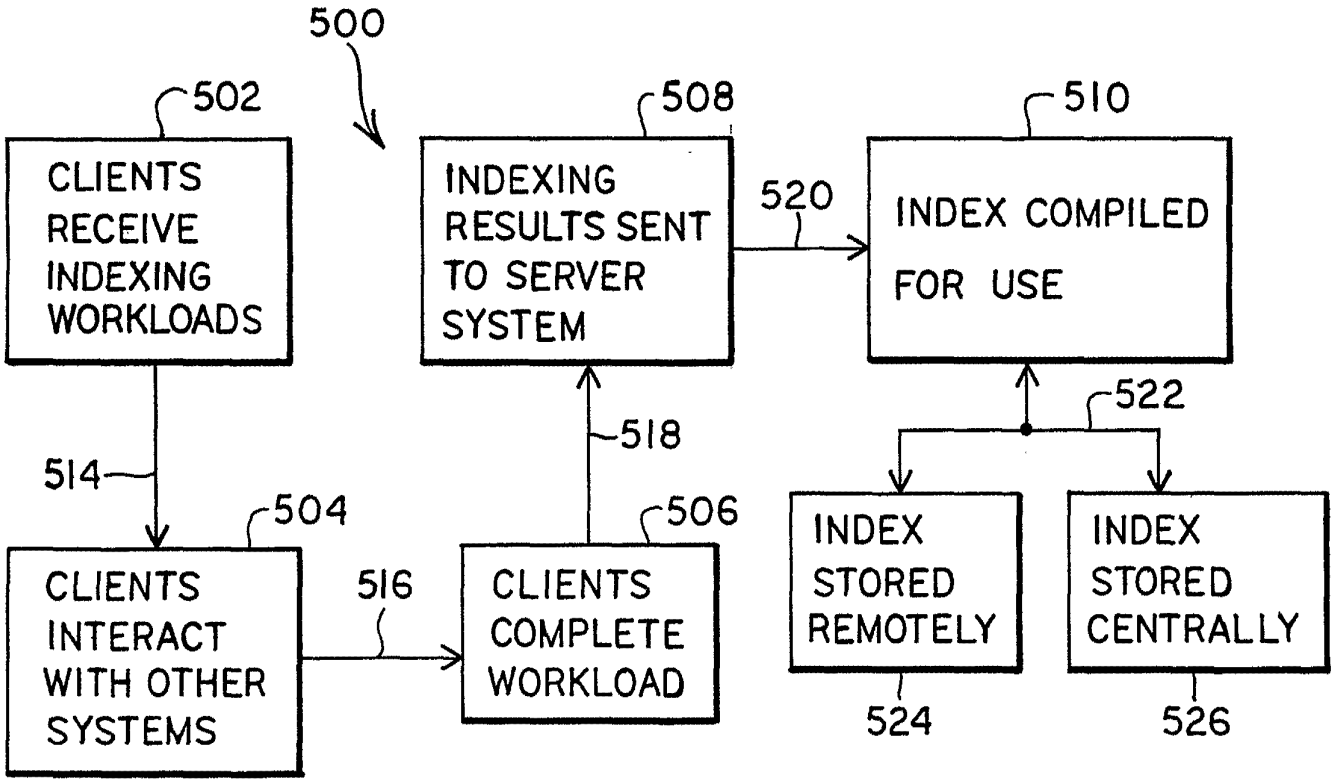

500
502
CLIENTS RECEIVE INDEXING WORKLOADS
508
INDEXING RESULTS SENT TO SERVER SYSTEM
520
510
INDEX COMPILED FOR USE
522
514
518
504
CLIENTS INTERACT WITH OTHER SYSTEMS
516
506
CLIENTS COMPLETE WORKLOAD
INDEX STORED REMOTELY
INDEX STORED CENTRALLY
524
526

FIG. 5B

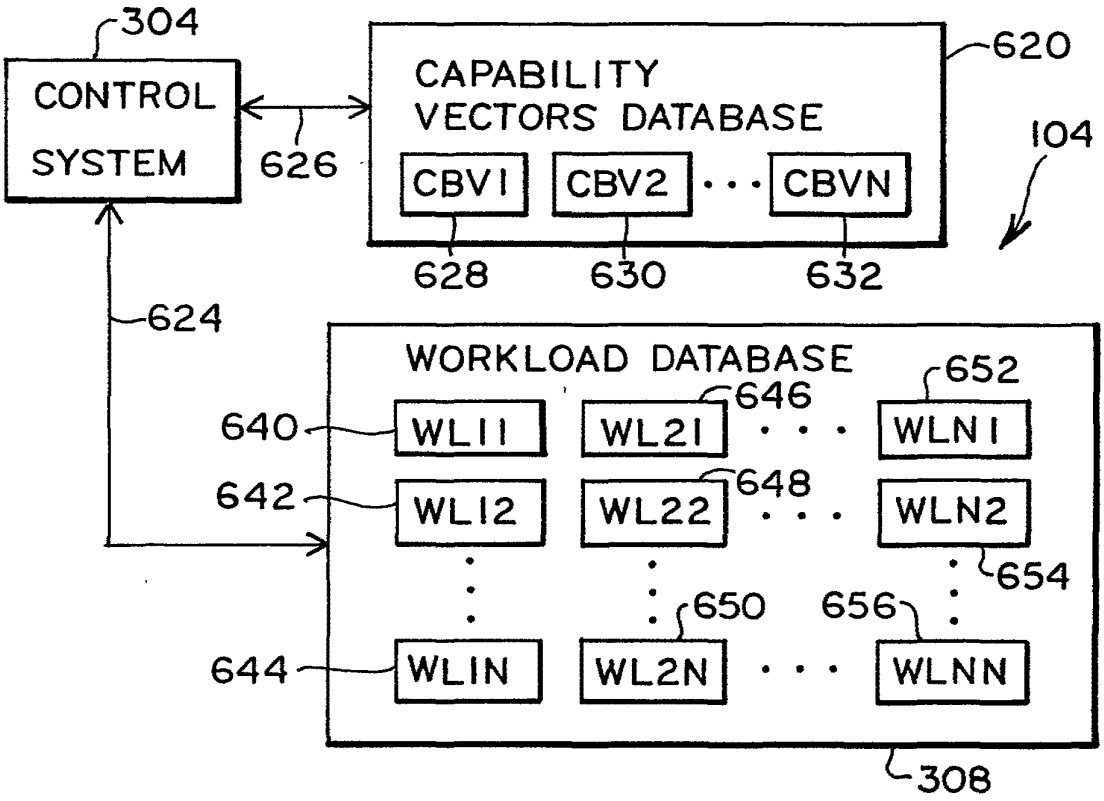

304
CONTROL SYSTEM
626
CAPABILITY VECTORS DATABASE
620
104
CBV1
CBV2
CBVN
628
630
632
624
WORKLOAD DATABASE
652
646
640
WL11
WL21
WLN1
642
WL12
WL22
648
WLN2
654
650
656
644
WLIN
WL2N
WLNN
308

FIG. 6A

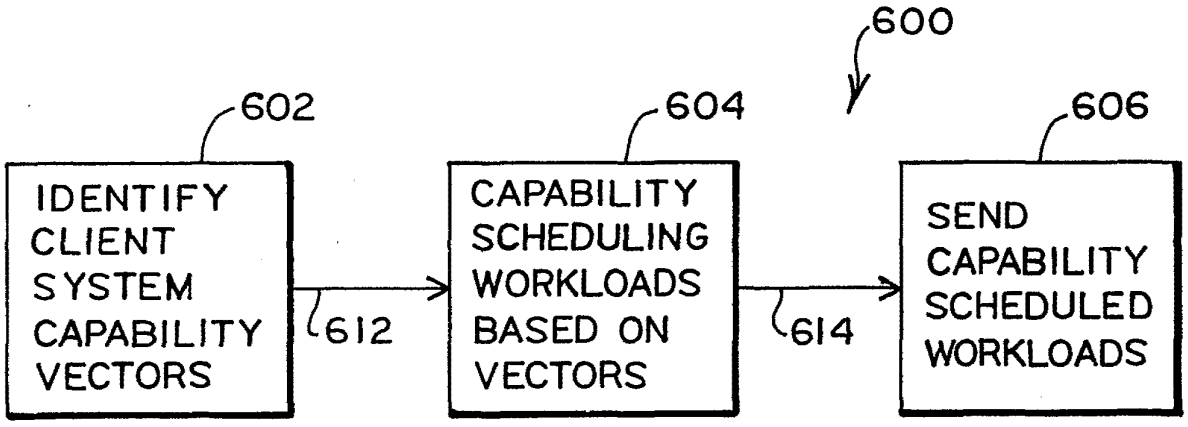

600
602
IDENTIFY CLIENT SYSTEM CAPABILITY VECTORS
612
604
CAPABILITY SCHEDULING WORKLOADS BASED ON VECTORS
614
606
SEND CAPABILITY SCHEDULED WORKLOADS

FIG. 6B

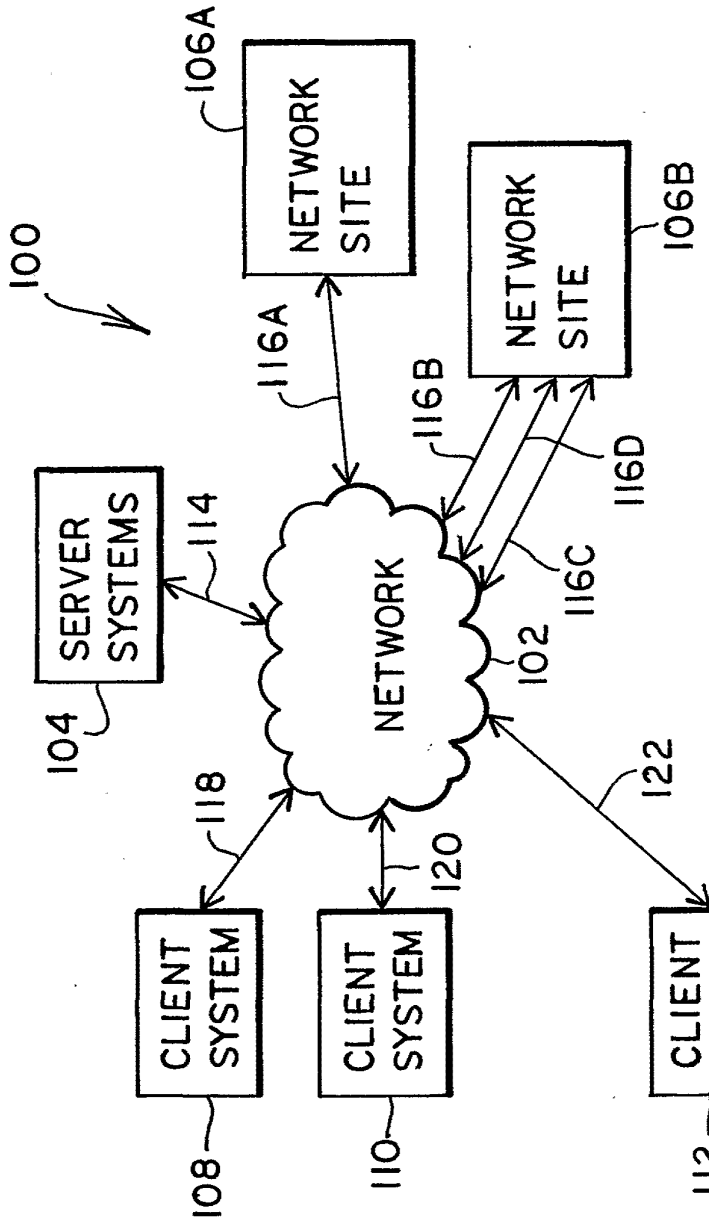

100
106A
NETWORK SITE
106B
NETWORK SITE
116A
116B
116C
116D
SERVER SYSTEMS
114
104
NETWORK
102
118
120
122
CLIENT SYSTEM
108
CLIENT SYSTEM
110
CLIENT SYSTEM
112

FIG. 7A

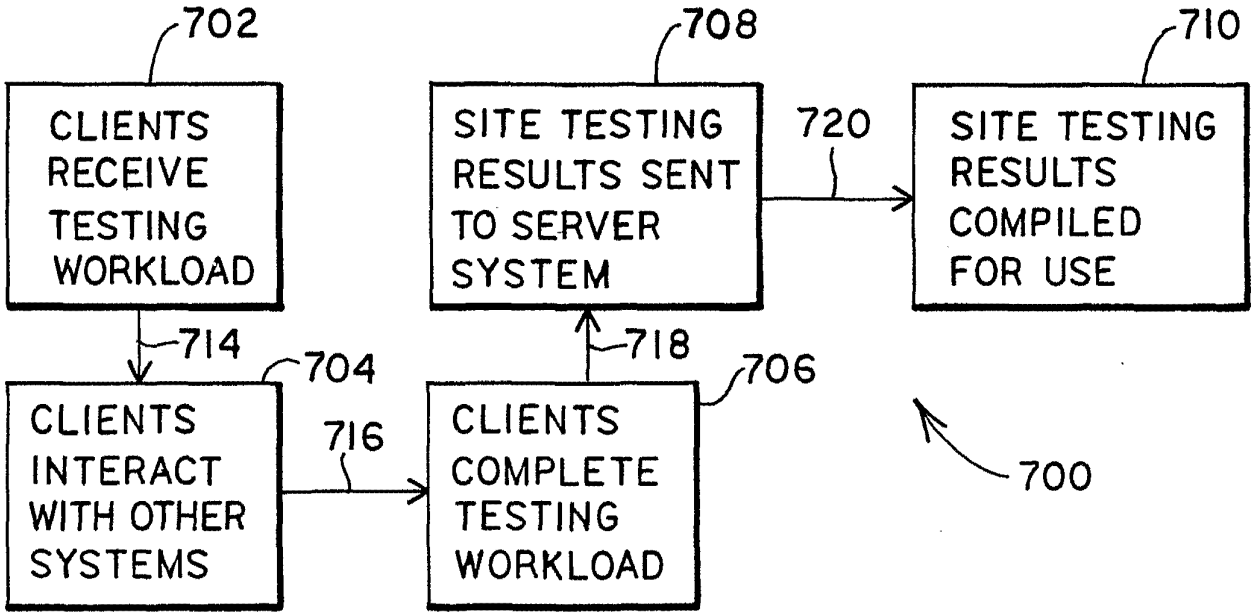

702
CLIENTS RECEIVE TESTING WORKLOAD
714
704
CLIENTS INTERACT WITH OTHER SYSTEMS
716
706
CLIENTS COMPLETE TESTING WORKLOAD
718
708
SITE TESTING RESULTS SENT TO SERVER SYSTEM
720
710
SITE TESTING RESULTS COMPILED FOR USE
700

FIG. 7B

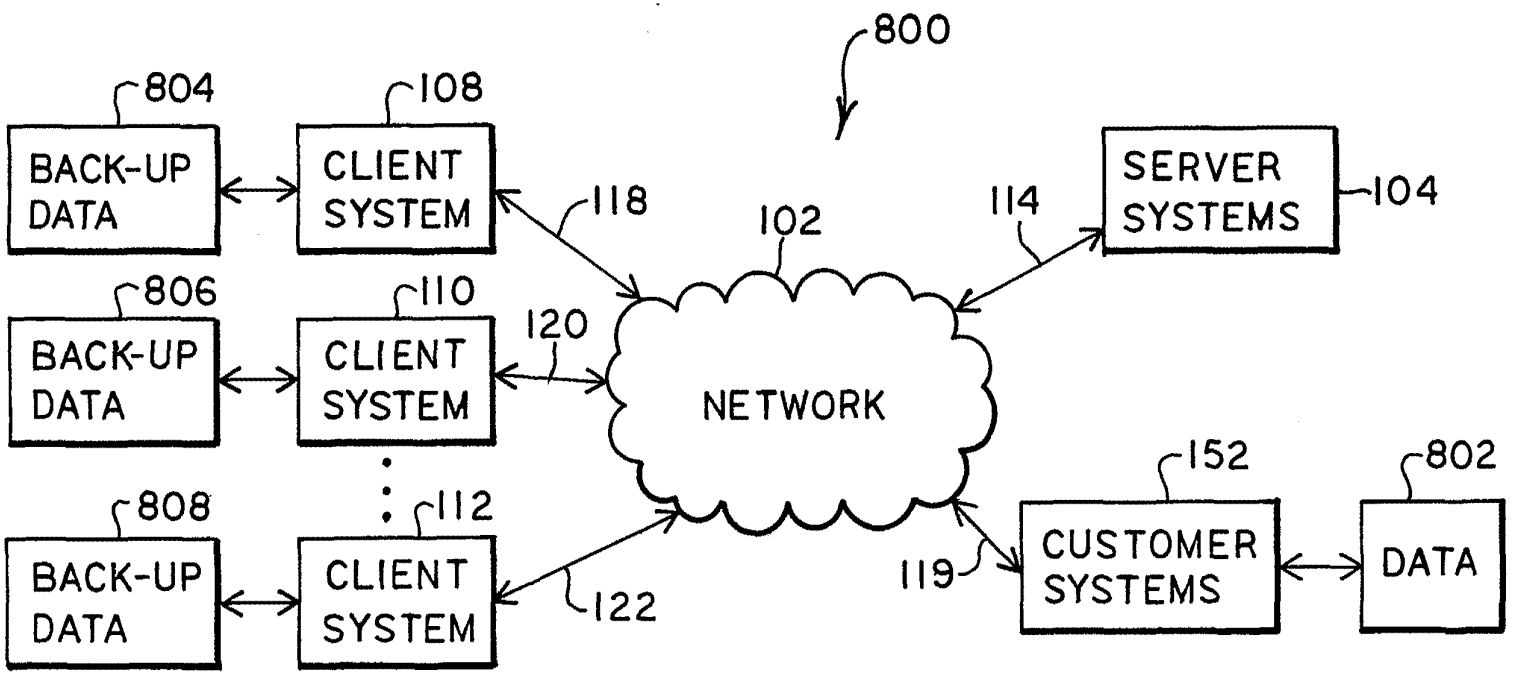

800
804
108
BACK-UP DATA
CLIENT SYSTEM
118
102
114
SERVER SYSTEMS
104
806
110
BACK-UP DATA
CLIENT SYSTEM
120
NETWORK
808
112
BACK-UP DATA
CLIENT SYSTEM
122
152
802
119
CUSTOMER SYSTEMS
DATA

FIG. 8

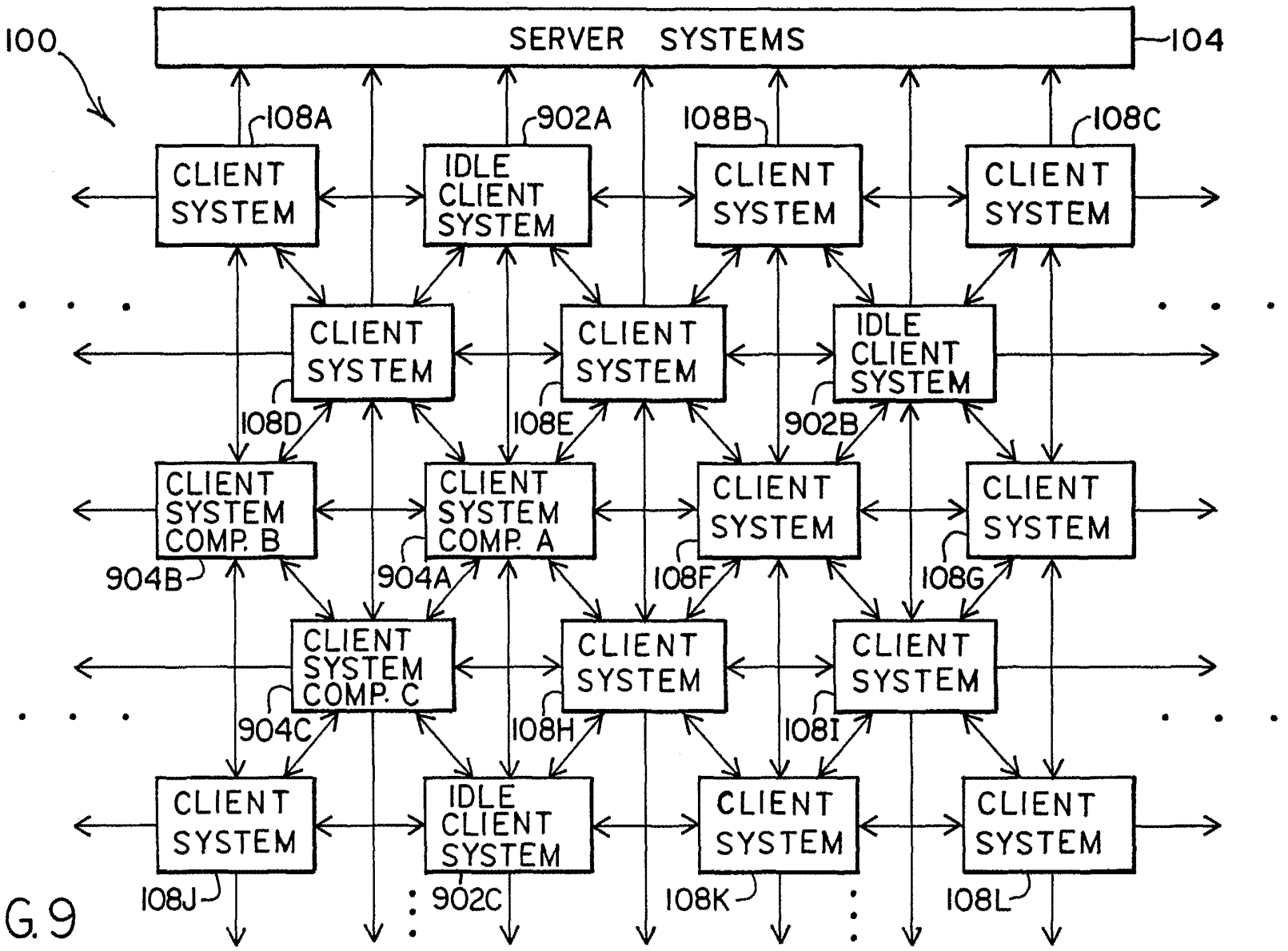

100
SERVER SYSTEMS
104
108A
902A
108B
108C
CLIENT SYSTEM
IDLE CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
IDLE CLIENT SYSTEM
108D
108E
902B
CLIENT SYSTEM COMP. B
CLIENT SYSTEM COMP. A
CLIENT SYSTEM
CLIENT SYSTEM
904B
904A
108F
108G
CLIENT SYSTEM COMP. C
CLIENT SYSTEM
CLIENT SYSTEM
904C
108H
108I
CLIENT SYSTEM
IDLE CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
108J
902C
108K
108L

FIG. 9

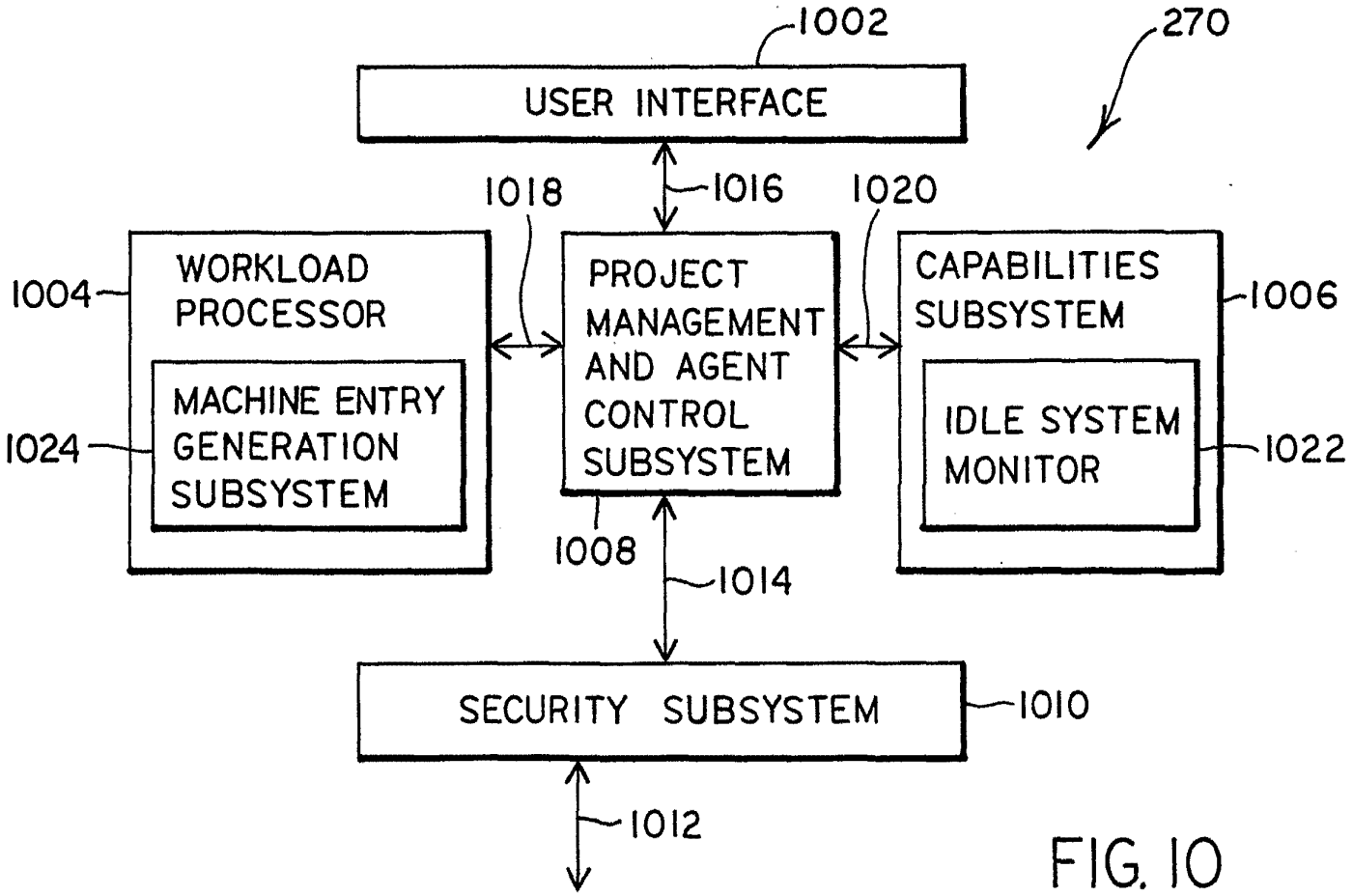

1002
270
USER INTERFACE
1018
1016
1020
1004
WORKLOAD PROCESSOR
PROJECT MANAGEMENT AND AGENT CONTROL SUBSYSTEM
CAPABILITIES SUBSYSTEM
1006
MACHINE ENTRY GENERATION SUBSYSTEM
1024
IDLE SYSTEM MONITOR
1022
1008
1014
SECURITY SUBSYSTEM
1010
1012

FIG. 10

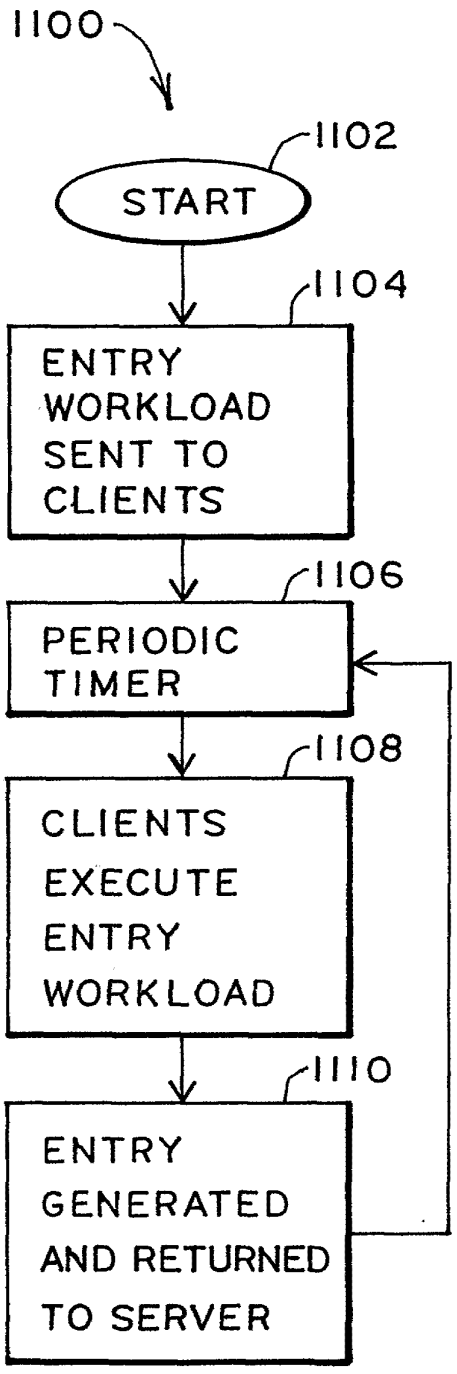


FIG. 11A

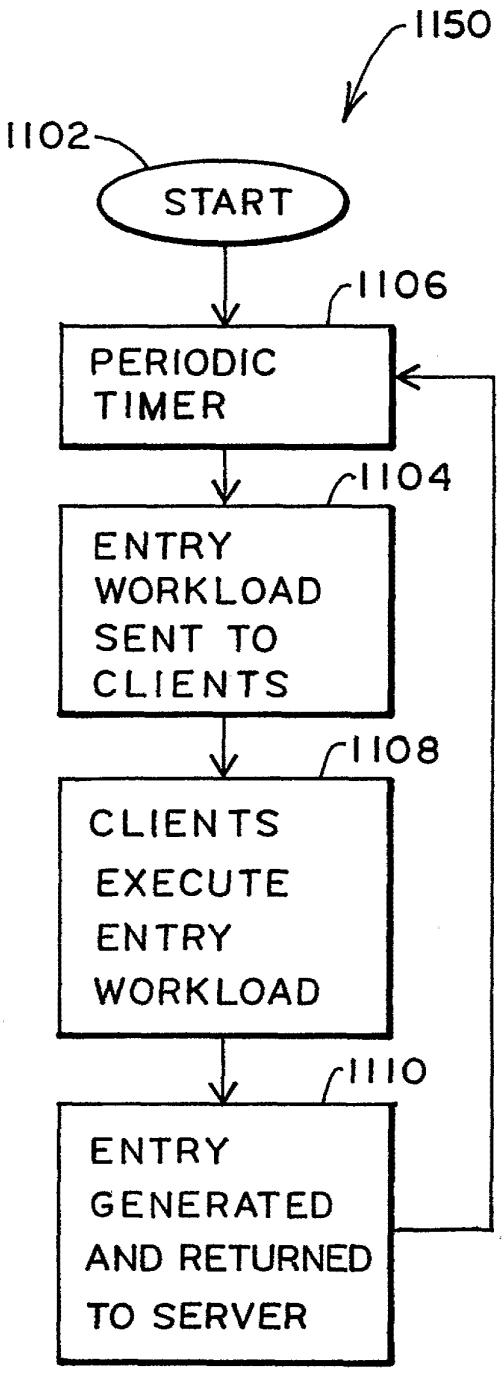


FIG. 11B

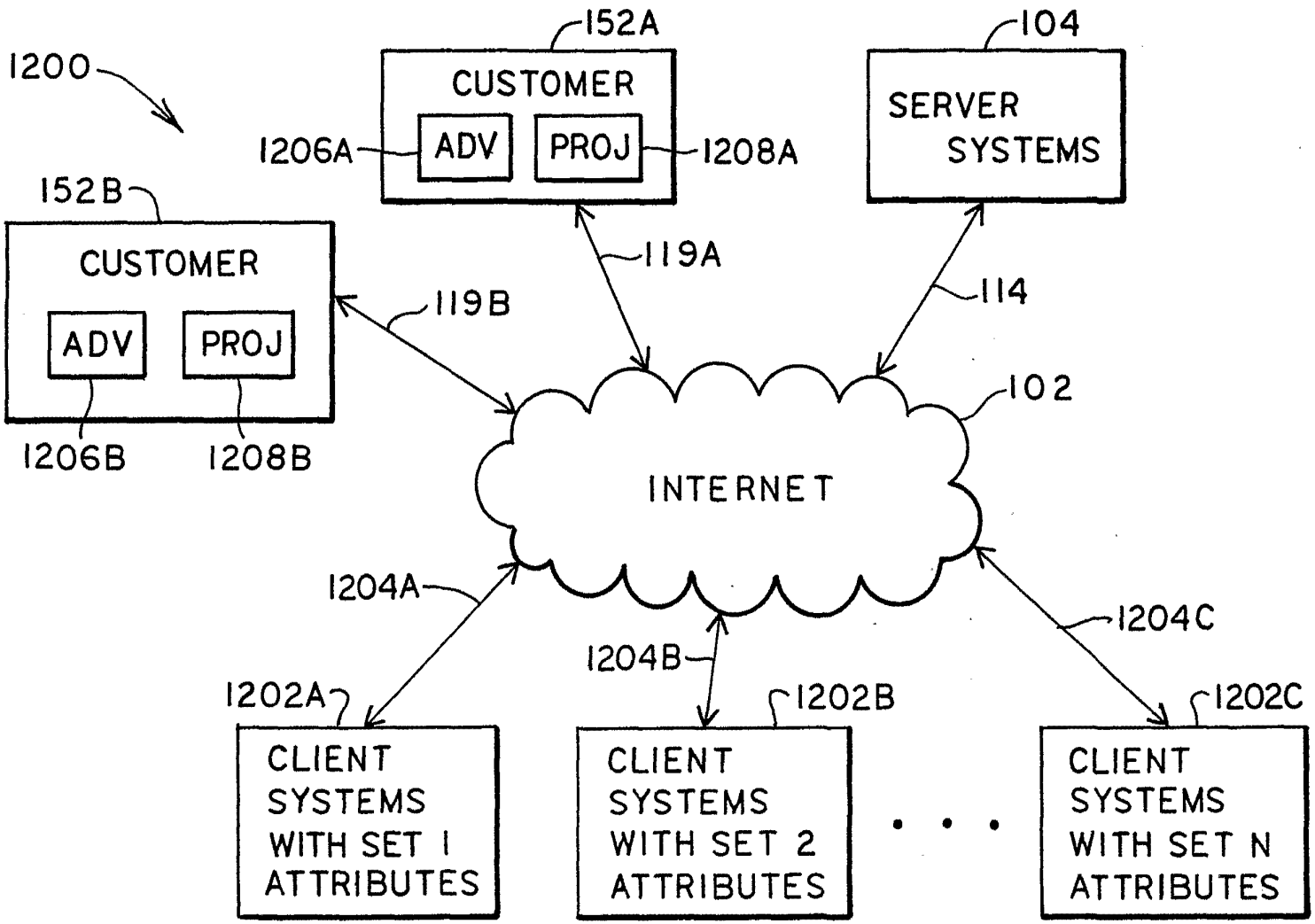

1200
152A
CUSTOMER
ADV
PROJ
1206A
1208A
104
SERVER SYSTEMS
152B
CUSTOMER
ADV
PROJ
1206B
1208B
119A
119B
114
102
INTERNET
1204A
1204B
1204C
1202A
1202B
1202C
CLIENT SYSTEMS WITH SET 1 ATTRIBUTES
CLIENT SYSTEMS WITH SET 2 ATTRIBUTES
CLIENT SYSTEMS WITH SET N ATTRIBUTES

FIG. 12A

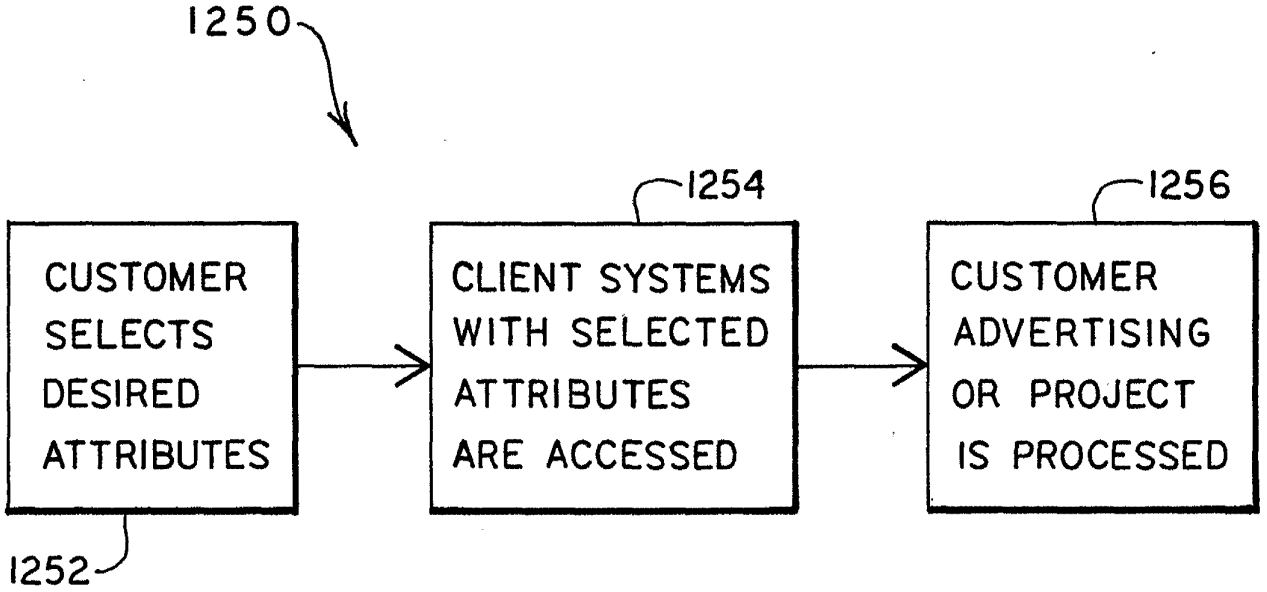

1250
1254
1256
CUSTOMER SELECTS DESIRED ATTRIBUTES
CLIENT SYSTEMS WITH SELECTED ATTRIBUTES ARE ACCESSED
CUSTOMER ADVERTISING OR PROJECT IS PROCESSED
1252

FIG. 12B

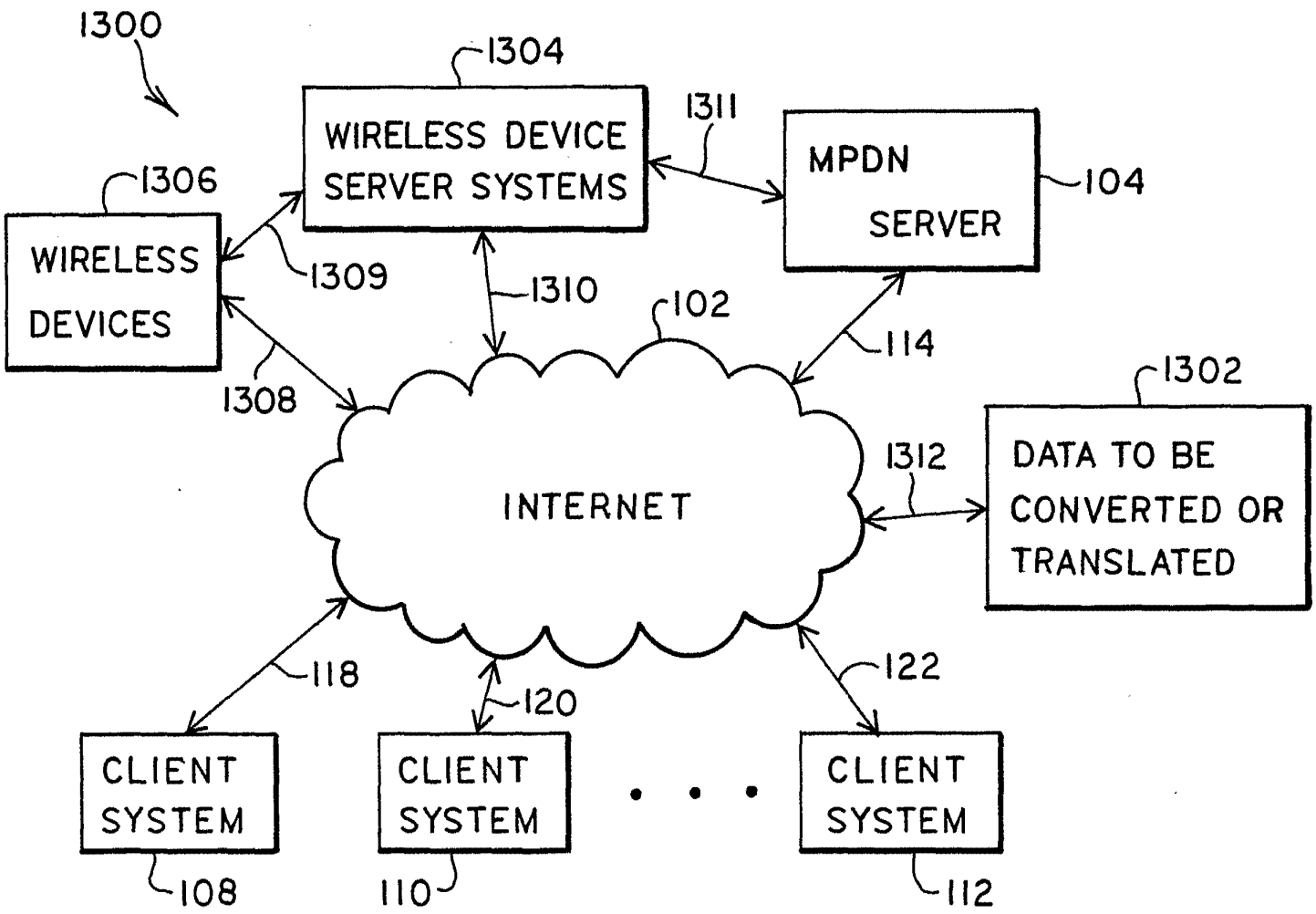

1300
1304
WIRELESS DEVICE SERVER SYSTEMS
1311
MPDN SERVER
104
1306
WIRELESS DEVICES
1309
1310
102
114
1308
1302
INTERNET
1312
DATA TO BE CONVERTED OR TRANSLATED
118
120
122
CLIENT SYSTEM
CLIENT SYSTEM
CLIENT SYSTEM
108
110
112

FIG. 13A

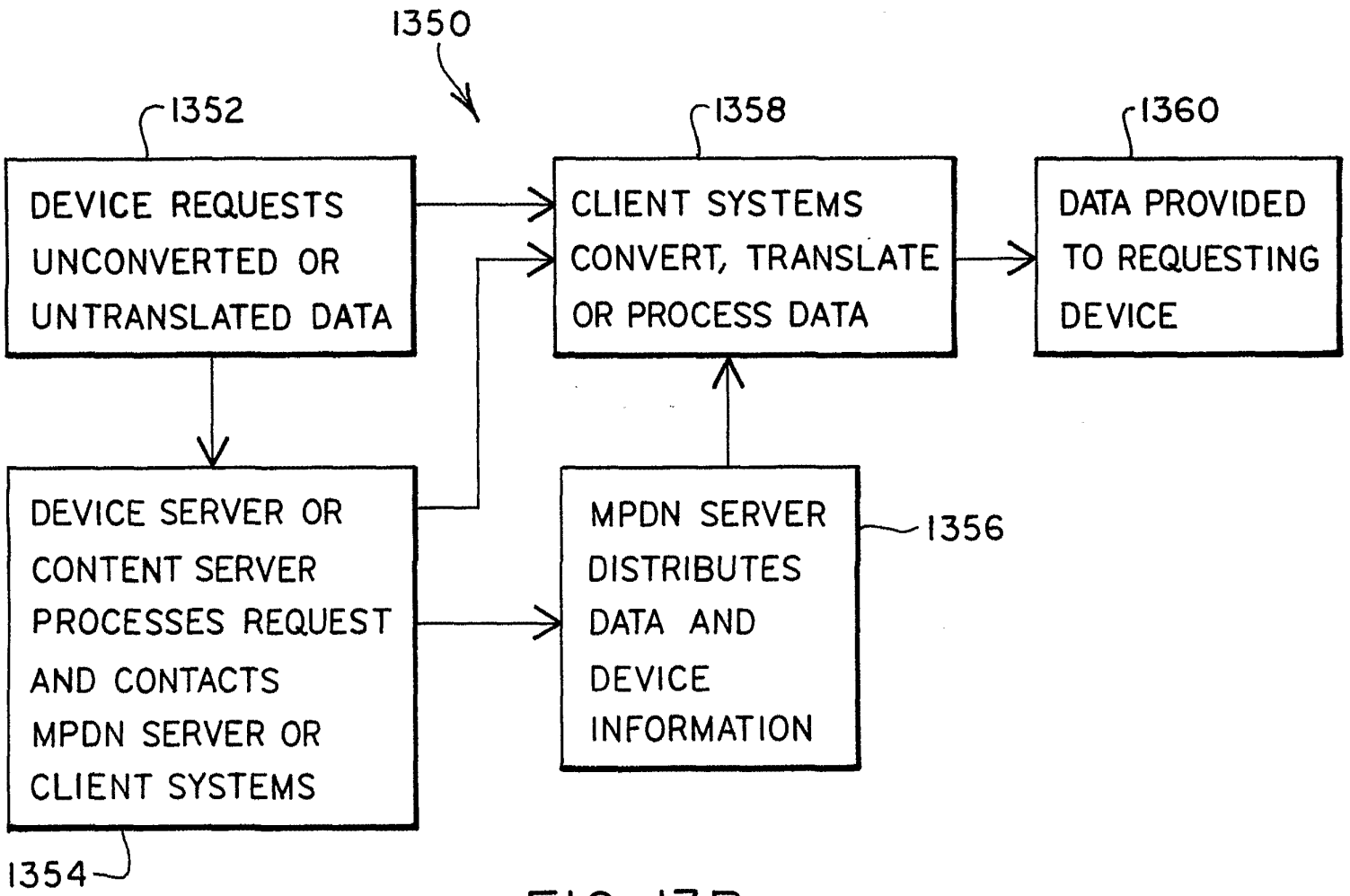

1350
1352
1358
1360
DEVICE REQUESTS UNCONVERTED OR UNTRANSLATED DATA
CLIENT SYSTEMS CONVERT, TRANSLATE OR PROCESS DATA
DATA PROVIDED TO REQUESTING DEVICE
DEVICE SERVER OR CONTENT SERVER PROCESSES REQUEST AND CONTACTS MPDN SERVER OR CLIENT SYSTEMS
MPDN SERVER DISTRIBUTES DATA AND DEVICE INFORMATION
1356
1354

FIG. 13B

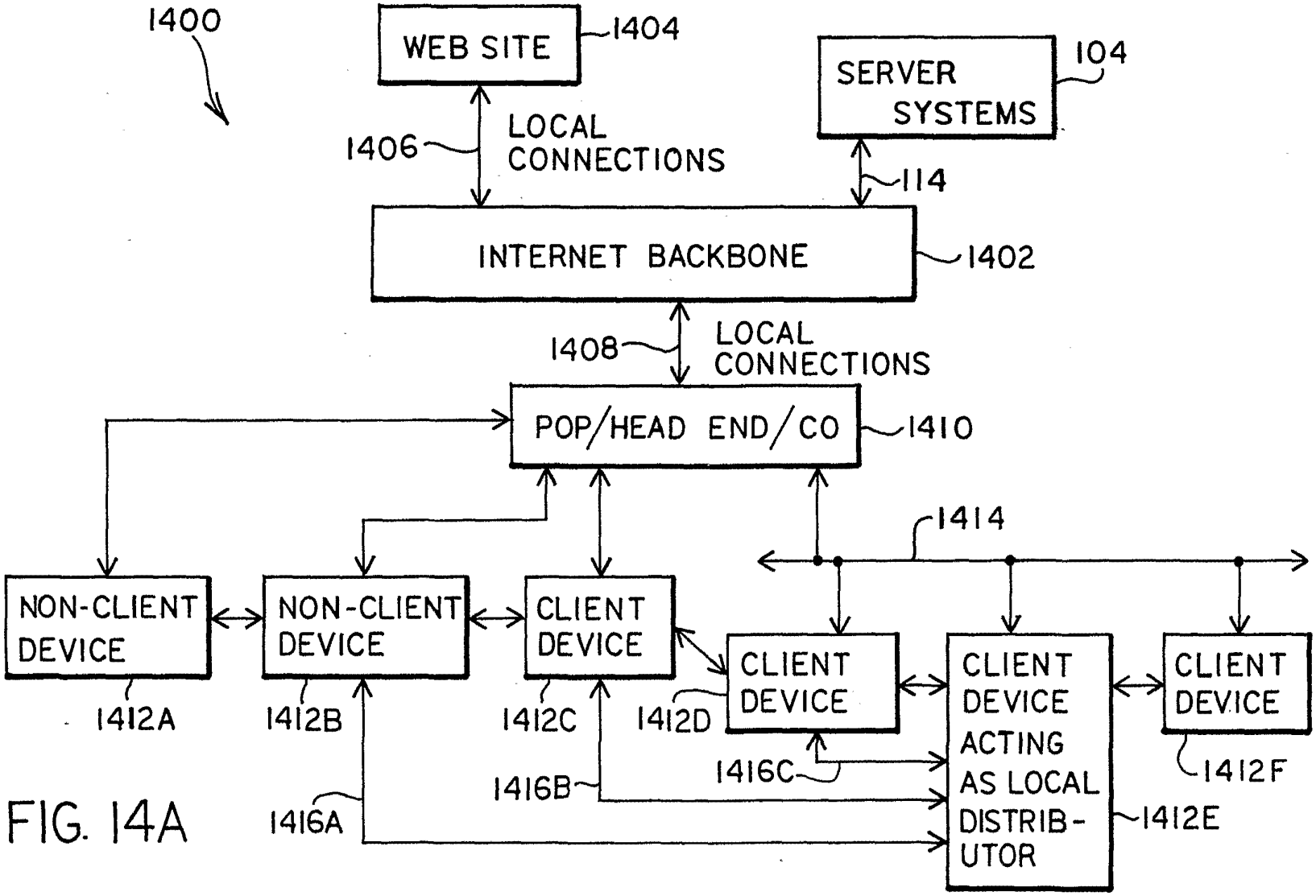

1400
WEB SITE
1404
SERVER SYSTEMS
104
1406
LOCAL CONNECTIONS
114
INTERNET BACKBONE
1402
1408
LOCAL CONNECTIONS
POP/HEAD END/CO
1410
1414
NON-CLIENT DEVICE
NON-CLIENT DEVICE
CLIENT DEVICE
CLIENT DEVICE
CLIENT DEVICE ACTING AS LOCAL DISTRIB-UTOR
CLIENT DEVICE
1412A
1412B
1412C
1412D
1412E
1412F
1416A
1416B
1416C

FIG. 14A

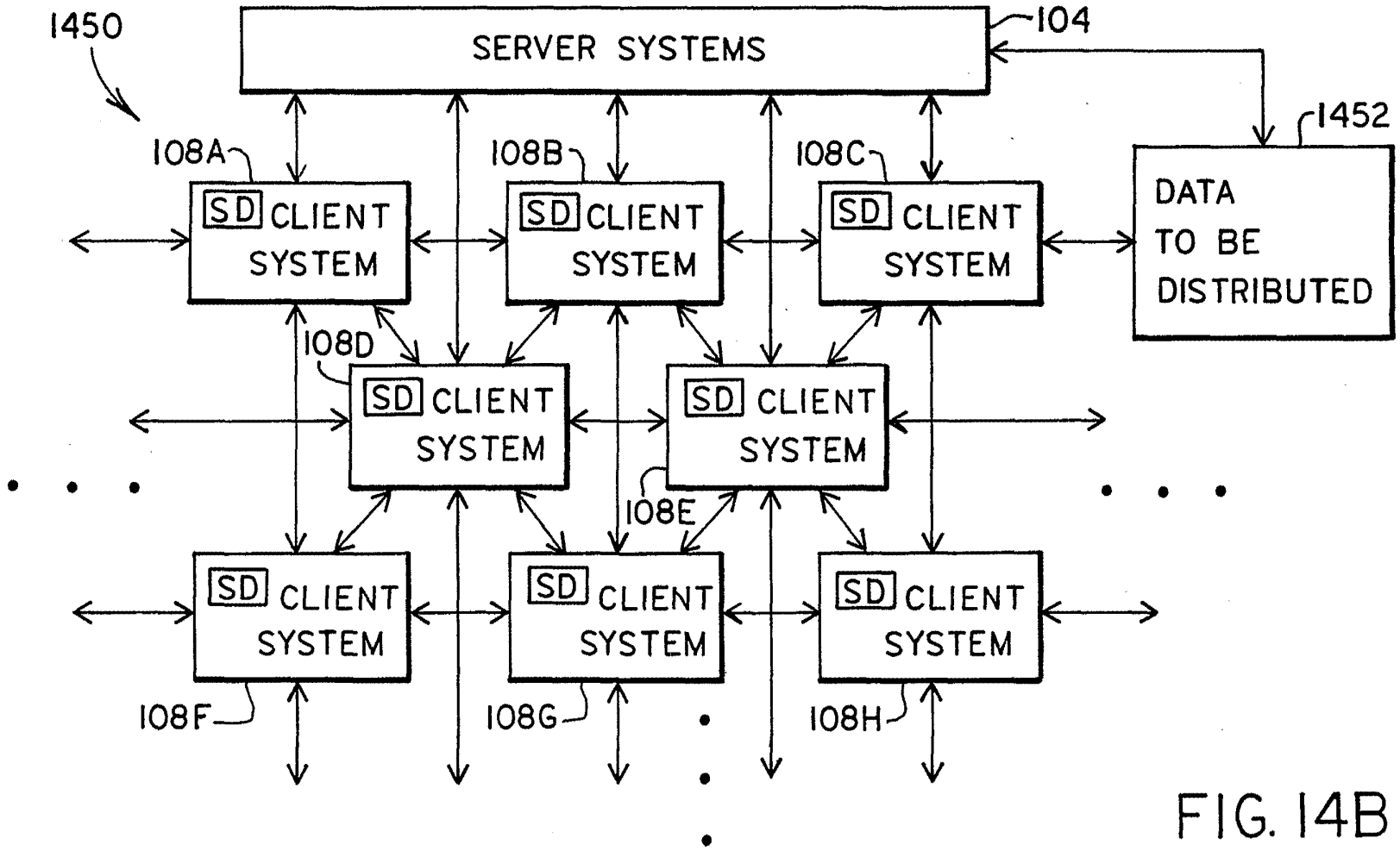

1450
SERVER SYSTEMS
104
1452
DATA TO BE DISTRIBUTED
108A
108B
108C
108D
108E
108F
108G
108H
SD CLIENT SYSTEM

FIG. 14B

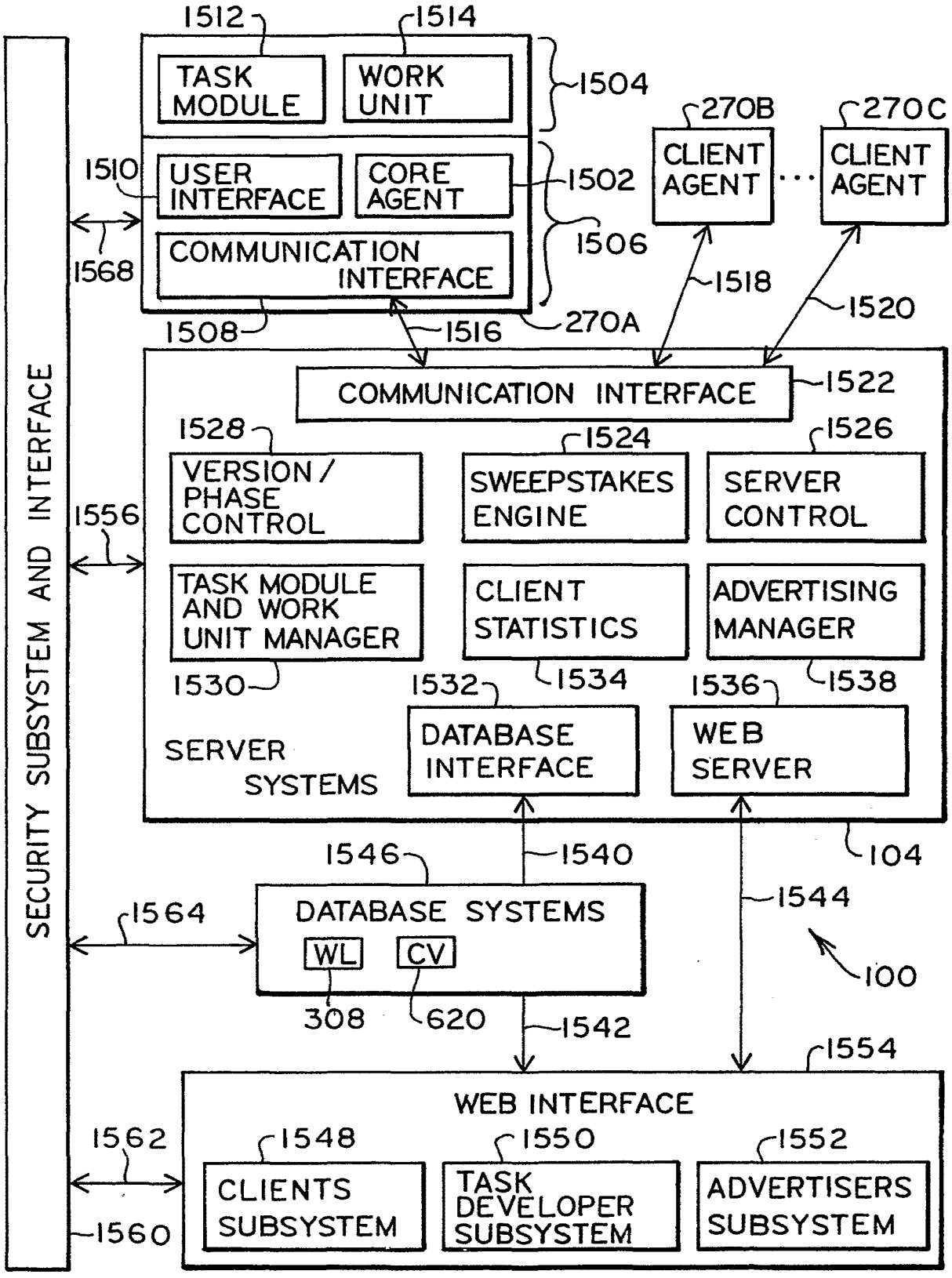

1512
1514
TASK MODULE
WORK UNIT
1504
270B
270C
CLIENT AGENT
CLIENT AGENT
1510
USER INTERFACE
CORE AGENT
1502
1506
1568
COMMUNICATION INTERFACE
1518
1520
1508
1516
270A
SECURITY SUBSYSTEM AND INTERFACE
COMMUNICATION INTERFACE
1522
1528
1524
1526
VERSION / PHASE CONTROL
SWEEPSTAKES ENGINE
SERVER CONTROL
1556
TASK MODULE AND WORK UNIT MANAGER
CLIENT STATISTICS
ADVERTISING MANAGER
1530
1532
1534
1536
1538
SERVER SYSTEMS
DATABASE INTERFACE
WEB SERVER
104
1546
1540
1544
1564
DATABASE SYSTEMS
WL
CV
100
308
620
1542
1554
WEB INTERFACE
1562
1548
1550
1552
CLIENTS SUBSYSTEM
TASK DEVELOPER SUBSYSTEM
ADVERTISERS SUBSYSTEM
1560

FIG. 15

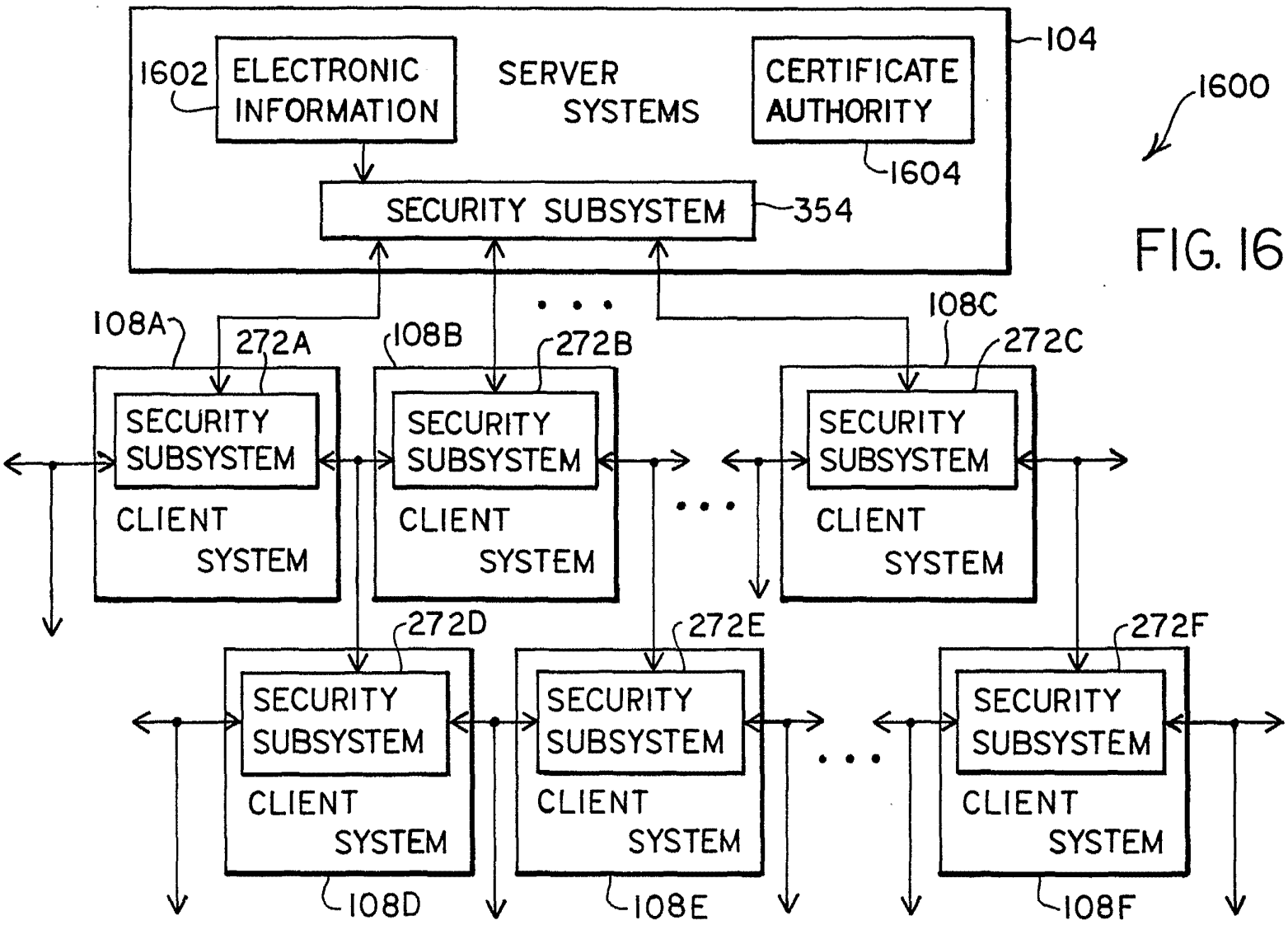

104
1602
ELECTRONIC INFORMATION
SERVER SYSTEMS
CERTIFICATE AUTHORITY
1604
1600
SECURITY SUBSYSTEM
354
108A
272A
108B
272B
108C
272C
SECURITY SUBSYSTEM
CLIENT SYSTEM
272D
272E
272F
108D
108E
108F

FIG. 16

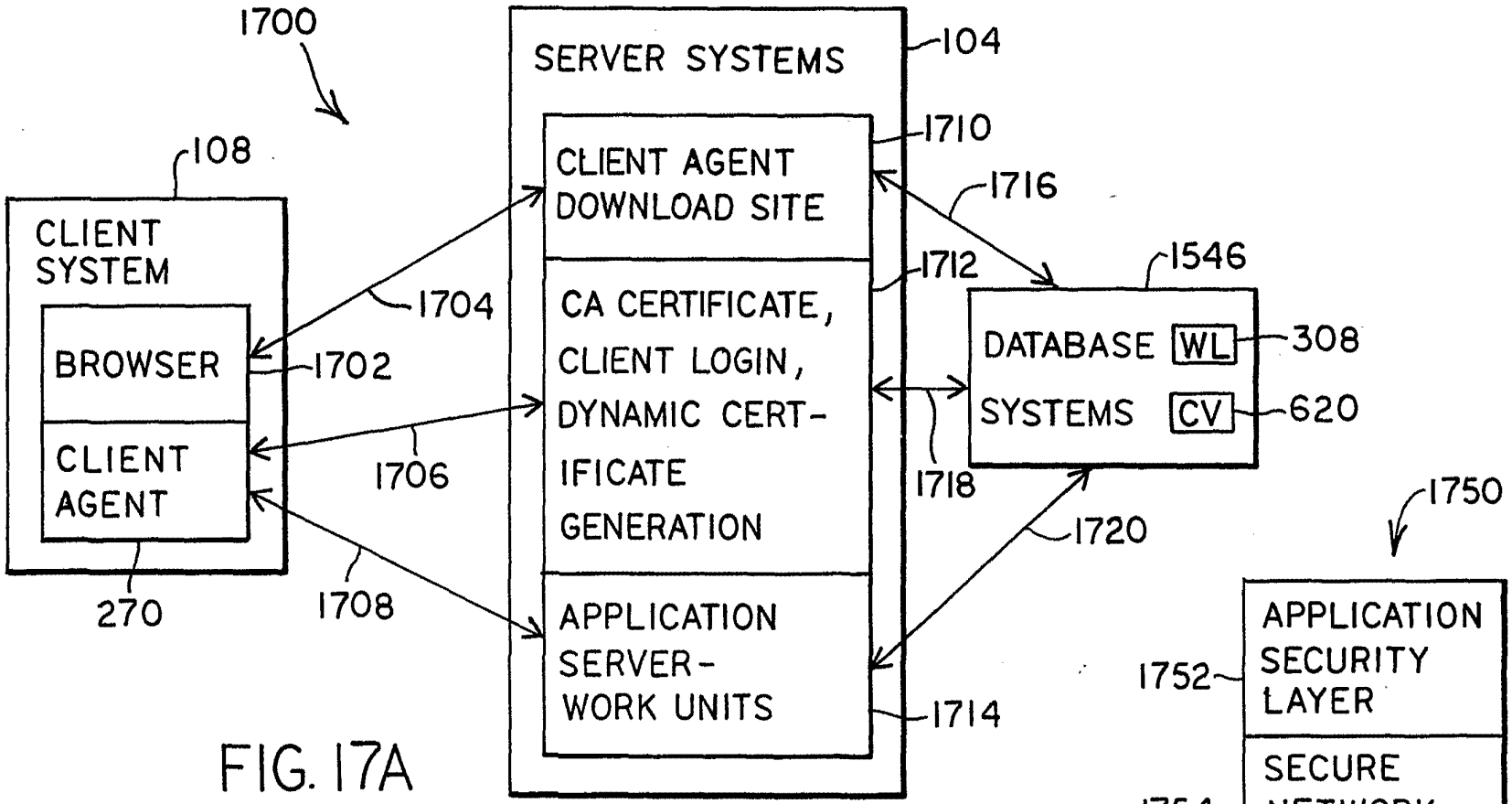


FIG. 17A

FIG. 17B

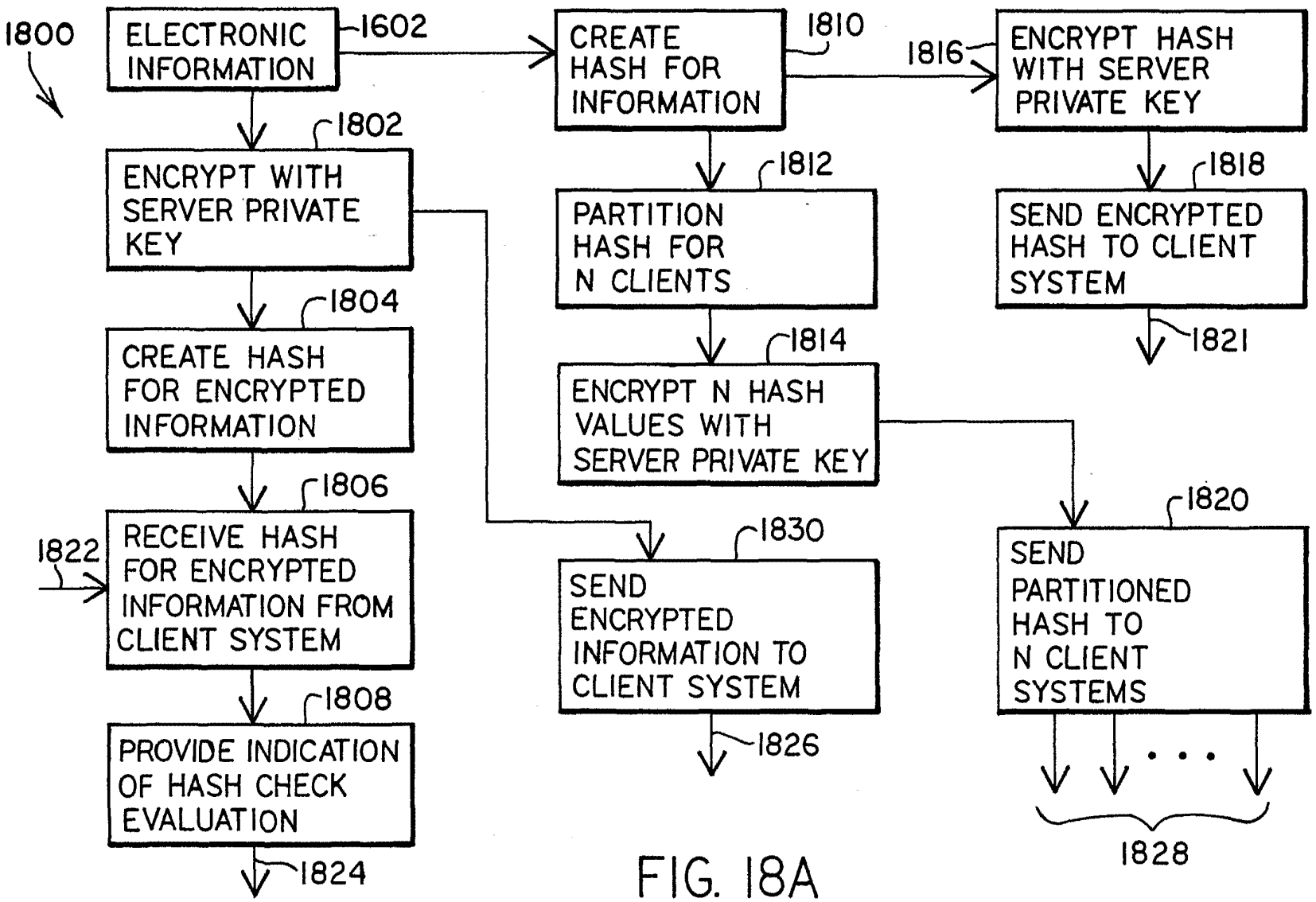

1800
ELECTRONIC INFORMATION
1602
ENCRYPT WITH SERVER PRIVATE KEY
1802
CREATE HASH FOR ENCRYPTED INFORMATION
1804
RECEIVE HASH FOR ENCRYPTED INFORMATION FROM CLIENT SYSTEM
1806
1822
PROVIDE INDICATION OF HASH CHECK EVALUATION
1808
1824
CREATE HASH FOR INFORMATION
1810
PARTITION HASH FOR N CLIENTS
1812
ENCRYPT N HASH VALUES WITH SERVER PRIVATE KEY
1814
SEND ENCRYPTED INFORMATION TO CLIENT SYSTEM
1830
1826
ENCRYPT HASH WITH SERVER PRIVATE KEY
1816
SEND ENCRYPTED HASH TO CLIENT SYSTEM
1818
1821
SEND PARTITIONED HASH TO N CLIENT SYSTEMS
1820
1828

FIG. 18A

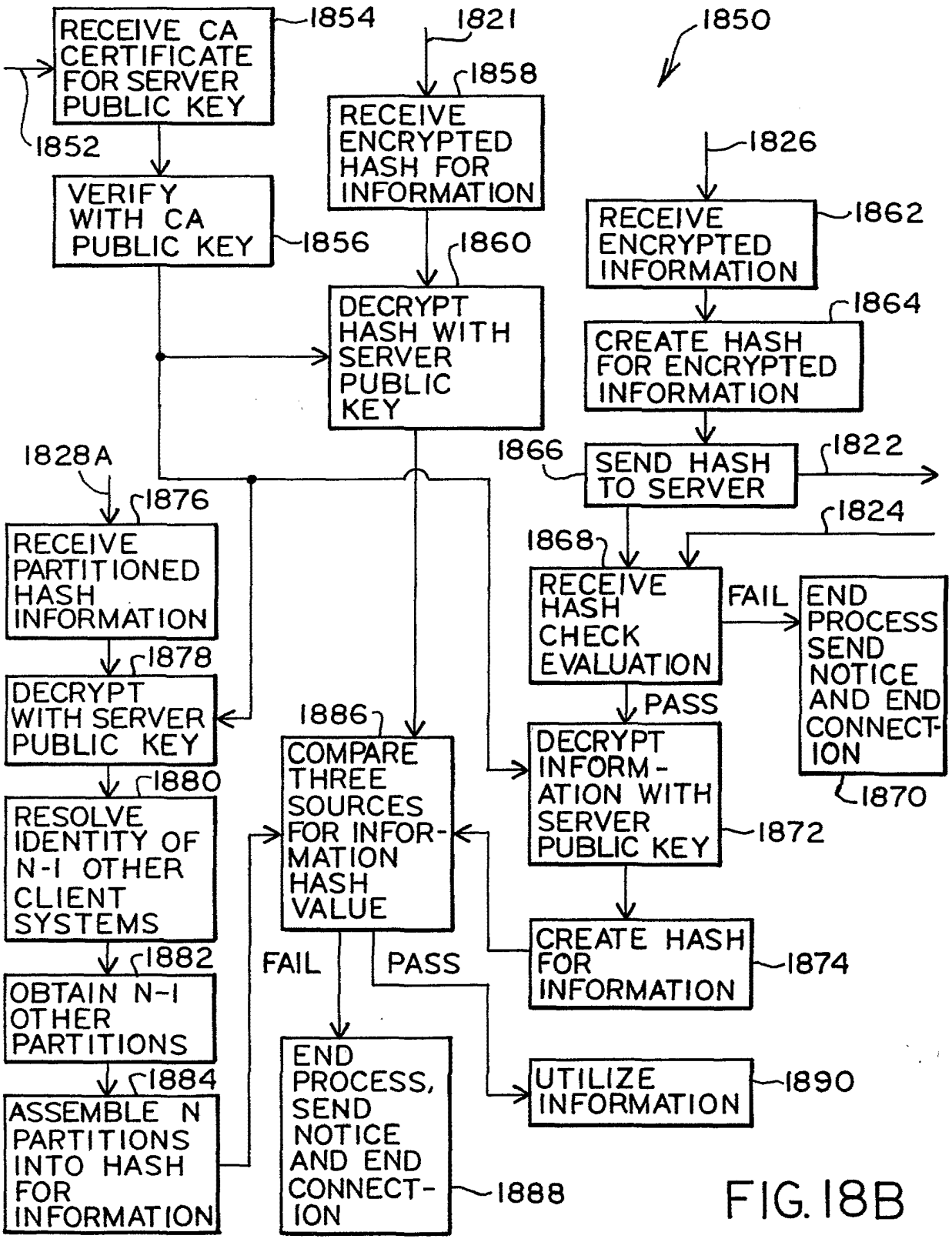

RECEIVE CA CERTIFICATE FOR SERVER PUBLIC KEY
1854
1852
VERIFY WITH CA PUBLIC KEY
1856
1821
1858
RECEIVE ENCRYPTED HASH FOR INFORMATION
1860
DECRYPT HASH WITH SERVER PUBLIC KEY
1850
1826
RECEIVE ENCRYPTED INFORMATION
1862
1864
CREATE HASH FOR ENCRYPTED INFORMATION
1866
SEND HASH TO SERVER
1822
1824
1828A
1876
RECEIVE PARTITIONED HASH INFORMATION
1878
DECRYPT WITH SERVER PUBLIC KEY
1880
RESOLVE IDENTITY OF N-1 OTHER CLIENT SYSTEMS
1882
OBTAIN N-1 OTHER PARTITIONS
1884
ASSEMBLE N PARTITIONS INTO HASH FOR INFORMATION
1886
COMPARE THREE SOURCES FOR INFORMATION HASH VALUE
FAIL
PASS
END PROCESS, SEND NOTICE AND END CONNECTION
1888
1868
RECEIVE HASH CHECK EVALUATION
FAIL
END PROCESS SEND NOTICE AND END CONNECTION
1870
PASS
DECRYPT INFORMATION WITH SERVER PUBLIC KEY
1872
CREATE HASH FOR INFORMATION
1874
UTILIZE INFORMATION
1890

FIG. 18B

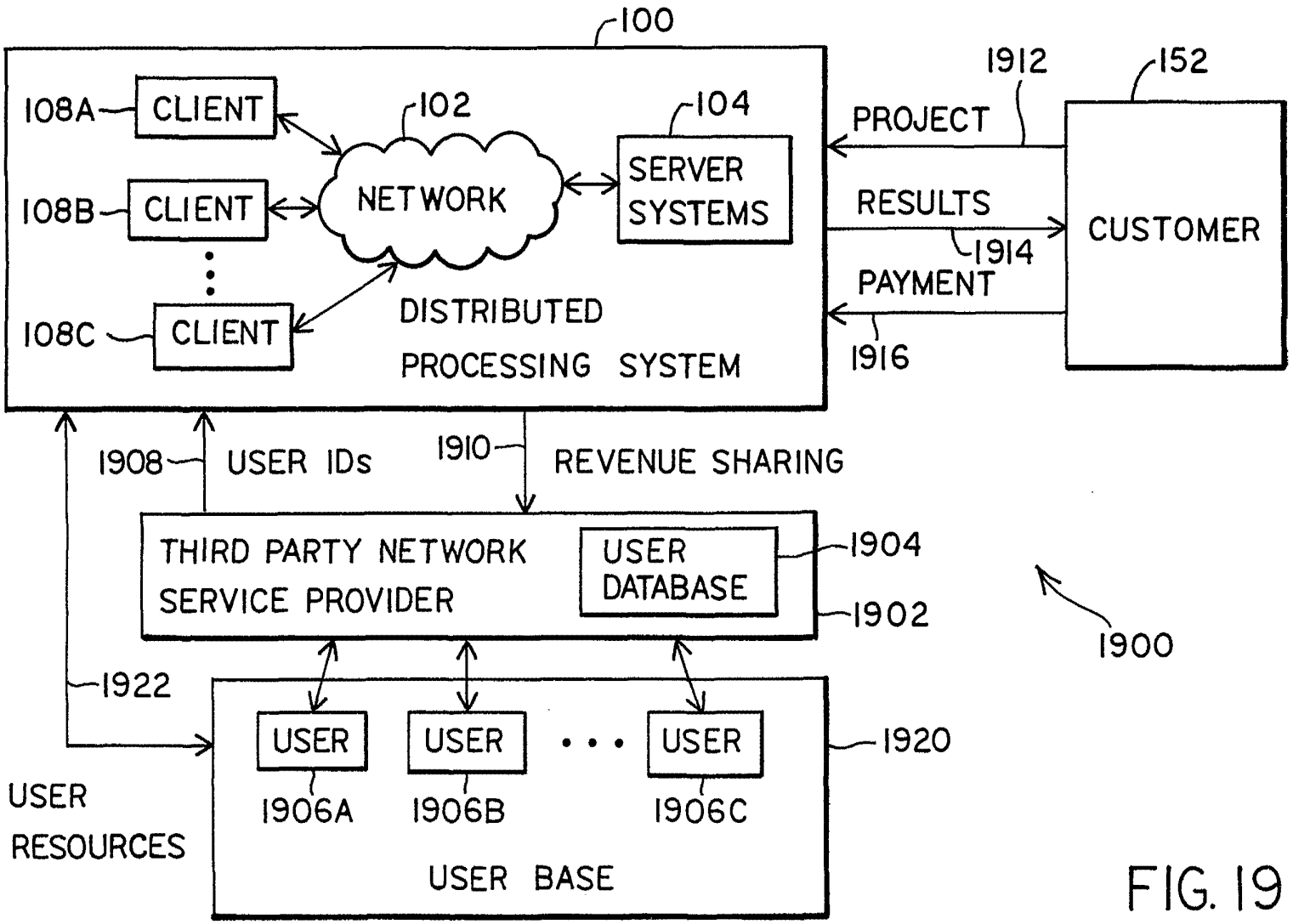

100
108A
CLIENT
102
NETWORK
104
SERVER SYSTEMS
108B
CLIENT
108C
CLIENT
DISTRIBUTED PROCESSING SYSTEM
1912
152
PROJECT
RESULTS
1914
PAYMENT
1916
CUSTOMER
1908
USER IDs
1910
REVENUE SHARING
THIRD PARTY NETWORK SERVICE PROVIDER
USER DATABASE
1904
1902
1900
1922
USER
USER
USER
1920
1906A
1906B
1906C
USER RESOURCES
USER BASE

FIG. 19

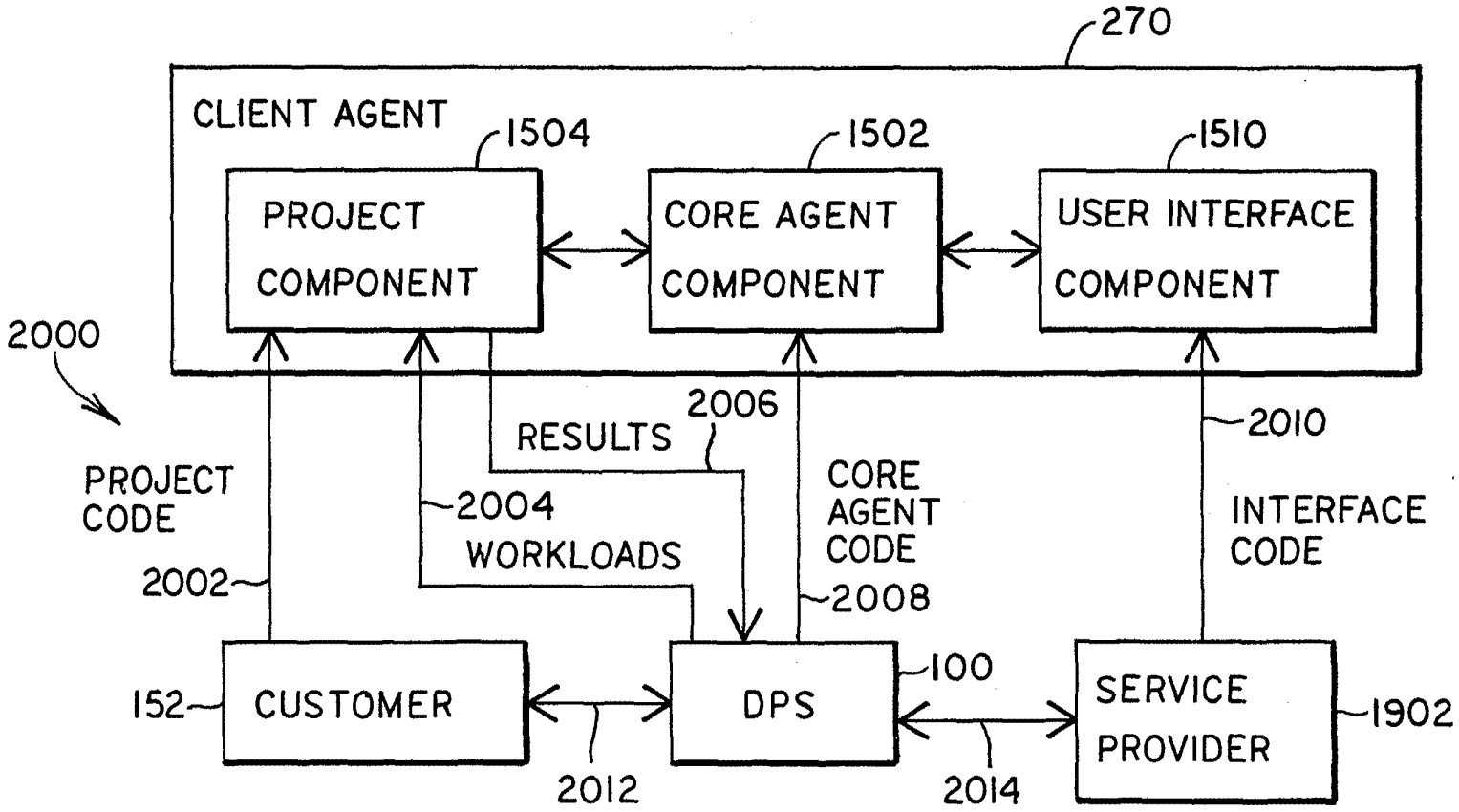

270
CLIENT AGENT
1504
1502
1510
PROJECT COMPONENT
CORE AGENT COMPONENT
USER INTERFACE COMPONENT
2000
2006
RESULTS
2010
PROJECT CODE
2004
WORKLOADS
CORE AGENT CODE
INTERFACE CODE
2002
2008
152
CUSTOMER
100
DPS
SERVICE PROVIDER
1902
2012
2014

FIG. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	NING0008	8392

75671 7590 12/28/2009

Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Ave, Suite 424
Spokane, WA 99201

EXAMINER	
DALENCOURT, YVES	

ART UNIT	PAPER NUMBER
2457	

NOTIFICATION DATE	DELIVERY MODE
12/28/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptocorrespondence@sbmc-law.com

Office Action Summary	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	YVES DALENCOURT	2457	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29-65* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/08/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is responsive to Request for Continued Examination (RCE) filed 10/08/2009.

Claim Objections

Claims 29 and 42 are objected to because of the following informalities: It is suggested to delete “by” (line 4) and insert --- to ---. Appropriate correction is required.

Claim 29 is objected to because of the following informalities: It is suggested to delete “ operable to “ (line 5) because it has been held that the recitation that an element is **“ operable“** to perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 29 and 42 recite the limitation of "said distributed device" in lines 5 and 7. A distributed device has not previously been identified in the claims. There is insufficient antecedent basis for this limitation in the claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 29 – 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Hartsell et al (US 20020065864; hereinafter Hartsell).

Regarding claim 29, Hartsell discloses a computer-implemented method providing network attached storage (NAS) services (fig. 2) comprising: configuring a distributed processing system by coupling of a multiplicity of distributed devices coupled by a network, wherein each said distributed device has a client agent operable to process a workload for the distributed processing system (paragraphs [0189], [0204], [0236], and [0245], lines 1 - 8), wherein the client agent for a particular said distributed device has a software-based network attached storage (NAS) component configured to assess unused or under-utilized storage resources in selected distributed devices of the multiplicity of distributed devices (paragraphs [0190], [0208], and [0245], lines 8 - 15); representing with the software-based NAS component that the selected distributed devices each comprise a NAS device having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices (paragraphs [0197], [0210], and [0245 – 0246]); and processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data into at least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network (paragraphs

[0210 – 0211]). Claim 42 adds the limitation of allocating an available amount of unused storage resources in selected distributed devices of the multiplicity of distributed devices (paragraphs [0012], [0097], [0181], and [0262].

Regarding claim 30, Hartsell discloses the method of claim 29, wherein the client agent for the particular said distributed device enables at least one of the selected distributed devices to function as a stand-alone dedicated NAS device (paragraph [0213].

Regarding claim 31, Hartsell discloses the method of claim 29, wherein the client agent for the particular said distributed device enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices (paragraph [0213]).

Regarding claim 32, Hartsell discloses the method of claim 31, wherein the location distributed device is further configured to receive an access request from the client device and direct the client device to data requested on at least one of the selected distributed devices (paragraphs [0214] and [0219]).

Regarding claim 33, Hartsell discloses the method of claim 32, further comprising managing NAS service for said distributed devices at least in part utilizing a centralized server (paragraphs [0215] and [0219]).

Regarding claim 34, Hartsell discloses the method of claim 33, wherein the centralized server is further configured to enable download of the NAS component to the selected distributed devices (paragraphs [0068], [0100], [0286], and [0324]).

Regarding claim 35, Hartsell discloses the method of claim 33, further comprising storing with the centralized server location information for the data stored in the selected distributed devices (paragraphs [0088 - 0089], and [0116]).

Regarding claim 36, Hartsell discloses the method of claim 35, further comprising utilizing the centralized server to receive and route the data for storage to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database (paragraphs [0089] and [0116].

Regarding claim 37, Hartsell discloses the method of claim 29, wherein the network comprises the Internet (paragraphs [0005] and [0174]).

Regarding claim 38, Hartsell discloses the method of claim 29, further comprising managing storage resources for the selected distributed devices with a storage priority control that facilitates use of the available amount of storage resources for the selected distributed devices (paragraphs [0233], [0247], and [0302]).

Regarding claim 39, Hartsell discloses the method of claim 38, wherein the storage priority control comprises a parameter selectable by the client device ().

Regarding claim 40, Hartsell discloses the method of claim 39, wherein the storage priority control comprises storage priority level schemes that prioritize one or more of storage or deletion of data (paragraphs [0233], [0247], and [0302])

Regarding claim 41, Hartsell discloses the method of claim 38, wherein the storage priority control comprises a priority marking directly given to data or files (paragraphs [0233], [0247 - 0248], [0302], and [0321]).

Claims 42 – 65 substantially disclose all the limitations of claims 29 – 41 in system and computer-implemented method with minor modification in the claimed language. The reasons for rejecting claims 29 – 41 apply in claims 42 – 65. Therefore, claims 42 – 65 are rejected for the same reasons.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YVES DALENCOURT whose telephone number is (571)272-3998. The examiner can normally be reached on M-F 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YVES DALENCOURT/

Primary Examiner, Art Unit 2457

Notice of References Cited	Application/Control No. 09/834,785	Applicant(s)/Patent Under Reexamination HUBBARD, EDWARD A.	
	Examiner YVES DALENCOURT	Art Unit 2457	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
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	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

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*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

SEARCHED

Class	Subclass	Date	Examiner
709	203, 223, 226		

SEARCH NOTES

Search Notes	Date	Examiner
WEST (see attached text search)	12/19/2009	YD

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/14/2009								
	1	-								
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	27	-								
	28	-								
	29	✓								
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	31	✓								
	32	✓								
	33	✓								
	34	✓								
	35	✓								
	36	✓								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/14/2009								
	37	✓								
	38	✓								
	39	✓								
	40	✓								
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	64	✓								
	65	✓								

WEST Search History for Application 09834785

Creation Date: 2009121920:09

Prior Art Searches

Query	DB	Op.	Plur.	Thes.	Date
(configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
		OR	YES		12-19-2009

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(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD				
stor$3 adj7 (data or information)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(stor$3 adj7 (data or information)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1 and available adj7 storage source$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)) and	PGPB, USPT, EPAB,	OR	YES		12-19-2009

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((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	JPAB, DWPI, TDBD				

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Complete if Known

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	~~2457~~ 2457
Examiner Name	Dalencourt, Yves

Sheet	1	of	4

Attorney Docket No: NING0008

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Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	2157
Examiner Name	Dalencourt, Yves

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Attorney Docket No: NING0008

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

	Complete if Known
Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	~~2457~~ 2457
Examiner Name	Dalencourt, Yves

Sheet	4	of	4	Attorney Docket No: NING0008

Examiner Initials*	Cite No [1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		"Distributed.net: The fastest computer on earth", (02/08/99),3 pages	
		TAKAGI, et al., "Ninflet: A migratable parallel objects framework using java", Java for high performance network computing, (1998),page 1063-1078	
		WALDSPURGER, et al., "Spawn: a distributed computational economy", IEEE transactions on software engineering, IEEE Inc., (1992),page 103-117	
		HENRY, SHANNON "Putting Idle Computers to Work", Washington Post, (June 2000),3 pages	
		"Parabon Computation Rewards Providers Through Daily and Monthly Sweepstakes Drawings", News Release, 2 pages	
		"Porivo Technologies Offers $Thousands in Prizes for Spare Computing Capacity", News Release, 2 pages	
		SHMULIK, LONDON "POPCORN- A Paradigm for Global-Computing", Master of Computer Science thesis, supervised by Prof. Noam Nisan, Institute of Computer Science, The Hebrew University of Jerusalem,(06/1998),94 pages	
		"GIMPS Finds First Million- Digit Prime, Stakes Claim To $50,000 EFF Award", (06/1999),3 pages	
		"Parabon Sweepstakes a Win For Cancer Research", News Release, 2 pages	

EXAMINER /Yves Dalencourt/ **DATE CONSIDERED** 12/14/2009

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional) [2] Applicant is to place a check mark here if English language Translation is attached

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 09/834,785
Filing Date 4/13/2001
Confirmation No. 8392
Applicant ..... Niration Network Group, L.L.C.
Inventorship ..... Hubbard
Group Art Unit 2457
Examiner ..... Dalencourt, Y.
Attorney Docket No. NING0008
Title: Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks

RESPONSE TO OFFICE ACTION DATED DECEMBER 28, 2009

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

From: Nathan Grebasch (Tel. 509-755-7267; Fax 509-755-7252)
Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Avenue, Suite 424
Spokane, WA 99201

Customer No. 75671

This communication is in response to an Office Action dated December 28, 2009.

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DATABRICKS EX1002 Page 684

IN THE CLAIMS

Claims pending:

- At time of the Action: 29-65
- After this Response: 29-65

Canceled or Withdrawn claims: 1-28
Amended claims: 29-35, 37, 39-43, 48, 50, 55, 57, 58, and 60-63, and 65
New claims: none

This listing of claims replaces all prior versions and listings:

1. - 28. canceled.

29. (currently amended) A computer-implemented method comprising:

configuring a distributed processing system of a plurality ~~multiplicity~~ of distributed devices coupled [[by]] to a network, wherein the ~~each said~~ distributed ~~device~~ devices include respective ~~has a~~ client ~~agent operable~~ agents configured to process respective portions of a workload for the distributed processing system,

wherein the client ~~agent~~ agents for [[a]] particular said distributed ~~device~~ devices have corresponding ~~has a~~ software-based network attached storage (NAS) ~~component~~ components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality ~~multiplicity~~ of distributed devices;

representing with the software-based NAS component that the selected distributed devices ~~each~~ respectively comprise [[a]] NAS ~~device~~ devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices; and

processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data [[into]] to at

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least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network.

30. (currently amended) The method of claim 29, ~~wherein the client agent for the particular said distributed device enables at least one of the selected distributed devices to function as a stand-alone dedicated NAS device~~ further comprising enabling at least one of the selected distributed devices to function as a stand-alone dedicated NAS device through use of the client agent for the particular said distributed device.

31. (currently amended) The method of claim 29, ~~wherein the client agent for the particular said distributed device enables at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices~~ further comprising enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the client agent for the particular said distributed device.

32. (currently amended) The method of claim 31, ~~wherein the location distributed device is further configured to receive an access request from the client device and direct the client device to data requested on at least one of the selected distributed devices~~ further comprising receiving an access request from the client device and directing the client device to data requested on at least one of the selected distributed devices.

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33. (currently amended) The method of claim 32, further comprising managing the NAS service for said distributed devices at least in part utilizing a centralized server.

34. (currently amended) The method of claim 33, ~~wherein the centralized server is further configured to enable download of the NAS component to the selected distributed devices~~ further comprising downloading the software-based NAS component to the selected distributed devices.

35. (currently amended) The method of claim 33, further comprising storing, with the centralized server, location information [[for]] associated with the data stored in the selected distributed devices.

36. (previously presented) The method of claim 35, further comprising utilizing the centralized server to receive and route the data for storage to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database.

37. (currently amended) The method of claim 29, wherein the ~~network comprises~~ method is at least partially performed through use of the Internet.

38. (previously presented) The method of claim 29, further comprising managing storage resources for the selected distributed devices with a storage priority control that facilitates use of the available amount of storage resources for the selected distributed devices.

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39. (currently amended) The method of claim 38, ~~wherein the storage priority control comprises a parameter selectable by the client device~~ further comprising accepting selection of the storage priority control, by the client device, that comprises a parameter.

40. (currently amended) The method of claim 39, ~~wherein the storage priority control comprises storage priority level schemes that prioritize one or more of storage or deletion of data~~ 38, further comprising prioritizing one or more of storage or deletion of data using the storage priority control that comprises storage priority level schemes.

41. (currently amended) The method of claim 39, ~~wherein the storage priority control comprises a priority marking directly given to data or files~~ wherein the managing storage resources further comprises marking directly data or files.

42. (currently amended) A system comprising:

a plurality ~~multiplicity~~ of distributed devices configured to be coupled [[by]] to a network, wherein ~~each said~~ the distributed ~~device~~ devices include respective ~~includes a~~ client ~~agent~~ agents configured to process respective portions of workloads for the distributed processing system, ~~each~~ the client ~~agent~~ agents including respective instances of:

a software-based network attached storage (NAS) component configured to:

assess unused storage resources of said distributed devices;

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allocate [[an]] respective available amount of unused storage resources in selected distributed devices of the plurality ~~multiplicity~~ of distributed devices;

represent that the selected distributed devices ~~each~~ comprise [[a]] respective NAS ~~device~~ devices having the respective available ~~amount~~ amounts of storage resources; and

process workloads associated with data storage and access ~~workloads~~ by accessing data from and storing data into portions of ~~each of~~ the ~~available amounts of unused~~ storage resources in the selected distributed devices to provide NAS service to a client device.

43. (currently amended) The system of claim 42, wherein ~~each~~ at least one of the client agent is configured to enable at least one of the selected distributed devices to function as a stand-alone dedicated NAS device.

44. (previously presented) The system of claim 42, wherein the client agent is configured to enable at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

45. (previously presented) The system of claim 44, wherein the location distributed device is configured to receive an access request from the client device and direct the client device to the data stored on the selected distributed devices that was requested.

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46. (previously presented) The system of claim 45, wherein the system is further configured to manage the NAS service for said distributed devices at least in part utilizing a centralized server system.

47. (previously presented) The system of claim 46, wherein the centralized server system is further configured to enable download of the NAS component to the selected distributed devices.

48. (currently amended) The system of claim 46, wherein the centralized server system is configured to store location information [[for]] associated with the data stored in the selected distributed devices.

49. (previously presented) The system of claim 48, wherein the centralized server system is configured to receive data storage and access requests from the client device and route a data storage workload to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database.

50. (currently amended) The system of claim 42, wherein the distributed devices are configured to be coupled to ~~network comprises~~ the Internet.

51. (previously presented) The system of claim 42, further comprising a storage priority control configured to facilitate use of the available amount of storage resources for the selected distributed devices.

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52. (previously presented) The system of claim 51, wherein the storage priority control comprises a parameter selectable by the client device.

53. (previously presented) The system of claim 52, wherein the storage priority control comprises storage priority level schemes that prioritize one or more of storage or deletion of data.

54. (previously presented) The system of claim 52, wherein the storage priority control comprises a priority marking directly given to data or files.

55. (currently amended) A computer-implemented method comprising:

allocating data for storage among selected devices of a ~~multiplicity~~ plurality of devices that are ~~each~~ independent and available on a network, wherein ~~each of~~ the ~~multiplicity of~~ devices have respective [[a]] software ~~agent~~ agents that [[is]] are usable to control respective local storage resources that are unused or underused ~~for~~ on the devices ~~that device~~; and

representing, using at least one of said software agents, that the selected devices ~~individually~~ comprise a network attached storage (NAS) device with storage capacity equal to a total of the unused or underused storage resource.

56. (previously presented) The computer-implemented method of claim 55, wherein the allocating is performed by a server.

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57. (currently amended) The computer-implemented method of claim 55, wherein the allocating and representing are performed by one of the ~~multiplicity~~ plurality of devices.

58. (currently amended) The computer-implemented method of claim 55, wherein the allocating is performed in accordance with respective capability vectors calculated for ~~each of~~ the selected devices.

59. (previously presented) The computer-implemented method of claim 55, further comprising:

identifying whether the storage resources for a particular device, of the selected devices, are idle, and

performing the allocating so a greater portion of the data for storage is sent to the particular device if the storage resources for the particular device are idle, wherein the greater portion is greater than a portion of the data that would be allocated to the particular device if the storage resources for the particular device were not idle.

60. (currently amended) The computer-implemented method of claim 55, wherein the allocating and representing are performed by at least one of the ~~multiplicity~~ plurality of devices via interaction with other devices on a peer-to-peer basis.

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61. (currently amended) A computer-implemented method comprising:

downloading to at least one ~~or more~~ selected ~~devices~~ device, included in a ~~multiplicity~~ plurality of devices, a network attached storage (NAS) component and a portion of a storage workload for storage in memory that is unused or under-utilized; and

representing to a client device, coupled to the multiplicity of devices by a network, that ~~each~~ at least one selected device is a dedicated NAS device.

62. (currently amended) The computer-implemented method of claim 61, further comprising storing location information in a database that is usable to indicate locations in memory where the portion of the storage workload is stored.

63. (currently amended) The computer-implemented method of claim 61, wherein the computer-implemented method is performed by at least one [[a]] central server coupled to the network.

64. (previously presented) The computer-implemented method of claim 61, wherein the computer-implemented method is performed by a particular device of the multiplicity of devices.

65. (currently amended) The computer-implemented method of claim 61, wherein the ~~network comprises the Internet~~ computer-implemented method is at least partially performed through use of the Internet.

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REMARKS

Claims 29-35, 37, 39-43, 48, 50, 55, 57, 58, and 60-63, and 65 are amended without prejudice or disclaimer. Support for the amendments may be found in the claims themselves and throughout the specification. Claims 29-65 remain pending in the application for consideration. In view of the following remarks, Applicant respectfully requests reconsideration and allowance of the subject application.

Examiner Interview

Counsel would like to thank Examiner Dalencourt for a telephonic interview on February 16, 2010. During the interview Counsel and Examiner discussed the pending rejection with respect to the priority documents on which this Application and U.S. Published Patent Application Number 20020065864 naming Hartsell et al. (hereinafter, "Hartsell") rely. Counsel noted that Hartsell had an actual filing date after the actual filing date of this Application. Counsel and Examiner also discussed the impact of the various priority applications. No agreement was reached.

Counsel and Examiner also discussed whether a restriction requirement had issued in this Application. Although no agreement was reached, it is Counsel's understanding is that the Office has not issued a restriction requirement in this Application.

Applicant respectfully requests that the Examiner contact Counsel to discuss this application before issuing any subsequent office actions. Applicant sincerely appreciates the Examiner's willingness to work with Applicant in advancing prosecution.

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Claim Objection

Claims 29 and 42 are objected to based on the inclusion of the word "by." Claim 29 was also objected to based on the inclusion of the term "operable." Without conceding the propriety of the objections and solely for the purpose of furthering prosecution, Applicant has amended claims 29 and 42 as suggested by the Office. Removal of the objection is requested and allowance is solicited.

Claim Rejection 35 U.S.C. §112, Second Paragraph

Claims 29 and 42 are rejected based on the inclusion of the phrase "said distributed device." Without conceding the propriety of the objections and solely for the purpose of furthering prosecution, Applicant has amended claims 29 and 42. Removal of the objection is requested and allowance is solicited.

Claim Rejection 35 U.S.C. §102

Claims 29-65 stand rejected as anticipated under 35 U.S.C. §102(e) over Hartsell. Applicant traverses the rejection.

In order for a *prima facie* case of anticipation to be proper under 35 U.S.C. §102(e) the cited document must have been filed before the effective filing date of the application under examination. In the present case, the Hartsell document has an actual filing date of June 12, 2001 which is after the actual filing date of this Application, April 13, 2001. Further, Applicant respectfully notes that Hartsell is a continuation-in-part application of U.S. Patent Application Serial Number 09/797,200 which was filed on March 1, 2001. Thus, Hartsell may include new matter that was not present in the 09/797,200 Application.

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DATABRICKS EX1002 Page 695

In addition, while the cross-reference portion of the Hartsell document does claim priority to several U.S. Provisional Patent Applications within the March 2000 to May 2001 timeframe, Applicant respectfully notes that this Application claims priority to, and incorporates by reference in their entirety, several U.S. Patent Applications which predate the priority documents on which the Hartsell document relies.

Support for the features included in claims 29-65 may be found throughout the applications, including drawings, to which this Application claims priority and incorporates by reference in their entirety. In particular, support may be found at the following locations in the U.S. Patent Applications to which this Application claims priority. This listing is not exhaustive of all the locations at which support may be found. This list is provided for the Office's convenience. Reference is made to the paragraph numbers appearing in the published applications and page and line numbers in the filed application.

U.S. Patent Application Serial Number 09/538,543

Page 5, lines 1-6; Page 9, lines 3-6 and 21-23; Page 10, lines 16-23; Page 16, lines 1-6; Page 17, lines 1-8; Page 21, lines 5-14; Page 26, lines 8-19; and Page 39, lines 11-18;

U.S. Patent Application Serial Number 09/603,740

Page 13, lines 1-10; Page 14, lines 1-8; Page 21, lines 16-22; page 40, item 4; and page 54, item f;

U.S. Patent Application Serial Number 09/602,789

Page 49, lines 1-9; Page 65, line 3 - Page 66, line 6; Page 68, lines 5-19;

U.S. Patent Application Serial Number 09/539,428

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Page 5, lines 6-13 and Page 5, lines 7-22;

U.S. Patent Application Serial Number 09/539,106

Page 36, lines 3-10;

U.S. Patent Application Serial Number 09/602,803

Page 24, lines 4-18; Page 47, line 14 - Page 48, line 19; and

U.S. Patent Application Serial Number 09/794,969

Paragraphs: [0048]-[0050], [0062], and [0071].

For at least the foregoing reasons, removal of the pending rejection is requested and allowance is solicited.

Conclusion

Applicant requests reconsideration of all stated rejections, and requests issuance of a Notice of Allowability. If the Office's next anticipated action is to be anything other than issuance of a Notice of Allowability, Applicant respectfully requests a telephone call for the purpose of scheduling an interview.

Respectfully submitted,

Dated: 3/27/10

By: /Nathan Grebasch/
Nathan Grebasch
Reg. No. 48600
(509) 755-7267

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DATABRICKS EX1002 Page 697

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Edward A. Hubbard et al.	Examiner:	Yves Dalencourt
Serial No.:	09/834,785	Group Art Unit:	2457
Filed:	April 13, 2001	Docket:	NING0008
Title:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS		

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq*., the referenced materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicants respectfully request that this Supplemental Information Disclosure Statement be entered and the documents listed on the attached Form 1449 be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicants request that a copy of the 1449 form, initialed as being considered by the Examiner, be returned to the Applicants with the next official communication.

Pursuant to 37 C.F.R. §1.97(c)(2), Applicants have included the fee of $180.00 as set forth in 37 C.F.R. §1.17(p). Please charge any additional fees or credit any overpayment to Deposit Account No. 50-4143.

Pursuant to 37 C.F.R. 1.98(a)(2), Applicant believes that copies of cited U.S. Patents and Published Applications are no longer required to be provided to the Office. Notification of this change was provided in the United States Patent and Trademark Office OG Notices dated October 12, 2004. Thus, Applicant has not included copies of any US Patents or Published Applications cited with this submission. Should the Office require copies to be provided, Applicant respectfully requests that notice of such requirement be directed to Applicant's below-signed representative. Applicant acknowledges the requirement to submit copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R. 1.98(a)(2).

Respectfully submitted,

EDWARD A. HUBBARD ET AL.

By their Representatives,

Date March 26, 2010 By /Nathan Grebasch/
Nathan T. Grebasch
Reg. No. 48,600

PTO/SB/08a(04-07)
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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	1	of	1	Attorney Docket No: NING0008

Complete if Known

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	2457
Examiner Name	Dalencourt, Yves

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Filing Date If Appropriate
		US-20040098449	05/20/2004	Bar-Lavi et al.	
		US-20070011224	01/11/2007	Mena, Jesus	
		US-20100036723	02/11/2010	Hubbard, Edward A.	
		US-7143089	11/28/2006	Petras et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of cited Document	T[2]

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No [1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		"Non-Final Office Action", Application Number 10/687,210, (11/25/2009), 20 pages	

EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

Electronic Patent Application Fee Transmittal

Application Number:	09834785
Filing Date:	13-Apr-2001
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Filer:	William Breen/Kenneth Linder
Attorney Docket Number:	NING0008

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	7302512
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	75671
Filer:	William Breen/Kenneth Linder
Filer Authorized By:	William Breen
Attorney Docket Number:	NING0008
Receipt Date:	29-MAR-2010
Filing Date:	13-APR-2001
Time Stamp:	11:57:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	10222
Deposit Account	504143
Authorized User	SADLER,LANCE R.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		NING0008NFOAResponse.pdf	144035 ad294a32eac95fc2474f92d64a145f09ef7295a8	yes	14

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	2
Claims	3	10
Applicant summary of interview with examiner	11	11
Applicant Arguments/Remarks Made in an Amendment	12	14

Warnings:

Information:

2		NING0008IDS.pdf	159928 71d3461031a11f4e9c50f242d53c80e2f59474cb	yes	3

Multipart Description/PDF files in .zip description

Document Description	Start	End
Transmittal Letter	1	2
Information Disclosure Statement (IDS) Filed (SB/08)	3	3

Warnings:

Information:

3	NPL Documents	10687210NFOA112509.pdf	477293 b742f6858c1924399ae4786ef206d225b80c9957	no	20

Warnings:

Information:

4	Fee Worksheet (PTO-875)	fee-info.pdf	30919 176bbc4caa915102a9d8c9a2e6b339874f6384fc	no	2

Warnings:

Information:

Total Files Size (in bytes):	801255

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
09/834,785	04/13/2001	

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 03/29/2010	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 37	Minus	** 59	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 4	Minus	***12	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/Susan K. Ford/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/08a(04-07)
Approved for use through 7/31/2006. OMB 0651-0031
US Patent & Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	2457
Examiner Name	Dalencourt, Yves

Sheet	1	of	1

Attorney Docket No: NING0008

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Filing Date If Appropriate
		US-20020133593	9/19/2002	Johnson et al.	
		US-60/187,211		Beale et al.	03/03/2000
		US-60/246,401		Johnson et al.	11/07/2000
		US-60/285,211		Johnson et al.	4/20/2001
		US-60/291,073		Johnson et al.	5/15/2001

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of cited Document	T^2

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No [1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T^2

EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional) [2] Applicant is to place a check mark here if English language Translation is attached

Electronic Patent Application Fee Transmittal

Application Number:	09834785
Filing Date:	13-Apr-2001
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Filer:	William Breen/Kenneth Linder
Attorney Docket Number:	NING0008

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	7326629
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	75671
Filer:	William Breen/Kenneth Linder
Filer Authorized By:	William Breen
Attorney Docket Number:	NING0008
Receipt Date:	31-MAR-2010
Filing Date:	13-APR-2001
Time Stamp:	15:38:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	2050
Deposit Account	504143
Authorized User	SADLER,LANCE R.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		NING0008IDS.pdf	155396 6fcdd4b32d8582967ec0c4dc24d14cacd2735197	yes	3

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Transmittal Letter	1	2
Information Disclosure Statement (IDS) Filed (SB/08)	3	3

Warnings:

Information:

2	Fee Worksheet (PTO-875)	fee-info.pdf	30919 79f82975f9deea7205a97ad9857e9bf119292f9f	no	2

Warnings:

Information:

Total Files Size (in bytes):	186315

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Edward A. Hubbard et al.	Examiner:	Yves Dalencourt
Serial No.:	09/834,785	Group Art Unit:	2457
Filed:	April 13, 2001	Docket:	NING0008
Title:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS		

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq*., the referenced materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicants respectfully request that this Supplemental Information Disclosure Statement be entered and the documents listed on the attached Form 1449 be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicants request that a copy of the 1449 form, initialed as being considered by the Examiner, be returned to the Applicants with the next official communication.

Pursuant to 37 C.F.R. §1.97(c)(2), Applicants have included the fee of $180.00 as set forth in 37 C.F.R. §1.17(p). Please charge any additional fees or credit any overpayment to Deposit Account No. 50-4143.

Pursuant to 37 C.F.R. 1.98(a)(2), Applicant believes that copies of cited U.S. Patents and Published Applications are no longer required to be provided to the Office. Notification of this change was provided in the United States Patent and Trademark Office OG Notices dated October 12, 2004. Thus, Applicant has not included copies of any US Patents or Published Applications cited with this submission. Should the Office require copies to be provided, Applicant respectfully requests that notice of such requirement be directed to Applicant's below-signed representative. Applicant acknowledges the requirement to submit copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R. 1.98(a)(2).

Respectfully submitted,

EDWARD A. HUBBARD ET AL.

By their Representatives,

Date March 31, 2010 By /Nathan Grebasch/
Nathan T. Grebasch
Reg. No. 48,600

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	NING0008	8392

75671 7590 06/24/2010

Sadler, Breen, Morasch & Colby, ps
422 W. Riverside Ave, Suite 424
Spokane, WA 99201

EXAMINER
DALENCOURT, YVES

ART UNIT	PAPER NUMBER
2457	

NOTIFICATION DATE	DELIVERY MODE
06/24/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptocorrespondence@sbmc-law.com

Office Action Summary	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	YVES DALENCOURT	2457	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29-65* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/29/2010; 3/31/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is responsive to amendment filed on 03/29/2010.

Response to Amendment

The Examiner has acknowledged the amended claims 29 – 35, 37, 39 – 43, 48, 50, 55, 57 - 58, 60 - 63, and 65.

Response to Arguments

Applicant's arguments filed on 03/29/2010 have been fully considered but they are not persuasive.

Regarding Applicant's argument (pages 12 – 13), that in order for a prima facie case of anticipation to be proper under 35 U.S.C. § 102(e) the cited document must have been filed before the effective filing date of the application under examination. In the present case, the Hartsell document has an actual filing date of June 12, 2001 which is after the actual filing date of this Application, April 13, 2001. Further, Applicant respectfully notes that Hartsell is a continuation-in-part application of U.S. Patent Application Serial Number 09/797,200 which was filed on March 1, 2001. Thus, Hartsell may include new matter that was not present in the 09/797,200 Application.

In addition, while the cross-reference portion of the Hartsell document does claim priority to several U.S. Provisional Patent Applications within the March 2000 to May 2001 timeframe, Applicant respectfully notes that this Application claims priority to, and

incorporates by reference in their entirety, several U.S. Patent Applications which predate the priority documents on which the Hartsell document relies.

The Examiner respectfully disagrees with Applicant's assertion because Hartsell has several non-provisional of provisional applications, which one of them (US 60/187,211) is filed on **March 3, 2000** before any of U.S Patent Applications that the instant Application claims priority. Thus, the Hartsell's reference is still applied to the claimed limitations.

Claim Objections

Claim 40 is objected to because of the following informalities: It is suggested to delete --- 38, --- (line 2). Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 29 – 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Hartsell et al (US 20020065864; hereinafter Hartsell).

Regarding claim 29, Hartsell discloses a computer-implemented method providing network attached storage (NAS) services (fig. 2) comprising:

configuring a distributed processing system by coupling of a plurality of distributed devices coupled to a network, wherein the distributed device include respective client agents configured to process respective portions of a workload for the distributed processing system (paragraphs [0189], [0204], [0236], and [0245], lines 1 - 8), wherein the client agents for particular said distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices (paragraphs [0190], [0208], and [0245], lines 8 - 15);

representing with the software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices (paragraphs [0197], [0210], and [0245 – 0246]); and

processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network (paragraphs [0210 – 0211]). Claim 42 adds the limitation of allocating respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices (paragraphs [0012], [0097], [0181], and [0262].

Regarding claim 30, Hartsell discloses the method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a stand-alone

dedicated NAS device through use of the client agent for the particular said distributed device (paragraph [0213].

Regarding claim 31, Hartsell discloses the method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the client agent for the particular said distributed device (paragraph [0213]).

Regarding claim 32, Hartsell discloses the method of claim 31, further comprising receiving an access request from the client device and directing the client device to data requested on at least one of the selected distributed devices (paragraphs [0214] and [0219]).

Regarding claim 33, Hartsell discloses the method of claim 32, further comprising managing the NAS service for said distributed devices at least in part utilizing a centralized server (paragraphs [0215] and [0219]).

Regarding claim 34, Hartsell discloses the method of claim 33, further comprising downloading the software-based NAS component to the selected distributed devices(paragraphs [0068], [0100], [0286], and [0324]).

Regarding claim 35, Hartsell discloses the method of claim 33, further comprising storing, with the centralized server, location information associated with the data stored in the selected distributed devices (paragraphs [0088 - 0089], and [0116]).

Regarding claim 36, Hartsell discloses the method of claim 35, further comprising utilizing the centralized server to receive and route the data for storage to the selected

distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database (paragraphs [0089] and [0116].

Regarding claim 37, Hartsell discloses the method of claim 29, wherein the method is at least partially performed through use of the Internet (paragraphs [0005] and [0174]).

Regarding claim 38, Hartsell discloses the method of claim 29, further comprising managing storage resources for the selected distributed devices with a storage priority control that facilitates use of the available amount of storage resources for the selected distributed devices (paragraphs [0233], [0247], and [0302]).

Regarding claim 39, Hartsell discloses the method of claim 38, further comprising accepting selection of the storage priority control, by the client device, that comprises a parameter (paragraphs [0124] and [0229]).

Regarding claim 40, Hartsell discloses the method of claim 39, further comprising prioritizing one or more of storage or deletion of data using the storage priority control that comprises storage priority level schemes (paragraphs [0233], [0247], and [0302])

Regarding claim 41, Hartsell discloses the method of claim 38, wherein the managing storage resources further comprises marking directly data or files (paragraphs [0233], [0247 - 0248], [0302], and [0321]).

Claims 42 – 65 substantially disclose all the limitations of claims 29 – 41 in system and computer-implemented method with minor modification in the claimed

language. The reasons for rejecting claims 29 – 41 apply in claims 42 – 65. Therefore, claims 42 – 65 are rejected for the same reasons.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YVES DALENCOURT whose telephone number is (571)272-3998. The examiner can normally be reached on M-F 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/14/2009	06/10/2010							
	1	-	-							
	2	-	-							
	3	-	-							
	4	-	-							
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	24	-	-							
	25	-	-							
	26	-	-							
	27	-	-							
	28	-	-							
	29	✓	✓							
	30	✓	✓							
	31	✓	✓							
	32	✓	✓							
	33	✓	✓							
	34	✓	✓							
	35	✓	✓							
	36	✓	✓							

IPR2025-00716
DATABRICKS EX1002 Page 723

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/14/2009	06/10/2010							
	37	✓	✓							
	38	✓	✓							
	39	✓	✓							
	40	✓	✓							
	41	✓	✓							
	42	✓	✓							
	43	✓	✓							
	44	✓	✓							
	45	✓	✓							
	46	✓	✓							
	47	✓	✓							
	48	✓	✓							
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	62	✓	✓							
	63	✓	✓							
	64	✓	✓							
	65	✓	✓							

PTO/SB/08a(04-07)
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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	1	of	1	Attorney Docket No: NING0008

Complete if Known

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	2457
Examiner Name	Dalencourt, Yves

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Filing Date If Appropriate
		US-20040098449	05/20/2004	Bar-Lavi et al.	
		US-20070011224	01/11/2007	Mena, Jesus	
		US-20100036723	02/11/2010	Hubbard, Edward A.	
		US-7143089	11/28/2006	Petras et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of cited Document	T[2]

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No [1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		"Non-Final Office Action", Application Number 10/687,210, (11/25/2009), 20 pages	

EXAMINER /Yves Dalencourt/ **DATE CONSIDERED** 06/10/2010

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D./

PTO/SB/08a(04-07)
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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	09/834,785
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First Named Inventor	Hubbard, Edward
Art Unit	2457
Examiner Name	Dalencourt, Yves

Sheet	1	of	1	Attorney Docket No: NING0008

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Filing Date If Appropriate
		US-20020133593	9/19/2002	Johnson et al.	
		US-60/187,211		Beale et al.	03/03/2000
		US-60/246,401		Johnson et al.	11/07/2000
		US-60/285,211		Johnson et al.	4/20/2001
		US-60/291,073		Johnson et al.	5/15/2001

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of cited Document	T^2

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No [1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T^2

EXAMINER	/Yves Dalencourt/	DATE CONSIDERED	06/10/2010

Substitute Disclosure Statement Form (PTO-1449)
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional) [2] Applicant is to place a check mark here if English language Translation is attached

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No 09/834,785
Filing Date 4/13/2001
Confirmation No 8392
Applicant ..... Niration Network Group, L.L.C.
Inventorship ..... Hubbard
Group Art Unit 2457
Examiner ..... Dalencourt, Y.
Attorney Docket No NING0008
Title: Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks

RESPONSE TO OFFICE ACTION DATED JUNE 24, 2010

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

From: Christopher J. Culberson (Tel. 509-755-7267; Fax 509-755-7252)
Sadler, Breen, Morasch & Colby, ps
601 W. Main Avenue, Suite 1300
Spokane, WA 99201

Customer No. 75671

This communication is in response to a final Office Action dated June 24, 2010.

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DATABRICKS EX1002 Page 727

IN THE CLAIMS

Claims pending:

- At time of the Action: 29-65
- After this Response: 29-65

Canceled or Withdrawn claims: 1-28 (previously cancelled)
Amended claims: 40, 42, and 59
New claims: none

This listing of claims replaces all prior versions and listings:

1. - 28. canceled.

29. (previously presented) A computer-implemented method comprising:

configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system,

wherein the client agents for particular said distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices;

representing with the software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices; and

processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a

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portion of the available amount of storage resources to provide NAS service to a client device coupled to the network.

30. (previously presented) The method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a stand-alone dedicated NAS device through use of the client agent for the particular said distributed device.

31. (previously presented) The method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the client agent for the particular said distributed device.

32. (previously presented) The method of claim 31, further comprising receiving an access request from the client device and directing the client device to data requested on at least one of the selected distributed devices.

33. (previously presented) The method of claim 32, further comprising managing the NAS service for said distributed devices at least in part utilizing a centralized server.

34. (previously presented) The method of claim 33, further comprising downloading the software-based NAS component to the selected distributed devices.

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35. (previously presented) The method of claim 33, further comprising storing, with the centralized server, location information associated with the data stored in the selected distributed devices.

36. (previously presented) The method of claim 35, further comprising utilizing the centralized server to receive and route the data for storage to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database.

37. (previously presented) The method of claim 29, wherein the method is at least partially performed through use of the Internet.

38. (previously presented) The method of claim 29, further comprising managing storage resources for the selected distributed devices with a storage priority control that facilitates use of the available amount of storage resources for the selected distributed devices.

39. (previously presented) The method of claim 38, further comprising accepting selection of the storage priority control, by the client device, that comprises a parameter.

40. (currently amended) The method of claim [[39,]] 38, further comprising prioritizing one or more of storage or deletion of data using the storage priority control that comprises storage priority level schemes.

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41. (previously presented) The method of claim 39, wherein the managing storage resources further comprises marking directly data or files.

42. (currently amended) A system comprising:

a plurality of distributed devices configured to be coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of workloads for the distributed processing system, the client agents including respective instances of[[:]] a software-based network attached storage (NAS) component, wherein the NAS component is configured to:

assess unused storage resources of said distributed devices;

allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices;

represent that the selected distributed devices comprise respective NAS devices having the respective available amounts of storage resources; and

process workloads associated with data storage and access by accessing data from and storing data into portions of the storage resources in the selected distributed devices to provide NAS service to a client device.

43. (previously presented) The system of claim 42, wherein at least one of the client agent is configured to enable at least one of the selected distributed devices to function as a stand-alone dedicated NAS device.

44. (previously presented) The system of claim 42, wherein the client agent is configured to enable at least one of the selected distributed devices to function as a

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location distributed device to store location information for data stored by the selected distributed devices.

45. (previously presented) The system of claim 44, wherein the location distributed device is configured to receive an access request from the client device and direct the client device to the data stored on the selected distributed devices that was requested.

46. (previously presented) The system of claim 45, wherein the system is further configured to manage the NAS service for said distributed devices at least in part utilizing a centralized server system.

47. (previously presented) The system of claim 46, wherein the centralized server system is further configured to enable download of the NAS component to the selected distributed devices.

48. (previously presented) The system of claim 46, wherein the centralized server system is configured to store location information associated with the data stored in the selected distributed devices.

49. (previously presented) The system of claim 48, wherein the centralized server system is configured to receive data storage and access requests from the client device and route a data storage workload to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database.

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50. (previously presented) The system of claim 42, wherein the distributed devices are configured to be coupled to the Internet.

51. (previously presented) The system of claim 42, further comprising a storage priority control configured to facilitate use of the available amount of storage resources for the selected distributed devices.

52. (previously presented) The system of claim 51, wherein the storage priority control comprises a parameter selectable by the client device.

53. (previously presented) The system of claim 52, wherein the storage priority control comprises storage priority level schemes that prioritize one or more of storage or deletion of data.

54. (previously presented) The system of claim 52, wherein the storage priority control comprises a priority marking directly given to data or files.

55. (previously presented) A computer-implemented method comprising:

allocating data for storage among selected devices of a plurality of devices that are independent and available on a network, wherein the devices have respective software agents that are usable to control respective local storage resources that are unused or underused on the devices; and

representing, using at least one of said software agents, that the selected devices comprise a network attached storage (NAS) device with storage capacity equal to a total of the unused or underused storage resource.

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56. (previously presented) The computer-implemented method of claim 55, wherein the allocating is performed by a server.

57. (previously presented) The computer-implemented method of claim 55, wherein the allocating and representing are performed by one of the plurality of devices.

58. (previously presented) The computer-implemented method of claim 55, wherein the allocating is performed in accordance with respective capability vectors calculated for the selected devices.

59. (currently amended) The computer-implemented method of claim 55, further comprising:

identifying whether the storage resources for a particular device[[,]] of the selected devices[[,]] are idle, and

performing the allocating so a greater portion of the data for storage is sent to the particular device if the storage resources for the particular device are idle, wherein the greater portion is greater than a portion of the data that would be allocated to the particular device if the storage resources for the particular device were not idle.

60. (previously presented) The computer-implemented method of claim 55, wherein the allocating and representing are performed by at least one of the plurality of devices via interaction with other devices on a peer-to-peer basis.

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61. (previously presented) A computer-implemented method comprising:

downloading to at least one selected device, included in a plurality of devices, a network attached storage (NAS) component and a portion of a storage workload for storage in memory that is unused or under-utilized; and

representing to a client device, coupled to the multiplicity of devices by a network, that at least one selected device is a dedicated NAS device.

62. (previously presented) The computer-implemented method of claim 61, further comprising storing location information in a database that is usable to indicate locations in memory where the portion of the storage workload is stored.

63. (previously presented) The computer-implemented method of claim 61, wherein the computer-implemented method is performed by at least one central server coupled to the network.

64. (previously presented) The computer-implemented method of claim 61, wherein the computer-implemented method is performed by a particular device of the multiplicity of devices.

65. (previously presented) The computer-implemented method of claim 61, wherein the computer-implemented method is at least partially performed through use of the Internet.

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REMARKS

Claims 40, 42, and 59 are amended and claims 29-65 remain pending in the application for consideration. In view of the following remarks, Applicant respectfully requests reconsideration and allowance of the subject application.

Applicant makes no representation that the cited references are prior art. This response and any remarks or comments included herein are not intended to be, and are not to be interpreted as, an admission that any cited references are prior art. Applicant reserves the right to dispose of any cited reference under 35 U.S.C. § 102 and/or 35 U.S.C. § 103, including but not limited to antedating any one or more of the cited references.

Claim Objection

Claim 40 is objected to based on an alleged informality. Without conceding the propriety of the objection and solely for the purpose of furthering prosecution, Applicant has amended claim 40. Accordingly, withdrawal of the objection to claim 40 is requested.

Claim Rejection 35 U.S.C. §102

Claims 29-65 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat. App. Pub. No. 2002/0065864 to Hartsell, et al. ("Hartsell"). Applicant respectfully traverses this rejection and submits that a prima facie case of anticipation cannot be established based on the subject matter cited in Hartsell for at least the reason that Applicant's claimed subject matter has a priority date prior to the effective priority date of the subject matter relied on in Hartsell.

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To be used in support of a prima facie case of anticipation under 35 U.S.C. § 102(e), the subject matter relied upon in a cited reference must have a priority date that occurs before the earliest priority date of the application under examination. The present application claims priority to several earlier applications dated March 30, 2000. In the Response to Arguments section of the office action, the Office mentions that Hartsell claims priority to several provisional applications, one of which is dated March 3, 2000. Applicant has reviewed the subject matter cited by the Office in the Hartsell reference and submits that this subject matter is not entitled to the March 3, 2000 priority date for at least the reason that this subject matter is not disclosed in the provisional application of March 3, 2000. See, e.g., 35 U.S.C. §119(e). Accordingly, Applicant submits that for at least the aforementioned reason, the subject matter cited in the Hartsell reference cannot be relied upon in establishing a prima facie case of anticipation with respect to the claims herein. Applicant respectfully requests that the rejections of claims 29-65 under § 102(e) be withdrawn.

The Claims

Independent claim 29 stands rejected under 35 U.S.C. § 102(e) as being anticipated by Hartsell. Applicant respectfully traverses this rejection for at least the following two reasons. First, Hartsell fails to disclose, teach, or suggest all of the features recited in claim 29 and thus a prima facie case of anticipation cannot be established based on Hartsell.

Second, in its rejection of claim 29, the Office cites to several sections of Hartsell. The sections of Hartsell cited by the Office include Fig. 2 and paragraphs [0189], [0190], [0197], [0204], [0208], [0210], [0236], [0245], and

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DATABRICKS EX1002 Page 737

[0246]. As discussed above, however, Applicant has reviewed the subject matter discussed in these sections of Hartsell and submits that this subject matter is not disclosed in the provisional application of March 3, 2000 and thus is not entitled to the priority date of the provisional application. Thus, this subject matter cannot be utilized in support of a prima facie case of anticipation of claim 29.

Accordingly, Applicant submits that the Office has failed to establish a prima facie case of anticipation with respect to claim 29 and claim 29 is allowable.

Claims 30-41 depend from claim 29 and thus are allowable as depending from an allowable base claim. These claims are also allowable for their own recited features which, in combination with those recited in claim 29, are neither disclosed nor suggested in the references of record.

Claims 42-65 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Hartsell. In the Office Action, the Office simply states that:

> Claims 42 - 65 substantially disclose all the limitations of claims 29 - 41 in system and computer-implemented method with minor modification in the claimed language. The reasons for rejecting claims 29 - 41 apply in claims 42 - 65. Therefore, claims 42 - 65 are rejected for the same reasons. Office Action at pages 6-7.

First, inasmuch as this statement by the Office may be interpreted to limit the scope of any of the claims herein, Applicant respectfully disagrees and submits that the Office's reasoning is misguided. Second, Applicant submits that the Office has failed to establish a prima facie case of anticipation with respect to claims 42-65 for at least the reasons that (1) Hartsell fails to disclose, teach, or suggest all of the features recited in claims 42-65 and (2) as discussed above, Applicant's claimed subject matter has a priority date that predates that of the subject matter of Hartsell cited by the Office.

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Accordingly, and at least for these reasons, Applicant submits that the Office has failed to establish a prima facie case of anticipation with respect to claims 42-65 and claims 42-65 are allowable.

Conclusion

Applicant requests reconsideration of all stated rejections, and requests issuance of a Notice of Allowability. If the Office's next anticipated action is to be anything other than issuance of a Notice of Allowability, Applicant respectfully requests a telephone call for the purpose of scheduling an interview.

Respectfully submitted,

Dated: 23 August 2010

By:/Christopher J. Culberson/
Christopher J. Culberson
Reg. No. 59136
(509) 755-7266

IPR2025-00716
DATABRICKS EX1002 Page 739

Electronic Acknowledgement Receipt

EFS ID:	8272514
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	75671
Filer:	William Breen/Kenneth Linder
Filer Authorized By:	William Breen
Attorney Docket Number:	NING0008
Receipt Date:	23-AUG-2010
Filing Date:	13-APR-2001
Time Stamp:	17:18:44
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		NING0008FOAResponse.pdf	126099 da9450cbdf34d18413677b45344dcda7d5e79c1f	yes	13

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment After Final	1	1
	Claims	2	9
	Applicant Arguments/Remarks Made in an Amendment	10	13
Warnings:			
Information:			
	Total Files Size (in bytes):	126099	

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
09/834,785	04/13/2001	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 08/23/2010	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 37	Minus	** 59	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 4	Minus	***12	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/CATHERINE d. SMITH/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	NING0008	8392

75671 7590 09/21/2010

Sadler, Breen, Morasch & Colby, ps
601 W. Main Ave.
Suite 1300
Spokane, WA 99201

EXAMINER	
DALENCOURT, YVES	
ART UNIT	**PAPER NUMBER**
2457	

NOTIFICATION DATE	DELIVERY MODE
09/21/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptocorrespondence@sbmc-law.com

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 09/834,785	**Applicant(s)** HUBBARD, EDWARD A.	
	Examiner YVES DALENCOURT	**Art Unit** 2457	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 23 August 2010 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires _____months from the mailing date of the final rejection.
   b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: *none*.
   Claim(s) objected to: *none*.
   Claim(s) rejected: *29-65*.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
13. ☐ Other: _____.

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

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DATABRICKS EX1002 Page 744

Continuation of 11. does NOT place the application in condition for allowance because: The Examiner respecfully disagrees with Applicant's assertion that the claimed subject matter of this instant application has a priority dateprior to the effective priority date of the subject matter relied on in Hartsell. Hartsell claim priority of Continuation-in-part of US application 09/797,200, which claims priority of provisional application 60/187,211. Applicant is kindly suggested to look at paragraphs [0142 - 0143], [0158 = 0159], [0165 - 0166], [0172], [0172], [0179], [0181], [0185], and [0195] of CIP 09/797,200 which correspond to the claimed subject matter of Hartsell (US 2002/0065864). Therefore, based on the priority date of the provisional application (US 60/187,211), which is 03/03/2000, the rejection is proper and sustained by the Examiner.

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DATABRICKS EX1002 Page 745

Doc Code: AP.PRE.REQ

PTO/SB/33 (07-05)
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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional): NING0008

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]

on _____

Signature: Filed via EFS Website

Typed or printed name _____

Application Number	Filed
09/834,785	April 13, 2001

First Named Inventor: Hubbard, Edward A.

Art Unit	Examiner
2457	Dalencourt, Yves

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

☒ attorney or agent of record.
Registration number 59,136.

☐ attorney or agent acting under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____

/Christopher J. Culberson/
Signature

Christopher J. Culberson
Typed or printed name

509-755-7266
Telephone number

November 22, 2010
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required.
Submit multiple forms if more than one signature is required, see below*.

☒ *Total of 1 forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No	09/834,785
Filing Date	4/13/2001
Confirmation No	8392
Applicant	Niration Network Group, L.L.C.
Inventorship	Hubbard
Group Art Unit	2457
Examiner	Dalencourt, Y.
Attorney Docket No	NING0008

Title: Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks

PRE-APPEAL BRIEF REQUEST FOR REVIEW

To: Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

From: Christopher J. Culberson (Tel: 509.755.7266; Fax: 509.755.7252)
Sadler, Breen, Morasch & Colby, P.S.
601 W. Main Ave., Ste. 1300
Spokane, WA 99201

The Pre-Appeal Review Panel is respectfully requested to consider the following issues, which are submitted in accordance with the Pre-Appeal Conference Program Rules. Applicant respectfully requests review of the Final Office Action dated 6/24/2010 ("Final Office Action"), Applicant's Response to the Final Office Action, and the Advisory Action dated 9/21/2010. Applicant reserves the right to address additional issues and features of the claims in an appeal.

In the discussion below, Applicant will refer to the following references:

(1) U.S. Pat. App. Pub. No. 2002/0065864 to Hartsell, et al., filed on June 12, 2001 ("Hartsell");

(2) U.S. Pat. App. Pub. No. 2002/0133593 to Johnson, et al., filed on March 1, 2001 ("Johnson"), of which Hartsell is a continuation-in-part; and

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(3) U.S. Provisional App. No. 60/187,211 to Beale, et al., filed on March 3, 2000 ("Beale"), to which Hartsell and Johnson claim priority.

Claims 29-65 stand rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Hartsell. Applicant respectfully disagrees. As articulated herein and in Applicant's Response to the Final Office Action, the Office has failed to establish a prima facie case of anticipation with respect to claims 29-65 for at least the reason that Applicant's claimed subject matter has a priority date prior to the effective priority date of the subject matter relied on in Hartsell. Withdrawal of the rejections is respectfully requested for at least the reasons presented herein.

To be used in support of a prima facie case of anticipation under 35 U.S.C. § 102(e), the subject matter relied upon in a cited reference must have a priority date that occurs before the earliest priority date of the application under examination. The present application claims priority to several earlier applications dated March 30, 2000. In the Response to Arguments section of the office action, the Office mentions that Hartsell claims priority to several provisional applications, one of which is Beale. Applicant has reviewed the subject matter cited by the Office in the Hartsell reference and submits that this subject matter is not entitled to the March 3, 2000 priority date of Beale for at least the reason that this subject matter is not disclosed in Beale. See, e.g., 35 U.S.C. §119(e). Accordingly, Applicant submits that for at least the aforementioned reason, the subject matter cited by the Office in Hartsell cannot be relied upon in establishing a prima facie case of anticipation with respect to the claims herein. Applicant respectfully requests that the rejections of claims 29-65 under § 102(e) be withdrawn.

1. Independent Claim 29

In making out the rejection of claim 29, the Office argues that its subject matter is anticipated by Hartsell. Applicant respectfully traverses this rejection for at least the following three reasons. First, Hartsell fails to disclose, teach, or suggest all of the

features recited in claim 29 and thus a prima facie case of anticipation cannot be established based on Hartsell.

Second, in its rejection of claim 29 in the Final Office Action, the Office cites to several sections of Hartsell. The sections of Hartsell cited by the Office include Fig. 2 and paragraphs [0189], [0190], [0197], [0204], [0208], [0210], [0236], [0245], and [0246]. As discussed above, however, Applicant has reviewed the subject matter discussed in these sections of Hartsell and submits that this subject matter is not disclosed in Beale and thus is not entitled to the March 3, 2000 priority date of Beale. Thus, this subject matter cannot be utilized in support of a prima facie case of anticipation of claim 29.

Third, in the Advisory Action, the Office states that (sic):

> The Examiner respectfully disagrees with Applicant's assertion that the claimed subject matter of this instant application has a priority date prior to the effective priority date of the subject matter relied on in Hartsell. Hartsell claim priority of Continuation-in-part of US application 09/797,200 [Johnson], which claims priority of provisional application 60/187,211. Applicant is kindly suggested to look at paragraphs [0142 - 0143], [0158 - 0159], [0165 - 0166], [0172], [0172], [0179], [0181], [0185], and [0195] of CIP 09/797,200 which correspond to the claimed subject matter of Hartsell (US 2002/0065864). Therefore, based on the priority date of the provisional application (US 60/187,211), which is 03/03/2000, the rejection is proper and sustained by the Examiner. Advisory Action at p. 2.

Thus, in the Advisory Action the Office cites to several sections of Johnson. However, for at least the following reasons, these arguments by the Office still fail to establish a prima facie case of anticipation of claim 29 based on Hartsell.

First, Johnson has a filing date of March 1, 2001, which is after Applicant's priority date of March 30, 2000. Thus, Johnson cannot be relied upon in attempting to establish a prima facie case of anticipation with respect to claim 29.

Second, the subject matter relied on by the Office in Johnson (e.g., paragraphs [0142], [0143], [0158], [0159], [0165], [0166], [0172], [0172], [0179], [0181], [0185],

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and [0195]) is not entitled to the priority date of Beale for at least the reason that this subject matter is not disclosed in Beale.

If the Office chooses to continue to rely upon the priority date of Beale in rejecting claim 29, Applicant respectfully requests that the Office cite to specific subject matter in Hartsell and/or Johnson and that the Office explain how this specific subject matter is entitled to the priority date of Beale. For example, Applicant respectfully requests that the Office cite to specific figures and/or paragraphs in Beale that provide support for the subject matter relied upon in its rejections of the claims herein.

2. Dependent Claims 30-41

Claims 30-41 each depend from allowable independent claim 29. Therefore, it is respectfully submitted that the rejection of claims 30-41 is not supported for at least this reason.

3. Claims 42-65

Claims 42-65 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Hartsell. In the Final Office Action, the Office simply states that:

> Claims 42 - 65 substantially disclose all the limitations of claims 29 - 41 in system and computer-implemented method with minor modification in the claimed language. The reasons for rejecting claims 29 - 41 apply in claims 42 - 65. Therefore, claims 42 - 65 are rejected for the same reasons. Final Office Action at pp. 6-7.

First, inasmuch as this statement by the Office may be interpreted to limit the scope of any of the claims herein, Applicant respectfully disagrees and submits that the Office's reasoning is misguided. Second, Applicant submits that the Office has failed to establish a prima facie case of anticipation with respect to claims 42-65 for at least the reasons that (1) Hartsell fails to disclose, teach, or suggest all of the features recited in claims 42-65 and (2) as discussed above, Applicant's claimed subject matter has a priority date that predates that of the subject matter of Hartsell cited by the Office.

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Accordingly, and at least for these reasons, Applicant submits that the Office has failed to establish a prima facie case of anticipation with respect to claims 42-65 and claims 42-65 are allowable.

Conclusion

The rejections set forth in the Final Office Action and the Advisory Action are not supported for at least the foregoing reasons. Accordingly, withdrawal of all of the rejections it is respectfully requested.

Respectfully submitted,

Date: 22 November 2010

By: /Christopher J. Culberson/
Christopher J. Culberson
Reg. No. 59136

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DATABRICKS EX1002 Page 751

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NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Docket Number (Optional): NING0008

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]
on _____

Signature _____

Typed or printed name Filed via EFS Website

In re Application of: Hubbard, Edward A.

Application Number	Filed
09/834,785	April 13, 2001

For: Software-Based Network Attached Storage Services...

Art Unit	Examiner
2457	Dalencourt, Yves

Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the examiner.

The fee for this Notice of Appeal is (37 CFR 41.20(b)(1)) $ 540

☐ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is: $ _____

☐ A check in the amount of the fee is enclosed.

☑ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account. I have enclosed a duplicate copy of this sheet.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 50-4143 . I have enclosed a duplicate copy of this sheet.

☐ A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

☑ attorney or agent of record. Registration number 59,136.

☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34. _____

/Christopher J. Culberson/
Signature

Christopher J. Culberson
Typed or printed name

509-755-7266
Telephone number

November 22, 2010
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 41.31. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Patent Application Fee Transmittal

Application Number:	09834785
Filing Date:	13-Apr-2001
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Filer:	William Breen/Kenneth Linder
Attorney Docket Number:	NING0008

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Notice of appeal	1401	1	540	540
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 2 months with $0 paid	1252	1	490	490
Miscellaneous:				
			Total in USD ($)	**1030**

Electronic Acknowledgement Receipt

EFS ID:	8887307
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	75671
Filer:	William Breen/Kenneth Linder
Filer Authorized By:	William Breen
Attorney Docket Number:	NING0008
Receipt Date:	22-NOV-2010
Filing Date:	13-APR-2001
Time Stamp:	14:15:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1030
RAM confirmation Number	595
Deposit Account	504143
Authorized User	SADLER,LANCE R.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Pre-Brief Conference request	NING0008PreAppealBriefRequest.pdf	175654 0917664473bdeecab4cd91d6ff8b8751dc152851	no	6
Warnings:					
Information:					
2	Notice of Appeal Filed	NING0008NoticeofAppeal.pdf	51912 9078a2d16771cf9e1cddb284430c1ec72f0f0a02	no	1
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	32545 77ec1c26f93cd1ab59acf3e341e9920ffe5c676f	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	260111		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	NING0008	8392

75671 7590 01/10/2011

Sadler, Breen, Morasch & Colby, ps
601 W. Main Ave.
Suite 1300
Spokane, WA 99201

EXAMINER	
DALENCOURT, YVES	
ART UNIT	PAPER NUMBER
2457	

MAIL DATE	DELIVERY MODE
01/10/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of Panel Decision from Pre-Appeal Brief Review	Application/Control No.	Applicant(s)/Patent under Reexamination	
	09/834,785	HUBBARD, EDWARD A.	
	YVES DALENCOURT	Art Unit	
		2457	

This is in response to the Pre-Appeal Brief Request for Review filed 22 November 2010.

1. ☐ **Improper Request** – The Request is improper and a conference will not be held for the following reason(s):

☐ The Notice of Appeal has not been filed concurrent with the Pre-Appeal Brief Request.
☐ The request does not include reasons why a review is appropriate.
☐ A proposed amendment is included with the Pre-Appeal Brief request.
☐ Other: .

The time period for filing a response continues to run from the receipt date of the Notice of Appeal or from the mail date of the last Office communication, if no Notice of Appeal has been received.

2. ☐ **Proceed to Board of Patent Appeals and Interferences** – A Pre-Appeal Brief conference has been held. The application remains under appeal because there is at least one actual issue for appeal. Applicant is required to submit an appeal brief in accordance with 37 CFR 41.37. The time period for filing an appeal brief will be reset to be one month from mailing this decision, or the balance of the two-month time period running from the receipt of the notice of appeal, whichever is greater. Further, the time period for filing of the appeal brief is extendible under 37 CFR 1.136 based upon the mail date of this decision or the receipt date of the notice of appeal, as applicable.

☐ The panel has determined the status of the claim(s) is as follows:
Claim(s) allowed: _____.
Claim(s) objected to: _____.
Claim(s) rejected: _____.
Claim(s) withdrawn from consideration: _____.

3. ☐ **Allowable application** – A conference has been held. The rejection is withdrawn and a Notice of Allowance will be mailed. Prosecution on the merits remains closed. No further action is required by applicant at this time.

4. ☒ **Reopen Prosecution** – A conference has been held. The rejection is withdrawn and a new Office action will be mailed. No further action is required by applicant at this time.

All participants:

(1) *YVES DALENCOURT*. (3)_____.

(2) *ARIO ETIENNE*. (4)_____.

/ARIO ETIENNE/
Supervisory Patent Examiner, Art Unit 2457

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

IPR2025-00716
DATABRICKS EX1002 Page 758

PTO/SB/80 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 20322

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 20322

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Niration Network Group, L.L.C.
2711 Centerville Rd, Suite 400
Wilmington, DE 19808

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	Dana Morris	Date	12/30/10
Name	Dana Morris	Telephone	
Title	Authorized Person for Niration Network Group, L.L.C.		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

DECLARATION REGARDING AUTHORITY TO SIGN ON BEHALF OF A LEGAL ENTITY
37 C.F.R. 3.73(b)(2)(i)

I, Dana Morris (whose title is supplied below), hereby declare that I am authorized to sign on behalf of Niration Network Group, L.L.C.

D Morris

Dana Morris, Authorized Person for Niration Network Group, L.L.C.

12/30/10

[date]

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Niration Network Group, L.L.C.

Application No./Patent No.: 09/834,785 Filed/Issue Date: April 13, 2001

Titled: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

Niration Network Group, L.L.C. , a Limited Liability Company
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy therefore is attached.

OR

B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Edward A. Hubbard To: United Devices, Inc.
   The document was recorded in the United States Patent and Trademark Office at
   Reel 012004, Frame 0544, or for which a copy thereof is attached.

2. From: United Devices, Inc. To: Univa Corporation
   The document was recorded in the United States Patent and Trademark Office at
   Reel 020353, Frame 0187, or for which a copy thereof is attached.

3. From: Univa Corporation (AKA United Devices) To: Niration Network Group, L.L.C.
   The document was recorded in the United States Patent and Trademark Office at
   Reel 020831, Frame 0104, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature 1/7/11 Date

Todd P. Komaromy Attorney for Assignee
Printed or Typed Name Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/122 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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CHANGE OF CORRESPONDENCE ADDRESS
Application

Address to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Edward A. Hubbard
Art Unit	2457
Examiner Name	Yves Dalencourt
Attorney Docket Number	59659.1200

Please change the Correspondence Address for the above-identified patent application to:

☑ The address associated with Customer Number: 20322

OR

☐ Firm or Individual Name

Address

City | State | Zip

Country

Telephone | Email

This form cannot be used to change the data associated with a Customer Number. To change the data associated with an existing Customer Number use "Request for Customer Number Data Change" (PTO/SB/124).

I am the:

☐ Applicant/Inventor

☐ Assignee of record of the entire interest.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☑ Attorney or agent of record. Registration Number 64680.

☐ Registered practitioner named in the application transmittal letter in an application without an executed oath or declaration. See 37 CFR 1.33(a)(1). Registration Number_____.

Signature

Typed or Printed Name Todd P. Komaromy

Date January 7, 2011 | Telephone 602-382-6321

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____forms are submitted.

This collection of information is required by 37 CFR 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	9195690
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	75671
Filer:	Todd P. Komaromy/Kelsi Rigby
Filer Authorized By:	Todd P. Komaromy
Attorney Docket Number:	NING0008
Receipt Date:	10-JAN-2011
Filing Date:	13-APR-2001
Time Stamp:	12:02:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		596591200_POA.PDF	351313 f13e4bfbd2207bdec0d4314370ab4697367348c7	yes	6

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Power of Attorney	1	2
	Assignee showing of ownership per 37 CFR 3.73(b).	3	4
	Change of Address	5	6
Warnings:			
Information:			
	Total Files Size (in bytes):	351313	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	59659.1200

CONFIRMATION NO. 8392

POA ACCEPTANCE LETTER

20322
SNELL & WILMER L.L.P. (Main)
400 EAST VAN BUREN
ONE ARIZONA CENTER
PHOENIX, AZ 85004-2202

OC00000045452160

Date Mailed: 01/13/2011

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/10/2011.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/bcrittenden/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IPR2025-00716
DATABRICKS EX1002 Page 767

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	NING0008

CONFIRMATION NO. 8392

POWER OF ATTORNEY NOTICE

75671
Sadler, Breen, Morasch & Colby, ps
601 W. Main Ave.
Suite 1300
Spokane, WA 99201

OC000000045452055

Date Mailed: 01/13/2011

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/10/2011.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/bcrittenden/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IPR2025-00716
DATABRICKS EX1002 Page 768

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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Bib Data Sheet

CONFIRMATION NO. 8392

SERIAL NUMBER	FILING OR 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/834,785	04/13/2001 RULE	709	2457	59659.1200

APPLICANTS

Edward A. Hubbard, Round Rock, TX;

**** CONTINUING DATA ***************************

This application is a CIP of 09/538,543 03/30/2000 PAT 7,003,547
and is a CIP of 09/539,023 03/30/2000 ABN
and is a CIP of 09/539,448 03/30/2000 ABN
and is a CIP of 09/539,428 03/30/2000 ABN
and is a CIP of 09/539,106 03/30/2000 PAT 6,891,802
and is a CIP of 09/538,542 03/30/2000 PAT 6,654,783
and is a CIP of 09/539,107 03/30/2000 ABN
and is a CIP of 09/603,740 06/23/2000 ABN
and is a CIP of 09/602,789 06/23/2000 PAT 7,020,678
and is a CIP of 09/602,803 06/23/2000 PAT 7,082,474
and is a CIP of 09/602,844 06/23/2000 ABN
and is a CIP of 09/602,983 06/23/2000 PAT 6,963,897
and is a CIP of 09/648,832 08/25/2000 PAT 6,847,995
and is a CIP of 09/794,969 02/27/2001 ABN

**** FOREIGN APPLICATIONS *********************

IF REQUIRED, FOREIGN FILING LICENSE GRANTED **
06/07/2001

		STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS
Foreign Priority claimed	☐ yes ☐ no	TX	31	28	2
35 USC 119 (a-d) conditions met	☐ yes ☐ no ☐ Met after Allowance				
Verified and Acknowledged	Examiner's Signature Initials				

ADDRESS
20322

TITLE
SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

FILING FEE RECEIVED		
792	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	59659.1200	8392

86244 7590 03/18/2011

Snell & Wilmer L.L.P., (Komaromy)
One Arizona Center
400 East Van Buren Street
Pheonix, AZ 85004-2202

EXAMINER	
DALENCOURT, YVES	
ART UNIT	PAPER NUMBER
2457	

NOTIFICATION DATE	DELIVERY MODE
03/18/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

landerson@swlaw.com
tkomaromy@swlaw.com
ccrawford@swlaw.com

Office Action Summary	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	YVES DALENCOURT	2457	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 November 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29-65* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is responsive to communication filed on 11/22/2010.

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 29 – 65 are rejected under 35 U.S.C. 102(e) as being anticipated by James J. Wolff (US 6,101,508; hereinafter Wolff).

Regarding claim 29, Wolff discloses a computer-implemented method providing network attached storage (NAS) services (fig. 1A-C; abstract; col. 4, lines 16 - 61) comprising:

configuring a distributed processing system by coupling of a plurality of distributed devices coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system (fig. 1A-B; col. 6, lines 14 – 39; col. 6, lines 40 – 49; col. 61, lines 25 – 37; **Wolff discloses that the aware client** software **modules may**

reside on a server, which implements client processes, or a stand-alone unit as shown in FIG. 1A.),

wherein the client agents for particular said distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices (col. 2, line 54 through col. 3, line 9);

representing with the software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices (fig. 7A; col. 25, lines 34 - 64); and

processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network (col. 54, line 66 through col. 55, line 53). Claim 42 adds the limitation of allocating respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices (col. 36, lines 53 – 65; col. 39, lines 30 - 66; *Wolff discloses the ideal and remaining capacities, respectively fields 420H-I (see FIG. 5A), are recalculated for each of the active servers*).

Regarding claim 30, Wolff discloses the method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a stand-alone dedicated NAS device through use of the client agent for the particular said distributed device (col. 12, lines 40 – 49; Wolff discloses that the aware client software modules

may reside on a server, which implements client processes, or a stand-alone unit as shown in FIG. 1A).

Regarding claim 31, Wolff discloses the method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the client agent for the particular said distributed device (fig. 12A; col. 61, lines 25 - 37]).

Regarding claim 32, Wolff discloses the method of claim 31, further comprising receiving an access request from the client device and directing the client device to data requested on at least one of the selected distributed devices (col. 2, lines 49 - 65).

Regarding claim 33, Wolff discloses the method of claim 32, further comprising managing the NAS service for said distributed devices at least in part utilizing a centralized server (104B, fig, 3C; col. 18, lines 9 - 17).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 34 – 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over James J. Wolff (US 6,101,508; hereinafter Wolff) in view of Duso et al (US 5,987,621; hereinafter Duso).

Regarding claim 34, Wolff discloses substantially all the limitations in claim 33, but fails to specifically disclose downloading the software-based NAS component to the selected distributed devices.

However, Duso discloses an analogous hardware and software failover services for a file server which shows the idea of downloading the software-based NAS component to the selected distributed devices (col. 6, lines 58 – 68; Duso discloses fast downloading).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Wolff by downloading the software-based NAS component to the selected distributed devices as evidenced by Duso for the purpose of providing a fast and reliable distributed processing system.

Regarding claim 35, Wolff discloses the method of claim 33, further comprising storing, with the centralized server, location information associated with the data stored in the selected distributed devices (col. 18, lines 9 - 17).

Regarding claim 36, Wolff discloses the method of claim 35, further comprising utilizing the centralized server to receive and route the data for storage to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database (col. 8, line 47 through col. 9, line 6).

Regarding claim 37, Wolff and Duso disclose the method of claim 29, and Duso further discloses that the method is at least partially performed through use of the Internet (col. 7, lines 53 - 65).

Regarding claim 38, Wolff discloses the method of claim 29, further comprising managing storage resources for the selected distributed devices with a storage priority control that facilitates use of the available amount of storage resources for the selected distributed devices (col. 8, line 47 through col. 9, line 6).

Regarding claim 39, Wolff discloses the method of claim 38, further comprising accepting selection of the storage priority control, by the client device that comprises a parameter (col. 8, line 47 through col. 9, line 6; col. 40, line 52 through col. 41, line 15).

Regarding claim 40, Wolff discloses the method of claim 39, further comprising prioritizing one or more of storage or deletion of data using the storage priority control that comprises storage priority level schemes (col. 8, line 47 through col. 9, line 6; col. 40, line 52 through col. 41, line 15).

Regarding claim 41, Wolff discloses the method of claim 38, wherein the managing storage resources further comprises marking directly data or files (col. 6, line 40 through col. 7, line 46).

Claims 42 – 65 substantially disclose all the limitations of claims 29 – 41 in system and computer-implemented method with minor modification in the claimed language. The reasons for rejecting claims 29 – 41 apply in claims 42 – 65. Therefore, claims 42 – 65 are rejected for the same reasons by the prior art applied.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YVES DALENCOURT whose telephone number is (571)272-3998. The examiner can normally be reached on M-F 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

Notice of References Cited	Application/Control No. 09/834,785	Applicant(s)/Patent Under Reexamination HUBBARD, EDWARD A.	
	Examiner YVES DALENCOURT	Art Unit 2457	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,987,621	11-1999	Duso et al.	714/4.11
*	B	US-6,101,508	08-2000	Wolff, James J.	709/223
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

WEST Search History for Application 09834785

Creation Date: 2011031214:13

Prior Art Searches

Query	DB	Op.	Plur.	Thes.	Date
(configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
		OR	YES		12-19-2009

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(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD				
stor$3 adj7 (data or information)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(stor$3 adj7 (data or information)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1 and available adj7 storage source$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)) and	PGPB, USPT, EPAB,	OR	YES		12-19-2009

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((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	JPAB, DWPI, TDBD				
(configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or	PGPB, USPT, EPAB,	OR	YES		09-06-2010

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information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	JPAB, DWPI, TDBD				
stor$3 adj7 (data or information)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(stor$3 adj7 (data or information)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1 and available adj7 storage source$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)) and ((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010

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process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)					
709/203.ccls.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
allocat$3 adj7 data and underutiliz$3 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(allocat$3 adj7 data and underutiliz$3 adj7 resource$1) and conterol$3 adj7 local adj7 storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(allocat$3 adj7 data and underutiliz$3 adj7 resource$1) and control$3 adj7 local adj7 storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(allocat$3 adj7 data and underutiliz$3 adj7 resource$1) and local adj7 storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011

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distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
stor$3 adj7 (data or information)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(stor$3 adj7 (data or information)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1 and available adj7 storage source$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)	PGPB, USPT, EPAB, JPAB,	OR	YES		03-12-2011

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	DWPI, TDBD				
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)) and ((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(709/203).ccls.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory) and	PGPB, USPT, EPAB,	OR	YES		03-12-2011

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distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu))	JPAB, DWPI, TDBD				
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and @pd<20000218	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
6101508.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn.) and workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn.) and process$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3) and nas	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
		OR	YES		03-12-2011

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(6101508.pn. and process$3) and attach$$3 adj7 storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD				
(6101508.pn. and process$3 and attach$$3 adj7 storage$1) and configur$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3) and client$1 and agent$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3) and client$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1) and agent$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1) and portion$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1) and assess$3 near3 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1) and assess$3	PGPB, USPT, EPAB, JPAB,	OR	YES		03-12-2011

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	DWPI, TDBD				
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1) and resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1 and resource$1) and analyz$3 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1 and resource$1) and control$5 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1 and resource$1 and control$5 adj7 resource$1) and amount$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
20020065864	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011

IPR2025-00716
DATABRICKS EX1002 Page 788

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	**Art Unit**
	YVES DALENCOURT	2457

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/14/2009	06/10/2010	09/06/2010	03/11/2011					
	1	-	-	-	-					
	2	-	-	-	-					
	3	-	-	-	-					
	4	-	-	-	-					
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	30	✓	✓	=	✓					
	31	✓	✓	=	✓					
	32	✓	✓	=	✓					
	33	✓	✓	=	✓					
	34	✓	✓	=	✓					
	35	✓	✓	=	✓					
	36	✓	✓	=	✓					

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/14/2009	06/10/2010	09/06/2010	03/11/2011					
	37	✓	✓	=	✓					
	38	✓	✓	=	✓					
	39	✓	✓	=	✓					
	40	✓	✓	=	✓					
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	63	✓	✓	=	✓					
	64	✓	✓	=	✓					
	65	✓	✓	=	✓					

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

SEARCHED			
Class	Subclass	Date	Examiner
709	203, 223, 226	06/09/2010	YD

SEARCH NOTES		
Search Notes	Date	Examiner
WEST (see attached text search)	12/19/2009	YD
WEST (updated text search)	09/06/2010	YD
WEST (updated text search)	03/12/2011	YD

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

IPR2025-00716
DATABRICKS EX1002 Page 791

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	PATENT NUMBER	GROUP ART UNIT	FILE WRAPPER LOCATION
09/834,785		2457	21M1

OC000000047468852

Correspondence Address/Fee Address Change

The following fields have been set to Customer Number 86244 on 02/17/2011

- **Correspondence Address**
- **Maintenance Fee Address**

The address of record for Customer Number 86244 is:

86244
Snell & Wilmer L.L.P., (Komaromy)
One Arizona Center
400 East Van Buren Street
Pheonix, AZ 85004-2202

IPR2025-00716
DATABRICKS EX1002 Page 792

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	09834785
Filing Date	2001-04-13
First Named Inventor	Edward A. Hubbard
Art Unit	2457
Examiner Name	Yves Dalencourt
Attorney Docket Number	59659.1200

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4987533		1999-01-22	Clark et al.	
	2	5806045		1998-09-08	Biorge et al.	
	3	5987621		1999-11-16	Duso et al.	
	4	6101508		2000-08-08	Wolff	
	5	6222449		2001-04-24	Twining	
	6	6601101		2003-07-29	Lee et al.	
	7	6611686		2003-08-26	Smith et al.	
	8	6735630		2004-05-11	Gelvin et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	09834785
	Filing Date	2001-04-13
	First Named Inventor	Edward A. Hubbard
	Art Unit	2457
	Examiner Name	Yves Dalencourt
	Attorney Docket Number	59659.1200

	9	6738614		2004-05-18	Blankenship et al.	
	10	6742038		2004-05-25	Britt Jr.	
	11	7134073		2006-11-07	Fiedorowicz et al.	
	12	7269664		2007-09-11	Hutsch et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20010014868		2001-08-16	Herz et al.	
	2	20020078075		2002-06-20	Colson et al.	
	3	20020052778		2002-05-02	Murphy et al.	
	4	20020194329		2002-12-19	Alling	
	5	20020065864		2002-05-30	Hartsell et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	09834785
	Filing Date	2001-04-13
	First Named Inventor	Edward A. Hubbard
	Art Unit	2457
	Examiner Name	Yves Dalencourt
	Attorney Docket Number	59659.1200

	6	20020194251		2002-12-19	Richter et al.	
	7	20020188733		2002-12-12	Collins et al.	
	8	20020143729		2002-10-03	Fostick	
	9	20010044588		2001-11-22	Mault	
	10	20040043758		2004-03-04	Sorvari et al.	

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Office Action dated April 1, 2009 in Serial No. 10/766,972	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	09834785
	Filing Date	2001-04-13
	First Named Inventor	Edward A. Hubbard
	Art Unit	2457
	Examiner Name	Yves Dalencourt
	Attorney Docket Number	59659.1200

	2	Final Office Action dated November 06, 2009 in Serial No. 10/766,972	☐
	3	Advisory Action dated January 20, 2010 in Serial No. 10/766,972	☐
	4	Office Action dated March 25, 2010 in Serial No. 10/766,972	☐
	5	Notice of Allowance dated May 12, 2011 in Serial No. 10/766,972	☐
	6	Final Office Action dated October 10, 2010 in Serial No. 10/766,972	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	09834785
Filing Date	2001-04-13
First Named Inventor	Edward A. Hubbard
Art Unit	2457
Examiner Name	Yves Dalencourt
Attorney Docket Number	59659.1200

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Todd P. Komaromy/	Date (YYYY-MM-DD)	2011-05-11
Name/Print	Todd P. Komaromy	Registration Number	64680

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	09834785
Filing Date:	13-Apr-2001
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Filer:	Todd P. Komaromy/Kelsi Rigby
Attorney Docket Number:	59659.1200

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	10127156
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	86244
Filer:	Todd P. Komaromy/Kelsi Rigby
Filer Authorized By:	Todd P. Komaromy
Attorney Docket Number:	59659.1200
Receipt Date:	19-MAY-2011
Filing Date:	13-APR-2001
Time Stamp:	14:22:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	615
Deposit Account	192814
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	596591200_IDSLTR20110519.pdf	175882 6c6bfdb4d1511f088ff7fb5e090debc02f8bad6f	no	4
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Filed (SB/08)	596591200_SB0820110518.pdf	612744 cd9df459808d486f36bccbc620a1932c5d3de298	no	6
Warnings:					
Information:					
3	NPL Documents	OA-dated-04012009-10766972.pdf	860692 7f55c5c95f8fc2b9b25c7db1fc32b034f2e8c0de	no	24
Warnings:					
Information:					
4	NPL Documents	FOA-dated-11062009-10766972.pdf	454503 679d21ae677951cf57f0f74c50b8b065f89b895e	no	14
Warnings:					
Information:					
5	NPL Documents	AA-dated-01202010-10766972.pdf	107336 95f605730d28532963830e75f56094bf83a79fa1	no	2
Warnings:					
Information:					
6	NPL Documents	OA-dated-03252010-10766972.pdf	413329 65da1fee4f57a7fbc7b33ea4bc5ac1fddef6cbc6	no	13
Warnings:					
Information:					
7	NPL Documents	NOA-dated-05122011-10766972.pdf	718024 98c2c88dc69c3116c73cef95a58b976ede5f70b5	no	17
Warnings:					
Information:					
8	NPL Documents	FOA-dated-10122010-10766972.pdf	845036 3e5bced90194ad4f5c8d6a99dac393d4902c55bd	no	27
Warnings:					
Information:					

9	Fee Worksheet (PTO-875)	fee-info.pdf	30861 a2b44f2a9c3eb319b244b5b96967e5d40627b5c1	no	2

Warnings:	
Information:	
Total Files Size (in bytes):	4218407

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

FILED VIA EFS WEB

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

Applicants:	Edward A. Hubbard	Docket No.:	59659.1200
Serial No.:	09/834,785	Examiner:	Yves Dalencourt
Filing Date:	April 13, 2001	Group Art Unit:	2457
Title:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS	Confirmation No.:	8392

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

In accordance with the duty of disclosure under 37 C.F.R. §1.56 and pursuant to 37 C.F.R., §§1.97 and 1.98, Applicant hereby notifies the U.S. Patent and Trademark Office of the documents listed on the attached Form PTO/SB/08A. Applicant respectfully submits that all pending claims are patentable over the foregoing references, alone or in combination. The Examiner is requested to initial the enclosed Form PTO/SB/08A and return a copy thereof to the undersigned.

The items listed on Form PTO/SB/08A may be deemed to be pertinent to the above-identified application and are made of record to assist the Patent and Trademark Office in its examination of this application. The Examiner is respectfully requested to fully consider the items and to independently ascertain their teaching.

The present application is part of a large family of related applications and thousands of references have been cited in this family. Due to the large number of references involved in the

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DATABRICKS EX1002 Page 804

family, Applicants have decided not to submit every reference cited in an Information Disclosure Statement so as not to bury the Office with thousands of references. Instead, with this IDS Applicants respectfully submit a list of references, some of which, to our knowledge, have been more frequently cited by other Examiners or in related cases.

The submission of the listed documents is not intended as an admission that any such document constitutes prior art against the claims of the present application. Applicants reserve the right to dispute any of the listed documents as prior art during examination. Further, Applicants do not waive any right to take any action that would be appropriate to antedate or otherwise remove any listed document as a competent reference against the claims of the present application. Furthermore, the submission of this Information Disclosure Statement is not to be construed as a representation that a search has been made or that no other material information may exist.

1. [ ] For each of the following items listed on the enclosed copy of Form PTO/SB/08A that is not in the English language, an English language translation of that item or a portion thereof or a concise explanation of the relevance of that item is enclosed:

---

2. [ ] Any copy of the items listed on the enclosed copy of Form PTO/SB/08A that is not enclosed with this Information Disclosure Statement was previously cited by or submitted to the Patent and Trademark Office in the prior [ ] Parent Application, [ ] Continuation, [ ] Divisional or [ ] Continuation-In-Part application under 37 C.F.R. §1.97, U.S. Serial No._____, filed _____.

3. [ ] No fee is due under 37 C.F.R. §1.17(p) for this Information Disclosure Statement since it is being filed in compliance with:

   [ ] 37 C.F.R. §1.97(b)(1), within three months of the filing date of the above-identified application.

   [ ] 37 C.F.R. §1.97(b)(2), within three months of the date of entry into the national stage as set forth in §1.491 in an international application.

   [ ] 37 C.F.R. §1.97(b)(3), before the mailing of a first Office action on the merits.

   [ ] 37 C.F.R. §1.97(b)(4), before the mailing of a first Office action after the filing of a request for continued examination under §1.114.

4. [ ] No fee is due under 37 C.F.R. §1.17(p) for this Information Disclosure Statement since it is being filed in compliance with 37 C.F.R. §1.97(c), after the period specified in paragraph 3 above but before the mailing date of a final action or a Notice of Allowance

IPR2025-00716
DATABRICKS EX1002 Page 805

(where there has been no prior final action), and is accompanied by one of the certifications pursuant to 37 C.F.R. §1.97(e) set forth in paragraph 8 below.

5. [X] A fee is due under 37 C.F.R. §1.17(p) for this Information Disclosure Statement since it is being filed in compliance with 37 C.F.R. §1.97(c), after the period specified in paragraph 3 above but before the mailing date of a final action or a notice of allowance (where there has been no prior final action):

[ ] A check in the amount of $180.00 is enclosed in payment of the fee.

[X] Charge the fee to Deposit Account No. 19-2814.

6. [ ] A fee is due under 37 C.F.R. §1.17(p) for this Information Disclosure Statement since it is being filed in compliance with 37 C.F.R. §1.97(d), after the mailing date of a final action or a notice of allowance, whichever comes first, but before payment of the issue fee, and is accompanied by:

a. one of the certifications pursuant to 37 C.F.R. §1.97(e) set forth in paragraph 8 below; and

b. the fee due under 37 C.F.R. §1.17(p) which is paid as set forth in paragraph 9 below.

7. [ ] A fee is due under 37 C.F.R. §1.17(p) for this Information Disclosure Statement since it is being filed in compliance with:

a. [ ] 37 C.F.R. §1.313(b)(3), after the issue fee has been paid and information cited in this Information Disclosure Statement may render at least one claim unpatentable and is accompanied by the attached Petition To Withdraw Application From Issue;

b. [ ] 37 C.F.R. §1.313(b)(5), after the issue fee has been paid and information cited in this Information Disclosure Statement is to be considered in a Continuation application upon abandonment of the instant application and is accompanied by the attached Petition To Withdraw Application From Issue.

c. [ ] The fee due under 37 C.F.R. §1.17(p) is paid as set forth in paragraph 9 below.

8. [ ] I hereby certify that each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement.

[ ] I hereby certify that no item of information in the Information Disclosure Statement filed herewith was cited in a communication from a foreign patent office in a counterpart foreign application or, to my knowledge after making reasonable inquiry, was known to any individual designated in §1.56(c) more than three months prior to the filing of this Information Disclosure Statement.

9. [ ] A check in the amount of $180.00 is enclosed in payment of the fee due under 37 C.F.R. §1.17(p).

[X] Charge the fee due under 37 C.F.R. §1.17(p) to Deposit Account No. 19-2814.

[X] The Commissioner is hereby authorized to charge any additional fees which may be required for this Information Disclosure Statement, or credit any overpayment to Deposit Account No. 19-2814.

Respectfully submitted,

Dated: 5/18/11

Todd P. Komaromy
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FILED VIA EFS WEB

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

Applicants:	Edward A. Hubbard, et al.	Docket No.:	59659.1200
Serial No.:	09/834,785	Examiner:	Yves Dalencourt
Filed:	April 13, 2001	Group Art Unit:	2457
Title:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS	Confirmation No.:	8392

REPLY

Mail Stop Amendment
Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

In reply to the Office Action dated March 18, 2011, of which this Reply is filed within three months, please consider the following remarks:

The listing of the Claims begins on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

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The Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. - 28. canceled.

29. (previously presented) A computer-implemented method comprising:

configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system,

wherein the client agents for particular said distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices;

representing with the software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices; and

processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network.

30. (previously presented) The method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a stand-alone dedicated NAS device through use of the client agent for the particular said distributed device.

31. (previously presented) The method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the client agent for the particular said distributed device.

32. (previously presented) The method of claim 31, further comprising receiving an access request from the client device and directing the client device to data requested on at least one of the selected distributed devices.

33. (previously presented) The method of claim 32, further comprising managing the NAS service for said distributed devices at least in part utilizing a centralized server.

34. (previously presented) The method of claim 33, further comprising downloading the software-based NAS component to the selected distributed devices.

35. (previously presented) The method of claim 33, further comprising storing, with the centralized server, location information associated with the data stored in the selected distributed devices.

36. (previously presented) The method of claim 35, further comprising utilizing the centralized server to receive and route the data for storage to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database.

37. (previously presented) The method of claim 29, wherein the method is at least partially performed through use of the Internet.

38. (previously presented) The method of claim 29, further comprising managing storage resources for the selected distributed devices with a storage priority control that facilitates use of the available amount of storage resources for the selected distributed devices.

39. (previously presented) The method of claim 38, further comprising accepting selection of the storage priority control, by the client device, that comprises a parameter.

40. (previously presented) The method of claim 38, further comprising prioritizing one or more of storage or deletion of data using the storage priority control that comprises storage priority level schemes.

41. (previously presented) The method of claim 39, wherein the managing storage resources further comprises marking directly data or files.

42. (previously presented) A system comprising:

a plurality of distributed devices configured to be coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of workloads for the distributed processing system, the client agents including respective instances of a software-based network attached storage (NAS) component, wherein the NAS component is configured to:

assess unused storage resources of said distributed devices;

allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices;

represent that the selected distributed devices comprise respective NAS devices having the respective available amounts of storage resources; and

process workloads associated with data storage and access by accessing data from and storing data into portions of the storage resources in the selected distributed devices to provide NAS service to a client device.

43. (previously presented) The system of claim 42, wherein at least one of the client agent is configured to enable at least one of the selected distributed devices to function as a stand-alone dedicated NAS device.

44. (previously presented) The system of claim 42, wherein the client agent is configured to enable at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

45. (previously presented) The system of claim 44, wherein the location distributed device is configured to receive an access request from the client device and direct the client device to the data stored on the selected distributed devices that was requested.

46. (previously presented) The system of claim 45, wherein the system is further configured to manage the NAS service for said distributed devices at least in part utilizing a centralized server system.

47. (previously presented) The system of claim 46, wherein the centralized server system is further configured to enable download of the NAS component to the selected distributed devices.

48. (previously presented) The system of claim 46, wherein the centralized server system is configured to store location information associated with the data stored in the selected distributed devices.

49. (previously presented) The system of claim 48, wherein the centralized server system is configured to receive data storage and access requests from the client device and route a data storage workload to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database.

50. (previously presented) The system of claim 42, wherein the distributed devices are configured to be coupled to the Internet.

51. (previously presented) The system of claim 42, further comprising a storage priority control configured to facilitate use of the available amount of storage resources for the selected distributed devices.

52. (previously presented) The system of claim 51, wherein the storage priority control comprises a parameter selectable by the client device.

53. (previously presented) The system of claim 52, wherein the storage priority control comprises storage priority level schemes that prioritize one or more of storage or deletion of data.

54. (previously presented) The system of claim 52, wherein the storage priority control comprises a priority marking directly given to data or files.

55. (previously presented) A computer-implemented method comprising:

allocating data for storage among selected devices of a plurality of devices that are independent and available on a network, wherein the devices have respective software agents

that are usable to control respective local storage resources that are unused or underused on the devices; and

representing, using at least one of said software agents, that the selected devices comprise a network attached storage (NAS) device with storage capacity equal to a total of the unused or underused storage resource.

56. (previously presented) The computer-implemented method of claim 55, wherein the allocating is performed by a server.

57. (previously presented) The computer-implemented method of claim 55, wherein the allocating and representing are performed by one of the plurality of devices.

58. (previously presented) The computer-implemented method of claim 55, wherein the allocating is performed in accordance with respective capability vectors calculated for the selected devices.

59. (previously presented) The computer-implemented method of claim 55, further comprising:

identifying whether the storage resources for a particular device of the selected devices are idle, and

performing the allocating so a greater portion of the data for storage is sent to the particular device if the storage resources for the particular device are idle, wherein the greater portion is greater than a portion of the data that would be allocated to the particular device if the storage resources for the particular device were not idle.

60. (previously presented) The computer-implemented method of claim 55, wherein the allocating and representing are performed by at least one of the plurality of devices via interaction with other devices on a peer-to-peer basis.

61. (previously presented) A computer-implemented method comprising:

downloading to at least one selected device, included in a plurality of devices, a network attached storage (NAS) component and a portion of a storage workload for storage in memory that is unused or under-utilized; and

representing to a client device, coupled to the multiplicity of devices by a network, that at least one selected device is a dedicated NAS device.

62. (previously presented) The computer-implemented method of claim 61, further comprising storing location information in a database that is usable to indicate locations in memory where the portion of the storage workload is stored.

63. (previously presented) The computer-implemented method of claim 61, wherein the computer-implemented method is performed by at least one central server coupled to the network.

64. (previously presented) The computer-implemented method of claim 61, wherein the computer-implemented method is performed by a particular device of the multiplicity of devices.

65. (previously presented) The computer-implemented method of claim 61, wherein the computer-implemented method is at least partially performed through use of the Internet.

REMARKS

Applicants reply to the Office Action dated March 18, 2011 within three months. Claims 29-65 are pending in the application and the Examiner rejects claims 29-65. Reconsideration of this application is respectfully requested.

Examiner Interview

Applicants thank the Examiner for the courtesies extended during the Examiner interview of May 11, 2011. Informalities of the Office Action and the rejections under 35 U.S.C. § 102(e) and 35 U.S.C. § 103(a) were discussed; however, no agreement to the claims was reached. The Examiner noted Applicants' argument that Wolff is not directed to a software-based network attached storage; rather, Wolff is directed to processing functions related to I/O requests.

Also, the Examiner clarified that page 2 of the Office Action under the 35 U.S.C. § 102 section header should read "Claims 20-33 are rejected..." instead of "Claims 29-65." Also, the Examiner clarified that page 4 of the Office Action under the 35 U.S.C. § 103 section header should read "Claims 34-65 are rejected..." instead of "Claims 34-36."

Rejection under 35 U.S.C. § 102

The Examiner rejects claims 29-33 under U.S.C. § 102(e) as being anticipated by James J. Wolff, U.S. Patent No. 6,101,508 ("Wolff"). For at least the reasons below, Applicant traverses the rejections and respectfully submits that the Office Action does not establish a *prima facie* case of anticipation.

Wolff is generally related to "a system for distributing the I/O request load over the components of a network. More particularly, the field of the invention relates to distributing the responsibility for **carrying out I/O requests** among various **servers** on a network." (abstract, emphasis added.) The Examiner states on page 3 of the Office Action "wherein the client agents for particular said distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices (col. 2, line 54 through col. 3, line 9)," is disclosed by Wolff. Col. 2, line 54 through col. 3, line 9 of Wolff is reproduced below for Examiner's convenience.

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> Each of the resources couples to at least two of the server nodes. The method for operating comprises the acts of: (1) redirecting an I/O request for a resource from a server node coupled to the resource to a second server node coupled to the resource; (2) splitting the I/O request at the second server node into an access portion and a data transfer portion and passing the access portion to a corresponding administrative server node for the resource: and (3) completing, at the second server nodes subsequent to receipt of an access grant from the corresponding administrative server node, a data transfer for the resource. In an alternate embodiment of the invention, the methods may additionally include the acts of detecting a change in the availability of the server nodes and rebalancing the network by applying a load balancing function to the network in order to re-assign each of the available resources to a corresponding available administrative server node that is responsive to the detecting act. In still another embodiment of the invention, the method for operating a network comprises the acts of redirecting an I/O request for a resource to an underutilized server node coupled to the resource.

Wolff does not disclose "software-based network attached storage," as recited by independent claim 29 (emphasis added). **Wolff is limited to handling I/O requests, and the handling of I/O requests is not analogous to software-based network attached storage.** As discussed during the Examiner interview, NAS is a well known and widely used industry term. Wolff is not directed to network attached storage, and in fact, does not mention the industry phrase at all. Wolff is directed to "an improved system and method for distributed processing over a network," (col. 2, lines 28-29.) Further, Wolff discloses "Methods for operating a network as a clustered file system are disclosed. The methods involve client load rebalancing, distributed Input and Output (I/O), and resource load rebalancing" (col. 2 lines 38-42.) These are processing functions related to I/O requests which are not network attached storage elements. At best, Wolff may arguably disclose elements of a clustered file server; however, this type of system is not analogous to a network attached storage system.

On Page 3 of the Office Action, the Examiner states "representing with the software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices (Fig. 7A; col. 25, lines 34-64)," is disclosed by Wolff. Col. 25, lines 34-63 of Wolff is reproduced below for Examiner's convenience.

> FIG. 7A shows the condition before a rebalance. FIG. 7B shows the condition after a rebalance. FIGS. 7A-B both show a plurality of aware clients 102A and

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> normal clients 100A interfacing with a plurality of nodes, e.g. servers, one of which is referenced as server 104A. Each of the servers, in turn, interfaces with a clustered node database 120A which is shown on memory resource 118. Memory resource 118 may be a network attached peripherally or may itself be handled independently by a file server or load-balance monitor server or process. The cluster node database 120A may, alternatively, be resident in the memory in each of the nodes. She cluster node database 120A is maintained by periodic updates from each of the nodes as to their current utilization. **Utilization can, for example, correlate with processor activity as a percentage of total processor capability, and/or I/O activity as a percentage of total I/O capacity.**
>
> In FIG. 7A. node 4, i.e. server 104A, has detected a utilization condition in **excess of an overload threshold**. Responsive to that determination, server 104A reads the clustered node database 120A in whatever location it may reside, e.g. volatile or non-volatile memory, on a storage volume resource, or in node memory. The server 104A determines which, among those clients that account for its current I/O activity, is an aware client. An aware client connects with a utilization server with a message indicating to the utilization server that the client is capable of running aware processes 102P1 (see FIG. 1A). [emphasis added].

Wolff does not disclose "representing ... available amount of storage resources," as recited by independent claim 29 (emphasis added). As stated above, Wolff explicitly defines utilization as: "Utilization can, for example, correlate with processor activity as a percentage of total processor capability, and/or I/O activity as a percentage of total I/O capacity." These are not storage resources, utilization as defined by Wolff are related to processor functions concerning I/O activity. Processor functions are not storage resources.

Thus, Applicants respectfully submit that Wolff does not recite each and every limitation of the claims. For instance Wolff does not recite "software-based network attached storage" and "representing ... available amount of storage resources," as recited by independent claim 29 (emphasis added). For at least the above reasons, Applicants respectfully submit that the *prima facie* case has not been established.

Dependent claims 30-33 variously depend from independent claim 29. Therefore, Applicants assert that dependent claims 30-33 are patentable for at least the same reasons stated above for differentiating independent claim 29, as well as in view of their own respective features. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of dependent claims 30-33.

Rejection under 35 U.S.C. § 103(a)

The Examiner rejects claims 34-65 under 35 U.S.C. § 103(a) as being unpatentable over Wolff in view of Duso et al., U.S. Patent No. 5,987,621 ("Duso"). For at least the reasons below, Applicant traverses the rejections and respectfully submits that the Office Action does not establish a *prima facie* case of obviousness.

On page 5 of the Office Action the Examiner states "Wolff discloses substantially all the limitations in claim 33, but fails to specifically disclose downloading the software-based NAS component to the selected devices. However, Duso discloses an analogous hardware and software failover services for file server which shows the idea of downloading the software based NAS component to the selected distributed devices (col. 6, lines 58-68: Duso discloses fast downloading)." Duso is not offered by the Examiner to cure the above noted failings of Wolff nor does Duso cure what is lacking in Wolff. In fact, Duso, is silent as to "Network Attached Storage." Applicants respectfully assert that Wolff and Duso alone or in combination fail to disclose or contemplate "software-based network attached storage" and "representing ... available amount of storage resources," as recited by independent claim 29 (emphasis added) and as similarly recited by independent claims 42, 55, and 61. For at least the above reasons, Applicants respectfully submit that the *prima facie* case of obviousness has not been established.

Dependent claims 30-41, 43-54, 56-60 and 62-65 variously depend from independent claims 29, 42, 55 and 16. Therefore, Applicants assert that dependent claims 30-41, 43-54, 56-60 and 62-65 are patentable for at least the same reasons stated above for differentiating independent claims 29, 42, 55 and 16, as well as in view of their own respective features. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of dependent claims 34-41, 43-54, 56-60 and 62-65.

When a phrase similar to "at least one of A, B, or C" or "at least one of A, B, and C" is used in the claims or specification, Applicants intend the phrase to mean any of the following: (1) at least one of A; (2) at least one of B; (3) at least one of C; (4) at least one of A and at least one of B; (5) at least one of B and at least one of C; (6) at least one of A and at least one of C; or (7) at least one of A, at least one of B, and at least one of C.

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Applicants respectfully submit that the pending claims are in condition for allowance. The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account No. **19-2814**. Applicants invite the Examiner to telephone the undersigned, if the Examiner has any questions regarding this Reply or the present application in general.

Respectfully submitted,

Dated: 6/8/11

By: _____
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IPR2025-00716
DATABRICKS EX1002 Page 819

Electronic Acknowledgement Receipt

EFS ID:	10259113
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	86244
Filer:	Todd P. Komaromy/Kelsi Rigby
Filer Authorized By:	Todd P. Komaromy
Attorney Docket Number:	59659.1200
Receipt Date:	08-JUN-2011
Filing Date:	13-APR-2001
Time Stamp:	14:18:42
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		596591200_ROA20110318.pdf	534981 9b8b4ea013ca435381041650bbea0a0d56d1a20a	yes	12

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	12
Warnings:			
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	Total Files Size (in bytes):	534981	

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
09/834,785	04/13/2001	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 06/08/2011

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 37	Minus	** 28	= 9	X $ =		OR	X $52=	468
Independent (37 CFR 1.16(h))	* 4	Minus	***3	= 1	X $ =		OR	X $220=	220
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	688

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/ANNETTE SMITH/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	59659.1200	8392

86244 7590 09/08/2011

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EXAMINER	
DALENCOURT, YVES	
ART UNIT	**PAPER NUMBER**
2457	

NOTIFICATION DATE	DELIVERY MODE
09/08/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

landerson@swlaw.com
tkomaromy@swlaw.com
krigby@swlaw.com

Office Action Summary	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	YVES DALENCOURT	2457	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06/08/2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *29-65* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *29-65* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05/19/2011*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is responsive to amendment filed on 06/08/2011.

Response to Amendment

The Examiner has acknowledged Applicant's response.

Response to Arguments

Applicant's arguments with respect to claims 29 - 65 have been considered but are moot in view of the new ground(s) of rejection.

Regarding Applicant's argument (pagers 2 – 4) that Wolf is not directed to network attached storage, and in fact, does not mention the industry phrase at all. The Examiner respectfully disagrees with Applicant's assertion because Wolff discloses that FIG. 5A shows a record for node 1, node 2, and node N which represents the plurality of records contained in the clustered node database. Fields 420A-I within the node 1 record are shown. Name field 420A contains the node name, i.e. "CFN 8." a node in the examples shown in FIGS. 1A-C comprises a server. In alternate embodiments of the invention, a node can include any network attached processor embodied in servers, workstations, computers, routers, gateways, bridges, storage devices, printers, cameras, etc. Field 420B is the node weight field which, in the example shown, is assigned a weight of "2.00." Node weight may correlate with the relative processing capability of the node (see col. 20, lines 55 - 62). Thus, the nodes are attached in a

cluster environment having storage capacity, which read on the limitation of network attached storage.

Wolff further discloses that FIG. 2A shows the software modules present on server 104 for enabling client load balancing, distributed I/O, and resource rebalancing embodiments of the current invention (see col. 2, line 54 through col. 3, line 9).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 29 – 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over James J. Wolff (US 6,101,508; hereinafter Wolff) in view of John D. Frazier (US 6,078,990; hereinafter Frazier).

Regarding claim 29, Wolff discloses a computer-implemented method providing network attached storage (NAS) services (fig. 1A-C; abstract; col. 4, lines 16 - 61) comprising:

configuring a distributed processing system by coupling of a plurality of distributed devices coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system (fig. 1A-B; col. 6, lines 14 – 39; col. 6, lines 40 – 49; col. 61, lines 25 – 37; **Wolff discloses that the aware client software modules may**

reside on a server, which implements client processes, or a stand-alone unit as shown in FIG. 1A.),

wherein the client agents for particular said distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices (col. 2, line 54 through col. 3, line 9; *Wolff discloses that FIG. 2A shows the software modules present on server 104 for enabling client load balancing, distributed I/O, and resource rebalancing embodiments of the current invention*); and

processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a portion of the available amount of storage resources to a client device coupled to the network (col. 54, line 66 through col. 55, line 53). Claim 42 adds the limitation of allocating respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices (col. 36, lines 53 – 65; col. 39, lines 30 - 66; *Wolff discloses the ideal and remaining capacities, respectively fields 420H-I (see FIG. 5A), are recalculated for each of the active servers*).

Wolff discloses substantially all the limitations, but fails to specifically disclose the step of representing with the software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the

selected distributed devices, and checking the available amount of storage resources to provide NAS service to a client device.

However, Frazier discloses the step of representing with the software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices, and checking the available amount of storage resources to provide NAS service to a client device (fig. 6; col. 15, line 57 through col. 16, line 45; col. 26, lines 17 – 29; and col. 30, lines 8 - 24*Frazier discloses local entry points in the compute nodes 200 are dynamically updated by the ION* ***212 to track the current availability of the exported storage*** *resources* ***104****. The VSI 602 is used by an OS dependent algorithm running on the compute node 200 to create device entry point names for imported storage* ***resources***).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching of Wolff by automatically locates all free space on a fabric attached storage system and presents this data to the administrator so that volume sets can be created, thereby allowing increased flexibility in managing storage and computer resources (see col. 3, lines 19 – 22).

Regarding claim 30, Wolff discloses the method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a stand-alone dedicated NAS device through use of the client agent for the particular said distributed device (col. 12, lines 40 – 49; Wolff discloses that the aware client software modules

may reside on a server, which implements client processes, or a stand-alone unit as shown in FIG. 1A).

Regarding claim 31, Wolff discloses the method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the client agent for the particular said distributed device (fig. 12A; col. 61, lines 25 - 37]).

Regarding claim 32, Wolff discloses the method of claim 31, further comprising receiving an access request from the client device and directing the client device to data requested on at least one of the selected distributed devices (col. 2, lines 49 - 65).

Regarding claim 33, Wolff discloses the method of claim 32, further comprising managing the NAS service for said distributed devices at least in part utilizing a centralized server (104B, fig, 3C; col. 18, lines 9 - 17).

Regarding claim 35, Wolff discloses the method of claim 33, further comprising storing, with the centralized server, location information associated with the data stored in the selected distributed devices (col. 18, lines 9 - 17).

Regarding claim 36, Wolff discloses the method of claim 35, further comprising utilizing the centralized server to receive and route the data for storage to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database (col. 8, line 47 through col. 9, line 6).

Regarding claim 37, Wolff discloses the method of claim 29, wherein the method is at least partially performed through use of the Internet (col. 7, lines 53 - 65).

Regarding claim 38, Wolff discloses the method of claim 29, further comprising managing storage resources for the selected distributed devices with a storage priority control that facilitates use of the available amount of storage resources for the selected distributed devices (col. 8, line 47 through col. 9, line 6).

Regarding claim 39, Wolff discloses the method of claim 38, further comprising accepting selection of the storage priority control, by the client device that comprises a parameter (col. 8, line 47 through col. 9, line 6; col. 40, line 52 through col. 41, line 15).

Regarding claim 40, Wolff discloses the method of claim 39, further comprising prioritizing one or more of storage or deletion of data using the storage priority control that comprises storage priority level schemes (col. 8, line 47 through col. 9, line 6; col. 40, line 52 through col. 41, line 15).

Regarding claim 41, Wolff discloses the method of claim 38, wherein the managing storage resources further comprises marking directly data or files (col. 6, line 40 through col. 7, line 46).

Claims 34, 47 - 49, and 61 - 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wolff and Frazier in view of Duso et al (US 5,987,621; hereinafter Duso).

Regarding claim 34, Wolff and Frazier disclose substantially all the limitations in claim 33, but fail to specifically disclose downloading the software-based NAS component to the selected distributed devices.

However, Duso discloses an analogous hardware and software failover services for a file server which shows the idea of downloading the software-based NAS

component to the selected distributed devices (col. 6, lines 58 – 68; Duso discloses fast downloading).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Wolff and Frazier by downloading the software-based NAS component to the selected distributed devices as evidenced by Duso for the purpose of providing a fast and reliable distributed processing system.

Claims 42 – 65 substantially disclose all the limitations of claims 29 – 41 in system and computer-implemented method with minor modification in the claimed language. The reasons for rejecting claims 29 – 41 apply in claims 42 – 65. Therefore, claims 42 – 65 are rejected for the same reasons by the prior art applied.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YVES DALENCOURT whose telephone number is (571)272-3998. The examiner can normally be reached on M-F 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

Notice of References Cited	Application/Control No. 09/834,785	Applicant(s)/Patent Under Reexamination HUBBARD, EDWARD A.	
	Examiner YVES DALENCOURT	Art Unit 2457	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,078,990	06-2000	Frazier, John D.	711/114
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

WEST Search History for Application 09834785

Creation Date: 2011082221:23

Prior Art Searches

Query	DB	Op.	Plur.	Thes.	Date
(configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
		OR	YES		12-19-2009

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(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD				
stor$3 adj7 (data or information)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(stor$3 adj7 (data or information)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1 and available adj7 storage source$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)) and	PGPB, USPT, EPAB,	OR	YES		12-19-2009

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((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	JPAB, DWPI, TDBD				
(configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or	PGPB, USPT, EPAB,	OR	YES		09-06-2010

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information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	JPAB, DWPI, TDBD				
stor$3 adj7 (data or information)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
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(workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
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process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)					
709/203.ccls.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
allocat$3 adj7 data and underutiliz$3 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(allocat$3 adj7 data and underutiliz$3 adj7 resource$1) and conterol$3 adj7 local adj7 storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
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(configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011

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distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
stor$3 adj7 (data or information)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(stor$3 adj7 (data or information)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1 and available adj7 storage source$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)	PGPB, USPT, EPAB, JPAB,	OR	YES		03-12-2011

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	DWPI, TDBD				
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)) and ((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(709/203).ccls.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory) and	PGPB, USPT, EPAB,	OR	YES		03-12-2011

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distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu))	JPAB, DWPI, TDBD				
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and @pd<20000218	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
6101508.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn.) and workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn.) and process$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3) and nas	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
		OR	YES		03-12-2011

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DATABRICKS EX1002 Page 842

(6101508.pn. and process$3) and attach$$3 adj7 storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD				
(6101508.pn. and process$3 and attach$$3 adj7 storage$1) and configur$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3) and client$1 and agent$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3) and client$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1) and agent$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1) and portion$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1) and assess$3 near3 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1) and assess$3	PGPB, USPT, EPAB, JPAB,	OR	YES		03-12-2011

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DATABRICKS EX1002 Page 843

	DWPI, TDBD				
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1) and resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1 and resource$1) and analyz$3 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1 and resource$1) and control$5 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1 and resource$1 and control$5 adj7 resource$1) and amount$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
20020065864	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
network near attach$3 adj7 storage and cluster near3 file near3 server$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
(network near attach$3 adj7 storage and cluster near3 file near3 server$1) and difference$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
		OR	YES		08-22-2011

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(network near attach$3 adj7 storage and cluster near3 file near3 server$1) and @pd<20000303	PGPB, USPT, EPAB, JPAB, DWPI, TDBD				
(network near attach$3 adj7 storage and cluster near3 file near3 server$1) and @pd<20003003	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
(unuse$3 and under-utiliz$3) adj7 nas adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
(un-use$3 and under-utiliz$3) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
(un-use$3 or unus$3 and under-utiliz$3 or underutilis$5) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((un-use$3 or unus$3 and under-utiliz$3 or underutilis$5) adj7 resource$1) and nas	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((un-use$3 or unus$3 and under-utiliz$3 or underutilis$5) adj7 resource$1 and nas) and storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
control$5 adj7 local adj7 storage adj7 resource$1	PGPB, USPT, EPAB, JPAB,	OR	YES		08-22-2011

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DATABRICKS EX1002 Page 845

	DWPI, TDBD				
(unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage) and (control$5 adj7 local adj7 storage adj7 resource$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage) and allocat$3 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1) and storage adj7 capacity$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3) and using adj7 memory adj7 capacity	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3) and memory adj7 capacity	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3 and memory adj7 capacity) and idl$3 adj7 device$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
		OR	YES		08-22-2011

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DATABRICKS EX1002 Page 846

((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3 and memory adj7 capacity and idl$3 adj7 device$1) and software adj7 agent$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD				

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DATABRICKS EX1002 Page 847

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

SEARCHED

Class	Subclass	Date	Examiner
709	203, 223, 226	06/09/2010	YD

SEARCH NOTES

Search Notes	Date	Examiner
WEST (see attached text search)	12/19/2009	YD
WEST (updated text search)	09/06/2010	YD
WEST (updated text search)	03/12/2011	YD
WEST (updated text search)	08/21/2011	YD

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

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DATABRICKS EX1002 Page 848

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	09834785
Filing Date	2001-04-13
First Named Inventor	Edward A. Hubbard
Art Unit	2457
Examiner Name	Yves Dalencourt
Attorney Docket Number	59659.1200

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4987533		1999-01-22	Clark et al.	
	2	5806045		1998-09-08	Biorge et al.	
	3	5987621		1999-11-16	Duso et al.	
	4	6101508		2000-08-08	Wolff	
	5	6222449		2001-04-24	Twining	
	6	6601101		2003-07-29	Lee et al.	
	7	6611686		2003-08-26	Smith et al.	
	8	6735630		2004-05-11	Gelvin et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2001-04-13
	First Named Inventor	Edward A. Hubbard
	Art Unit	2457
	Examiner Name	Yves Dalencourt
	Attorney Docket Number	59659.1200

	9	6738614		2004-05-18	Blankenship et al.	
	10	6742038		2004-05-25	Britt Jr.	
	11	7134073		2006-11-07	Fiedorowicz et al.	
	12	7269664		2007-09-11	Hutsch et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20010014868		2001-08-16	Herz et al.	
	2	20020078075		2002-06-20	Colson et al.	
	3	20020052778		2002-05-02	Murphy et al.	
	4	20020194329		2002-12-19	Alling	
	5	20020065864		2002-05-30	Hartsell et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D./

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	Filing Date	2001-04-13
	First Named Inventor	Edward A. Hubbard
	Art Unit	2457
	Examiner Name	Yves Dalencourt
	Attorney Docket Number	59659.1200

	6	20020194251		2002-12-19	Richter et al.	
	7	20020188733		2002-12-12	Collins et al.	
	8	20020143729		2002-10-03	Fostick	
	9	20010044588		2001-11-22	Mault	
	10	20040043758		2004-03-04	Sorvari et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Office Action dated April 1, 2009 in Serial No. 10/766,972	☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	09834785
	Filing Date	2001-04-13
	First Named Inventor	Edward A. Hubbard
	Art Unit	2457
	Examiner Name	Yves Dalencourt
	Attorney Docket Number	59659.1200

	2	Final Office Action dated November 06, 2009 in Serial No. 10/766,972	☐
	3	Advisory Action dated January 20, 2010 in Serial No. 10/766,972	☐
	4	Office Action dated March 25, 2010 in Serial No. 10/766,972	☐
	5	Notice of Allowance dated May 12, 2011 in Serial No. 10/766,972	☐
	6	Final Office Action dated October 10, 2010 in Serial No. 10/766,972	☐

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EXAMINER SIGNATURE

Examiner Signature	/Yves Dalencourt/	Date Considered	08/21/2011

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D./

IPR2025-00716
DATABRICKS EX1002 Page 852

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	**Art Unit**
	YVES DALENCOURT	2457

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/14/2009	06/10/2010	09/06/2010	03/11/2011	08/22/2011				
	1	-	-	-	-	-				
	2	-	-	-	-	-				
	3	-	-	-	-	-				
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	28	-	-	-	-	-				
	29	✓	✓	=	✓	✓				
	30	✓	✓	=	✓	✓				
	31	✓	✓	=	✓	✓				
	32	✓	✓	=	✓	✓				
	33	✓	✓	=	✓	✓				
	34	✓	✓	=	✓	✓				
	35	✓	✓	=	✓	✓				
	36	✓	✓	=	✓	✓				

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/14/2009	06/10/2010	09/06/2010	03/11/2011	08/22/2011				
	37	✓	✓	=	✓	✓				
	38	✓	✓	=	✓	✓				
	39	✓	✓	=	✓	✓				
	40	✓	✓	=	✓	✓				
	41	✓	✓	=	✓	✓				
	42	✓	✓	=	✓	✓				
	43	✓	✓	=	✓	✓				
	44	✓	✓	=	✓	✓				
	45	✓	✓	=	✓	✓				
	46	✓	✓	=	✓	✓				
	47	✓	✓	=	✓	✓				
	48	✓	✓	=	✓	✓				
	49	✓	✓	=	✓	✓				
	50	✓	✓	=	✓	✓				
	51	✓	✓	=	✓	✓				
	52	✓	✓	=	✓	✓				
	53	✓	✓	=	✓	✓				
	54	✓	✓	=	✓	✓				
	55	✓	✓	=	✓	✓				
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	58	✓	✓	=	✓	✓				
	59	✓	✓	=	✓	✓				
	60	✓	✓	=	✓	✓				
	61	✓	✓	=	✓	✓				
	62	✓	✓	=	✓	✓				
	63	✓	✓	=	✓	✓				
	64	✓	✓	=	✓	✓				
	65	✓	✓	=	✓	✓				

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	59659.1200	8392

86244 7590 11/16/2011

Snell & Wilmer L.L.P., (Komaromy)
One Arizona Center
400 East Van Buren Street
Pheonix, AZ 85004-2202

EXAMINER	
DALENCOURT, YVES	
ART UNIT	PAPER NUMBER
2457	

NOTIFICATION DATE	DELIVERY MODE
11/16/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

landerson@swlaw.com
tkomaromy@swlaw.com
krigby@swlaw.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	YVES DALENCOURT	2457	

All participants (applicant, applicant's representative, PTO personnel):

(1) *YVES DALENCOURT*. (3)_____.

(2) *James W. Henson*. (4)_____.

Date of Interview: *09 November 2011*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *29-65*.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

We discussed the Wolff reference in view of the claimed limitations. Applicant argued that Wolff is limited to a system in which a process 102P1 reroutes I/O traffic over a network depending on the utilization of the servers, but fails to disclose the claimed subject matter as recited in the instant application. The Examiner suggested to the Applicant to insert the limitations of claim 31 into the independent claims to overcome the prior applied. The Examiner will update his search upon receiving a formal amendment.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/YVES DALENCOURT/ Primary Examiner, Art Unit 2457	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

FILED VIA EFS WEB

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

Applicants:	Edward A. Hubbard, et al.	Docket No.:	59659.1200
Serial No.:	09/834,785	Examiner:	Yves Dalencourt
Filed:	April 13, 2001	Group Art Unit:	2457
Title:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS	Confirmation No.:	8392

REPLY

Mail Stop Amendment
Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

In reply to the Office Action dated September 8, 2011, of which this Reply is filed within three months, please consider the following remarks:

The listing of the Claims begins on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

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Listing of the Claims

1. - 28. canceled.

29. (previously presented) A computer-implemented method comprising:

configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system,

wherein the client agents for particular said distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices;

representing with the software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices; and

processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network.

30. (previously presented) The method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a stand-alone dedicated NAS device through use of the client agent for the particular said distributed device.

31. (previously presented) The method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the client agent for the particular said distributed device.

32. (previously presented) The method of claim 31, further comprising receiving an access request from the client device and directing the client device to data requested on at least one of the selected distributed devices.

33. (previously presented) The method of claim 32, further comprising managing the NAS service for said distributed devices at least in part utilizing a centralized server.

34. (previously presented) The method of claim 33, further comprising downloading the software-based NAS component to the selected distributed devices.

35. (previously presented) The method of claim 33, further comprising storing, with the centralized server, location information associated with the data stored in the selected distributed devices.

36. (previously presented) The method of claim 35, further comprising utilizing the centralized server to receive and route the data for storage to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database.

37. (previously presented) The method of claim 29, wherein the method is at least partially performed through use of the Internet.

38. (previously presented) The method of claim 29, further comprising managing storage resources for the selected distributed devices with a storage priority control that facilitates use of the available amount of storage resources for the selected distributed devices.

39. (previously presented) The method of claim 38, further comprising accepting selection of the storage priority control, by the client device, that comprises a parameter.

40. (previously presented) The method of claim 38, further comprising prioritizing one or more of storage or deletion of data using the storage priority control that comprises storage priority level schemes.

41. (previously presented) The method of claim 39, wherein the managing storage resources further comprises marking directly data or files.

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42. (previously presented) A system comprising:

a plurality of distributed devices configured to be coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of workloads for the distributed processing system, the client agents including respective instances of a software-based network attached storage (NAS) component, wherein the NAS component is configured to:

assess unused storage resources of said distributed devices;

allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices;

represent that the selected distributed devices comprise respective NAS devices having the respective available amounts of storage resources; and

process workloads associated with data storage and access by accessing data from and storing data into portions of the storage resources in the selected distributed devices to provide NAS service to a client device.

43. (previously presented) The system of claim 42, wherein at least one of the client agent is configured to enable at least one of the selected distributed devices to function as a stand-alone dedicated NAS device.

44. (previously presented) The system of claim 42, wherein the client agent is configured to enable at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

45. (previously presented) The system of claim 44, wherein the location distributed device is configured to receive an access request from the client device and direct the client device to the data stored on the selected distributed devices that was requested.

46. (previously presented) The system of claim 45, wherein the system is further configured to manage the NAS service for said distributed devices at least in part utilizing a central

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47. (previously presented) The system of claim 46, wherein the centralized server system is further configured to enable download of the NAS component to the selected distributed devices.

48. (previously presented) The system of claim 46, wherein the centralized server system is configured to store location information associated with the data stored in the selected distributed devices.

49. (previously presented) The system of claim 48, wherein the centralized server system is configured to receive data storage and access requests from the client device and route a data storage workload to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database.

50. (previously presented) The system of claim 42, wherein the distributed devices are configured to be coupled to the Internet.

51. (previously presented) The system of claim 42, further comprising a storage priority control configured to facilitate use of the available amount of storage resources for the selected distributed devices.

52. (previously presented) The system of claim 51, wherein the storage priority control comprises a parameter selectable by the client device.

53. (previously presented) The system of claim 52, wherein the storage priority control comprises storage priority level schemes that prioritize one or more of storage or deletion of data.

54. (previously presented) The system of claim 52, wherein the storage priority control comprises a priority marking directly given to data or files.

55. (previously presented) A computer-implemented method comprising:

allocating data for storage among selected devices of a plurality of devices that are independent and available on a network, wherein the devices have respective software agents

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that are usable to control respective local storage resources that are unused or underused on the devices; and

representing, using at least one of said software agents, that the selected devices comprise a network attached storage (NAS) device with storage capacity equal to a total of the unused or underused storage resource.

56. (previously presented) The computer-implemented method of claim 55, wherein the allocating is performed by a server.

57. (previously presented) The computer-implemented method of claim 55, wherein the allocating and representing are performed by one of the plurality of devices.

58. (previously presented) The computer-implemented method of claim 55, wherein the allocating is performed in accordance with respective capability vectors calculated for the selected devices.

59. (previously presented) The computer-implemented method of claim 55, further comprising:

identifying whether the storage resources for a particular device of the selected devices are idle, and

performing the allocating so a greater portion of the data for storage is sent to the particular device if the storage resources for the particular device are idle, wherein the greater portion is greater than a portion of the data that would be allocated to the particular device if the storage resources for the particular device were not idle.

60. (previously presented) The computer-implemented method of claim 55, wherein the allocating and representing are performed by at least one of the plurality of devices via interaction with other devices on a peer-to-peer basis.

61. (previously presented) A computer-implemented method comprising:

downloading to at least one selected device, included in a plurality of devices, a network attached storage (NAS) component and a portion of a storage workload for storage in memory that is unused or under-utilized; and

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representing to a client device, coupled to the multiplicity of devices by a network, that at least one selected device is a dedicated NAS device.

62. (previously presented) The computer-implemented method of claim 61, further comprising storing location information in a database that is usable to indicate locations in memory where the portion of the storage workload is stored.

63. (previously presented) The computer-implemented method of claim 61, wherein the computer-implemented method is performed by at least one central server coupled to the network.

64. (previously presented) The computer-implemented method of claim 61, wherein the computer-implemented method is performed by a particular device of the multiplicity of devices.

65. (previously presented) The computer-implemented method of claim 61, wherein the computer-implemented method is at least partially performed through use of the Internet.

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REMARKS

Applicants reply to the Office Action dated September 8, 2011 within three months. Claims 29-65 are pending in the application and the Examiner rejects claims 29-65. Reconsideration and allowance of the pending claims are respectfully requested.

Examiner Interview

Applicants thank the Examiner for the courtesies extended during the Examiner interview of November 8, 2011. Applicants further thank the Examiner for his suggestion that incorporation of claim 31 in the independent claims would overcome the reference Wolff (below). However, at this juncture (as described below), Applicants believe that incorporation of additional subject matter in the independent claims is unnecessary and therefore respectfully request re-consideration and allowance.

Rejection under 35 U.S.C. § 103

The Examiner rejects claims 29-65 under U.S.C. § 103(a) as allegedly being unpatentable over Wolff, U.S. Patent No. 6,101,508 ("Wolff") in view of Frazier, U.S. Patent No. 6,078,990 ("Frazier"). The Examiner further rejects claims 34, 47-49, and 61-65 under 35 U.S.C. §103(a) as allegedly being unpatentable over Wolff in view of Frazier and further in view of Duso et al., U.S. Patent No. 5,987,621 ("Duso"). Applicants respectfully traverse. Applicants further respectfully submit that the Office Action does not establish a *prima facie* case of obviousness.

Wolff is generally related to a system for distributing an I/O request load over the components of a network. More particularly, Wolff discloses "distributing the responsibility for carrying out I/O requests among various servers on a network" (Abstract, emphasis added). The methods disclosed by Wolff include load rebalancing (fig. 1A), distributed Input and Output (I/O) (fig. 1B), and resource load rebalancing (fig. 1C). Applicants therefore respectfully supply a brief description of each of the three load rebalancing embodiments (again, as depicted by figs. 1A-1C) disclosed by Wolff.

(i) Figure 1A: Load Rebalancing

With particular regard to fig. 1A, Wolff discloses a load rebalancing embodiment in which "[a]t time T=1, process 102P1, implemented on aware client 102A, detects the overload condition of server 104A, and accesses memory resource 118 via an alternate path 76 through server 106A" (col. 5, lines 46-49). "Thus," Wolff explains, "in this subsequent state, the load on

server 104A is reduced and the access by aware client 102A to memory resource 118 is enhanced" (col. 5, lines 49-53).

(ii) Figure 1B: Distributed I/O

With regard to fig. 1B, Wolff discloses a distributed I/O embodiment in which servers 104B and 104B "split...the traditional I/O request into an administrative portion and a data transfer portion" (col. 6, lines 23-25, 41-43). "In operation," Wolff explains, "one of the servers, i.e. server 104B, is responsible for maintaining the integrity and security of the certain file systems 122 on memory resource 118" (col. 6, lines 44-47). "A server that is responsible for a file system is identified as the administrative server" (col. 6, lines 48-49). "When an I/O request for a resource is received by a data transfer server, that server looks up the administrative server for that resource...and sends the I/O request to the administrative server..." (col. 6, line 67—col. 7, line 5). Thus, Wolff discloses a system, at fig. 1B, which permits "[c]oncurrent access to a resource..." (col. 6, lines 18-19). Concurrent access may, in turn, "allow...a higher volume of I/O traffic to the resource, while maintaining file system integrity and security" (col. 6, lines 19-21).

(iii) Figure 1C: Resource Rebalancing

With regard to fig. 1C, Wolff discloses a resource rebalancing embodiment in which "pathways between nodes, e.g., servers, and resources, e.g., volumes/file systems" are "re-mapp[ed]" (col. 8, lines 1-5). "Load rebalancing," explains Wolff, "allows the network to reconfigure itself as components come on-line/off-line, as components fail, and as components fail back" (col. 8, lines 5-7). More particularly, and by way of example, Wolff details: "In operation at time t=0, server 104C alone is operational" (col. 8, lines 31-32). "At time t=1, servers 106C and 104C are operational. When server 106C comes online...[it] becomes the temporary master of the resource rebalancing process"(col. 39-46). "The master uses the configuration database records for all volumes and active nodes to rebalance the system. Rebalancing the system takes into account preferred resource-server affiliations, expected volume traffic, relative server processing capability" and the like (col. 8, lines 47-51).

Therefore, Applicants respectfully assert that Wolff is limited to systems and methods in which: (1) an aware client 102A communicates with a resource 118 through a different server 106A in response to a load on a first server 104A (load rebalancing); (2) an I/O request to a resource 118 is split between an administrative server 104B and a data transfer server 106B

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(distributed I/O); and (3) pathways between servers 104C and 106C and resources 118A and 118B are remapped based on network conditions (resource remapping).

With regard to independent claim 29, the Examiner asserts that Wolff discloses "wherein the client agents...have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices" at col. 2, line 54 through col. 3, line 9. This portion of the disclosure summarizes each of the embodiments described above, and describes "detecting a change in the availability of server nodes and rebalancing the network..." (co. 3, lines 1-3), as well as, "redirecting an I/O request for a resource to an underutilized server node coupled to the resource" (col. 3, lines 7-9). Thus, the cited portions of Wolff merely relate to load and/or resource rebalancing as well as I/O rebalancing.

With continuing regard to claim 29, the Examiner further asserts that Wolff discloses, "processing...workloads...by accessing data from or storing data to at least a portion of the available amount of storage resources to a client device coupled to the network" at col. 54, line 66 through col. 55, line 53. The cited portions of the reference are directed to "the processes for the subroutine associated with distributed I/O" (col. 53, lines 32-33). These processes include a "[p]rocess 1218 [that] allocates resources required to store and forward the I/O requests to/from the client over the network" (col. 55, lines 1-3). Thus, as described above, the processes described by Wolff are related to processing I/O requests from a client. Applicants respectfully submit, however, that these processes have nothing to do with storing data to a client device, as recited by the independent claims. On the contrary, Wolff is directed to systems and methods for storing data on resources 118 (which are databases remote from one or more clients).

Accordingly, Applicants respectfully assert that none of the configurations disclosed by Wolff discloses or contemplates, at least, "**the distributed devices include respective client agents...wherein the client agents...have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices...processing...workloads...by accessing data from or storing data to at least a portion of the available amount of storage resources**..." as recited by independent claim 29 (emphasis added). Applicants further respectfully assert that none of the configurations disclosed by Wolff disclose or contemplate, at least, "**a plurality of distributed devices...wherein the distributed devices include respective client agents configured to**

process respective portions of workloads...the client agents including respective instances of a software-based network attached storage (NAS) component, wherein the NAS component is configured to: assess unused storage resources of said distributed devices...and process workloads...by accessing data from and storing data into portions of the storage resources in the selected distributed devices to provide NAS service to a client device," as recited by independent claim 42 (emphasis added). Applicants further respectfully assert that none of the configurations disclosed by Wolff disclose or contemplate, at least, "**allocating data for storage among selected devices...wherein the devices have respective software agents that are usable to control respective local storage resources that are unused or underused on the devices; and representing, using at least one of said software agents, that the selected devices comprise a network attached storage (NAS) device with storage capacity equal to a total of the unused or underused storage resource**," as recited by independent claim 55 (emphasis added). Applicants further respectfully assert that none of the configurations disclosed by Wolff disclose or contemplate, at least, "**downloading to at least one selected device, included in a plurality of devices, a network attached storage (NAS) component and a portion of a storage workload for storage in memory that is unused or under-utilized; and representing to a client device, coupled to the multiplicity of devices by a network, that at least one selected device is a dedicated NAS device**," as recited by independent claim 61 (emphasis added).

Frazier discloses a system for configuring volume sets in a distributed processing system comprising "the steps of querying the I/O nodes to determine available storage space at each I/O node...displaying information representing the available storage space to the user, and accepting a volume set name and selected volume set size smaller than the largest storage space block size" (col. 3, lines 26-36). Applicants therefore respectfully assert that Frazier fails to remedy the deficiencies noted above.

Duso discloses a system for implementing hardware and software failover services for a file server in which "server computers are programmed for detecting a failure of one of the server computers...and...causing another one of the server computers to resume automatically the interrupted one of the tasks" (col. 2, lines 39-44). Applicants therefore respectfully assert that Duso fails to remedy the deficiencies noted above.

Therefore Applicants respectfully assert that none of the cited references, alone or in combination, disclose or contemplate, at least, the limitations recited by independent claims 29, 42, 55, and 61.

Dependent claims 30-41, 43-54, 56-60, and 62-65 variously depend from independent claims 29, 42, 55, and 61. Therefore, Applicants assert that dependent claims 30-41, 43-54, 56-60, and 62-65 are patentable for at least the same reasons stated above for differentiating independent claims 29, 42, 55 and 16, as well as in view of their own respective features. Accordingly, Applicants respectfully request reconsideration and allowance of all of the pending claims.

When a phrase similar to "at least one of A, B, or C" or "at least one of A, B, and C" is used in the claims or specification, Applicants intend the phrase to mean any of the following: (1) at least one of A; (2) at least one of B; (3) at least one of C; (4) at least one of A and at least one of B; (5) at least one of B and at least one of C; (6) at least one of A and at least one of C; or (7) at least one of A, at least one of B, and at least one of C.

Applicants respectfully submit that the pending claims are in condition for allowance. The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account No. **19-2814**. **This does NOT authorize payment of the issue fee.** Applicants invite the Examiner to telephone the undersigned, if the Examiner has any questions regarding this Reply or the present application in general.

Respectfully submitted,

Dated: 11/28/11

By: _____
James W. Henson
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Electronic Acknowledgement Receipt

EFS ID:	11492036
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	86244
Filer:	James Henson/Kim Moore
Filer Authorized By:	James Henson
Attorney Docket Number:	59659.1200
Receipt Date:	28-NOV-2011
Filing Date:	13-APR-2001
Time Stamp:	17:45:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		596591200_ROA20110908.PDF	605555 f35f2f41edb703993f6ebc53cf9b621e5d3486ba	yes	12

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	12
Warnings:			
Information:			
	Total Files Size (in bytes):	605555	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
09/834,785	04/13/2001	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
			TOTAL			TOTAL	

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

AMENDMENT **11/28/2011**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 37	Minus	** 37	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	* 4	Minus	***4	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/KATRINA . TURNER/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	59659.1200	8392

86244 7590 01/31/2012

Snell & Wilmer L.L.P., (Komaromy)
One Arizona Center
400 East Van Buren Street
Pheonix, AZ 85004-2202

EXAMINER	
DALENCOURT, YVES	
ART UNIT	PAPER NUMBER
2457	

NOTIFICATION DATE	DELIVERY MODE
01/31/2012	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

landerson@swlaw.com
tkomaromy@swlaw.com
krigby@swlaw.com

Office Action Summary	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	YVES DALENCOURT	2457	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 November 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *29-65* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *29-65* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *01/11/2012* .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	YVES DALENCOURT	2457	

All participants (applicant, applicant's representative, PTO personnel):

(1) *YVES DALENCOURT*. (3)_____.

(2) *David Lee*. (4)_____.

Date of Interview: *11 January 2012*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: _____.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

The Examiner has called Applicants' representatives in several occasions to amend the claims to put them in condition for allowance either by moving dependent claims into independent claims or cancel some broad claims. They refused to do so because they believed that the claims are allowable as presented right now..

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/YVES DALENCOURT/ Primary Examiner, Art Unit 2457	

DETAILED ACTION

This office action is responsive to amendment filed on 11/28/2011.

Response to Amendment

The Examiner has acknowledged Applicant's response.

Response to Arguments

Applicant's arguments filed on 11/28/2011 have been fully considered but they are not persuasive.

Regarding Applicant's argument (pages 9 - 10) that Wolf is not directed to network attached storage, and in fact, does not mention the industry phrase at all. Regarding Applicant's argument (page 10) that with continuing regard to claim 29, the Examiner further asserts that Wolff discloses, "processing...workloads...by accessing data from or storing data to at least a portion of the available amount of storage resources to a client device coupled to the network" at col. 54, line 66 through col. 55, line 53. The cited portions of the reference are directed to "the processes for the subroutine associated with distributed I/O" (col. 53, lines 32-33). These processes include a "[p]rocess 1218 [that] allocates resources required to store and forward the I/O requests to/from the client over the network" (col. 55, lines 1-3). Thus, as described above, the processes described by Wolff are related to processing I/O requests from a client. Applicants respectfully submit, however, that these processes have nothing to do with storing data to a client device, as recited by the independent claims. On the

contrary, Wolff is directed to systems and methods for storing data on resources 118 (which are databases remote from one or more clients).

The Examiner respectfully disagrees with Applicant's assertion because Wolff discloses that FIG. 5A shows a record for node 1, node 2, and node N which represents the plurality of records contained in the clustered node database. Fields 420A-I within the node 1 record are shown. Name field 420A contains the node name, i.e. "CFN 8." a node in the examples shown in FIGS. 1A-C comprises a server. In alternate embodiments of the invention, a node can include any network attached processor embodied in servers, workstations, computers, routers, gateways, bridges, storage devices, printers, cameras, etc. Field 420B is the node weight field which, in the example shown, is assigned a weight of "2.00." Node weight may correlate with the relative processing capability of the node (see col. 20, lines 55 - 62).

Applicants assert (pages 10 – 11) that none of the configurations disclose Wolff discloses or contemplates, at least, "the distributed devices include respective client agents...wherein the client agents...have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices...processing...workloads...by accessing data from or storing data to at least a portion of the available amount of storage resources..." as recited by independent claim 29 (emphasis added). Applicants further respectfully assert that none of the configurations disclosed by Wolff disclose or contemplate, at least, "a plurality of distributed devices...wherein the distributed devices include respective client agents configured to process respective portions of

workloads...the client agents including respective instances of a software-based network attached storage (NAS) component, wherein the NAS component is configured to: assess unused storage resources of said distributed devices...and process workloads...by accessing data from and storing data into portions of the storage resources in the selected distributed devices to provide NAS service to a client device," as recited by independent claim 42 (emphasis added). Applicants further respectfully assert that none of the configurations disclosed by Wolff disclose or contemplate, at least, "allocating data for storage among selected devices...wherein the devices have respective software agents that are usable to control respective local storage resources that are unused or underused on the devices; and representing, using at least one of said software agents, that the selected devices comprise a network attached storage (NAS) device with storage capacity equal to a total of the unused or underused storage resource," as recited by independent claim 55 (emphasis added).

The Examiner respectfully disagrees with Applicants' argument because Wolff discloses that in fig. 12A shows the software modules present on server 104 for enabling client load balancing, distributed I/O, and resource rebalancing (col. 2, line 54 through col. 3, line 9). Wolff also discloses that the ideal and remaining capacities, respectively field 420H-I (see fig. 5A) are recalculated for each of the active servers (see col. 36, lines 53 - 65; col. 39, lines 30 - 66).

Applicants argued that Frazier discloses a system for configuring volume sets in a distributed processing system comprising "the steps of querying the I/O nodes to determine available storage space at each I/O node… displaying information

representing the available storage space to the user, and accepting a volume set name and selected volume set size smaller than the largest storage space block size" (col. 3, lines 26-36). **Applicants therefore respectfully assert that Frazier fails to remedy the deficiencies noted above.**

The Examiner wants to point out to the Applicants that Frazier was combined with Wolff to show the step of representing with the software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under- utilized storage resources for the selected distributed devices, and checking the available amount of storage resources to provide NAS service to a client device. Frazier discloses local entry points in the compute nodes 200 are dynamically updated by the ION 212 to track the current availability of the exported storage resources 104. The VSI 602 is used by an OS dependent algorithm running on the compute node 200 to create device entry point names for imported storage resources) (see (fig. 6; col. 15, line 57 through col. 16, line 45; col. 26, lines 17-29; and col. 30, lines 8 – 24).

Applicants further argued (page 11) that Duso fails to remedy the deficiencies noted above.

The Examiner respectfully disagrees with Applicants' argument, and contends that the combination of Wolff, Frazier, and Duso do read on the language of claims 34, 47 – 49, and 61 – 65.

In fact, it appears that Applicants are interpreting the claims very narrow without

considering the broad teaching of the reference used in the rejection.

Applicants are reminded that the examiner is entitled to the broadest reasonable interpretation of the claims. Applicants always have the opportunity to amend the claims during prosecution and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater 162 USPQ 541,550-51 (CCPA 1969).

In view of such, the rejection is maintained as follows:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 29 – 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over James J. Wolff (US 6,101,508; hereinafter Wolff) in view of John D. Frazier (US 6,078,990; hereinafter Frazier).

Regarding claim 29, Wolff discloses a computer-implemented method providing network attached storage (NAS) services (fig. 1A-C; abstract; col. 4, lines 16 - 61) comprising:

configuring a distributed processing system by coupling of a plurality of distributed devices coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of a workload for the

distributed processing system (fig. 1A-B; col. 6, lines 14 – 39; col. 6, lines 40 – 49; col. 61, lines 25 – 37; **Wolff discloses that the aware client software modules may reside on a server, which implements client processes, or a stand-alone unit as shown in FIG. 1A**.),

wherein the client agents for particular said distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices (col. 2, line 54 through col. 3, line 9; *Wolff discloses that FIG. 2A shows the software modules present on server 104 for enabling client load balancing, distributed I/O, and resource rebalancing embodiments of the current invention*); and

processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a portion of the available amount of storage resources to a client device coupled to the network (col. 54, line 66 through col. 55, line 53). Claim 42 adds the limitation of allocating respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices (col. 36, lines 53 – 65; col. 39, lines 30 - 66; *Wolff discloses the ideal and remaining capacities, respectively fields 420H-I (see FIG. 5A), are recalculated for each of the active servers*).

Wolff discloses substantially all the limitations, but fails to specifically disclose the step of representing with the software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of

storage resources related to the unused and under-utilized storage resources for the selected distributed devices, and checking the available amount of storage resources to provide NAS service to a client device.

However, Frazier discloses the step of representing with the software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices, and checking the available amount of storage resources to provide NAS service to a client device (fig. 6; col. 15, line 57 through col. 16, line 45; col. 26, lines 17 – 29; and col. 30, lines 8 - 24*Frazier discloses local entry points in the compute nodes 200 are dynamically updated by the ION* ***212 to track the current availability of the exported storage*** *resources* ***104****. The VSI 602 is used by an OS dependent algorithm running on the compute node 200 to create device entry point names for imported storage* ***resources***).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching of Wolff by automatically locates all free space on a fabric attached storage system and presents this data to the administrator so that volume sets can be created, thereby allowing increased flexibility in managing storage and computer resources (see col. 3, lines 19 – 22).

Regarding claim 30, Wolff discloses the method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a stand-alone dedicated NAS device through use of the client agent for the particular said distributed device (col. 12, lines 40 – 49; Wolff discloses that the aware client software modules

may reside on a server, which implements client processes, or a stand-alone unit as shown in FIG. 1A).

Regarding claim 31, Wolff discloses the method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the client agent for the particular said distributed device (fig. 12A; col. 61, lines 25 - 37]).

Regarding claim 32, Wolff discloses the method of claim 31, further comprising receiving an access request from the client device and directing the client device to data requested on at least one of the selected distributed devices (col. 2, lines 49 - 65).

Regarding claim 33, Wolff discloses the method of claim 32, further comprising managing the NAS service for said distributed devices at least in part utilizing a centralized server (104B, fig, 3C; col. 18, lines 9 - 17).

Regarding claim 35, Wolff discloses the method of claim 33, further comprising storing, with the centralized server, location information associated with the data stored in the selected distributed devices (col. 18, lines 9 - 17).

Regarding claim 36, Wolff discloses the method of claim 35, further comprising utilizing the centralized server to receive and route the data for storage to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database (col. 8, line 47 through col. 9, line 6).

Regarding claim 37, Wolff discloses the method of claim 29, wherein the method is at least partially performed through use of the Internet (col. 7, lines 53 - 65).

Regarding claim 38, Wolff discloses the method of claim 29, further comprising managing storage resources for the selected distributed devices with a storage priority control that facilitates use of the available amount of storage resources for the selected distributed devices (col. 8, line 47 through col. 9, line 6).

Regarding claim 39, Wolff discloses the method of claim 38, further comprising accepting selection of the storage priority control, by the client device that comprises a parameter (col. 8, line 47 through col. 9, line 6; col. 40, line 52 through col. 41, line 15).

Regarding claim 40, Wolff discloses the method of claim 39, further comprising prioritizing one or more of storage or deletion of data using the storage priority control that comprises storage priority level schemes (col. 8, line 47 through col. 9, line 6; col. 40, line 52 through col. 41, line 15).

Regarding claim 41, Wolff discloses the method of claim 38, wherein the managing storage resources further comprises marking directly data or files (col. 6, line 40 through col. 7, line 46).

Claims 34, 47 - 49, and 61 - 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wolff and Frazier in view of Duso et al (US 5,987,621; hereinafter Duso).

Regarding claim 34, Wolff and Frazier disclose substantially all the limitations in claim 33, but fail to specifically disclose downloading the software-based NAS component to the selected distributed devices.

However, Duso discloses an analogous hardware and software failover services for a file server which shows the idea of downloading the software-based NAS

component to the selected distributed devices (col. 6, lines 58 – 68; Duso discloses fast downloading).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Wolff and Frazier by downloading the software-based NAS component to the selected distributed devices as evidenced by Duso for the purpose of providing a fast and reliable distributed processing system.

Claims 42 – 65 substantially disclose all the limitations of claims 29 – 41 in system and computer-implemented method with minor modification in the claimed language. The reasons for rejecting claims 29 – 41 apply in claims 42 – 65. Therefore, claims 42 – 65 are rejected for the same reasons by the prior art applied.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YVES DALENCOURT whose telephone number is (571)272-3998. The examiner can normally be reached on M-F 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/14/2009	06/10/2010	09/06/2010	03/11/2011	08/22/2011	01/19/2012			
	1	-	-	-	-	-	-			
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	28	-	-	-	-	-	-			
	29	✓	✓	=	✓	✓	✓			
	30	✓	✓	=	✓	✓	✓			
	31	✓	✓	=	✓	✓	✓			
	32	✓	✓	=	✓	✓	✓			
	33	✓	✓	=	✓	✓	✓			
	34	✓	✓	=	✓	✓	✓			
	35	✓	✓	=	✓	✓	✓			
	36	✓	✓	=	✓	✓	✓			

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/14/2009	06/10/2010	09/06/2010	03/11/2011	08/22/2011	01/19/2012			
	37	✓	✓	=	✓	✓	✓			
	38	✓	✓	=	✓	✓	✓			
	39	✓	✓	=	✓	✓	✓			
	40	✓	✓	=	✓	✓	✓			
	41	✓	✓	=	✓	✓	✓			
	42	✓	✓	=	✓	✓	✓			
	43	✓	✓	=	✓	✓	✓			
	44	✓	✓	=	✓	✓	✓			
	45	✓	✓	=	✓	✓	✓			
	46	✓	✓	=	✓	✓	✓			
	47	✓	✓	=	✓	✓	✓			
	48	✓	✓	=	✓	✓	✓			
	49	✓	✓	=	✓	✓	✓			
	50	✓	✓	=	✓	✓	✓			
	51	✓	✓	=	✓	✓	✓			
	52	✓	✓	=	✓	✓	✓			
	53	✓	✓	=	✓	✓	✓			
	54	✓	✓	=	✓	✓	✓			
	55	✓	✓	=	✓	✓	✓			
	56	✓	✓	=	✓	✓	✓			
	57	✓	✓	=	✓	✓	✓			
	58	✓	✓	=	✓	✓	✓			
	59	✓	✓	=	✓	✓	✓			
	60	✓	✓	=	✓	✓	✓			
	61	✓	✓	=	✓	✓	✓			
	62	✓	✓	=	✓	✓	✓			
	63	✓	✓	=	✓	✓	✓			
	64	✓	✓	=	✓	✓	✓			
	65	✓	✓	=	✓	✓	✓			

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DATABRICKS EX1002 Page 889

PTO/SB/80 (01-06)
Approved for use through 12/31/2008. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

[X] Practitioners associated with the Customer Number: **86636**

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number		Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

[X] The address associated with Customer Number: **86636**

OR

[ ] Firm or Individual Name

Address					
City		State		Zip	
Country		Telephone		Email	

Assignee Name and Address:

Niration Network Group, L.L.C.
2711 Centerville Road
Suite 400
Wilmington, DE 19808

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	Dana Morris	Date	1/3/2012
Name	Dana Morris	Telephone	
Title	Authorized Person for Niration Network Group, L.L.C.		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

DECLARATION REGARDING AUTHORITY TO SIGN ON BEHALF OF A LEGAL ENTITY
37 C.F.R. 3.73(b)(2)(i)

I, Dana Morris (whose title is supplied below), hereby declare that I am authorized to sign on behalf of Niration Network Group, L.L.C.

Dana Morris

Dana Morris, Authorized Person for Niration Network Group, L.L.C.

12/30/10

[date]

Electronic Acknowledgement Receipt

EFS ID:	11963226
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	86244
Filer:	David S. Lee/Ashley Behrend
Filer Authorized By:	David S. Lee
Attorney Docket Number:	59659.1200
Receipt Date:	31-JAN-2012
Filing Date:	13-APR-2001
Time Stamp:	14:24:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73(b).	1842-8-373.pdf	430358 a6da5f6ce450ee1916b5c02fac08f6e40a8ec7f9	no	2

Warnings:	
Information:	

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DATABRICKS EX1002 Page 892

2	Power of Attorney	PoA.pdf	84026 47c0fc8fbb47f5760218e83daf87ef50a6f05f60	no	2

Warnings:	
Information:	
Total Files Size (in bytes):	514384

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/96 (06-09)
Approved for use through 07/31/2009. OMB 0651-0031
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: NIRATION NETWORK GROUP, LLC

Application No./Patent No.: 09/834,785 Filed/Issue Date: 04/13/2001

Titled: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

NIRATION NETWORK GROUP, LLC , a Limited Liability Corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy therefore is attached.

OR

B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Hubbard, Edward A. To: United Devices, Inc

The document was recorded in the United States Patent and Trademark Office at
Reel 012004 , Frame 0544 , or for which a copy thereof is attached.

2. From: Univa Corporation To: Niration Network Group, L.L.C.

The document was recorded in the United States Patent and Trademark Office at
Reel 020831 , Frame 0104 , or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____ , Frame _____ , or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/David S. Lee/ January 31, 2012

Signature Date

David S. Lee Patent Attorney for Applicant

Printed or Typed Name Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	59659.1200

CONFIRMATION NO. 8392

86636
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

POA ACCEPTANCE LETTER

OC000000052411855

Date Mailed: 02/08/2012

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/31/2012.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/ttkim/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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DATABRICKS EX1002 Page 896

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	59659.1200

CONFIRMATION NO. 8392

POWER OF ATTORNEY NOTICE

86244
Snell & Wilmer L.L.P., (Komaromy)
One Arizona Center
400 East Van Buren Street
Pheonix, AZ 85004-2202

OC000000052411824

Date Mailed: 02/08/2012

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 01/31/2012.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/ttkim/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IPR2025-00716
DATABRICKS EX1002 Page 897

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	1842-8.747BS	8392

86636 7590 05/14/2012
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER	
DALENCOURT, YVES	
ART UNIT	PAPER NUMBER
2457	

MAIL DATE	DELIVERY MODE
05/14/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	YVES DALENCOURT	2457	

All participants (applicant, applicant's representative, PTO personnel):

(1) *YVES DALENCOURT*. (3)_____.

(2) *Theodore Shih*. (4)_____.

Date of Interview: *03 May 2012*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: _____.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

We basically discussed how to amend the claims in order to put them in condition for allowance. The Examiner suggested to the Applicant's representative how to amend the claims to put them in condition for allowance. Applicant will send a response to the Examiner if such amendment is agreed upon.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/YVES DALENCOURT/ Primary Examiner, Art Unit 2457	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 09/834,785
Filing Date .....April 13, 2001
Confirmation No. 8392
Inventorship..... Edward A. Hubbard
Group Art Unit 2457
Examiner .....Dalencourt, Yves
Attorney Docket No. 1842-8.747BS
Title: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVLEY DISTRIBUTED PARALLEL COMPUTING NETWORKS

REPLY TO FINAL OFFICE ACTION OF JANUARY 31, 2012 AND STATEMENT OF SUBSTANCE OF INTERVIEW

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

From: David S. Lee
Customer No. 86636
Brundidge & Stanger, PC
2318 Mill Road, Suite 1020
Alexandria, VA 22314
(703) 684 - 1470

Sir:

In connection with the above-identified application, the following amendments and remarks are respectfully submitted in response to the Final Office Action dated January 31, 2012 and Examiner Interview conducted May 3, 2012. Reconsideration and withdrawal of the outstanding rejections and allowance of the present application are respectfully requested in view of the following remarks and amendments. Favorable consideration is respectfully requested.

Fees will be paid by credit card through the EFS Web; however the Commissioner is hereby authorized to charge any deficiency of fees and credit any overpayments to Deposit Account Number 50-4888.

Statement of Substance of Interview begins on page 2.
Listing of the Claims begin on page 3.
Remarks are included following the **Listing of the Claims**.

STATEMENT OF SUBSTANCE OF INTERVIEW

(A) Exhibit shown: None.

(B) Identification of the claims discussed: Claims 29, 31, 42, and 44

(C) Identification of specific prior art discussed: N/A

(D) Identification of the principal proposed amendments of a substantive nature discussed: Proposed amendments to Claim 29 and 42.

(E) Principal arguments of the applicant: N/A

(F) Other pertinent matters discussed: None.

(G) Outcome of the interview:

I. Independent Claim 29 would be allowable if the subject matter of dependent Claim 31 were entered, and cancel Claim 31.

II. Independent Claim 42 would be allowable if the subject matter of dependent Claim 44 were entered, and cancel Claim 44.

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DATABRICKS EX1002 Page 902

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Claims pending

- At time of the Action: Claims 29 - 65
- After this Reply: Claims 29, 30, 32 – 43, and 45 - 54

Currently Canceled or Withdrawn Claims: Claims 1 – 28, 31, 44, and 55 - 65

Currently Amended Claims: Claims 29, 30, 32, 42, 43, 45, 46, and 51

New Claims: None

1. - 28. (**Canceled**)

29. (**Currently Amended**) A computer-implemented method comprising:

configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system,

wherein the respective client agents for particular distributed devices of ~~said~~ the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices;

representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices; ~~and~~

processing one or more of data storage or access workloads for the distributed processing

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DATABRICKS EX1002 Page 903

system by accessing data from or storing data to at least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network; and

enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the respective client agents for the particular distributed device.

30. (**Currently Amended**) The method of claim 29, further comprising enabling at least one of the selected distributed devices to function as a stand-alone dedicated NAS device through use of the respective client agents for the particular ~~said~~ distributed device.

31. (**Canceled**)

32. (**Currently Amended**) The method of claim ~~31~~29, further comprising receiving an access request from the client device and directing the client device to data requested on at least one of the ~~s~~elected distributed devices.

33. (**Currently Amended**) The method of claim 32, further comprising managing the NAS service for ~~said~~the at least one of the particular distributed devices at least in part utilizing a centralized server.

34. (**Previously Presented**) The method of claim 33, further comprising downloading the software-based NAS component to the selected distributed devices.

35. (**Previously Presented**) The method of claim 33, further comprising storing, with the centralized server, location information associated with the data stored in the selected distributed devices.

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36. (**Previously Presented**) The method of claim 35, further comprising utilizing the centralized server to receive and route the data for storage to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database.

37. (**Previously Presented**) The method of claim 29, wherein the method is at least partially performed through use of the Internet.

38. (**Previously Presented**) The method of claim 29, further comprising managing storage resources for the selected distributed devices with a storage priority control that facilitates use of the available amount of storage resources for the selected distributed devices.

39. (**Previously Presented**) The method of claim 38, further comprising accepting selection of the storage priority control, by the client device, that comprises a parameter.

40. (**Previously Presented**) The method of claim 38, further comprising prioritizing one or more of storage or deletion of data using the storage priority control that comprises storage priority level schemes.

41. (**Previously Presented**) The method of claim 39, wherein the managing storage resources further comprises marking directly data or files.

42. (**Currently Amended**) A system comprising:

a plurality of distributed devices configured to be coupled to a network, wherein the distributed

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devices include respective client agents configured to process respective portions of workloads for the distributed processing system, the respective client agents including respective instances of a software-based network attached storage (NAS) component, wherein the NAS component is configured to:

assess unused storage resources of the distributed devices;

allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices;

represent that the selected distributed devices comprise respective NAS devices having the respective available amounts of storage resources; ~~and~~

process workloads associated with data storage and access by accessing data from and storing data into portions of the storage resources in the selected distributed devices to provide NAS service to a client device; and

wherein the respective client agents are configured to enable at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

43. (**Currently Amended**) The system of claim 42, wherein at least one of the respective client agents are ~~is~~ configured to enable at least one of the selected distributed devices to function as a stand-alone dedicated NAS device.

44. (**Canceled**)

45. (**Currently Amended**) The system of claim ~~44~~42, wherein the location distributed device is configured to receive an access request from the client device and direct the client device to the data stored on the selected distributed devices that was requested.

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46. (**Currently Amended**) The system of claim 45, wherein the system is further configured to manage the NAS service for the distributed devices at least in part utilizing a centralized server system.

47. (**Previously Presented**) The system of claim 46, wherein the centralized server system is further configured to enable download of the NAS component to the selected distributed devices.

48. (**Previously Presented**) The system of claim 46, wherein the centralized server system is configured to store location information associated with the data stored in the selected distributed devices.

49. (**Previously Presented**) The system of claim 48, wherein the centralized server system is configured to receive data storage and access requests from the client device and route a data storage workload to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database.

50. (**Previously Presented**) The system of claim 42, wherein the distributed devices are configured to be coupled to the Internet.

51. (**Currently Amended**) The system of claim 42, further comprising a storage priority control configured to facilitate use of the respective available amount of unused storage resources for the selected distributed devices.

52. (**Previously Presented**) The system of claim 51, wherein the storage priority control comprises a

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parameter selectable by the client device.

53. (**Previously Presented**) The system of claim 52, wherein the storage priority control comprises storage priority level schemes that prioritize one or more of storage or deletion of data.

54. (**Previously Presented**) The system of claim 52, wherein the storage priority control comprises a priority marking directly given to data or files.

55. - 65. (**Canceled**)

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DATABRICKS EX1002 Page 908

REMARKS

Applicant thanks Examiner Dalencourt for the courtesy and cooperation shown to Applicant's representative during the Examiner Interview on May 3, 2012

Regarding the Final Office Action dated January 31, 2012, reconsideration and allowance in view of the foregoing amendments and the following remarks are respectfully requested. **Claims 29, 30, 32, 42, 43, 45, 46, and 51** are currently amended. No new matter is added. **Claims 31, 44, and 55 - 65** are currently canceled and **Claims 1 – 28** were previously canceled. Accordingly, favorable consideration of pending **Claims 29, 30, 32 – 43, and 45 - 54** is respectfully requested.

REJECTIONS UNDER 35 U.S.C. §103(a)

The outstanding Office Action includes the following rejections under 35 U.S.C. §103(a):

a) *Claims 29-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wolff (US 6,101,508) in view of Frazier (US 6,078,990).*

b) *Claims 34, 47-49, and 61-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wolff and Frazier in view of Duso et al. (US 5,987,621; hereinafter Duso).*

Applicant respectfully submits that in view of the amendment to independent **Claims 29 and 42**, the current rejections under 35 U.S.C. 103(a) are now moot. Therefore, Applicant respectfully requests the withdrawal of the current rejections under 35 U.S.C. § 103(a).

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CONCLUSION

All objections and rejections having been addressed, it is respectfully submitted that the present application is now in condition for allowance, and early and forthright issuance of a Notice to that effect is earnestly solicited.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed above.

Respectfully Submitted,

BRUNDIDGE & STANGER, PC

Dated: May 30, 2012

/David S. Lee/

David S. Lee

Reg No. 38,222

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DATABRICKS EX1002 Page 910

Electronic Acknowledgement Receipt

EFS ID:	12892362
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	86636
Filer:	David S. Lee/Debbie Phelps
Filer Authorized By:	David S. Lee
Attorney Docket Number:	1842-8.747BS
Receipt Date:	30-MAY-2012
Filing Date:	13-APR-2001
Time Stamp:	14:43:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment After Final	1842-8_20120530_FOAResponse.pdf	95112 e07c5310e3f2546c9a0a08e6f706647a5893b37b	no	10

Warnings:	
Information:	

Total Files Size (in bytes):	95112

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
09/834,785	04/13/2001	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 05/30/2012	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 24	Minus	** 37	= 0	X $ =		OR	X $60=	0
Independent (37 CFR 1.16(h))	* 2	Minus	***4	= 0	X $ =		OR	X $250=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/DIANE WILLIAMS/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

86636 7590 06/13/2012

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
DALENCOURT, YVES

ART UNIT	PAPER NUMBER
2457	

DATE MAILED: 06/13/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	1842-8.747BS	8392

TITLE OF INVENTION: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$0	$0	$1740	09/13/2012

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

IPR2025-00716
DATABRICKS EX1002 Page 915

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
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Alexandria, Virginia 22313-1450
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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86636 7590 06/13/2012
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	1842-8.747BS	8392

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APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$0	$0	$1740	09/13/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
DALENCOURT, YVES	2457	709-203000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1_____

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2_____ 3_____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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DATABRICKS EX1002 Page 916

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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	1842-8.747BS	8392

86636 7590 06/13/2012

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER	
DALENCOURT, YVES	
ART UNIT	PAPER NUMBER
2457	

DATE MAILED: 06/13/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 86 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 86 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

IPR2025-00716
DATABRICKS EX1002 Page 917

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	YVES DALENCOURT	2457	

All participants (applicant, applicant's representative, PTO personnel):

(1) *YVES DALENCOURT*. (3)_____.

(2) *David S. Lee*. (4)_____.

Date of Interview: *03 May 2012*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *29-65*.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

We discussed how to amend the claims in order to place the claims in condition for allowance.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

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Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	09/834,785	HUBBARD, EDWARD A.	
	Examiner	Art Unit	
	YVES DALENCOURT	2457	

All participants (applicant, applicant's representative, PTO personnel):

(1) *YVES DALENCOURT*. (3)_____.

(2) *David S. Lee*. (4)_____.

Date of Interview: *03 May 2012*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *29-65*.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

We discussed how to amend the claims in order to place the claims in condition for allowance.

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☐ Attachment

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DATABRICKS EX1002 Page 920

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a plurality of distributed devices include respective client agents configured to pi

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include patents
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Massively **distributed processing system** architecture, scheduling, unique **device** identification and associated methods
EA Hubbard, SS Mandyam... - US Patent App. 10/..., 2003 - Google Patents
... for **a** multitude of widely **distributed devices** to **process distributed** workloads for **a plurality distributed processing** projects. ... be used by **a** server **system** to schedule workloads based upon the capabilities of the **distributed devices**. ... 204 208 RESULTS 7 210 202 I N T E R F **A** C E ...
Cited by 45 - Related articles - All 2 versions

Distributed processing system having sensor based data collection and associated method
EA Hubbard... - US Patent App. 10/667,210, 2003 - Google Patents
... 27,2004 Sheet 10 of 10 US 2004/0103139 Al Coupling **a** server to **a** network connecting **a plurality** of remote ... The incentives block 126 is also **a** subset of the server systems 104 and represents an incentive provided to ... 112 to be utilized by the **distributed processing system** 100. ...
Cited by 16 - Related articles - All 2 versions

Software-based network attached storage services hosted on massively **distributed** parallel computing networks
EA Hubbard - US Patent App. 09/854,785, 2001 - Google Patents
... This NAS functionality takes advantage of unused or under-utilized resources of these **distributed devices** to advantageously ... REMOTE INDEX STORAGE r 108 **CLIENT SYSTEM** L 10 **CLIENT SYSTEM** : ^2 **CLIENT SYSTEM** V. s ... o o 2 CO LU cr OJ in CO UJ UJ UJ -J o oo **a** < o cr ...
Cited by 38 - Related articles - All 2 versions

Customer services and advertising based upon **device** attributes and associated **distributed processing system**
EA Hubbard - US Patent 6,963,897, 2005 - Google Patents
... Bolosky, William J. et al., "Feasibility of **a** Serverless **Distributed** File **System** Deployed ... HARD DRIVES ♦ > 260 252 VIDEO PROCESSOR FLOATING POINT PROCESSOR OTHER **PROCESSING DEVICES** >54 r258 ... BI 358- 132 **WORKLOAD** MANAGER **A** V 356 ^ APIs **A** v DATA ...
Cited by 12 - Related articles - All 2 versions

Security architecture for **distributed processing** systems and associated method
EA Hubbard... - US Patent 6,847,995, 2005 - Google Patents
... **a** server **system** is coupled to **a** network that is **configured** to be coupled to **a plurality** of **distributed** ... Renu Tewari, et al., "Design Considerations for **Distributed** Caching on the Internet," pp ... 25,2005 Sheet 9 of 33 US 6,847,995 BI -350 358- 132 ±2L **WORKLOAD** MANAGER **A** V 356 ...
Cited by 19 - Related articles - All 2 versions

System and method for monitizing network connected user bases utilizing **distributed processing systems**
EA Hubbard - US Patent App. 09/794,366, 2001 - Google Patents
... The **distributed** computing **system** includes **a plurality** of network connected **distributed devices** providing computing resources ... to allow computing resources related to the users to be utilized by the **distributed processing system**. ... CO **A** CO o eg UJ I- (/) > CO h- 2 UJ -ZhujtrL<uuj ...
Cited by 13 - Related articles - All 2 versions

Network site content indexing method and associated **system**
EA Hubbard - US Patent 6,654,783, 2003 - Google Patents
... Huberman, Bernardo **A**., et al.; **Distributed** Computation as an Economic **System**: Journal of ... FLOATING POINT PROCESSOR 256 ~I54 DSPS 258 OTHER **PROCESSING DEVICES** FIG. ... 424 , N 410' 414 DETERMINE SWEEPSTAKES ENTRIES 426 .**A**. **PROCESS** ENTRIES ...
Cited by 19 - Related articles - All 2 versions

Duplicated naming service in **a distributed processing system**
DB Jacobs... - US Patent 6,928,457, 2005 - Google Patents
... Examples of 3Q other transaction **processing** architectures **include** IBM® Corporation's CICS®, Compaq's ... should allow for the determi- nation of the state of **a processing device**. SUMMARY OF THE INVENTION An improved **distributed processing system** is provided and, in ...
Cited by 53 - Related articles - All 4 versions

Distributed parallel **processing system** having capability-based incentives and associated method
EA Hubbard - US Patent 7,003,547, 2006 - Google Patents
... 25 the server **system** utilizing the **workload** capacity factors to determine the incentive values for the **plurality** of **distributed** ... computers systems to perform the tasks required by the ISP, the present invention preferably utilizes **a** multitude of widely **distributed devices** to provide **a** ...
Cited by 7 - Related articles - All 2 versions

Method of managing workloads and associated **distributed processing system**
EA Hubbard - US Patent 7,092,985, 2006 - Google Patents
... Huberman, Bernardo **A**., et al.; **Distributed** Computation as ... 15,2006 Sheet 4 of 29 US 7,092,985 B2 108- 262 DIGITAL CAMERA L 250 -264 HARD DRIVES ♦ > 260 252 VIDEO PROCESSOR FLOATING POINT PROCESSOR 256 OTHER **PROCESSING DEVICES** 54 r258 FIG. ...
Cited by 8 - Related articles - All 4 versions

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BIB DATA SHEET

CONFIRMATION NO. 8392

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/834,785	04/13/2001	709	2457	1842-8.747BS

APPLICANTS

Edward A. Hubbard, Round Rock, TX;

**** CONTINUING DATA ****************************

This application is a CIP of 09/538,543 03/30/2000 PAT 7,003,547
and is a CIP of 09/539,023 03/30/2000 ABN
and is a CIP of 09/539,448 03/30/2000 ABN
and is a CIP of 09/539,428 03/30/2000 ABN
and is a CIP of 09/539,106 03/30/2000 PAT 6,891,802
and is a CIP of 09/538,542 03/30/2000 PAT 6,654,783
and is a CIP of 09/539,107 03/30/2000 ABN
and is a CIP of 09/603,740 06/23/2000 ABN
and is a CIP of 09/602,789 06/23/2000 PAT 7,020,678
and is a CIP of 09/602,803 06/23/2000 PAT 7,082,474
and is a CIP of 09/602,844 06/23/2000 ABN
and is a CIP of 09/602,983 06/23/2000 PAT 6,963,897
and is a CIP of 09/648,832 08/25/2000 PAT 6,847,995
and is a CIP of 09/794,969 02/27/2001 ABN

**** FOREIGN APPLICATIONS ****************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

06/07/2001

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /YVES DALENCOURT/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		TX	31	28	2

ADDRESS

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314
UNITED STATES

TITLE

SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

FILING FEE RECEIVED		
1480	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____

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DATABRICKS EX1002 Page 923

		❑ Credit

IPR2025-00716
DATABRICKS EX1002 Page 924

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	**Art Unit**
	YVES DALENCOURT	2457

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/14/2009	06/10/2010	09/06/2010	03/11/2011	08/22/2011	01/19/2012	06/05/2012		
	1	-	-	-	-	-	-	-		
	2	-	-	-	-	-	-	-		
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	4	-	-	-	-	-	-	-		
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	28	-	-	-	-	-	-	-		
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	33	✓	✓	=	✓	✓	✓	=		
	34	✓	✓	=	✓	✓	✓	=		
	35	✓	✓	=	✓	✓	✓	=		
	36	✓	✓	=	✓	✓	✓	=		

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

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CLAIM		DATE								
Final	Original	12/14/2009	06/10/2010	09/06/2010	03/11/2011	08/22/2011	01/19/2012	06/05/2012		
	37	✓	✓	=	✓	✓	✓	=		
	38	✓	✓	=	✓	✓	✓	=		
	39	✓	✓	=	✓	✓	✓	=		
	40	✓	✓	=	✓	✓	✓	=		
	41	✓	✓	=	✓	✓	✓	=		
	42	✓	✓	=	✓	✓	✓	=		
	43	✓	✓	=	✓	✓	✓	=		
	44	✓	✓	=	✓	✓	✓	-		
	45	✓	✓	=	✓	✓	✓	=		
	46	✓	✓	=	✓	✓	✓	=		
	47	✓	✓	=	✓	✓	✓	=		
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	62	✓	✓	=	✓	✓	✓	-		
	63	✓	✓	=	✓	✓	✓	-		
	64	✓	✓	=	✓	✓	✓	-		
	65	✓	✓	=	✓	✓	✓	-		

WEST Search History for Application 09834785

Creation Date: 2012060511:35

Interference Searches

Query	DB	Op.	Plur.	Thes.	Date
(unus $ 3 or availabl $ 3 or underutiliz $ 3 or underus $ 3) adj7 resource $ 1 and network adj7 attach $ 3 adj7 storage	PGPB, USPT, UPAD	OR	YES		01-04-2012
709/203.ccls.	PGPB, USPT, UPAD	OR	YES		01-04-2012
709/223.ccls.	PGPB, USPT, UPAD	OR	YES		01-04-2012
714/4.11, SPACE~114.ccls.	PGPB, USPT, UPAD	OR	YES		01-04-2012
network near attach $ 3 adj7 storage and cluster near3 file near3 server $ 1	PGPB, USPT, UPAD	OR	YES		01-04-2012
(network near attach $ 3 adj7 storage and cluster near3 file near3 server $ 1) and ((unus $ 3 or availabl $ 3 or underutiliz $ 3 or underus $ 3) adj7 resource $ 1 and network adj7 attach $ 3 adj7 storage)	PGPB, USPT, UPAD	OR	YES		01-04-2012
(network near attach $ 3 adj7 storage and cluster near3 file near3 server $ 1 and (unus $ 3 or availabl $ 3 or underutiliz $ 3 or underus $ 3) adj7 resource $ 1 and network adj7 attach $ 3 adj7 storage) and (709/203.ccls.)	PGPB, USPT, UPAD	OR	YES		01-04-2012
(network near attach $ 3 adj7 storage and cluster near3 file near3 server $ 1 and (unus $ 3 or availabl $ 3 or underutiliz $ 3 or underus $ 3) adj7 resource $ 1 and network adj7 attach $ 3 adj7 storage) and (709/223.ccls.)	PGPB, USPT, UPAD	OR	YES		01-04-2012
709/203.ccls.	PGPB, USPT, UPAD	OR	YES		06-05-2012
location adj7 distribut $ 3 adj7 stor43 adj7 location adj7 information	PGPB, USPT, UPAD	OR	YES		06-05-2012
		OR	YES		06-05-2012

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DATABRICKS EX1002 Page 927

location adj7 distribut $ 3 adj7 stor $ 3 adj7 location adj7 information and (client adj7 agent $ 1 or software)	PGPB, USPT, UPAD				
(location adj7 distribut $ 3 adj7 stor $ 3 adj7 location adj7 information and (client adj7 agent $ 1 or software)) and (709/203.ccls.)	PGPB, USPT, UPAD	OR	YES		06-05-2012

Prior Art Searches

Query	DB	Op.	Plur.	Thes.	Date
(configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI,	OR	YES		12-19-2009

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	TDBD				
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
stor$3 adj7 (data or information)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(stor$3 adj7 (data or information)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1 and available adj7 storage source$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
(assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		12-19-2009
		OR	YES		12-19-2009

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((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)) and ((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD				
(configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010

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DATABRICKS EX1002 Page 930

(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
stor$3 adj7 (data or information)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(stor$3 adj7 (data or information)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1 and available adj7 storage source$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
(assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)) and	PGPB, USPT, EPAB,	OR	YES		09-06-2010

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((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	JPAB, DWPI, TDBD				
709/203.ccls.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		09-06-2010
allocat$3 adj7 data and underutiliz$3 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(allocat$3 adj7 data and underutiliz$3 adj7 resource$1) and conterol$3 adj7 local adj7 storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(allocat$3 adj7 data and underutiliz$3 adj7 resource$1) and control$3 adj7 local adj7 storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(allocat$3 adj7 data and underutiliz$3 adj7 resource$1) and local adj7 storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1	PGPB, USPT, EPAB,	OR	YES		03-12-2011

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	JPAB, DWPI, TDBD				
distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1) and available adj7 storage adj source$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
stor$3 adj7 (data or information)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(stor$3 adj7 (data or information)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1 and available adj7 storage source$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011

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(workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)) and ((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (configur$3 or control$5 or manag$3) adj7 (data or information) and process$3 adj7 workload$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(709/203).ccls.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory)) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI,	OR	YES		03-12-2011

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	TDBD				
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas)) and ((workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
((assess$3 or determin$3 or analyz$3) adj7 (idle or availabl$3 or unuse$1 or underutiliz$3) adj7 (resource$1 or cpu or processor$1 or memory) and distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas) and (workload$1 or load$1 or process$3 or comput$3) and distribut$3 near3 (comput$3 or process$3 or cpu) and (idle or unuse$3 or spare or extra) near3 (comput$5 or process$3 or cpu)) and @pd<20000218	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(assess$3 adj7 (unus$3 or under near3 utiliz$3 or left-over) adj7 resource$1) and (distribut$3 adj7 (resource$1 or workload$3) and network adj attach$3 adj storage$1 or (nas))	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
6101508.pn.	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn.) and workload$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn.) and process$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3) and nas	PGPB, USPT, EPAB,	OR	YES		03-12-2011

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	JPAB, DWPI, TDBD				
(6101508.pn. and process$3) and attach$$3 adj7 storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1) and configur$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3) and client$1 and agent$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3) and client$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1) and agent$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1) and portion$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1) and assess$3 near3 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011

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(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1) and assess$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1) and resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1 and resource$1) and analyz$3 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1 and resource$1) and control$5 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
(6101508.pn. and process$3 and attach$$3 adj7 storage$1 and configur$3 and client$1 and portion$1 and resource$1 and control$5 adj7 resource$1) and amount$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
20020065864	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		03-12-2011
network near attach$3 adj7 storage and cluster near3 file near3 server$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
(network near attach$3 adj7 storage and cluster near3 file near3 server$1) and difference$1	PGPB, USPT, EPAB, JPAB,	OR	YES		08-22-2011

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	DWPI, TDBD				
(network near attach$3 adj7 storage and cluster near3 file near3 server$1) and @pd<20000303	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
(network near attach$3 adj7 storage and cluster near3 file near3 server$1) and @pd<20003003	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
(unuse$3 and under-utiliz$3) adj7 nas adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
(un-use$3 and under-utiliz$3) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
(un-use$3 or unus$3 and under-utiliz$3 or underutilis$5) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((un-use$3 or unus$3 and under-utiliz$3 or underutilis$5) adj7 resource$1) and nas	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((un-use$3 or unus$3 and under-utiliz$3 or underutilis$5) adj7 resource$1 and nas) and storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
control$5 adj7 local adj7 storage adj7 resource$1		OR	YES		08-22-2011

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	PGPB, USPT, EPAB, JPAB, DWPI, TDBD				
(unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage) and (control$5 adj7 local adj7 storage adj7 resource$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage) and allocat$3 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1) and storage adj7 capacity$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3) and using adj7 memory adj7 capacity	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3) and memory adj7 capacity	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3 and memory adj7 capacity) and idl$3 adj7	PGPB, USPT, EPAB, JPAB,	OR	YES		08-22-2011

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device$1	DWPI, TDBD				
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3 and memory adj7 capacity and idl$3 adj7 device$1) and software adj7 agent$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		08-22-2011
network near attach$3 adj7 storage and cluster near3 file near3 server$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
(network near attach$3 adj7 storage and cluster near3 file near3 server$1) and difference$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
(network near attach$3 adj7 storage and cluster near3 file near3 server$1) and @pd<20000303	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
(network near attach$3 adj7 storage and cluster near3 file near3 server$1) and @pd<20003003	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
(unuse$3 and under-utiliz$3) adj7 nas adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
(un-use$3 and under-utiliz$3) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
		OR	YES		01-04-2012

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(un-use$3 or unus$3 and under-utiliz$3 or underutilis$5) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD				
((un-use$3 or unus$3 and under-utiliz$3 or underutilis$5) adj7 resource$1) and nas	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
((un-use$3 or unus$3 and under-utiliz$3 or underutilis$5) adj7 resource$1 and nas) and storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
control$5 adj7 local adj7 storage adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
(unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage) and (control$5 adj7 local adj7 storage adj7 resource$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage) and allocat$3 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1) and storage adj7 capacity$3	PGPB, USPT, EPAB, JPAB,	OR	YES		01-04-2012

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	DWPI, TDBD				
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3) and using adj7 memory adj7 capacity	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3) and memory adj7 capacity	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3 and memory adj7 capacity) and idl$3 adj7 device$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3 and memory adj7 capacity and idl$3 adj7 device$1) and software adj7 agent$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		01-04-2012
network near attach$3 adj7 storage and cluster near3 file near3 server$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
(network near attach$3 adj7 storage and cluster near3 file near3 server$1) and difference$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
(network near attach$3 adj7 storage and cluster near3 file near3 server$1) and @pd<20000303	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
		OR	YES		06-05-2012

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(network near attach$3 adj7 storage and cluster near3 file near3 server$1) and @pd<20003003	PGPB, USPT, EPAB, JPAB, DWPI, TDBD				
(unuse$3 and under-utiliz$3) adj7 nas adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
(un-use$3 and under-utiliz$3) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
(un-use$3 or unus$3 and under-utiliz$3 or underutilis$5) adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
((un-use$3 or unus$3 and under-utiliz$3 or underutilis$5) adj7 resource$1) and nas	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
((un-use$3 or unus$3 and under-utiliz$3 or underutilis$5) adj7 resource$1 and nas) and storage$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
control$5 adj7 local adj7 storage adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
(unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage	PGPB, USPT, EPAB, JPAB,	OR	YES		06-05-2012

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	DWPI, TDBD				
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage) and (control$5 adj7 local adj7 storage adj7 resource$1)	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage) and allocat$3 adj7 resource$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1) and storage adj7 capacity$3	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3) and using adj7 memory adj7 capacity	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3) and memory adj7 capacity	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3 and memory adj7 capacity) and idl$3 adj7 device$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012
((unus$3 or availabl$3 or underutiliz$3 or underus$3) adj7 resource$1 and network adj7 attach$3 adj7 storage and allocat$3 adj7 resource$1 and storage adj7 capacity$3 and memory adj7 capacity and idl$3 adj7 device$1) and software adj7 agent$1	PGPB, USPT, EPAB, JPAB, DWPI, TDBD	OR	YES		06-05-2012

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Issue Classification

Application/Control No.	Applicant(s)/Patent Under Reexamination
09834785	HUBBARD, EDWARD A.
Examiner	**Art Unit**
YVES DALENCOURT	2457

ORIGINAL		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
709	203	G 0 6 F 15 / 16 (2006.01.01)	

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
709	201	202	205	212	226
719	317				

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17	4	33	19	49		65						
	2		18	5	34	20	50								
	3		19	6	35	21	51								
	4		20	7	36	22	52								
	5		21	8	37	23	53								
	6		22	9	38	24	54								
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	8		24	11	40		56								
	9		25	12	41		57								
	10		26	13	42		58								
	11		27	14	43		59								
	12		28		44		60								
	13	1	29	15	45		61								
	14	2	30	16	46		62								
	15		31	17	47		63								
	16	3	32	18	48		64								

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 24	
/YVES DALENCOURT/ Primary Examiner.Art Unit 2457 (Primary Examiner)	06/05/2012 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 19

IPR2025-00716
DATABRICKS EX1002 Page 945

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	09834785	HUBBARD, EDWARD A.
	Examiner	Art Unit
	YVES DALENCOURT	2457

SEARCHED

Class	Subclass	Date	Examiner
709	201, 202, 203, 205, 212, 223, 226, 229	06/09/2010	YD
719	317	06/09/2010	YD

SEARCH NOTES

Search Notes	Date	Examiner
WEST (see attached text search)	12/19/2009	YD
WEST (updated text search)	09/06/2010	YD
WEST (updated text search)	03/12/2011	YD
WEST (updated text search)	08/21/2011	YD
WEST (updated text search)	06/05/2012	YD
Google Advanced Scholar Search	06/05/2012	YD

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner
WEST (updated text search 709/203)		06/05/2012	YD

IPR2025-00716
DATABRICKS EX1002 Page 946

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	1842-8.747BS	8392

86636 7590 06/26/2012

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER	
DALENCOURT, YVES	
ART UNIT	**PAPER NUMBER**
2457	

MAIL DATE	DELIVERY MODE
06/26/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address : COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
09/834,785	13 April, 2001	HUBBARD, EDWARD A.	1842-8.747BS

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER	
YVES DALENCOURT	
ART UNIT	PAPER
2457	20120622

DATE MAILED:

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Commissioner for Patents

The IDS filed on 03/29/2010 and 03/31/2010 have been considered and recorded.

/YVES DALENCOURT/
Primary Examiner, Art Unit 2457

PTO-90C (Rev.04-03)

PTO/SB/08a(04-07)
Approved for use through 7/31/2006. OMB 0651-0031
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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	1	of	1

Complete if Known

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	2457
Examiner Name	Dalencourt, Yves

Attorney Docket No: NING0008

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Filing Date If Appropriate
		US-20040098449	05/20/2004	Bar-Lavi et al.	
		US-20070011224	01/11/2007	Mena, Jesus	
		US-20100036723	02/11/2010	Hubbard, Edward A.	
		US-7143089	11/28/2006	Petras et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of cited Document	T[2]

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No [1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		"Non-Final Office Action", Application Number 10/687,210, (11/25/2009), 20 pages	

EXAMINER /Yves Dalencourt/ **DATE CONSIDERED** 06/10/2010

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D./

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	2457
Examiner Name	Dalencourt, Yves

Sheet	1	of	1	Attorney Docket No: NING0008

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Filing Date If Appropriate
		US-20020133593	9/19/2002	Johnson et al.	
		US-60/187,211		Beale et al.	03/03/2000
		US-60/246,401		Johnson et al.	11/07/2000
		US-60/285,211		Johnson et al.	4/20/2001
		US-60/291,073		Johnson et al.	5/15/2001

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of cited Document	T^2

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No [1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T^2

EXAMINER /Yves Dalencourt/ **DATE CONSIDERED** 06/10/2012

Substitute Disclosure Statement Form (PTO-1449)

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D./

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Brundidge & Stanger, P.C.
2318 Mill Road
Suite 1020
Alexandria, VA 22314

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	04/13/2001	Edward A. Hubbard	1842-8.747BS	8392

TITLE OF INVENTION:

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$0	$1740	09/13/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Brundidge & Stanger, P.C.
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE	(B) RESIDENCE: (CITY and STATE OR COUNTRY)
Niration Network Group, L.L.C.	Wilmington, DE

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☑ Corporation or other private group entity ☐ Government

4a. The following fee(s) are enclosed:

☑ Issue Fee
☑ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _

4b. Payment of Fee(s):

☐ A check in the amount of the fee(s) is enclosed.
☑ Payment by credit card. Form PTO-2038 is attached.
☑ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number 50-4888 .

5. **Change in Entity Status** (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /David S. Lee/ Date August 22, 2012

Typed or printed name David S. Lee Registration No. 38,222

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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IPR2025-00716
DATABRICKS EX1002 Page 951

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	09834785
Filing Date:	13-Apr-2001
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Filer:	David S. Lee/Kristin Huber
Attorney Docket Number:	1842-8.747BS

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	1501	1	1740	1740
Extension-of-Time:				

IPR2025-00716
DATABRICKS EX1002 Page 953

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**1740**

Electronic Acknowledgement Receipt

EFS ID:	13554030
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	86636
Filer:	David S. Lee/Kristin Huber
Filer Authorized By:	David S. Lee
Attorney Docket Number:	1842-8.747BS
Receipt Date:	22-AUG-2012
Filing Date:	13-APR-2001
Time Stamp:	11:00:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1740
RAM confirmation Number	8564
Deposit Account	504888
Authorized User	LEE,DAVID S.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

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Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	1842-8_20120822_issue_fee.pdf	228604 a9996fe2d9203fa6371d9b112a60799a31251347	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30522 b858c78353d8cf50d2de06f06fdd3977bed6e967	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	259126		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 09/834,785
Filing Date .....April 13, 2001
Confirmation No. 8392
Inventorship..... Edward A. Hubbard
Group Art Unit 2457
Examiner .....Dalencourt, Yves
Attorney Docket No. 1842-8.747BS
Title: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

REQUEST FOR REFUND

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

From: David S. Lee
Customer No. 86636
Brundidge & Stanger, PC
2318 Mill Road, Suite 1020
Alexandria, VA 22314
(703) 684 - 1470

Sir:

On August 22, 2012 the Applicant paid the Issue Fee in the amount of $1740.00 in connection with the above-identified application. A review of the Image File Wrapper and the Fee tab in PAIR indicates that on February 26, 2007 the Issue Fee in the amount of $700.00, which was the Issue Fee for a small entity at that time, was paid. Therefore, the Applicant respectfully requests a refund in the amount of $700.00 to be credited to Deposit Account No. 50-4888.

Respectfully Submitted,

BRUNDIDGE & STANGER, PC

Dated: August 22, 2012

/David S. Lee/
David S. Lee
Reg No. 38,222

Electronic Acknowledgement Receipt

EFS ID:	13554853
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	86636
Filer:	David S. Lee/Kristin Huber
Filer Authorized By:	David S. Lee
Attorney Docket Number:	1842-8.747BS
Receipt Date:	22-AUG-2012
Filing Date:	13-APR-2001
Time Stamp:	11:20:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Refund Request	1842-8_Request_for_Refund.pdf	34937 40dfb0a8b825a29ca8b31bd1b5747d8625f288d7	no	1

Warnings:	
Information:	

IPR2025-00716
DATABRICKS EX1002 Page 958

Total Files Size (in bytes):	34937

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08a(04-07)
Approved for use through 7/31/2006. OMB 0651-0031
US Patent & Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known

Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	2157
Examiner Name	Dalencourt, Yves

Sheet	2	of	4

Attorney Docket No: NING0008

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Filing Date If Appropriate
		US-5907619	05/25/1999	Davis, Derek L.	
		US-5911776	06/15/1999	Guck, Randal L.	
		US-5953420	09/14/1999	Matyas Jr., Stephen M.	
		US-6014712	01/11/2000	Islam, Farhead F.	
		US-6052584	04/18/2000	Harvey, Richard et al.	
		US-6065046	05/16/2000	Feinberg, Michael A.	
		US-6078953	06/20/2000	Vaid, Aseem et al.	
		US-6098091	08/01/2000	Kisor, Greg	
		US-6112181	08/29/2000	Shear et al.	
		US-6128644	10/03/2000	Nozaki, Hideki	
		US-6131067	10/10/2000	Girerd et al.	
		US-6134532	10/17/2000	Lazarus, Michael A., et al.	
		US-6135646	10/24/2000	Kahn, Robert E.	
		US-6138155	10/24/2000	Davis, Owen	
		US-6167428	12/26/2000	~~Frampton, Ellis E.~~	Ellis, Frampton E.
		US-6189045	02/13/2001	O'Shea, Cynthia	
		US-6191847	02/20/2001	Melendez	
		US-6208975	03/27/2001	Bull, David` S.	
		US-6211782	04/03/2001	Sandelman et al.	
		US-6212550	04/03/2001	Segur, Shawn` T.	
		US-6249836	06/19/2001	Downs, Terry	
		US-6253193	06/26/2001	Ginter, Karl	
		US-6263358	07/17/2001	~~Lyndon, Lee C.~~	Lee, Lyndon C.
		US-6308203	10/23/2001	Itabashi, Tatsuo et al.	
		US-6334126	12/25/2001	Nagamoto, Shoichi	
		US-6336124	01/01/2002	Alam et al.	
		US-6345240	02/05/2002	Havens, Joseph H.	
		US-6347340	02/12/2002	Coelho et al.	
		US-6356929	03/12/2002	Gall et al.	
		US-6370510	04/09/2002	McGovern et al.	
		US-6370560	04/09/2002	Roberrtazzi et al.	
		US-6374254	04/16/2002	Cochran et al.	
		US-6377975	04/23/2002	Florman	
		US-6389421	05/14/2002	Hawkins et al.	
		US-6393014	05/21/2002	Daly et al.	

Change(s) applied to document, /J.F./ 8/28/2012

EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D./

PTO/SB/08a(04-07)
Approved for use through 7/31/2006. OMB 0651-0031
US Patent & Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	09/834,785
Filing Date	April 13, 2001
First Named Inventor	Hubbard, Edward
Art Unit	2157
Examiner Name	Dalencourt, Yves

Sheet	3	of	4

Attorney Docket No: NING0008

US PATENT DOCUMENTS

Examiner Initial *	Cite No	Document Number	Publication Date	Name of Patentee or Applicant of Cited Document	Filing Date If Appropriate
		US-6415373	07/02/2002	Peters et al.	
		US-6421781	07/16/2002	Fox, Mark et al.	
		US-6434594	08/13/2002	Wesemann	
		US-6434609	08/13/2002	Humphrey	
		US-6438553	08/20/2002	Yamada	
Change(s) applied		US-6473805	10/29/2002	Lewis	
to document,		US-6477565	11/05/2002	Daswani et al.	
/J.F./		US-6499105	12/24/2002	Yoshiura et al.	
8/28/2012		~~US-6505246~~	02/04/2003	Landsman et al.	6516338
		US-6516338	02/04/2003	Landsman, Rick W., et al.	
		US-6516350	02/04/2003	Lumelsky et al.	
		US-6546419	04/08/2003	Humpleman, Richard et al.	
		US-6570870	05/27/2003	Bertstis, Viktors	
		US-6574628	06/03/2003	Kahn, Robert	
		US-6604122	08/05/2003	Nilsson, Hans	
		US-6615166	09/02/2003	Guheen, Michael F.	
		US-6643291	11/04/2003	Yoshihara et al.	
		US-6643640	11/04/2003	Getchius, Jeffrey	
		US-6654783	11/25/2003	Hubbard, Edward	
		US-6757730	06/29/2004	Berardin, James	
		US-6847995	08/25/2000	Hubbard, Edward	
		US-6891802	05/10/2005	Hubbard, Edward	
		US-6963897	11/08/2005	Hubbard, Edward	
		US-7003547	02/21/2006	Hubbard, Edward	
		US-7020678	03/28/2006	Hubbard, Edward	
		US-7082474	07/25/2006	Hubbard, Edward	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of cited Document	T[2]
		WO-2001073545	10/04/2001	Hubbard, Edward , et al.	
		WO-2001014961	03/01/2001	Armentrout, Steven , et al.	
		EP-0883313	09/12/1998	Daly, Brian K., et al.	

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

EXAMINER **DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Y.D./

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,785	09/25/2012	8275827	1842-8.747BS	8392

86636 7590 09/05/2012

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 1946 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Edward A. Hubbard, Round Rock, TX;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

USPTO
ACCOUNTING
2012 AUG 22 PM 4:14

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 09/834,785
Filing Date ..... April 13, 2001
Confirmation No. 8392
Inventorship ..... Edward A. Hubbard
Group Art Unit 2457
Examiner ..... Dalencourt, Yves
Attorney Docket No. 1842-8.747BS
Title: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

REQUEST FOR REFUND

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

From: David S. Lee
Customer No. 86636
Brundidge & Stanger, PC
2318 Mill Road, Suite 1020
Alexandria, VA 22314
(703) 684 - 1470

Sir:

On August 22, 2012 the Applicant paid the Issue Fee in the amount of $1740.00 in connection with the above-identified application. A review of the Image File Wrapper and the Fee tab in PAIR indicates that on February 26, 2007 the Issue Fee in the amount of $700.00, which was the Issue Fee for a small entity at that time, was paid. Therefore, the Applicant respectfully requests a refund in the amount of $700.00 to be credited to Deposit Account No. 50-4888.

Respectfully Submitted,

BRUNDIDGE & STANGER, PC

Dated: August 22, 2012

/David S. Lee/
David S. Lee
Reg No. 38,222

PTO/SB/44 (09-07)
Approved for use through 08/31/2013. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 8,275,827 B2

APPLICATION NO. : 09/834,785

ISSUE DATE : September 25, 2012

INVENTOR(S) : Hubbard

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 1, Lines 23-24, delete "Proc of the Fifth Intl Conf Bioastronomy IAU Colloq" and
insert - - Proc. of the Fifth Intl. Conf. Bioastronomy IAU Colloq. - -, therefor.

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Lines 56-58, delete "Distributed.net: …..3 pages."

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Lines 23-24, delete "London et al.,….. Jun. 1998."

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Lines 58-60, delete "Takagi, et al., "Ninflet: ….. p. 1063-1078."

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Lines 61-63, delete "Waldspurger, et al.,….. p. 103-117."

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Maschoff Gilmore & Israelsen
1441 West Ute Boulevard, Suite 100
Park City, UT 84098 United States

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/44 (09-07)
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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

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APPLICATION NO. : 09/834,785

ISSUE DATE : September 25, 2012

INVENTOR(S) : Hubbard

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In Column 1, Line 16, delete “PROCESING” and insert - - PROCESSING - -, therefor.

In Column 3, Line 2, delete “us” and insert - - use - -, therefor.

In Column 4, Line 5, delete “DESCRIPTION” and insert - - BRIEF DESCRIPTION - -, therefor.

In Column 6, Line 24, delete “of a” and insert - - of an - -, therefor.

In Column 14, Line 61, delete “be an” and insert - - be a - -, therefor.

In Column 22, Line 4, delete “a interaction” and insert - - an interaction - -, therefor.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

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Park City, UT 84098 United States

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PTO/SB/44 (09-07)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 8,275,827 B2

APPLICATION NO. : 09/834,785

ISSUE DATE : September 25, 2012

INVENTOR(S) : Hubbard

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In Column 22, Line 37, delete “present B” and insert - - present - -, therefor.

In Column 23, Line 18, delete “an summary” and insert - - a summary - -, therefor.

In Column 43, Line 15, delete “that that” and insert - - that - -, therefor.

In Column 45, Line 15, delete “AS” and insert - - NAS - -, therefor.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Maschoff Gilmore & Israelsen
1441 West Ute Boulevard, Suite 100
Park City, UT 84098 United States

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

PATENT NO.: 8,275,827

USPTO CONFIRMATION CODE: 8392

APPLICATION NO.: 09/834,785

FILED: April 13, 2001

EXAMINER: Yves Dalencourt

GROUP ART UNIT: 2457

FOR: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

37 CFR 1.322 & 37 CFR 1.323 REQUEST FOR CERTIFICATE OF CORRECTION FOR USPTO AND/OR APPLICANT MISTAKE

Commissioner for Patents
Office of Patent Publication
ATTN: Certificate of Correction Branch
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

A certificate of correction under 35 USC 254 is respectfully requested in the above-identified patent.

It is believed that all errors identified herein were the fault of both the applicant and USPTO and, accordingly, please charge **$100.00** to our Deposit Account No. 50-5394. In the event that a further fee is required, please charge the amount to the same Deposit Account.

The exact locations where the errors appear in the patent and patent application are as follows:

IPR2025-00716
DATABRICKS EX1002 Page 968

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 1, Lines 23-24, delete "Proc of the Fifth Intl Conf Bioastronomy IAU Colloq" and insert - - Proc. of the Fifth Intl. Conf. Bioastronomy IAU Colloq. - -, therefor.
(LIST OF REFERENCES CITED BY APPLICANT AND CONSIDERED BY EXAMINER DATED SEPTEMBER 3, 2004, PAGE 3 OF 5 (PAGE 705 OF FW), UNDER "OTHER ART", ENTRY 11, LINE 2)

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Lines 56-58, delete "Distributed.net: …..3 pages."
(LIST OF REFERENCES CITED BY APPLICANT AND CONSIDERED BY EXAMINER DATED DECEMBER 28, 2009, SHEET 4 OF 4 (PAGE 299 OF FW), UNDER "OTHER DOCUMENTS", ENTRY 1, LINE 1)

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Lines 23-24, delete "London et al.,….. Jun. 1998."
(LIST OF REFERENCES CITED BY APPLICANT AND CONSIDERED BY EXAMINER DATED SEPTEMBER 14, 2006, SHEET 1 OF 2 (PAGE 563 OF FW), UNDER "OTHER ART", ENTRY 2, LINES 1-2)

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Lines 58-60, delete "Takagi, et al., "Ninflet: ….. p. 1063-1078."
(LIST OF REFERENCES CITED BY APPLICANT AND CONSIDERED BY EXAMINER DATED DECEMBER 28, 2009, SHEET 4 OF 4 (PAGE 299 OF FW), UNDER "OTHER DOCUMENTS", ENTRY 2, LINES 1-2)

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Lines 61-63, delete "Waldspurger, et al.,….. p. 103-117."
(LIST OF REFERENCES CITED BY APPLICANT AND CONSIDERED BY EXAMINER DATED DECEMBER 28, 2009, SHEET 4 OF 4 (PAGE 299 OF FW), UNDER "OTHER DOCUMENTS", ENTRY 3, LINES 1-2)

In Column 1, Line 16, delete "PROCESING" and insert - - PROCESSING - -, therefor.
(AMENDMENTS TO THE SPECIFICATION DATED JULY 25, 2006, PAGE 1, LINE 11)

In Column 3, Line 2, delete "us" and insert - - use - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED APRIL 13, 2001, PAGE 3, (PAGE 749 OF FW), LINE 22)

In Column 4, Line 5, delete "DESCRIPTION" and insert - - BRIEF DESCRIPTION - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED APRIL 13, 2001, PAGE 5, (PAGE 751 OF FW), LINE 1)

IPR2025-00716
DATABRICKS EX1002 Page 969

In Column 6, Line 24, delete "of a" and insert - - of an - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED APRIL 13, 2001, PAGE 9, (PAGE 755 OF FW), LINE 8)

In Column 14, Line 61, delete "be an" and insert - - be a - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED APRIL 13, 2001, PAGE 20, (PAGE 766 OF FW), LINE 25)

In Column 22, Line 4, delete "a interaction" and insert - - an interaction - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED APRIL 13, 2001, PAGE 31, (PAGE 777 OF FW), LINE 24)

In Column 22, Line 37, delete "present B" and insert - - present - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED APRIL 13, 2001, PAGE 32, (PAGE 778 OF FW), LINE 14)

In Column 23, Line 18, delete "an summary" and insert - - a summary - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED APRIL 13, 2001, PAGE 33, (PAGE 779 OF FW), LINES 13-14)

In Column 43, Line 15, delete "that that" and insert - - that - -, therefor.
(AMENDMENTS TO THE SPECIFICATION DATED AUGUST 31, 2006, PAGE 2, LINES 8-9)

In Column 45, Line 15, delete "AS" and insert - - NAS - -, therefor.
(ORIGINALLY FILED SPECIFICATION DATED APRIL 13, 2001, PAGE 63, (PAGE 809 OF FW), LINE 14)

The requested corrections are attached on Form PTO/SB/44.

Dated this 28th day of January, 2013.

Respectfully Submitted,

/R. Burns Israelsen/ Reg. # 42,685
R. BURNS ISRAELSEN
Acting in Representative Capacity
(37 CFR 1.34)
Registration No. 42,685
Telephone No. (435) 252-1360

IPR2025-00716
DATABRICKS EX1002 Page 970

Electronic Patent Application Fee Transmittal

Application Number:	09834785
Filing Date:	13-Apr-2001
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Filer:	Robert Burns Israelsen/Tonya Kusitor
Attorney Docket Number:	1842-8.747BS

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Certificate of correction	1811	1	100	100
Extension-of-Time:				

IPR2025-00716
DATABRICKS EX1002 Page 971

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**100**

Electronic Acknowledgement Receipt

EFS ID:	14803706
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	86636
Filer:	Robert Burns Israelsen/Tonya Kusitor
Filer Authorized By:	Robert Burns Israelsen
Attorney Docket Number:	1842-8.747BS
Receipt Date:	28-JAN-2013
Filing Date:	13-APR-2001
Time Stamp:	12:12:42
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$100
RAM confirmation Number	14180
Deposit Account	505394
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	0884USAP145358_20130128_CoC.pdf	281178 e3c541ab192647c2fa0929295e689f2557bf5986	no	4
Warnings:					
Information:					
2	Request for Certificate of Correction	0884USAP145358_20130128_RequestLetter.pdf	153865 168085f8e6deb03c01c3f5bbe227cab81a1e2f7f	no	3
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30509 42583ccf29843f3e2e97db249b6c4b8f2c2e0f75	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	465552		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 8,275,827 B2
APPLICATION NO. : 09/834785
DATED : September 25, 2012
INVENTOR(S) : Hubbard

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 1, Lines 23-24, delete "Proc of the Fifth Intl Conf Bioastronomy IAU Colloq" and insert -- Proc. of the Fifth Intl. Conf. Bioastronomy IAU Colloq. --, therefor.

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Lines 56-58, delete "Distributed.net: .....3 pages.".

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Lines 23-24, delete "London et al.,..... Jun. 1998.".

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Lines 58-60, delete "Takagi, et al., "Ninflet: ..... p. 1063-1078.".

On Page 3, in Field (56), under "OTHER PUBLICATIONS", in Column 2, Lines 61-63, delete "Waldspurger, et al.,..... p. 103-117.".

In Column 1, Line 16, delete "PROCESING" and insert -- PROCESSING --, therefor.

In Column 3, Line 2, delete "us" and insert -- use --, therefor.

In Column 4, Line 5, delete "DESCRIPTION" and insert -- BRIEF DESCRIPTION --, therefor.

In Column 6, Line 24, delete "of a" and insert -- of an --, therefor.

In Column 14, Line 61, delete "be an" and insert -- be a --, therefor.

In Column 22, Line 4, delete "a interaction" and insert -- an interaction --, therefor.

In Column 22, Line 37, delete "present B" and insert -- present --, therefor.

Signed and Sealed this
Fifth Day of March, 2013

Teresa Stanek Rea
Acting Director of the United States Patent and Trademark Office

In Column 23, Line 18, delete “an summary” and insert -- a summary --, therefor.

In Column 43, Line 15, delete “that that” and insert -- that --, therefor.

In Column 45, Line 15, delete “AS” and insert -- NAS --, therefor.

AO 120 (Rev. 3/04)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Massachusetts on the following ☑ Patents or ☐ Trademarks:

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
16-10860	5/10/2016	Massachusetts

PLAINTIFF	DEFENDANT
Intellectual Ventures I, LLC and Intellectual Ventures II, LLC	Lenovo Group Ltd., Lenovo (United States) Inc., LenovoEMC Products USA, LLC, and EMC Corp.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6,516,442	2/4/2003	Intellectual Ventures II, LLC
2	6,775,745	8/10/2004	Intellectual Ventures I, LLC
3	6,968,459	11/22/2005	Intellectual Ventures II, LLC
4	8,275,827	9/25/2012	Intellectual Ventures I, LLC
5	8,387,132	2/26/2013	Intellectual Ventures I, LLC
6.	9,098,685	08/04/2015	Intellectual Ventures I, LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director **Copy 3—Upon termination of action, mail this copy to Director**
Copy 2—Upon filing document adding patent(s), mail this copy to Director **Copy 4—Case file copy**

PTO/SB/80 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

[X] Practitioners associated with the Customer Number: **26111**

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

[X] The address associated with Customer Number: **26111**

OR

[ ] Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Intellectual Ventures I LLC
2711 Centerville Road, Suite 400
Wilmington, DE 19808

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	Tracy Lemke	Date	8/1/19
Name	Tracy Lemke	Telephone	
Title	Authorized Person for Intellectual Ventures I LLC		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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STATEMENT UNDER 37 CFR 3.73(b)

Atty. Docket No. 3059.730000G

Applicant/Patent Owner: Intellectual Ventures I LLC

Application No./Patent No.: 8,275,827 Filed/Issue Date: September 25, 2012

Titled: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

INTELLECTUAL VENTURES I LLC , a Limited Liability Company
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. [X] the assignee of the entire right, title, and interest in;

2. [ ] an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. [ ] the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. [ ] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy therefore is attached.

OR

B. [X] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: HUBBARD, EDWARD A. To: UNITED DEVICES, INC.
The document was recorded in the United States Patent and Trademark Office at
Reel 012004, Frame 0544, or for which a copy thereof is attached.

2. From: UNITED DEVICES, INC. To: UNIVA CORPORATION
The document was recorded in the United States Patent and Trademark Office at
Reel 020353, Frame 0187, or for which a copy thereof is attached.

3. From: UNIVA CORPORATION To: NIRATION NETWORK GROUP, L.L.C.
The document was recorded in the United States Patent and Trademark Office at
Reel 020831, Frame 0104, or for which a copy thereof is attached.

[X] Additional documents in the chain of title are listed on a supplemental sheet(s).

[X] As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature

3/31/2014
Date

Lori A. Gordon, Reg. No. 50,633
Printed or Typed Name

Attorney for Patent Owner
Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Supplemental Sheet to Chain of Title, Item B of the Statement Under 37 CFR 3.73(b) (PTO/SB/96)

Applicant/Owner: Intellectual Ventures I LLC

Application No./Patent No.: 8,275,827

Application Date/Issue Date: September 25, 2012

Title: SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS

Name of Assignee: INTELLECTUAL VENTURES I LLC Type of Assignee: Limited Liability Company

Supplemental Sheet to Part B: Continuation of the chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

4. From: NIRATION NETWORK GROUP, L.L.C. To: F. POSZAT HU, L.L.C.
   The document was recorded in the United States Patent and Trademark Office at
   Reel 037233, Frame 0651, or for which a copy thereof is attached.

5. From: F. POSZAT HU, L.L.C. To: INTELLECTUAL VENTURES I LLC
   The document was recorded in the United States Patent and Trademark Office at
   Reel 038514, Frame 0263, or for which a copy thereof is attached.

6. From: _____ To: _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.

7. From: _____ To: _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.

8. From: _____ To: _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.

9. From: _____ To: _____
   The document was recorded in the United States Patent and Trademark Office at
   Reel _____, Frame _____, or for which a copy thereof is attached.

10. From: _____ To: _____
    The document was recorded in the United States Patent and Trademark Office at
    Reel _____, Frame _____, or for which a copy thereof is attached.

PTO/SB/47 (03-09)
Approved for use through 05/31/2015. OMB 0651-0016
U.S. Patent and Trademark Office; U. S. DEPARTMENT OF COMMERCE
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"FEE ADDRESS" INDICATION FORM

Address to:
Mail Stop M Correspondence
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

- OR -

Fax to:
571-273-6500

INSTRUCTIONS: The issue fee must have been paid for application(s) listed on this form. In addition, only an address represented by a Customer Number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application. **When to check the first box below**: If you have a Customer Number to represent the fee address. **When to check the second box below**: If you have no Customer Number representing the desired fee address, in which case a completed Request for Customer Number (PTO/SB/125) must be attached to this form. For more information on Customer Numbers, see the Manual of Patent Examining Procedure (MPEP) § 403.

For the following listed application(s), please recognize as the "Fee Address" under the provisions of 37 CFR 1.363 the address associated with:

[X] Customer Number: **26111**

OR

[ ] The attached Request for Customer Number (PTO/SB/125) form.

PATENT NUMBER (if known)	APPLICATION NUMBER
8,275,827	09/834,785

Completed by (check one):

[ ] Applicant/Inventor

[X] Attorney or Agent of record 50,633 (Reg. No.)

[ ] Assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

[ ] Assignee recorded at Reel _____ Frame_____

Signature

Lori A. Gordon
Typed or printed name

(202) 371-2600
Requester's telephone number

8/8/2017
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more that one signature is required, see below*.

[ ] * Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.363. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1. 11 and 1.14. This collection is estimated to take 5 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313- 1450. DO NOT SEND COMPLETED FORMS TO THIS ADDRESS.
SEND TO: Mail Stop M Correspondence, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	28795308
Application Number:	09834785
International Application Number:	
Confirmation Number:	8392
Title of Invention:	SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS
First Named Inventor/Applicant Name:	Edward A. Hubbard
Customer Number:	86636
Filer:	Lori Ann Gordon/Casey Berger
Filer Authorized By:	Lori Ann Gordon
Attorney Docket Number:	1842-8.747BS
Receipt Date:	31-MAR-2017
Filing Date:	13-APR-2001
Time Stamp:	13:51:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		3059730000GPOA.PDF	2528951 9e7472bb57fc88c638736df13655769fbfc0ac9d	yes	5

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Power of Attorney	2	2
	Assignee showing of ownership per 37 CFR 3.73	3	4
	Change of Address	5	5
Warnings:			
Information:			
	Total Files Size (in bytes):	2528951	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

LORI A. GORDON
DIRECTOR
(202) 772-8862
LGORDON@SKGF.COM

Sterne Kessler Goldstein Fox
ATTORNEYS AT LAW

March 31, 2017

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Confirmation No. 8392
Art Unit 2457

Re: U.S. Patent No. 8,275,827; Issue Date: September 25, 2012
(from U.S. Appl. No. 09/834,785, filed April 13, 2001)
For: **SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS**
Inventor: Edward A. Hubbard
Our Ref: 3059.730000G

Commissioner:

Transmitted herewith for appropriate action are the following documents:

1. Power of Attorney to Prosecute Applications Before the USPTO (PTO/SB/80);
2. Statement Under 37 C.F.R. 3.73(b) (PTO/SB/96); and
3. Fee Address Indication Form (PTO/SB/47).

The above-listed documents are filed electronically through EFS-Web.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency or credit any overpayment to our Deposit Account No. 19-0036.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

Lori A. Gordon
Attorney for Patent Owner
Registration No. 50,633

LAG/cmb
Enclosures

5149550_1

IPR2025-00716
DATABRICKS EX1002 Page 984

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	1842-8.747BS

CONFIRMATION NO. 8392

POWER OF ATTORNEY NOTICE

86636
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

OC00000090355743

Date Mailed: 04/03/2017

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/31/2017.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/tmwilliams/

IPR2025-00716
DATABRICKS EX1002 Page 985

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
09/834,785	04/13/2001	Edward A. Hubbard	1842-8.747BS

CONFIRMATION NO. 8392

26111
STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.
1100 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

POA ACCEPTANCE LETTER

OC00000090355744

Date Mailed: 04/03/2017

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/31/2017.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/tmwilliams/

IPR2025-00716
DATABRICKS EX1002 Page 986

Trials@uspto.gov
571.272.7822

Paper No. 11
Filed: July 26, 2017

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EMC CORPORATION, LENOVO (UNITED STATES) INC.,
NETAPP, INC.,
Petitioner,

v.

INTELLECTUAL VENTURES I LLC,
Patent Owner.

Case IPR2017-00374
Patent 8,275,827

Before GEORGIANNA W. BRADEN, DANIEL J. GALLIGAN, and KRISTI L. R. SAWERT, *Administrative Patent Judges*.

BRADEN, *Administrative Patent Judge.*

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

A. Background

EMC Corporation, Lenovo (United States) Inc., and NetApp, Inc. ("Petitioner") filed a Petition (Paper 5, "Pet.") to institute an *inter partes* review of claims 1, 3–9, 13, and 15–21 of U.S. Patent No. 8,275,827 (Ex. 1001, "the '827 patent"). Intellectual Ventures I LLC ("Patent Owner") timely filed a Preliminary Response (Paper 9, "Prelim. Resp."). We have authority under 35 U.S.C. § 314 and 37 C.F.R § 42.4(a), where section 314(a) provides that an *inter partes* review may not be instituted "unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." *See* 37 C.F.R § 42.4(a) (delegating authority to institute trial to the Board).

Upon consideration of the Petition, Petitioner's cited evidence, and Patent Owner's Preliminary Response, we conclude Petitioner has established a reasonable likelihood it would prevail with respect to at least one of the challenged claims. Accordingly, for the reasons that follow, we institute an *inter partes* review.

B. Related Proceedings

The parties inform us that the challenged patent is the subject of two district court proceedings in the District of Massachusetts, captioned *Intellectual Ventures I LLC et al. v. Lenovo Group Ltd.* (1:16-cv-10860-IT) and *Intellectual Ventures I, LLC et al. v. NetApp, Inc.* (1:16-cv-10868-IT). Pet. 2; Paper 7, 1 (Patent Owner's Mandatory Notices).

C. The '827 Patent

The '827 patent was filed on April 13, 2001, and is titled "Software-Based Network Attached Storage Services Hosted on Massively Distributed

Parallel Computing Networks." Ex. 1001, Title. It describes systems and methods for software-based network attached storage (NAS) services hosted on a massively-distributed network of devices. *Id.* at Abstract. The '827 patent discloses that the term "NAS device" generally refers to "a specialized file server that connects to the network to provide storage capacity to network-connected users" (*id.* at 2:18–20), and, in the context of the '827 patent, "broadly refers to a device that makes data storage resources available to network-connected user devices" (*id.* at 2:31–34). The '827 patent further discloses that a NAS device typically takes the form of a standalone dedicated hardware device that contains its "own storage, processing, connectivity, and management resources." *Id.* at 2:12–14. According to the '827 patent, ordinary desktop computers often sit idle for long periods of time, but have the same specifications (e.g., a Pentium processor, a hard drive, and an Ethernet connection) and often greater functional capabilities than dedicated NAS devices. *Id.* at 2:46–55. The '827 patent proposes making these otherwise unused storage resources available to other devices connected to the network. *Id.* at 2:66–3:1, 42:36–41.

In one embodiment, the '827 patent describes a distributed NAS system, shown in Figure 21 reproduced below, that includes user devices 152 and NAS client devices 108. *Id.* at 43:6–15.

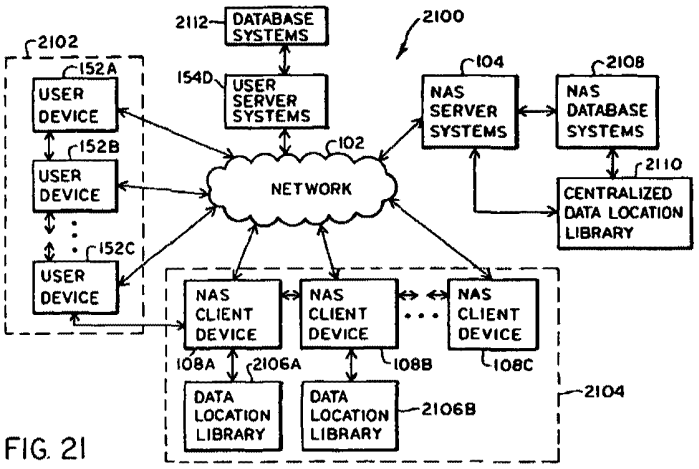


FIG. 21

Figure 21 provides a block diagram for an embodiment for a distributed processing system that provides network attached storage (NAS) services. Ex. 1001, 42:29–31.

As illustrated above in Figure 21 of the '827 patent, the server systems may include user server systems 154D, which have attached database systems 2112 and NAS server systems 104 with attached NAS database systems 2108 and centralized data location library 2110. Ex. 1001, 43:22–26. To provide NAS functionality, the '827 patent describes client devices 108A, 108B . . . 108C as running a client agent that provides NAS functionality by running a NAS component as one of the projects for the distributed device. *Id.* at 43:26–30. According to the '827 patent, some of these NAS devices, such as NAS client devices 108A and 108B may store distributed data location information, such as data location libraries 2106A and 2106B. *Id.* at 43:30–33.

The '827 patent discloses that the NAS client devices within client device fabric 2104 can act as stand-alone NAS devices and user devices within user device fabric 2102 can directly access them as such. *Id.* at 43:44–46. Additionally, at least some of the NAS client devices within

client device fabric 2104 include data location information or libraries that are used to provide links or directions to data distributed on various NAS client devices 108A, 108B, . . . 108C. *Id.* at 43:59–63. These links help provide a NAS device fabric from which user server systems 154D and user devices 152A, 152B, . . . 152C within user device fabric 2102 can draw storage resources. *Id.* at 43:63–66.

The '827 patent also contemplates that server systems 104 facilitate the NAS functionality, for example, by providing centralized management, control, and support for the NAS architecture. *Id.* at 44:24–27. According to the '827 patent, NAS servers systems 104 may include, for example, file storage database systems 2108 and centralized data location library 2110. *Id.* at 44:27–29. Additionally, the '827 patent discloses that the user devices, which can be any type of computer devices, are configured to access data stored on the NAS client devices. *Id.* at 44:60–64.

D. Illustrative Claims

As noted above, Petitioner challenges claims 1, 3–9, 13, and 15–21 with claims 1 and 13 being independent. Claims 1 and 13 are illustrative of the challenged claims and are reproduced below:

1. A computer-implemented method comprising:

configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system,

wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-

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utilized storage resources in selected distributed devices of the plurality of distributed devices;

representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices;

processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network; and

enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the respective client agents for the particular distributed device.

Ex. 1001, 46:28–56.

13. A system comprising:

a plurality of distributed devices configured to be coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of workloads for the distributed processing system, the respective client agents including respective instances of a software-based network attached storage (NAS) component, wherein the NAS component is configured to:

assess unused storage resources of the distributed devices;

allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices;

represent that the selected distributed devices comprise respective NAS devices having the respective available amounts of storage resources;

> process workloads associated with data storage and access by accessing data from and storing data into portions of the storage resources in the selected distributed devices to provide NAS service to a client device: and
>
> wherein the respective client agents are configured to enable at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

Id. at 47:28–48:7.

E. The Evidence of Record

Petitioner relies upon the following references, as well as the Declaration of John D. Kubiatowicz, Ph.D. (Ex. 1002):

Reference	Patent or Publication	Date	Exhibit
OceanStore	Kubiatowicz, John et al., "OceanStore: An Architecture for Global-Scale Persistent Storage," ASPLOS-IX proceedings: Ninth International Conference on Architectural Support for Programming Languages and Operating Systems, Cambridge, Mass., pages 190–201	Nov. 12–15, 2000	1003
Condor	Litzkow, M.J., et al., "Condor – A Hunter of Idle Workstations," Computer Sciences Technical Report #730	December 1987	1017

F. The Asserted Grounds of Unpatentability

Petitioner challenges the patentability of claims 1, 3–9, 13, and 15–21 of the '827 patent based on the following grounds (Pet. 3, 19, 47, 48):

Reference(s)	Basis	Claims Challenged
OceanStore	§ 102(a)	1, 3–9, 13, and 15–21
OceanStore	§ 103(a)	1, 3–9, 13, and 15–21

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Reference(s)	Basis	Claims Challenged
OceanStore and Condor	§ 103(a)	4, 6, 7, 16, 18, and 19

II. DISCUSSION

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) ("We conclude that the regulation represents a reasonable exercise of the rulemaking authority that Congress delegated to the Patent Office."). Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An inventor, however, may provide a meaning for a term that is different from its ordinary meaning by defining the term in the specification with "reasonable clarity, deliberateness, and precision." *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Limitations, however, are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). In addition, the Board may not "construe claims during [an *inter partes* review] so broadly that its constructions are unreasonable under general claim construction principles." *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015).

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For purposes of this Decision and based on the record before us, we need not provide express constructions for any claim terms at this stage of the proceeding.

B. Principles of Law

A claim is unpatentable under 35 U.S.C. § 102 if a prior art reference discloses every limitation of the claimed invention, either explicitly or inherently. *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047 (Fed. Cir. 1995). If the prior art reference does not expressly set forth a particular element of the claim, that reference still may anticipate if that element is "inherent" in its disclosure. *In re Robertson*, 169 F.3d 743 (Fed. Cir. 1999). To establish inherency, extrinsic evidence, when relied upon, "must make clear that the missing descriptive matter is necessarily present," or inherent, in the single anticipating reference. *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991). "Inherency, however, may not be established by *probabilities* or *possibilities*. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Id.* at 1269 (quoting *In re Oelrich*, 666 F.2d 578, 581 (CCPA 1981)). Inherent anticipation, however, does not require recognition in the prior art. *Schering Corp. v. Geneva Pharmaceuticals*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) ("*Continental Can* does not stand for the proposition that an inherent feature of a prior art reference must be perceived as such by a person of ordinary skill in the art before the critical date.").

A claim is unpatentable under 35 U.S.C. § 103(a) if "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said

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subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966).

"[I]t is error to reach a conclusion of obviousness until all [the *Graham*] factors are considered." *Apple v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc) (citations omitted). "This requirement is in recognition of the fact that each of the *Graham* factors helps inform the ultimate obviousness determination." *Id.*

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing "mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Thus, to prevail in an *inter partes* review, Petitioner must explain how the proposed combinations of prior art would have rendered the challenged claims unpatentable. At this preliminary stage, we determine whether the

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information presented in the Petition shows there is a reasonable likelihood that Petitioner would prevail in establishing that one of the challenged claims was anticipated by the cited prior art or would have been obvious over the proposed combinations of prior art.

We analyze the challenges presented in the Petition in accordance with the above-stated principles.

C. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. "The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991).

Petitioner argues that a person of ordinary skill in the art relevant to the '827 patent would have had "at least a bachelor's degree in computer science or electrical engineering and 3–5 years of professional experience in computer systems design, or a master's or doctorate and 1–2 years of professional experience in computer systems design, or equivalent academic experience." Pet. 4. According to Petitioner, "[s]uch a person would have been familiar with computer systems architecture and design, and would have been aware of design trends relating to distributed processing systems." *Id.* Petitioner's Declarant, John D. Kubiatowicz, Ph.D. ("Dr. Kubiatowicz"), proffers the same level of skill as that argued by Petitioner. Ex. 1002 ¶ 20.

At this stage of the proceeding, Patent Owner does not contest Petitioner's definition of a person of ordinary skill in the art. *See generally* Prelim. Resp.

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Based on our review of the '827 patent, the types of problems and solutions described in the '827 patent and cited prior art, and the testimony of Dr. Kubiatowicz, for purposes of this Decision, we adopt and apply Petitioner's definition of a person of ordinary skill in the art, specifically that a person of ordinary skill in the art at the time of the claimed invention would have had "at least a bachelor's degree in computer science or electrical engineering and 3–5 years of professional experience in computer systems design, or a master's or doctorate and 1–2 years of professional experience in computer systems design, or equivalent academic experience."

D. Alleged Anticipation of Claims 1, 3–9, 13, and 15–21 of the '827 Patent in View of OceanStore

Petitioner contends claims 1, 3–9, 13, and 15–21 of the '827 patent are unpatentable under 35 U.S.C. § 102(a) in view of OceanStore. Pet. 19–47. Patent Owner disputes Petitioner's contentions. Prelim. Resp. 7–32. For reasons that follow, we determine Petitioner has not demonstrated a reasonable likelihood of prevailing on its anticipation challenge as to the challenged claims.

1. Overview of OceanStore

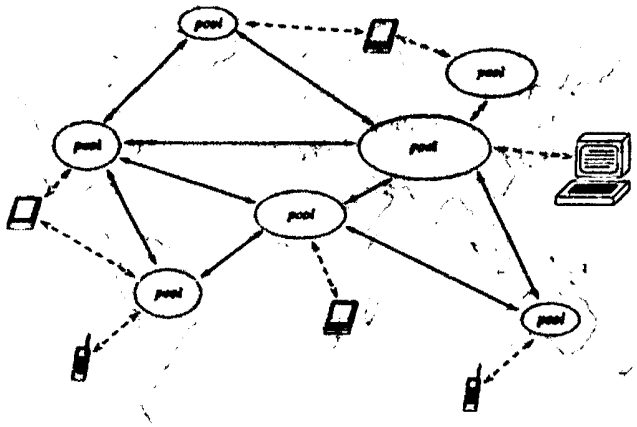
OceanStore is an article titled "OceanStore: An Architecture for Global-Scale Persistent Storage." Ex. 1003, Title. OceanStore is directed to "a utility infrastructure designed to span the globe and provide continuous access to persistent information." *Id.* at Abstract. OceanStore discloses that for improved performance, "data is allowed to be cached anywhere, anytime." *Id.* According to OceanStore, "information must be divorced from location." *Id.* at 190 (emphases removed). Specifically, OceanStore

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sought to accomplish these goals by taking advantage of the excess, or unused, storage resources on desktop workstations and the like:

> In a time when desktop workstations routinely ship with tens of gigabytes of spinning storage, the management of data is far more expensive than the storage media. OceanStore hopes to take advantage of this excess of storage space to make the management of data seamless and carefree.

Id. at 191. In OceanStore, computers that store data are referred to as "nodes" or "servers." *Id.* at 191. Computers that access data are referred to as "clients." *Id.* A data unit in OceanStore is referred to as a "persistent object." Ex. 1003, 191. Each "persistent object" is named by a globally unique identifier (GUID). *Id.* OceanStore clients access data by connecting to one or more "pools" of nodes. *Id.* An OceanStore "pool" is a number of OceanStore nodes grouped together. *Id.* One embodiment disclosed in OceanStore is shown in Figure 1, reproduced below.



> Figure 1 depicts the OceanStore system, made up of pools connected to each another. OceanStore 191.

As shown in Figure 1, above, the pools are also connected to each other, which allows data to "flow freely" between the pools. *Id.*

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OceanStore indicates its system uses two different algorithms for locating data across its distributed network of nodes. The first method, is "a fast probabilistic algorithm" that uses "attenuated bloom filters." *Id.* at 193. The second method, is a "slower, reliable hierarchical method" (*id.*) that uses a "randomized hierarchical distributed data structure" (*id.* at 194). At a high-level, both algorithms work similarly. *Id.* Each node contains routing information, and routing of messages happens in two stages. *Id.* When a client needs to access data, the client sends a message to a node specifying the object it wishes to access via its GUID. *Id.* In the first stage, each node, based on its routing table, routes the message, until it finally reaches the node that actually stores the requested object. Ex. 1003, 194. In the second stage, after the node that has the requested object is identified, messages can be directly sent to that node without having to route through the other nodes. *Id.* at 193.

2. *Analysis of Cited Art as Applied to Independent Claims 1 and 13*

a. Preamble to Claims 1 and 13

Preamble language that merely states the purpose or intended use of an invention generally is not treated as limiting the scope of a claim. *See Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1345 (Fed. Cir. 2003); *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997). When the limitations in the body of the claim rely upon or derive essential structure from the preamble, however, then the preamble acts as a necessary component of the claimed invention and is limiting. *See Eaton Corp. v. Rockwell Int'l Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003).

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The preamble of claim 1 recites a "computer-implemented method comprising," and the preamble of claim 13 recites a "system comprising." Ex. 1001, 46:28, 47:28. Petitioner first contends the preamble of claim 1 does not limit the claim under the claim's broadest reasonable interpretation. Petitioner then contends that nonetheless, OceanStore teaches a "computer-implemented method" as required by claim 1 and is a system as required by claim 13. Pet. 27 (citing Ex. 1002 ¶ 94), 44–45 (citing Ex. 1002 ¶ 135). Petitioner specifically points out that OceanStore software is used on the servers (or pools) in the network depicted in Figure 1. *Id.* (Ex. 1003, 191; Ex. 1002 ¶ 95).

Patent Owner does not address the preambles of independent claims 1 and 13. *See generally* Prelim. Resp. The burden remains, however, on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

At this stage of the proceeding and based on the record before us, we agree with Petitioner that OceanStore discloses a "computer implemented method" and is a system. *See* Ex. 1003, 191; Ex. 1002 ¶ 95.

> *b. "configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system" (claim 1)*

Petitioner contends OceanStore teaches this limitation as recited by claim 1 with similar language recited in claim 13. Pet. 27 (citing Ex. 1002 ¶ 96), 45 (citing Ex. 1002 ¶ 136). According to Petitioner, OceanStore describes a widely-distributed network of devices including desktop workstations and servers with excess storage space to provide a "utility

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infrastructure designed to span the globe." *Id.* (citing Ex. 1003, Abstract, 190–191, Fig. 1; Ex. 1002 ¶ 96). Petitioner then argues that the software in OceanStore would be considered an "agent" running on the networked, distributed devices. *Id.* at 27–28.

Petitioner relies on the testimony of its declarant, Dr. Kubiatowicz, to support its position. Dr. Kubiatowicz testifies that, as described in the '827 patent, a "client agent" includes core agent 1502, project component 1504, and user interface component 1510, and that each component provides a function. Ex. 1002 ¶¶ 29–31 (citing Ex. 1001, 33:19–21, 41:54–57, 42:5–7, 42:18–28), ¶¶ 96–96.

Patent Owner does not address this limitation of independent claims 1 and 13, but the burden remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

At this stage of the proceeding and based on the record before us, we are satisfied that Petitioner has shown adequately that OceanStore discloses "configuring a distributed processing system of a plurality of distributed devices coupled to a network, whercin the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system" as recited in claim 1 and similarly recited in claim 13.

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c. *"wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices" (claim 1)*

Petitioner contends OceanStore discloses this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 29 (citing Ex. 1002 ¶ 100), 45 (citing Ex. 1002 ¶ 137). Petitioner argues that "a person of ordinary skill in the art would appreciate that the various server functionality discussed in OceanStore would be implemented by software." *Id.* (citing Ex. 1002 ¶ 100). In particular, Petitioner argues that "a person of skill in the art would appreciate that an OceanStore software-based component would assess the unused, i.e., excess, storage resources of the device (e.g., desktop workstation with excess storage space) when making this excess storage available for use by other devices on the network, as depicted in Figure 1." Pet. 30 (citing Ex. 1002 ¶ 101; Ex. 1003, 190–191).

Patent Owner contests Petitioner's position. Prelim. Resp. 18–21. Patent Owner specifically argues that Petitioner's reliance on "a single, aspirational sentence" from OceanStore to show the disclosure of the claim limitation is insufficient. According to Patent Owner, the sentence "OceanStore hopes to take advantage of this excess of storage space to make the management of data seamless and carefree" does not disclose expressly that OceanStore "assess[es] unused or under-utilized storage resources" as required by claim 1 and 13. *Id.* at 19 (citing Pet. 30; Ex. 1003, 191). Patent Owner argues that neither Petitioner nor Dr. Kubiatowicz demonstrate that OceanStore necessarily assesses the unused or under-utilized resources of a

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device, and the fact that OceanStore may assess resources is not sufficient to establish inherency. *Id.* (citing *Continental Can*, 948 F.2d at 1268–69 ("The mere fact that a certain thing may result from a given set of circumstances is not sufficient.")).

We agree with Patent Owner. Based on the record before us, we are not satisfied that Petitioner has shown adequately for an anticipation challenge that OceanStore discloses "wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices" as recited in claim 1 and similarly recited in claim 13. Although it appears OceanStore discloses distributed routing in order to find and fulfill a request for an entity with a GUID (global unique identifier) (*see* Ex. 1003, 193), there does not appear to be an explicit disclosure that any software-based network attached storage (NAS) component on a distributed device assesses unused or under-utilized storage resources in selected distributed devices. Nor does Petitioner adequately explain how such an assessment would be inherent in the disclosure of OceanStore.

We note that Petitioner cites to the prosecution history of the '827 patent while making arguments regarding a potential claim construction. *See* Pet. 12 n2. Although the '827 patent prosecution history states that its "client agent programs must be capable of assessing what capabilities are spare and/or unused (unused or under-utilized)" (Ex. 1015, 8), such a statement by the patent applicant does not relieve Petitioner of its burden to

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point out where such a feature is found in the prior art reference that forms the basis of its anticipation challenge.

Accordingly, we do not find Petitioner has shown a reasonable likelihood of prevailing as to this limitation in claims 1 and 13.

> *d. "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices" (claim 1)*

Petitioner contends OceanStore discloses this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 31 (citing Ex. 1002 ¶ 102), 45 (citing Ex. 1002 ¶ 138). Petitioner argues that "Ocean Store software causes the pool devices (e.g., desktop workstation with excess storage space, servers, and/or other pool devices) to represent, or mimic, dedicated NAS devices." *Id.* (citing Ex. 1002 ¶ 102). Petitioner relies on the declaration of Dr. Kubiatowicz, who testifies that that the '827 patent provides scant detail as to what is meant by the "representing" requirement of the claim and further testifies that "a person of skill in the art would appreciate the OceanStore software causes the pool devices to appear as 'a device that makes data storage resources available to network-connected user devices' as depicted in Figure 1 and described throughout the document." Ex. 1002 ¶ 104 (citing Ex. 1001, 2:32–35).

Petitioner, therefore, argues that "the pool devices are made to mimic dedicated NAS devices via the use of the OceanStore software components executing on them, allowing end user[s] to request or store objects on the OceanStore pool devices (e.g., desktop workstation with excess storage

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space, servers, and/or other pool devices)." Pet. 32 (citing Ex. 1002 ¶ 104). That is, according to Petitioner, "the OceanStore software provided the functionality for the pool devices, such as desktop workstations with excess storage, to instead appear, function and act as storage servers on the network, providing storage resources to user devices connected to the network." *Id.* (citing Ex. 1002 ¶ 104). Petitioner further notes that OceanStore discloses "facades" to its API that provide "a traditional, familiar interface," including transactional database and UNIX file system interfaces. *Id.* (citing Ex. 1003, 197–198; Ex. 1001, 2:22–31; Ex. 1002 ¶ 103).

Patent Owner contests Petitioner's position. Prelim. Resp. 10–16. Patent Owner first contends that the NAS component must represent for each respective NAS device that it has "an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices." *Id.* at 10. Second, Patent Owner contends that the NAS component must "represent[] with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices." *Id.* Patent Owner argues the NAS component must represent that each distributed device includes its own NAS device. *Id.* According to Patent Owner, Petitioner fails to show that OceanStore discloses a component performing both recited representations or to cite to any express disclosure of OceanStore supporting its position. *Id.* Rather, Patent Owner argues Petitioner inappropriately relies on its expert to fill in the missing teachings of OceanStore. *Id.*

At this stage of the proceeding, we do not agree with Patent Owner's positions. First, we do not understand the claim language to require two

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representations, specifically that (1) NAS device has unused or under-utilized storage resources and (2) each distributed device includes its own NAS device. Such a position appears unduly narrow given the language of the claim because the plain language of the claim limitation appears to require only a representation that the selected distributed devices respectively comprise NAS devices where the NAS devices have unused or under-utilized storage resources.

Second, we do not agree Patent Owner's position that the NAS component must represent that each distributed device includes its own NAS device because it appears contradictory to the disclosure in the '827 patent. The '827 patent states that "a large number of desktop PCs in the enterprise (Intranet) or on the Internet can each act as a NAS device by running a client agent program and NAS component that brings its resources to the network with the appearance of a dedicated NAS device or as part of an integrated system that appears as a single or dedicated NAS device." *See* Ex. 1001, 42:59–65. Therefore, Patent Owner's argument that the NAS component must represent that each distributed device includes its own NAS device appears unduly narrow in light of the '827 patent.

Accordingly, based on the record before us, we are satisfied that Petitioner has shown adequately for purposes of this Decision that OceanStore discloses "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices" as recited in claim 1 and similarly recited in claim 13.

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e. "allocat[ing] respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices" (claim 13)

Petitioner contends OceanStore discloses the limitation "wherein the NAS component is configured to: . . . allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices; represent that the selected distributed devices comprise NAS devices having the respective available amounts of storage resources," as recited in claim 13. Pet. 45 (citing Ex. 1002 ¶ 138). Petitioner specifically states that "claim element 13[d] is satisfied for the same reasons as element 1[d]." *Id.*

Petitioner relies on the declaration of Dr. Kubiatowicz to support its position. *Id.* (citing Ex. 1002 ¶ 138). Dr. Kubiatowicz testifies that the reasoning for claim 1's limitation [d] applies to claim 13's limitation [d] and states that, "[d]esktop workstations with excess storage and using OceanStore software would allocate the excess storage for use by OceanStore users (*i.e.*, making it available for other devices to use) but would reserve other workstation storage for purely local use, *e.g.*, to store computer programs, local operating system and the like." Ex. 1002 ¶ 138 (citing Ex. 1002 ¶¶ 102–104). Dr. Kubiatowicz further testifies in regard to claim 1's limitation [d] that, "the OceanStore software makes the distributed devices in the 'pools' and forming the 'ocean' (including but not limited to 'desktop workstations' with excess capacity) appear to be, or mimic, NAS devices having an available amount of storage related to the unused, or excess, storage for those distributed devices." *Id.* ¶ 104. According to Dr. Kubiatowicz, "[i]t does so, by making available and providing those excess

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data storage resources to other network connected devices, and by not appearing as mere workstations acting in isolation without providing any storage resources to other users." *Id.* ¶ 104 (citing Ex. 1003, 198). Dr. Kubiatowicz, therefore, asserts that "a person of skill in the art would appreciate the OceanStore software causes the pool devices to appear as 'a device that makes data storage resources available to network-connected user devices' as depicted in Figure 1 and described throughout the document." *Id.* (citing Ex. 1001, 2:32–35).

Patent Owner contests Petitioner's position, arguing that Petitioner presents no relevant correlation between this limitation of claim 13 and claim 1's limitation reciting "wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices." Prelim. Resp. 16. According to Patent Owner, Petitioner provides no explanation as to how these claim limitations correlate nor does Petitioner provide an analysis of how the "representing . . . that the selected distributed devices . . . hav[e] an available amount of storage resources" limitation of claim 1[d] corresponds to the "allocate" limitation of claim 13. *Id.* Patent Owner argues that Dr. Kubiatowicz's testimony is conclusory and offers no explanation of how the disputed limitation is disclosed in OceanStore. *Id.* at 17.

We have reviewed Dr. Kubiatowicz's testimony and the cited portion of OceanStore. Based on what we can discern from OceanStore and the corresponding explanation from Dr. Kubiatowicz, we agree with Patent Owner that Petitioner fails to demonstrate that OceanStore explicitly or

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inherently discloses "wherein the NAS component is configured to: . . . allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices," as recited in claim 13.

f. Summary

On this record and for purposes of this Decision, we determine that Petitioner has failed to present sufficient evidence to establish a reasonable likelihood it would prevail in showing that claims 1 and 13 are anticipated under 35 U.S.C. § 102(a) based on OceanStore.

3. Analysis of Cited Art as Applied to Dependent Claims 3–9 and 15–21

Petitioner contends dependent claims 3–9 and 15–21 of the '827 patent are unpatentable under 35 U.S.C. § 102(a) in view of OceanStore. Pet. 36–44, 46. Patent Owner disputes Petitioner's contentions. Prelim. Resp. 21–32. Patent Owner specifically argues that Petitioner fails to show that OceanStore discloses (1) "utilizing a centralized server," *id.* at 21–27; (2) downloading the software-based NAS component to the selected distributed devices, *id.* at 27–28; and (3) storing, with the centralized server, location information associated with the data stored in the selected distributed devices, *id.* at 28–32).

After considering the parties' arguments and evidence, for the same reasons as discussed above in regard to independent claims 1 and 13, we determine Petitioner has failed to present sufficient evidence to establish a reasonable likelihood it would prevail in showing that dependent claims 3–9 and 15–21 are anticipated under 35 U.S.C. § 102(a) by OceanStore.

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E. Alleged Obviousness of Claims 1, 3–9, 13, and 15–21 of the '827 Patent in View of OceanStore

Petitioner contends that claims 1, 3–9, 13, and 15–21 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore. Pet. 47. Most of Petitioner's arguments for its obviousness challenge to the '827 patent appear to address potential deficiencies in OceanStore related to the "client agents" on the "distributed devices," which include "software-based network attached storage (NAS) components" recited in independent claims 1 and 13. *Id.* Petitioner also appears to rely on its OceanStore anticipation arguments for the remaining elements of its obviousness challenge. *Id.*; Prelim. Resp. 32.

Patent Owner disputes Petitioner's contentions, arguing that Petitioner provides no analysis or discussion that OceanStore would have rendered the challenged claims obvious. Prelim. Resp. 32–33. For reasons that follow, we determine Petitioner has demonstrated a reasonable likelihood of prevailing as to the challenged claims under 35 U.S.C. § 103(a).

1. Overview of OceanStore

See supra Section II.D.1.

2. Analysis of Cited Art as Applied to Independent Claims 1 and 13

a. Preamble to Claims 1 and 13

As discussed previously, at this stage of the proceeding and based on the record before us, we agree with Petitioner that OceanStore teaches a "computer-implemented method" and is a system.

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b. *"configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system"*

As discussed previously, at this stage of the proceeding and based on the record before us, we are satisfied that Petitioner has shown adequately that OceanStore teaches or suggests "configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system" as recited in claim 1 and similarly recited in claim 13.

c. *"wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices"*

Petitioner reiterates its anticipation arguments in contending that OceanStore renders obvious this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 29 (citing Ex. 1002 ¶ 100), 45 (citing Ex. 1002 ¶ 137), 47. Petitioner argues that "a person of ordinary skill in the art would appreciate that the various server functionality discussed in Ocean Store would be implemented by software." Pet. 29 (citing Ex. 1002 ¶ 100). In particular, Petitioner argues that "a person of skill in the art would appreciate that an OceanStore software-based component would assess the unused, i.e., excess, storage resources of the device (e.g., desktop workstation with excess storage space) when making this excess storage

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available for use by other devices on the network, as depicted in Figure 1." Pet. 30 (citing Ex. 1002 ¶ 101; Ex. 1003, 190–191); *see also* ¶ 155. Petitioner further cites to the prosecution history of the '827 patent to support its position that a person of ordinary skill in the art would understand that the NAS components are configured to assess unused or under-utilized storage resources because the'827 patent prosecution history states that its "client agent programs must be capable of assessing what capabilities are spare and/or unused (unused or under-utilized)." Pet. 12 n.2 (citing Ex. 1015, 8).

As discussed above, Patent Owner contests Petitioner's position with regard to its anticipation challenge (Prelim. Resp. 18–21) and argues that Petitioner provides no analysis or discussion for it obviousness challenge (*id.* at 32–33). Patent Owner specifically argues that Petitioner's reliance on "a single, aspirational sentence" from OceanStore to show the disclosure of the claim limitation is insufficient. *Id.* at 19. According to Patent Owner, the sentence "OceanStore hopes to take advantage of this excess of storage space to make the management of data seamless and carefree" does not disclose expressly that OceanStore "assess[es] unused or under-utilized storage resources" as required by claim 1 and 13. *Id.* at 19 (citing Pet. 30; Ex. 1003, 191). Patent Owner argues that "neither Petitioner nor [Dr. Kubiatowicz] demonstrate that OceanStore necessarily assesses the unused or under-utilized resources of a device" and "the fact that OceanStore may assess resources is not sufficient to establish inherency." Prelim. Resp. 19 (citing *Continental Can* , 948 F.2d at 1268–69 ("The mere fact that a certain thing may result from a given set of circumstances is not sufficient.")).

As discussed previously, we agree with Patent Owner that OceanStore does not disclose expressly or inherently "assess[ing] unused or under-utilized storage resources" as required by claim 1 and 13. We are satisfied, however, for purposes of institution that Petitioner has demonstrated adequately that the teachings of OceanStore would have rendered the claim limitations obvious to a person of ordinary skill in the art. Specifically, at this stage of the proceeding and on this record, we are persuaded by Petitioner's argument, as supported by Dr. Kubiatowicz's declaration, that "a person of skill in the art would appreciate that an OceanStore software-based component would assess the unused, i.e., excess, storage resources of the device (e.g., desktop workstation with excess storage space) when making this excess storage available for use by other devices on the network, as depicted in Figure 1." *See* Pet. 30; Ex. 1002 ¶ 101 (citing Ex. 1003, 190–191), ¶ 155. Put differently, although the disclosure is not express or inherent, OceanStore appears to at least suggest an assessment to an ordinarily skilled artisan based on Dr. Kubiatowicz's testimony. Accordingly, we find Petitioner has shown a reasonable likelihood of prevailing as to this limitation in claims 1 and 13.

> *d. "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices" (claim 1)*

Petitioner reiterates its contentions that OceanStore discloses this limitation as recited in claim 1 and similarly recited in claim 13. Pet. 31 (citing Ex. 1002 ¶ 102), 45 (citing Ex. 1002 ¶ 138), 47.

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Patent Owner again contests Petitioner's position. Prelim. Resp. 10–16, 32–33.

As discussed previously in Section II.D.2.d, we are satisfied that Petitioner has shown adequately for purposes of this Decision that OceanStore teaches or suggests "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices" as recited in claim 1 and similarly recited in claim 13.

e. "allocat[ing] respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices" (claim 13)

Petitioner reiterates its contentions that OceanStore discloses the limitation "wherein the NAS component is configured to: . . . allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices; represent that the selected distributed devices comprise NAS devices having the respective available amounts of storage resources" as recited in claim 13. Pet. 45 (citing Ex. 1002 ¶ 138), 47. Petitioner specifically states that "claim element 13[d] is satisfied for the same reasons as element 1[d]." *Id.* at 45.

Patent Owner again contests Petitioner's position, arguing that Petitioner has failed to show a relevant correlation between this limitation of claim 13 and claim 1's limitation reciting "wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS)

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components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices." Prelim. Resp. 16, 32–33.

We have reviewed Dr. Kubiatowicz's testimony and the cited portion of OceanStore. Crediting the testimony of Dr. Kubiatowicz, a discussed previously in Section II.D.2.e., we are satisfied at this stage of the proceeding that a person of ordinary skill in the art would have understood OceanStore as teaching or at least suggesting "wherein the NAS component is configured to: . . . allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices," as recited in claim 13.

f. Summary

On this record and for purposes of this Decision, we determine Petitioner has presented sufficient evidence to establish a reasonable likelihood it would prevail in showing that claims 1 and 13 would have been obvious under 35 U.S.C. § 103(a) in view of OceanStore.

3. Analysis of Cited Art as Applied to Dependent Claims 3–9 and 15–21

Petitioner contends that dependent claims 3–9 and 15–21 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore. Pet. 36–44, 46, 47. Specifically, for claims 4 and 6 requiring a centralized server, Petitioner notes that OceanStore discloses installing servers at local premises to act as a local cache node for local users and to provide better performances for local users. Pet. 37–38 (citing Ex. 1002 ¶ 118). For claims 5 and 17 that require downloading the software-based NAS component to the selected distributed devices, Petitioner contends

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OceanStore meets this limitation because "OceanStore software is written as downloadable Java, and deployed to devices in the pool providing storage services." *Id.* at 41 (citing Ex. 1003, 199, 198 ("These interfaces exist as libraries or 'plugins' to existing browsers or operating systems")); Ex. 1002 ¶ 122). For claims 6 and 18 that require storing, with the centralized server, location information associated with the data stored in the selected distributed devices, Petitioner contends a person of ordinary skill in the art would appreciate that the local server from claim 4 "becomes another OceanStore server (or node) and as such would store and maintain the routing information used and discussed above in connection with data location." *Id.* at 41–42 (citing Ex. 1002 ¶ 124).

Patent Owner disputes Petitioner's contentions. Prelim. Resp. 21–33. Patent Owner specifically argues that Petitioner fails to show that OceanStore discloses (1) "utilizing a centralized server," *id.* at 21–27; (2) downloading the software-based NAS component to the selected distributed devices, *id.* at 27–28; and (3) storing, with the centralized server, location information associated with the data stored in the selected distributed devices, *id.* at 28–32.

After considering the parties' arguments and evidence, we determine for purposes of this Decision that Petitioner has presented sufficient evidence at this stage of the proceeding to establish a reasonable likelihood it would prevail in showing that dependent claims 3–9 and 15–21 would have been obvious under 35 U.S.C. § 103(a) in view of OceanStore. *See* Ex. 1002 ¶¶ 118, 122, 124; Ex. 1003, 199, 198

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F. Alleged Obviousness of Dependent Claims 4, 6, 7, 16, 18, and 19 in view of OceanStore and Condor

Petitioner contends dependent claims 4, 6, 7, 16, 18, and 19 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore and Condor. Pet. 48–53. Patent Owner disputes Petitioner's contentions. Prelim. Resp. 33–39. For reasons that follow, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing on this ground as to the challenged claims.

1. Overview of OceanStore

See supra Section II.D.1.

2. Overview of Condor

Condor is a publication titled "Condor – A Hunter of Idle Workstations." Ex. 1017, Title. Condor is directed to a scheduling system that operates in a workstation environment. *Id.* at Abstract. Condor discloses "maximiz[ing] the utilization of workstations with as little interference as possible between the jobs it schedules and the activities of the people who own workstations." *Id.* It teaches identifying idle workstations and scheduling background jobs on them so that, when the owner of a workstation resumes activity at a station, Condor checkpoints the remote job running on the station and transfers it to another workstation. *Id.* According to Condor, the "system guarantees that the job will eventually complete, and that very little, if any, work will be performed more than once." *Id.*

Condor contemplates a "wide spectrum of scheduling structures" that use scheduling coordinators that "follow[] the principle that workstations are autonomous computing resources and they should be managed by their own

users." Ex. 1017, 4, 6. Condor states that "[t]his also helps to keep the responsibilities of the coordinator simple." *Id.* at 6. According to Condor, "[s]implicity is important so that a central site is not required to maintain a great amount of information about each workstation." *Id.* Condor contemplates that either a centralized, static coordinator could assign background jobs to execute at available remote workstations (*id.* at 4–5) or a distributed approach could be used where assignment of available processors is accomplished by each workstation cooperating to conduct a scheduling policy (*id.* at 4–5).

One embodiment disclosed in Condor is shown in Figure 1, reproduced below.

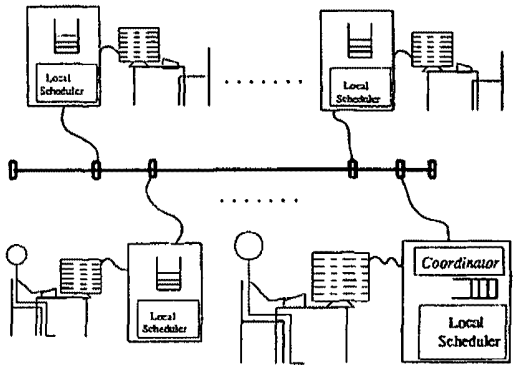


Figure 1 illustrates the Condor scheduling system.

Figure 1, above, shows one version of the Condor background job scheduler that lies between a centralized, static approach and the fully distributed approach. Condor explains that "[t]his approach uses the efficiency of scheduling with a central node to avoid the overhead of messages to decide which workstations should be allocated available capacity." *Id.* at 5. Condor discloses that its system can be extendible to a large number of workstations and eases the required recovery when a centralized coordinator

fails. *Id.* at 6–7. According to the teachings of Condor, "[l]ocal schedulers are not affected if a remote site discontinues service." *Id.* at 7. Condor discloses that "if the site on which the coordinator is executing fails, remotely executing jobs initiated and executing on other machines are not affected. Only the allocation of new capacity to requesting users is affected." *Id.* Condor explains that because "the coordinator has few duties, its recovery at another site is simplified in relation to a fully centralized strategy." *Id.* In order to balance the burden of coordination, Condor states that the central coordinator can be moved to other locations. *Id.*

3. Analysis of Cited Art as Applied to the Challenged Dependent Claims

Claim 4 depends from claim 3, and further requires "managing the NAS service for the at least one of the particular distributed devices at least in part utilizing a centralized server." Ex. 1001, 46:65–67. Claim 6 depends from claim 4, and requires the method of claim 4 to further comprise "storing, with the centralized server, location information associated with the data stored in the selected distributed devices." *Id.* at 47:4–6. Claim 7 depends from claim 6, and requires the method of claim 6 to further comprise "utilizing the centralized server to receive and route the data for storage to the selected devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database." *Id.* at 47:7–12. Dependent claims 16, 18, and 19 recite substantially similar limitations as claims 4, 6, and 7 but depend from independent claim 13. *Id.* at 48:15–29.

Petitioner contends these dependent claims would have been obvious in view of the combined teachings of OceanStore and Condor. Pet. 49

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(citing Ex. 1002 ¶ 159). In particular, for claim 4, Petitioner argues that "Condor teaches 'managing' the use of 'resources of the workstation [that] are underutilized' at least in part using a 'central coordinator.'" *Id.* (brackets in original) (citing Ex. 1017, 1, 5–6; Ex. 1002 ¶ 159). According to Petitioner, "the central coordinator is held on one of the workstations that also has its own local scheduler and background job queue." *Id.* (citing Ex. 1017, 6; Ex. 1002 ¶ 159). Petitioner argues that the central coordinator "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting." *Id.* Petitioner further argues the central coordinator knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* (citing Ex. 1017, 16; Ex. 1002 ¶ 159).

For dependent claim 6, Petitioner contends, "Condor teaches 'storing' 'location information associated with the data' stored on the distributed devices with a 'central coordinator.'" Pet. 51 (citing Ex. 1017, 1, 5–6; Ex. 1002 ¶ 164). According to Petitioner, the central coordinator "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting." *Id.* (citing Ex. 1017, 6; Ex. 1002 ¶ 164). Petitioner further argues that the central coordinator knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* (citing Ex. 1017, 16; Ex. 1002 ¶ 164). For claim 7, Petitioner argues that "Condor teaches 'utilizing' a central coordinator to 'receive and route data for storage' based upon a 'capabilities database.'" *Id.* at 52 (Ex. 1002 ¶ 167). Petitioner relies on Condor's disclosure of a central coordinator that "allocates capacity from idle workstations to local schedulers on workstations that have background jobs

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waiting," and which knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* (Ex. 1017, 6; Ex. 1002 ¶ 167).

Petitioner supports its position with the declaration of Dr. Kubiatowicz, who testifies that the challenged dependent claims would have been obvious in light of the combination of OceanStore and Condor. Ex. 1002 ¶¶ 160, 165, 168. Dr. Kubiatowicz specifically testifies that "the advantages and disadvantages of both centralized and distributed approaches to coordination and management were well known even at the time Condor was published." *Id.* ¶ 160 (citing Ex. 1017, 5 ("Both the centralized and the distributed approaches have well known advantages and disadvantages.")). Dr. Kubiatowicz specifically testifies that it would have been obvious to a person of ordinary skill in the art that both approaches have advantages that could have been exploited using well known techniques, as well as disadvantages that could have been avoided using well known techniques, just like Condor's central coordinator. Ex. 1002 ¶ 161. According to Dr. Kubiatowicz, "[i]ncorporating Condor's explicit teaching of a "central coordinator" into OceanStore would have been obvious to one of ordinary skill in the art, would have yielded predictable results, and would have involved tools and techniques that were well known at the time." *Id.* ¶ 162.

Patent Owner contests Petitioner's position, arguing that Petitioner fails to provide an adequate rationale as to why a person of skill in the art would combine an entirely distributed system from OceanStore with a centralized system from Condor, especially in light of OceanStore's criticism of centralized approaches (i.e., teaching away from using centralized servers), such as those required in claims 4 and 6. Prelim. Resp.

33–36. Patent Owner specifically argues that Petitioner provides no analysis regarding the combination of OceanStore and Condor but, rather, offers only conclusory statements that merely are reiterated by Dr. Kubiatowicz. *Id.* at 36–37.

Patent Owner bases its characterization of Condor as a centralized system on Condor's use of a "centralized, static coordinator" for tracking idle workstations and coordinating which workstations will perform specific tasks. *Id.* at 34. Yet, Condor explicitly contemplates use of a distributed coordinator for its systems. Ex. 1017, 4–5. Additionally, at this stage of the proceeding, we are unpersuaded by Patent Owner's position that OceanStore teaches away from use of centralized servers. *See* Prelim. Resp. 36. To establish teaching away, the prior art reference must criticize, discredit, or otherwise discourage the solution claimed. *See In re Fulton,* 391 F.3d 1195, 1201 (Fed. Cir. 2004). Although OceanStore emphasizes that "information must be divorced from location" and "[c]entralized servers are subject to crashes, DoS attacks, and unavailability due to regional network outages," it also states that local businesses "could install servers on their premises to give customers better performance." Ex. 1003, 190. Such disclosures do not teach away because they does not criticize, discredit, or otherwise discourage the use of local or centralized servers; instead, OceanStore appears to offer an alternative to reliance solely on centralized server systems.

We agree, however, with Patent Owner that Petitioner fails to offer sufficient explanation as to why a person of ordinary skill in the art would have combined the teachings of OceanStore and Condor. Rather, Petitioner appears to argue that, based on the advantages described by Condor (Ex.

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1017, 5), and using well-known techniques with unspecified predictable results, a person of ordinary skill in the art would have had sufficient reason to combine these disparate elements taught in the prior art references to render the challenged claims obvious. Pet. 50–53. Yet, Petitioner fails to identify what particular advantages or efficiencies would have prompted a person of ordinary skill in the art to combine Condor's scheduler with OceanStore's system.

Petitioner must articulate a *reason why* a person of ordinary skill in the art would combine the prior art references. *In re NuVasive*, 842 F.3d 1376, 1382 (Fed. 2016); *Metalcraft of Mayville, Inc. v. The Toro Company*, 848 F.3d 1358, 1366 (Fed. Cir. 2017) ("[I]t is insufficient to simply conclude the [prior art] combination would have been obvious without identifying any reason why a person of skill in the art would have made the combination."); *see Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) ("obviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention"). Conclusory statements alone, even those provided by a declarant, are inadequate to demonstrate a rationale for why a person of ordinary skill in the art would combine the teachings from prior art references. *NuVasive*, 842 F.3d at 1383. Instead, Petitioner's arguments must be supported by a "reasoned explanation." *Id.* (citing *In re Lee*, 277 F.3d 1338, 1342, 1345 (Fed. Cir. 2002)). We understand that a person of ordinary skill is a person of ordinary creativity, not an automaton, but "[w]ithout any explanation as to how or why the references would be combined to arrive at the claimed invention, we are left with only hindsight bias that *KSR* warns against." *Metalcraft*, 848

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F.3d at 1367 ("'[T]he obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation,' we also recognize that we cannot allow hindsight bias to be the thread that stitches together prior art patches into something that is the claimed invention." (quoting *KSR*, 550 U.S. at 420–21)).

Accordingly, on this record, we determine Petitioner has failed to present sufficient evidence to establish a reasonable likelihood it would prevail in showing that claims 4, 6, 7, 16, 18, and 19 would have been obvious under 35 U.S.C. § 103(a) in view of OceanStore and Condor.

III. CONCLUSION

For the foregoing reasons, we determine Petitioner has demonstrated that there is a reasonable likelihood it would prevail in establishing the unpatentability of claims 1, 3–9, 13, and 15–21 of the '827 patent.

At this stage of the proceeding, the Board has not made a final determination as to the patentability of any challenged claim.

IV. ORDER

For the reasons given, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is hereby instituted as to claims 1, 3–9, 13, and 15–21 of the '827 patent on the following asserted ground:

> Claims 1, 3–9, 13, and 15–21 under 35 U.S.C. § 103(a) as unpatentable over OceanStore.

FURTHER ORDERED that the trial is limited to the ground identified above, and no other grounds are authorized; and

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FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, the trial commencing on the entry date of this Decision.

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Paper No. 11
Filed: July 11, 2017

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EMC CORPORATION, LENOVO (UNITED STATES) INC.,
NETAPP, INC.,
Petitioner,

v.

INTELLECTUAL VENTURES I LLC,
Patent Owner.

Case IPR2017-00439
Patent 8,275,827

Before GEORGIANNA W. BRADEN, DANIEL J. GALLIGAN, and KRISTI L. R. SAWERT, *Administrative Patent Judges*.

BRADEN, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

A. Background

EMC Corporation, Lenovo (United States) Inc., and NetApp, Inc. ("Petitioner") filed a Petition (Paper 5, "Pet.") to institute an *inter partes* review of claims 1, 3–9, 13, and 15–21 of U.S. Patent No. 8,275,827 (Ex. 1101, "the '827 patent"). Intellectual Ventures I LLC ("Patent Owner") timely filed a Preliminary Response (Paper 9, "Prelim. Resp."). We have authority under 35 U.S.C. § 314 and 37 C.F.R § 42.4(a), where section 314(a) provides that an *inter partes* review may not be instituted "unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." *See* 37 C.F.R § 42.4(a) (delegating authority to institute trial to the Board).

Upon consideration of the Petition, Petitioner's cited evidence, and Patent Owner's Preliminary Response, we conclude Petitioner has established a reasonable likelihood it would prevail with respect to at least one of the challenged claims. Accordingly, for the reasons that follow, we institute an *inter partes* review.

B. Related Proceedings

The parties inform us that the challenged patent is the subject of two district court proceedings in the District of Massachusetts, captioned *Intellectual Ventures I LLC et al. v. Lenovo Group Ltd.* (1:16-cv-10860-IT) and *Intellectual Ventures I, LLC et al. v. NetApp, Inc.* (1:16-cv-10868-IT). Pet. 2; Paper 8, 1 (Patent Owner's Mandatory Notices).

C. The '827 Patent

The '827 patent was filed on April 13, 2001, and is titled "Software-Based Network Attached Storage Services Hosted on Massively Distributed

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Parallel Computing Networks." Ex. 1101, Title. It describes systems and methods for software-based network attached storage (NAS) services hosted on a massively-distributed network of devices. *Id.* at Abstract. The '827 patent discloses that the term "NAS device" generally refers to "a specialized file server that connects to the network to provide storage capacity to network-connected users," (*id.* at 2:18–20), and, in the context of the '827 patent, "broadly refers to a device that makes data storage resources available to network-connected user devices," (*id.* at 2:31–34). The '827 patent further discloses that a NAS device typically takes the form of a standalone dedicated hardware device that contains its "own storage, processing, connectivity, and management resources." *Id.* at 2:12–14. According to the '827 patent, ordinary desktop computers often sit idle for long periods of time, but have the same specifications (e.g., a Pentium processor, a hard drive, and an Ethernet connection) and often greater functional capabilities than dedicated NAS devices. *Id.* at 2:46–55. The '827 patent proposes making these otherwise unused storage resources available to other devices connected to the network. *Id.* at 2:66–3:1, 42:36–41.

In one embodiment, the '827 patent describes a distributed NAS system, shown in Figure 21 reproduced below, that includes user devices 152 and NAS client devices 108. *Id.* at 43:6–15.

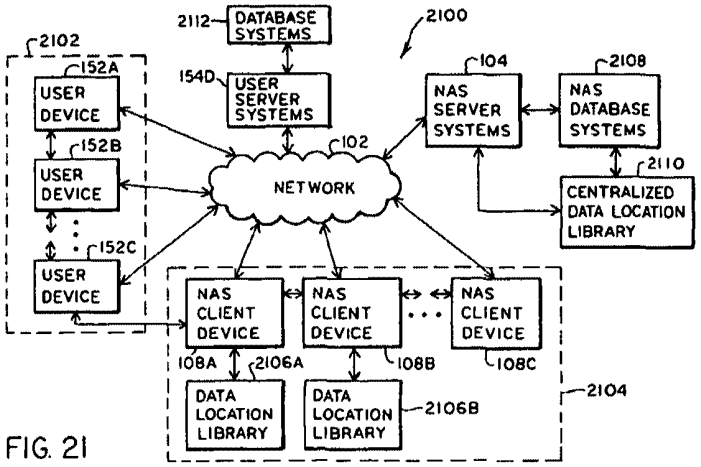


FIG. 21

As illustrated above in Figure 21 of the '827 patent, the server systems may include user server systems 154D, which have attached database systems 2112 and NAS server systems 104 with attached NAS database systems 2108 and centralized data location library 2110. Ex. 1101, 43:22–26. To provide NAS functionality, the '827 patent describes client devices 108A, 108B . . . 108C as running a client agent that provides NAS functionality by running a NAS component as one of the projects for the distributed device. *Id.* at 43:26–30. According to the '827 patent, some of these NAS devices, such as NAS client devices 108A and 108B may store distributed data location information, such as data location libraries 2106A and 2106B. *Id.* at 43:30–33.

The '827 patent discloses that the NAS client devices within client device fabric 2104 can act as stand-alone NAS devices and user devices within user device fabric 2102 can directly access them as such. *Id.* at 43:44–46. Additionally, at least some of the NAS client devices within client device fabric 2104 include data location information or libraries that are used to provide links or directions to data distributed on various NAS client devices 108A, 108B, . . . 108C. *Id.* at 43:59–63. These links help

provide a NAS device fabric from which user server systems 154D and user devices 152A, 152B, . . . 152C within user device fabric 2102 can draw storage resources. *Id.* at 43:63–66.

The '827 patent also contemplates that server systems 104 facilitate the NAS functionality, for example, by providing centralized management, control, and support for the NAS architecture. *Id.* at 44:24–27. According to the '827 patent, NAS servers systems 104 may include, for example, file storage database systems 2108 and centralized data location library 2110. *Id.* at 44:27–29. Additionally, the '827 patent discloses that the user devices, which can be any type of computer devices, are configured to access data stored on the NAS client devices. *Id.* at 44:60–64.

D. Illustrative Claims

As noted above, Petitioner challenges claims 1, 3–9, 13, and 15–21 with claims 1 and 13 being independent. Claims 1 and 13 are illustrative of the challenged claims, and are reproduced below:

1. A computer-implemented method comprising:

configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system,

wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices;

representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage

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resources related to the unused and under-utilized storage resources for the selected distributed devices;

processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network; and

enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the respective client agents for the particular distributed device.

Ex. 1101, 46:28–56.

13. A system comprising:

a plurality of distributed devices configured to be coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of workloads for the distributed processing system, the respective client agents including respective instances of a software-based network attached storage (NAS) component, wherein the NAS component is configured to:

assess unused storage resources of the distributed devices;

allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices;

represent that the selected distributed devices comprise respective NAS devices having the respective available amounts of storage resources;

process workloads associated with data storage and access by accessing data from and storing data into portions of the storage resources in the selected distributed devices to provide NAS service to a client device: and

wherein the respective client agents are configured to enable at least one of the selected distributed devices to function as

a location distributed device to store location information for data stored by the selected distributed devices.

Id. at 47:28–48:7.

E. The Evidence of Record

Petitioner relies upon the following references, as well as the Declaration of John D. Kubiatowicz, Ph.D. (Ex. 1102):

Reference	Patent or Publication	Date	Exhibit
Condor	Litzkow, M.J., et al., "Condor – A Hunter of Idle Workstations," Computer Sciences Technical Report #730	December 1987	1117
Carter	PCT Pub No. WO 98/22881 App. No. PCT/US97/21460	May 28, 1998	1140
Pitzel	US Pat. No. 7,062,765 B1	Filed: May 25, 1999 Issued: June 13, 2006	1142

F. The Asserted Grounds of Unpatentability

Petitioner challenges the patentability of claims 1, 3–9, 13, and 15–21 of the '827 patent based on the following grounds (Pet. 18, 55, 59):

Reference(s)	Basis	Claims Challenged
Carter	§ 102(b)	1, 3, 4, 6, 8, 9, 13, 15, 16, 18, 20, and 21
Carter and Pitzel	§ 103(a)	5 and 17
Carter and Condor	§ 103(a)	4, 6, 7, 16, 18, and 19

II. DISCUSSION

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see*

Cuozzo Speed Techs., LLC v. Lee, 136 S. Ct. 2131, 2144–46 (2016) ("We conclude that the regulation represents a reasonable exercise of the rulemaking authority that Congress delegated to the Patent Office."). Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An inventor, however, may provide a meaning for a term that is different from its ordinary meaning by defining the term in the specification with "reasonable clarity, deliberateness, and precision." *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Limitations, however, are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). In addition, the Board may not "construe claims during [an *inter partes* review] so broadly that its constructions are *unreasonable* under general claim construction principles." *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015).

For purposes of this Decision and based on the record before us, we need not provide express constructions for any claim terms at this stage of the proceeding.

B. Principles of Law

A claim is unpatentable under 35 U.S.C. § 102 if a prior art reference discloses every limitation of the claimed invention, either explicitly or inherently. *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047 (Fed. Cir. 1995). If the prior art reference does not expressly set forth a particular element of the claim, that reference still may anticipate if that element is "inherent" in its disclosure. *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir.

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1999). To establish inherency, extrinsic evidence, when relied upon, "must make clear that the missing descriptive matter is necessarily present," or inherent, in the single anticipating reference. *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991). "Inherency, however, may not be established by *probabilities* or *possibilities*. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Id.* at 1269 (first and second emphasis added) (quoting *In re Oelrich*, 666 F.2d 578, 581 (CCPA 1981)). Inherent anticipation, however, does not require recognition in the prior art. *Schering Corp. v. Geneva Pharmaceuticals*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) ("*Continental Can* does not stand for the proposition that an inherent feature of a prior art reference must be perceived as such by a person of ordinary skill in the art before the critical date.").

A claim is unpatentable under 35 U.S.C. § 103(a) if "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966).

"[I]t is error to reach a conclusion of obviousness until all [the *Graham*] factors are considered." *Apple v. Samsung Elecs. Co., Ltd.*, 839

F.3d 1034, 1048 (Fed. Cir. 2016) (en banc) (citations omitted). "This requirement is in recognition of the fact that each of the *Graham* factors helps inform the ultimate obviousness determination." *Id.*

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing "mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Thus, to prevail in an *inter partes* review, Petitioner must explain how the proposed combinations of prior art would have rendered the challenged claims unpatentable. At this preliminary stage, we determine whether the information presented in the Petition shows there is a reasonable likelihood that Petitioner would prevail in establishing that one of the challenged claims was anticipated by the cited prior art or would have been obvious over the proposed combinations of prior art.

We analyze the challenges presented in the Petition in accordance with the above-stated principles.

C. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art

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at the time of the invention. *Graham*, 383 U.S. at 17. "The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991).

Petitioner argues that a person of ordinary skill in the art relevant to the '827 patent would have had "at least a bachelor's degree in computer science or electrical engineering and 3–5 years of professional experience in computer systems design, or a master's or doctorate and 1–2 years of professional experience in computer systems design, or equivalent academic experience." Pet. 4–5. According to Petitioner, "[s]uch a person would have been familiar with computer systems architecture and design, and would have been aware of design trends relating to distributed processing systems." *Id.* at 5. Petitioner's Declarant, John D. Kubiatowicz, Ph.D. ("Dr. Kubiatowicz"), proffers the same level of skill as that argued by Petitioner. Ex. 1102 ¶ 20.

At this stage of the proceeding, Patent Owner does not contest Petitioner's definition of a person of ordinary skill in the art. *See generally* Prelim. Resp.

Based on our review of the '827 patent, the types of problems and solutions described in the '827 patent and cited prior art, and the testimony of Dr. Kubiatowicz, for purposes of this Decision we adopt and apply Petitioner's definition of a person of ordinary skill in the art, specifically that a person of ordinary skill in the art at the time of the claimed invention would have had "at least a bachelor's degree in computer science or electrical engineering and 3–5 years of professional experience in computer

systems design, or a master's or doctorate and 1–2 years of professional experience in computer systems design, or equivalent academic experience."

D. Alleged Anticipation of Claims 1, 3, 4, 6, 8, 9, 13, 15, 16, 18, 20, and 21 of the '827 Patent in View of Carter

Petitioner contends claims 1, 3, 4, 6, 8, 9, 13, 15, 16, 18, 20, and 21 of the '827 patent are unpatentable under 35 U.S.C. § 102(b) in view of Carter. Pet. 18–55. Patent Owner disputes Petitioner's contentions. Prelim. Resp. 7–28. For reasons that follow, we determine Petitioner has demonstrated a reasonable likelihood of prevailing on its anticipation challenge as to the challenged claims.

1. Overview of Carter

Carter is a PCT publication titled "Remote Access in a Globally Addressable Storage Environment." Ex. 1140, Title. Carter is directed to "a globally addressable storage environment that allows a plurality of networked computers to access data by addressing even when the data is stored on a persistent storage device such as a computer hard disk and other traditionally non-addressable data storage devices." *Id.* at Abstract. Carter discloses that "computers can be located on a single computer network or on a plurality of interconnected computer networks such as two local area networks (LANs) coupled by a wide area network (WAN)." *Id.* According to Carter, "[t]he globally addressable storage environment allows data to be accessed and shared by and among the various computers on the plurality of networks." *Id.* Additionally, Carter discloses that at least one of the computers can be located remote from the network and coupled thereto by a communications adapter such as a modem. *Id.* at 5:26–28. Carter further contemplates that "[t]he globally addressable data storage system preferably replicates and/or migrates data stored in the persistent data storage device

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among two or more of the computers based on, for example, accesses by the computers of the globally addressable data storage system to obtain data stored in the persistent data storage device." *Id.* at 5:28–6:2.

In Carter, computer groups are referred to as "nodes" and each of the nodes runs a software program that accesses and manages a structured store of data that is stored in an addressable shared memory space. *Id.* at 9:14–17. "The structured store of data may be stored in an addressable shared memory or the structured store may be stored in a more traditional fashion. For example, each node may be responsible for storing a particular element or elements of the structured store of data." Ex. 1140, 9:17–19. One embodiment disclosed in Carter is shown in Figure 1, reproduced below.

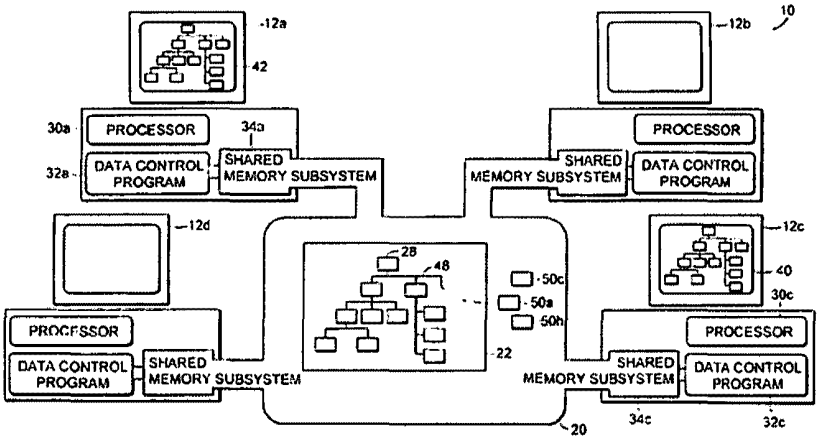
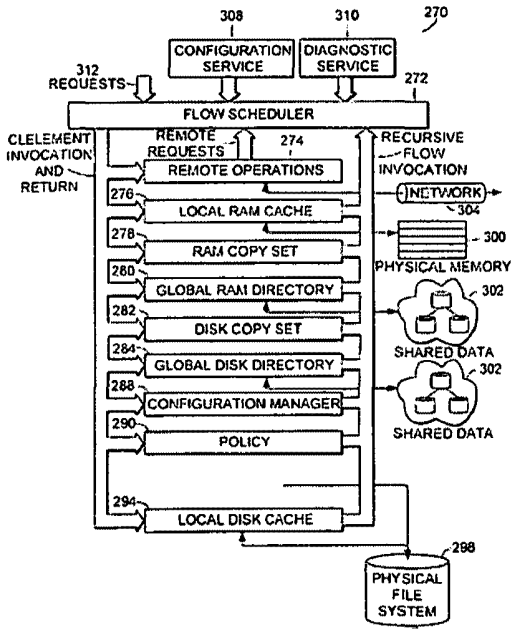


Figure 1, above, illustrates a block diagram of a distributed addressable share memory structured data storage system. *Id.* at 8:5–6. Carter discloses that network system 10 includes a plurality of network nodes 12a–12d and addressable shared memory space 20 that has portion 22 for storing a structured store of data 28. *Id.* at 10:6–8. According to Carter, each of nodes 12a–12d can include several sub-elements, such as processor 30a, data control program 32a, and shared memory subsystem 34a. *Id.* at 10:8–9. For

the embodiment shown above in Figure 1, "two of the nodes, 12a and 12c, include monitors that provide displays 40 and 42 graphically depicting the structured store of data 28 within addressable shared memory space 20." *Id.* at 10:10–12. Carter discloses that addressable shared memory space 20 interconnects each of network nodes 12a–12d and provides each node 12a–12d with access to the structured store of data 28 contained within addressable shared memory space 20. *Id.* at 10:12–14. Carter contemplates that system 10 can provide, among other things, each network node 12a–12d with shared control over the structured store of data 28 and, therefore, system 10 can distribute control of the data store across the nodes of the network. Ex. 1140, 10:15–17. To this end, Carter states that each node of system 10, such as node 12a, includes data control program 32a that interfaces to shared memory subsystem 34a. *Id.* at 10:17–18.

Carter discloses that its shared memory subsystem is a software module that can couple between an operating system ("OS") and a virtual shared memory and can form an interface between the OS and the virtual shared memory. *Id.* at 28:27–30. This allows the OS to access the virtual shared memory. *Id.* One embodiment of Carter's shared memory subsystem is shown in Figure 8, reproduced below.

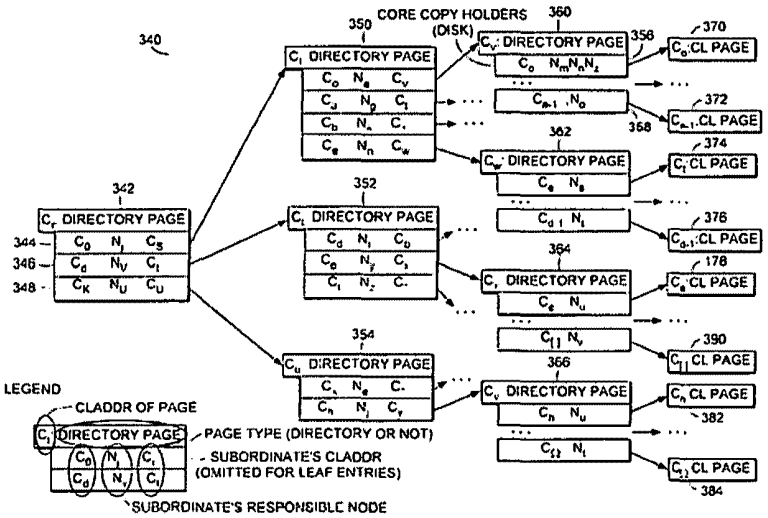
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As shown in Figure 8, above, shared memory subsystem 270 includes remote operations element 274, local random access memory ("RAM") cache 276, global RAM directory 280, global disk directory 284, configuration manager 288, policy element 290, local disk cache 294, physical memory 300, OS 216, and memory access request 312. Ex. 1140, 34:28–35:4. Carter discloses that "policy element 290 . . . can be a software module that acts as a controller to determine the availability of resources, such as printer capabilities, hard-disk space, available RAM and other such resources." *Id.* at 36:27–29. Carter also states that policy controller 290 "can employ any of the suitable heuristics to direct the elements, such as the paging controller, disk directory manager, and other elements to dynamically distribute the available resources." *Id.* at 36:29–37:2.

Carter indicates its system can provide nodes with access to distributed memory space by using the coordinated operation of a directory manager. *Id.* at 37:27–29. According to Carter, a directory manager can provide a directory structure that indexes the shared address space. *Id.* at

38:3–4. Figure 10, reproduced below, illustrates one embodiment of a directory structure disclosed in Carter.



As shown in Figure 10, above, directory 340 is formed from directory pages 342, 350–354, and 360–366, and provides location information to the pages of the distributed shared memory space depicted as pages 370–384. Ex. 1140, 39:12–15. Carter states that directory page 342 acts like a root directory page and can be located at a static address that is known to each node coupled to the distributed address space. *Id.* at 39:16–17.

2. *Analysis of Cited Art as Applied to Independent Claims 1 and 13*

a. Preamble to Claims 1 and 13

Preamble language that merely states the purpose or intended use of an invention generally is not treated as limiting the scope of a claim. *See Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1345 (Fed. Cir. 2003); *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997). When the limitations in the body of the claim rely upon or derive essential structure from the preamble, however, then the preamble acts as a

necessary component of the claimed invention and is limiting. *See Eaton Corp. v. Rockwell Int'l Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003).

The preamble of claim 1 recites a "computer-implemented method comprising," and the preamble of claim 13 recites a "system comprising." Ex. 1101, 46:28, 47:28. Petitioner first contends the preamble of claim 1 does not limit the claim under the claim's broadest reasonable interpretation. Petitioner then contends that, nonetheless, Carter discloses a "computer implemented method" as required by claim 1 and a system as required by claim 13. Pet. 32 (citing Ex. 1102 ¶ 102); 53 (citing Ex. 1102 ¶ 154).

Patent Owner does not address the preambles of independent claims 1 and 13. *See generally* Prelim. Resp. The burden remains, however, on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

At this stage of the proceeding and based on the record before us, we agree with Petitioner that Carter discloses a "computer implemented method" and a system. Ex. 1102 ¶¶ 102, 154.

> *b. "configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system" (claim 1)*

Petitioner contends Carter discloses this limitation as recited by claim 1 with similar language recited in claim 13. Pet. 33 (citing Ex. 1102 ¶ 103), 53–54 (citing Ex. 1102 ¶ 155). As noted by Petitioner, Carter is directed to "provid[ing] computer network systems that have adaptable system configurations for dynamically exploiting distributed network resources" with "a plurality of network nodes that access a memory space

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storing a structured store of data, such as a structured file system or a database." Ex. 1140, 4, 9 (cited at Pet. 33); *see also* Ex. 1102 ¶ 105). Petitioner argues that "the systems of Carter are implemented using a computer program that comprises various software components that run on each of the distributed devices in the system, including the 'shared memory subsystem' and the 'data control program' described above, as well as additional components including, among others, a 'distributor' component, a 'disk directory manager,' and a 'migration controller.' Pet. 33–34 (citing Ex. 1140, 24). Petitioner further argues that, collectively, Carter's software is a "client agent" for processing portions of a distributed workload. *Id.* at 34 (citing Ex. 1102 ¶ 107).

Petitioner relies on the testimony of its declarant, Dr. Kubiatowicz, to support its position. Dr. Kubiatowicz testifies that, storage or access workloads are processed in Carter by the "shared memory subsystem," which is a component of the client agent. Ex. 1102 ¶ 108 (citing Ex. 1140, Fig. 2). According to Dr. Kubiatowicz, "[t]he shared memory subsystems running on the distributed nodes communicate with each other over the network, and cooperate to manage the transfer and storage of data among the various physical storage devices that make up the distributed system. They serve to export storage resources to client devices over the network and are 'NAS components' . . . ." *Id.* Dr. Kubiatowicz further testifies that "[t]he shared memory subsystem is responsible for processing storage workloads generated by the distributed devices." *Id.* ¶ 109. Dr. Kubiatowicz then opines that "[a]ll of these storage and access capabilities are provided by the shared memory subsystem, which is a component of the software package described by Carter." *Id.* (citing Ex. 1140, 29).

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Patent Owner does not address this limitation of independent claims 1 and 13, but the burden remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

At this stage of the proceeding and based on the record before us, we are satisfied that Petitioner has shown adequately that Carter discloses "configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system" as recited in claim 1 and similarly recited in claim 13. *See* Ex. 1140, 4, 9, 24, 29, 34; *see also* Ex. 1102 ¶¶ 103, 105, 107–09, 155.

> c. *"wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices" (claim 1)*

Petitioner contends Carter discloses this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 37 (citing Ex. 1102 ¶ 114), 54 (citing Ex. 1102 ¶ 156). Petitioner first argues that "the shared memory subsystem is a component of the larger 'client agent' provided by Carter, which allows low-level access to a shared addressable memory. By communicating over the network with other nodes in the Carter system, the shared memory subsystem makes data storage resources available to network-connected user devices, and thus, it is a 'NAS component.'" *Id.* at 37 (citing Ex. 1140, 39–42, Figs. 7, 10, 11; Ex. 1102 ¶ 115). Petitioner then argues that the shared memory subsystem is implemented in software because it is a "software module." *Id.* at 38 (citing Ex. 1140, 28; Ex. 1102

¶ 116). Petitioner further argues that the shared memory subsystem "assesses unused or under-utilized storage resources" because Carter teaches that nodes may have an "optional private memory device 218" that

> provides the node with local storage that can be kept inaccessible to the other nodes on the network. Typically the private memory device 218 includes a RAM, or a portion of a RAM memory, for temporarily storing data and application programs and for providing the processor 214 with memory storage for executing programs. The private memory device 18 can also include persistent memory storage, typically a hard disk unit or a portion of a hard disk unit, for the persistent storage of data.

Id. (quoting Ex. 1140, 28). Petitioner, thus, asserts that "Carter teaches systems that distinguish between 'unused' storage space (*i.e.*, the storage space that is pooled to form the shared virtual address space) and 'used' storage space (*i.e.*, private storage that is reserved for the use of a particular node)." Pet. 38 (citing Ex. 1102 ¶ 117).

In addition, Petitioner argues Carter discloses this limitation because "the shared memory subsystem assesses the extent to which storage resources are being utilized and uses load balancing and resource distribution techniques to prevent underutilization." Pet. 38. In support, Petitioner relies on the declaration of Dr. Kubiatowicz, who testifies that memory subsystems 232a–232c in Carter can include a hierarchy manager that provides hierarchical control for the distribution of data, which controls load balancing and resource distribution. Ex. 1102 ¶ 118 (citing Ex. 1140, 31). Dr. Kubiatowicz further testifies that "[t]he shared memory subsystem may also include a 'policy controller [that] can employ any of the suitable heuristics to direct the elements, such as the paging controller, disk directory manager, and other elements to dynamically distribute the available

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resources'" and "is configured to 'allow portions of the distributed shared memory to move between persistent and electronic memory depending on predetermined conditions, such as recent usage.'" *Id.* (alteration in original) (emphases omitted) (quoting Ex. 1140, 30, 36–37). Therefore, Dr. Kubiatowicz opines that "the shared memory subsystem assesses the extent to which storage resources are being utilized and uses load balancing and resource distribution techniques to prevent underutilization." *Id.* (citing Ex. 1140, 30).

Patent Owner contests Petitioner's position. Prelim. Resp. 12–18. Patent Owner argues that Petitioner presents two theories with respect to the "assessing" limitation of claims 1 and 13, both of which fail. *Id.* at 12. According to Patent Owner, the theory that Carter's "private" storage performs the claimed assessment fails because the cited portion of Carter does not expressly disclose assessing unused or under-used storage resources and because there is no evidence that Carter's "shared memory system" must perform some assessment to distinguish between private storage and non-private storage. Prelim. Resp. 14. Patent Owner argues that the mere fact that Carter could perform such an assessment is not enough to establish that it inherently does so. *Id.* (citing *Continental Can*, 948 F.2d at 1268–69 ("The mere fact that a certain thing may result from a given set of circumstances is not sufficient.")). Patent Owner further argues that "any distinguishing between private or non-private storage has no bearing on whether such storage is 'used' or 'unused'" because "[t]he fact that storage is private does not mean it is 'used' and the fact that storage is non-private does not mean such storage is 'unused.'" *Id.* at 15 (citing Pet. 38).

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For Petitioner's second theory regarding Carter's resource distribution, Patent Owner argues that Petitioner fails to explain how dynamic distribution of available resources requires assessment of unused or underused storage resources. *Id.* at 17. Patent Owner further argues that distribution of resources could be done using heuristics based on any factor, not necessarily that of unused or underused storage resources. *Id.* Patent Owner, thus, contends that Petitioner has failed to show assessment is either explicitly or inherently disclosed in its second theory. *Id.*

Despite Patent Owner's arguments, at this stage of the proceeding, we are satisfied Petitioner has shown adequately that Carter's policy element 290 (a software module) is configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices. We understand policy element 290 to satisfy this limitation because Carter specifically discloses that policy element 290 "acts as a controller *to determine the availability of resources, such as* printer capabilities, *hard-disk space, available RAM and other such resources*." Ex. 1140, 36:27–29 (emphases added). Additionally, Carter states that policy controller 290 "can employ any of the suitable heuristics to direct the elements, such as the paging controller, disk directory manager, and other elements to dynamically distribute the available resources." *Id.* at 36:29–37:2. As we understand Petitioner's argument, as supported by the testimony of Dr. Kubiatowicz, policy element 290 assesses the unused or underused storage resources when it determines the availability of such resources and uses some heuristics when distributing those resources that were assessed. *See* Pet 39 (citing Ex. 1102 ¶ 118).

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Accordingly, based on the record before us, we find Petitioner has shown a reasonable likelihood of prevailing as to this limitation in claims 1 and 13.

> *d. "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices" (claim 1)*

Petitioner contends Carter discloses this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 39 (citing Ex. 1102 ¶ 119), 54 (citing Ex. 1102 ¶ 157). Petitioner argues that "the shared memory subsystem of Carter satisfies this requirement by making the aggregated, shared storage space *appear* to be 'a device that makes data storage resources available to network-connected user devices.'" *Id.* at 39 (citing Ex. 1102 ¶ 119). Petitioner argues that, "by communicating over the network with other nodes in the Carter system, the shared memory subsystem makes data storage resources available to network-connected user devices, thus providing the functionality of a NAS device." *Id.* at 39–40 (citing Ex. 1102 ¶ 120). According to Petitioner, "in providing access to data storage resources, the shared memory subsystem *appears* to be (*i.e.*, 'mimics') a NAS device, transparently providing a disk-like interface to external clients and user applications, while concealing the underlying details of the shared storage space behind a layer of abstraction." *Id.* at 40.

Petitioner relies on the declaration of Dr. Kubiatowicz, who testifies that the '827 patent provides scant detail as to what is meant by the "representing" requirement of the claim and further testifies that because Carter's "shared memory subsystem hides the details of (or 'encapsulates')

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memory management from applications running on the local node, the local node 'views' the shared storage space provided by Carter as a single large storage device, rather than the aggregated storage resources of an entire network of participating computers." Ex. 1102 ¶ 119 (citing Ex. 1101, 2:32–35), ¶ 122.

Petitioner, therefore, argues that "even though the shared addressable memory of Carter is created by pooling together unused space from each of the distributed nodes in the system, this pooled storage appears to application programs as a dedicated network-attached storage (NAS) device." Pet. 42 (citing Ex. 1102 ¶ 125). Petitioner cites to Carter's disclosure that "the total volume size" that is provided to the user is equal to the "*current aggregate storage capacity* in the addressable shared memory space 20" as support for its position. *Id.* at 43 (citing Ex. 1140, 16[1]). That is, according to Petitioner, "using the shared memory subsystem, the shared storage space of Carter is represented as a NAS device that has a capacity equal to the total aggregate capacity." *Id.*

Patent Owner contests Petitioner's position. Prelim. Resp. 18–21. Patent Owner first contends that the NAS component must represent for each respective NAS device that it has "an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices." *Id.* at 18–19 (emphasis omitted). Second, Patent Owner contends that the NAS component must "represent[] with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices." *Id.* at 19 (alteration in

[1] Although Petitioner's citation is to page 15 of Carter, the quoted material appears on page 16 of Carter.

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original). Patent Owner argues "the NAS component must represent that each distributed device includes its own NAS device." *Id.* According to Patent Owner, Petitioner fails to show that Carter discloses a component performing both recited representations. *Id.*

At this stage of the proceeding, we do not agree with Patent Owner's positions. First, we do not understand the claim language to require two representations, specifically that (1) NAS device has unused or under-utilized storage resources and (2) each distributed device includes its own NAS device. Such a position appears unduly narrow given the language of the claim because the plain language of the claim limitation appears to require only a representation that the selected distributed devices respectively comprise NAS devices where the NAS devices have unused or under-utilized storage resources.

Second, we do not agree with Patent Owner's position on this record that the NAS component must represent that each distributed device includes its own NAS device because it appears contradictory to the disclosure in the '827 patent. The '827 patent states that "a large number of desktop PCs in the enterprise (Intranet) or on the Internet can each act as a NAS device by running a client agent program and NAS component that brings its resources to the network with the appearance of a dedicated NAS device or as part of an integrated system that appears as a single or dedicated NAS device." Ex. 1101, 42:59–65. Therefore, Patent Owner's argument that the NAS component must represent that each distributed device includes its own NAS device appears unduly narrow in light of the '827 patent.

Accordingly, based on the record before us, we are satisfied that Petitioner has shown adequately for purposes of this Decision that Carter

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discloses "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices" as recited in claim 1 and similarly recited in claim 13. *See* Ex. 1140, 16; *see also* Ex. 1102, ¶¶ 119, 120, 122, 125, 157.

e. "allocat[ing] respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices" (claim 13)

Petitioner contends Carter discloses the limitation "wherein the NAS component is configured to: . . . allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices; represent that the selected distributed devices comprise respective NAS devices having the respective available amounts of storage resources," as recited in claim 13. Pet. 54 (citing Ex. 1102 ¶ 138). Petitioner specifically states that this "limitation is satisfied for the reasons given above in the context of claim 1." *Id.* (citing Pet. 37–43; Ex. 1102 ¶ 157).

Patent Owner contests Petitioner's position, arguing that Petitioner "ignores the fact that claim 13 combines two separate and distinct features—allocating respective available amount of unused storage resources and representing that the selected distributed devices comprise NAS devices." Prelim. Resp. 21. According to Patent Owner, Petitioner's "single sentence fails to analyze or explain how Carter discloses this." *Id.* Patent Owner argues Petitioner provides no explanation as to how these claim limitations correlate in regards to "assess" versus "allocate." *Id.* at 22. Patent Owner argues that Dr. Kubiatowicz's testimony is conclusory and offers no support

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or analysis to explain how the disputed limitation is disclosed in Carter. *Id.* at 22–23.

At this stage of the proceeding, we disagree with Patent Owner that Petitioner fails to demonstrate where Carter explicitly discloses "wherein the NAS component is configured to . . . allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices" as recited in claim 13. Petitioner and Dr. Kubiatowicz cite to Carter's policy controller for "dynamically distribut[ing] the available resources." Pet. 39, 54; Ex 1102 ¶ 118. We understand Petitioner's argument regarding distribution and movement of data or resources to correspond to the claimed "allocate."

Accordingly, based on the record before us, we are satisfied that Petitioner has shown adequately for purposes of this Decision that Carter discloses "wherein the NAS component is configured to: . . . allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices; represent that the selected distributed devices comprise respective NAS devices having the respective available amounts of storage resources," as required by claim 13.

f. Summary

On this record and for purposes of this Decision, we determine Petitioner presents sufficient evidence to establish a reasonable likelihood it would prevail in showing that claims 1 and 13 are anticipated under 35 U.S.C. § 102(b) based on Carter.

3. Analysis of Cited Art as Applied to Dependent Claims 3, 4, 6, 8, 9, 15, 16, 18, 20, and 21

Petitioner contends dependent claims 3, 4, 6, 8, 9, 15, 16, 18, 20, and 21 of the '827 patent are unpatentable under 35 U.S.C. § 102(b) in view of

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Carter and provides specific arguments for each challenged claim. Pet. 47–53, 55. Patent Owner disputes Petitioner's contentions for claims 4, 9, 16, and 21. Prelim. Resp. 24–28. Patent Owner specifically argues that Petitioner fails to show that Carter discloses explicitly or inherently (1) "utilizing a centralized server" as recited in claims 4 and 16 (*id.* at 24–26) or (2) "managing storage resources for the selected distributed devices with a storage priority control" (*id.* at 26–28). We address arguments regarding claims 4, 9, 16, and 21 in detail below.

a. Analysis of the Prior Art as Applied to Dependent Claims 4 and 16

Petitioner argues that Carter discloses using a "centralized server," as recited in claims 4 and 16, because Carter uses a root directory page that "can be located at a *static* address that is known to each node coupled to the distributed address space." *Id.* at 49 (quoting Ex. 1140, 39), 55 (citing Ex. 1102 ¶ 163). According to Petitioner, "[w]hile the other structures stored in the addressable shared memory space can be shifted dynamically from one underlying device to another, the root node is located at a 'static' location – *i.e.*, a known physical address on one of the nodes attached to the system." *Id.* (citing Ex. 1140, 14; Ex. 1102 ¶ 139). Petitioner relies on the testimony of it declarant Dr. Kubiatowicz to support its position. Dr. Kubiatowicz testifies that in Carter

> the node that stores the root directory page 342 is *centralized,* in the sense that it is known to all of the other nodes on the system as a starting point for translating a global address into a physical one. While the traversal of the directory page structure shown in Fig. 10 may involve many different nodes in the system, it always starts with the node that stores the root directory page. Unlike other data structures in the Carter system, which are

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> distributed fluidly among many different computers, this root node is stored in a centralized location.

Ex. 1102 ¶ 142. Dr. Kubiatowicz further testifies that nodes that store Carter's root directory page 342 and root entry point 64 are servers because they receive and respond to requests for information from other nodes in the system. *Id.* ¶¶ 143–144.

Patent Owner disputes Petitioner's contentions, arguing that Petitioner fails to show that Carter discloses explicitly or inherently "utilizing a centralized server" as recited in claims 4 and 16. Prelim. Resp. 24–26. Patent Owner specifically argues that "Carter never explicitly discloses that either the 'root directory page 342' or 'root 64' are stored on a single centralized server." *Id.* at 24–25. According to Patent Owner, "Petitioner[] attempt[s] to create the impression of centralization by repeatedly stating that root 64 and root 342 are the 'starting point for translating a global address into a physical one.'" *Id.* at 25 (quoting Pet. 50). Patent Owner argues, however, that "whether 'root directory page 342' or 'root 64' are used every time a node needs to access a fileset" is irrelevant "because there is no explicit description in Carter that these elements must be centralized." *Id.*

Patent Owner further argues that data in a known or static location is not necessarily stored in a centralized server and "there is no requirement that all of Carter's nodes must be accessing a 'centralized node' that stores either 'root 64' or 'root directory page 342' simply because they are stored in a 'static' and 'known' location to each node." *Id.*

On the current record, we are persuaded by Petitioner's contentions that Carter's disclosure of the use of root directory pages and root entry

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points stored at static and known locations describes the limitations of claims 4 and 16.

Patent Owner's position regarding an alleged required "single centralized server" (Prelim. Resp. 24–25) appears unduly narrow given the language of claim 4 reciting "managing the NAS service for the at least one of the particular distributed devices *at least in part utilizing a centralized server*." Ex. 1101, 46:65–67 (emphasis added). The express language of claim 4, therefore, contemplates the use of a "centralized server" "at least in part," not exclusively (i.e., not "only a single centralized server"). Still further, multiple such "centralized server[s]" may be used within the scope of claims 4 and 16.

Furthermore, Carter's description of root directories as providing a "starting point to locate the filesets" that are used "[w]hen a node is accessing a fileset for the first time" (Ex. 1140, 14:1–6) appears consistent with the '827 patent's description of "centralized": "Thus, the NAS server systems storing data location information in the centralized data location library 2110, for example, would receive storage and access requests from user devices and would at least in part direct the user devices to the distributed devices storing the requested data." Ex. 1101, 44:37–42. Dr. Kubiatowicz's testimony that "the node that stores the root directory page 342 is *centralized,* in the sense that it is known to all of the other nodes on the system as a starting point for translating a global address into a physical one" (Ex. 1102 ¶ 142) also appears consistent with the notion of centralization in the '827 patent.

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Accordingly, we determine Petitioner presents sufficient evidence to establish a reasonable likelihood it would prevail in showing that claims 4 and 16 are anticipated under 35 U.S.C. § 102(b) based on Carter.

b. Analysis of the Prior Art as Applied to Dependent Claims 9 and 21

Petitioner contends that Carter teaches "managing storage resources for the selected distributed devices with a storage priority control," as recited in claims 9 and 21. Pet. 52–53 (citing Ex. 1102 ¶ 150), 55 (citing Ex. 1102 ¶ 169). Petitioner argues that a "storage priority control" is demonstrated by Carter's disclosure that the shared memory subsystems can include logic to assess the "*availability of resources*, such as printer capabilities, *hard-disk space*, available RAM and other such resources." *Id.* at 52 (citing Ex. 1140, 36–37). Petitioner further notes that Carter's shared memory subsystem may include a "'policy controller [that] can employ any of the suitable heuristics to direct the elements, such as the paging controller, disk directory manager, and other elements to dynamically *distribute the available resources*.'" *Id.* at 52–53 (alteration in original) (quoting Ex. 1140, 36–37; Ex. 1102 ¶ 151). Petitioner also explains that Carter's "'memory subsystems 232a-232c can include a migration controller, and policy controller . . . to perform hierarchical data migration and *load balancing*.'" *Id.* at 53 (quoting Ex. 1140, 31 ("*Resource distribution* is similarly managed"); Ex. 1102 ¶ 152).

Patent Owner contests Petitioner's position, arguing that "Carter does not explain what these 'heuristics' are, let alone explicitly disclose that such 'heuristics' would be a 'storage priority control.'" Prelim. Resp. 27. Patent Owner further argues that Carter's heuristics would not necessarily be "a storage priority control" as required by the challenged claims. *Id.*

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According to Patent Owner, "[t]he fact Carter distributes resources does not necessitate 'storage priority control.'" *Id.*

At this stage of the proceeding, based on current record, we are persuaded by Petitioner that "storage priority control" is demonstrated by Carter's disclosure that the shared memory subsystems can include logic to assess the "*availability of resources*, such as printer capabilities, *hard-disk space*, available RAM and other such resources." Ex. 1140, 36–37 (emphasis added). Accordingly, we determine Petitioner presents sufficient evidence to establish a reasonable likelihood it would prevail in showing that dependent claims 9 and 21 are anticipated under 35 U.S.C. § 102(b) based on Carter.

c. Summary

On this record and for purposes of this Decision, we determine Petitioner presents sufficient evidence to establish a reasonable likelihood it would prevail in showing that dependent claims 3, 4, 6, 8, 9, 15, 16, 18, 20, and 21 are anticipated under 35 U.S.C. § 102(b) based on Carter.

E. Alleged Obviousness of Dependent Claims 5 and 17 of the '827 Patent in View of Carter and Pitzel

Petitioner contends dependent claims 5 and 17 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of Carter and Pitzel. Pet. 55–59. Patent Owner disputes Petitioner's contentions, arguing Pitzel fails to remedy the deficiencies of Carter. Prelim. Resp. 28. For reasons that follow, we determine Petitioner has demonstrated a reasonable likelihood of prevailing as to the challenged claims.

1. Overview of Carter

See supra Section II.D.1.

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2. Overview of Pitzel

Pitzel is a US Patent titled "System and Method for Updating Information via a Network." Ex. 1142, Title. Pitzel is directed to "method for upgrading software for various users, each of the users having diverse hardware and software configurations." *Id.* at Abstract. The invention of Pitzel "includes a method for automatically determining the hardware and software configuration of the client computer without user intervention." *Id.* According to Pitzel, "[t]o begin the upgrade, the client computer reads a configuration file that identifies the components for downloading." *Id.* Pitzel discloses that "[u]pon receipt of the configuration file, the client computer determines the hardware and software configuration of the client computer." *Id.* The client computer of Piztel then "automatically communicates with a component server via a network and requests one or more components for downloading to the client computer based upon the configuration file and the hardware and software conditions of the client computer." *Id.*

3. Analysis of the Prior Art as Applied to Dependent Claims

Claims 5 and 17 depend from dependent claims 4 and 16, respectively. As discussed previously (*see supra* Section II.D.3.a.), we are persuaded by Petitioner's arguments that Carter satisfies the limitations in claims 4 and 16 requiring a centralized server. For claims 5 and 17 that require downloading the software-based NAS component to the selected distributed devices (Ex. 1101, 47:1–3, 48:19–21), Petitioner contends Pitzel meets this limitation. Pet. 56. According to Petitioner, "Pitzel teaches 'downloading' of a component to a client, which is equivalent to the 'selected distributed device[]'" and "teaches a network with multiple clients,

each of which can download and install a component." *Id.* (citing Ex. 1142, Abstract, 3:23–27). Petitioner contends that a person of ordinary skill in the art would have had a reason to combine the teachings of Carter with that of Pitzel, because (1) the references both are in the same field of endeavor, *id.* at 57; (2) a person of ordinary skill in the art would have recognized the benefits of incorporating the teachings of Pitzel to the system of Carter, *id.* at 58; and (3) Pitzel could have been easily incorporated into the Carter system, and such combination would have yielded predictable results, *id.*.

Petitioner argues that "the network system in Carter can advantageously incorporate the downloading mechanism in Pitzel to provide a software-based NAS component to a computer in the network. The computer can install the downloaded component to provide NAS service to other computers in the network." *Id.* According to Petitioner, "[t]he downloading mechanism in Pitzel can also provide an update to an existing software-based NAS component on a computer in the network. Such an update can make a version change, fix software issues, and/or implement a feature change." *Id.* (citing Ex. 1102 ¶ 177). Petitioner supports its position with the declaration of Dr. Kubiatowicz, who testifies that "[a] [person of ordinary skill in the art] would further appreciate that any software of the level of complexity of Carter would greatly benefit from the ability to perform updates—especially over geographic distances such as illustrated by Carter's discussion of Figs. 12A, 12B and 13." Ex. 1102 ¶ 177 (citing Ex. 1140, 49–50, Figs. 12A, 12B, 13).

Patent Owner disputes Petitioner's position, arguing that Pitzel fails to cure the deficiencies of Carter. Prelim. Resp. 28.

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Based on the current record and crediting the testimony of Dr. Kubiatowicz (*see* Ex. 1102 ¶ 177), we are persuaded by Petitioner's arguments regarding claims 5 and 17. Accordingly, we find Petitioner presents sufficient evidence to establish a reasonable likelihood it would prevail in showing that dependent claims 5 and 17 would have been obvious under 35 U.S.C. § 103(a) in view of Carter and Pitzel.

F. Alleged Anticipation of Dependent Claims 4, 6, 7, 16, 18, and 19 in view of Carter and Condor

Petitioner contends dependent claims 4, 6, 7, 16, 18, and 19 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of Carter and Condor. Pet. 59–66. Patent Owner disputes Petitioner's contentions. Prelim. Resp. 29–35. For reasons that follow, we determine Petitioner has not demonstrated a reasonable likelihood of prevailing as to the challenged claims.

1. Overview of Carter

See supra Section II.D.1.

2. Overview of Condor

Condor is a publication titled "Condor – A Hunter of Idle Workstations." Ex. 1117, Title. Condor is directed to a scheduling system that operates in a workstation environment. *Id.* at Abstract. Condor discloses "maximiz[ing] the utilization of workstations with as little interference as possible between the jobs it schedules and the activities of the people who own workstations." *Id.* It teaches identifying idle workstations and scheduling background jobs on them, so that when the owner of a workstation resumes activity at a station, Condor checkpoints the remote job running on the station and transfers it to another workstation. *Id.* According to Condor, the "system guarantees that the job will eventually

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complete, and that very little, if any, work will be performed more than once." *Id.*

Condor contemplates a "wide spectrum of scheduling structures" that use scheduling coordinators that "follow[] the principle that workstations are autonomous computing resources and they should be managed by their own users. *Id.* at 4, 6. Condor states that "[t]his also helps to keep the responsibilities of the coordinator simple." Ex. 1117, 6. According to Condor, "[s]implicity is important so that a central site is not required to maintain a great amount of information about each workstation." *Id.* Condor contemplates that either a centralized, static coordinator could assign background jobs to execute at available remote workstations (*id.* at 4–5) or a distributed approach could be used where assignment of available processors is accomplished by each workstation cooperating to conduct a scheduling policy (*id.* at 4–5).

One embodiment disclosed in Condor is shown in Figure 1, reproduced below.

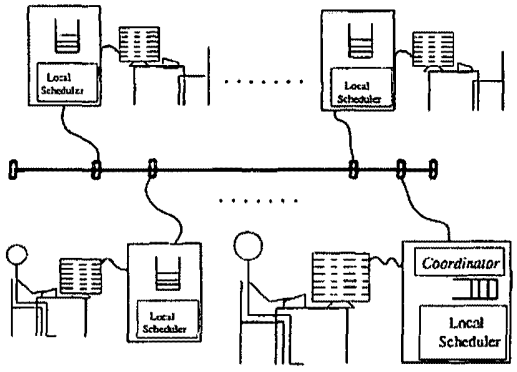


Figure 1, above, shows one version of the Condor background job scheduler that lies between a centralized, static approach and the fully distributed approach. Condor explains that "[t]his approach uses the efficiency of

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scheduling with a central node to avoid the overhead of messages to decide which workstations should be allocated available capacity." *Id.* at 5. Condor discloses that its system can be extendible to a large number of workstations and eases the required recovery when a centralized coordinator fails. *Id.* at 6–7. According to the teachings of Condor, "[l]ocal schedulers are not affected if a remote site discontinues service." *Id.* at 7. Condor discloses that "if the site on which the coordinator is executing fails, remotely executing jobs initiated and executing on other machines are not affected. Only the allocation of new capacity to requesting users is affected." *Id.* Condor explains that "because the coordinator has few duties, its recovery at another site is simplified in relation to a fully centralized strategy." *Id.* In order to balance the burden of coordination, Condor states that the central coordinator can be moved to other locations. *Id.*

3. Analysis of Cited Art as Applied to the Challenged Dependent Claims

Claim 4 depends from claim 3, and further requires "managing the NAS service for the at least one of the particular distributed devices at least in part utilizing a centralized server." Ex. 1101, 46:65–67. Claim 6 depends from claim 4, and requires the method of claim 4 to further comprise "storing, with the centralized server, location information associated with the data stored in the selected distributed devices." *Id.* at 47:4–6. Claim 7 depends from claim 6, and requires the method of claim 6 to further comprise "utilizing the centralized server to receive and route the data for storage to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database." *Id.* at 47:7–12. Dependent claims 16, 18, and 19 recite substantially similar

limitations as claims 4, 6, and 7 but depend from independent claim 13. *Id.* at 48:15–29.

Petitioner contends these dependent claims would have been obvious in view of the combined teachings of Carter and Condor. Pet. 60 (citing Ex. 1102 ¶ 184). In particular, for claim 4, Petitioner argues that "Condor teaches 'managing' the use of 'resources of the workstation [that] are underutilized' at least in part using a 'central coordinator.'" *Id.* (brackets in original) (citing Ex. 1117, 1, 5–6). According to Petitioner, "the central coordinator is held on one of the workstations that also has its own local scheduler and background job queue." *Id.* (citing Ex. 1117, 6). Petitioner argues that the central coordinator "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting." *Id.* Petitioner further argues the central coordinator knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* (citing Ex. 1117, 16; Ex. 1102 ¶ 184).

For dependent claim 6, Petitioner contends "Condor teaches 'storing' 'location information associated with the data' stored on the distributed devices with a 'central coordinator.'" Pet. 62 (citing Ex. 1117, 1, 5–6). According to Petitioner, the central coordinator "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting." *Id.* (citing Ex. 1117, 6). Petitioner further argues that the central coordinator knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* (citing Ex. 1117, 16; Ex. 1102 ¶ 189). For claim 7, Petitioner argues that "Condor teaches 'utilizing' a central coordinator to 'receive and route data for storage' based upon a 'capabilities database.'" *Id.* at 63. Petitioner relies on

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Condor's disclosure of central coordinator that "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting," and which knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* at 63–64 (citing Ex. 1117, 6; Ex. 1102 ¶ 192). For claims 16, 18, and 19, Petitioner states that the arguments and rationales for claims 4, 6, and 7 apply. *Id.* at 64–65.

Petitioner supports its position with the declaration of Dr. Kubiatowicz, who testifies that the challenged dependent claims would have been obvious in light of the combination of Carter and Condor. Ex. 1102 ¶¶ 183–201. Dr. Kubiatowicz specifically testifies that "the advantages and disadvantages of both centralized and distributed approaches to coordination and management were well-known even at the time Condor was published." *Id.* ¶ 185 (citing Ex. 1117, 5 ("Both the centralized and the distributed approaches have well known advantages and disadvantages.")). Dr. Kubiatowicz specifically testifies that "it would have been obvious to a person of ordinary skill in the art that both approaches have advantages that could have been exploited using well known techniques, as well as disadvantages that could have been avoided using well known techniques, just like Condor's central coordinator." Ex. 1102 ¶ 186. According to Dr. Kubiatowicz, "[i]ncorporating Condor's explicit teaching of a 'central coordinator' into Carter would have been obvious to one of ordinary skill in the art, would have yielded predictable results, and would have involved tools and techniques that were well known at the time." *Id.* ¶ 187. Dr. Kubiatowicz further testifies that a person of ordinary skill in the art "would readily recognize the benefits of incorporating the teachings of Condor to the

system of Carter. For example, the network system in Carter can advantageously incorporate the central coordinator in Condor to provide a centralized mechanism to manage resource sharing." *Id.* ¶ 199.

Patent Owner contests Petitioner's position, arguing that Petitioner fails to provide an adequate rationale as to why a person of skill in the art would combine an entirely distributed system from Carter with a centralized system from Condor, especially in light of Carter criticizing centralized servers such as those required in claims 4 and 6. Prelim. Resp. 31–32. Patent Owner specifically argues that Petitioner provides no analysis regarding the combination of Carter and Condor but, rather, offers only conclusory statements that merely are reiterated by Dr. Kubiatowicz. *Id.* at 32–33.

We agree with Patent Owner that Petitioner fails to offer sufficient explanation as to why a person of ordinary skill in the art would have combined the teachings of Carter and Condor. Rather, Petitioner appears to argue that, based on the advantages described by Condor (Ex. 1017, 5), and using well-known techniques with unspecified predictable results, a person of ordinary skill in the art would have had sufficient reason to combine these disparate elements taught in the prior art references to render the challenged claims obvious. Pet. 61–66. Yet, other than Petitioner's cursory assertion of "advantageously incorporat[ing] the central coordinator in Condor to provide a centralized mechanism to manage resource sharing" (Pet. 65), which cites equally cursory and unsupported testimony by Dr. Kubiatowicz (Ex. 1102 ¶ 199), Petitioner fails to identify what particular advantages or efficiencies would have prompted a person of ordinary skill in the art to combine Condor's scheduler with Carter's system. Furthermore, Dr.

Kubiatowicz's testimony regarding predictable results and obviousness to try are similarly lacking in elaboration and substantiation. *See* Ex. 1102 ¶¶ 200–201. Such conclusory statements and unspecific testimony without evidence on the record cannot satisfy the Petitioner's burden of demonstrating obviousness. *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016); *I/P Engine, Inc. v. AOL Inc.*, 576 Fed. Appx. 982, 999 (Fed. Cir. 2014) ("The testimony of the Defendants' expert amounts to a 'mere conclusory statement' that may not serve as a basis for finding the asserted claims obvious."); *see also InTouch Techs., Inc. v. VGO Commc'ns, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014) (holding that expert's testimony could not support a finding of obviousness where "testimony primarily consisted of conclusory references to [the expert's] belief that one of ordinary skill in the art *could* combine these references, not that they *would* have been motivated to do so"); *see also* 37 C.F.R. 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

Accordingly, on this record, we determine Petitioner has failed to present sufficient evidence to establish a reasonable likelihood it would prevail in showing that claims 4, 6, 7, 16, 18, and 19 would have been obvious under 35 U.S.C. § 103(a) in view of Carter and Condor.

III. CONCLUSION

For the foregoing reasons, we determine Petitioner has demonstrated there is a reasonable likelihood it would prevail in establishing the unpatentability of claims 1, 3, 4–6, 8, 9, 13, 15, 16–18, 20, and 21 of the '827 patent.

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At this stage of the proceeding, the Board has not made a final determination as to the patentability of any challenged claim.

IV. ORDER

For the reasons given, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is hereby instituted as to claims 1, 3, 4–6, 8, 9, 13, 15, 16–18, 20, and 21 of the '827 patent on the following asserted grounds:

> Claims 1, 3, 4, 6, 8, 9, 13, 15, 16, 18, 20, and 21 under 35 U.S.C. § 102(b) as unpatentable over Carter;
>
> Claims 5 and 17 under 35 U.S.C. § 103(a) as unpatentable over Carter and Pitzel.

FURTHER ORDERED that the trial is limited to the grounds identified above, and no other grounds are authorized; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, the trial commencing on the entry date of this Decision.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EMC CORPORATION, LENOVO (UNITED STATES) INC.,
NETAPP, INC.,
Petitioner,

v.

INTELLECTUAL VENTURES I LLC,
Patent Owner.

Case IPR2017-00439
Patent 8,275,827

Before JEFFREY S. SMITH, GEORGIANNA W. BRADEN, and DANIEL J. GALLIGAN, *Administrative Patent Judges*.

BRADEN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION

35 U.S.C. § 318

I. INTRODUCTION

We have jurisdiction to hear this *inter partes* review under 35 U.S.C. § 6, and this Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 3–6, 8, 9, 13, and 15, 16–18, 20, and 21 of U.S. Patent No. 8,275,827 (Ex. 1101, "the '827 patent") are unpatentable.

A. Procedural History

EMC Corporation, Lenovo (United States) Inc., and NetApp, Inc. ("Petitioner") filed a Petition (Paper 5, "Pet.") to institute an *inter partes* review of the challenged claims of the '827 patent. Intellectual Ventures I LLC ("Patent Owner") timely filed a Preliminary Response (Paper 9, "Prelim. Resp."). Pursuant to 35 U.S.C. § 314(a), an *inter partes* review was originally instituted for (1) claims 1, 3, 4, 6, 8, 9, 13, 15, 16, 18, 20, and 21 under 35 U.S.C. § 102(b) as unpatentable over Carter[1]; and (2) claims 5 and 17 under 35 U.S.C. § 103(a) as unpatentable over Carter and Pitzel.[2] *See* Paper 11 ("Dec. to Inst."), 42.

On April 24, 2018, the Supreme Court held that a decision to institute under 35 U.S.C. § 314 may not institute on fewer than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348 (2018). Thereafter, we modified the institution decision to institute on all of the challenged claims and all of the grounds presented in the Petition. Accordingly, this

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[1] PCT Pub No. WO 98/22881, App. No. PCT/US97/21460, May 28, 1998 (Ex. 1140, "Carter").
[2] US Pat. No. 7,062,765 B1, filed May 25, 1999, issued June 13, 2006 (Ex. 1142, "Pitzel").

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inter partes review also includes review of (1) claims 1, 3, 4, 6, 8, 9, 13, 15, 16, 18, 20, and 21 under 35 U.S.C. § 102(b) as unpatentable over Carter; (2) claims 5 and 17 under 35 U.S.C. § 103(a) as unpatentable over Carter and Pitzel; and (3) claims 4, 6, 7, 16, 18, and 19 under 35 U.S.C. § 103(a) as unpatentable over Carter and Condor.[3] *See* Paper 48, 2; *see also* Ex. 3001 (email "advis[ing] the Board that Patent Owner will waive its right to file a [Patent Owner Response] and will not request an oral hearing on the newly instituted grounds in these proceedings. Both parties have conferred and believe this closes the record and allows the Board to issue a final written decision based on the current record.").

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 21, "PO Resp."), to which Petitioner filed a Reply (Paper 29, "Reply"). Patent Owner also filed Objections to Evidence (Papers 14, 17) and a Motion for Observation on Cross-Examination (Paper 32). Petitioner responded to Patent Owner's Motion for Observation on Cross-Examination. Paper 36. In addition, and with our authorization, Patent Owner filed a list of alleged improper reply arguments (Paper 37), to which Petitioner filed a Response (Paper 38).

An oral argument was held on March 5, 2018, together with co-pending Case IPR2017-00374. A transcript of the oral argument is included in the record. Paper 49 ("Tr.").

B. Related Proceedings

The parties inform us that the challenged patent is the subject of two district court proceedings in the District of Massachusetts, captioned

[3] Litzkow, M.J. et al., Condor – A Hunter of Idle Workstations, Computer Sciences Technical Report #730, Dec. 1987 (Ex. 1117, "Condor").

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Intellectual Ventures I LLC et al. v. Lenovo Group Ltd. (1:16-cv-10860-IT) and *Intellectual Ventures I, LLC et al. v. NetApp, Inc.* (1:16-cv-10868-IT). Pet. 2; Paper 8, 1 (Patent Owner's Mandatory Notices).

C. The '827 Patent

The '827 patent was filed on April 13, 2001, and is titled "Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks." Ex. 1101, Title. It describes systems and methods for software-based network attached storage (NAS) services hosted on a massively-distributed network of devices. *Id.* at Abstract. The '827 patent discloses that the term "NAS device" generally refers to "a specialized file server that connects to the network to provide storage capacity to network-connected users," (*id.* at 2:18–20), and, in the context of the '827 patent, "broadly refers to a device that makes data storage resources available to network-connected user devices," (*id.* at 2:31–34). The '827 patent further discloses that a NAS device typically takes the form of a standalone dedicated hardware device that contains its "own storage, processing, connectivity, and management resources." *Id.* at 2:12–14. According to the '827 patent, ordinary desktop computers often sit idle for long periods of time but have the same specifications (e.g., a Pentium processor, a hard drive, and an Ethernet connection) and often greater functional capabilities than dedicated NAS devices. *Id.* at 2:46–55. The '827 patent proposes making these otherwise unused storage resources available to other devices connected to the network. *Id.* at 2:66–3:1, 42:36–41.

In one embodiment, the '827 patent describes a distributed NAS system, shown in Figure 21 reproduced below, that includes user devices 152 and NAS client devices 108. *Id.* at 43:6–15.

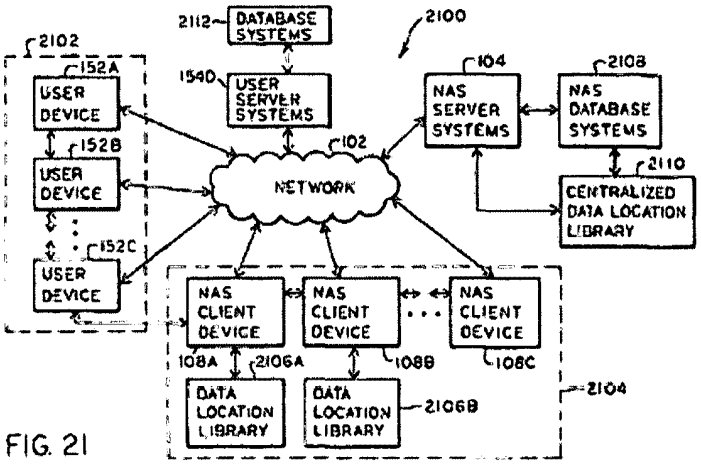


FIG. 21

As illustrated above in Figure 21 of the '827 patent, the server systems may include user server systems 154D, which have attached database systems 2112, and NAS server systems 104 with attached NAS database systems 2108 and centralized data location library 2110. Ex. 1101, 43:22–26. To provide NAS functionality, the '827 patent describes client devices 108A, 108B, . . . 108C as running a client agent that provides NAS functionality by running a NAS component as one of the projects for the distributed device. *Id.* at 43:26–30. According to the '827 patent, some of these NAS devices, such as NAS client devices 108A and 108B, may store distributed data location information, such as data location libraries 2106A and 2106B. *Id.* at 43:30–33.

The '827 patent discloses that the NAS client devices within client device fabric 2104 can act as stand-alone NAS devices and user devices within user device fabric 2102 can directly access them as such. *Id.* at 43:44–46. Additionally, at least some of the NAS client devices within

client device fabric 2104 include data location information or libraries that are used to provide links or directions to data distributed on various NAS client devices 108A, 108B, . . . 108C. *Id.* at 43:59–63. These links help provide a NAS device fabric from which user server systems 154D and user devices 152A, 152B, . . . 152C within user device fabric 2102 can draw storage resources. *Id.* at 43:63–66.

The '827 patent also contemplates that server systems 104 facilitate the NAS functionality, for example, by providing centralized management, control, and support for the NAS architecture. *Id.* at 44:24–27. According to the '827 patent, NAS servers systems 104 may include, for example, file storage database systems 2108 and centralized data location library 2110. *Id.* at 44:27–29. Additionally, the '827 patent discloses that the user devices, which can be any type of computer devices, are configured to access data stored on the NAS client devices. *Id.* at 44:60–64.

D. Illustrative Claims

As noted above, an *inter partes* review was instituted as to claims 1, 3–9, 13, and 15–21 with claims 1 and 13 being independent. Claims 1 and 13 are illustrative of the challenged claims, and are reproduced below:

1. A computer-implemented method comprising:

configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system,

wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-

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utilized storage resources in selected distributed devices of the plurality of distributed devices;

representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices;

processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network; and

enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the respective client agents for the particular distributed device.

Ex. 1101, 46:28–56.

13. A system comprising:

a plurality of distributed devices configured to be coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of workloads for the distributed proccssing system, the respective client agents including respective instances of a software-based network attached storage (NAS) component, wherein the NAS component is configured to:

assess unused storage resources of the distributed devices;

allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices;

represent that the selected distributed devices comprise respective NAS devices having the respective available amounts of storage resources;

process workloads associated with data storage and access by accessing data from and storing data into portions of the

> storage resources in the selected distributed devices to provide NAS service to a client device: and
>
> wherein the respective client agents are configured to enable at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

Id. at 47:28–48:7.

II. DISCUSSION

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear.[4] 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) ("We conclude that the regulation represents a reasonable exercise of the rulemaking authority that Congress delegated to the Patent Office."). Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An inventor, however, may provide a meaning for a term that is different from its ordinary meaning by defining the term in the specification with "reasonable clarity, deliberateness, and precision." *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Limitations, however, are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). In addition,

[4] We are not aware of any evidence of record in this proceeding that would lead to a different outcome under the *Phillip* claim construction standard. *See Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005).

the Board may not "construe claims during [an *inter partes* review] so broadly that its constructions are *unreasonable* under general claim construction principles." *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015), *overruled on other grounds by Aqua Prods., Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017).

Thus, when construing the claims at issue (1) we look at the language of the claims themselves, (2) we consult the patent's specification to help clarify the meaning of claim terms, because the claims "must be read in view of the specification, of which they are a part," *Trading Techs. Int'l, v. eSpeed, Inc.*, 595 F.3d 1340, 1352 (Fed. Cir. 2010) (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996)), and (3) we review "the patent's prosecution history in proceedings in which the patent has been brought back to the [US Patent and Trademark Office] for a second review" (*Microsoft Corp.*, 789 F.3d at 1298).

The parties dispute the proper construction of the limitation "[r]epresenting with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices" as recited in claims 1 and 13. *See* Pet. 10–11; PO Resp. 7–11; Reply 8–14. Specifically, the parties proposed the following constructions:

Petitioner	"using the corresponding software-based NAS components of the selected distributed devices to mimic dedicated NAS devices"
Patent Owner	"using the corresponding software-based NAS components of the selected distributed devices to cause each selected distributed

	device to separately appear to network-connected user devices as a dedicated NAS device"

Patent Owner argues the explicit language of the claims requires that each distributed device includes its own NAS device. PO Resp. 8. Patent Owner notes that the term "respectively" has "a well-settled meaning of '[s]eparately or individually and in the order already mentioned.'" *Id.* (citing Exhibit 2001, 1219). According to Patent Owner, the word "respectively" as used in claims 1 and 13 modifies the clause "selected distributed devices." *Id.* Thus, Patent Owner argues that the explicit and plain language of the claims requires a representation that each of the "selected distributed devices," separately or individually, appears to the network-connected user devices as a "NAS device." *Id.* Patent Owner further argues that its construction is consistent with the specification of the '827 patent because "[t]he '827 patent defines a 'NAS device' as 'a device that makes data storage resources available **to network-connected user devices**.'" *Id.* (quoting Ex. 1101, 2:31–34). Patent Owner contends that "[w]hen this definition of NAS device is applied, the '*representing*' phrase requires a representation that each individual 'selected distributed device' comprises 'a device that makes data storage resources available to network-connected user devices.'" *Id.*

Patent Owner contends that an integrated system that appears as a single device cannot satisfy this requirement, as the individual distributed devices in this integrated system would not separately make or appear to make their resources available to network-connected user devices. Patent Owner argues that "the explicit language of the claims excludes this

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embodiment by requiring the representation that the 'selected distributed devices **respectively** comprise NAS devices.'" *Id.* at 10 (citing Ex. 1101, 46:41–46 (emphasis added).) Instead, according to Patent Owner, the claim language recites the embodiment described first in this passage—that each individual NAS device "brings **its** resources to the network **with the appearance of a dedicated NAS device**." *Id.* (citing Ex. 1101, 42:59–65 (emphasis added by Patent Owner)).

We agree with Patent Owner regarding the ordinary meaning of the term "respectively." Specifically, we understand that the word "respectively" can be an adverb that means "for each separately or in turn, and in the order mentioned." The use of "respectively" as an adverb in the English language requires parallelism. *See* Ex. 3002. In other words, there must be a direct one-to-one correspondence and specific referents must be *individually* identified before there can be a "parallel list" of attribute values applicable to *each, in that order.* The term "respectively" also can be an attributive adjective that means "concerning or appropriate to each of several individually." *Id.* In the present case, the term "respectively" appears to modify "the selected distributed devices." Because specific referents are not individually identified, we understand the term to act as an attributive adjective modifying each of several selected distributed devices.

Although we agree with Patent Owner regarding the use of the term "respectively," we do not understand its use to require "the selected distributed devices to cause each selected distributed device to separately appear to network-connected user devices as a dedicated NAS device." We cannot construe individual terms in isolation. Rather, we must consider claims as a whole in view of the specification. Specifically, we must

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consider the implications of other terms recited in claims 1 and 13 (e.g., "location information") and how the claims are supported by the disclosed embodiments.

As a general rule, "there is a strong presumption against a claim construction that excludes a disclosed embodiment." *See In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1324 (Fed. Cir. 2011). Several exceptions to this presumption apply. For example, a claim may be interpreted to exclude embodiments "where those embodiments are clearly disclaimed in the specification . . . or prosecution history." *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1277 (Fed. Cir. 2008). Similarly, where the disputed term is not present in the other independent claims of the patent-in-suit, it is permissible to construe the term so as to exclude an embodiment. This is because the other claim terms "leave[] open the possibility that claims not at issue in [the claim construction] encompass omitted embodiments." *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1383 (Fed. Cir. 2008). Otherwise, "where claims can reasonably [be] interpreted to include a specific embodiment, it is incorrect to construe the claims to exclude that embodiment, absent probative evidence [to] the contrary." *Oatey Co.*, 514 F.3d at 1277.

In this case, the disclosure in the '827 patent teaches at least three embodiments using the selected distributed devices in a variety of ways, including as "stand-alone" devices (Ex. 1101, 43:44–47), as part of a "NAS device fabric" (*id.* at 43:59–63, 44:9–12), and in a "server assisted [implementation]" (*id.* at 44:24–27). Specifically, the '827 patent discloses that "a large number of desktop PCs in the enterprise (Intranet) or on the Internet can each act as a NAS device by running a client agent program and

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NAS component that brings its resources to the network with the appearance of a dedicated NAS device or **as part of an integrated system that appears as a single or dedicated NAS device**." *See* Ex. 1101, 42:59–65 (emphasis added). The '827 patent further discloses:

> A relatively simple implementation is to have the devices simply mimic the functionality of stand-alone NAS devices, while a more complex implementation is to provide a storage fabric across the Intranet or Internet where hundreds or thousands of devices work cooperatively as NAS devices in conjunction with server systems that assist in controlling and managing the storage function of the NAS fabric.

See Ex. 1101, 42:66–43:5. Yet, Patent Owner's construction intentionally reads out the embodiments covering a NAS fabric and the "server assisted implementation" of the devices. Patent Owner specifically argues:

> [T]he explicit language of the claims excludes this embodiment by requiring the representation that the "selected distributed devices **respectively** comprise NAS devices." ('827 patent, 46:41–46 (emphasis added).) Instead, the claim language recites the embodiment described first in this passage—that each individual NAS device "brings **its** resources to the network **with the appearance of a dedicated NAS device**." ('827 patent, 42:59–65 (emphasis added).)

PO Resp. 10. Patent Owner's position is contrary to the recited claims when considered as a whole and runs counter to prevailing case law. *See Oatey Co.*, 514 F.3d at 1277; *Helmsderfer, Inc.*, 527 F.3d at 1383.

Both independent claims 1 and 13 recite "enabling at least one of the selected distributed devices to function as a location distributed device to store *location information* associated with data stored by the selected distributed devices." As Petitioner argues, the NAS fabric embodiment disclosed in the '827 patent is "the ***only*** embodiment in which [Patent

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Owner's declarant], Dr. Shenoy, could identify disclosure of the recited 'location information' that was required to secure allowance of the claims." Reply 10–11 (citing Ex. 1144, 43:16–44:16); *see* Ex. 1144, 57:7–21. According to Dr. Shenoy, one reason that a "stand-alone implementation does not require the data location library to be used" is "presumably because it's a stand-alone implementation, and clients connect to the stand-alone NAS devices directly." Ex. 1144, 53:18–54:8. Thus, Patent Owner's argument that each selected distributed device must appear separately to network-connected user devices as a dedicated NAS device improperly imports selected limitations from the specification into the claim and ignores additional required elements recited in the claims. *See In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Accordingly, we do not agree with Patent Owner's position because Patent Owner's proposed construction narrows unnecessarily the scope of the challenged claims. Furthermore, as detailed below, even if we accepted Patent Owner's proposed construction, it would not alter our determination regarding the patentability of the challenged claims. No further construction is necessary for our analysis.

B. Principles of Law

A claim is unpatentable under 35 U.S.C. § 102 if a prior art reference discloses every limitation of the claimed invention, either explicitly or inherently. *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047 (Fed. Cir. 1995). If the prior art reference does not expressly set forth a particular element of the claim, that reference still may anticipate if that element is "inherent" in its disclosure. *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). To establish inherency, extrinsic evidence, when relied upon, "must

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make clear that the missing descriptive matter is necessarily present," or inherent, in the single anticipating reference. *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991). "Inherency, however, may not be established by *probabilities* or *possibilities*. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Id.* at 1269 (emphasis added) (quoting *In re Oelrich*, 666 F.2d 578, 581 (CCPA 1981)). Inherent anticipation, however, does not require recognition in the prior art. *Schering Corp. v. Geneva Pharmaceuticals*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) ("*Continental Can* does not stand for the proposition that an inherent feature of a prior art reference must be perceived as such by a person of ordinary skill in the art before the critical date.").

A claim is unpatentable under 35 U.S.C. § 103(a) if "'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17 (1966).

"[I]t is error to reach a conclusion of obviousness until all [the *Graham*] factors are considered." *Apple Inc. v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc) (citations omitted). "This

requirement is in recognition of the fact that each of the *Graham* factors helps inform the ultimate obviousness determination." *Id.*

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing "mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Thus, to prevail in an *inter partes* review, Petitioner must explain how the proposed combinations of prior art would have rendered the challenged claims unpatentable. At this final stage, we determine whether a preponderance of the evidence of record shows that the challenged claims are anticipated by or would have been obvious over the cited prior art.

We analyze the instituted grounds of unpatentability in accordance with the above-stated principles.

C. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. "The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v.*

Nu-Star, Inc., 950 F.2d 714, 718 (Fed. Cir. 1991). The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). The level of ordinary skill in the art may be reflected by the prior art of record. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *GPAC*, 57 F.3d at 1579. In a given case, one or more factors may predominate. *Id.* Generally, it is easier to establish obviousness under a higher level of ordinary skill in the art. *Innovention Toys, LLC v. MGA Entm't, Inc.*, 637 F.3d 1314, 1323 (Fed. Cir. 2011) ("A less sophisticated level of skill generally favors a determination of nonobviousness . . . while a higher level of skill favors the reverse.").

Petitioner argues that a person of ordinary skill in the art relevant to the '827 patent would have had "at least a bachelor's degree in computer science or electrical engineering and 3–5 years of professional experience in computer systems design, or a master's or doctorate and 1–2 years of professional experience in computer systems design, or equivalent academic experience." Pet. 4–5. According to Petitioner, "[s]uch a person would have been familiar with computer systems architecture and design, and would have been aware of design trends relating to distributed processing systems." *Id.* at 5. Petitioner's declarant, John D. Kubiatowicz, Ph.D. ("Dr. Kubiatowicz"), proffers the same level of skill as that argued by Petitioner. Ex. 1102 ¶ 20.

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Patent Owner contests Petitioner's definition of a person of ordinary skill in the art, specifically arguing that "Petitioners' proposed requirements especially with regard to work experience, are higher than can be reasonably supported." PO Resp. 5. Patent Owner notes that Petitioners' declarant, Dr. Kubiatowicz, testified on cross-examination that "somebody coming directly out of college, likely, would need **a couple** of extra years to understand this," and that "a little bit of professional experience might help them -- would help them understand the details involved in this case." *Id.* (citing Ex. 2002, 25:13–14; 26:2–5). Patent Owner's declarant, Dr. Shenoy, testified that, "at the time of the '827 patent, a person of ordinary skill in the art should have had a bachelor's degree in computer science, computer engineering, electrical engineering, or equivalent, with 1–2 years of work experience in the field of computer networking, storage systems, or a related field." Ex. 2003 ¶ 19. According to Dr. Shenoy, "[l]ack of experience can be remedied by additional education or vice versa." *Id.*

Based on our review of the '827 patent, the types of problems and solutions described in the '827 patent and cited prior art, and the testimony of Dr. Kubiatowicz and Dr. Shenoy, we adopt and apply Patent Owner's definition of a person of ordinary skill in the art, specifically that a person of ordinary skill in the art at the time of the claimed invention would have had "a bachelor's degree in computer science, computer engineering, electrical engineering, or equivalent, with 1–2 years of work experience in the field of computer networking, storage systems, or a related field." *See id.* We also determine that such a person would have been familiar with computer systems architecture and design, and would have been aware of design trends relating to distributed processing systems.

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D. Alleged Anticipation of Claims 1, 3, 4, 6, 8, 9, 13, 15, 16, 18, 20, and 21 of the '827 Patent by Carter

Petitioner contends claims 1, 3, 4, 6, 8, 9, 13, 15, 16, 18, 20, and 21 of the '827 patent are unpatentable under 35 U.S.C. § 102(b) as anticipated by Carter. Pet. 18–55. Patent Owner disputes Petitioner's contentions. PO. Resp. 11–50. For reasons that follow, we determine Petitioner has established by a preponderance of the evidence that these claims of the '827 patent are unpatentable under 35 U.S.C. § 102(b) as anticipated by Carter.

1. Overview of Carter

Carter is a PCT publication titled "Remote Access in a Globally Addressable Storage Environment." Ex. 1140, Title. Carter is directed to "a globally addressable storage environment that allows a plurality of networked computers to access data by addressing even when the data is stored on a persistent storage device such as a computer hard disk and other traditionally non-addressable data storage devices." *Id.* at Abstract. Carter discloses that "computers can be located on a single computer network or on a plurality of interconnected computer networks such as two local area networks (LANs) coupled by a wide area network (WAN)." *Id.* According to Carter, "[t]he globally addressable storage environment allows data to be accessed and shared by and among the various computers on the plurality of networks." *Id.* Additionally, Carter discloses that at least one of the computers can be located remote from the network and coupled thereto by a communications adapter such as a modem. *Id.* at 5:26–28. Carter further contemplates that "[t]he globally addressable data storage system preferably replicates and/or migrates data stored in the persistent data storage device among two or more of the computers based on, for example, accesses by the

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computers of the globally addressable data storage system to obtain data stored in the persistent data storage device." *Id.* at 5:28–6:2.

In Carter, computer groups are referred to as "nodes" and each of the nodes runs a software program that accesses and manages a structured store of data that is stored in an addressable shared memory space. *Id.* at 9:14–17. "The structured store of data may be stored in an addressable shared memory or the structured store may be stored in a more traditional fashion. For example, each node may be responsible for storing a particular element or elements of the structured store of data." Ex. 1140, 9:17–19. One embodiment disclosed in Carter is shown in Figure 1, reproduced below.

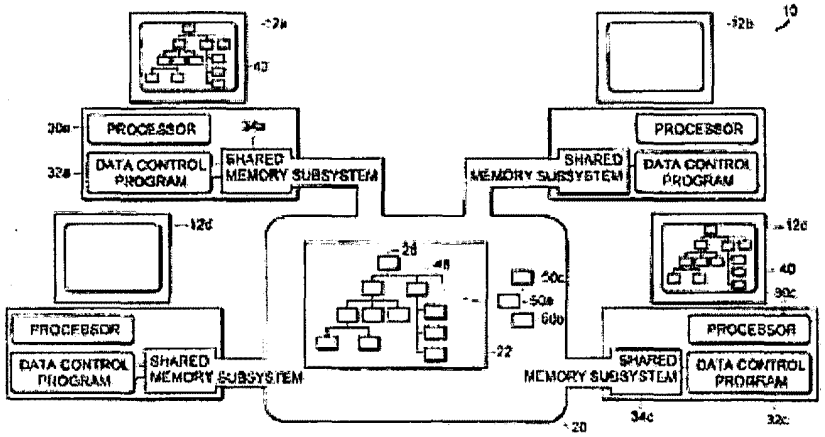
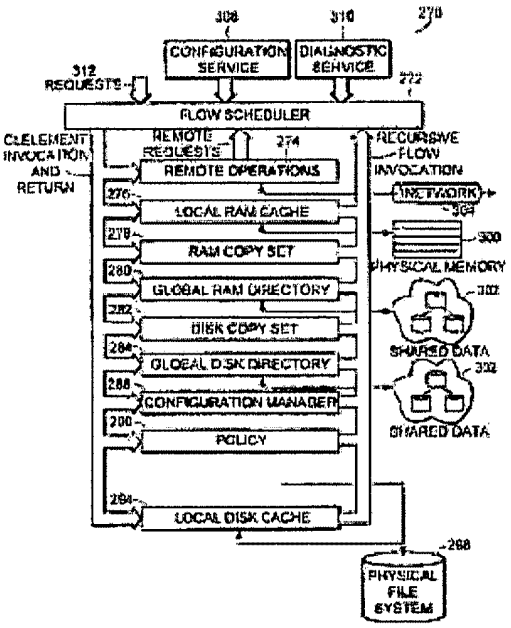


Figure 1, above, illustrates a block diagram of a distributed addressable shared memory structured data storage system. *Id.* at 8:5–6. Carter discloses that network system 10 includes a plurality of network nodes 12a–12d and addressable shared memory space 20 that has portion 22 for storing a structured store of data 28. *Id.* at 10:6–8. According to Carter, each of nodes 12a–12d can include several sub-elements, such as processor 30a, data control program 32a, and shared memory subsystem 34a. *Id.* at 10:8–9. For the embodiment shown above in Figure 1, "two of the nodes, 12a and 12c,

include monitors that provide displays 40 and 42 graphically depicting the structured store of data 28 within addressable shared memory space 20." *Id.* at 10:10–12. Carter discloses that addressable shared memory space 20 interconnects each of network nodes 12a–12d and provides each node 12a–12d with access to the structured store of data 28 contained within addressable shared memory space 20. *Id.* at 10:12–14. Carter contemplates that system 10 can provide, among other things, each network node 12a–12d with shared control over the structured store of data 28 and, therefore, system 10 can distribute control of the data store across the nodes of the network. Ex. 1140, 10:15–17. To this end, Carter states that each node of system 10, such as node 12a, includes data control program 32a that interfaces to shared memory subsystem 34a. *Id.* at 10:17–18.

Carter discloses that its shared memory subsystem is a software module that can couple between an operating system ("OS") and a virtual shared memory and can form an interface between the OS and the virtual shared memory. *Id.* at 28:27–30. This allows the OS to access the virtual shared memory. *Id.* One embodiment of Carter's shared memory subsystem is shown in Figure 8, reproduced below.

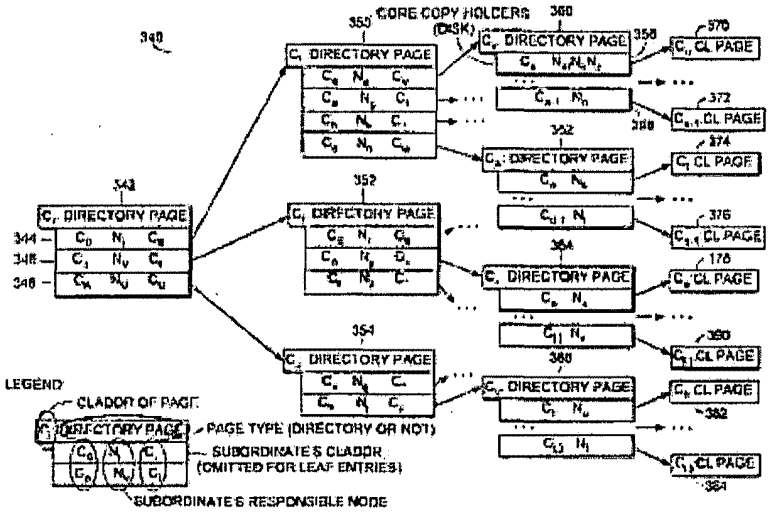
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As shown in Figure 8, above, shared memory subsystem 270 includes remote operations element 274, local random access memory ("RAM") cache 276, global RAM directory 280, global disk directory 284, configuration manager 288, policy element 290, local disk cache 294, physical memory 300, OS 216, and memory access request 312. Ex. 1140, 34:28–35:4. Carter discloses that "policy element 290 . . . can be a software module that acts as a controller to determine the availability of resources, such as printer capabilities, hard-disk space, available RAM and other such resources." *Id.* at 36:27–29. Carter also states that policy controller 290 "can employ any of the suitable heuristics to direct the elements, such as the paging controller, disk directory manager, and other elements to dynamically distribute the available resources." *Id.* at 36:29–37:2.

Carter indicates its system can provide nodes with access to distributed memory space by using the coordinated operation of a directory manager. *Id.* at 37:27–29. According to Carter, a directory manager can provide a directory structure that indexes the shared address space. *Id.* at

38:3–4. Figure 10, reproduced below, illustrates one embodiment of a directory structure disclosed in Carter.



As shown in Figure 10, above, directory 340 is formed from directory pages 342, 350–354, and 360–366, and provides location information to the pages of the distributed shared memory space depicted as pages 370–384. Ex. 1140, 39:12–15. Carter states that directory page 342 acts like a root directory page and can be located at a static address that is known to each node coupled to the distributed address space. *Id.* at 39:16–17.

2. *Analysis of Cited Art as Applied to Independent Claims 1 and 13*

a. *Preamble to Claims 1 and 13*

Preamble language that merely states the purpose or intended use of an invention generally is not treated as limiting the scope of a claim. *See Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1345 (Fed. Cir. 2003); *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997). When the limitations in the body of the claim rely upon or derive essential structure from the preamble, however, then the preamble acts as a

necessary component of the claimed invention and is limiting. *See Eaton Corp. v. Rockwell Int'l Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003).

The preamble of claim 1 recites a "computer-implemented method comprising," and the preamble of claim 13 recites a "system comprising." Ex. 1101, 46:28, 47:28. Petitioner first contends the preamble of claim 1 does not limit the claim under the claim's broadest reasonable interpretation. Petitioner then contends that, nonetheless, Carter discloses a "computer-implemented method" as required by claim 1 and a system as required by claim 13. Pet. 32 (citing Ex. 1102 ¶ 102); 53 (citing Ex. 1102 ¶ 154).

Patent Owner does not address the preambles of independent claims 1 and 13. *See generally* PO Resp. The burden remains, however, on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

We agree with Petitioner, and we find, that Carter discloses a "computer-implemented method" and a system. Ex. 1102 ¶¶ 102, 154.

> *b. "configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system"*

Petitioner contends Carter discloses this limitation as recited by claim 1 with similar language recited in claim 13. Pet. 33 (citing Ex. 1102 ¶ 103), 53–54 (citing Ex. 1102 ¶ 155). As noted by Petitioner, Carter is directed to "provid[ing] computer network systems that have adaptable system configurations for dynamically exploiting distributed network resources" with "a plurality of network nodes that access a memory space storing a structured store of data, such as a structured file system or a

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database." Ex. 1140, 4, 9, *cited in* Pet. 33; *see* Ex. 1102 ¶ 105. Petitioner argues that

> the systems of Carter are implemented using a computer program that comprises various software components that run on each of the distributed devices in the system, including the "shared memory subsystem" and the "data control program" described above, as well as additional components including, among others, a "distributor" component, a "disk directory manager," and a "migration controller."

Pet. 33–34 (citing Ex. 1140, 24). Petitioner further argues that, collectively, Carter's software is a "client agent" for processing portions of a distributed workload. *Id.* at 34 (citing Ex. 1102 ¶ 107).

Petitioner relies on the testimony of its declarant, Dr. Kubiatowicz, to support its position. Dr. Kubiatowicz testifies that storage or access workloads are processed in Carter by the "shared memory subsystem," which is a component of the client agent. Ex. 1102 ¶ 108 (citing Ex. 1140, Fig. 2). According to Dr. Kubiatowicz, "[t]he shared memory subsystems running on the distributed nodes communicate with each other over the network, and cooperate to manage the transfer and storage of data among the various physical storage devices that make up the distributed system. They serve to export storage resources to client devices over the network and are 'NAS components' . . . ." *Id.* Dr. Kubiatowicz further testifies that "[t]he shared memory subsystem is responsible for processing storage workloads generated by the distributed devices." *Id.* ¶ 109. Dr. Kubiatowicz then opines that "[a]ll of these storage and access capabilities are provided by the shared memory subsystem, which is a component of the software package described by Carter." *Id.* (citing Ex. 1140, 29).

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Patent Owner does not address this limitation of independent claims 1 and 13, but the burden remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

Based on our review of the entirety of the record before us, we agree with Petitioner and find that Carter discloses "configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system" as recited in claim 1 and similarly recited in claim 13. *See* Ex. 1140, 4, 9, 24, 29, 34; *see* Ex. 1102 ¶¶ 103, 105, 107–109, 155.

> c. *"wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices"*

Petitioner contends Carter discloses this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 37 (citing Ex. 1102 ¶ 114), 54 (citing Ex. 1102 ¶ 156). Petitioner first argues

> the shared memory subsystem is a component of the larger "client agent" provided by Carter, which allows low-level access to a shared addressable memory. By communicating over the network with other nodes in the Carter system, the shared memory subsystem makes data storage resources available to network-connected user devices, and thus, it is a "NAS component.'

Id. at 37 (citing Ex. 1140, 39–42, Figs. 7, 10, 11; Ex. 1102 ¶ 115). Petitioner then argues that the shared memory subsystem is implemented in software because it is a "software module." *Id.* at 38 (citing Ex. 1140, 28; Ex. 1102

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¶ 116). Petitioner further argues that the shared memory subsystem "assesses unused or under-utilized storage resources" because Carter describes nodes as having an "optional private memory device 218" that

> provides the node with local storage that can be kept inaccessible to the other nodes on the network. Typically the private memory device 218 includes a RAM, or a portion of a RAM memory, for temporarily storing data and application programs and for providing the processor 214 with memory storage for executing programs. The private memory device 18 can also include persistent memory storage, typically a hard disk unit or a portion of a hard disk unit, for the persistent storage of data.

Id. (quoting Ex. 1140, 28). Petitioner, thus, asserts that "Carter teaches systems that distinguish between 'unused' storage space (*i.e.*, the storage space that is pooled to form the shared virtual address space) and 'used' storage space (*i.e.*, private storage that is reserved for the use of a particular node)." Pet. 38 (citing Ex. 1102 ¶ 117).

In addition, Petitioner argues Carter discloses this limitation because "the shared memory subsystem assesses the extent to which storage resources are being utilized and uses load balancing and resource distribution techniques to prevent underutilization." Pet. 38. In support, Petitioner relies on the declaration of Dr. Kubiatowicz, who testifies that memory subsystems 232a–232c in Carter can include a hierarchy manager that provides hierarchical control for the distribution of data, which controls load balancing and resource distribution. Ex. 1102 ¶ 118 (citing Ex. 1140, 31). Dr. Kubiatowicz further testifies that "[t]he shared memory subsystem may also include a 'policy controller [that] can employ any of the suitable heuristics to direct the elements, such as the paging controller, disk directory manager, and other elements to dynamically distribute the available

resources'" and "is configured to 'allow portions of the distributed shared memory to move between persistent and electronic memory depending on predetermined conditions, such as recent usage.'" *Id.* (alteration in original) (emphases omitted) (quoting Ex. 1140, 30, 36–37). Therefore, Dr. Kubiatowicz opines that "the shared memory subsystem assesses the extent to which storage resources are being utilized and uses load balancing and resource distribution techniques to prevent underutilization." *Id.* (citing Ex. 1140, 30).

Patent Owner contests Petitioner's position. PO Resp. 19–29. Patent Owner argues that Petitioner presents two theories with respect to the "assessing" limitation of claims 1 and 13, both of which fail. *Id.* at 19. According to Patent Owner, the theory that Carter's "private" storage performs the claimed assessment fails because the cited portion of Carter does not expressly disclose assessing unused or under-used storage resources and because there is no evidence that Carter's "shared memory system" must perform some assessment to distinguish between private storage and non-private storage. *Id.* at 20. Patent Owner further argues that any distinguishing between "private or non-private storage has no bearing on whether such storage is 'unused' or 'under-utilized'" because "the fact that storage is private does not mean it is 'used'" and the fact that storage is non-private does not mean such storage is "'unused.'" *Id.* at 21 (citing Pet. 38). Patent Owner insists that "distinguishing between private and non-private storage does not **necessitate** 'assessing unused or under-utilized storage.'" *Id.* at 22 (citing Ex. 2003 ¶ 55). Patent Owner contends that a wide variety of different methods could be used by Carter to distinguish between private and non-private storage without performing any assessment of whether

storage is unused or underused. *Id.* (citing Ex. 2003 ¶ 55). Patent Owner notes, for example, that "Carter could reserve a static location and fixed amount of storage as 'private storage' on every node. In such a case, no assessment would be required as the private storage is located in the same place on every device, and has the same size." *Id.* (citing Ex. 2003 ¶ 56).

For Petitioner's second theory regarding Carter's resource distribution, Patent Owner argues that Petitioner fails to demonstrate that the Carter's policy controller assesses unused or underused storage resources as required by the claims. *Id.* Patent Owner further argues that distribution of resources could be done using heuristics based on any factor, not necessarily that of unused or underused storage resources. *Id.* Patent Owner, thus, contends that Petitioner has failed to show assessment is either explicitly or inherently disclosed in its second theory. *Id.*

Patent Owner also argues that Carter "states that the policy controller 'direct[s] the elements, such as the paging controller, disk directory manager, and other elements **to dynamically distribute the available resources**.'" *Id.* (citing Ex. 1140, 36–37 (emphasis added by Patent Owner)). Patent Owner further argues that "dynamically distributing available resources" and assessing unused storage resources are "completely different options (i.e., distribution vs. assessment). *Id.* (citing Ex. 2003 ¶ 62). Patent Owner then argues that "Carter itself contradicts Petitioners' conclusion" because "[t]he cited sentence states that the 'paging controller' and 'disk directory manager' distribute available resources. A paging controller and disk directory manager have nothing to do with assessing storage resources." *Id.* at 26 (citing Ex. 2003 ¶ 63). Rather, according to Patent Owner, "the page controller can remap portions of the addressable

memory space between the volatile memories and persistent memories and the disk directory manager to track portions of the addressable memory space mapped to the persistent memories." *Id.* (citing Ex. 1140, 25, 36). Patent Owner asserts that "Carter's mention of heuristics also cannot salvage Petitioners' argument" because "Carter does not disclose what 'heuristics' are used, let alone disclose that such 'heuristics' would be based on unused or underutilized storage resources." *Id.*

Patent Owner also contends that Petitioner's reliance on Carter's shared memory caching embodiment is misplaced. *Id.* at 29. Patent Owner specifically notes that the Petition relies only on Carter's statement that "the shared memory subsystem is configured to 'allow portions of the distributed shared memory to move between persistent and electronic memory depending on predetermined conditions, such as recent usage.'" *Id.* (citing Pet. 39; Ex. 1140, 30 (emphasis added by Petitioner)). Patent Owner argues that neither Petitioner nor its declarant, Dr. Kubiatowicz, explain how nor why Carter's mention of "recent usage" relates to as assessment of unused storage resources. *Id.* (citing Pet. 39; Ex. 1102 ¶ 118). According to Patent Owner, "[e]ven a cursory reading of Carter illustrates that 'recent usage' has nothing to do with assessing 'unused storage resources.'" *Id.* (citing Ex. 2003 ¶ 69). Patent Owner asserts that "Carter's reference to 'recent usage' refers to the concept that more frequently accessed data (*i.e.*, recently used), should be stored in faster speed RAM and not on slower speed hard disks (*i.e.*, it should be cached)." *Id.* (citing Ex. 2003 ¶ 69). Patent Owner, thus, concludes that Carter's discussion of shared memory caching does not expressly, or inherently, disclose "assess[ing] unused or underutilized storage resources." *Id.* (citing Ex. 2003 ¶ 69).

Despite Patent Owner's arguments, we find that Carter's policy element 290 (a software module) is configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices. We understand policy element 290 to satisfy this limitation because Carter specifically discloses that policy element 290 "acts as a controller *to determine the availability of resources, such as* printer capabilities, *hard-disk space, available RAM and other such resources*." Ex. 1140, 36:27–29 (emphases added). We credit the testimony of Dr. Kubiatowicz, who during his deposition stated, "I would say this policy controller certainly can evaluate the hard disk space on the local node, but could also potentially evaluate storage throughout the system by communicating with other nodes." Ex. 2002, 86:13–16; *see id.* at 88:5–7; *see also id.* at 88:12–16 ("What I said was that this policy element is determining the availability of resources. So it's assessing whether or not hard disk space of various sorts is available. So it's availability, not just available."); *see id.* at 88:18–89:18, 90:5–91:1. We further credit the testimony of Patent Owner's declarant, Dr. Shenoy, who testified that Carter discloses "determin[ing] the free volume space available for allocation." *See* Ex. 1144, 142:19–20 (referencing Ex. 1140, 19:14–17). Reading directly from Carter, Dr. Shenoy further testified that Carter discloses "request[ing] the total available space information and us[ing] this information to quickly determine whether to proceed with the allocation processing." *Id.* at 142:14–17, 143:1617. In view of the explicit disclosure of Carter and the testimony of both declarants, we find that Carter's controller performs an "assessment" in order to "determine the availability of resources." Additionally, Carter states that policy controller 290 "can employ any of the

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suitable heuristics to direct the elements, such as the paging controller, disk directory manager, and other elements to dynamically distribute the available resources." Ex. 1140, 36:29–37:2. Thus, we agree with Petitioner's argument, as supported by the testimony of Dr. Kubiatowicz, that policy element 290 assesses the unused or underused storage resources when it determines the availability of such resources and uses some heuristics when distributing those resources that were assessed. *See* Pet 39 (citing Ex. 1102 ¶ 118).

Accordingly, based on the entirety of the record before us, we find Petitioner has shown by a preponderance of the evidence that Carter discloses the "assessing" limitations of claims 1 and 13.

> *d. "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices"*

Petitioner contends Carter discloses this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 39 (citing Ex. 1102 ¶ 119), 54 (citing Ex. 1102 ¶ 157). Petitioner argues that "the shared memory subsystem of Carter satisfies this requirement by making the aggregated, shared storage space *appear* to be 'a device that makes data storage resources available to network-connected user devices.'" *Id.* (citing Ex. 1102 ¶ 119). Petitioner argues that, "by communicating over the network with other nodes in the Carter system, the shared memory subsystem makes data storage resources available to network-connected user devices, thus providing the functionality of a NAS device." *Id.* at 39–40 (citing Ex. 1102 ¶ 120). According to Petitioner, "in providing access to data storage

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resources, the shared memory subsystem *appears* to be (*i.e.*, 'mimics') a NAS device, transparently providing a disk-like interface to external clients and user applications, while concealing the underlying details of the shared storage space behind a layer of abstraction." *Id.* at 40.

Petitioner relies on the declaration of Dr. Kubiatowicz, who testifies that the '827 patent provides scant detail as to what is meant by the "representing" requirement of the claim and further testifies that because Carter's "shared memory subsystem hides the details of (or 'encapsulates') memory management from applications running on the local node, the local node 'views' the shared storage space provided by Carter as a single large storage device, rather than the aggregated storage resources of an entire network of participating computers." Ex. 1102 ¶ 119 (citing Ex. 1101, 2:32–35), ¶ 122.

Petitioner, therefore, argues that "even though the shared addressable memory of Carter is created by pooling together unused space from each of the distributed nodes in the system, this pooled storage appears to application programs as a dedicated network-attached storage (NAS) device." Pet. 42 (citing Ex. 1102 ¶ 125). Petitioner cites to Carter's disclosure that "the total volume size" that is provided to the user is equal to the "*current aggregate storage capacity* in the addressable shared memory space 20" as support for its position. *Id.* at 43 (citing Ex. 1140, 16[5]). That is, according to Petitioner, "using the shared memory subsystem, the shared storage space of Carter is represented as a NAS device that has a capacity equal to the total aggregate capacity." *Id.*

[5] Although Petitioner's citation is to page 15 of Carter, the quoted material appears on page 16 of Carter.

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Patent Owner contests Petitioner's position. PO Resp. 30–35. Patent Owner first contends that the NAS component must "represent" "using the corresponding software-based NAS components of the selected distributed devices to cause **each** selected distributed device to **separately** appear to network-connected user devices as a dedicated NAS device." *Id.* at 30. According to Patent Owner, the Carter system appears as a single NAS device because "Carter only discloses a single shared memory space across all nodes, and thus cannot disclose separate NAS devices." *Id.* at 31 (citing Ex. 2003 ¶ 73).

Patent Owner further contends that the term "NAS devices" indicates a plurality and that the claims required multiple selected distributed devices each including a NAS device. *Id.* at 31–32 (citing Ex. 2003 ¶ 74). Patent Owner argues (*id.* at 31) that Dr. Kubiatowicz's testimony during cross-examination supports its position regarding Petitioner's claim construction:

> Q. But you would agree, the single NAS device cannot satisfy the claims of the '827 patent, correct?
>
> . . . .
>
> A. So, it says here that they comprise NAS devices more than one. So, if an analysis were to come out with only one NAS device be represented, it wouldn't satisfy this claim language. However, as I mentioned before, I said multiple NAS devices, both at the individual level, aggregates because there is more than one Carter instance, and the file system example I give here where there are two NAS devices.
>
> . . . .
>
> Q. You would agree that a single NAS device could not meet the limitations of the claims of the '827 patent? Yes or no?

. . . .

A. So I -- so the read on this claim language is potentially a little loose, in the sense that it's, you know, the selected devices comprise NAS devices. But, I will-- you know, I will stipulate that having more than one NAS device when you're done here, seems like it's the closest read on the claim language.

Q. I am just trying to understand what you're understanding is and you are kind of giving me these wishy-washy answers.

A. Fine. It requires more than one NAS device.

Ex. 2002, 80:18–81:25 (objections omitted). Patent Owner further argues that Carter only describes a single shared storage space across all nodes, not separate storage spaces. PO Resp. 32 (citing Ex. 1140, 5). Patent Owner notes that "[e]ven Carter's title acknowledges that it only discloses a single coherent storage space: '**globally** addressable storage environment.'" *Id.* (citing Ex. 1140, Title; Ex. 2003 ¶ 75). And, according to Patent Owner, "Petitioners repeatedly confirm throughout the Petition that Carter discloses only as a single NAS device." *Id.* (citing Pet. 39, 40, 41).

Patent Owner next contends that Dr. Kubiatowicz suggested, in his deposition, that "multiple distributed computer work groups of Carter can each include a single aggregated shared memory, thereby making up multiple shared memory spaces," and Patent Owner contends this is procedurally improper and also technically flawed. *Id.* at 34 (citing Ex. 2002, 78:9–80:17). According to Patent Owner, the testimony is a new theory of operation not supported by Dr. Kubiatowicz's declaration and even if Carter did disclose each computer workgroup having a shared memory space, Carter still does not disclose that each node represents its own

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respective NAS device as required by the claims under the proper interpretation of the "representing" element. *Id.* at 35 (citing Ex. 2003 ¶ 78).

We do not agree with Patent Owner for several reasons. First, "NAS device" as defined in the '827 patent "broadly refers to a device that makes data storage resources available to network-connected user devices. A 'dedicated NAS device' is a device whose primary operational purpose is for providing NAS services." *See* Ex. 1101, 2:31–34. And as discussed previously, one embodiment disclosed in the '827 patent includes an integrated system referred to as a "NAS device fabric." *See* Ex. 1101, 42:65–43:5. Carter discloses a similarly integrated system. Specifically, Carter uses software that causes individual nodes (e.g., commercially available PCs) to represent, or mimic, dedicated NAS devices. Ex. 1140, 10:6–26, Fig. 1. Carter states that "each node may be responsible for storing a particular element or elements of the structured store of data." *Id.* at 9:18–19. Carter discloses that the system can be any structured storage system that maintains an organized set of data. *Id.* at 9:26–27. Carter further discloses with reference to Fig. 1 that "[e]ach of the nodes 12a-12d can access the addressable shared memory space 20 through the shared memory subsystems 34a-34d." *Id.* at 10:30–11:2, Fig. 1.

Additionally, Carter's Figure 11 shows multiple commercially available PC nodes (406a and 406b) each mimicking NAS devices by making storage available. *See* Ex. 1140, 41:12–21. Carter states that, as shown in Figure 11, the "data associated with the directory pages are distributively stored across the two local memories and duplicate copies can exist." *Id.* at 41:29–30, Fig. 11. Carter further discloses that "the data can move between different local memories and also move, or page, between

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volatile and persistent storage." *Id.* at 41:30–42:1. According to Carter, "[t]he data movement can be responsive to data requests made by memory users like application programs, or by operation of the migration controller." *Id.* at 42:1–3.

Based on the disclosure of Carter, we agree with Petitioner, as supported by the testimony of Dr. Kubiatowicz, that Carter's "shared memory subsystem" is the software-based NAS component on each node that cooperates with "shared memory subsystems" on other nodes to make physical storage available. *See* Pet. 22–23, 31–32; Ex. 1102 ¶¶ 79–80, 98–100. Thus, we do not agree with Patent Owner that Carter does not disclose a "'shared memory subsystem' . . . [that] appears as a **single** shared resource across all of Carter's nodes." *See* PO Resp. 30. Rather, we find that Carter discloses a shared memory subsystem on each node that allows the node to mimic a dedicated NAS device by making its storage available to other nodes.

Accordingly, having reviewed the entirety of the record before us and the claim constructions for "representing" proposed by either party, we find that Carter discloses "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices" as recited in claim 1 and similarly recited in claim 13.

e. "allocat[ing] respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices"

Petitioner contends Carter discloses the limitation "wherein the NAS component is configured to: . . . allocate respective available amount of

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unused storage resources in selected distributed devices of the plurality of distributed devices; represent that the selected distributed devices comprise respective NAS devices having the respective available amounts of storage resources," as recited in claim 13. Pet. 54. Petitioner specifically states that this "limitation is satisfied for the reasons given above in the context of claim 1." *Id.* (citing Pet. 37–43; Ex. 1102 ¶ 157).

Patent Owner contests Petitioner's position, arguing that "distributing available resources" does not meet the allocating requirements of the claims. PO Resp. 36–37. Patent Owner contends Petitioner's position and Dr. Kubiatowicz's testimony are conclusory and offer no support or analysis to explain how the disputed limitation is disclosed in Carter. *Id.* at 37. According to Patent Owner, "merely distributing the available resources across the nodes has nothing to do with 'allocate[ing] [sic] respective available amount of unused storage resources.'" *Id.* (alteration in original) (citing Ex. 2003 ¶ 109). Patent Owner asserts that to "allocate" means "[t]o reserve a resource, such as sufficient memory, for use by a program." *Id.* (citing Ex. 2005, 20). Patent Owner cites to the deposition testimony of Dr. Kubiatowicz to support its position (*id.* at 37–38) because Dr. Kubiatowicz testified as follows:

> Q. So allocation means reserving storage on the node?
>
> A. Allocation means basically making the storage available exclusively to the NAS component so that you can represent that you have that amount of storage.
>
> Q. And so because it's available exclusively to the NAS component, you would agree that when storage is allocated, it can't be used for storage purposes other than for use by the NAS component; correct?

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. . . .

A. So we were talking in the context of claim 13. And in the context of claim 13, allocate here means in the context of claim 13 locking down the storage resources so that when you represent that the NAS device has an available amount of storage resources, they are not going to be taken over by local node use.

Ex. 2002, 105:21–106:21 (objection omitted).

Patent Owner then contends "Carter does not explicitly disclose reserving or 'locking down' resources as part of its policy controller's distribution of resource activities to make the[m] 'exclusively available' to Carter's shared memory subsystem." PO. Resp. 38 (citing Ex. 1102 ¶ 111). According to Patent Owner, the mere fact "[t]hat Carter discloses distributing resources does not necessarily mean that unused or under-utilized resources are allocated." *Id.*

We do not agree with Patent Owner. Rather, we find Petitioner has shown that Carter explicitly discloses "allocation" as required by claim 13 for at least the following reasons. First, Petitioner cites to Carter's policy controller because the policy element 290 "acts as a controller to determine the availability of resources, such as . . . hard-disk space, available RAM and other such resources." *See* Pet. 39 (citing Ex. 1140, 36:27–29). In order to determine the availability of memory resources, we understand that the controller assesses used, unused, and allocated space. *See* Ex. 1144, 131:19–22 ("the available amount of unused storage in the allocate step is the amount of unused storage that you determine in the assessment step."). Once data has been moved into previously unused memory space, that space is now allocated to the stored data. We do not agree with Patent Owner's

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overly narrow reading of "allocate" because the claim does not require pre-allocation of specific memory space, nor does it require "exclusive" allocation of memory space for any specific duration. *See* Tr. 32:7–9, 32:21–33:14, 35:1–37:3. As Patent Owner agreed during oral argument, there is no temporal limitation on claim 13's "allocation" so the "allocation" need not be exclusive for a given time period. *Id.* at 32:3–33:5.

Second, we credit the testimony of Dr. Shenoy, who testifies that Carter discloses "allocation" of memory space. Ex. 1144, 133:20–134:3, 127:1–8, 128:1–7, 135:5–17. Additionally, Dr. Shenoy testified that "allocate" has the same meaning when used in Carter as it has in the '827 patent. *Id.* at 124:3–6.

Third, we credit the testimony of Dr. Kubiatowicz, who testifies that both assessing and allocating are old, well-known, and basic functions and would not require significant description. *See* Ex. 1145 ¶ 21. Dr. Kubiatowicz's testimony supports Petitioner's argument that the '827 patent specification lacks a description of both functions because these functions were well understood by a person of ordinary skill in the art. Reply 7 (citing *Microsoft Corp. v. Biscotti, Inc.*, 878 F.3d 1052, 1068 (Fed. Cir. 2017)); *see also Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381 (Fed. Cir. 2015) ("a reference can anticipate a claim even if it 'd[oes] not expressly spell out' all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would 'at once envisage' the claimed arrangement or combination.").

Lastly, we find that Carter explicitly discloses the action of "allocation." Carter specifically "allocates" when it "reserves (sometimes much) larger than requested memory space for a file, and substantiates the

storage by allocating backing storage page by page." *See* Ex. 1140, 19:2–4. Carter further discloses that file system 60 requests the total available space information and uses this information to quickly determine whether to proceed with the allocation processing. *Id.* at 19:14–17. Carter then discloses that "[t]he distributed directory manager can include a directory page generator for allocating a portion of the addressable memory space." *Id.* at 26:18–19. Carter also discloses that its "data streams are mapped onto pages allocated from the addressable shared memory space 20 for storage." *Id.* at 17:18–19. Thus, given Petitioner's argument, Dr. Kubiatowicz's and Dr. Shenoy's testimony, and the explicit disclosures in Carter, we find that Carter's assessment and allocation of memory space for files meets the challenged claim limitation.

f. Summary

Accordingly, having analyzed the entirety of the record, we determine Petitioner has established by a preponderance of the evidence that claims 1 and 13 are anticipated under 35 U.S.C. § 102(b) based on Carter.

3. Analysis of Cited Art as Applied to Dependent Claims 3, 4, 6, 8, 9, 15, 16, 18, 20, and 21

Petitioner contends dependent claims 3, 4, 6, 8, 9, 15, 16, 18, 20, and 21 of the '827 patent are unpatentable under 35 U.S.C. § 102(b) in view of Carter and provides specific arguments for each challenged claim. Pet. 47–53, 55. Patent Owner specifically disputes Petitioner's contentions for claims 4, 9, 16, and 21. PO Resp. 39–50. We address arguments regarding the dependent claims in detail below.

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a. Analysis of Cited Art as Applied to Dependent Claims 3, 6, 8, 15, and 18–20

Petitioner contends that dependent claims 3, 6–8, 15, and 18–20 of the '827 patent are unpatentable under 35 U.S.C. § 12(b) in view of Carter. Pet. 47–48, 51–52, 55.

For claims 3 and 15, which require "receiving an access request from the client device and directing the client device to data requested on at least one of the selected distributed devices," Petitioner argues Carter meets the claim because the shared memory subsystem includes a "flow scheduler" that is a semi-autonomous software agent that routes and services requests from the distributed nodes, as indicated by red arrows in an annotated version of Carter's Figure 8 provided on page 35 of the Petition. *Id.* at 47–48. Petitioner relies on Carter's disclosure that "flow scheduler 272 can be a state machine that monitors and responds to the requests 312 and remote requests through network 304 which can be instructions for memory operations and which can include signals representative of the global addresses being operated on. These memory operation requests 312 can act as op-codes for primitive operations on one or more global addresses. They can be read and write requests, or other memory operations." Ex. 1140, 35:9–14, *cited in* Pet. 48; *see also* Ex. 1102 ¶ 136. In response to such requests, Petitioner cites to Carter's explanation that "[e]ach node 212a-212c *through the shared memory subsystem* 220 can access each page 224a-224d stored in the virtual shared memory 222." *Id.* (citing Ex. 1140, 29 (emphasis added by Petitioner)). Carter further discloses that "[e]ach page 224a-224d represents a unique entry of computer data stored within the virtual shared memory 222." Ex. 1140, 29:14–15. Petitioner asserts that, using the shared

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memory subsystem, each page 224a-224d can be accessed or modified by each one of the nodes 212a-212c. Pet. 48 (citing Ex. 1140, 29). It is in this way, according to Petitioner, that "the shared memory subsystem 'receiv[es] an access request from the client device and directing the client device to data requested on at least one of the selected distributed devices,' as required by the claim." *Id.* at 48 (citing Ex. 1102 ¶ 137).

For claims 6 and 18, which require storing, with the centralized server, location information associated with the data stored in the selected distributed devices, Petitioner contends "Carter teaches that the node responsible for storing the root of the filesystem acts as a centralized server." *Id.* at 51. According to Petitioner, the root of the file system is "location information associated with the data stored in the selected distributed devices," as required by claim 6. *Id.* Similarly, Petitioner argues that the node responsible for storing root directory page 342 acts as a centralized server. *Id.* Petitioner notes that the root directory page contains "location information associated with the data stored in the selected distributed devices," as required by claim 6. *Id.* (citing Ex. 1140, Fig. 10; Ex. 1102 ¶ 146).

For claim 8, which requires that the method be "at least partially performed through the use of the Internet," Petitioner argues that Carter points to the need for strong authentication "because of the ability of the invention to run over physically insecure WANs *such as the Internet.*" *Id.* at 52 (citing Ex. 1140, 63; Ex. 1102 ¶ 149).

For claim 20, which depends from claim 1 and further requires "wherein the distributed devices are configured to be coupled to the

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Internet." Ex. 1101, 48:30–31. Petitioner contends claim 20 is satisfied for the same reasons as claim 8. Pet. 55 (citing Ex. 1102 ¶ 167).

Patent Owner disputes Petitioner's contentions, arguing that dependent claims are not anticipated by Carter for the same reasons as claims 1 and 13. PO Resp. 11.

After considering the parties' arguments and evidence, we agree with Petitioner's position and adopt its arguments as our own. Accordingly, we determine Petitioner has shown by a preponderance of the evidence that dependent claims 3, 6, 8, 15, and 18–20 of the '827 patent are unpatentable under 35 U.S.C. § 102(b) in view of Carter.

b. Analysis of the Prior Art as Applied to Dependent Claims 4 and 16

Claims 4 depends from claim 3, while claim 16 depends from claim 15, and each further require "manag[ing] the NAS service for the [at least one of the particular] distributed devices at least in part utilizing a centralized server." Ex. 1101, 46:65–67, 48:15–17.

Petitioner argues that Carter discloses using a "centralized server," as recited in claims 4 and 16, because Carter uses a root directory page that "can be located at a *static* address that is known to each node coupled to the distributed address space." Pet. 49 (quoting Ex. 1140, 39), 55 (citing Ex. 1102 ¶ 163). According to Petitioner, "[w]hile the other structures stored in the addressable shared memory space can be shifted dynamically from one underlying device to another, the root node is located at a 'static' location – *i.e.*, a known physical address on one of the nodes attached to the system." *Id.* (citing Ex. 1140, 14; Ex. 1102 ¶ 139). Petitioner relies on the testimony

of its declarant, Dr. Kubiatowicz, to support its position. Dr. Kubiatowicz testifies that in Carter

> the node that stores the root directory page 342 is *centralized,* in the sense that it is known to all of the other nodes on the system as a starting point for translating a global address into a physical one. While the traversal of the directory page structure shown in Fig. 10 may involve many different nodes in the system, it always starts with the node that stores the root directory page. Unlike other data structures in the Carter system, which are distributed fluidly among many different computers, this root node is stored in a centralized location.

Ex. 1102 ¶ 142. Dr. Kubiatowicz further testifies that nodes that store Carter's root directory page 342 and root entry point 64 are servers because they receive and respond to requests for information from other nodes in the system. *Id.* ¶¶ 143–144.

Patent Owner disputes Petitioner's contentions, arguing that the claimed "centralized server" must "form[] a known, physical 'center' from the perspective of the distributed devices" and that it "must be physically separate from the client devices (the claimed 'distributed devices') that it serves."[6] PO Resp. 41–42 (citing Ex. 2003 ¶ 85). Patent Owner contends that the nodes storing Carter's root directory page 342 and root 64 are neither centralized nor separate from Carter's distributed nodes. *Id.* at 43 (citing Ex. 2003 ¶ 88). Patent Owner argues that "Petitioners' reliance on Carter's discussion of a 'static address or location' is misplaced because

[6] We note this proposed construction of "centralized server" differs from Patent Owner's proposed construction in related IPR2017-00374. *See* IPR2017-00374, Paper 24, 29–30 ("centralized server" requires "a single server or a single group of servers that are commonly controlled and managed.")

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Carter's reference to a 'static address or location' is with respect to memory addresses in the **virtual shared memory space**, which is a logical address decoupled from the actual physical nodes." *Id.* at 44 (citing Ex. 2003 ¶ 91). According to Patent Owner, "Carter, at best, discloses that the logical address of root directory page 342 or root 64 in the virtual shared memory space can be static and known to each node." *Id.* Patent Owner asserts that "Carter does not teach, or even suggest, that the actual physical node(s) in which root directory page 342 or root 64 is stored is known also to each node." *Id.* Furthermore, according to Patent Owner, "the logical address of root directory page 342 or root 64 can be potentially linked to any node in Carter's systems" such that "Carter contemplates that all its nodes could be linked to the logical address of root directory page 342 or root 64." *Id.* at 44–45 (citing Ex. 2003 ¶ 92).

Patent Owner also contends that applying Carter's distributed architecture to claims 4 and 16 reads the term "centralized" out of the claims. *Id.* at 45. According to Patent Owner, "the term 'centralized' becomes meaningless because it is nonsensical to say there is still a known 'center' in a system when every node in the system is part of the 'center.'" *Id.* (citing Ex. 2003 ¶ 92). Patent Owner argues that, although in one embodiment shown in Figure 11, the root page is stored in persistent memory 262a on one of the nodes, along with some other pages of directory structure 340, Carter neither discloses that the node storing the root page is known to other nodes nor discloses that there is only one, or a limited number of, "centralized" node(s) that store the root page. *Id.* (citing Ex. 2003 ¶ 93). Patent Owner further argues that the root directory page in Figure 11 cannot be the centralized server because it violates one of the key

requirements of a centralized server—that the server is separate from the clients that it serves. *Id.* at 46 (citing Ex. 2003 ¶ 95). Patent Owner asserts that, "[i]n Carter, the root directory is stored in the same node in which distributed data is stored (*i.e.*, a client device), as opposed to being stored in a centralized server, separate from the distributed devices." *Id.* Thus, Patent Owner argues that, "[e]ven if the physical node storing the root directory page was known to other nodes, such a node is merely one of the '*distributed devices*,' as opposed to a '*centralized server*.'" *Id.*

Patent Owner further contends that centralized servers are the antithesis of Carter's architecture. *Id.* at 43–44. According to Patent Owner, "Carter recognized that centralized client-server approaches had limitations such as 'fail[ing] [sic] to exploit available resources as network activity changes,' not 'improve[ing] system performance,' being 'subject to complete system failure each time the server system crashes,' and having 'complex' functionality." *Id.* at 43 (citing Ex. 1140, 2–3; Ex. 2003 ¶ 89). Therefore, Patent Owner argues, "Carter designed its architecture to be completely distributed, with no conventional 'client-server' systems having servers acting as 'a central controller.'" *Id.* (citing Ex. 1140, 1, 2–4; Ex. 2003 ¶ 89). Patent Owner asserts that Petitioner's position that Carter includes a centralized server contradicts Carter's motivations and objectives. *Id.* at 44 (citing Ex. 2003 ¶ 89).

We do not agree with Patent Owner. First, Patent Owner's position regarding an alleged required "single centralized server" is unduly narrow given the language of claim 4 reciting "managing the NAS service for the at least one of the particular distributed devices *at least in part utilizing a centralized server*." Ex. 1101, 46:65–67 (emphasis added). The express

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language of claim 4, therefore, contemplates the use of a "centralized server" "at least in part," not exclusively (i.e., not "[only a single] centralized server"). Still further, multiple such "centralized server[s]" may be used within the scope of claims 4 and 16.

Furthermore, Carter's description of root directories as providing a "starting point to locate the filesets" that are used "[w]hen a node is accessing a fileset for the first time" (Ex. 1140, 14:1–6) appears consistent with the '827 patent's description of "centralized": "Thus, the NAS server systems storing data location information in the centralized data location library 2110, for example, would receive storage and access requests from user devices and would at least in part direct the user devices to the distributed devices storing the requested data." Ex. 1101, 44:37–42. Dr. Kubiatowicz's testimony that "the node that stores the root directory page 342 is *centralized,* in the sense that it is known to all of the other nodes on the system as a starting point for translating a global address into a physical one" (Ex. 1102 ¶ 142) also appears consistent with the notion of centralization in the '827 patent.

Accordingly, after consideration of the entire record before us, we determine Petitioner has shown by a preponderance of the evidence that dependent claims 4 and 16 of the '827 patent are unpatentable under 35 U.S.C. § 102(b) in view of Carter.

c. Analysis of the Prior Art as Applied to Dependent Claims 9 and 21

Claim 9 recites "managing storage resources for the selected distributed devices with a storage priority control that facilitates use of the available amount of storage resources for the selected distributed devices."

Ex. 1101, 47:15–19. Similarly, claim 21 recites "a storage priority control configured to facilitate use of the respective available amount of unused storage resources for the selected distributed devices." *Id.* at 48:32–35.

Petitioner contends that Carter describes "managing storage resources for the selected distributed devices with a storage priority control," as recited in claims 9 and 21. Pet. 52–53 (citing Ex. 1102 ¶ 150), 55 (citing Ex. 1102 ¶ 169). Petitioner argues that a "storage priority control" is demonstrated by Carter's disclosure that the shared memory subsystems can include logic to assess the "*availability of resources*, such as printer capabilities, *hard-disk space*, available RAM and other such resources." *Id.* at 52 (citing Ex. 1140, 36–37). Petitioner further notes that Carter's shared memory subsystem may include a "'policy controller [that] can employ any of the suitable heuristics to direct the elements, such as the paging controller, disk directory manager, and other elements to dynamically *distribute the available resources*.'" *Id.* at 52–53 (alteration in original) (quoting Ex. 1140, 36–37; citing Ex. 1102 ¶ 151). Petitioner also explains that Carter's "memory subsystems 232a-232c can include a hierarchy manager that provides hierarchical control for the distribution of data. This includes controlling the migration controller, and policy controller, which are discussed in detail below, to perform hierarchical data migration and load balancing, such that data migrates primarily between computers of the same group, and passes to other groups in hierarchical order.'" *Id.* at 53 (quoting Ex. 1140, 31 ("*Resource distribution* is similarly managed"); Ex. 1102 ¶ 152).

Patent Owner contests Petitioner's position, arguing that Petitioner fails to demonstrate how Carter describes the management of storage resources by any component, "let alone management that facilitates the use

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of an available amount of **unused** storage resources of distributed devices." PO Resp. 48. Specifically, Patent Owner argues that "Carter does not disclose that it determines availability based on priority (the ranks, positions, or privileges) assigned to different storage resources for the selected distributed devices." *Id.* at 49 (citing Ex. 2003 ¶ 100). Patent Owner further argues that Petitioner does not explain how or why using "heuristics" teaches that the policy controller facilitates the usage of unused storage resources in any manner. *Id.* Patent Owner then argues that Carter's heuristics would not necessarily be "a storage priority control" as required by the challenged claims. *Id.* at 50. According to Patent Owner, "Carter's disclosure of 'load balancing' or 'resource distribution' does not necessitate '*storage priority control.*'" *Id.* (citing Ex. 2003 ¶ 102).

We do not agree with Patent Owner. Rather, we find that "storage priority control" is demonstrated by Carter's disclosure that the shared memory subsystems can include logic to assess the "*availability of resources*, such as printer capabilities, *hard-disk space*, available RAM and other such resources." Ex. 1140, 36:27–29 (emphases added). Additionally, we agree with Petitioner that Carter's "policy controller," which "dynamically distribute[s] the available resources" based on "suitable heuristics," and Carter's memory subsystems that prioritize storage resources using functionality like "hierarchical data migration," "load balancing," and "resource distribution" describe the disputed claim limitation. *See* Pet. 52–53; Ex. 1102 ¶ 151; Ex. 1140, 31, 36.

Accordingly, after consideration of the entire record before us, we determine Petitioner has shown by a preponderance of the evidence that

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dependent claims 9 and 21 of the '827 patent are unpatentable under 35 U.S.C. § 102(b) in view of Carter.

d. Summary

On this record and for purposes of this Decision, we determine Petitioner has shown by a preponderance of the evidence that dependent claims 3, 4, 6, 8, 9, 15, 16, 18, 20, and 21 are anticipated under 35 U.S.C. § 102(b) based on Carter.

E. Alleged Obviousness of Dependent Claims 5 and 17 of the '827 Patent in View of Carter and Pitzel

Petitioner contends dependent claims 5 and 17 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of Carter and Pitzel. Pet. 55–59. Patent Owner disputes Petitioner's contentions, arguing Pitzel fails to remedy the alleged deficiencies of Carter with respect to independent claims 1 and 13. PO Resp. 51. For reasons that follow, we determine Petitioner has shown by a preponderance of the evidence that the challenged claims would have been obvious in view of Carter and Pitzel.

1. Overview of Carter

See supra Section II.D.1.

2. Overview of Pitzel

Pitzel is a US Patent titled "System and Method for Updating Information via a Network." Ex. 1142, Title. Pitzel is directed to a "method for upgrading software for various users, each of the users having diverse hardware and software configurations." *Id.* at Abstract. The invention of Pitzel "includes a method for automatically determining the hardware and software configuration of the client computer without user intervention." *Id.* According to Pitzel, "[t]o begin the upgrade, the client computer reads a configuration file that identifies the components for downloading." *Id.*

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Pitzel discloses that "[u]pon receipt of the configuration file, the client computer determines the hardware and software configuration of the client computer." *Id.* The client computer of Pitzel then "automatically communicates with a component server via a network and requests one or more components for downloading to the client computer based upon the configuration file and the hardware and software conditions of the client computer." *Id.*

3. Analysis of the Prior Art as Applied to Dependent Claims

Claims 5 and 17 depend from dependent claims 4 and 16, respectively. As discussed previously (*see supra* Section II.D.3.b), we are persuaded by Petitioner's arguments that Carter satisfies the limitations in claims 4 and 16 requiring a centralized server. For claims 5 and 17, which require downloading the software-based NAS component to the selected distributed devices (Ex. 1101, 47:1–3, 48:19–21), Petitioner contends Pitzel meets this limitation. Pet. 56. According to Petitioner, "Pitzel teaches 'downloading' of a component to a client, which is equivalent to the 'selected distributed device[]'" and "teaches a network with multiple clients, each of which can download and install a component." *Id.* (citing Ex. 1142, Abstract, 3:23–27). Petitioner contends that a person of ordinary skill in the art would have had a reason to combine the teachings of Carter with that of Pitzel because (1) the references both are in the same field of endeavor, *id.* at 57; (2) a person of ordinary skill in the art would have recognized the benefits of incorporating the teachings of Pitzel to the system of Carter, *id.* at 58; and (3) Pitzel could have been easily incorporated into the Carter system, and such combination would have yielded predictable results, *id.*

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Petitioner argues that "the network system in Carter can advantageously incorporate the downloading mechanism in Pitzel to provide a software-based NAS component to a computer in the network. The computer can install the downloaded component to provide NAS service to other computers in the network." *Id.* According to Petitioner, "[t]he downloading mechanism in Pitzel can also provide an update to an existing software-based NAS component on a computer in the network. Such an update can make a version change, fix software issues, and/or implement a feature change." *Id.* (citing Ex. 1102 ¶ 177). Petitioner supports its position with the declaration of Dr. Kubiatowicz, who testifies that "[a] [person of ordinary skill in the art] would further appreciate that any software of the level of complexity of Carter would greatly benefit from the ability to perform updates—especially over geographic distances such as illustrated by Carter's discussion of Figs. 12A, 12B and 13." Ex. 1102 ¶ 177 (citing Ex. 1140, 49–50, Figs. 12A, 12B, 13).

Patent Owner disputes Petitioner's position, arguing that Pitzel fails to cure the alleged deficiencies of Carter with respect to independent claims 1 and 13. PO. Resp. 51.

After considering the entirety of the record and analyzing the parties' arguments and evidence, we agree with Petitioner's position and adopt its arguments as our own. *See, e.g.*, Ex. 1102 ¶ 177. In particular, we credit Dr. Kubiatowicz's testimony regarding the advantages of being able to perform software updates. *See id.* Accordingly, we determine Petitioner has shown by a preponderance of the evidence that dependent claims 5 and 17 would have been obvious under 35 U.S.C. § 103(a) in view of Carter and Pitzel.

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F. Alleged Obviousness of Dependent Claims 4, 6, 7, 16, 18, and 19 in view of Carter and Condor

Petitioner contends dependent claims 4, 6, 7, 16, 18, and 19 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of Carter and Condor. Pet. 59–66. Prior to our Decision to Institute, Patent Owner disputed Petitioner's contentions. Prelim. Resp. 29–35. As discussed previously, following the issuance of *SAS Institute*, we modified our Decision to Institute to include all of the challenged claims and all of the grounds presented in the Petition. Paper 48.

1. Overview of Carter

See supra Section II.D.1.

2. Overview of Condor

Condor is a publication titled "Condor – A Hunter of Idle Workstations." Ex. 1117, Title. Condor is directed to a scheduling system that operates in a workstation environment. *Id.* at Abstract. Condor discloses "maximiz[ing] the utilization of workstations with as little interference as possible between the jobs it schedules and the activities of the people who own workstations." *Id.* It teaches identifying idle workstations and scheduling background jobs on them, so that when the owner of a workstation resumes activity at a station, Condor checkpoints the remote job running on the station and transfers it to another workstation. *Id.* According to Condor, the "system guarantees that the job will eventually complete, and that very little, if any, work will be performed more than once." *Id.*

Condor contemplates a "wide spectrum of scheduling structures" that use scheduling coordinators that "follow[] the principle that workstations are autonomous computing resources and they should be managed by their own

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users. *Id.* at 4, 6. Condor states that "[t]his also helps to keep the responsibilities of the coordinator simple." Ex. 1117, 6. According to Condor, "[s]implicity is important so that a central site is not required to maintain a great amount of information about each workstation." *Id.* Condor contemplates that either a centralized, static coordinator could assign background jobs to execute at available remote workstations (*id.* at 4–5) or a distributed approach could be used where assignment of available processors is accomplished by each workstation cooperating to conduct a scheduling policy (*id.*).

One embodiment disclosed in Condor is shown in Figure 1, reproduced below.

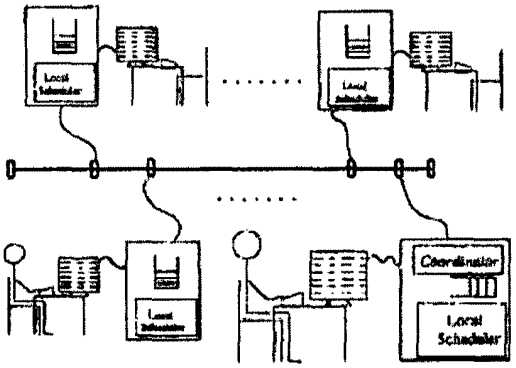


Figure 1, above, shows one version of the Condor background job scheduler that lies between a centralized, static approach and the fully distributed approach. Condor explains that "[t]his approach uses the efficiency of scheduling with a central node to avoid the overhead of messages to decide which workstations should be allocated available capacity." *Id.* at 5. Condor discloses that its system can be extendible to a large number of workstations and eases the required recovery when a centralized coordinator fails. *Id.* at 6–7. According to the teachings of Condor, "[l]ocal schedulers

are not affected if a remote site discontinues service." *Id.* at 7. Condor discloses that "[i]f the site on which the coordinator is executing fails, remotely executing jobs initiated and executing on other machines are not affected. Only the allocation of new capacity to requesting users is affected." *Id.* Condor explains that because "the coordinator has few duties, its recovery at another site is simplified in relation to a fully centralized strategy." *Id.* In order to balance the burden of coordination, Condor states that the central coordinator can be moved to other locations. *Id.*

3. Analysis of Cited Art as Applied to the Challenged Dependent Claims

Claim 4 depends from claim 3, and further requires "managing the NAS service for the at least one of the particular distributed devices at least in part utilizing a centralized server." Ex. 1101, 46:65–67. Claim 6 depends from claim 4, and requires the method of claim 4 to further comprise "storing, with the centralized server, location information associated with the data stored in the selected distributed devices." *Id.* at 47:4–6. Claim 7 depends from claim 6, and requires the method of claim 6 to further comprise "utilizing the centralized server to receive and route the data for storage to the selected distributed devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database." *Id.* at 47:7–12. Dependent claims 16, 18, and 19 recite substantially similar limitations as claims 4, 6, and 7 but depend from independent claim 13. *Id.* at 48:15–29.

Petitioner contends these dependent claims would have been obvious in view of the combined teachings of Carter and Condor. Pet. 60 (citing Ex. 1102 ¶ 184). In particular, for claim 4, Petitioner argues that "Condor teaches 'managing' the use of 'resources of the workstation [that] are

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underutilized' at least in part using a 'central coordinator.'" *Id.* (brackets in original) (citing Ex. 1117, 1, 5–6). According to Petitioner, "[t]he central coordinator is held on one of the workstations that also has its own local scheduler and background job queue." *Id.* (citing Ex. 1117, 6). Petitioner argues that the central coordinator "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting." *Id.* Petitioner further argues the central coordinator knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* (citing Ex. 1117, 16; Ex. 1102 ¶ 184).

For dependent claim 6, Petitioner contends "Condor teaches 'storing' 'location information associated with the data' stored on the distributed devices with a 'central coordinator.'" Pet. 62 (citing Ex. 1117, 1, 5–6). According to Petitioner, the central coordinator "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting." *Id.* (citing Ex. 1117, 6). Petitioner further argues that the central coordinator knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* (citing Ex. 1117, 16; Ex. 1102 ¶ 189). For claim 7, Petitioner argues that "Condor teaches 'utilizing' a central coordinator to 'receive and route data for storage' based upon a 'capabilities database.'" *Id.* at 63. Petitioner relies on Condor's disclosure of central coordinator that "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting," and which knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* at 63–64 (citing Ex. 1117, 6; Ex. 1102 ¶ 192). For claims

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16, 18, and 19, Petitioner states that the arguments and rationales for claims 4, 6, and 7 apply. *Id.* at 64–65.

Petitioner supports its position with the declaration of Dr. Kubiatowicz, who testifies that the challenged dependent claims would have been obvious in light of the combination of Carter and Condor. Ex. 1102 ¶¶ 183–201. Dr. Kubiatowicz specifically testifies that "[t]he advantages and disadvantages of both centralized and distributed approaches to coordination and management were well[-]known even at the time Condor was published." *Id.* ¶ 185 (citing Ex. 1117, 5 ("Both the centralized and the distributed approaches have well known advantages and disadvantages.")). Dr. Kubiatowicz specifically testifies that "it would have been obvious to a person of ordinary skill in the art that both approaches have advantages that could have been exploited using well known techniques, as well as disadvantages that [could have been] avoided using well known techniques, just like Condor's central coordinator." Ex. 1102 ¶ 186. According to Dr. Kubiatowicz, "[i]ncorporating Condor's explicit teaching of a 'central coordinator' into Carter would have been obvious to one of ordinary skill in the art, would have yielded predictable results, and would have involved tools and techniques that were well known at the time." *Id.* ¶ 187. Dr. Kubiatowicz further testifies that a person of ordinary skill in the art "would readily recognize the benefits of incorporating the teachings of Condor to the system of Carter. For example, the network system in Carter can advantageously incorporate the central coordinator in Condor to provide a centralized mechanism to manage resource sharing." *Id.* ¶ 199.

Patent Owner contests Petitioner's position, arguing Petitioner fails to provide an adequate rationale as to why a person of skill in the art would

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combine an entirely distributed system from Carter with a centralized system from Condor, especially in light of Carter criticizing centralized servers such as those required in claims 4 and 6. Prelim. Resp. 31–32. Patent Owner specifically argues that Petitioner provides no analysis regarding the combination of Carter and Condor but, rather, offers only conclusory statements that merely are reiterated by Dr. Kubiatowicz. *Id.* at 32–33.

We agree with Patent Owner that Petitioner fails to offer sufficient explanation as to why a person of ordinary skill in the art would have combined the teachings of Carter and Condor. Rather, Petitioner appears to argue that, based on the advantages described by Condor (Ex. 1017, 5), and using well-known techniques with unspecified predictable results, a person of ordinary skill in the art would have had sufficient reason to combine these disparate elements taught in the prior art references to render the challenged claims obvious. Pet. 61–66. Yet, other than Petitioner's cursory assertion of "advantageously incorporat[ing] the central coordinator in Condor to provide a centralized mechanism to manage resource sharing" (Pet. 66), which cites equally cursory and unsupported testimony by Dr. Kubiatowicz (Ex. 1102 ¶ 199), Petitioner fails to identify what particular advantages or efficiencies would have prompted a person of ordinary skill in the art to combine Condor's scheduler with Carter's system. Furthermore, Dr. Kubiatowicz's testimony regarding predictable results and obviousness to try are similarly lacking in elaboration and substantiation. *See* Ex. 1102 ¶¶ 200–201. Such conclusory statements and unspecific testimony without evidence on the record cannot satisfy the Petitioner's burden of demonstrating obviousness. *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016); *I/P Engine, Inc. v. AOL Inc.*, 576 F. App'x 982,

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999 (Fed. Cir. 2014) ("The testimony of the Defendants' expert amounts to a 'mere conclusory statement' that may not serve as a basis for finding the asserted claims obvious."); *see also InTouch Techs., Inc. v. VGO Commc'ns, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014) (holding that expert's testimony could not support a finding of obviousness where "testimony primarily consisted of conclusory references to [the expert's] belief that one of ordinary skill in the art *could* combine these references, not that they *would* have been motivated to do so"); *see also* 37 C.F.R. 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

Although Petitioner has not provided a sufficient rationale to combine in this asserted ground of unpatentability, Petitioner has otherwise demonstrated that claims 4, 6, 16, and 18 are unpatentable under 35 U.S.C. § 102(b) because they are anticipated by Carter. Petitioner, however, has not asserted claims 7 and 19 are unpatentable under any other ground in this proceeding. Therefore, we determine Petitioner has failed to establish by a preponderance of the evidence that claims 7 and 19 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of Carter and Condor.

III. CHALLENGE TO PETITIONER'S REPLY ARGUMENTS

With Board authorization (Paper 37), Patent Owner filed a list of alleged improper reply arguments (Paper 37), to which Petitioner filed a Reply (Paper 38). Patent Owner lists several portions of Petitioner's Reply and evidence allegedly beyond the scope of what can be considered appropriate for a reply. *See* Paper 37 (citing Reply).

We have considered Patent Owner's listing, but we disagree that the cited portions of Petitioner's Reply and reply evidence are beyond the scope

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of what is appropriate for a reply. Replies are a vehicle for responding to arguments raised in a corresponding Patent Owner Response. Petitioner's arguments and evidence are not beyond the proper scope of a reply because we find that they fairly respond to Patent Owner's arguments raised in Patent Owner's Response. *See Idemitsu Kosan Co., LTD. v. SFC Co. Ltd.*, 870 F.3d 1376, 1381 (Fed. Cir. 2017) ("This back-and-forth shows that what [Patent Owner] characterizes as an argument raised 'too late' is simply the by-product of one party necessarily getting the last word. If anything, [Patent Owner] is the party that first raised this issue, by arguing—at least implicitly—that [a reference] teaches away from non-energy-gap combinations. [Petitioner] simply countered, as it was entitled to do."); *see also Anacor Pharms., Inc. v. Iancu*, 889 F.3d 1372, 1380 (Fed. Cir. 2018) ("In addition, the petitioner in an inter partes review proceeding may introduce new evidence after the petition stage if the evidence is a legitimate reply to evidence introduced by the patent owner . . . .").

IV. CONCLUSION

For the foregoing reasons, we conclude Petitioner has shown by a preponderance of the evidence that (1) claims 1, 3, 4, 6, 8, 9, 13, 15, 16, 18, 20, and 21 under 35 U.S.C. § 102(b) as unpatentable over Carter, and (2) claims 5 and 17 under 35 U.S.C. § 103(a) as unpatentable over Carter and Pitzel. We find, however, Petitioner has failed to provide an adequate rationale to combine the teachings of Carter and Condor, and we determine Petitioner has failed to establish by a preponderance of the evidence that claims 7 and 19 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of Carter and Condor.

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V. ORDER

For the reasons given, it is

ORDERED that, by a preponderance of the evidence, claims 1, 3–6, 8, 9, 13, 15, 16–18, 20, and 21 of the '827 patent are unpatentable; and

FURTHER ORDERED that because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Paper No. 53
Filed: June 20, 2018

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EMC CORPORATION, LENOVO (UNITED STATES) INC.,
NETAPP, INC.,
Petitioner,

v.

INTELLECTUAL VENTURES I LLC,
Patent Owner.

Case IPR2017-00374
Patent 8,275,827

Before JEFFREY S. SMITH, GEORGIANNA W. BRADEN, and DANIEL J. GALLIGAN, *Administrative Patent Judges*.

BRADEN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION

35 U.S.C. § 318

I. INTRODUCTION

We have jurisdiction to hear this inter partes review under 35 U.S.C. § 6, and this Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 3–9, 13, and 15, 16, and 18–21 of U.S. Patent No. 8,275,827 (Ex. 1001, "the '827 patent") are unpatentable.

A. Procedural History

EMC Corporation, Lenovo (United States) Inc., and NetApp, Inc. ("Petitioner") filed a Petition (Paper 5, "Pet.") to institute an *inter partes* review of the challenged claims of the '827 patent. Intellectual Ventures I LLC ("Patent Owner") timely filed a Preliminary Response (Paper 9, "Prelim. Resp.").

Pursuant to 35 U.S.C. § 314(a), we originally instituted an *inter partes* review of claim 1, 3–9, 13, and 15–21 under 35 U.S.C. § 103(a) as unpatentable over OceanStore.[1] *See* Paper 11 ("Dec. to Inst."), 39–40. On April 24, 2018, the Supreme Court held that a decision to institute under 35 U.S.C. § 314 may not institute on fewer than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348 (2018). Thereafter, we modified the institution decision to institute on all of the challenged claims and all of the grounds presented in the Petition. Accordingly, this *inter partes* review also includes review of (1) claims 1, 3–9, 13, and 15–21 as

[1] Kubiatowicz, John et al., *OceanStore: An Architecture for Global-Scale Persistent Storage*, ASPLOS-IX proceedings: Ninth International Conference on Architectural Support for Programming Languages and Operating Systems, pages 190–201 (2000) (Ex. 1003, "OceanStore").

unpatentable under 35 U.S.C. § 102(a) in view of OceanStore and (2) claims 4, 6, 7, 16, 18, and 19 as unpatentable under 35 U.S.C. § 103(a) in view of OceanStore and Condor[2]. *See* Paper 51, 2; *see also* Ex. 3001 (email "advis[ing] the Board that Patent Owner will waive its right to file a [Patent Owner Response] and will not request an oral hearing on the newly instituted grounds in this proceeding. Both parties have conferred and believe this closes the record and allows the Board to issue a final written decision based on the current record.").

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 24, "PO Resp."), to which Petitioner filed a Reply (Paper 32, "Reply"). Patent Owner also filed Objections to Evidence (Papers 14, 17, 35) and a Motion for Observation on Cross-Examination (Paper 36). Petitioner responded to Patent Owner's Motion for Observation on Cross-Examination. Paper 40. In addition, and with our authorization, Patent Owner filed a list of alleged improper reply arguments (Paper 41) to which Petitioner filed a Response (Paper 42).

An oral argument was held on March 5, 2018, together with co-pending Case IPR2017-00429. A transcript of the oral argument is included in the record. Paper 52 ("Tr.").

B. Related Proceedings

The parties inform us that the challenged patent is the subject of two district court proceedings in the District of Massachusetts, captioned *Intellectual Ventures I LLC et al. v. Lenovo Group Ltd.* (1:16-cv-10860-IT)

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[2] Litzkow, M.J., et al., *Condor – A Hunter of Idle Workstations*, Computer Sciences Technical Report #730 (1987) (Ex. 1017, "Condor").

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and *Intellectual Ventures I, LLC et al. v. NetApp, Inc.* (1:16-cv-10868-IT). Pet. 2; Paper 7, 1 (Patent Owner's Mandatory Notices).

C. The '827 Patent

The '827 patent was filed on April 13, 2001, and is titled "Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks." Ex. 1001, Title. It describes systems and methods for software-based network attached storage (NAS) services hosted on a massively-distributed network of devices. *Id.* at Abstract. The '827 patent discloses that the term "NAS device" generally refers to "a specialized file server that connects to the network to provide storage capacity to network-connected users" (*id.* at 2:18–20), and, in the context of the '827 patent, "broadly refers to a device that makes data storage resources available to network-connected user devices" (*id.* at 2:31–34). The '827 patent further discloses that a NAS device typically takes the form of a standalone dedicated hardware device that contains its "own storage, processing, connectivity, and management resources." *Id.* at 2:12–14. According to the '827 patent, ordinary desktop computers often sit idle for long periods of time but have the same specifications (e.g., a Pentium processor, a hard drive, and an Ethernet connection) and often greater functional capabilities than dedicated NAS devices. *Id.* at 2:46–55. The '827 patent proposes making these otherwise unused storage resources available to other devices connected to the network. *Id.* at 2:66–3:1, 42:36–41.

In one embodiment, the '827 patent describes a distributed NAS system, shown in Figure 21 reproduced below, that includes user devices 152 and NAS client devices 108. *Id.* at 43:6–15.

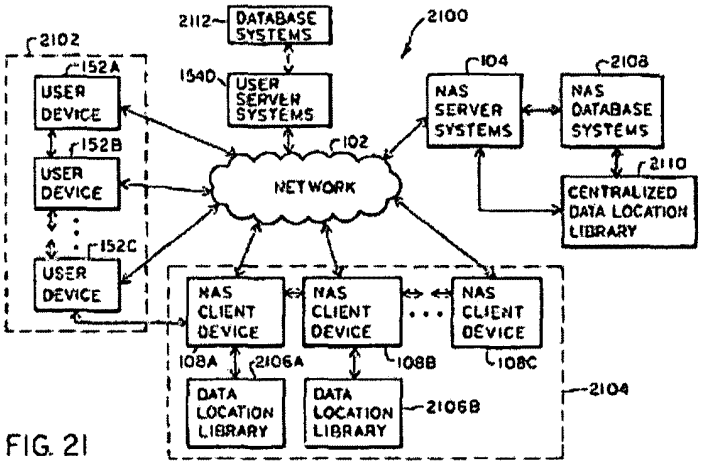


FIG. 21

Figure 21 provides a block diagram for an embodiment for a distributed processing system that provides network attached storage (NAS) services. Ex. 1001, 42:29–31.

As illustrated above in Figure 21 of the '827 patent, the server systems may include user server systems 154D, which have attached database systems 2112, and NAS server systems 104 with attached NAS database systems 2108 and centralized data location library 2110. Ex. 1001, 43:22–26. To provide NAS functionality, the '827 patent describes client devices 108A, 108B, . . . 108C as running a client agent that provides NAS functionality by running a NAS component as one of the projects for the distributed device. *Id.* at 43:26–30. According to the '827 patent, some of these NAS devices, such as NAS client devices 108A and l08B, may store distributed data location information, such as data location libraries 2106A and 2106B. *Id.* at 43:30–33.

The '827 patent discloses that the NAS client devices within client device fabric 2104 can act as stand-alone NAS devices and user devices within user device fabric 2102 can directly access them as such. *Id.* at 43:44–46. Additionally, at least some of the NAS client devices within

client device fabric 2104 include data location information or libraries that are used to provide links or directions to data distributed on various NAS client devices 108A, 108B, . . . 108C. *Id.* at 43:59–63. These links help provide a NAS device fabric from which user server systems 154D and user devices 152A, 152B, . . . 152C within user device fabric 2102 can draw storage resources. *Id.* at 43:63–66.

The '827 patent also contemplates that server systems 104 facilitate the NAS functionality, for example, by providing centralized management, control, and support for the NAS architecture. *Id.* at 44:24–27. According to the '827 patent, NAS servers systems 104 may include, for example, file storage database systems 2108 and centralized data location library 2110. *Id.* at 44:27–29. Additionally, the '827 patent discloses that the user devices, which can be any type of computer devices, are configured to access data stored on the NAS client devices. *Id.* at 44:60–64.

D. Illustrative Claims

As noted above, an *inter partes* review was instituted as to claims 1, 3–9, 13, and 15–21 with claims 1 and 13 being independent. Claims 1 and 13 are illustrative of the challenged claims and are reproduced below:

1. A computer-implemented method comprising:

configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system,

wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-

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utilized storage resources in selected distributed devices of the plurality of distributed devices;

representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices;

processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network; and

enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the respective client agents for the particular distributed device.

Ex. 1001, 46:28–56.

13. A system comprising:

a plurality of distributed devices configured to be coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of workloads for the distributed processing system, the respective client agents including respective instances of a software-based network attached storage (NAS) component, wherein the NAS component is configured to:

assess unused storage resources of the distributed devices;

allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices;

represent that the selected distributed devices comprise respective NAS devices having the respective available amounts of storage resources;

> process workloads associated with data storage and access by accessing data from and storing data into portions of the storage resources in the selected distributed devices to provide NAS service to a client device: and
>
> wherein the respective client agents are configured to enable at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

Id. at 47:28–48:7.

II. DISCUSSION

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear.[3] 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) ("We conclude that the regulation represents a reasonable exercise of the rulemaking authority that Congress delegated to the Patent Office."). Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An inventor, however, may provide a meaning for a term that is different from its ordinary meaning by defining the term in the specification with "reasonable clarity, deliberateness, and precision." *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

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[3] We are not aware of any evidence of record in this proceeding that would lead to a different outcome under the *Phillip* claim construction standard. *See Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed.Cir.2005).

Limitations, however, are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). In addition, the Board may not "construe claims during [an *inter partes* review] so broadly that its constructions are unreasonable under general claim construction principles." *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015), *overruled on other grounds by Aqua Prods., Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017).

Thus, when construing the claims at issue (1) we look at the language of the claims themselves, (2) we consult the patent's specification to help clarify the meaning of claim terms, because the claims "must be read in view of the specification, of which they are a part," *Trading Techs. Int'l, v. eSpeed, Inc.*, 595 F.3d 1340, 1352 (Fed.Cir.2010) (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (en banc), *aff'd*, 517 U.S. 370 (1996)), and (3) we review "the patent's prosecution history in proceedings in which the patent has been brought back to the [US Patent and Trademark Office] for a second review" (*Microsoft Corp.*, 789 F.3d at 1298).

The parties dispute the proper construction of the limitation "[r]epresenting with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices" as recited in claims 1 and 13. *See* Pet 11–12; PO Resp. 8–11; Reply 3–8. Specifically, the parties proposed the following constructions:

Petitioner	"using the corresponding software-based NAS components of the selected distributed devices to mimic dedicated NAS devices"

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Patent Owner	"using the corresponding software-based NAS components of the selected distributed devices to cause each selected distributed device to separately appear to network-connected user devices as a dedicated NAS device"

Patent Owner argues the explicit language of the claims requires that each distributed device includes its own NAS device. PO Resp. 8. Patent Owner notes that the term "respectively" has "a well-settled meaning of '[s]eparately or individually and in the order already mentioned.'" *Id.* at 9 (citing Exhibit 2001, 1219). According to Patent Owner, the word "respectively" as used in claims 1 and 13 modifies the clause "selected distributed devices." *Id.* Thus, Patent Owner argues that the explicit and plain language of the claims requires a representation that each of the "selected distributed devices," separately or individually, appears to the network-connected user devices as a "NAS device." *Id.* Patent Owner further argues that its construction is consistent with the specification of the '827 patent because "[t]he '827 patent defines a 'NAS device' as 'a device that makes data storage resources available **to network-connected user devices**.'" *Id.* (quoting Ex. 1001, 2:31–34). Patent Owner contends that "[w]hen this definition of NAS device is applied, the '*representing*' phrase requires a representation that each individual 'selected distributed device' comprises 'a device that makes data storage resources available to network-connected user devices.'" *Id.*

Patent Owner relies on the testimony of its declarant, Prashant Shenoy, Ph.D. ("Dr. Shenoy") to support its position. PO Resp. 9 (citing Ex. 2003 ¶ 34). Dr. Shenoy testifies that "[a]n integrated system that

appears as a single device would not satisfy this requirement, as each individual distributed device would not separately make, or appear to make its resources available to network-connected user devices." Ex. 2003 ¶ 34. Dr. Shenoy concludes that "the plain language of the claims requires each individual 'selected distributed device' to 'bring[] **its** resources to the network **with the appearance of a dedicated NAS device**.'" *Id.* (alteration in original) (quoting Ex. 1001, 42:59–65).

We agree with Patent Owner regarding the ordinary meaning of the term "respectively." Specifically, we understand that the word "respectively" can be an adverb that means for each "separately or individually, and in the order already mentioned." The use of "respectively" as an adverb in the English language requires parallelism. *See* Ex. 2001; Ex. 3002. In other words, there must be a direct one-to-one correspondence and specific referents must be *individually* identified before there can be a "parallel list" of attribute values applicable to *each, in that order.* The term "respectively" also can be an attributive adjective that means "concerning or appropriate to each of several individually." Ex. 3002. In the present case, the term "respectively" appears to modify "the selected distributed devices." Because specific referents are not individually identified, we understand the term to act as an attributive adjective modifying each of several selected distributed devices.

Although we agree with Patent Owner regarding the use of the term "respectively," we do not understand its use to require "the selected distributed devices to cause each selected distributed device to separately appear to network-connected user devices as a dedicated NAS device." We cannot construe individual terms in isolation. Rather, we must consider the

claim as a whole in view of the specification. Specifically, we must consider the implications of other terms recited in claims 1 and 13 (e.g., "location information") and how the claims are supported by the disclosed embodiments.

As a general rule, "there is a strong presumption against a claim construction that excludes a disclosed embodiment." *See In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1324 (Fed. Cir. 2011). Several exceptions to this presumption apply. For example, a claim may be interpreted to exclude embodiments "where those embodiments are clearly disclaimed in the specification . . . or prosecution history." *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1277 (Fed. Cir. 2008). Similarly, where the disputed term is not present in the other independent claims of the patent-in-suit, it is permissible to construe the term so as to exclude an embodiment. This is because the other claim terms "leave[] open the possibility that claims not at issue in [the claim construction] encompass omitted embodiments." *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1383 (Fed. Cir. 2008). Otherwise, "where claims can reasonably [be] interpreted to include a specific embodiment, it is incorrect to construe the claims to exclude that embodiment, absent probative evidence [to] the contrary." *Oatey Co.*, 514 F.3d at 1277.

In this case, the disclosure in the '827 patent teaches at least three embodiments using the selected distributed devices in a variety of ways, including as "stand-alone" devices (Ex. 1001, 43:44–47), as part of a "NAS device fabric" (*id.* at 43:59–63, 44:9–12), and in a "server assisted implementation" (*id.* at 44:24–27). Specifically, the '827 patent discloses that "a large number of desktop PCs in the enterprise (Intranet) or on the

Internet can each act as a NAS device by running a client agent program and NAS component that brings its resources to the network with the appearance of a dedicated NAS device or **as part of an integrated system that appears as a single or dedicated NAS device**." *See* Ex. 1001, 42:59–65 (emphasis added). The '827 patent further discloses:

> A relatively simple implementation is to have the devices simply mimic the functionality of stand-alone NAS devices, while a more complex implementation is to provide a storage fabric across the Intranet or Internet where hundreds or thousands of devices work cooperatively as NAS devices in conjunction with server systems that assist in controlling and managing the storage function of the NAS fabric."

See Ex. 1001, 42:66–43:5. Yet, Patent Owner's construction intentionally reads out the embodiments covering a NAS fabric and the "server assisted implementation" of the devices. Patent Owner specifically argues:

> [T]he explicit language of the claims excludes this embodiment by requiring the representation that the "selected distributed devices **respectively** comprise NAS devices." ('827 patent, 46:41–46 (emphasis added).) Instead, the claim language recites the embodiment described first in this passage—that each individual NAS device "brings **its** resources to the network **with the appearance of a dedicated NAS device**." ('827 patent, 42:59–65 (emphasis added).)

PO Resp. 11. Patent Owner's position is contrary to the recited claims when considered as a whole and runs counter to prevailing case law. *See Oatey Co.*, 514 F.3d at 1277; *Helmsderfer, Inc.*, 527 F.3d at 1383.

Both independent claims 1 and 13 recite "enabl[ing] at least one of the selected distributed devices to function as a location distributed device to store *location information* associated with data stored by the selected

distributed devices." As Petitioner argues, the NAS fabric embodiment disclosed in the '827 patent is "the ***only*** embodiment in which [Patent Owner's declarant], Dr. Shenoy, could identify disclosure of the recited 'location information' that was required to secure allowance of the claims." Reply 5 (citing Ex. 1053, 43:16–44:16); *see* Ex. 1053:57:7–21. According to Dr. Shenoy, one reason that a "stand-alone implementation does not require the data location library to be used" is "presumably because it's a stand-alone implementation, and clients connect to the stand-alone NAS devices directly." Ex. 1053, 53:18–54:8. Thus, Patent Owner's argument that each selected distributed device must appear separately to network-connected user devices as a dedicated NAS device improperly imports selected limitations from the specification into the claim and ignores additional required elements recited in the claims. *See In re Van Geuns,* 988 F.2d 1181, 1184 (Fed.Cir.1993).

Accordingly, we do not agree with Patent Owner's position because Patent Owner's proposed construction narrows unnecessarily the scope of the challenged claims. Furthermore, as detailed below, even if we accepted Patent Owner's proposed construction, it would not alter our determination regarding the patentability of the challenged claims. No further construction is necessary for our analysis.

B. Principles of Law

A claim is unpatentable under 35 U.S.C. § 102 if a prior art reference discloses every limitation of the claimed invention, either explicitly or inherently. *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047 (Fed. Cir. 1995). If the prior art reference does not expressly set forth a particular element of the claim, that reference still may anticipate if that element is

"inherent" in its disclosure. *In re Robertson*, 169 F.3d 743 (Fed. Cir. 1999). To establish inherency, extrinsic evidence, when relied upon, "must make clear that the missing descriptive matter is necessarily present," or inherent, in the single anticipating reference. *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991). "Inherency, however, may not be established by *probabilities* or *possibilities*. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Id.* at 1269 (quoting *In re Oelrich*, 666 F.2d 578, 581 (CCPA 1981)) (emphasis added). Inherent anticipation, however, does not require recognition in the prior art. *Schering Corp. v. Geneva Pharmaceuticals*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) ("*Continental Can* does not stand for the proposition that an inherent feature of a prior art reference must be perceived as such by a person of ordinary skill in the art before the critical date.").

A claim is unpatentable under 35 U.S.C. § 103(a) if "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966).

"[I]t is error to reach a conclusion of obviousness until all [the *Graham*] factors are considered." *Apple v. Samsung Elecs. Co., Ltd.*, 839

F.3d 1034, 1048 (Fed. Cir. 2016) (en banc) (citations omitted). "This requirement is in recognition of the fact that each of the *Graham* factors helps inform the ultimate obviousness determination." *Id.*

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing "mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Thus, to prevail in an *inter partes* review, Petitioner must explain how the proposed combinations of prior art would have rendered the challenged claims unpatentable. At this final stage, we determine whether a preponderance of the evidence of record shows that the challenged claims are anticipated by or would have been obvious over the cited prior art.

We analyze the instituted grounds of unpatentability in accordance with the above-stated principles.

C. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. "The importance of resolving the level of ordinary skill in the art lies in the necessity of

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maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). The level of ordinary skill in the art may be reflected by the prior art of record. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *GPAC*, 57 F.3d at 1579. In a given case, one or more factors may predominate. *Id.* Generally, it is easier to establish obviousness under a higher level of ordinary skill in the art. *Innovention Toys, LLC v. MGA Entm't, Inc.*, 637 F.3d 1314, 1323 (Fed. Cir. 2011) ("A less sophisticated level of skill generally favors a determination of nonobviousness . . . while a higher level of skill favors the reverse.").

Petitioner argues that a person of ordinary skill in the art relevant to the '827 patent would have had "at least a bachelor's degree in computer science or electrical engineering and 3–5 years of professional experience in computer systems design, or a master's or doctorate and 1–2 years of professional experience in computer systems design, or equivalent academic experience." Pet. 4. According to Petitioner, "[s]uch a person would have been familiar with computer systems architecture and design, and would have been aware of design trends relating to distributed processing systems." *Id.* Petitioner's declarant, John D. Kubiatowicz, Ph.D. ("Dr. Kubiatowicz"), proffers the same level of skill as that argued by Petitioner. Ex. 1002 ¶ 20.

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Patent Owner contests Petitioner's definition of a person of ordinary skill in the art, specifically arguing that "Petitioners' proposed requirements, especially with regard to work experience, are higher than can be reasonably supported." PO Resp. 5–6. Patent Owner notes that Petitioners' declarant, Dr. Kubiatowicz, testified on cross-examination that "somebody coming directly out of college, likely, would need a couple of extra years to understand this," and that "a little bit of professional experience might help them -- would help them understand the details involved in this case." *Id.* at 6 (citing Ex. 2002, 25:13–14; 26:2–5). Patent Owner's declarant, Dr. Shenoy, testified that, at the time "of the '827 patent, one of ordinary skill in the art would have had a bachelor's degree in computer science, computer engineering, electrical engineering, or equivalent, with 1–2 years of work experience in the field of computer networking, storage systems, or a related field." Ex. 2003 ¶ 19. According to Dr. Shenoy, "[l]ack of experience can be remedied by additional education or vice versa." *Id.*

Based on our review of the '827 patent, the types of problems and solutions described in the '827 patent and cited prior art, and the testimony of Dr. Kubiatowicz and Dr. Shenoy, we adopt and apply Patent Owner's definition of a person of ordinary skill in the art, specifically that a person of ordinary skill in the art at the time of the claimed invention would have had "a bachelor's degree in computer science, computer engineering, electrical engineering, or equivalent, with 1–2 years of work experience in the field of computer networking, storage systems, or a related field." We also determine that such a person would have been familiar with computer systems architecture and design, and would have been aware of design trends relating to distributed processing systems.

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D. Alleged Anticipation of Claims 1, 3–9, 13, and 15–21 of the '827 Patent by OceanStore

Petitioner contends claims 1, 3–9, 13, and 15–21 of the '827 patent are unpatentable under 35 U.S.C. § 102(a) as anticipated by OceanStore. Pet. 19–47. Prior to our Decision to Institute, Patent Owner disputed Petitioner's contentions. Prelim. Resp. 7–32. As discussed previously, following the issuance of *SAS Institute*, we modified our Decision to Institute to include all of the challenged claims and all of the grounds presented in the Petition. Paper 51. For reasons that follow, we determine Petitioner has failed to establish by a preponderance of the evidence that the challenged claims of the '827 patent are unpatentable under 35 U.S.C. § 102(a) as anticipated by OceanStore.

1. Overview of OceanStore

OceanStore is an article titled "OceanStore: An Architecture for Global-Scale Persistent Storage." Ex. 1003, Title. OceanStore is directed to "a utility infrastructure designed to span the globe and provide continuous access to persistent information." *Id.* at Abstract. OceanStore discloses that for improved performance, "data is allowed to be cached anywhere, anytime." *Id.* According to OceanStore, "information must be divorced from location." *Id.* at 190 (emphases removed). Specifically, OceanStore sought to accomplish these goals by taking advantage of the excess, or unused, storage resources on desktop workstations and the like:

> In a time when desktop workstations routinely ship with tens of gigabytes of spinning storage, the management of data is far more expensive than the storage media. OceanStore hopes to take advantage of this excess of storage space to make the management of data seamless and carefree.

Id. at 191. In OceanStore, computers that store data are referred to as "nodes" or "servers." *Id.* at 191. Computers that access data are referred to as "clients." *Id.* A data unit in OceanStore is referred to as a "persistent object." Ex. 1003, 191. Each "persistent object" is named by a globally unique identifier (GUID). *Id.* OceanStore clients access data by connecting to one or more "pools" of nodes. *Id.* An OceanStore "pool" is a number of OceanStore nodes grouped together. *Id.* One embodiment disclosed in OceanStore is shown in Figure 1, reproduced below.

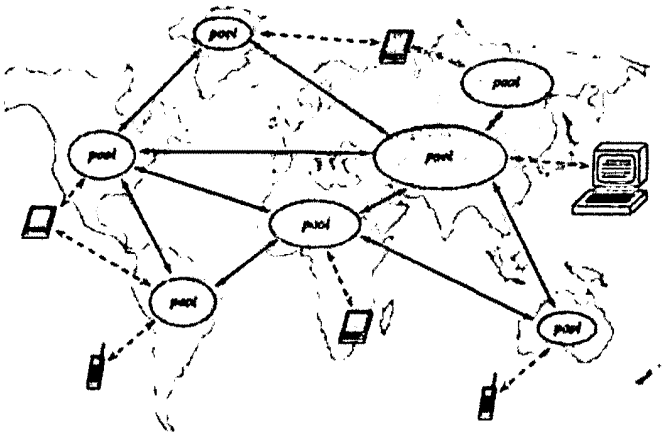


Figure 1 depicts the OceanStore system, made up of pools connected to each another. OceanStore 191.

As shown in Figure 1, above, the pools are also connected to each other, which allows data to "flow freely" between the pools. *Id.*

OceanStore indicates its system uses two different algorithms for locating data across its distributed network of nodes. The first method, is "a fast probabilistic algorithm" that uses "attenuated bloom filters." *Id.* at 193. The second method, is a "slower, reliable hierarchical method" (*id.*) that uses a "randomized hierarchical distributed data structure" (*id.* at 194). At a high-level, both algorithms work similarly. *Id.* Each node contains routing

information, and routing of messages happens in two stages. *Id.* When a client needs to access data, the client sends a message to a node specifying the object it wishes to access via its GUID. *Id.* In the first stage, each node, based on its routing table, routes the message, until it finally reaches the node that actually stores the requested object. Ex. 1003, 194. In the second stage, after the node that has the requested object is identified, messages can be directly sent to that node without having to route through the other nodes. *Id.* at 193.

2. *Analysis of Cited Art as Applied to Independent Claims 1 and 13*

a. *Preamble to Claims 1 and 13*

Preamble language that merely states the purpose or intended use of an invention generally is not treated as limiting the scope of a claim. *See Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1345 (Fed. Cir. 2003); *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997). When the limitations in the body of the claim rely upon or derive essential structure from the preamble, however, then the preamble acts as a necessary component of the claimed invention and is limiting. *See Eaton Corp. v. Rockwell Int'l Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003).

The preamble of claim 1 recites a "computer-implemented method comprising," and the preamble of claim 13 recites a "system comprising." Ex. 1001, 46:28, 47:28. Petitioner first contends the preamble of claim 1 does not limit the claim under the claim's broadest reasonable interpretation. Petitioner then contends that nonetheless, OceanStore teaches a "computer-implemented method" as required by claim 1 and is a system as required by claim 13. Pet. 27 (citing Ex. 1002 ¶ 94), 44–45 (citing Ex. 1002 ¶ 135).

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Petitioner specifically points out that OceanStore software is used on the servers (or pools) in the network depicted in Figure 1. *Id.* (Ex. 1003, 191; Ex. 1002 ¶ 95).

Patent Owner does not address the preambles of independent claims 1 and 13. *See generally* Prelim. Resp. and PO Resp. The burden remains, however, on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

OceanStore is a utility infrastructure designed for computers that are geographically dispersed and allowed for continuous access to persistent information stored on remotely located storage devices. *See* Ex. 1003, Abstract. OceanStore discloses support of legacy computer coding languages by providing familiar computer interfaces such as the Unix file system interface. *Id.* at 191. Based on the record before us, we agree with Petitioner and find that OceanStore discloses a "computer implemented method" and a system. *See id.*; Ex. 1002 ¶ 95.

> *b. "configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system"*

Petitioner contends OceanStore teaches this limitation as recited by claim 1 with similar language recited in claim 13. Pet. 27 (citing Ex. 1002 ¶ 96), 45 (citing Ex. 1002 ¶ 136). According to Petitioner, OceanStore describes a widely-distributed network of devices including desktop workstations and servers with excess storage space to provide a "utility infrastructure designed to span the globe." *Id.* (citing Ex. 1003, Abstract, 190–191, Fig. 1; Ex. 1002 ¶ 96). Petitioner then argues that the software in

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OceanStore would be considered an "agent" running on the networked, distributed devices. *Id.* at 27–28.

Petitioner relies on the testimony of its declarant, Dr. Kubiatowicz, to support its position. Dr. Kubiatowicz testifies that, as described in the '827 patent, a "client agent" includes core agent 1502, project component 1504, and user interface component 1510, and that each component provides a function. Ex. 1002 ¶¶ 29–31 (citing Ex. 1001, 33:19–21, 41:54–57, 42:5–7, 42:18–28), ¶¶ 96–96.

Patent Owner does not address this limitation of independent claims 1 and 13. Nonetheless, the burden remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

In OceanStore, computers that store data are referred to as "nodes" or "servers." *Id.* at 191. OceanStore clients access data by connecting to one or more "pools" of nodes. *Id.* One embodiment disclosed in OceanStore indicates that the pools are also connected to each other, which allows data to "flow freely" between the pools. *Id.* Thus, based on the record before us, we find that OceanStore discloses "configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system," as recited in claim 1 and similarly recited in claim 13.

c. *"wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices"*

Petitioner contends OceanStore discloses this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 29 (citing Ex. 1002 ¶ 100), 45 (citing Ex. 1002 ¶ 137). Petitioner argues that "a person of ordinary skill in the art would appreciate that the various server functionality discussed in OceanStore would be implemented by software." *Id.* (citing Ex. 1002 ¶ 100). In particular, Petitioner argues that "a person of skill in the art would appreciate that an OceanStore software-based component would assess the unused, i.e., excess, storage resources of the device (e.g., desktop workstation with excess storage space) when making this excess storage available for use by other devices on the network, as depicted in Figure 1." Pet. 30 (citing Ex. 1002 ¶ 101; Ex. 1003, 190–191).

Patent Owner contests Petitioner's position. Prelim. Resp. 18–21. Patent Owner specifically argues that Petitioner's reliance on "a single, aspirational sentence" from OceanStore to show the disclosure of the claim limitation is insufficient. According to Patent Owner, the sentence "OceanStore hopes to take advantage of this excess of storage space to make the management of data seamless and carefree" does not disclose expressly that OceanStore "assess[es] unused or under-utilized storage resources" as required by claim 1 and 13. *Id.* at 19 (citing Pet. 30; Ex. 1003, 191). Patent Owner argues that neither Petitioner nor Dr. Kubiatowicz demonstrate that OceanStore necessarily assesses the unused or under-utilized resources of a

device, and the fact that OceanStore may assess resources is not sufficient to establish inherency. *Id.* (citing *Continental Can*, 948 F.2d at 1268–69 ("The mere fact that a certain thing may result from a given set of circumstances is not sufficient.")).

We agree with Patent Owner. Based on the record before us, we are not satisfied Petitioner has shown adequately for an anticipation challenge that OceanStore discloses "wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices" as recited in claim 1 and similarly recited in claim 13. Although it appears OceanStore discloses distributed routing in order to find and fulfill a request for an entity with a GUID (global unique identifier) (*see* Ex. 1003, 193), there does not appear to be an explicit disclosure that any software-based network attached storage (NAS) component on a distributed device assesses unused or under-utilized storage resources in selected distributed devices. Nor docs Petitioner adequately explain how such an assessment would be inherent in the disclosure of OceanStore.

We note that Petitioner cites to the prosecution history of the '827 patent while making arguments regarding claim construction. *See* Pet. 12 n2. Although the '827 patent prosecution history states that its "client agent programs must be capable of assessing what capabilities are spare and/or unused (unused or under-utilized)" (Ex. 1015, 8), such a statement by the patent applicant does not relieve Petitioner of its burden to point out where

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such a feature is found in the prior art reference that forms the basis of its anticipation challenge.

Accordingly, we determine Petitioner has not established by a preponderance of the evidence that OceanStore describes this limitation of claims 1 and 13.

d. Summary

Petitioner has failed to demonstrate that OceanStore describes every limitation of claims 1 and 13. Accordingly, we determine Petitioner has failed to establish by a preponderance of the evidence that claims 1 and 13 are anticipated under 35 U.S.C. § 102(a) based on OceanStore.

3. Analysis of Cited Art as Applied to Dependent Claims 3–9 and 15–21

Petitioner contends dependent claims 3–9 and 15–21 of the '827 patent are unpatentable under 35 U.S.C. § 102(a) in view of OceanStore. Pet. 36–44, 46. For the same reason as discussed above in regard to independent claims 1 and 13 above, we determine Petitioner has failed to establish by a preponderance of the evidence that claims 3–9 and 15–21 of the '827 patent are anticipated under 35 U.S.C. § 102(a) based on OceanStore.

E. Alleged Obviousness of Claims 1, 3–9, 13, and 15–21 of the '827 Patent in View of OceanStore

Petitioner contends that claims 1, 3–9, 13, and 15–21 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore. Pet. 47. Most of Petitioner's arguments for its obviousness challenge to the '827 patent appear to address potential deficiencies in OceanStore related to the "client agents" on the "distributed devices," which include "software-

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based network attached storage (NAS) components" recited in independent claims 1 and 13. *Id.* Petitioner also appears to rely on its OceanStore anticipation arguments for the remaining elements of its obviousness challenge. *Id.*

Patent Owner disputes Petitioner's contentions, arguing that Petitioner provides no analysis or discussion that OceanStore would have rendered the challenged claims obvious. PO Resp. 22–23. For reasons that follow, we determine Petitioner has establish by a preponderance of the evidence that claims 1, 3–9, 13, 15, 16, and 18–21 of the '827 patent would have been obvious under 35 U.S.C. § 103 in view of OceanStore. We further determine Petitioner has failed to establish by a preponderance of the evidence that claim 17 would have been obvious in view of OceanStore.

1. Overview of OceanStore

See supra Section II.D.1.

2. Analysis of Cited Art as Applied to Independent Claims 1 and 13

a. Preamble to Claims 1 and 13

As discussed previously, based on the entirety of the record before us, we find that OceanStore teaches a "computer-implemented method" and is a system.

b. "configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system"

As discussed previously, based on the entirety of the record before us, we find OceanStore teaches or suggests "configuring a distributed

processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system" as recited in claim 1 and similarly recited in claim 13.

> c. *"wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices"*

Petitioner reiterates its anticipation arguments in contending that OceanStore renders obvious this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 29 (citing Ex. 1002 ¶ 100), 45 (citing Ex. 1002 ¶ 137), 47. Petitioner argues that "a person of ordinary skill in the art would appreciate that the various server functionality discussed in Ocean Store would be implemented by software." *Id.* at 29 (citing Ex. 1002 ¶ 100). In particular, Petitioner argues that "a person of skill in the art would appreciate that an OceanStore software-based component would assess the unused, i.e., excess, storage resources of the device (e.g., desktop workstation with excess storage space) when making this excess storage available for use by other devices on the network, as depicted in Figure 1." Pet. 30 (citing Ex. 1002 ¶ 101, 155; Ex. 1003, 190–191). Petitioner further cites to the prosecution history of the '827 patent to support its position that a person of ordinary skill in the art would understand that the NAS components relying on spare and/or unused capabilities of existing storage resources are configured to assess the capabilities of the unused or under-utilized storage resources, because the '827 patent prosecution history states

that its "client agent programs must be capable of assessing what capabilities are spare and/or unused (unused or under-utilized)." *Id.* at 12 n.2 (citing Ex. 1015, 8).

Patent Owner originally contested Petitioner's position with regard to its anticipation challenge (Prelim. Resp. 18–21) arguing that Petitioner provides no analysis or discussion for it obviousness challenge (*id.* at 32–33). Patent Owner did not maintain its arguments against Petitioner's position in its Patent Owner Response.

As discussed previously, we agreed with Patent Owner that OceanStore does not disclose expressly or inherently "assess[ing] unused or under-utilized storage resources" as required by claim 1 and 13. We conclude, however, Petitioner has demonstrated that the teachings of OceanStore would have rendered the claim limitations obvious to a person of ordinary skill in the art. Specifically, on the entirety of the record, we agree with Petitioner's argument, as supported by Dr. Kubiatowicz's declaration, that "a person of skill in the art would appreciate that an OceanStore software-based component would assess the unused, i.e., excess, storage resources of the device (e.g., desktop workstation with excess storage space) when making this excess storage available for use by other devices on the network, as depicted in Figure 1." *See* Pet. 30; Ex. 1002 ¶ 101 (citing Ex. 1003, 190–191), ¶ 155. Put differently, although the disclosure is not express or inherent, OceanStore teaches or suggest an assessment to an ordinarily skilled artisan based on Dr. Kubiatowicz's testimony. Additionally, the prosecution history of the '827 patent makes the point that for the NAS device to rely on unused capabilities of storage devices, the NAS device has to assess the unused capabilities of the device.

See Ex. 1015, 8 ("it would have been obvious to one of ordinary skill in the art that the client agent programs must assess unused or under utilized capabilities for it to be able to configure the devices . . . using their spare and/or unused capabilities"). Accordingly, we conclude Petitioner has shown by a preponderance of the evidence this limitation in claims 1 and 13 would have been obvious in view of OceanStore.

> *d. "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices"*

Petitioner contends OceanStore discloses this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 31 (citing Ex. 1002 ¶ 102), 45 (citing Ex. 1002 ¶ 138). Petitioner argues that "Ocean Store software causes the pool devices (e.g., desktop workstation with excess storage space, servers, and/or other pool devices) to represent, or mimic, dedicated NAS devices." *Id.* (citing Ex. 1002 ¶ 102). Petitioner relies on the declaration of Dr. Kubiatowicz, who testifies that the '827 patent provides scant detail as to what is meant by the "representing" requirement of the claim and further testifies that "a person of skill in the art would appreciate the OceanStore software causes the pool devices to appear as 'a device that makes data storage resources available to network-connected user devices' as depicted in Figure 1 and described throughout the document." Ex. 1002 ¶ 104 (citing Ex. 1001, 2:32–35).

Petitioner, therefore, argues that "the pool devices are made to mimic dedicated NAS devices via the use of the OceanStore software components executing on them, allowing end user[s] to request or store objects on the

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OceanStore pool devices (e.g., desktop workstation with excess storage space, servers, and/or other pool devices)." Pet. 32 (citing Ex. 1002 ¶ 104). That is, according to Petitioner, "the OceanStore software provided the functionality for the pool devices, such as desktop workstations with excess storage, to instead appear, function and act as storage servers on the network, providing storage resources to user devices connected to the network." *Id.* (citing Ex. 1002 ¶ 104). Petitioner further notes that OceanStore discloses "facades" to its API that provide "a traditional, familiar interface," including transactional database and UNIX file system interfaces. *Id.* (citing Ex. 1003, 197–198; Ex. 1001, 2:22–31; Ex. 1002 ¶ 103).

Patent Owner contests Petitioner's position. PO Resp. 16–22. Patent Owner first contends that the NAS component must "represent[] with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices." *Id.* at 17. According to Patent Owner, the OceanStore system appears as a single NAS device with a user accessing data and storage through a single, logical interface that makes the data and storage available to users. *Id.* at 17–18 (citing Ex. 2003 ¶ 39). Patent Owner relies on the testimony of Petitioner's declarant, Dr. Kubiatowicz, to support its position. *See* PO Resp. 18. Specifically, Dr. Kubiatowicz testified that "a user could have their data stored among multiple pools." Ex. 2002, 140:9–12. Patent Owner, thus, argues there is no need for each OceanStore node to include and appear as its own NAS device, as users can access data stored across multiple pools via a single interface without directly accessing each pool and relevant OceanStore node. PO Resp. 18–19 (citing Ex. 2003 ¶¶ 39–40). Therefore, according to Patent

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Owner, "OceanStore's representation of a single NAS device fails to meet the proper construction of the 'representing' limitation, requiring '**each** selected distributed device to **separately appear** to network-connected user devices as a dedicated NAS device.'" *Id.* at 18–19.

Patent Owner further contends that the single, collective NAS device provided by OceanStore also does not meet Petitioners' proposed construction of "using the corresponding software based NAS components of the selected distributed devices to mimic dedicated NAS devices." *Id.* at 19. Patent Owner argues that Petitioner's construction still requires multiple "dedicated NAS devices" to meet the claim limitation. *Id.* Patent Owner then argues Dr. Kubiatowicz's testimony during cross-examination supports its position regarding Petitioner's claim construction:

> Q: You would agree that a single NAS device could not meet the limitations of the claims of the '827 patent? Yes or no?
>
> A: So I -- so the read on this claim language is potentially a little loose, in the sense that it's, you know, the selected devices comprise NAS devices. But, I will-- you know, I will stipulate that having more than one NAS device when you're done here, seems like it's the closest read on the claim language.
>
> Q. I am just trying to understand what you're understanding is and you are kind of giving me these wishy-washy answers.
>
> A. Fine. It requires more than one NAS device."

Ex. 2002, 81:11–25.

We do not agree with Patent Owner for several reasons. First, "NAS device" as defined in the '827 patent "broadly refers to a device that makes data storage resources available to network-connected user devices. A

'dedicated NAS device' is a device whose primary operational purpose is for providing NAS services." *See* Ex. 1001 2:31–34. In OceanStore, multiple storage resources are provided by an aggregation of "pools" of storage, ***each of which*** can cache or serve data to the user devices. Ex. 1003, 191. Moreover, ***each pool device*** makes it storage available for use by others as depicted in Figures 2 and 3. *Id.* at 192, 193. OceanStore also provides "facades" to its underlying client user that provide a "traditional, familiar interface" such as "UNIX file system, a transactional database, and a gateway to the World Wide Web." *Id.* at 197–198. Moreover, OceanStore allows a user's email to migrate closer to his client and use locally cached email, thereby indicating that the OceanStore clients see more than a single NAS device. *Id.* at 192, 199. Additionally, a user of the OceanStore can choose several directories as "roots" and secure those directories through external methods, such as a public key authority. *Id.* at 192. Again, this indicates that the client device sees more than a single NAS device.

Accordingly, based on the entirety of the record before us and the claim constructions for "representing" proposed by either party, we find that OceanStore discloses "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices" as recited in claim 1 and similarly recited in claim 13.

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e. "allocat[ing] respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices"

Petitioner contends OceanStore discloses the limitation "wherein the NAS component is configured to: . . . allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices; represent that the selected distributed devices comprise NAS devices having the respective available amounts of storage resources," as recited in claim 13. Pet. 45 (citing Ex. 1002 ¶ 138). Petitioner specifically states that "claim element 13[d] is satisfied for the same reasons as element 1[d]" noting that "OceanStore software would allocate the excess storage [e.g., on a desktop workstation] for use by OceanStore users (i.e., making it available for other devices to use) but would reserve other workstation storage for purely local use, e.g., to store computer programs, local operation system and the like." *Id.* at 45 (citing Ex. 1002 ¶¶ 104, 138; Ex. 1003, 198). Petitioner then argues "that 'allocating' available storage for particular uses was well-known and entirely conventional." Reply 14 (citing Ex. 1053, 38:6–15; *id.* 83:4–18).

Petitioner relies on Dr. Kubiatowicz to support it position. *Id.* (citing Ex. 1002 ¶ 138). Dr. Kubiatowicz testifies in regard to claim 1's limitation [d] that, "the OceanStore software makes the distributed devices in the 'pools' and forming the 'ocean' (including but not limited to 'desktop workstations' with excess capacity) appear to be, or mimic, NAS devices having an available amount of storage related to the unused, or excess, storage for those distributed devices." *Id.* ¶ 104. According to Dr. Kubiatowicz, "[i]t does so, by making available and providing those excess

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data storage resources to other network connected devices, and by not appearing as mere workstations acting in isolation without providing any storage resources to other users." *Id.* ¶ 104 (citing Ex. 1003, 198). Dr. Kubiatowicz, therefore, asserts that "a person of skill in the art would appreciate the OceanStore software causes the pool devices to appear as 'a device that makes data storage resources available to network-connected user devices' as depicted in Figure 1 and described throughout the document." *Id.* (citing Ex. 1001, 2:32–35).

Dr. Kubiatowicz further testifies that "one of ordinary skill would clearly understand that you need to allocate data in order to represent that you have an available amount of unused or under-utilized storage." Ex. 2002, 108:2–14. According to Petitioner, "OceanStore thus discloses the 'allocating' limitations at least at the same level as the '827 patent, which is to say that nothing unique about 'allocating' is described in the '827 patent, or ***needed*** to be described given a [person of ordinary skill in the art]'s knowledge." Reply 16.

Patent Owner contests Petitioner's position, arguing we should not rely on Petitioner's anticipation arguments to evaluate obviousness, but rather we should observe that no evidence has been presented about how OceanStore renders obvious claim 1. PO Resp. 22–23. We decline to do so. Although a majority of the Petition is allocated to arguing that claims 1 and 13 are unpatentable as anticipated, we determine that such a presentation is not a basis for an adverse finding. Moreover, Petitioner provides arguments regarding the application of OceanStore under 35 U.S.C. § 103 to the challenged claims. Pet. 47.

Patent Owner further contends Petitioner provides no explanation as to how any statements or arguments made supporting claim element 1[d] are relevant to the "*allocating*" limitation of claim 13. PO Resp. 23. According to Patent Owner, Dr. Kubiatowicz's testimony is conclusory and offers no explanation of how the disputed limitation is disclosed in OceanStore. *Id.* at 23–24. Patent Owner contends that OceanStore provides no teaching or suggestion for the "*NAS component*" to "*allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices.*" *Id.* at 24. Patent Owner's declarant, Dr. Shenoy, testifies that one of ordinary skill would not understand that OceanStore exclusively allocates storage for exclusive use by OceanStore users prior to representing those storage resources to users. Ex. 2003 ¶ 61. Dr. Shenoy further testifies that exclusive allocation of resources in OceanStore could have undesirable effects on users of local machines whose resources are being allocated. *Id.* Patent Owner then argues "the OceanStore software may check available storage . . . and dynamically allocate only sufficient space to store the data," but OceanStore does not allocate "the assessed unused storage resources prior to making them available to OceanStore users." PO Resp. 27. According to Patent Owner, OceanStore "does not exclusively '*allocate*' represented storage '*in selected distributed devices.*'" *Id.*

We have reviewed the entirety of the record, including Dr. Kubiatowicz's testimony, the cited portion of OceanStore, and the '827 patent specification. Although the term "allocating" is recited specifically in claim 13, there is no specific method of allocating either required by the claim or by disclosed in the specification of the '827 patent. We note the

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Patent Owner's declarant, Dr. Shenoy, confirmed that the claims do not recite any particular manner of allocating. Ex. 1053, 83:4–18. Patent Owner's contentions are not commensurate with the scope of "allocating" as claimed.

Petitioner's declarant, Dr. Kubiatowicz, testified that "one of ordinary skill would clearly understand that you need to allocate data in order to represent that you have an available amount of unused or under-utilized storage." Ex. 2002, 108:2–14. Here, Dr. Kubiatowicz explains that OceanStore software makes excess storage available for other devices to use and, thus, teaches the claimed "allocat[ing]." Ex. 1002 ¶ 138. Indeed, the purpose of OceanStore is to provide storage space in servers around the world, allowing data to be "cached anywhere." Ex. 1003, 190 (Abstract). Based on the evidence of record, we credit the testimony Dr. Kubiatowicz and determine that a person of ordinary skill in the art would have understood OceanStore as teaching or at least suggesting "wherein the NAS component is configured to: . . . allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices," as recited in claim 13. *Cf. In re Epstein*, 32 F.3d 1559, 1568 (Fed. Cir. 1994) ("appellant did not provide the type of detail in his specification that he now argues is necessary in prior art references supports the Board's finding that one skilled in the art would have known how to implement the features of the references.").

f. Summary

Accordingly, having analyzed the entirety of the record, we determine Petitioner has established by a preponderance of the evidence that claims 1

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and 13 would have been obvious under 35 U.S.C. § 103(a) in view of OceanStore.

3. Analysis of Cited Art as Applied to Dependent Claims 3, 6–9, 15, and 18–21

Petitioner contends that dependent claims 3, 6–9, 15, and 18–21 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore. Pet. 36–44, 46, 47. Specifically, for claims 3 and 15 that require "receiving an access request from the client device and directing the client device to data requested on at least one of the selected distributed devices," Petitioner argues OceanStore meets the claim because, when its pool device receives a request, it uses OceanStore's data location algorithms (i.e., both the local and global algorithms) to either return data to the client or direct the request to another node based on location information. Pet. 36 (citing Ex. 1002 ¶ 113).

For claims 6 and 18 that require storing, with the centralized server, location information associated with the data stored in the selected distributed devices, Petitioner contends a person of ordinary skill in the art would appreciate that the local server from claim 4 "becomes another OceanStore server (or node) and as such would store and maintain the routing information used and discussed above in connection with data location." Pet. 41–42 (citing Ex. 1002 ¶ 124).

For claims 7 and 19, which require "utilizing the centralized server to receive and route the data for storage to the selected devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database," Petitioner argues that OceanStore envisions servers in airports and small cafes, for example, to provide connectivity to the

OceanStore network and caching services for objects stored in other OceanStore devices. *Id.* at 42 (citing Ex. 1002 ¶ 125). Citing the testimony of Dr. Kubiatowicz, Petitioner asserts that "a person of skill in the art would appreciate that users would connect to the airport server when attempting to read or update objects on a pool device (i.e., either the airport cache or any other distributed device on the network)." *Id.* at 42 (citing Ex. 1002 ¶ 126).

Patent Owner disputes Petitioner's contentions, arguing that these dependent claims are not obvious in view of OceanStore for the same reasons as claims 1 and 13. PO Resp. 40–41.

After considering the parties' arguments and evidence, we agree with Petitioner's positions and adopt its arguments as our own. Accordingly, we determine Petitioner has shown by a preponderance of the evidence that dependent claims 3, 6–9, 15, and 18–21 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore.

4. Analysis of Cited Art as Applied to Dependent Claims 4 and 16

Claims 4 depends indirectly from claim 1, while claim 16 depends indirectly from claim 13, and each further require "manag[ing] the NAS service for the [at least one of the particular] distributed devices at least in part utilizing a centralized server." Ex. 1001, 46:65–67, 48:15–17.

Petitioner contends that dependent claims 4 and 16 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore. Pet. 37–40, 46. Petitioner specifically alleges that OceanStore discloses three examples using centralized servers. *Id.* First, Petitioner argues that OceanStore discloses installing servers at local premises to act as a local cache node for local users and to provide better performances for local users. Pet. 37–38 (citing Ex. 1002 ¶ 118; Ex. 1003, 190), 46. Second, Petitioner

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argues that OceanStore discloses using management services through a group of servers that act as a centralized server. *Id.* at 39. According to Petitioner, OceanStore discusses using a tier of server machines to do "server-side" computations on data in conjunction with its distributed update model. *Id.* at 39 (citing Ex. 1003, 195; Ex. 1002 ¶ 119). Third, Petitioner argues that OceanStore discloses a level of "event handlers" that summarize local events and store these summaries in a local database. *Id.* at 40 (citing Ex. 1003, 198; Ex. 1002 ¶ 120). According to Petitioner, after processing and responding to its own events, each node "'forwards an appropriate summary of its knowledge to a parent node for further processing on the wider scale.'" *Id.* (quoting Ex. 1003, 198; Ex. 1002 ¶ 120). Petitioner explains that "[t]he 'parent node' is identified by a GUID like every other node in the OceanStore." *Id.* (citing Ex. 1003, 198).

Patent Owner disputes Petitioner's contentions. PO Resp. 28–37. Patent Owner first argues that OceanStore criticizes and teaches away from the use of centralized servers. *Id.* at 30. Whether a reference teaches away from a claimed invention is a question of fact. *In re Harris,* 409 F.3d 1339, 1341 (Fed. Cir. 2005). For a reference to "teach away," it must criticize, discredit, or otherwise discourage the claimed solution. *See In re Fulton,* 391 F.3d 1195, 1201 (Fed. Cir. 2004). Although OceanStore enumerates certain disadvantages plaguing centralized servers (Ex. 1003, 190), it nonetheless provides specific examples of how such servers can be used in connection with it decentralized system (*id.* at 190, 195, 198). Accordingly, we find that OceanStore does not teach away from using centralized servers.

Patent Owner then argues that OceanStore's use of airport servers acting as local cache nodes for users at an airport or café means the server is

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simply a local cache server and not a centralized cache server for the distributed nodes of OceanStore. PO Resp. 32 (citing Ex. 2003 ¶ 48). Patent Owner further argues that even if the airport and café servers were managed by the "confederation of companies" that Petitioners discuss, the plurality of servers would still be managed by different utility providers, rather than being commonly controlled and managed. *Id.* According to Patent Owner, the claimed "centralized server" requires "a single server or a single group of servers that are commonly controlled and managed."[4] *Id.* at 28 (citing Ex. 2003 ¶ 44).

Next, Patent Owner argues that OceanStore's use of a tier of server machines to do 'server-side' computations on data in conjunction with its distributed update model fails to qualify as a centralized server and Petitioner fails to explain how it could constitute the "centralized server" of the claims. *Id.* at 34. According to Patent Owner, the "primary tier" of servers assisting with updates are untrusted in part because they may be managed and controlled by different utility providers. *Id.* (citing Ex. 2003 ¶ 52). Patent Owner contends that the primary tier of replicas would typically be separately managed distributed servers that communicate to "choose the final commit order for updates." *Id.* at 34–35 (citing Ex. 2003 ¶ 52; Ex. 1003, 195). Patent Owner, thus, concludes that "[t]his differs from the single server or commonly controlled and managed group of servers

[4] We note this proposed construction of "centralized server" differs from Patent Owner's proposed construction in related IPR2017-00439. *See* IPR2017-00439, Paper 21, 41–42 ("centralized server" must "form[ ] a known, physical 'center' from the perspective of the distributed devices," and that it "must be physically separate from the client devices (claimed 'distributed devices') that it serves."

described in every embodiment the '827 patent." *Id.* at 35 (citing Ex. 2003 ¶ 52).

Lastly, Patent Owner argues that Petitioner does not explain how distributed parent nodes provide "centralized" management of the NAS service for distributed OceanStore nodes. *Id.* at 36 (citing Ex. 2003 ¶ 54). Rather, to the contrary, Patent Owner contends that the parent nodes are distributed to process events from nearby nodes. *Id.* According to Patent Owner, "[t]here is no indication that these parent nodes are commonly controlled and managed, nor would they be in a distributed architecture consisting of a 'confederation of companies.'" *Id.* (citing Ex. 2003 ¶ 54; Pet. 37). Patent Owner, thus concludes that the purpose of OceanStore's distributed hierarchy is to enable cooperation between separately controlled, distributed devices and fails to meet the claimed limitation of a "centralized server." *Id.*

After considering the entirety of the record, we find OceanStore discloses the recited "centralized server." Specifically, we find that OceanStore's disclosure that "airports or small cafes could install servers on their premises to give customers better performance" meets the claimed limitation. We credit the testimony of Dr. Kubiatowicz, who explains that a person of ordinary skill in the art would have understood that such a server would "monitor and manage usage" in addition to serving as a local cache, "in exchange for a dividend from the utility provider." Ex. 1002 ¶ 118, *cited in* Pet. 38; *see also* Ex. 1003, 190–191 (describing goals of "exploit[ing] caching close to . . . clients" and that "data can be cached *anywhere*, *anytime*"). As Petitioner notes, "[m]onitoring and managing usage, as well as serving as a local cache, are both within the functions the '827 patent

describes as performed by the centralized servers." Reply 21; *see* Ex. 1001, 44:24–35, *cited in* Pet. 37 (describing provision of "centralized management, control and support" by "indexing, monitoring, backup, security, and other services"). Moreover, as Patent Owner notes, a single airport node would "act as its own local cache server for nearby users" (PO Resp. 32), thereby managing the claimed NAS service for the users and distributed devices in the airport.

Accordingly, we determine Petitioner has shown by a preponderance of the evidence that dependent claims 4 and 16 would have been obvious under 35 U.S.C. § 103(a) in view of OceanStore.

5. Analysis of Cited Art as Applied to Dependent Claim 5

Claim 5 depends from claim 4 and further requires "download[ing] the software-based NAS component to the selected distributed devices." Ex. 1001, 47:1–3.

Petitioner contends that dependent claim 5 of the '827 patent is unpatentable under 35 U.S.C. § 103(a) in view of OceanStore. Pet. 41; Reply 23–26. Specifically, Petitioner argues that OceanStore meets the recited limitation because "OceanStore software is written as downloadable Java, and deployed to devices in the pool providing storage services." Pet. 41 (citing Ex. 1003, 199, 198 ("These interfaces exist as libraries or 'plugins' to existing browsers or operating systems")); Ex. 1002 ¶ 122).

Petitioner relies on the testimony of its declarant, Dr. Kubiatowicz, to support its position. Dr. Kubiatowicz testifies as follows:

> OceanStore software is written as downloadable Java, and deployed to devices in the pool providing storage services. (Ex. 1003, p. 199.) A person of skill in the art would appreciate that, when a new device first comes into service as an OceanStore

> server ("distributed device," *e.g.*, a desktop workstation with excess storage space or any other pool device participating in the network), it needs to have an up-to-date version of the Java virtual machine and any supporting libraries installed; typically these items were downloaded from the Sun Java site at the time. Then, the Java code for OceanStore would be downloaded from the OceanStore release servers and installed in the correct local directory on the distributed device. This process could be either done manually or through automatic scripts to update remote devices when newer versions of the OceanStore were released. A person of ordinary skill in the art would appreciate that a system of this magnitude would involve downloading code from an appropriate revision-control system.

Ex. 1002 ¶ 122. Petitioner further contends that Patent Owner's declarant, Dr. Shenoy, supports its position. During his deposition, Dr. Shenoy testified as follows:

> Q. So is it your opinion that in April of 2001, a person of ordinary skill, knowing that a particular software program had been written in Java, would have no idea whether or not that piece of software could or could not be downloaded?
>
> A: That's not what I said. As I had said previously, you can download -- at that time, you could have downloaded data software or anything else, for that matter, over the network. Downloading was not -- not an issue. You could certainly download things, because the Internet existed. Networks existed. The issue was what was common practice at that time, what were some of the impediments to making software distribution over a network in a downloadable form more prevalent. Today, this is fairly common. This is how you download apps to your phone or your tablet or your PC. In those days, it was not, because networks had issues. And people were still using dialup modems, and DSL was just becoming popular. So the state of the art was very different at that time, and it was common practice to use physical media, like CDs or floppy disks, to distribute and install software. That doesn't mean it was

> impossible to download software at all. It was just inconvenient, based on what was common at that time.

Ex. 1053, 100:12–101:18. Based on the testimony of the two declarants and citations to several references that discuss the downloadable nature of Java programs, Petitioner argues that a person of ordinary skill in the art at the time of the invention "would have certainly understood that using Java software teaches, or at least strongly suggests, that such software could be, and in fact was most likely intended to be, downloaded. Java was known as platform independent and was designed for wide deployment via downloadable software, for example via the Internet." Reply 25 (citing Ex. 1002 ¶ 122; Ex. 1056 ¶ 57; Ex. 1054 (Not Just Java (1997)) 72 ("when you browse a Java program, the program is downloaded onto your system and executed); *id.* 73 (contrasting "the old way of distributing software [of] mailing a floppy disk" with the "reasons why it is useful to download a program").

Patent Owner disputes Petitioner's contentions. PO Resp. 37–40. Patent Owner specifically argues that OceanStore provides no information about whether the libraries and plugins are downloaded "*to the selected distributed devices*." *Id.* at 38 (citing Ex. 2003 ¶ 57). Patent Owner then argues that Petitioner's declarant, Dr. Kubiatowicz, only provides speculative and conclusory statements unsupported by the OceanStore reference, and therefore, does not support Petitioner's position. *Id.* According to Patent Owner, OceanStore merely describes a prototype that "'is written in Java with a state machine-based request model for fast I/O.'" *Id.* at 38–39 (quoting Ex. 1003, 199). Patent Owner contends that

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"[n]owhere does OceanStore describe an implementation written as '**downloadable** Java,' nor does OceanStore discuss downloading any software components to OceanStore nodes." *Id.* at 39 (emphasis in original). Patent Owner argues that "[e]ven if Dr. Kubiatowicz['s] statements were true, this knowledge would not be accessible to one of ordinary skill reading the OceanStore paper and must be attributed to Dr. Kubiatowicz's specialized knowledge of OceanStore as the lead author." *Id.* (citing Ex. 2003 ¶ 58).

Patent Owner relies on the testimony of its declarant, Dr. Shenoy, to support its position. Dr. Shenoy testifies that, at the time of the '827 patent, software was typically distributed through some type of physical media, such as a compact disk (CD), digital video disk (DVD), or floppy disk variation. Ex. 2003 ¶ 59. According to Dr. Shenoy, "[s]oftware downloads were rare due to bandwidth limitations, and thus one of ordinary skill would expect distribution by physical media to avoid these limitations." *Id.*

After considering the entirety of the record, and crediting the testimony of Dr. Kubiatowicz, as supported by evidence demonstrating the knowledge of Java's downloadable nature at the time of the '827 patent, we agree with Petitioner with regarding to claim 5. Specifically, we find OceanStore discloses that the software is written in Java and deployed to devices in the pool and that it communicates with applications through a Unix file system interface. *See* Ex. 1003, 199 ("The system is written in Java with a state machine-based request model for fast UO. Initially, OceanStore will communicate with applications through a UNIX file system interface . . . .) (citation omitted). Given the known ability for downloading Java in view of OceanStore's instruction to implement the "introspection"

monitoring and analysis mechanisms (*see id.* at 198), we determine that a preponderance of the evidence shows that the subject matter of claim 5 would have been obvious to a person of ordinary skill in the art in view of OceanStore.

6. Analysis of Cited Art as Applied to Dependent Claim 17

Claim 17 depends from claim 16 and further requires that "the centralized server system is further configured to enable download of the NAS component to the selected distributed devices." Ex. 1001, 48:18–20.

Petitioner contends that dependent claim 17 of the '827 patent is unpatentable under 35 U.S.C. § 103(a) in view of OceanStore. Pet. 46; Reply 23–26. Specifically, Petitioner argues that the download of a java program "in enabled" by OceanStore's release servers. Reply 25–26; Tr. 50:10–51:6. Petitioner's declarant, Dr. Kubiatowicz testifies that "[a person of ordinary skill in the art at the time of the invention] would [have] appreciate[d] that OceanStore 'would involve downloading code from an appropriate revision-control system'" such as "'from the OceanStore release servers.'" Ex. 1002 ¶ 122. Thus, Petitioner concludes that a "[a person of ordinary skill in the art at the time of the invention] would [have] appreciate[d] that Java comes from a centralized server of one or more machines to manage releases of code." Reply 26.

Patent Owner disputes Petitioner's contentions arguing Petitioner fails to show how "**the centralized server system** is further configured to enable download of the NAS component to the selected distributed devices." PO Resp. 40 (emphasis in original). Patent Owner contends Dr. Kubiatowicz's testimony that "the Java code for OceanStore would be downloaded from the **OceanStore release servers**" makes no connection between the OceanStore

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release servers and any of the components Petitioner points to with respect to claim 16 to meet the recited "*centralized server system*." *Id.* (citing Ex. 1002 ¶ 122 (emphasis added by Patent Owner)); *see also* Tr. 39:1–12 ("And when you look at the argument in the petition or in Dr. Kubiatowicz['s] declaration, petitioner's position seems to be that the centralized server in claim 17 is now no longer one of those three options we talked about before: the airport server, the tier of server side machines, or the event handlers. It's now the OceanStore release servers, which as I understand it is the server is on the internet or wherever they may be located that would store the software for download.")). Patent Owner notes that claim 17 depends from claim 16, which provides antecedent basis to the "*centralized server system*" of claim 17. PO Resp. 40. According to Patent Owner, Petitioner fails to explain how the same "centralized server system" of claim 16 "enable[s] download of the NAS component to the selected distributed devices," and any attempt to substitute a new device for the "centralized server system" in claim 17 is improper. *Id.*

After considering the entirety of the record, we find Petitioner has failed to demonstrate by a preponderance the evidence that the limitations of claim 17 would have been obvious. Claim 17 depends directly from claim 16, which recites "utilizing a centralized server system." Ex. 1001, 48:15–17. Claim 17 then states, "wherein the centralized server system . . . ." *Id.* at 48:18–20. Thus, we determine that the "centralized server system" of claim 16 provides antecedent basis for the "centralized server system" recited in claim 17. We would expect, therefore, for the "centralized server system" of claim 16 to be the "centralized server system" of claim 17.

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The Petition specifically enumerates three examples of centralized servers in its arguments regarding claims 4 and 16. Those enumerated servers are: (1) airports and cafés installing servers to provide better performance, achieving OceanStore's stated goal of "exploiting caching close to clients" (Pet. 37–38; Reply 17); (2) tiers of servers providing "server-side" computations, such as updating objects to keep them encrypted in an untrusted distributed infrastructure (Pet. 39; Reply 18); and (3) event handlers summarizing stored local events and forwarding that information to parent nodes that provide optimization services (Pet., 40; Reply 18). At no time during its analysis of claim 4, does the Petition discuss OceanStore's release servers. *See* Pet. 41, 46; Tr. 50:10–51:6. Additionally, although Dr. Kubiatowicz cites to the release servers in his discussion of claim 17, he makes no mention of them in his analysis of claims 4 and 16. *See* Ex. 1002 ¶¶ 118–120. Nor does Dr. Kubiatowicz explain sufficiently how OceanStore's release servers constitute the "central server systems" of claims 4 and 16. *See id.* ¶¶ 118–122, 143–146.

As previously noted in "an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc., v. Avid Tech., Inc.*, 815 F.3d at 1363. Under 35 U.S.C. § 312(a)(3), a petition must identify "with particularity . . . . the evidence that supports the grounds for the challenge to each claim." We find Petitioner has failed to show by a preponderance of the evidence that claim 17 would have been obvious in view of OceanStore because it fails to explain explicitly how OceanStore's release servers meet the "central server system" limitation of claim 16, from which claim 17 depends.

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F. Alleged Obviousness of Dependent Claims 4, 6, 7, 16, 18, and 19 in view of OceanStore and Condor

Petitioner contends dependent claims 4, 6, 7, 16, 18, and 19 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore and Condor. Pet. 48–53. Patent Owner originally disputes Petitioner's contentions. Prelim. Resp. 33–39. Pursuant to 35 U.S.C. § 314(a), we originally instituted an *inter partes* review of claim 1, 3–9, 13, and 15–21 under 35 U.S.C. § 103(a) as unpatentable over OceanStore. *See* Paper 11 ("Dec. to Inst."), 39–40.

As discussed previously, in view of the Supreme Court's *SAS Institute* decision, we modified our institution decision to institute on all challenged claims and all grounds presented in the Petition. *See* Paper 51, 2; *see also* Ex. 3001 (email "advis[ing] the Board that Patent Owner will waive its right to file a [Patent Owner Response] and will not request an oral hearing on the newly instituted grounds in this proceeding. Both parties have conferred and believe this closes the record and allows the Board to issue a final written decision based on the current record."). For reasons that follow, we determine Petitioner has not shown by a preponderance of the evidence that claims 4, 6, 7, 16, 18, and 19 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore and Condor.

1. Overview of OceanStore

See supra Section II.D.1.

2. Overview of Condor

Condor is a publication titled "Condor – A Hunter of Idle Workstations." Ex. 1017, Title. Condor is directed to a scheduling system that operates in a workstation environment. *Id.* at Abstract. Condor

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discloses "maximiz[ing] the utilization of workstations with as little interference as possible between the jobs it schedules and the activities of the people who own workstations." *Id.* It teaches identifying idle workstations and scheduling background jobs on them so that, when the owner of a workstation resumes activity at a station, Condor checkpoints the remote job running on the station and transfers it to another workstation. *Id.* According to Condor, the "system guarantees that the job will eventually complete, and that very little, if any, work will be performed more than once." *Id.*

Condor contemplates a "wide spectrum of scheduling structures" that use scheduling coordinators that "follow[] the principle that workstations are autonomous computing resources and they should be managed by their own users." Ex. 1017, 4, 6. Condor states that "[t]his also helps to keep the responsibilities of the coordinator simple." *Id.* at 6. According to Condor, "[s]implicity is important so that a central site is not required to maintain a great amount of information about each workstation." *Id.* Condor contemplates that either a centralized, static coordinator could assign background jobs to execute at available remote workstations (*id.* at 4–5) or a distributed approach could be used where assignment of available processors is accomplished by each workstation cooperating to conduct a scheduling policy (*id.* at 4–5).

One embodiment disclosed in Condor is shown in Figure 1, reproduced below.

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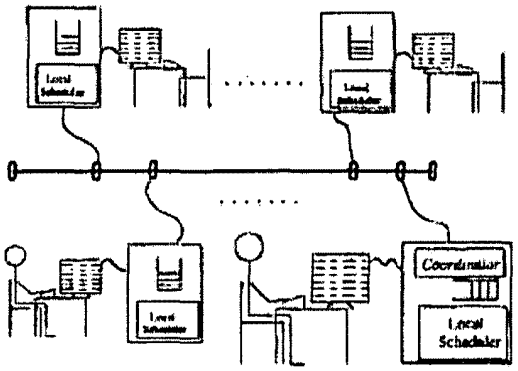


Figure 1 illustrates the Condor scheduling system.

Figure 1, above, shows one version of the Condor background job scheduler that lies between a centralized, static approach and the fully distributed approach. Condor explains that "[t]his approach uses the efficiency of scheduling with a central node to avoid the overhead of messages to decide which workstations should be allocated available capacity." *Id.* at 5. Condor discloses that its system can be extendible to a large number of workstations and eases the required recovery when a centralized coordinator fails. *Id.* at 6–7. According to the teachings of Condor, "[l]ocal schedulers are not affected if a remote site discontinues service." *Id.* at 7. Condor discloses that "[i]f the site on which the coordinator is executing fails, remotely executing jobs initiated and executing on other machines are not affected. Only the allocation of new capacity to requesting users is affected." *Id.* Condor explains that because "the coordinator has few duties, its recovery at another site is simplified in relation to a fully centralized strategy." *Id.* In order to balance the burden of coordination, Condor states that the central coordinator can be moved to other locations. *Id.*

3. Analysis of Cited Art as Applied to the Challenged Dependent Claims

Claim 4 depends from claim 3, and further requires "managing the NAS service for the at least one of the particular distributed devices at least in part utilizing a centralized server." Ex. 1001, 46:65–67. Claim 6 depends from claim 4, and requires the method of claim 4 to further comprise "storing, with the centralized server, location information associated with the data stored in the selected distributed devices." *Id.* at 47:4–6. Claim 7 depends from claim 6, and requires the method of claim 6 to further comprise "utilizing the centralized server to receive and route the data for storage to the selected devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database." *Id.* at 47:7–12. Dependent claims 16, 18, and 19 recite substantially similar limitations as claims 4, 6, and 7 but depend from independent claim 13. *Id.* at 48:15–29.

Petitioner contends these dependent claims would have been obvious in view of the combined teachings of OceanStore and Condor. Pet. 49 (citing Ex. 1002 ¶ 159). In particular, for claim 4, Petitioner argues that "Condor teaches 'managing' the use of 'resources of the workstation [that] are under utilized [sic]' at least in part using a 'central coordinator.'" *Id.* (brackets in original) (citing Ex. 1017, 1, 5–6; Ex. 1002 ¶ 159). According to Petitioner, "the central coordinator is held on one of the workstations that also has its own local scheduler and background job queue." *Id.* (citing Ex. 1017, 6; Ex. 1002 ¶ 159). Petitioner argues that the central coordinator "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting." *Id.* Petitioner further

argues the central coordinator knows "not only which workstation's processor is available, . . . but [also] how much disk space is available on each workstation." *Id.* at 52–53 (citing Ex. 1017, 16; Ex. 1002 ¶ 164).

For dependent claim 6, Petitioner contends, "Condor teaches 'storing' 'location information associated with the data' stored on the distributed devices with a 'central coordinator.'" Pet. 51 (citing Ex. 1017, 1, 5–6; Ex. 1002 ¶ 164). According to Petitioner, the central coordinator "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting." *Id.* (citing Ex. 1017, 6; Ex. 1002 ¶ 164). Petitioner further argues that the central coordinator knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* (citing Ex. 1017, 16; Ex. 1002 ¶ 164). For claim 7, Petitioner argues that "Condor teaches 'utilizing' a central coordinator to 'receive and route data for storage' based upon a 'capabilities database.'" *Id.* at 52 (Ex. 1002 ¶ 167). Petitioner relies on Condor's disclosure of a central coordinator that "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting," and which knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* (Ex. 1017, 6; Ex. 1002 ¶ 167).

Petitioner supports its position with the declaration of Dr. Kubiatowicz, who testifies that the challenged dependent claims would have been obvious in light of the combination of OceanStore and Condor. Ex. 1002 ¶¶ 160, 165, 168. Dr. Kubiatowicz specifically testifies that "the advantages and disadvantages of both centralized and distributed approaches to coordination and management were well known even at the time Condor

was published." *Id.* ¶ 160 (citing Ex. 1017, 5 ("Both the centralized and the distributed approaches have well known advantages and disadvantages.")). Dr. Kubiatowicz specifically testifies that it would have been obvious to a person of ordinary skill in the art that both approaches have advantages that could have been exploited using well known techniques, as well as disadvantages that could have been avoided using well known techniques, just like Condor's central coordinator. Ex. 1002 ¶ 161. According to Dr. Kubiatowicz, "[i]ncorporating Condor's explicit teaching of a "central coordinator" into OceanStore would have been obvious to one of ordinary skill in the art, would have yielded predictable results, and would have involved tools and techniques that were well known at the time." *Id.* ¶ 162.

Patent Owner originally contested Petitioner's position, arguing that Petitioner fails to provide an adequate rationale as to why a person of skill in the art would combine an entirely distributed system from OceanStore with a centralized system from Condor, especially in light of OceanStore's criticism of centralized approaches (i.e., teaching away from using centralized servers), such as those required in claims 4 and 6. Prelim. Resp. 33–36. Patent Owner specifically argued that Petitioner provides no analysis regarding the combination of OceanStore and Condor but, rather, offers only conclusory statements that merely are reiterated by Dr. Kubiatowicz. *Id.* at 36–37.

Patent Owner based its characterization of Condor as a centralized system on Condor's use of a "centralized, static coordinator" for tracking idle workstations and coordinating which workstations will perform specific tasks. *Id.* at 34. Yet, Condor explicitly contemplates use of a distributed coordinator for its systems. Ex. 1017, 4–5. We do not agree with Patent

Owner's position that OceanStore teaches away from use of centralized servers. *See* Prelim. Resp. 36. To establish teaching away, the prior art reference must criticize, discredit, or otherwise discourage the solution claimed. *See In re Fulton,* 391 F.3d 1195, 1201 (Fed. Cir. 2004). Although OceanStore emphasizes that "information must be divorced from location" and "[c]entralized servers are subject to crashes, DoS attacks, and unavailability due to regional network outages," it also states that local businesses "could install servers on their premises to give customers better performance." Ex. 1003, 190. Such disclosures do not teach away because they does not criticize, discredit, or otherwise discourage the use of local or centralized servers; instead, OceanStore appears to offer an alternative to reliance solely on centralized server systems.

We agree, however, with Patent Owner that Petitioner fails to offer sufficient explanation as to why a person of ordinary skill in the art would have combined the teachings of OceanStore and Condor. Rather, Petitioner appears to argue that, based on the advantages described by Condor (Ex. 1017, 5), and using well-known techniques with unspecified predictable results, a person of ordinary skill in the art would have had sufficient reason to combine these disparate elements taught in the prior art references to render the challenged claims obvious. Pet. 50–53. Yet, Petitioner fails to identify what particular advantages or efficiencies would have prompted a person of ordinary skill in the art to combine Condor's scheduler with OceanStore's system.

Petitioner must articulate a *reason why* a person of ordinary skill in the art would combine the prior art references. *In re NuVasive*, 842 F.3d 1376, 1382 (Fed. 2016); *Metalcraft of Mayville, Inc. v. The Toro Company*,

848 F.3d 1358, 1366 (Fed. Cir. 2017) ("[I]t is insufficient to simply conclude the [prior art] combination would have been obvious without identifying any reason why a person of skill in the art would have made the combination."); *see Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) ("obviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention") (emphasis in original). Conclusory statements alone, even those provided by a declarant, are inadequate to demonstrate a rationale for why a person of ordinary skill in the art would combine the teachings from prior art references. *NuVasive*, 842 F.3d at 1383. Instead, Petitioner's arguments must be supported by a "reasoned explanation." *Id.* (citing *In re Lee*, 277 F.3d 1338, 1342, 1345 (Fed. Cir. 2002)). We understand that a person of ordinary skill is a person of ordinary creativity, not an automaton, but "[w]ithout any explanation as to how or why the references would be combined to arrive at the claimed invention, we are left with only hindsight bias that *KSR* warns against." *Metalcraft*, 848 F.3d at 1367 ("'[t]he obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation,' we also recognize that we cannot allow hindsight bias to be the thread that stitches together prior art patches into something that is the claimed invention." (quoting *KSR*, 550 U.S. at 419, 421)).

Accordingly, on this record, we determine Petitioner has failed to provide an adequate rationale to combine the teachings of OceanStore and Condor.

III. SUPPLEMENTAL EVIDENCE

Patent Owner objected to certain evidence submitted by Petitioner. Papers 14, 17, 35. Petitioner served and moved to file certain supplemental evidence to cure Patent Owner's objections. Paper 18; *see* 37 C.F.R. § 42.63(a) ("All evidence must be filed in the form of an exhibit."). Patent Owner opposed Petitioner's motion, to which Petitioner filed a Reply. Papers 19, 20. Patent Owner did not move to exclude any evidence.

Petitioner's Motion to Supplement Evidence was filed timely and the cited evidence is relevant to the proceeding and Patent Owner's objections. Accordingly, we grant Petitioner's Motion to Supplement Evidence.

IV. CHALLENGE TO PETITIONER'S REPLY ARGUMENTS

With Board authorization (Paper 37), Patent Owner filed a list of alleged improper reply arguments (Paper 41), to which Petitioner filed a Reply (Paper 42). Patent Owner lists several portions of Petitioner's Reply and evidence allegedly beyond the scope of what can be considered appropriate for a reply. *See* Paper 41 (citing Reply).

We have considered Patent Owner's listing, but we disagree that the cited portions of Petitioner's Reply and reply evidence are beyond the scope of what is appropriate for a reply. Replies are a vehicle for responding to arguments raised in a corresponding Patent Owner Response. Petitioner's arguments and evidence are not beyond the proper scope of a reply because we find that they fairly respond to Patent Owner's arguments raised in Patent Owner's Response. *See Idemitsu Kosan Co., LTD. v. SFC Co. LTD*, 870 F.3d 1376, 1381 (Fed. Cir. 2017) ("This back-and-forth shows that what [Patent Owner] characterizes as an argument raised 'too late' is simply the

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by-product of one party necessarily getting the last word. If anything, [Patent Owner] is the party that first raised this issue, by arguing—at least implicitly—that [a reference] teaches away from non-energy-gap combinations. [Petitioner] simply countered, as it was entitled to do."); *Anacor Pharms., Inc. v. Iancu*, 889 F.3d 1372, 1380 (Fed. Cir. 2018) ("In addition, the petitioner in an inter partes review proceeding may introduce new evidence after the petition stage if the evidence is a legitimate reply to evidence introduced by the patent owner . . . .").

V. CONCLUSION

For the foregoing reasons, we conclude Petitioner has shown by a preponderance of the evidence that claims 1, 3–9, 13, 15, 16, and 18–21 of the '827 patent are unpatentable under 35 U.S.C. § 103 as obvious in view of OceanStore. We find, however, Petitioner has failed to demonstrate by a preponderance of the evidence (1) that claims 1, 3–9, 13, and 15–21 of the '827 patent are anticipated under 35 U.S.C. § 102(a) by OceanStore; (2) that claim 17 of the '827 patent would have been obvious under 35 U.S.C. § 103(a) in view of OceanStore; and (3) a sufficient rationale to combine the teachings of OceanStore and Condor.

VI. ORDER

For the reasons given, it is

ORDERED that, by a preponderance of the evidence, claims 1, 3–9, 13, 15, 16, and 18–21 of the '827 patent are unpatentable; and

FURTHER ORDERED that because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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NOTE: This order is nonprecedential.

United States Court of Appeals for the Federal Circuit

INTELLECTUAL VENTURES I LLC,
Appellant

v.

EMC CORPORATION, LENOVO (UNITED STATES) INC., NET APP, INC.,
Appellees

2018-2289, 2018-2290

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2017-00374, IPR2017-00439.

INTELLECTUAL VENTURES I LLC,
Appellant

v.

EMC CORPORATION, LENOVO (UNITED STATES) INC., NET APP, INC.,
Cross-Appellants

2018-2359, 2018-2360

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2017-00374, IPR2017-00439.

ON MOTION

ORDER

Cross-Appellants move unopposed to voluntarily dismiss Appeal Nos. 2018-2359 and 2018-2360, pursuant to Fed. R. App. P. 42(b).

Upon consideration thereof,

IT IS ORDERED THAT:

(1) Cross-Appellants' motion is granted. Appeal Nos. 2018-2359 and 2018-2360 are DISMISSED under Fed. R. App. P. 42(b).

(2) Each side shall bear their own costs in Appeal Nos. 2018-2359 and 2018-2360.

(3) The revised official caption for Appeal Nos. 2018-2289 and 2018-2290 is reflected above.

(4) Appellant Intellectual Ventures I LLC's reply brief is due no later than 21 days from the date of issuance of this order.

FOR THE COURT

March 08, 2019
Date

/s/Peter R. Marksteiner
Peter R. Marksteiner
Clerk of Court

ISSUED AS A MANDATE: March 08, 2019 (as to 2018-2359 and 2018-2360 only)

NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

INTELLECTUAL VENTURES I LLC,
Appellant

v.

EMC CORPORATION, LENOVO (UNITED STATES) INC., NET APP, INC.,
Appellees

2018-2289, 2018-2290

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2017-00374, IPR2017-00439.

Decided: September 25, 2019

WILLIAM H. MILLIKEN, Sterne Kessler Goldstein & Fox, PLLC, Washington, DC, argued for appellant. Also represented by BYRON LEROY PICKARD, DANIEL S. BLOCK.

CYNTHIA D. VREELAND, Wilmer Cutler Pickering Hale and Dorr LLP, Boston, MA, argued for all appellees. Appellee EMC Corporation also represented by DANA OLCOTT BURWELL, PETER M. DICHIARA, MARK CHRISTOPHER FLEMING; MICHAEL H. SMITH, Washington, DC; THOMAS A.

BROWN, Dell Inc., Hopkington, MA.

BENJAMIN EDWARD WEED, K&L Gates LLP, Chicago, IL, for appellees Lenovo (United States) Inc., Net App, Inc. Also represented by CHRISTOPHER CENTURELLI, Boston, MA.

Before TARANTO, CHEN, and STOLL, *Circuit Judges*.

TARANTO, *Circuit Judge*.

Intellectual Ventures I, LLC owns U.S. Patent No. 8,275,827, which describes and claims methods and systems for using storage available on network-attached devices. After IV filed suits alleging infringement of the '827 patent, EMC Corp., Lenovo (United States) Inc., and NetApp, Inc. (collectively, EMC) filed two petitions in the Patent and Trademark Office (PTO) for inter partes reviews of certain claims of the '827 patent under 35 U.S.C. §§ 311–319. The PTO's Patent Trial and Appeal Board, acting as delegee of the PTO's Director, 37 C.F.R. §§ 42.4, 42.108, instituted both reviews. The Board ultimately determined that several claims of the '827 patent are unpatentable.

IV appeals. It argues that the Board erred in its claim construction of one claim limitation and that, under a proper construction, that claim limitation is not taught by the cited references. IV also argues that EMC, in its petitions, did not adequately set forth the basis for its challenge regarding another claim limitation. Finally, IV argues that the Board improperly relied on its own filling of gaps left by EMC's evidence.

We conclude that the Board properly found the first claim limitation met for two reasons: for both IPRs, IV's proposed claim construction is incorrect; for one IPR, even under IV's construction, the cited reference discloses what the limitation requires. We also reject EMC's challenge to

the sufficiency of EMC's petitions regarding the second claim limitation at issue. And we determine that the Board did not rely on improper gap filling in its obviousness analysis. We therefore affirm the Board's decisions.

I

A

The '827 patent is titled "Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks." A "network attached storage (NAS) device" is a device that is connected to a network to provide storage capacity to network-connected users. '827 patent, col. 2, lines 18–20. Traditionally, the patent says, NAS devices were "stand-alone devices or systems that contain[ed] their own storage, processing, connectivity and management resources." *Id.*, col. 2, lines 12–14. A "dedicated NAS device" is one "whose primary operational purpose is for providing NAS service." *Id.*, col. 2, lines 34–35. The patent asserts that traditional dedicated NAS devices often had inferior hardware components compared to increasingly cheap and increasingly ubiquitous desktop computers, *id.*, col. 2, lines 46–55, and that the invention takes advantage of the storage resources on those desktop computers, which often sat idle, *id.*

Because the patent contemplates provision of NAS services by devices (such as desktop computers) that are not *dedicated* to providing NAS functionality, the specification states that the term "NAS device," as used in the patent, "broadly refers to a device that makes data storage resources available to network-connected user devices." *Id.*, col. 2, lines 31–35. It describes creating non-dedicated NAS devices through installation of a client agent program on a multiplicity of networked, distributed computers, many of which are used for non-NAS purposes. *Id.*, col. 2, line 59, through col. 3, line 17. This program takes advantage of unused resources on the distributed computers

and provides NAS services to connected user devices. *Id.*, col. 3, lines 6–21.

The patent states that "a large number of desktop" computers "can each act as a[n] NAS device by running a client agent program and NAS component that brings its resources to the network with the appearance of a dedicated NAS device or as part of an integrated system that appears as a single or dedicated NAS device." *Id.*, col. 42, lines 59–65. The patent goes on to describe at least three embodiments of the NAS system claimed in the '827 patent: (1) a system in which the NAS devices function as "stand-alone" devices, each directly accessed by user devices; (2) an "NAS fabric" system in which some NAS devices maintain storage-location information about other NAS devices, with the information used to direct users to the particular devices storing requested data; and (3) a "server assisted" system in which a server receives storage and access requests from user devices and plays a role in directing user devices to the distributed device storing requested data. *Id.*, col. 43, line 34 through col. 44, line 46; *see also id.*, fig. 21.

The patent includes two independent claims, claims 1 and 13, both at issue in this appeal. Claim 1 recites:

> 1. A computer-implemented method comprising:
>
> configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system,
>
> wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to

> assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices;
>
> representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices;
>
> processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network; and
>
> enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the respective client agents for the particular distributed device.

Id., col. 46, lines 28–56. Claim 13 parallels claim 1, except that, *first*, the subject of claim 13 is a system, rather than a method, and, *second*, it adds a requirement that the NAS component is configured to "allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices." *Id.*, col. 47, lines 38–40.

B

In December 2016, EMC petitioned for an inter partes review of certain claims of the '827 patent, relying for its primary reference on John Kubiatowicz et al., *OceanStore: An Architecture for Global-Scale Persistent Storage*, 35 ACM SIGPLAN NOTICES 190 (2000) (OceanStore). Later that month, EMC petitioned for another inter partes

review of a slightly different set of the '827 patent's claims, this time invoking as its primary reference a patent application naming Carter and others as inventors, Patent Cooperation Treaty publication WO 98/22881 (Carter).

On the first petition, the Board instituted a review of claims 1, 2–9, 13, and 15–21—the OceanStore IPR. That IPR came to include three grounds: anticipation by OceanStore; obviousness over OceanStore; and obviousness over OceanStore combined with another reference (Condor). In its final written decision, the Board held claims 1, 3–9, 13, 15, 16, and 18–21 unpatentable for obviousness over OceanStore. *EMC Corp. v. Intellectual Ventures I LLC*, No. IPR2017-00374, 2018 WL 3089864, at *11–21 (P.T.A.B. June 20, 2018) (*OceanStore Decision*).

On the second petition, the Board instituted a review of claims 1, 3–6, 8, 9, 13, 15–18, 20, and 21—the Carter IPR. That IPR came to include two grounds: anticipation by Carter of all but claims 5 and 17; and obviousness of claims 5 and 17 over Carter and another reference (Pitzel). In its final written decision, the Board held claims 1, 3, 4, 6, 8, 9, 13, 15, 16, 18, 20, and 21 unpatentable as anticipated by Carter and claims 5 and 17 unpatentable for obviousness over Carter and Pitzel. *EMC Corp. v. Intellectual Ventures I LLC*, No. IPR2017-00439, 2018 WL 3089250, at *8–21 (P.T.A.B. June 20, 2018) (*Carter Decision*). Claim 17 was addressed only in the Carter IPR, whereas claims 7 and 19 were addressed only in the OceanStore IPR.

In both the OceanStore IPR and the Carter IPR, the parties proposed competing constructions of the claim limitation, "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices." EMC proposed that the phrase means "using the corresponding software-based NAS components of the selected distributed devices to mimic dedicated NAS devices," whereas IV proposed that

the phrase means "using the corresponding software-based NAS components of the selected distributed devices to cause each selected distributed device to separately appear to network-connected user devices as a dedicated NAS device." *OceanStore Decision* at *4; *Carter Decision* at *4. The Board rejected IV's construction as unduly narrow. *OceanStore Decision* at *5–6; *Carter Decision* at *5–6. It also concluded that, even under IV's construction, both OceanStore and Carter disclose "representing" as required by this claim limitation. *OceanStore Decision* at *6, *14; *Carter Decision* at *6, *15–16.

In each proceeding, IV sought leave to file a motion to strike EMC's reply. The Board allowed IV to file a two-page paper in each proceeding that identified the arguments in EMC's replies that IV deemed improper. In those papers, IV argued that EMC, in its replies, had improperly presented arguments for unpatentability not contained in EMC's petitions. The Board disagreed, reasoning that EMC's arguments and evidence fairly responded to arguments raised in IV's responses. *OceanStore Decision* at *25; *Carter Decision* at *25–26.

IV timely appealed the Board's decisions. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

We review claim constructions de novo in a case like this, in which the relevant issue turns only on intrinsic evidence. *Teva Pharmaceuticals USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 840–41 (2015); *Hamilton Beach Brands, Inc. v. f'real Foods, LLC*, 908 F.3d 1328, 1339 (Fed. Cir. 2018). It is not disputed that, in this case, the Board was required by regulation to adopt the broadest reasonable interpretation when construing the claims.

Anticipation is a question of fact, whose resolution by the Board we review for substantial evidence. *In re Rambus, Inc.*, 753 F.3d 1253, 1256 (Fed. Cir. 2014). We review the Board's determination of obviousness de novo and its underlying factual findings for substantial-evidence

support. *Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 991 (Fed. Cir. 2017). Factual determinations include "findings as to the scope and content of the prior art, the differences between the prior art and the claimed invention, the level of ordinary skill in the art, the presence or absence of a motivation to combine or modify with a reasonable expectation of success, and objective indicia of nonobviousness." *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1364 (Fed. Cir. 2015). "Substantial evidence review asks 'whether a reasonable fact finder could have arrived at the agency's decision' and requires examination of the 'record as a whole, taking into account evidence that both justifies and detracts from an agency's decision.'" *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1366 (Fed. Cir. 2016) (quoting *In re Gartside*, 203 F.3d 1305, 1312 (Fed. Cir. 2000)).

We review the Board's procedural decisions for abuse of discretion. *Ericsson Inc. v. Intellectual Ventures I LLC*, 901 F.3d 1374, 1379 (Fed. Cir. 2018).

II

IV challenges the Board's construction of the "representing" limitation. According to IV, the Board's construction omitted both parts of what IV says is a dual requirement of the limitation—that (1) *each distributed device* must represent (2) "*to the user device*" that it includes its own NAS device. Appellant's Brief at 22. Under a proper construction of the term, IV contends, neither OceanStore nor Carter discloses a process that meets the "representing" limitation.

A

We conclude first that IV's claim construction is incorrect in demanding that the representation required by the "representing" limitation be made "to the user device" (the device of a user requesting storage). IV has made no substantial argument that, if there is no such requirement, the

Board was wrong to find that both OceanStore and Carter meet the "representing" limitation. In both IPRs, we therefore affirm the Board's finding that this limitation is met.

1

We reject IV's argument that the "representing" limitation requires the representation to be made to the user device. We find nothing in the claim language or specification that supports IV's position under the broadest-reasonable-interpretation standard.

The claim language does not say to whom the required representation must be made. In particular, it does not narrow the recipient class for the required representation to the user device. The claims at issue do not recite user devices at all. '827 patent, col. 46, lines 28–56.

We also see inadequate support for IV's "to the user device" requirement in the specification, either in the two specification statements to which IV has pointed or elsewhere. The first statement reads, "[A] client agent program is configured to run on the network-connected client devices that are part of the distributed computing system to provide what appears to user devices as dedicated NAS functionality . . . ." '827 patent, col. 2, lines 61–66. The second reads, "Through the client agent and infrastructure implementation of the present invention, such devices can provide storage capabilities that allow these devices to appear to users as dedicated NAS devices . . . ." *Id.*, col. 42, lines 54–59. Merely "appear[ing]" to a user device does not mean that a given distributed device has represented itself as an NAS device to the user device; such a device may appear as an NAS device to the user device because, *e.g.*, the user device received that representation about the particular device from another device. Regardless, even if "appear(s)" equates to "represent," the two specification statements do not require each individual client device to present itself to a user device as a dedicated NAS device. The first statement speaks only of a user device seeing NAS

"functionality," and both it and the second statement are reasonably understood as covering a user device seeing the client devices collectively as dedicated NAS devices. The specification language does not include the word "respectively" that appears in the claims and points toward individualized representations (though not "to the user device").

Indeed, the sentence following IV's citation to column 42 says that "a large number of desktop PCs in the enterprise (Intranet) or on the Internet can each act as a[n] NAS device by running a client agent program and NAS component that brings its resources to the network . . . as part of an integrated system that appears as a single or dedicated NAS device." *Id.*, col. 42, lines 59–65. Thus, the specification contemplates that each distributed device might not make a representation to a user device. IV has so acknowledged, explaining that, while its proposed construction covers the three specific embodiments described in columns 43 and 44, it reads out the "integrated system" implementation identified in column 42.

2

Having rejected IV's proposed requirement that the claimed representation must be made to the user device, we affirm the Board's finding that both OceanStore and Carter teach the claim limitation. The crux of IV's argument that neither reference teaches the limitation is that both references disclose systems in which user devices see only a single, aggregated storage pool. Appellant's Reply Brief at 9 ("OceanStore does not disclose the 'representing' limitation under the correct construction because OceanStore's system appears to user devices as a single pot of storage."), 12 ("Carter describes only a shared memory that appears to each node as a single, large storage space."). IV does not argue that, in the absence of a "to the user device" requirement, OceanStore and Carter do not disclose the representing limitation.

Nor is it surprising that IV keys its argument to the "to the user device" requirement. As we will discuss in the next section, IV's position is that a distributed device represents itself as an NAS device whenever it engages in a memory transaction with another device. To function as an NAS device on that understanding—*i.e.*, making storage resources available to network-connected user devices—a given distributed device must communicate to some other network-connected device that it has available storage space. Likewise, when a user device accesses data stored on an NAS device, the latter must communicate that data to another device so that it may, directly or indirectly, reach the user device. Therefore, under IV's position described next, a network-connected distributed device functioning as an NAS device necessarily represents that it is an NAS device to some other device on the network, even if that other device may not be the user device.

B

For the OceanStore IPR, there is a second basis to affirm the Board's finding about the "representing" limitation. Substantial evidence supports the Board's finding that OceanStore teaches the limitation even under IV's construction.

1

In its opening brief and its reply brief, IV argues that all three embodiments discussed in columns 43 and 44 of the '827 patent—*i.e.*, "stand alone" NAS, "NAS fabric," and "server assisted" NAS—meet the "representing" limitation. In so arguing, IV makes clear what suffices to meet the claim limitation within its construction.

The first embodiment meets the limitation, IV says, because user devices directly access each NAS device as if it were a traditional dedicated NAS device. '827 patent, col. 43, lines 44–58. In the NAS fabric embodiment, at least some of the distributed devices contain location

information used to provide links or directions to data that might be stored in any of several NAS devices on the network, *id.*, col. 43, lines 59–66, and an NAS device storing location information receives a request from a user device and then directs the user device to the NAS device storing the requested data, *id.*, col. 44, lines 13–16. IV asserts that the "representing" limitation is met in this setting because, once the user device is directed to the storing device, the resulting direct user-device/storing-device interaction necessarily includes the storing device representing *to* the user device, not just to some other entity on the internal network, that it is an NAS device. IV's position on coverage of the third embodiment, involving server assistance, is similar. In that embodiment, the server receives requests from a user device and directs the user device to the NAS device storing the requested data. *Id.*, col. 44, lines 24–42. According to IV, the resulting direct user-device/storing-device interaction means that the latter is representing itself to the former as an NAS device, as in the NAS fabric embodiment.

2

IV's argument for why the NAS fabric and server assisted embodiments come within its construction establishes a sufficient condition for a disclosure to meet the "representing" limitation under IV's construction. OceanStore satisfies that condition.

Like the '827 patent, OceanStore notes the ubiquity of computing devices configured with excess storage space. OceanStore at 191. OceanStore envisions a system of geographically distributed servers—referred to as "nodes"—that store "replicas" (copies) of user data, easing users' access to their data. *Id.* at 191, 193. Every "persistent object" (stored item) in OceanStore is identified by a globally unique identifier (GUID). *Id.* at 191. An object and a replica of the object are directly addressable using the same GUID. *Id.* at 192–93.

Messages in OceanStore are handled by the routing layer of the OceanStore protocol. *Id.* at 193. A user device accesses requested data by a two-step process. "Messages begin by routing from node to node along the distributed data structure until a destination is discovered. At that point, *they route directly to the destination.*" *Id.* (emphasis added); *see also id.* at 194 ("When someone searches for information, they climb the tree until they run into a pointer, after which they route directly to the object.").

The Board found: "In the second stage, after the node that has the requested object is identified, messages can be directly sent to that node without having to route through the other nodes." *OceanStore Decision* at *9. That finding is a reasonable reading of the article. And the Board's finding establishes that OceanStore discloses the "representing" limitation for the same reasons that the NAS fabric meets the limitation according to IV. Just as the user device comes to directly interact with the storing node in the NAS fabric embodiment, the user devices in OceanStore come to communicate directly with the desired object once the location of that object is discovered.

IV suggests that substantial evidence does not support the Board's finding about OceanStore. IV disputes that OceanStore teaches an NAS device communicating directly with a *user device*; rather, IV argues, the direct communication that occurs during the second stage of message routing is between the storing node and the node nearest the user device. The Board could reasonably find otherwise. Although OceanStore discusses communication with "the closest entity," the "entit[ies]" at issue in this particular context are the nodes storing a replica of the desired object. OceanStore at 193. OceanStore explains that its method of routing messages allows the client—*i.e.*, the user device—to communicate with the nearest node storing a replica of the desired object, rather than whichever node the client last communicated with when accessing the desired object.

Id. Therefore, this "closest entity" is the storing node, not the node nearest the user device. *Id.*

Figure 2 of OceanStore does not contradict this understanding. OceanStore's mechanism for routing uses a two-tiered approach, "featuring a fast, probabilistic algorithm backed up by a slower, reliable hierarchical method." *Id.* The probabilistic algorithm uses attenuated Bloom filters, which indicate the objects stored on an edge of nodes. *Id.* Figure 2 illustrates how queries are routed along the edge whose Bloom filter indicates the desired object is closest; this query eventually determines the precise node where the object is located. *Id.* Thus, Figure 2 portrays how the first step of message routing works—routing node to node until the destination is discovered; it is unrelated to the direct communication that occurs after the destination is discovered. The figure thus does not support IV's argument.

Nor is IV's argument about OceanStore supported by OceanStore's statement that "[i]f replicas move around, only the network, not the users of the data, needs to know." *Id.* Users need not know the location of the desired object because they are eventually directed there by the network. This is precisely how the NAS fabric described by the '827 patent functions: A user device makes a request, and another device with location information directs it to the storing device. '827 patent, col. 44, lines 13–16. IV has insisted that the "representing" limitation is met by that process.

We conclude that substantial evidence supports the Board's finding that OceanStore discloses the "representing" limitation under IV's proposed construction. We do not address the same alternative ground for Carter, as to which the resolution of this issue is less clear from the Board's decision, the particular portions of Carter relied on by the Board's decision, and EMC's petition and evidence.

III

IV asserts that the Board erred in holding that the "allocate" limitation of claim 13 was taught by or would have been obvious in light of the prior art. IV's argument is that the Board, in making that determination, improperly relied on arguments and evidence presented for the first time in EMC's reply. That reliance, EMC contends, violates statutory and regulatory requirements. *See* 35 U.S.C. § 312(a)(3) (IPR petition must identify the grounds with particularity and the evidence that supports the grounds); 37 C.F.R. § 42.104(b)(4) (petition must specify where each claim element is found in the relied-on prior art); Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,767 (Aug. 14, 2012) (a reply may respond to the patent owner's response but "a reply that raises a new issue or belatedly presents evidence will not be considered").

We have generally treated Board rulings challenged on such grounds as subject to review for abuse of discretion. *See, e.g., Intelligent Bio-Systems*, 821 F.3d at 1367; *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1078 (Fed. Cir. 2015). Legal errors can make a ruling an abuse of discretion, and legal questions are decided de novo. *See Yancheng Baolong Biochemical Products Co., Ltd. v. United States*, 406 F.3d 1377, 1380 (Fed. Cir. 2005). But we do not see a genuine legal issue here, only an application of the legal standards to the case-specific facts presented in the two IPRs.

We find no reversible error regarding the "allocate" limitation of claim 13. We consider the OceanStore petition first, then the Carter petition.

A

The entirety of the discussion of the "allocate" limitation in the OceanStore petition is as follows:

> Claim element 13[d] is satisfied for the same reasons as element 1[d]. (Ex. 1002, ¶138.) In this regard, Dr. Kubiatowicz explains that desktop

> workstations with excess storage and using OceanStore software would allocate the excess storage for use by OceanStore users (i.e., making it available for other devices to use) but would reserve other workstation storage for purely local use, e.g., to store computer programs, local operating system and the like. (Ex. 1002, ¶138.).

J.A 249. The referred-to element 1[d] is the "representing" limitation. J.A. 235. The cited paragraph of the declaration of EMC's expert, Dr. Kubiatowicz, is almost identical to the paragraph in the petition. J.A. 1386 (itself citing back to earlier paragraphs 102–104, J.A. 1371–72).

In its preliminary response, IV argued that EMC failed to explain how any statements it made regarding the "representing" limitation were relevant to the "allocate" limitation. J.A. 298. IV further argued that Dr. Kubiatowicz's testimony deserved little weight, because it simply parroted the arguments made in the petition. J.A. 299–300. But the Board, in its institution decision, relied partly on Dr. Kubiatowicz's declaration to determine, under the institution-stage standard, that a relevant artisan would have understood OceanStore as teaching or at least suggesting the "allocate" limitation. J.A. 357–58.

In its post-institution response, IV again argued that EMC's petition failed to establish a prima facie case of obviousness for the "allocate" limitation of claim 13. J.A. 465. IV further argued that OceanStore does not in fact teach or suggest allocating and contains no discussion of how or when storage is allocated in the OceanStore system. J.A. 467. In reply, EMC pointed out that the '827 patent itself neither claims any particular method of allocation nor contains any description of an allocation method in its specification. J.A. 535–36. EMC also quoted a portion of its expert's deposition and argued that IV had not explained why OceanStore does not suggest allocating when it

teaches that its nodes both assess unused storage and make that storage available to other devices. J.A. 536–37.

IV then requested authorization to file a motion to strike certain portions of EMC's reply. The Board declined, instead granting IV authorization to submit a list of improper reply arguments, a list the Board would consider in its final written decision. J.A. 587–88. IV filed its list, identifying one argument regarding the "allocate" limitation. J.A. 608–09. In its final written decision, the Board determined that the arguments in EMC's reply were appropriate and fairly responded to arguments IV raised in its responses. *OceanStore Decision* at *25.

We conclude that EMC's petition provided IV legally adequate notice of and support for its theory of unpatentability, including with respect to the "allocate" limitation. In the portion of its petition effectively incorporated by reference into the analysis of the "allocate" limitation, EMC explained that "the OceanStore software provided the functionality for the pool devices, such as desktop workstations with excess storage, to instead appear, function and act as storage servers on the network, providing storage resources to user devices connected to the network." J.A. 235–36. Both the petition and Dr. Kubiatowicz's declaration, in their brief discussions of the claim 13 "allocate" limitation, refer back to passages that highlight the requirement to make storage available. *See* J.A. 1371. The express assertions that this claim 13 limitation is satisfied because of the earlier explanation amount to, and should have been understood as, assertions that the claimed allocating is taught or would have been obvious from the other features, including the making available of storage, taught in OceanStore.

Thus, we think that the Board could properly conclude that EMC's argument from the outset was that, because the OceanStore nodes function as NAS devices and represent that they have available storage, it would have been

obvious to a relevant artisan that the nodes would allocate excess storage space for use by the user devices, and that is the rationale the Board adopted when it found that OceanStore taught or at least suggested the "allocate" limitation. *OceanStore Decision* at *16. In these circumstances, we think that the initial notice was sufficient even without further explanation, especially given that IV's patent itself provides no more explanation of allocating separate and apart from the other features calling for making storage available. *Cf. SRI Intern. Inc. v. Internet Sec. Systems, Inc.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008) (determining that an anticipatory reference was enabled when its level of detail on how to make was as great as the discussion of the claimed limitation in the patent at issue).

It is not clear that EMC's argument about the Board's reliance on reply material is intended to stand independently of its contention about the inadequacy of the petition, but we see no reversible error in this respect if it is. The Board could fairly conclude that the arguments in EMC's reply were responsive to arguments IV made in its patent owner's response. They helped explain why the argument in EMC's petition was correct—namely, why disclosure of the "representing" limitation would teach or suggest the "allocate" limitation. *See Wasica Finance GmbH v. Continental Automotive Systems, Inc.*, 853 F.3d 1272, 1286 (Fed. Cir. 2017). EMC did not abandon its previous theory of prima facie obviousness in favor of a new one, nor did it advance a new theory of invalidity using entirely different references. *See id.* at 1286–87; *Intelligent Bio-Systems*, 821 F.3d at 1369–70.

Therefore, we reject IV's challenge to the Board's decision regarding the "allocate" limitation of claim 13 in the OceanStore IPR.

B

The Carter petition's treatment of the "allocate" limitation is like that of the OceanStore petition in relying on

a cross-reference back to a discussion earlier in the document. *See* J.A. 828 (referring to J.A. 811–17, citing ¶157 of Dr. Kubiatowicz's declaration, J.A. 1483). But in the Carter IPR, neither the petition's paragraph on the "allocate" limitation nor the cited paragraph of Dr. Kubiatowicz's declaration includes even the single explanatory sentence found in their OceanStore IPR counterparts. The petition simply states, "This limitation is satisfied for the reasons given above in the context of claim 1. *See* §§VII.B.1(c), VII.B.1(d), *supra*. (Ex. 1102, ¶157.)." J.A. 828. The cross references are to the petition's analysis of the "assess" and "representing" limitations of claim 1. J.A. 811–17. Dr. Kubiatowicz's declaration, for its part, simply states, "This limitation is satisfied for the reasons given above in the context of claim 1." J.A. 1483.

In its preliminary response, IV argued that claim 1 did not recite the "allocate" limitation, so the petition's discussion of the "assess" and "representing" limitations could not satisfy the "allocate" limitation. J.A. 885–86. In its institution decision, the Board found that Dr. Kubiatowicz's discussion of "dynamically distribut[ing] the available resources," in the context of the "assess" limitation, corresponds to the "allocate" limitation and sufficed to meet EMC's burden. J.A. 936. In its response, IV argued that merely "distributing available resources" does not satisfy the "allocate" limitation. J.A. 1037–40. In reply, EMC again pointed out that the '827 patent does not provide any description of allocating. J.A. 1096–97. Additionally, EMC argued that IV's expert, Dr. Shenoy, admitted during cross-examination that Carter has numerous disclosures regarding allocating, and Dr. Kubiatowicz further testified that allocating was a well-known function that would not require significant description. *Id.*

IV requested permission to file a motion to strike and was granted leave to submit a list of allegedly improper reply arguments. J.A. 1147–48. In its list, IV pointed to EMC's arguments regarding Dr. Shenoy's identification of

allocating in Carter and Dr. Kubiatowicz's testimony that allocating was a well-known function. J.A. 1162–63. In the final written decision, the Board determined that the identified arguments were not improper and fairly responded to IV's arguments raised in its responses. *Carter Decision* at *25–26.

We do not think that IV's argument as to claim 13 calls for a result for the Carter IPR different from the result we have reached for the OceanStore IPR. On this record, we cannot say that the Board erred in determining that the Carter petition gave adequate notice of and support for its theory of why the "allocate" limitation was taught. The express assertions that this claim 13 limitation is satisfied because of the earlier explanation amount to, and should have been understood to be, assertions that the claimed allocating is taught by the other features disclosed in Carter, including its distinguishing of used and unused storage space and employment of the policy controller to distribute the available unused resources. J.A. 812–13.

This is the disclosure the Board relied on in its institution decision and again in its final written decision for claim 13. *Carter Decision* at *17. There was no switching of theories from petition to decision. And we see no impropriety in the Board's treatment of EMC's reply submissions.

Therefore, we reject IV's challenge to the Board's decision regarding the "allocate" limitation of claim 13 in the Carter IPR.

IV

IV's final argument applies only to the OceanStore IPR. IV argues that the Board's obviousness analysis in that IPR is legally deficient because it relies on gap-filling to find teaching or suggestion of several limitations that IV says are not disclosed by OceanStore. In particular, IV contends that the Board did not find that the "assess unused

or under-utilized storage resources," "representing," "centralized server," and "downloading" limitations are disclosed by OceanStore.

A

With regard to the "representing" and "centralized server" limitations, the Board found that each was explicitly disclosed by OceanStore. There was no gap to fill for those limitations if those findings are supported by substantial evidence. We conclude that they are. We have already discussed the substantial evidence that supports the Board's finding that OceanStore discloses the "representing" limitation. We discuss here only the "centralized server."

Claim 4—which depends indirectly on claim 1—recites "managing the NAS service for the at least one of the particular distributed devices at least in part utilizing a centralized server." '827 patent, col. 46, lines 65–67. Claim 16 depends indirectly on claim 13 and recites a similar limitation. *Id.*, col. 48, lines 16–18. The Board found that OceanStore discloses the "centralized server" limitation required by claims 4 and 16. *OceanStore Decision* at *18.

IV argues that the Board relied on Dr. Kubiatowicz's conclusory assertions to reach its finding. But Dr. Kubiatowicz's declaration is not conclusory: it cites to several portions of OceanStore to support his statements that the disclosed servers would cache, monitor, and manage the NAS functionality for users associated with the server. J.A. 1376–79. Moreover, the Board's decision cites not only to Dr. Kubiatowicz's testimony but to OceanStore. *OceanStore Decision* at *18. Although IV contends that the '827 specification describes a centralized server performing several functions not disclosed by OceanStore, those functions are not recited in the claims.

We conclude that substantial evidence supports the Board's finding that OceanStore discloses the "centralized server" limitation in '827 claims 4 and 16.

B

With regard to "assess[ing] unused or under-utilized storage resources" as required by claims 1 and 13, the Board found that OceanStore does not disclose that limitation expressly or inherently. *Id.* at *11. Nevertheless, based on the testimony of Dr. Kubiatowicz and the prosecution history of the '827 patent, the Board determined that the assessing required by this limitation would have been obvious to a relevant artisan. *Id.* at *12–13. We see no reversible error in that determination.

IV argues that Dr. Kubiatowicz's declaration is conclusory on this point. We disagree. The declaration cites to several portions of OceanStore that describe providing storage resources to users by using software, and the declaration concludes that a device must "assess" storage resources in order to make them available. J.A. 1369–70. Additionally, both the Board and Dr. Kubiatowicz noted that the '827 patent itself provides no detail of how the NAS devices assess resources. *Id.*; *OceanStore Decision* at *13. Indeed, in response to a § 112 rejection during prosecution, the applicant argued that "it would have been obvious to one of ordinary skill in the art that the client agent programs must assess unused or under utilized capabilities for it to be able to configure the devices to mimic standalone NAS devices using their spare and/or unused capabilities." J.A. 1701 (underlining omitted). This argument is strikingly similar to Dr. Kubiatowicz's own argument.

We conclude that substantial evidence supports the Board's finding that OceanStore teaches or suggests the "assess" limitation.

C

We reach the same conclusion with respect to the claim 5 requirement of "downloading the software-based NAS component to the selected distributed devices." '827 patent, col. 47, lines 1–3. Although OceanStore discloses that its software is written in Java, OceanStore at 199, it does not disclose that the software can be downloaded. But based on the record, particularly the testimony of Drs. Kubiatowicz and Shenoy, the Board determined that it would have been obvious to a relevant artisan to download the Java files. *OceanStore Decision* at *18–20. We see no reversible error in that determination.

The Board credited Dr. Kubiatowicz's testimony that Java was downloadable at the time of the '827 patent's priority date, and his testimony is supported by documentary evidence. J.A. 3365–67. The Board could reasonably credit that testimony even though Dr. Shenoy testified that software was typically distributed using compact disks at the time. That testimony about what was typical was about software generically, not about Java specifically, and Dr. Shenoy recognized that software could have been downloaded over the network. *OceanStore Decision* at *18–20. Dr. Shenoy did not opine on the distribution practices for Java in particular. J.A. 3665–67.

We conclude that substantial evidence supports the Board's finding that OceanStore teaches or suggests "downloading the software based NAS component."

V

For the foregoing reasons, we affirm the Board's decisions.

The parties shall bear their own costs.

AFFIRMED

United States Court of Appeals for the Federal Circuit

INTELLECTUAL VENTURES I LLC,
Appellant

v.

EMC CORPORATION, LENOVO (UNITED STATES) INC., NET APP, INC.,
Appellees

2018-2289, 2018-2290

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2017-00374, IPR2017-00439.

JUDGMENT

THIS CAUSE having been considered, it is

ORDERED AND ADJUDGED:

AFFIRMED

ENTERED BY ORDER OF THE COURT

September 25, 2019

/s/ Peter R. Marksteiner
Peter R. Marksteiner
Clerk of Court

United States Court of Appeals for the Federal Circuit

September 26, 2019

ERRATA

Appeal Nos. 2018-2289, 2018-2290

INTELLECTUAL VENTURES I LLC,
Appellant

v.

EMC CORPORATION, LENOVO (UNITED STATES) INC., NET APP, INC.,
Appellees

Decided: September 25, 2019
Non-Precedential Opinion

Please make the following change:

On page 2, line 36: change "reject EMC's challenge" to "reject IV's challenge".

United States Court of Appeals for the Federal Circuit

INTELLECTUAL VENTURES I LLC,
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2018-2289, 2018-2290

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MANDATE

In accordance with the judgment of this Court, entered September 25, 2019, and pursuant to Rule 41 of the Federal Rules of Appellate Procedure, the formal mandate is hereby issued.

FOR THE COURT

November 1, 2019

/s/ Peter R. Marksteiner
Peter R. Marksteiner
Clerk of Court

(12) **INTER PARTES REVIEW CERTIFICATE** (1849th)
United States Patent
Hubbard

(10) **Number: US 8,275,827 K1**
(45) **Certificate Issued: Sep. 24, 2020**

(54) **SOFTWARE-BASED NETWORK ATTACHED STORAGE SERVICES HOSTED ON MASSIVELY DISTRIBUTED PARALLEL COMPUTING NETWORKS**

(75) Inventor: **Edward A. Hubbard**

(73) Assignee: **INTELLECTUAL VENTURES I LLC**

Trial Numbers:

IPR2017-00374 filed Dec. 13, 2016
IPR2017-00439 filed Dec. 22, 2016

Inter Partes Review Certificate for:

Patent No.: **8,275,827**
Issued: **Sep. 25, 2012**
Appl. No.: **09/834,785**
Filed: **Apr. 13, 2001**

The results of IPR2017-00374 and IPR2017-00439 are reflected in this inter partes review certificate under 35 U.S.C. 318(b).

INTER PARTES REVIEW CERTIFICATE
U.S. Patent 8,275,827 K1
Trial No. IPR2017-00374
Certificate Issued Sep. 24, 2020

AS A RESULT OF THE INTER PARTES REVIEW PROCEEDING, IT HAS BEEN DETERMINED THAT:

Claims **1**, **3-9**, **13** and **15-21** are cancelled.

* * * * *