

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
MIDLAND/ODESSA DIVISION**

HEADWATER RESEARCH LLC,	§	
	§	
Plaintiff	§	
	§	
v.	§	Case No. 7:25-CV-00374-DC-DTG
	§	
GOOGLE LLC,	§	JURY TRIAL DEMANDED
	§	
Defendant.	§	
	§	
	§	

DEFENDANT GOOGLE LLC’S INVALIDITY CONTENTIONS

I. INTRODUCTION

Pursuant to the Scheduling Order (Dkt. 43), and the Standing Order Governing Patent Proceedings (“OGP”) 4.4, Defendant Google LLC (“Google” or “Defendant”), hereby discloses these Invalidity Contentions in the above-captioned case to Plaintiff Headwater LLC (“Headwater” or “Plaintiff”). On December 17, 2025, Headwater served Defendant with Infringement Contentions alleging infringement of the following claims (“Asserted Claims”) of the following patents (“Asserted Patents”):

- Claims 1-30 of U.S. Patent No. 8,666,364 (the “’364 Patent”)
- Claims 1-19 of U.S. Patent No. 9,647,918 (the “’918 Patent”)

See Plaintiff Headwater’s Preliminary Contentions (“Infringement Contentions”). As discovery and possible third-party productions relevant to invalidity have not yet begun, Defendant reserves the right to supplement these Invalidity Contentions, including to add additional prior art, supporting evidence, and obviousness combinations.

As explained below and in the accompanying exhibits, incorporated by reference herein, Defendant contends that each of the claims asserted by Headwater is invalid under at least 35

U.S.C. §§ 101, 102, 103, and/or 112 (pre-AIA and AIA). In its Infringement Contentions Headwater asserts that the Asserted Claims of the '364 Patent are entitled to a priority date of January 28, 2009, and the Asserted Claims of the '918 Patent are entitled to a priority date of January 24, 2011, Infringement Contentions at 5, which would mean that the Asserted Patent falls under pre- Leahy-Smith America Invents Act patent law (“pre-AIA”) as their effective filing dates fall before March 16, 2013. Defendant’s disclosures in these Invalidity Contentions, including claim charts and related documents, reflect Headwater’s representations regarding the alleged priority date of the Asserted Patents, but Defendant reserves the right to amend its contentions pending further discovery regarding conception and reduction to practice. Moreover, Defendant does not concede that any or all of the Asserted Claims of the Asserted Patents are entitled to the alleged priority date, and thus may not be subject to pre-AIA treatment. OGP 4.4 does not require Defendant to provide their alleged priority dates in these Invalidity Contentions and Defendant reserves the right to challenge the alleged priority date for any of the Asserted Claims of the Asserted Patents.

Defendant notes that it may challenge the priority date of the Asserted Claims of the Asserted Patents. Exemplary bases for challenging the claimed priority dates are set forth below.

- *Headwater Rsch. LLC v. Samsung Elecs. Co., Ltd.*, No. 2:22-cv-00422-JRG-RSP, Dkt. 399 at 2 (E.D. Tex. Aug. 2, 2024) (“Dr. Raleigh left Qualcomm on September 19, 2008 and filed a provisional '354 application on January 28, 2009 within one year of his departure. Plaintiff initially asserted that all patents claimed priority to this provisional but has since agreed that the priority date is May 25, 2010.”)

In addition, Plaintiff has modified its priority date claims in actions against other parties, and Plaintiff does not appear to have produced all documents evidencing the conception and reduction to practice of each claimed invention in accordance with OGP 4.4.

Should any application for one of the Asserted Patents contain or have contained at any time, a claim having an effective filing date of March 16, 2013, or later, or a specific reference under 35 U.S.C. §§ 120, 121, or 365(c), to any patent or application that contains or contained at any time such a claim, the AIA's provisions would apply to every claim to have issued from such an application. *See* AIA § 3(n)(1). As such, these invalidity contentions and the attached exhibits address invalidity and ineligibility under both pre-AIA and AIA patent law. Unless stated otherwise, each citation to any of 35 U.S.C. §§ 101, 102, 103, and/or 112, shall be interpreted as referring to both the pre-AIA and AIA section(s).

For purposes of these Invalidity Contentions, Defendant identifies prior art references and provides element-by-element claim charts based, in part, on the implicit claim constructions advanced by Plaintiff in its Infringement Contentions. The citation of prior art herein and in the accompanying exhibits is not intended to reflect Defendant's claim construction positions, which will be disclosed in due course in accordance with the Scheduling Order (Dkt. 43), and may instead reflect Plaintiff's implicit (and potentially erroneous) claim constructions based on its Infringement Contentions. Nothing stated herein shall be treated as an admission or suggestion that Defendant agrees with Plaintiff regarding either the scope of any of the Asserted Claims or the claim constructions advanced in the Infringement Contentions. Moreover, nothing in these Invalidity Contentions shall be treated as an admission that Defendant's accused technology meets any limitations of the claims.

Defendant's Invalidity Contentions herein reflect Defendant's knowledge as of this early date in the present action. Defendant reserves the right, to the extent permitted by the Court and the applicable statutes and rules, to modify and/or supplement its Invalidity Contentions in response to becoming aware of additional prior art or information regarding prior art, any modification or supplementation of Plaintiff's Infringement Contentions, any claim construction by the Court, or as otherwise may be appropriate.

Defendant's Exhibits attached hereto cite to particular teachings and disclosures of the prior art as applied to features of the Asserted Claims. However, persons having ordinary skill in the art ("POSITA") generally view a prior disclosure in its entirety (e.g., view specific disclosures in the context of the general disclosures), in the context of other publications, literature, products, and understanding and knowledge of such a person. As such, the cited portions of prior art identified herein are exemplary only. Defendant may rely on the entirety of the prior art references listed herein, including un-cited portions of those prior art references, and on other publications, systems, evidence, and expert testimony shedding light on those prior art references or the state of the art in general, including as aids in understanding and interpreting the cited portions, as providing context thereto, and as additional evidence that the prior art discloses a claim limitation.

Defendant may also rely on documents, systems, products, testimony, and other evidence to establish bases for, and motivations to make, combinations of or modifications to certain cited references that render the Asserted Claims obvious. Defendant may rely upon corroborating documents, products, testimony, and other evidence, including confidential and non-confidential materials obtained through further discovery, investigation, and third-party discovery of the prior art identified herein that describes the invalidating features identified in these contentions;

evidence of the state of the art in the relevant time period (irrespective of whether such references themselves qualify as prior art to the Asserted Patents), including prior art listed on the face of the Asserted Patents and/or disclosed in the specification(s) (i.e., applicant admitted prior art); and/or expert testimony to provide context to or aid in understanding the cited portions of the identified prior art.

The references discussed in the Exhibits hereto disclose the elements of the Asserted Claims explicitly, inherently, and/or in combination with themselves or the knowledge of one skilled in the art at the time of filing. The references also may be relied upon to show the state of the art in the relevant time frame. To the extent the attached claim charts cite to a reference for each element or limitation of an Asserted Claim, Defendant contends that such reference anticipates that claim or renders it obvious, either alone or in combination with other references. To the extent suggested obviousness combinations are included in the attached exhibits, they are provided in the alternative to Defendant's anticipation contentions and are not to be construed to suggest that any reference included in the combinations is not by itself anticipatory.

Pursuant to OGP 4.4, Defendant provides disclosures and related documents pertaining only to the Asserted Claims as identified by Plaintiff in its Infringement Contentions. Defendant reserves the right to amend these Invalidity Contentions should Plaintiff amend its Infringement Contentions or its implicit claim constructions. Defendant also reserves the right to modify, amend, and/or supplement its Invalidity Contentions in light of positions that Plaintiff or its expert witnesses may assert concerning claim construction, infringement, and/or invalidity issues including in any *inter partes* or *ex parte* proceedings or other post-grant proceedings. Defendant also reserves the right to modify, amend, and/or supplement its Invalidity Contentions in view of additional evidence, including third party evidence, produced in this matter in accordance with

all applicable orders and rules and/or as that information is produced in the ordinary course of discovery. Defendant will further supplement their OGP 4.4 document production should they later find additional prior art or obtain translations of previously-produced art. Much of the art identified in the attached Exhibits reflects common knowledge and the state of the art at or around the time of the earliest possible priority date of the Asserted Patents.

Each of the Asserted Claims of the Asserted Patents is anticipated by and/or obvious in view of one or more items of prior art identified herein, alone or in combination. Specific examples of this anticipation and obviousness, along with the motivation to combine the selected prior art, are set forth in the attached Claim Charts (Exs. A-01 – A-10, B-01 – B-12) and Section V below.

II. BACKGROUND AND STATE OF THE ART

The prior art identified herein and discussed in the Exhibits attached hereto may be relied on to show the state of the art and industry prior to Plaintiff's alleged priority dates for the Asserted Patents. This prior art identification is only exemplary and is not in any way intended to limit the scope of what one of ordinary skill in the art would have understood, or the breadth of the state of the art, at or around the time of the earliest possible priority date. Defendant reserves the right to rely upon additional prior art, information, testimony, and/or knowledge to demonstrate what one of ordinary skill in the art would have understood prior to the earliest possible priority date for the Asserted Claims of the Asserted Patents. Defendant may further rely upon the Admitted Prior Art disclosed in the Asserted Patents, including but not limited to the concepts and prior art references discussed therein. Defendant may also rely on patents and/or publications that encompass the state of the art at or around the time of the earliest possible priority date.

Defendant may also rely on certain prior art technologies and/or prior art systems and references as describing or indicating the industry state of the art, as would be known to a person of skill in the art, at or around the time of the earliest possible priority date(s) of the Asserted Claims of the Asserted Patents. These include all technologies, systems, and references cited in the Asserted Patents and related patent applications and/or raised during any proceedings before the U.S. Patent and Trademark Office. Defendant may rely on articles, publications, textbooks, and/or physical devices to establish the state of the art at or around the time of the earliest possible priority date(s) of the Asserted Claims of the Asserted Patents. Defendant reserves the right to add additional documents describing any such system that may become available through further investigation and discovery. More detailed discussion of the background and state of the prior art are set forth in Section VII, *infra*, and in the attached Claim Charts (Exs. C-01–C-02, D-01–D-02).

Indeed, myriad materials evidence the general state of the art, and the working knowledge of a POSITA, at or around the time of the earliest possible priority date. In accordance with typical practice in this district, Defendant does not exhaustively discuss and/or separately list such materials in these contentions, and there is no requirement that Defendant do so. Nevertheless, such materials likely will be the subject of expert opinion as to the relevant state of the art, and thus Defendant reserves the right to present expert evidence and testimony further detailing and providing additional context for the state of the art at the time of the alleged invention.

III. IDENTIFICATION OF PRIOR ART

In addition to the prior art identified in the prosecution history of the Asserted Patents, Defendant also relies upon the prior art identified pursuant in the attached Exhibits in support of these Invalidity Contentions. Defendant's identification of patents and publications as prior art

herein and in the attached claim charts includes the publications themselves, as well as the use of the products, devices, apparatuses and/or systems described therein. Although Defendant's investigation continues, information available to date indicates that such products, devices, and systems were known or used before the alleged filing date of the Asserted Claims. These prior art products, devices, apparatuses, and systems, and their associated references anticipate and/or render obvious each of the Asserted Claims.

Defendant further intends to rely on inventor admissions concerning the scope of the prior art relevant to the Asserted Patents found in, *inter alia*, the prosecution history of the Asserted Patents and any related patents, patent applications, and/or post-grant proceedings including reexaminations and *inter partes* reviews; any deposition testimony of a named inventor on the Asserted Patents; and the papers filed and any evidence submitted by Plaintiff in conjunction with this litigation.

Discovery is in its earliest stages, and Defendant's prior art investigation, including via discovery and third-party discovery, is therefore not yet complete. Defendant reserves the right to rely upon additional evidence of invalidity obtained in the future, to the extent that further investigation and discovery yield information forming the basis for such claims.

A. Applicant-Admitted Prior Art¹

The Asserted Patents admit that the following techniques and technology were known in the art:

- Access networks such wireless networks, cable networks and DSL (Digital Subscriber Line) networks, for example, EVDO (Evolution-Data Optimized), HSPA (High Speed Packet Access), LTE (Long Term Evolution), WiMax

¹ This section is for illustrative purposes only, as it is not required by the Scheduling Order or OGP 4.4. As such, Defendant reserves all rights to contend that additional or different prior art was admitted by the applicant.

(Worldwide Interoperability for Microwave Access), DOCSIS, DSL, and Wi-Fi (Wireless Fidelity) wireless networks. '364 patent, 1:33-40; '918 patent, 1:9-15.

- “[H]igher capacity wireless radio access technologies, such as MIMO (Multiple-Input Multiple-Output)[.]” ’364 patent, 1:42-44; ’918 patent, 1:17-19.
- “[W]ire line access networks, such as cable and DSL, can have higher average capacity per user[.]” ’364 patent, 1:48-49; ’918 patent, 1:23-24.
- “[V]ery high bandwidth applications []can quickly consume the available capacity and degrade overall network service experience.” ’364 patent, 1:51-53; ’918 patent, 1:26-28.
- “[C]omponents of service provider costs go up with increasing bandwidth.” ’364 patent, 1:53-54; ’918 patent, 1:29-30.
- “[B]illing for higher level service delivery with example services including rich Internet access and email, application based billing, content distribution, entertainment activities, information or content subscription or gaming.” ’364 patent, 2:21-24.
- Deploying wireless base stations, “also sometimes referred to as access points, base terminals, terminal nodes or other well known acronyms.” ’364 patent, 7:57-59.
- “[C]entral billing and content distribution models require either centralized content distribution maintained by the central service provider or central billing authority, or a centralized ecommerce website or portal traffic aggregation system controlled by the central service provider or central billing provider, or both.” ’364 patent, 8:35-40.
- Networks can be 2G, 3G and 4G capable and devices can be 2G, 3G and 4G capable with all or a subset of Global System for Mobile (GSM), General Packet Radio Service (GPRS), Code Division Multiple Access (CDMA) 1X, High Speed Packet Access (HSPA), Evolution Data Optimized (EVDO), Long Term Evolution (LTE) and WiMax modem capability. ’364 patent, 12:63-13:3.
- “IPDRs can include a time stamp, a device ID, and various levels of network measures of service usage for the device associated with that device ID, such as perhaps total traffic usage, network destination, time of day or device location[.]” ’364 patent, 13:55-59.
- The ability of CDRs (Charging Data Records) or IPDRs (Internet Protocol Detail Records) to track charges for voice and data usage, more specifically the capability to monitor, categorize, catalog, report and control service usage or service activity via a network. ’364 patent, 14:15-25.

- WiMax and Wi-Fi access technologies, Wimax providing a wide area networking technology and Wi-Fi providing a local area networking technology. '364 patent, 24:12-16.
- A device's connection to an access network can be via a direct connection, such as a 3G or 4G WWAN modem connection to a 3G or 4G WWAN network, or an intermediate connection, such as a Wi-Fi modem connection to a modem or networking device combination that has a Wi-Fi LAN connection and a 3G or 4G network access network connection. '364 patent, 32:22-31.
- Software/hardware device/network components that perform "signature, behavior blocking and/or intrusion detection identification/detection and/or blocking techniques based on the presence of potentially unwanted and/or potentially or known malicious software and/or intrusion attempts by unauthorized software and/or unauthorized users, using, for example, real-time, on access, periodic, and/or on demand scanning." '364 patent, 46:66-47:6.
- Traffic shaping algorithms to reduce traffic speed for all applications and traffic types successively until the service usage projections are within service usage limits for the present service billing period. '364 patent, 48:43-47.
- Some basic information is necessary for certain service provider needs in basic service policy implementations and is generally not considered private or sensitive, such as "total data transmitted and/or received, traffic downstream and/or upstream speed, overall traffic usage by time of day[.]" '364 patent, 54:42-49
- Adaptive algorithm techniques that can be used for various statistical analysis techniques. '364 patent, 63:34-37.
- Security techniques that can be used to ensure the integrity of a service downloader. '364 patent, 66:64-66.
- Billing systems receiving service usage information from IPDRs that are aggregated in the network. '364 patent, 83:27-29.
- Techniques for security analysis such as various malicious code, behavior blocking, and intrusion detection. '364 patent, 84:54-56.
- Various "security encryption techniques[.]" '364 patent, 87:66-67.
- "[S]tandard secure or open Internet networking protocols, such as TLS or TCP[.]" '364 patent, 88:5-6.
- "Open developer programs" offered by central providers in which a central provider brings in virtual service providers who offer special value in the devices or service plans. '364 patent, 115:13-16.
- Device networking communication stack processing. '364 patent, 96:49-50.

- Secure data storage techniques, such as use of security credentials. '364 patent, 124:26-30.
- Service gateway functions such as routing, switching, protocol translation/tunneling, charging data function (CDF), charging gateway function (GCF), mobility management, and/or suspend/resume for allowing or disallowing the device Internet access. '364 patent, 129:18-21.
- A provisioning and activation process is required to create a user service account and enable a device to access the desired level of service activities in some mobile device provisioning systems. '364 patent, 132:40-43.
- WLAN, WPAN connections made with one or more of Wi-Fi, Zigbee, Bluetooth, or NFC; LAN connections made with one or more of Ethernet, USB, Firewire, data over cable, or data over power line; and WWAN connections made with modem technologies such as 2G (e.g. CDMA 1xRT, GPRS), 3G (e.g. WCDMA UMTS/HSPA/non-MIMO HSPA+, CDMA EVDO Rev A/B, 802.16d/e WiMax), 4G (e.g. LTE, MIMO HSPA+, MIMO 802.16m WiMax). '364 patent, 153:44-54.
- "[I]t is becoming increasingly important to associate device access network services usage (e.g., network data services usage, voice services usage, etc.) to the applications (e.g., application, widget, service, process, embedded object, or any combination of these, etc.) that are using the services." '918 patent, 1:31-36.
- A relatively small number of users of various smart phone devices, net book devices, tablet computing devices, and various other wireless mobile computing devices, which are becoming increasingly popular on 3G, 4G, and other advanced wireless networks demand a disproportionately significant amount of network carrier capacity. '918 patent, 3:62-4:6.
- "[M]obile devices typically have specialized designs that are optimized to preserve network capacity and protect network resources from being over taxed. For example, wireless devices that browse the Internet often use specialized protocols such as WAP and data traffic compression or low resolution techniques rather than standard HTTP protocols and traffic used in wired Internet devices." '918 patent, 4:54-60.
- "[T]he wireless devices that implement specialized methods for accessing the Internet and/or other networks often implement complex specifications provided by one or more wireless carriers that own the networks that the device is designed to connect to." '918 patent, 4:61-65.
- "Device OEMs have recently created wireless devices that are designed more like standard Internet devices and not fully optimized to preserve network capacity and resources. Many wireless service customers desire this type of device, and the OEMs generally want to reduce the complexity and time to market to deliver such devices." '918 patent, 5:6-11.

- Many carriers sell “devices that are designed more as standard Internet service devices that connect to the Internet and other data networks through carrier wireless networks.” ’918 patent, 5:19-22.
- A network resource may experience “flooding” or “overloading” with excess demand or excess connections. ’918 patent, 7:23-25.
- “[E]stablishing a basic connection from a device to a wireless base station consumes base station resources for a period of time and in some cases can also consume other network resources such as AAA, HLR, HA, gateway, billing, and/or charging gateway resources.” ’918 patent, 8:13-17.
- A device may have a power save algorithm, such as an aggressive power save algorithm that enters power save state after a short idle period. ’918 patent, 8:24-26.
- Smart phones and similar devices make frequent queries of wireless networks. ’918 patent, 9:25-26.
- A smart phone will move into an idle mode to preserve battery life. ’918 patent, 9:33-34.
- Some smart phone vendors implement a fast dormancy feature, allowing a mobile device to quickly make a query to the radio network controller to release the connection so that it can return to the idle state faster. ’918 patent, 9:46-51.
- Network carriers attempt to manage network capacity using various purely central/core network-based approaches. ’918 patent, 9:58-60.
- Centralized network solutions to protect network capacity may control, block, throttle, and/or delay service usage activities via central network equipment. ’918 patent, 10:19-22.
- Traditional quality of service (QoS) techniques are “are used to establish a single end or end to end guaranteed service level(s) on a network[.]” ’918 patent, 11:28-30.
- “[S]ome applications and/or OS functions have limited capabilities to defer certain traffic types based on fixed settings in the application, and such applications and/or OS functions typically cannot optimize network service usage activities based on a current network busy state (e.g., based on changing levels of network capacity and/or network performance available to the device).” ’918 patent, 12:21-27.
- Traffic control techniques over a network may include throttle, delay, priority queue, time window, suspend, quarantine, kill, and remove, among others. ’918 patent, 13:64-67.

- The Android OS includes the activity manager, broadcast intent manager, media service manager, service manager, as well as other applications and service activity management functions. '918 patent, 68:1-3.
- OS designs such as Android OS, iPhone OS, windows mobile OS, windows PC OS, Blackberry OS, and Palm OS have application launch management functions. '918 patent, 68:8-11, 72:60-62.
- Applications for electronic devices may be downloaded “from the web or an online application store for a smart phone or other wireless/network computing device, such as an Apple iPhone or iPad, or Google Android/Chrome based device[.]” '918 patent, 68:31-35.
- Users may “initiate usage of a cloud based service/application (e.g., Google or Microsoft cloud service based apps).” '918 patent, 68:36-39.
- Intermediary data flow functions in a device operating system that sit on a data path between a device application and a device networking stack interface may include, but are not limited to, media service managers such as the Android media service library function, an e-mail service manager, a domain name server (DNS) function, a software download service manager, a media download manager (e.g. audio player, streaming media player, movie downloader, media service OS function, etc), a data download service manager, an Android “media” library function, the Android.net library function, the Java.net library function, an Apache library function, other similar software or library functions or services in other device operating systems, an SMTP, IMAP, or POP proxy, an HTTP proxy, an IM proxy, a VPN service manager, or an SSL proxy. '918 patent, 71:22-42, 113:57-114:10.
- For certain mobile OS implementations, such as Android, iPhone, Blackberry, and others, “there are some applications available in the market that allow a user to get an estimate for how much data a certain subset of applications are consuming on a wireless service provider network[.]” '918 patent, 72:29-34.
- A “user can be informed of generic common OS functions or proxy services (e.g. in the case of Android: “media service”, “media”, “gallery”, “google service framework” and other generic common OS software library functions or proxy services).” '918 patent, 72:42-46.
- Secure communication techniques include, but are not limited to, HTTPS, TLS, SSL, and/or an encrypted data connection or SS7 control channel. '918 patent, 75:27-31.
- Android email may be used with a network service. '918 patent, 90:49-54.
- Communications networks include, but are not limited to, the Internet, a public switched telephone network (PSTN), or an infrastructure network (e.g., private LAN). '918 patent, 97:51-54.

- The Internet is “a network of networks which uses certain protocols, such as the TCP/IP protocol, and possibly other protocols such as the hypertext transfer protocol (HTTP) for hypertext markup language (HTML) documents that make up the World Wide Web (the web).” ’918 patent, 97:54-59.
- Datastores include any organization of data, including tables, comma-separated values (CSV) files, traditional databases (e.g., SQL), or other applicable known or convenient organizational formats. Datastore-associated components, such as database interfaces, can be considered “part of” a datastore, part of some other system component, or a combination thereof. ’918 patent, 100:36-43, 106:28-35.
- Known or convenient forms of notifications to users include SMS, email, a popup window, or the like. ’918 patent, 101:43-45.
- “One example of operating system software with its associated file management system software is the family of operating systems known as Windows® from Microsoft Corporation of Redmond, Wash., and their associated file management systems. Another example of operating system software with its associated file management system software is the Linux operating system and its associated file management system.” ’918 patent, 102:64-103:4.
- Applications can be referred to as running on a device or as being executed by a device. ’918 patent, 103:31-34.
- Application traffic is typically cached in an output buffer. ’918 patent, 104:53-55.
- “In some existing device operating systems, a proxy service function is used to manage the network service flows between the network and an application (e.g., application program, widget, service, process, embedded object, or any combination of these, etc.), and the proxy service is stored in the operating system (OS) as the application responsible for using services rather than the application actually using the network service. For example, in the Android OS, there exists a “media service” OS library software program function that manages the network stack interface for download of network data (typically, but not limited to, multimedia data). The device makes a request to the media service, which then performs various network stack interface functions to transfer the network data between the device application and the network. The media service can also process media files to determine how best to decode the multimedia and play the multimedia on the device user interface (UI). For example, the media service can determine the media filing coding standard (e.g., MP3, MP4, OGG, H.264, VP8, etc.), decode the media, select a player for the media (e.g., libstagefright (an Android streaming service library function), a third-party or OEM media player, etc.), and send the decoded media to the media player for UI playback. In the case of the media service, the data flows to the network can be classified by various device service usage monitoring agents (e.g., a kernel agent in the network stack) as belonging to the media service, not the originating application, and the OS provides no mechanism for tracking the usage back to the originating application.” ’918 patent, 111:44-112:5.

- The Android OS includes “the “media” OS library software program that is used by applications such as the Android browser, Android store app downloader, the Gmail client, OS updater, etc. The media function manages network data transfers for such applications, allowing an application to launch a data transfer request and then continue other operations while the media service is managing the network data transfer. In the case of the media function, the data flows to the network can be classified as belonging to the media function[.]” ’918 patent, 112:6-15.
- “[H]igher-level library software functions or framework software functions provide proxy server client functions that encapsulate native application traffic to send application flows to a network proxy server for further network traffic processing, and this proxy client function sits above the network stack[.]” including “the Android.net library function, the Apache library function, and the Java.net library function, third-party proxy server client functions or tunneling protocol functions, and other proxy server client functions or tunneling protocol functions.” ’918 patent, 112:18-28.
- Many OS, such as Windows 7 and other Windows versions, have system services (e.g., DNS, certificate management, etc.) and functions which “manage data transfer with the OS network stack interface for an originating application, and the device network stack service flows can be classified back to these OS functions[.]” ’918 patent, 112:29-35.
- In an Android system, a network data flow can be associated with a UID. ’918 patent, 113:12-14.
- The Pandora application may call “a media service function with a network resource indicator (NRI) that includes a Pandora URL with a song identifier included in the URL descriptor.” ’918 patent, 115:38-41.
- Libraries in a media service system can include surface manager, java.net, android.net, apache, media, WebKit, freetype, SQLite, and libc datastores. ’918 patent, 119:10-13.
- An android runtime datastore can include a core libraries datastore and a dalvik VM datastore, among others. ’918 patent, 119:14-16.

The admitted prior art further includes all prior art of record, including all prior art references cited on the face of and/or during prosecution of each Asserted Patent, including all prior art cited or relied upon by the Examiner that were not challenged by the applicant, disclosed in any Information Disclosure Statement submitted by the applicant during prosecution, and/or cited or otherwise referred to in the course of any *inter partes* review, *ex parte* reexamination, or post-grant review proceedings of any Asserted Patent.

B. Prior Art Patents

Defendant contends that the following prior art patents anticipate or render obvious one or more Asserted Claims of the Asserted Patents under Pre-AIA 35 U.S.C. § 102(a), (b), (e), AIA 35 U.S.C. § 102(a) or Pre-AIA and AIA 35 U.S.C. § 103.

Country	Patent/Publication No.	Issue or Publication Date	Inventor (et al.)
U.S.	2008/0159175 A1	7/3/2008	Flack
U.S.	2010/0017506 A1	1/21/2010	Fadell
U.S.	2006/0285489 A1	12/21/2006	Francisco
U.S.	2007/0254628 A1	11/1/2007	Rybak (“Rybak 628”)
U.S.	2009/0265752 A1	10/22/2009	Sharif-Ahmadi
U.S.	2006/0084417 A1	4/20/2006	Melpignano
U.S.	2004/0009751 A1	1/15/2004	Michaelis
U.S.	2006/0149811 A1	7/6/2006	Bennett
U.S.	2012/0117478 A1	5/10/2012	Vadde
U.S.	8,429,516	4/23/2013	Riggs
EP	1 850 575 A1	10/31/2007	Rybak (“Rybak 575”)
U.S.	6,578,077	6/10/2003	Rakoshitz
U.S.	6,754,470	6/22/2004	Hendrickson
U.S.	2002/0056126 A1	5/9/2002	Srikantan
U.S.	8,402,165	3/19/2013	Deu-Ngoc
U.S.	2008/0080458 A1	4/3/2008	Cole (“Cole 458”)
U.S.	2006/0039354 A1	2/23/2006	Rao
U.S.	2004/0203584 A1	10/14/2004	White

Country	Patent/Publication No.	Issue or Publication Date	Inventor (et al.)
U.S.	8,238,913	8/7/2012	Bhattacharyya
U.S.	2006/0146825 A1	7/6/2006	Hofstaedter
U.S.	2004/0260630 A1	12/23/2004	Benco
U.S.	2006/0223495 A1	10/5/2006	Cassett
U.S.	2008/0209451 A1	8/28/2008	Michels
U.S.	2008/0122796 A1	5/29/2008	Jobs
U.S.	2007/0192818 A1	8/16/2007	Bourges-Sevenier
U.S.	6,701,363	3/2/2004	Chiu
U.S.	6,351,847	2/26/2002	Sakamoto
KR	100561678	3/15/2006	Jong
U.S.	20040103193 A1	5/27/2004	Pandya
U.S.	5,657,390	8/12/1997	Elgamal
KR	20050006572	1/17/2005	Kim

C. Prior Art Publications to the Asserted Patent

Defendant contends that the following publications anticipate or render obvious one or more Asserted Claims of the Asserted Patent under Pre-AIA 35 U.S.C. § 102(a), (b), (e), AIA 35 U.S.C. § 102(a), or Pre-AIA or AIA 35 U.S.C. § 103.

Publication Title	Date	Publisher	Author (et al.)
Microsoft Computer Dictionary, Fifth Edition	2002	Microsoft Press	Microsoft
Handover Management Architectures in Integrated WLAN/Cellular Networks	10/1/2005	IEEE Communications Surveys and Tutorials, Vol. 7	Lampropoulos

D. Prior Art Sales, Offers for Sale, Public Disclosures, or Otherwise Available to the Public

On information and belief, Defendant contends that the following items, which were used and/or offered for sale before the relevant filing dates, anticipate or render obvious one or more Asserted Claims of the Asserted Patents under pre-AIA 35 U.S.C. § 102(a), (b), (e), AIA 35 U.S.C. § 102(a), and/or pre-AIA and AIA 35 U.S.C. § 103.

Item Name or Description		Date Available	Manufacturer
Android Devices	HTC Dream/ T-Mobile G1	September 2008	HTC
	T-Mobile myTouch 3G	July 2009	
	Nexus One	January 2010	
	Motorola Droid	November 2009	Motorola
	Motorola Droid 2	August 2010	
Android OS	Android 1.0	September 2008	Google / Open Handset Alliance
	Android 1.1	February 2009	
	Android Cupcake (1.5)	April 2009	
	Android Donut (1.6)	September 2009	
	Android Eclair (2.0, 2.0.1, 2.1)	October 2009 - January 2010	
	Android Froyo (2.2)	May 20, 2010	
	Android Gingerbread (2.3)	December 2010	
JuiceDefender for Android		January 2010	Latedroid
Green Power for Android		March 2010	Binary Mango AS
NetCounter for Android		December 2008	Cyril Jaquier
Symbian OS 9.1		2005	Symbian Ltd.
Symbian OS 9.2, 9.3		2006	

Item Name or Description	Date Available	Manufacturer
Symbian OS 9.4	2007	Nokia
S60 3rd Edition including S60 3rd Edition, Feature Pack 1 and Feature Pack 2	2001/2002	
S60 5th Edition	October 2008	
Nokia E90	May 2007	
Nokia N95	March 2007	
Nokia N97	June 2009	
Nokia E72	November 2009	
Windows Mobile 6.1	April 2008	Microsoft
Windows Mobile 6.5	May 2009	
Windows XP and its various editions such as Home Edition and Tablet PC Edition	October 2001	
iPhone OS 1.0	June 2007	Apple
iPhone OS 2.0	July 2008	
iPhone OS 3.0	June 2009	
Apple iPhone	June 2007	
Apple iPhone 3G	July 2008	
Apple iPhone 3GS	June 2009	
Native applications on iPhone OS 1.0, including Mail, Calendar, MobileMe, Backup, and Newsstand API	June 2007	

Item Name or Description	Date Available	Manufacturer
Palm Smartphone Comparison	September 2008	Palm

E. Pre-AIA 35 U.S.C. §§ 102(f) and 102(g)

Each prior art patent, publication, or product identified above was either effectively filed or issued (for patents), published (for publications) or known, used, offered for sale or sold (for products) before either the earliest claimed priority date of the Asserted Patents, and none appears to have been abandoned, suppressed, or concealed, so each such reference also constitutes evidence of prior invention pursuant to 35 U.S.C. § 102(g), if it is in the U.S. The persons or entities involved with each such invention include the named inventors on the above-identified patents, the authors listed on the above-identified publications, and the entities and individuals identified in connection with the above-identified products.

Defendant does not yet have the benefit of discovery from Headwater, including taking depositions of the named inventors of the Asserted Patents, reviewing Headwater's productions, and seeking discovery of prior inventions by third parties. Defendant reserves the right to argue that the patentee derived the invention from other persons or that the authors or inventors of the prior art herein identified invented the subject matter claimed in the Asserted Patents prior to the filing date of the Asserted Patents. Discovery is ongoing and Defendant reserves the right to supplement these Invalidity Contentions with facts, documents, or other information learned at a later point through discovery or further investigation.

IV. ANTICIPATION AND OBVIOUSNESS

In addition to and including the prior art disclosed in the Exhibits incorporated by reference herein and attached hereto, each of the Asserted Claims of the Asserted Patents is anticipated by and/or obvious in view of one or more items of prior art, either alone or in

combination, as identified herein. Generally, it would have been obvious to one of ordinary skill in the art to combine or modify any of these references to arrive at the alleged invention.

Defendant's attached Exhibits contain claim charts identifying examples of prior art that anticipates and/or renders obvious each Asserted Claims of the Asserted Patents. Specifically, to the extent the attached claim charts cite to a reference for each element or limitation of an asserted claim, Defendant contends that such reference anticipates that claim. Defendant incorporates by reference each prior art reference of record in the prosecution of the Asserted Patent and related applications, including the statements made therein by the applicant, as well as the prior art discussed in the specification. Defendant further incorporates by reference all *inter partes* review proceedings, post-grant review proceedings, and *ex parte* reexamination requests filed in the future that challenge the patentability of any claim of the Asserted Patents, including all prior art, argument, and evidence. Defendant further incorporates by reference all invalidity contentions claim charts, invalidity expert reports, and any relevant trial testimony from any prior, pending, or future matter involving any Asserted Patent or related patents or applications.² In addition, to the extent that the attached claim charts cite to additional references, Defendant contends, in the alternative, that the Asserted Claims are rendered obvious for the reasons set forth in the attached charts and exhibits. To the extent the attached claim charts do not identify any explicit disclosures of the prior art for a claim or claim limitation, Defendant contends those claims or claim limitations would have been obvious in view of the reference as a whole and/or the knowledge, skill, and experience of a person having ordinary skill in the art. To the extent any obviousness combinations are included in the attached charts and exhibits, they are provided

² Given the number of prior, related proceedings, they are not separately enumerated herein; however, Defendant expects the identified documents to be produced promptly in connection with ongoing and/or forthcoming discovery.

in the alternative to Defendant’s anticipation contentions and are not to be construed to suggest that any reference included in the combinations is not by itself anticipatory.

A patentee bears the burden of production with respect to evidence of secondary considerations of non-obviousness. *ZUP, LLC v. Nash Mfg., Inc.*, 896 F.3d 1365, 1373 (Fed. Cir. 2018). As of the date of these Preliminary Invalidity Contentions, Headwater has not yet identified any evidence of secondary considerations. Defendant reserves all rights to further respond to any secondary considerations of non-obviousness raised by Headwater, including by updating, modifying, and/or adding to these Preliminary Invalidity Contentions. Defendant is not aware of any unexpected results (none is mentioned in the Asserted Patents or their file histories), long felt need, commercial success (or any nexus to any allegedly successful commercial embodiment), or awards for the alleged inventions of the Asserted Patents.

A. ’364 Patent

Invalidity Claim Charts for the ’364 Patent	
Exhibit No.	Reference
Ex. A-01	U.S. Patent Publication No. 2008/0159175A1 (“Flack”)
Ex. A-02	U.S. Patent Publication No. 2010/0017506A1 (“Fadell”)
Ex. A-03	U.S. Patent Publication No. 2006/0285489A1 (“Francisco”)
Ex. A-04	U.S. Patent Publication No. 2007/0254628A1 (“Rybak 628”)
Ex. A-05	U.S. Patent Publication No. 2009/0265752A1 (“Sharif-Ahmadi”)
Ex. A-06	U.S. Patent Publication No. 2006/0084417A1 (“Melpignano”)
Ex. A-07	U.S. Patent Publication No. 2004/0009751A1 (“Michaelis”)
Ex. A-08	Android Device with one or more applications
Ex. A-09	Mobile Device Systems with one or more applications
Ex. A-10	Combinations

B. '918 Patent

Invalidity Claim Charts for the '918 Patent	
Exhibit No.	Reference
Ex. B-01	U.S. Patent Publication No. 2006/0149811A1 (“Bennett”)
Ex. B-02	U.S. Patent Publication No. 2012/0117478A1 (“Vadde”)
Ex. B-03	U.S. Patent No. 8,429,516 (“Riggs”)
Ex. B-04	U.S. Patent No. 6,754,470 (“Hendrickson”)
Ex. B-05	U.S. Patent Publication No. 2002/0056126A1 (“Srikantan”)
Ex. B-06	U.S. Patent No. 6,578,077 (“Rakoshitz ”)
Ex. B-07	European Patent App. No. 1 850 575 A1 (“Rybak 575”)
Ex. B-08	U.S. Patent Publication No. 2009/0265752A1 (“Sharif-Ahmadi”)
Ex. B-09	U.S. Patent No. 8,402,165 (“Deu-Ngoc”)
Ex. B-10	Android Device with one or more applications
Ex. B-11	Mobile Device Systems with one or more applications
Ex. B-12	Combinations

To the extent not identified elsewhere herein, Defendant identifies all references listed in the above tables as prior art references anticipating and/or rendering obvious one or more claims of the Asserted Patents.

To the extent that Plaintiff contends that any one of the references in the above Invalidity Claim Charts does not disclose one or more elements of the Asserted Claims, it would have been obvious to combine the references in the Invalidity Charts with one another as discussed more fully in each of the Invalidity Charts and in Section V below. In presenting the obviousness positions identified herein, Defendant does not concede or represent that any element in any of the Asserted Claims is not disclosed or otherwise anticipated by the prior art reference(s) as indicated in Defendant’s anticipation contentions.

All of the Asserted Claims of the Asserted Patents are anticipated, expressly or inherently, and therefore fail to meet one or more of the requirements for patentability, as detailed in the Invalidity Charts. Additionally, and in the alternative, the Asserted Claims of the Asserted Patents are obvious in view of the state of the prior art (including Admitted Prior Art) alone and/or in combination with the references described in the above-referenced claim charts.

In an effort to focus the issues, Defendant has cited representative portions of identified references, even where a reference may contain additional support for a particular claim element. In addition, persons of ordinary skill in the art generally read a prior art reference as a whole and in the context of other publications and literature. Thus, to understand and interpret any specific statement or disclosure within a prior art reference, such persons would rely on other information within the reference, along with other publications and their general scientific knowledge. As noted above, Defendant will rely upon the prior art references identified herein in their entirety, including un-cited portions.

Additionally, any reference or combination of references that anticipates or renders obvious an asserted independent claim also renders obvious any asserted claim dependent on that independent claim because every element of each dependent claim was known by a person of ordinary skill at the time of the alleged invention, and it would have been obvious to combine those known elements with the independent claims at least as a matter of common sense and routine innovation.

V. OBVIOUSNESS COMBINATIONS & MOTIVATIONS TO COMBINE PRIOR ART

The Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), recognized that patents based on new combinations of elements or components already known in a technical field may be found to have been obvious. In doing so, the Supreme Court rejected a rigid application of

the “teaching, suggestion, or motivation [to combine]” test. *Id.* at 415, 419. “In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim.” *Id.* at 419. “Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.” *Id.* at 420. The Supreme Court emphasized the principle that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* at 416. A key inquiry is whether the “improvement is more than the predictable use of prior art elements according to their established function.” *Id.* at 417.

The Court further held that “in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” *Id.* at 420. It is sufficient that a combination of elements was “obvious to try”—“When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.” *Id.* at 421. “In that instance the fact that a combination was obvious to try might show that it was obvious under § 103.” *Id.* Finally, the Supreme Court recognized that “[g]ranting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility.” *Id.* at 419.³

³ The rationale to combine or modify prior art references is significantly stronger when the references seek to solve the same problem, come from the same field, and correspond well together. *See In re Inland Steel Co.*, 265 F.3d 1354, 1362 (Fed. Cir. 2001) (allowing two references to be combined as invalidating art under similar circumstances where the art “focus[ed] on the

In view of *KSR*, the PTO issued a set of new Examination Guidelines. *See* Examination Guidelines for Determining Obviousness Under 35 U.S.C. § 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*, 72 Fed. Reg. 57,526 (Oct. 10, 2007). Those Guidelines identified various rationales for finding a claim obvious, including:

- a) Combining prior art elements according to known methods to yield predictable results;
- b) Simple substitution of one known element for another to obtain predictable results;
- c) Use of known technique to improve similar devices (methods, or products) in the same way;
- d) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- e) “Obvious to try”—choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- f) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art;
- g) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

Id. at 57,529.

For each proposed combination of references described herein and in the attached exhibits and appendices hereto, because (i) there was a reason to make each combination, (ii) each combination of art would have produced no unexpected results, and/or (iii) each combination at most would simply represent a known alternative to one of ordinary skill in the art, no showing of a specific motivation to combine prior art is required. *See KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S.

same problem ... c[a]me from the same field of art [and] ... the identified problem found in the two references correspond[ed] well”).

398, 414–18 (2007) (rejecting the Federal Circuit’s “rigid” application of the teaching, suggestion, or motivation to combine test instead espousing an “expansive and flexible” approach).

In view of the above, Defendant has identified several exemplary motivations and reasons to combine the various references cited herein, and those motivations would have been supported, in part, by a reasonable expectation of success. The various teachings, suggestions, and/or reasons to modify any of the references and/or to combine any two or more of the references come from various sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, the nature of the problem faced, and/or the knowledge possessed by one of ordinary skill in the art. In addition, it would have been obvious to try combining the prior art references identified above.

These exemplary combinations demonstrate that there were only a finite number of predictable solutions to known problems addressed by the Asserted Patents. Furthermore, known work in one field or endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. The combination of features found in the prior art references identified in these contentions would have been obvious because the claimed combinations represent the known potential options, with each such option having a reasonable expectation of success. Additionally, one of ordinary skill in the art would have been motivated to create combinations identified in these contentions using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or teaching, suggestion, or motivation in the prior art generally. Also, market forces in the industry, and the desire to improve features and performance, would motivate the addition of features to systems as they become available, become less

expensive, become more commonly used, provide better performance and reliability, reduce costs, or predictably achieve other clearly desirable results.

To the extent Plaintiff alleges that any other claimed limitation or limitations are not disclosed in any primary reference, it would have been obvious to combine the teachings of the reference with the background knowledge of a person of ordinary skill in the art and/or it would have been obvious to incorporate the missing limitation(s), including as disclosed in the attached exhibits into the primary reference for the reasons disclosed herein. For example, one of ordinary skill in the art would have found substantial motivation to combine one or more of the primary references with one more of each other or the secondary references in order to disclose the alleged inventions recited in the Asserted Claims. Each of the references disclosed herein as invalidating an Asserted Patent was directed at the same or similar field of technology and the same or similar problem as that Asserted Patent. To the extent Plaintiff alleges that any particular claim limitation is not disclosed or inherent in the charted references, it would have been obvious to combine the charted reference with one or more of the references identified herein for the particular claim limitations.

Next, as Defendant is currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the Asserted Claims are not disclosed in the art identified herein as anticipatory, Defendant reserves the right to identify other references and combinations that may render an allegedly missing limitation obvious. In addition, if and to the extent that Plaintiff challenges the relevance of any of these references with respect to particular limitations of the Asserted Claims of the Asserted Patents, Defendant reserves their right to identify further motivation to combine particular references with additional particularity.

Finally, because Plaintiff's Infringement Contentions include a highly burdensome and improper number of Asserted Claims—49 claims across 2 patents—and because Plaintiff's Infringement Contentions do nothing more than point to mostly the same evidence for all Asserted Claims, Defendant reserves the right to identify other references, combinations, and motivations to combine that may render an allegedly missing limitation obvious.

A. U.S. Patent No. 8,666,364

1. Exemplary Combinations of Primary References

Defendant identifies below an exemplary list of anticipated combinations of the primary references identified above for the '364 Patent. Defendant offers these exemplary combinations for the purposes of illustration only and without any inference or admission that any such references are required to be combined as illustrated below to disclose any Asserted Claim of the '364 Patent. In providing these exemplary combinations, Defendant reserves all rights to assert that any primary reference, alone or in combination with any other primary reference, secondary reference, or reference disclosing the state of the art, anticipates or renders obvious the Asserted Claims of the '364 Patent (including for, but not limited to, the more than '364 Asserted Claims for which Plaintiff's Infringement Contentions include no independent evidence).

References	Combination References
Flack	Fadell, Francisco, Rybak 628, Sharif-Ahmadi, Melpignano, Michaelis, Android Device with one or more applications, White, Microsoft Computer Dictionary, iPhone 3G, Palm Smartphone Comparison, Bhattacharyya, Hofstaedter, and/or Lampropoulos.
Fadell	Flack, Francisco, Rybak 628, Sharif-Ahmadi, Melpignano, Michaelis, Android Device with one or more applications, White, Microsoft Computer Dictionary, iPhone 3G, Palm Smartphone Comparison, Bhattacharyya, Hofstaedter, and/or Lampropoulos.
Francisco	Flack, Fadell, Rybak 628, Sharif-Ahmadi, Melpignano, Michaelis, Android Device with one or more applications, White, Microsoft

References	Combination References
	Computer Dictionary, iPhone 3G, Palm Smartphone Comparison, Bhattacharyya, Hofstaedter, and/or Lampropoulos.
Rybak 628	Flack, Fadell, Francisco, Sharif-Ahmadi, Melpignano, Michaelis, Android Device with one or more applications, White, Microsoft Computer Dictionary, iPhone 3G, Palm Smartphone Comparison, Bhattacharyya, Hofstaedter, and/or Lampropoulos.
Sharif-Ahmadi	Flack, Fadell, Francisco, Rybak 628, Melpignano, Michaelis, Android Device with one or more applications, White, Microsoft Computer Dictionary, iPhone 3G, Palm Smartphone Comparison, Bhattacharyya, Hofstaedter, and/or Lampropoulos.
Melpignano	Flack, Fadell, Francisco, Rybak 628, Sharif-Ahmadi, Michaelis, Android Device with one or more applications, White, Microsoft Computer Dictionary, iPhone 3G, Palm Smartphone Comparison, Bhattacharyya, Hofstaedter, and/or Lampropoulos.
Michaelis	Flack, Fadell, Francisco, Rybak 628, Sharif-Ahmadi, Melpignano, Android Device with one or more applications, White, Microsoft Computer Dictionary, iPhone 3G, Palm Smartphone Comparison, Bhattacharyya, Hofstaedter, and/or Lampropoulos.
Android Device with one or more applications	Flack, Fadell, Francisco, Rybak 628, Sharif-Ahmadi, Melpignano, Michaelis, White, Microsoft Computer Dictionary, iPhone 3G, Palm Smartphone Comparison, Bhattacharyya, Hofstaedter, and/or Lampropoulos.

2. Exemplary Motivations to Combine

Defendant has identified several exemplary motivations and reasons to combine the various references cited herein. For any reference for which there is a claim element that does not have a corresponding citation in that reference, it would be obvious to combine with the knowledge or a person of skill and/or any other reference in the primary or secondary charts for which there is a citation for that element. These combinations would have been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field.

It would have been obvious to combine each of the references discussed below because they are analogous art generally directed to management of resource usage and network connections. For example:

a. Same Field of Technology

As shown below, each of the identified prior art references relates to the field of management of resource usage and network connections. For example:

- Flack at [0003]-[0004]: In one general aspect, network connectivity may be selectively established by monitoring, on a client, communications activity incident to accessing a network, the communications activity including a request to access the network. An application associated with the communications activity is identified. A communications configuration associated with the application is accessed, the communications configuration indicating how the application is configured to access the network. Network connectivity is selectively established based on the communications configuration, and the application is enabled to access the network to support the communications activity.

Implementations may include one or more of the following features. Identifying the application may include identifying a resource that originated the communications activity. Identifying the application may include identifying a remote resource to which the communications activity is intended as a destination. Accessing the communications configuration and selectively establishing the network connectivity based may include accessing a first setting to be used in response to identifying a first program as the application, accessing a second setting to be used in response to identifying a second program as the application, establishing network connectivity using the first setting in response to identifying communications activity related to the first program, and establishing network connectivity using the second setting that is different than the first setting in response to identifying communications activity related to the second program.

- Fadell at [0008]: The various embodiments of the invention describe metering, modeling, alerting a user to, and managing data provider resource utilization by a subscriber. This may include providing notifications, scheduling, application control, and switching or load balancing between different data provider resources (where more than one is available). These functions may be implemented in a centralized manner, distributed manner, or both and may also arbitrate among several devices accessing the same data provider resources.
- Francisco at [0001]: The present invention relates to performance monitoring and service quality enhancements for convergence enabled end-user devices, and more specifically, to a method and apparatus for enforcing service level agreements to end users based on end-to-end service performance characterization of network conditions.

- Rybak 628 at [0013]-[0015]: In one embodiment, the present disclosure is directed to a method for monitoring resource usage of a mobile communications device comprising the steps of: acquiring a mobile communication plan profile associated with a subscriber, the plan profile including at least a first value representing a limit of mobile communication resource usage within a specified calendar period; acquiring a second value representing a total quantity of time within the specified calendar period; acquiring a third value representing a quantity of mobile communication resources used by the mobile communications device within the specified calendar period; acquiring a fourth value representing a quantity of total time elapsed within the specified calendar period; calculating a first ratio between the third value and the first value; calculating a second ratio between the fourth value and the second value; and communicating the first ratio and the second ratio to an entity, e.g., the service subscriber, a network node, or a management department.

In another embodiment, the present disclosure is directed to a mobile communications device comprising: means for acquiring a mobile communication plan profile including at least a first value representing the amount of a wireless resource available to a subscriber within a current billing period; means for acquiring a second value representing a total quantity of time in the current billing period; means for acquiring a third value representing a quantity of usage of the wireless resource by the mobile communications device occurring within the current billing period; means for acquiring a fourth value representing a quantity of total time elapsed within the current billing period; means for calculating a first ratio between the third value and the first value; means for calculating a second ratio between the fourth value and the second value; and means for throttling the rate of resource usage by the mobile communications device depending on the values of the first ratio and the second ratio.

In a further embodiment, the present disclosure is directed to a system for monitoring resource usage of a mobile communications device comprising: a first storage area containing a first value representing a limit of mobile communication resource usage within a current billing period; a second storage area containing a second value representing a total quantity of time within the current billing period; a third storage area containing a third value representing a quantity of mobile communication resources used by the mobile communications device within the current billing period; a fourth storage area containing a fourth value representing a quantity of total time elapsed within the current billing period; and a wireless resource usage control module, disposed within the mobile communications device, having access to the first, second, third and fourth storage areas and operable to control the rate of wireless resource usage according to the relative values stored in the first, second, third and fourth storage areas.

- Sharif-Ahmadi at Abstract, [0002]: A method of controlling a mobile device based on a network policy, wherein the network policy is stored on the mobile device when a server or access point is accessed. When a packet is transmitted, it is sent only if it meets the policy parameters as established by the network policy. Parameters may include the type of service or packet, the time of day of the usage, or the maximum tolerable delay permitted.

This invention relates to systems and methods of managing data traffic over networks, and more particularly to systems and methods for addressing the diverse requirements of different data types and their behaviour over different types of wired and wireless networks, each such network having different characteristics and changing network status.

- Melpignano at Abstract, [0008]: An arrangement is disclosed that enables a mobile device to manage multiple network interfaces in order to be substantially always reachable on the Internet. Wired LAN, Wireless LAN, Wireless PAN and cellular systems are technologies that are employed in the exemplary embodiment described. Scanning of the available network infrastructures is performed by a specific software agent implemented in a mobile device. User mobility profiles, power consumption, cached context information and application requirements are taken into account so that the end user can always communicate through the most appropriate network interface without explicit manual intervention.

An automatic network interface selection mechanism would provide benefits for the end user in terms of usability. Accordingly, the present invention provides a wireless client device for use in an Internet Protocol compatible communications network, said client device being adapted to communicate with said network in accordance with one of a plurality of communications standards and to make a selection for connection to said network from among a plurality of network interfaces, said device being arranged in use to make a said selection automatically and according to a predetermined network interface selection policy implemented in said client device. Such a device may be called a multi-mode terminal. A client device may be a user terminal such as a mobile terminal.

- Michaelis at [0004]-[0005]: This disclosure is directed to techniques for selection of wireless network interfaces for data communication within a wireless communication network. The techniques may rely on a set of interface selection rules to identify wireless network interfaces that are qualified to serve packets associated with a particular communication application. A wireless network interface may be qualified in the sense that it satisfies all of the interface selection rules for a given packet. Each wireless network interface may be assigned an explicit priority, permitting the interfaces to be prioritized in terms of relative cost, latency, bandwidth, signal strength, quality of service (QoS), bearer requirements, or the like. Thus, interface priority may be explicitly identified, rather than inferred from the order in which the interface selection rules are applied.

Upon identifying one or more qualified interfaces for a given packet, e.g., interfaces that satisfy all of the interface selection rules, the techniques may involve selection of the qualified interface having the highest priority. The assigned priorities may be dynamically adjusted, however, based on the connection states of the wireless network interfaces. Dynamic prioritization permits consideration of changes in interface properties such as cost and latency when connection state changes. In this manner, a first interface may have a higher priority than a second interface when both interfaces are connected to respective access points, but a lower priority when the second interface is connected and the first interface is not. Thus, the priority assigned to a given interface may be

dynamically adjusted to reflect current interface state, e.g., on a packet-by-packet basis. In addition, explicit prioritization may promote processing efficiency in selecting the appropriate interface.

- Lampropoulos at p.21: The main contribution of this approach, compared to all the previous tight coupling solutions, is that a mobile node can maintain one data connection through WLAN and one voice connection through UMTS at the same time. This can happen in a hot-spot scenario where WLAN micro-cells are included in larger UMTS macro-cells. However, in the hot-spot scenario, UMTS is restricted only for voice calls and WLAN only for data communications. A similar load balancing policy has also been followed in [50], where data users were shifted to WLAN in order to release UMTS resources for voice calls. However, both policies result into inefficient use of the available resources, since the transfer of voice calls through WLAN or the overloading of WLAN are not considered. One advantage of this proposed approach is that the use of IP protocols at the terminal makes the dual mode terminal implementation easier.
- The Android Operating System provided a framework and interface that enabled developers to develop a wide array of applications, including applications directed to management of resource usage and network connections, such as the JuiceDefender and GreenPower Android applications, which provided configuration settings that allowed users to specify conditions under which to enable or disable a device's mobile network connection. *See, e.g.*, invalidity chart for Android Device with one or more applications and evidence cited therein ("The WiFi APIs provide a means by which applications can communicate with the lower-level wireless stack that provides Wi-Fi network access. Almost all information from the device supplicant is available, including the connected network's link speed, IP address, negotiation state, and more, plus information about all other available networks.").
- *See generally* Microsoft Computer Dictionary, iPhone 3G, and Palm Smartphone Comparison regarding dual-modem devices.

A person of ordinary skill in the art would naturally look to these references, related patents, patent applications, publications, and related commercial products/systems to provide insight into how the industry/field as a whole, inventors, authors, or companies viewed and applied these inventions, teachings, and commercial products/systems. Based on their related disclosures, one of ordinary skill in the art at the time of the invention would have been motivated to apply the teachings from one reference to another in the same way.

b. Market Forces and Design Incentives Drove Similar Solutions in the Prior Art

Many of the identified references address the same technical issues and suggest similar

solutions in the field of management of resource usage and network connections, such as application control. Moreover, because there were a finite number of predictable solutions, a person of ordinary skill in the art had good reason to pursue and/or combine known options and related applications. Many references describe market demand and market potential for these solutions such as:

- Flack at [0015]: Users rely on a variety of access techniques in order to access desired content through, for example, the Internet. Often times, carriers and OSPs (online service providers) charge for access to the Internet to pay for dialup-fees and other costs associated with such access. Even when the user does not directly incur charges based on their access, the requirement to support communications needs can bring costs on those supporting the user. For example, an OSP offering a bank of dialup modems may incur costs, e.g., for the equipment and leased circuits. Furthermore, the OSP may desire to reduce the magnitude of costs by not installing more capacity than is required. In another example, a user accessing a wireless circuit-switched network through a cell phone plan desires to avoid increased and/or escalating costs (e.g., per-minute fees) associated with using the wireless circuit-switched network.
- Fadell at [0003]-[0006]: “Data providers,” such as cellular network providers and Internet Service Providers, charge users to access and to post data from remote data resources such as web servers and mail servers. Data providers may charge based upon connection time or as a fixed recurring fee. In these instances, the data providers have traditionally allowed unlimited bandwidth (i.e. unlimited data size transfer). However, with the increase in connection speed affordability and in the size of files transferred, users have increased data consumption dramatically leading at times to congestion and utilization stress on data providers.

In addition, different protocols have been developed for allowing users to share files or other data between electronic devices. For example, the advent of peer-to-peer protocols and applications allowing peer-to-peer transfers of files (such as Limewire and Bearshare) have permitted a large network of users to transfer increasingly larger and larger amounts of data with few limits.

Recently, media files which are typically of very large relative size are also being increasingly transferred to portable electronic devices and computer systems. For example, with the advent of electronic purchasing of media, such as music and video, many users have stopped purchasing physical CDs and DVDs and have instead downloaded desired media to their devices. As another example, content providers now allow content to be rented electronically by enabling time-restricted downloading of media—downloaded media expires and can no longer be played back when a delay lapses (e.g., 30 days from date of rental, or 24 hours from beginning playback of the media). The portable electronic media device (e.g. Apple's iPod®) revolution has increased significantly the overall consumption of data provider resources.

Because of the wide disparity in types of data transfer some devices or users may use disproportionately more data provider resources (e.g., bandwidth) than others. In fact, some data providers have found that a mere 5% of users (e.g., power users) may be responsible for 50% of consumed resources.

- Francisco at [0002]-[0003]: Users of convergence enabled end-user devices (e.g., cellular phones, smart phones, laptops, PDAs, WiFi/WiMax integrated phones/devices, among others) select service providers based on many factors, including costs, type of services provided, and quality of such services, user friendliness, among other considerations. Due to the rapid proliferation of the wireless and wireline internet using various access technologies such as CDMA, 3G1X, EVDO, WiMAX, WiFi, Cable/DSL, etc., it is becoming increasingly important for service providers to accurately measure the communication performance between two users, between user and the Application servers, and ensure high end-to-end IP data network performance. Service providers need to monitor various performance parameters that may be associated with network disruptions, such as latency/delays above permissible thresholds, high jitter, low power, high signal interference, packet loss, network congestion, node and link failures, down access links, poor quality access, routing costs that impact end-user service expectations, availability of alternative service providers perceived by the end-users as being better, among other network measurement criteria.

Further, mere monitoring of network conditions (e.g., congestion, packet loss, among others) does not provide any real-time corrective action across the network for an end-user suffering from poor or low quality network conditions. Moreover, there are currently no satisfactory real-time techniques to monitor end-to-end performance of the network, as well as provide real-time connectivity changes at the convergence enabled end-user device, nodes, links, and network facilities.

- Rybak 628 at [0002]: Wireless service is generally offered by wireless service providers according to certain wireless service access plans. Most wireless service access plans include limitations as to the quantity of wireless access available in a given time. For example, a first wireless service access plan may provide for a certain number of cellular telephone voice minutes per month. Certain plans provide for unlimited cellular voice minutes during off-peak periods along with a limited number of minutes available during peak periods. Wireless service access plans may also provide for specified levels of wireless data access per month. While cellular telephone minutes are generally quantified in minutes per month, wireless data access is generally quantified in some units of bandwidth per month (e.g., megabytes per month). In either event, a wireless service provider will generally continue to provide service above the specified level, but will charge an additional premium for the usage above the level specified in the wireless service access plan.
- Sharif-Ahmadi at [0003], [0008]-[0009]: Wireless networks generally have very different properties when compared to traditional wired networks. For example, the “backbone” of a wired network is more homogeneous than a wireless network, and a wired network is typically, a mesh of intelligent sub networks connected through routers and switches that control data traffic. In wired networks, users are generally stationary and therefore movement of users has little impact on network service. The key influence on user

service in a wired network is the data traffic congestion on the network. This congestion problem is dealt with by using the Transmission Control Protocol/Internet Protocol (TCP/IP), a communications protocol that most network applications use.

Two parallel changes occurring in wireless network technologies are: i) the introduction of new wireless network types, so that the overall wireless network infrastructure is changing from being a single type network, for example a General Packet Radio Service (GPRS) network only, to an infrastructure comprising multiple network types, such as GPRS, Wi-Fi, Worldwide Interoperability for Microwave Access (WiMAX) and Universal Mobile Telecommunications System (UMTS); and, ii) wireless network users are no longer only using “background class” type of applications such as email, short message services (SMS) and downloads, but are now using more interactive applications such as web browsing, network gaming, and database access; streaming applications such as multimedia applications, video on demand, and webcasting; and conversational applications such as Voice over Internet Protocol (VoIP), video telephony, and video gaming. Service providers, or carriers, are driving to increase the usage of these applications over wireless networks as to increase “average revenue per user” and subscription rates. The service providers also differentiate themselves from competitors through the services offered along with Quality of Service (QoS) for their own “certified” applications as compared to third party applications. However, use of these different types of applications results in different data traffic types traversing the network, each data type having different delivery (time) requirements and different error tolerances (in time sensitive vs. error sensitive spectrums of applications). For example, a VoIP packet is very time sensitive and has a short time to live, whereas a data packet is very error sensitive. TCP and UDP/IP protocols (widely used by many software applications) are both network and application agnostic. TCP does provide congestion control features which occur on wired networks but the protocol doesn't distinguish a wired network from a wireless network. Also neither of these protocols are application aware (they are not sensitive to the type of applications and time vs. error sensitivity). TCP/IP has been designed specifically to overcome the congestion problems in wired networks by detecting the congestion on the network and controlling the traffic between the two communicating parties. However, use of TCP/IP over wireless networks may be problematic. For example, delays in the wireless network may be caused by signal attenuation (not by congestion), causing TCP/IP to actually reduce performance of a wireless network.

Therefore, what is lacking in the prior art is the awareness and involvement of the networked (for example, mobile) device in the network by enabling the networked device to act as an intelligent and integrated element (similar to a router/switch) within the network. In the prior art, the networked device, particularly mobile devices, lack the ability to make decisions based on the types of wired or wireless network(s) available to it and the types of data it is communicating to other networked devices (given the differences between wireless and wired networks, data communications should be treated differently over the two network types).

- Melpignano at [0002], [0004], [0006]: Wireless local area networks (WLAN) are becoming popular nowadays, not only in indoor environments but also in outdoor spaces.

By means of wireless access points, mobile/client devices can use networking services without a wired connection in similar fashion to use of a wired LAN. General information on wireless LAN protocols and systems may be found in “Wireless LANs”, by Jim Geier, Macmillan Technical press, 1999. One problem with WLAN is power consumption, which can become an issue for portable devices like a personal digital assistant (PDA). Wireless Personal Area Network (WPAN) technologies like Bluetooth™ can offer wireless network connectivity at a lower bandwidth but with significantly reduced power consumption. When neither WLAN nor WPAN access infrastructure is available, a mobile device would require a functionality which allows it to use other wireless systems, if available, e.g. outdoor cellular systems like General Purpose Packet Radio System (GPRS) to generate a new connection or possibly to stay connected with the Internet or with a corporate intranet. If properly adapted, the same mobile device could be plugged into a wired LAN when put into its docking station when coming back to office. At this point, the device may well be stationary, but it will be appreciated that it may still be considered a mobile device in reflection of portability or facility to change location.

To date, in cases where multiple options exist, there is no universal solution to automatically decide which network interface any particular device should use at a particular time. In fact, some chipset and card manufacturers are announcing proposals for combination products (“combo’ chipsets”) that embed multiple wireless transmission standards and some of these already exist on the market. However, without supporting software, the user must always manually select one network interface to connect to the Internet or to a corporate Intranet. This is the case for most operating systems like Windows CE and Windows XP as supplied by Microsoft Inc. USA or Linux.

Depending on the environment in which the user finds himself, it is probable, especially in the future, that there are multiple network infrastructures available, at least temporarily. The prior art arrangements can therefore be seen to be deficient in the automation of discovering whether and which wireless network infrastructures are available and in consequently activating the proper network interfaces. This may lead to deficiencies in a mobile device meeting a user's connectivity expectations, for example in terms of cost, convenience, power consumption and bandwidth. A user of currently disclosed arrangements may therefore experience difficulty in establishing or maintaining a location independent connection to a backbone network like the Internet. This is the case with current arrangements, at least without manual intervention which may be considered as inefficient and generally undesirable.

- Michaelis at [0002]-[0003], [0006]: In a wireless communication network, network nodes exchange data using network communication protocols. Internet Protocol (IP) is an example of a network communication protocol that facilitates packetized data communication between network nodes. A wireless communication device, or “access terminal (AT),” can be used to transmit and receive IP packets via a variety of different wireless network interfaces such as IS95 CDMA, CDMA2000, WCDMA, CDMA 1xEV-DO, GSM GPRS, WCDMA GPRS, IEEE 802.11(a), IEEE 802.11(b), IEEE 802.11(g), Bluetooth, and other interfaces. A wireless network interface may provide access to network nodes, e.g., web servers, email servers, or messaging servers, residing on an IP

network such as the Internet. The traffic transmitted and received by an AT may be originated by or destined for the AT. Alternatively, the traffic may be forwarded by the AT on behalf of another device attached to it, such as a personal digital assistant (PDA), notebook computer or the like.

Some ATs may support more than one of the wireless network interfaces. In addition, within a given coverage area, more than one wireless network access point (U_m) may be available to serve packets transmitted or received by a particular communication application running on the AT. For example, the coverage area may provide a number of long-range wireless network access points based on various communication standards, as well as short range wireless network access points based on other standards such as wireless local area networking (WLAN) standards. Accordingly, an AT may be equipped to select different wireless network interfaces to serve, via the available network access points, packets associated with particular communication applications such as web browsing, email, messaging or the like.

In one embodiment, the disclosure provides a method comprising assigning priorities to wireless network interfaces, and updating the priorities assigned to the wireless network interfaces based on status of the interfaces. The method further comprises selecting one of the wireless network interfaces for access by a wireless AT based on interface selection rules and the resulting priorities.

- Bhattacharyya at 1:19-50: The past few years have seen an explosive growth in the number of mobile devices such as cellphones, PDAs, and laptop computers. These devices can use a variety of wireless access technologies. These range from wide-area technologies such as GPRS, EDGE, CDMA 1 xRTT, EV-DO, and satellite access, to local-area technologies such as 802.11a/b/g and short-range technologies such as Bluetooth, Zigbee, etc. However, any wireless access technology must make a difficult tradeoff between the coverage of an access point and the capacity available to a user in that access point's coverage area. To offer wireless access in a given geographical area, wide-area wireless access technologies require fewer access points but offer inherently lower per-user capacity. Short-range access networks can offer large per-user capacity, but the capital cost to offer coverage in large geographical areas can be prohibitive. Consequently, no single wireless access technology can be expected to provide ubiquitous, high-bandwidth coverage. For example, high-speed 802.11a/b/g access coverage is typically confined to WLANs inside buildings and public hot-spots. In contrast, lower-speed WWAN technologies such as CDMA 1 xRTT and GPRS provide far wider coverage, although even such technologies cannot be expected to be available everywhere and coverage can be decidedly spotty inside enclosed areas. Although city-wide 802.11 mesh network deployment tries to provide ubiquitous wireless broadband access, the success is limited because of external interference in the 2.4 GHz band, and a reduction in capacity when the multi-hop count is large. Note that, besides this coverage-capacity tradeoff, managed wireless technologies impose limits on the number of simultaneous users in a given geographic area. This may prevent a user from using a network even when it is available.
- Hofstaedter at [0008]: While traditional applications did not require a link in real time, new applications are being and have been developed that require constant streaming of

data to mobile users. Applications like Voice over IP require a continuous stream of data packets between a mobile worker and the servers. In addition, applications like video surveillance, music, and movie broadcasts also require a constant stream of data. In traditional non-time-sensitive applications, if a packet is delayed due to network congestion or it is lost or corrupted during network transmission, the application can simply request the packet again with no adverse effect. However, in real time environments, delaying a packet may have an adverse effect on the data quality. In time-sensitive applications (such as streaming media applications), delayed packets can cause unexpected and noticeable pauses in the transmissions and dropped packets can cause corruption in the data stream for the receiver. In either case, the result can be an unacceptable loss of quality such that the transmission itself loses all value.

c. Combination of Known Methods/Techniques/Elements Yields Predictable Results

Generally, motivation to combine any of the references with other references exists within the references themselves, as well as within the knowledge of those of ordinary skill in the art at the relevant time. Many of the identified references address the same technical issues and suggest similar solutions in the field of management of resource usage and network connections. For example:

- Flack at [0016]-[0017]: However, oftentimes, background and ambient processes, such as spyware protection and update tools generate small amounts of traffic. The requirement for network connectivity for this small amount of traffic may instruct a communications interface to preserve the “on” or “open” state, even though these processes usually do not represent mission critical communications or represent communications that may be exchanged at a later time when communications do not incur the same costs for the user. It might be better to establish and preserve connectivity for only selective user applications, such as those having a relatively high degree of user reliance on the network connectivity, for example, based on user actions that generate visual feedback useful to the user in perceiving the user application.

As a result, network connectivity may be selectively established by monitoring, on a client, communications activity incident to accessing a network, the communications activity including a request to access the network. An application associated with the communications activity may be identified. A communications configuration associated with the application may be accessed, the communications configuration indicating how the application is configured to access the network. Network connectivity may be selectively established based on the communications configuration, and the application may be enabled to access the network to support the communications activity.

- Fadell at Abstract: Access to a communications network may be provided via a data provider that may charge for access. In some cases, the access fee may be related to the amount of network resources consumed (e.g., amount of data downloaded or bandwidth used). In some cases, a user may have access to a particular amount of data provider resources and be required to pay an additional fee for using resources in excess of the particular amount. To assist the user in managing his data resource consumption, a resource utilization component may provide different alerts and notices informing the user of current consumption, expected future consumption, and recommendations for reducing data provider resources consumed (e.g., stopping particular processes or data provider requests, such as downloading media). If several electronic devices in a network are connected to the same data provider resources, a network component may manage the data provider resource use among the several electronic devices (e.g., allow only particular users or devices access).
- Francisco at [0014]-[0016]: Service delivery suffers when supporting communications infrastructure performs poorly or fails, such as when unexpected spikes in the demand for services cause infrastructure node problems (server failures, data access disruptions). The methods and procedures and devices proposed in this invention address and prevent these potential service problems, thereby keeping their occurrence or associated disruptions to a minimum.

Specifically, the present invention provides a method and apparatus for providing session level optimization techniques to enhance services for a convergence enabled end-user device, such as a cellular phone, PDA, laptop, or any other convergence enabled end-user device utilizing wireless or wire line services to communicate information. In one embodiment, the methods and apparatus described herein provide end-to-end network monitoring by implementing a performance monitoring agent in the end user convergence enabled end-user device, as well as in network elements providing and controlling a session communications path for the convergence enabled end-user device, such as base stations, wireline points of presence, data centers, network operations centers, among other network elements (e.g., nodes and facilities).

In one embodiment, the performance monitoring agents implemented across the network (including the convergence enabled end-user device) monitor service quality with respect to the convergence enabled end-user devices current (real-time) session. Further, the performance monitoring agents are capable of determining alternative communications techniques to improve service quality for the ongoing session by the convergence enabled end-user device. Moreover, the performance monitoring agents are capable of implementing a real-time switchover between network elements (e.g., new communications path) to automatically provide improved service quality in real-time, and without having to reinitiate the session. That is, the present invention enables the quality of the session for end user services to be improved and enforced dynamically, on-the-fly.

- Rybak 628 at [0014]: In another embodiment, the present disclosure is directed to a mobile communications device comprising: means for acquiring a mobile communication plan profile including at least a first value representing the amount of a wireless resource available to a subscriber within a current billing period; means for acquiring a second

value representing a total quantity of time in the current billing period; means for acquiring a third value representing a quantity of usage of the wireless resource by the mobile communications device occurring within the current billing period; means for acquiring a fourth value representing a quantity of total time elapsed within the current billing period; means for calculating a first ratio between the third value and the first value; means for calculating a second ratio between the fourth value and the second value; and means for throttling the rate of resource usage by the mobile communications device depending on the values of the first ratio and the second ratio.

- Sharif-Ahmadi at [0042]-[0043]: The system and method according to the invention comprises a software platform that provides mixed mobile data traffic management over wired, wireless, or mixed networks. The system and method addresses the diverse requirements of different data types and their behaviour over different wireless networks, each network having different characteristics and changing network status. A mobile device is incorporated as part of the overall network instead of treated as an independent entity outside the network. In the prior art, the mobile node (i.e. the mobile device) is an independent entity, disjoint from the network, blind to the types of network(s) available, and blind to the different types of data it is communicating with other networked devices. The present invention provides a comprehensive software solution that incorporates the mobile node as part of the network, enabling it to be an active participant within the network, and enabling it to manage and negotiate specific data needs with the network components.

The system and method according to the invention makes the mobile device aware of the network situation and application types and therefore their requirements; and also is aware of network policies at any given time, and therefore can make efficient decisions. The necessary “intelligence” is available so that there is no need to alter “any” application, the mobile device's Operating System (OS) code structure, or hardware. The solution is such that the network works with or without the system according to the invention (but the network is more efficient with such system) and other mobile devices not using the system can operate within the network. This is accomplished by adding the capability to the mobile device's OS to intercept system calls and alter the calls without initiator and destination involvement.

- Melpignano at [0003], [0005], [0007]: The mobile device should therefore have multiple network interfaces available, at least temporarily, that provide connectivity in a variety of contexts. Such a terminal is described as a multi-mode terminal. These interfaces could be either embedded in the device or can be manually inserted by the user, as in for example the case of plug-in cards. One device of this general type is disclosed in GB-2362237, in which a PDA has a base unit with at least a battery holder and a number of changeable modules which slot, slide or clip into the base unit. This prior art arrangement proposes a card module that Implements radio frequency (RF) circuitry, link control and baseband functions for implementing wireless links, although there is no disclosure of how a selection could be made or implemented between a plurality of network interfaces which might become available for choice from time to time.

In order to use a specific wireless interface, a corresponding network infrastructure that provides access to a backbone network must be present and a discovery procedure for available networks access must be provided. This discovery process can be time and energy consuming. Even scanning for all the frequencies of one system is so power consuming that mobile terminals for cellular systems conventionally do not do this but only scan a limited number of frequencies. Scanning for a specific wireless network infrastructure (e.g. WLAN) may result in a list of usable access points to which the mobile device can connect. In case a WLAN infrastructure (as in the previous example) is not found, the WLAN interface in the mobile device cannot provide network connectivity and another one has to be investigated.

It is an object of the present invention to provide improved network selection from multiple networks and in particular, but not exclusively, to provide improved interface selection by a mobile device from among a plurality of networks, especially wireless access networks, that may be periodically available at least temporarily in a communications environment.

- Michaelis at [0004]-[0005]: This disclosure is directed to techniques for selection of wireless network interfaces for data communication within a wireless communication network. The techniques may rely on a set of interface selection rules to identify wireless network interfaces that are qualified to serve packets associated with a particular communication application. A wireless network interface may be qualified in the sense that it satisfies all of the interface selection rules for a given packet. Each wireless network interface may be assigned an explicit priority, permitting the interfaces to be prioritized in terms of relative cost, latency, bandwidth, signal strength, quality of service (QoS), bearer requirements, or the like. Thus, interface priority may be explicitly identified, rather than inferred from the order in which the interface selection rules are applied.

Upon identifying one or more qualified interfaces for a given packet, e.g., interfaces that satisfy all of the interface selection rules, the techniques may involve selection of the qualified interface having the highest priority. The assigned priorities may be dynamically adjusted, however, based on the connection states of the wireless network interfaces. Dynamic prioritization permits consideration of changes in interface properties such as cost and latency when connection state changes. In this manner, a first interface may have a higher priority than a second interface when both interfaces are connected to respective access points, but a lower priority when the second interface is connected and the first interface is not. Thus, the priority assigned to a given interface may be dynamically adjusted to reflect current interface state, e.g., on a packet-by-packet basis. In addition, explicit prioritization may promote processing efficiency in selecting the appropriate interface.

- White at [0003], [0029]: Users of wireless communication devices agree on rating and charging terms in a service provider agreement. The network service provider, or carrier, typically offers a variety of plans with different variables. The variables include the amount of air time per billing cycle that is charged at a minimum rate, more favorable rates during “off-peak” times such as nights and weekends (as opposed to “on-peak” or

“peak”) times, different rates for on-network use and roaming use, fees for special services such as call conferencing and email usage, etc. The amount of time available per billing cycle at a certain rate is sometimes referred to as the amount of time in a “bucket”. For example, the user typically chooses a number of minutes per month, e.g., 100 minutes per month, that are free or charged at a minimal rate. After the 100 bucket minutes are used, airtime is charged, or is charged at a higher rate.

FIG. 6 is another block diagram of the JAMS 406 showing more detail of the condition catalog 504 and the condition registry 506. The condition catalog 504 includes a list of conditions recognized by the device 118. The condition catalog is populated when the user downloads new user preferences as previously described. Some examples of financial conditions are off-peak rate time, peak rate time, being on the network, roaming for service, and the bucket being empty. The conditions shown are a subset of possible conditions that can be recognized by the device 118. The condition registry 506 includes a list of the conditions recognized by the device 118 for each condition, and which downloadable Java applications (A, B, C, and/or D) should be executed when the condition occurs. For example, when condition 2 (peak rates are current) occurs, application A and B are executed. Application A may be an application that generates a user message that the transition is occurring, while application B may block outgoing calls automatically (subject to user override). In other embodiments, the applications listed in the condition registry include native applications as well as downloaded applications. In other embodiments, the condition catalog and condition registry do not reside on the JAMS, but reside elsewhere on the device.

d. Additional Motivations to Combine

In addition to the exemplary motivations, suggestions, or reasons to combine described above, Defendant identifies additional motivations to combine in the sections below. The exemplary motivations, suggestions, or reasons to combine described above and below are not exclusive or exhaustive. Defendant may identify further examples as the case proceeds. In addition, Defendant provides additional reasons to combine various disclosures below.

(1) Data Usage Management

The independent claims of the '364 Patent recite management of data usage over a network. To the extent that Headwater contends that any of the references identified above does not disclose management of data usage over a network, a person of ordinary skill in the art would have arrived at the purported invention based on their own background knowledge and/or one or more of the prior art references identified below.

- Flack at [0054]: The client accesses a communications configuration associated with the application. (430). The communications configuration indicating how the application may access the network. The client may retrieve a communications script that selectively activates a communications network. For example, in order to avoid communication costs imposed by use of a high speed wireless network, a communications configuration may only establish network connectivity for email communications to priority recipients and for web access to a secure extranet.
- Fadell at [0018]: When the resource utilization component determines that the subscriber is within a particular range of the data provider resource limit, or has reached a particular threshold, the resource utilization component may provide several options or automate certain actions to assist a subscriber in managing his resource utilization so as to mitigate subscription costs. For example, the resource utilization component may prevent the subscriber from consuming any further resources. As another example, the types of resources consumed may be restricted, such that resource consumption associated with applications, protocols or data types that require significant resources are restricted (e.g., limit media downloads). As still another example, the resource utilization component may prompt the subscriber to purchase access to or authorize the purchase of additional data provider resources. In some embodiments, only the particular consumer (who may not be the subscriber per se) who purchased the additional resources may consume the additional resources.
- Sharif-Ahmadi at [0119]: The system according to the invention has the capability of distinguishing between different types of data received or sent by mobile device 30 (or other networked device) and can identify a mobile traffic model for such data. Each different data type has its own requirements, including end-to-end transmission control, and latency sensitive real-time requirements. An objective of the system according to the invention is to meet as many requirements as possible for these different data types. Therefore, the system differentiates the data and handles the packets with the objectives of: controlling traffic over the wireless link, maintaining loads, increasing the capacity of the network, and providing bandwidth improvements.
- Melpignano at [0069]: The wait task 300 is the idle task, the one that spawns all other tasks (the main). It also performs application initialization and resource allocation when IfManager 200 is started. Wait 300 performs application clean up and resource freeing when an application is closed. The wait task 300 also initializes all timers that govern the other task timings.
- Michaelis at [0049]: In some embodiments, processor 16 may be configured to dynamically reorder interfaces 28 within the data structure according to assigned priorities. Assignment of explicit priorities rather than reordering the data structure can provide significant computing efficiencies, however, particularly within an AT 12 that updates the priorities and makes interface selections on a packet-by-packet basis. In particular, the processing resources associated with AT 12 may be limited. In addition, excessive processing overhead can produce excess power consumption, which may be especially undesirable for a mobile AT 12 that relies on a finite reserve of battery power. By changing the priorities rather than reordering the data structure, the interface selection

techniques described herein can conserve processing and power resources and reduce processing time.

A person of ordinary skill in the art would have been motivated to incorporate management of data usage over a network because of cost management, traffic control, load maintenance, increasing network capacity, and/or bandwidth improvement, among other benefits. For example, Flack discusses “avoid[ing] communication costs.” Flack at [0054]. Sharif-Ahmadi discusses “controlling traffic over the wireless link, maintaining loads, increasing the capacity of the network, and providing bandwidth improvements.” Sharif-Ahmadi at [0119].

(2) Policy Application

The independent claims of the '364 Patent recite application of a service policy or set of rules to a service activity. To the extent that Headwater contends that any of the references identified above does not disclose application of a service policy or set of rules to a service activity, a person of ordinary skill in the art would have arrived at the purported invention based on their own background knowledge and/or one or more of the prior art references identified below.

- Flack at [0005]: Accessing the first setting may include accessing a first instruction specifying that connectivity should not be established for the first program and accessing the second setting may include accessing a second instruction specifying that connectivity for the second program should be established using a first communications mode. Accessing the first setting may include accessing a first instruction specifying that connectivity should be established for the first program using a first communications mode and accessing the second setting may include accessing a second instruction specifying that connectivity for the second program should be established using a second communications mode that is different than the first communications mode. Establishing network connectivity using the first setting and establishing network connectivity using the second settings may include establishing network connectivity using the first setting at a first time and establishing network connectivity using the second settings at a second time that is different than the first time. The first program may be enabled to access the network based on network connectivity that has already been established for the second program. The first program may be blocked from accessing the network based on network connectivity that has already been established for the second program.

- Sharif-Ahmadi at [0049]-[0050], [0145]-[0146]: A method of controlling a mobile device based on a network policy, is provided, comprising the steps of: storing said policy on a database on an advance server; sending said policy to said mobile device when said mobile requests registration with said server; when an application on said mobile device attempts to access a network via said server, checking said policy; and providing access to said network for said application when said policy permits.

If said policy changes at the database, said changed policy is pushed to said mobile device. Preferably, the network policy includes a plurality of parameters, including parameters base on the type of service provided by said application, the maximum tolerable delay and the time of usage of said application.

The method and system according to the invention can also control a network device based on the requirements of the network policy. In such a case, the network policy must be created, and transmitted to the network device for storage, such as a mobile device, when the network device requests registration.

When an application is attempting to access the network, the network policy usage will be checked, and TOPICS and LOWICS will provide network access to the application according to the policy. During the transactions between the network device and network server, at any time if the network policy is changed at the database in the advance server the change will be pushed to the network device in a form of “Policy Push” command.

- Melpignano at [0054]: The IfManager 200 takes care of the wireless interfaces connectivity, management and selection being performed by choosing the best available interface according to context and user's preferences. IfManager 200 also guarantees that Layer-three connectivity is always maintained by performing Vertical Handover between the available interfaces when needed and consequently updating routing information. It is supposed that the mobile terminal MT is willing to reach some host in the Internet, hereafter referenced as the server 12.
- Michaelis at [0042]: FIG. 3 is a diagram illustrating a set 32 of interface selection rules with dynamic prioritization. As shown in FIG. 3, rule set 32 is applied to a given packet processed by AT 12. Rule set 32 contains a number of rules (Rule 0 through Rule N) that are applied to each of multiple wireless network interfaces (Interface 0 through Interface N). In addition, each interface has an assigned priority that, in effect, ranks the interfaces in order of preference in the event more than one interface satisfies all of the rules, i.e., “matches” on all rules.

A person of ordinary skill in the art would have been motivated to incorporate application of a service policy or set of rules to a service activity because of [use of different, simultaneous communication modes and/or dynamic prioritization, among other benefits. For example, Flack discusses use of different, simultaneous communication modes. Flack at [0058]. Melpignano discusses dynamic prioritization. Melpignano at [0044].

B. U.S. Patent No. 9,647,918

1. Exemplary Combinations of Primary References

Defendant identifies below an exemplary list of anticipated combinations of the primary references identified above for the '918 Patent. Defendant offers these exemplary combinations for the purposes of illustration only and without any inference or admission that any such references are required to be combined as illustrated below to disclose any Asserted Claim of the '918 Patent. In providing these exemplary combinations, Defendant reserves all rights to assert that any primary reference, alone or in combination with any other primary reference, secondary reference, or reference disclosing the state of the art, anticipates or renders obvious the Asserted Claims of the '918 Patent (including for, but not limited to, the more than '918 Asserted Claims for which Plaintiff's Infringement Contentions include no independent evidence).

References	Combination References
Bennett	Vadde, Riggs, Rybak 575, Rakoshitz, Hendrickson, Srikantan, Sharif-Ahmadi, Deu-Ngoc, Android Device with one or more applications, Benco, Cassett, Cole 458, Michels, Rao, Jobs, Fadell, Bourges-Sevenier, Chiu, Sakamoto, Jong, Pandya, Elgamal, and/or Kim.
Vadde	Bennett, Riggs, Rybak 575, Rakoshitz, Hendrickson, Srikantan, Sharif-Ahmadi, Deu-Ngoc, Android Device with one or more applications, Benco, Cassett, Cole 458, Michels, Rao, Jobs, Fadell, Bourges-Sevenier, Chiu, Sakamoto, Jong, Pandya, Elgamal, and/or Kim.
Riggs	Bennett, Vadde, Rybak 575, Rakoshitz, Hendrickson, Srikantan, Sharif-Ahmadi, Deu-Ngoc, Android Device with one or more applications, Benco, Cassett, Cole 458, Michels, Rao, Jobs, Fadell, Bourges-Sevenier, Chiu, Sakamoto, Jong, Pandya, Elgamal, and/or Kim.
Rybak 575	Bennett, Vadde, Riggs, Rakoshitz, Hendrickson, Srikantan, Sharif-Ahmadi, Deu-Ngoc, Android Device with one or more applications, Benco, Cassett, Cole 458, Michels, Rao, Jobs, Fadell, Bourges-Sevenier, Chiu, Sakamoto, Jong, Pandya, Elgamal, and/or Kim.

References	Combination References
Rakoshitz	Bennett, Vadde, Riggs, Rybak 575, Hendrickson, Srikantan, Sharif-Ahmadi, Deu-Ngoc, Android Device with one or more applications, Benco, Cassett, Cole 458, Michels, Rao, Jobs, Fadell, Bourges-Sevenier, Chiu, Sakamoto, Jong, Pandya, Elgamal, and/or Kim.
Hendrickson	Bennett, Vadde, Riggs, Rybak 575, Rakoshitz, Srikantan, Sharif-Ahmadi, Deu-Ngoc, Android Device with one or more applications, Benco, Cassett, Cole 458, Michels, Rao, Jobs, Fadell, Bourges-Sevenier, Chiu, Sakamoto, Jong, Pandya, Elgamal, and/or Kim.
Srikantan	Bennett, Vadde, Riggs, Rybak 575, Rakoshitz, Hendrickson, Sharif-Ahmadi, Deu-Ngoc, Android Device with one or more applications, Benco, Cassett, Cole 458, Michels, Rao, Jobs, Fadell, Bourges-Sevenier, Chiu, Sakamoto, Jong, Pandya, Elgamal, and/or Kim.
Sharif-Ahmadi	Bennett, Vadde, Riggs, Rybak 575, Rakoshitz, Hendrickson, Srikantan, Deu-Ngoc, Android Device with one or more applications, Benco, Cassett, Cole 458, Michels, Rao, Jobs, Fadell, Bourges-Sevenier, Chiu, Sakamoto, Jong, Pandya, Elgamal, and/or Kim.
Deu-Ngoc	Bennett, Vadde, Riggs, Rybak 575, Rakoshitz, Hendrickson, Srikantan, Sharif-Ahmadi, Android Device with one or more applications, Benco, Cassett, Cole 458, Michels, Rao, Jobs, Fadell, Bourges-Sevenier, Chiu, Sakamoto, Jong, Pandya, Elgamal, and/or Kim.
Android Device with one or more applications	Bennett, Vadde, Riggs, Rybak 575, Rakoshitz, Hendrickson, Srikantan, Sharif-Ahmadi, Deu-Ngoc, Benco, Cassett, Cole 458, Michels, Rao, Jobs, Fadell, Bourges-Sevenier, Chiu, Sakamoto, Jong, Pandya, Elgamal, and/or Kim.

2. Exemplary Motivations to Combine

Defendant has identified several exemplary motivations and reasons to combine the various references cited herein. For any reference for which there is a claim element that does not have a corresponding citation in that reference, it would be obvious to combine with the knowledge or a person of skill and/or any other reference in the primary or secondary charts for which there is a citation for that element. These combinations would have been obvious to try given that there were a finite number of identified, predictable solutions in the prior art, and there would have been a

reasonable expectation of success to simply implement one prior art solution with concepts from prior art in the same field.

It would have been obvious to combine each of the references discussed below because they are analogous art generally directed to management of resource usage, media sessions, and network connections across multiple flows of data traffic. For example:

a. Same Field of Technology

As shown below, each of the identified prior art references relates to the field of management of resource usage, media sessions, and network connections across multiple flows of data traffic. For example:

- Bennett at Abstract: A media client for a networked communication device includes a user agent to communicate with a multimedia application in the networked communication device. The user agent provides a high-level application interface to the multimedia application. A signaling agent under the control of the user agent performs signaling operations necessary to establish and maintain communication sessions. A media agent under the control of the user agent performs media operations. The media client may be located in a network and remotely accessed by the multimedia application. The user agent, signaling agent and media agent have network interfaces that allow these elements to be distributed within the network and accessed remotely.
- Vadde at Abstract: Defining and applying policies to manage data traffic including data transmitted and/or received by each of a plurality of applications executing on a computing device. The data traffic is monitored per application and attributes are defined for the monitored data traffic to enable the user to evaluate the data traffic for each application. Usage patterns are determined based on the monitored data traffic and the attributes to create one or more policies. The policies are applied to prevent each application from exceeding a corresponding data usage limit defined by the policies.
- Riggs at Abstract, 5:1-4: Example configurations herein include a media player that initiates playback of content (e.g., play back of a movie in a web browser). Based on input from a respective user, the media player receives selections of playback commands (e.g., play, pause, stop, rewind, fast forward, etc.) applied to the content being played back by the media player. Based on the selections, the media player creates a log report. The log report records the selections of the playback commands applied to the content and indicates, for example, a corresponding time when the playback commands were applied. According to one configuration, the media player initiates distribution of the log report to notify a publisher associated with the content which playback commands were selected during playback of the content on the media player.

FIG. 3 is an example block diagram of a network environment illustrating distribution of log reports from multiple media players and use of the log reports by publishers according to embodiments herein.

- Rybak 575 at [0001]: The present disclosure generally relates to wireless packet data service networks. More particularly, and not by way of any limitation, the present disclosure is directed to a mobile communications device and related data service network employing features suitable for monitoring and controlling wireless service usage.
- Rakoshitz at 1:12-22: The present invention relates to communication or telecommunication. More particularly, the present invention provides a technique, including a method and system, for monitoring and allocating bandwidth on a telecommunication network at, for example, a firewall access point. As merely an example, the present invention is implemented on a wide area network of computers or workstations such as the Internet. But it would be recognized that the present invention has a much broader range of applicability including local area networks, a combination of wide and local area networks, and the like.
- Hendrickson at Abstract: Systems and methods for measuring wireless device and wireless network usage and performance metrics are set forth. The system includes at least one wireless device, and data gathering software installed on the wireless device for collecting device parametric data, network parametric data, event data. A control center may receive, store and process said device parametric data, network parametric data, and event data.
- Srikantan at Abstract: A system and method are provided for streaming a media track to multiple clients using a single copy of the track's metadata, rather than making separate copies of the metadata for each stream. A media track's metadata includes information that is used to identify and locate media corresponding to different time positions in the track or media program. Sharing one copy of the metadata among multiple client streams promotes more efficient use of a media streaming server's resources. When a media track is first requested, a track object is generated to store and allow access to the metadata. For each client stream, a separate track handle object is created to manage access to the metadata for the stream's specific context. The streamed media track may be part of a live media event or may be part of a pre-recorded media program.
- Sharif-Ahmadi at Abstract, [0002]: A method of controlling a mobile device based on a network policy, wherein the network policy is stored on the mobile device when a server or access point is accessed. When a packet is transmitted, it is sent only if it meets the policy parameters as established by the network policy. Parameters may include the type of service or packet, the time of day of the usage, or the maximum tolerable delay permitted.

This invention relates to systems and methods of managing data traffic over networks, and more particularly to systems and methods for addressing the diverse requirements of different data types and their behaviour over different types of wired and wireless

networks, each such network having different characteristics and changing network status.

- Deu-Ngoc at Abstract: Methods and apparatus for prioritizing assignment of a packet data session for a plurality of applications of a mobile communication device, especially when operating in wireless networks that limit the number of simultaneous packet data sessions available to the mobile device. The plurality of applications include at least a first (priority) application operative in connection with a first (priority) communication service and a second application operative in connection with a second communication service. The first (priority) service may be or include a “push” type data or message synchronization service. The mobile device causes a packet data session associated with the first (priority) application to be activated for accessing the first (priority) service. In response to identifying an indication of a request for information via the second application, the mobile device causes the packet data session associated with the first (priority) application to be deactivated, and causes a packet data session associated with the second application to be activated for accessing the second service. Subsequently, in response to identifying communication inactivity associated with the second application over a predetermined time period, the mobile device causes the packet data session associated with the second application to be deactivated, and causes a packet data session associated with the first (priority) application to be activated again with the wireless network for again accessing the first (priority) service.
- Benco at [0006]: In accordance with one set of features of Applicants' invention, current usage reports can be provided whenever the subscriber powers up the mobile, whenever an incoming call is received, whenever an outgoing call is initiated, whenever any call, either incoming or outgoing, is completed, or when the subscriber manually requests a report. The report, for example, in the case of voice minutes, would indicate how many minutes of usage by category (peak usage versus off-peak usage) have already been accumulated in the current billing cycle. This usage information can be reported as the number of minutes used and/or the percentage of the minutes used by category as compared to the number of minutes provided by category under the subscriber's billing plan. In accordance with another feature of Applicants' invention, subscribers have the ability to optionally choose the conditions for automatic usage reporting and subsequently change the reporting condition so that, for example, reports are only provided when the subscriber powers on the mobile phone and when a call is completed.
- Michels at [0007]: The invention, in various embodiments, is directed to systems, methods, and/or devices that allow for a proxy (application or server) to operate as an intermediary between the program calling the API and the API itself which enables monitoring and control of access to the API. By monitoring and controlling developer access to the API, usage of the API can be more fairly distributed among developers, developer profiles of usage may be tracked and/or analyzed, and/or usage-based billing models may be employed.
- Jobs at [0213]: In some embodiments, UI 400A or 400B includes a gauge (not shown) that displays an updated account usage metric for an account associated with usage of the device (e.g., a cellular phone account), as described in U.S. patent application Ser. No.

11/322,552, "Account Information Display For Portable Communication Device," filed Dec. 23, 2005, which is hereby incorporated by reference.

- Bourges-Sevenier at [0026]: In accordance with an embodiment of the invention, a multimedia terminal for operation in an embedded system, includes a native operating system that provides an interface for the multimedia terminal to gain access to native resources of the embedded system, an application platform manager that responds to execution requests for one or more multimedia applications that are to be executed by the embedded system, a virtual machine interface comprising a byte code interpreter that services the application platform manager; and an application framework that utilizes the virtual machine interface and provides management of class loading, of data object life cycle, and of application services and services registry, such that a bundled multimedia application received at the multimedia terminal in an archive file for execution includes a manifest of components needed for execution of the bundled multimedia application by native resources of the embedded system, wherein the native operating system operates in an active mode when a multimedia application is being executed and otherwise operates in a standby mode, and wherein the application platform manager determines presentation components necessary for proper execution of the multimedia applications and requests the determined presentation components from the application framework, and wherein the application platform manager responds to the execution requests regardless of the operating mode of the native operating system.
- Sakamoto at 1:6-14: The present invention generally relates to a method for acquiring data regarding use of an application on an information processing device, and more particularly to a method and a device for acquiring data regarding use of an application on an information processing device such as a computer, in which the method is applicable to research on an application usage trend, a measurement of an effect of Internet media, an advertising media value evaluation, and the like.
- Jong: The present invention relates to a mobile communication terminal that supports the use of a plurality of bearers (bearer) and a data transmission / reception method using the same. When the setup of a bearer and opening of a corresponding socket are completed by a wireless data based application, By registering the identifier of the bearer and the identifier of the socket for the effective bearer use.
- Kim: 1 is a flowchart illustrating a packet usage statistics method of a mobile communication terminal according to an embodiment of the present invention, in which an application opens a socket and requests a TCP / IP connection to a service server; Storing attributes of the socket in a socket structure in the TCP / IP; When receiving a packet from a service server in the TCP / IP, finding a corresponding socket, delivering the packet to an application, and storing the amount of transmitted / received packet in a corresponding socket structure; In the application, the packet amount is divided and stored according to a service type, and when the user checks the packet usage, the packet output is performed on the display window.
- The Android Operating System provided a framework and interface that enabled developers to develop a wide array of applications, including applications directed to

management of resource usage, media sessions, and network connections across multiple flows of data traffic, such as the JuiceDefender and GreenPower Android applications, which provided configuration settings that allowed users to specify conditions under which to enable or disable a device's mobile network connection, and various media streaming, video on demand (VOD), voice-over-IP (VoIP), and other applications with network access. *See, e.g.*, invalidity chart for Android Device with one or more applications and evidence cited therein ("The WiFi APIs provide a means by which applications can communicate with the lower-level wireless stack that provides Wi-Fi network access. Almost all information from the device supplicant is available, including the connected network's link speed, IP address, negotiation state, and more, plus information about all other available networks."; "The Media APIs are used to play media files. This includes both audio (such as playing MP3s or other music files, as well as game sound effects) and video (such as playing a video downloaded over the web). Support is included for "playing URIs" – that is, streaming media data over the internet. Technically the Media APIs are not optional since they'll always be present; however there may be differences in the specific sets of supported codecs across devices.").

A person of ordinary skill in the art would naturally look to these references, related patents, patent applications, publications, and related commercial products/systems to provide insight into how the industry/field as a whole, inventors, authors, or companies viewed and applied these inventions, teachings, and commercial products/systems. Based on their related disclosures, one of ordinary skill in the art at the time of the invention would have been motivated to apply the teachings from one reference to another in the same way.

b. Market Forces and Design Incentives Drove Similar Solutions in the Prior Art

Many of the identified references address the same technical issues and suggest similar solutions in the field of management of resource usage, media sessions, and network connections across multiple flows of data traffic, such as monitoring and allocating bandwidth on a network. Moreover, because there were a finite number of predictable solutions, a person of ordinary skill in the art had good reason to pursue and/or combine known options and related applications. Many references describe market demand and market potential for these solutions such as:

- Bennett at [0002]: The convergence of mobile and IP networks will allow service providers to offer new IP services to mobile subscribers that were previously available only to users in fixed networks, such as the Internet. Further, the convergence of mobile

and IP networks will enable mobile devices, such as cellular telephones and personal digital assistants, to communicate with other network devices. This convergence will permit mobile devices to be used in new ways to enhance utility of mobile devices and enrich user experience. One possible use of mobile devices is to remotely control media devices, such as media recorders (e.g., video and audio recorders), media players (e.g., video and audio players), and media storage devices.

- Vadde at [0001]: The cost of mobile operator data plans is often based on usage. Each data plan has data usage limits, but users have difficulty determining when the data usage limits have been reached or are about to be reached with existing systems. As a result, users can incur excess data charges. Further, with existing systems, users are unable to determine the relative costs incurred by different applications executing on a mobile telephone.
- Riggs at 1:39-48: Conventional media player applications that render content from a content publisher(s) suffer from a number of deficiencies. In particular, one such deficiency is the lack of useful feedback provided to the publisher. For example, conventional media player applications may only provide a content publisher with an indication that the content was in fact rendered by the media application. In certain cases, if a user consents, the publisher may be apprised of an identity of the media player application that played back the publisher's content.
- Rybak 575 at [0002]: Wireless service is generally offered by wireless service providers according to certain wireless service access plans. Most wireless service access plans include limitations as to the quantity of wireless access available in a given time. For example, a first wireless service access plan may provide for a certain number of cellular telephone voice minutes per month. Certain plans provide for unlimited cellular voice minutes during off-peak periods along with a limited number of minutes available during peak periods. Wireless service access plans may also provide for specified levels of wireless data access per month. While cellular telephone minutes are generally quantified in minutes per month, wireless data access is generally quantified in some units of bandwidth per month (e.g., megabytes per month). In either event, a wireless service provider will generally continue to provide service above the specified level, but will charge an additional premium for the usage above the level specified in the wireless service access plan.
- Rakoshitz at 1:44-2:35: In the 1990s, another significant development in the telecommunication industry occurred. People began communicating to each other by way of computers, which are coupled to the telephone lines or telephone network. These computers or workstations coupled to each other can transmit many types of information from one geographical location to another geographical location. This information can be in the form of voice, video, and data, which have been commonly termed as “multimedia.” Information transmitted over the Internet or Internet “traffic” has increased dramatically in recent years. In fact, the increased traffic has caused congestion, which leads to problems in responsiveness and throughput. This congestion is similar to the congestion of automobiles on a freeway, such as those in Silicon Valley from the recent “boom” in high technology companies, including companies specializing in telecommunication. As a result, individual users, businesses, and others have been

spending more time waiting for information, and less time on productive activities. For example, a typical user of the Internet may spend a great deal of time attempting to view selected sites, which are commonly referred to as “Websites,” on the Internet. Additionally, information being sent from one site to another through electronic mail, which is termed “e-mail,” may not reach its destination in a timely or adequate manner. In effect, quality of service or Quality of Service (“QoS”) of the Internet has decreased to the point where some messages are being read at some time significantly beyond the time the messages were sent.

Quality of Service is often measured by responsiveness, including the amount of time spent waiting for images, texts, and other data to be transferred, and by throughput of data across the Internet, and the like. Other aspects may be application specific, for example, jitter, quality of playback, quality of data transferred across the Internet, and the like. Three main sources of data latency include: the lack of bandwidth at the user (or receiving) end, the general congestion of Internet, and the lack of bandwidth at the source (or sending) end.

A solution to decreasing data latency includes increasing the bandwidth of the user. This is typically accomplished by upgrading the network link, for example by upgrading a modem or network connection. For example, the network link may be upgraded to X2 modems, 56K modems, ADSL or DMT modems, ISDN service and modems, cable TV service and modems, and the like. Drawbacks to these solutions include that they typically require additional network service; they also require additional hardware and/or software, and further they require both the sender and receiver to both agree on using the same hardware and/or software. Although one user may have a much faster line or faster modem, another user may still rely on the same 1,200 kb modem. So, the speed at which information moves from one location to another location is often determined by the slowest information, which is being transferred over the network. Accordingly, users of faster technology are basically going nowhere, or “running” nowhere fast, as is commonly stated in the network industry.

- Hendrickson at 1:49-4:4: Wireless data industry participants such as service providers, advertisers, content providers and electronic and mobile commerce companies have a need for information on consumer activity and usage of wireless data. First, for example, there exists a need to collect information on the activity and usage behavior of wireless data users. Consumer usage, audience, and purchase information statistics are staples in most developed industries. There is a need to rapidly make these information streams available to all participants of this new and not well understood industry in order to expedite the development of more effective service and product offerings—thereby improving the satisfaction level of users, accelerating the overall growth of the industry, and saving industry participants time and money by avoiding uninformed strategies and initiatives. Second, for example, there is a need to make available to the wireless industry a continuous, real-time set of independent and unbiased network and device performance data. Not only is there a need by network operators and device manufacturers to benchmark the performance of their own networks and devices specifically as it relates to wireless data and more traditional wireless voice applications, but also there is a need to provide to sellers, advertisers, and content providers objective data on the level of service

customers are receiving from wireless network and device partners. Third, for example, there is a need to integrate these information streams together, thereby providing industry participants an improved understanding of how wireless network service levels and device performance characteristics (and changes in them) impact wireless data user behavior. For instance, there is a need by electronic and mobile commerce companies to quantify “lost revenue” resulting from a failed wireless transaction due to poor network performance.

Usage, Audience, and Purchase Information

While the popularity of wireless telephony and WAP-based data services is surging, there has been no reliable system for measuring wireless data user behavior. Today, competitive marketing information on the wireless data industry is obtained primarily through consumer surveys, the accuracy of which are unreliable and often in question by the industry.

As a result, there is an acute demand for a more accurate service that monitors user activity and usage of wireless data. Wireless network operators, wireless device manufacturers, advertisers, and content providers are all looking for more accurate and detailed information to be able to better understand the behavior, experiences, and needs of wireless data users. Limited data presently exists on even the most basic of questions regarding wireless data users—the numbers and demographics of users; what wireless devices and networks they use; when, how often, for how long, and from what location they access the wireless internet; what sites they visit; what transactions they execute; what advertisements they view/redeem, etc. As the industry advances and matures and users of wireless data become more sophisticated, the ability to track user behavior over time will also become particularly important. Services exist in the wired internet and other industries that provide this type of consumer usage, audience rating, and purchase data.

Creating a system and method to effectively and accurately collect wireless data consumer usage and activity information poses a number of challenges over the wired internet industry. For instance, challenges typically confronted where wireless devices are involved include restricted memory capacity, power limitations, limited processing power, multiple proprietary operating systems with limited interfaces, and the like. Furthermore, there is a need to accommodate activity relating to different wireless network protocols, each designed according to its own specifications. Moreover, there is a need to track activity across a range of data applications and protocols including for example WAP, web clipping applications, HTML, WML, and XML browsers.

As the wireless data industry prepares for the expected flood of new wireless data users, there exists a strong market need for improved wireless data consumer usage and activity information.

Network/Device Performance Information

A strong market need exists for a system to monitor the performance of wireless data networks and wireless devices. At present, there is no industry standard for “Quality of

Service” (QOS) data on the performance of wireless data networks. Currently, network operators generally conduct proprietary drive test network benchmarking activities solely for their own internal use. Network operators generally do not make this information available to external parties, such as dotcoms, internet content partners, wireless data application services providers, wireless advertisers, wireless electronic commerce companies, etc. Even if such information were made available to other industry participants outside the network operator's organization, the information would not be sufficient because of the proprietary nature and varying approaches for data collection across network operators, lack of a standard schedule for data collection, and biases resulting from rating the performance of a network provider's own network versus that of its competitors.

Consequently, there is a need for a more robust and real-time method of monitoring the data performance of wireless networks. Network operators are inexperienced in providing data services, and they are keenly interested in information that will help them understand how their networks stack up in supplying wireless data services and where, when, and how to optimize their networks. Carrier interest in objective QOS data has been further heightened by recent federal mandates for E911 service capabilities—carriers can no longer tolerate coverage gaps and prolonged problems in their service areas. Objective information on the performance of network operators is also of great interest to other wireless industry participants who are looking to focus their sales, marketing, and product development efforts on those network operators and geographies providing satisfactory levels of service to wireless data users. In the wired internet industry, existing information service companies provide non-user based, automated, real-time QOS tracking of web hosting servers and backbone networks. There now exists a need to capture performance measurements which include wireless data in addition to the traditional back-end wireline performance metrics. This type of end-to-end measurement, which includes wireless data, is a more complex process compared with the back-end measurement typified by the wired internet industry as it must include the radio link. Continuously tracking statistics concerning RSSI, channel assignments, bit error rates, transmit power, call result, etc. can benefit the wireless data industry participants and users.

Similarly, there is a need for improvement in the real-time collection of wireless device statistics. Presently, manufacturers conduct only pre-shipping device performance tests. Once in the hands of consumers, the burden ordinarily is placed solely on wireless data users to determine whether a device is not functioning correctly. This is fairly easy if the device does not turn on or is visibly broken, but more difficult when other more subtle failures or performance degradations occur. For instance, there exists a need for wireless device parametric information based on real-time user activity (which can be tracked over a period of time) on metrics such as DSP, battery life, power consumption, finger assignments, etc. Device manufacturers and network operators, for example, could use this information to identify and replace “out of spec” or malfunctioning devices, thus reducing the number of wireless data users experiencing wireless device related performance problems. Other information such as available memory, control settings, and Personal Information Management (PIM) feature utilization could also assist device manufacturers in planning future wireless device features. Overall, such a capability

could lead to greater wireless data user satisfaction with network operators, wireless device manufacturers, applications companies, as well as help those parties more quickly understand device performance characteristics and address device design and manufacturing issues, in order to bring improved products and services to consumers.

- Srikantan at [0004]-[0006]: When streaming a media track or program to multiple clients, existing systems usually store separate copies of each track's metadata for each client. More specifically, from a media file containing the media to be streamed, these systems repeatedly extract and store the metadata each time a new client requests the media. When serving a large number of clients, this could require a significant amount of the server's resources (e.g., memory, processor, disk usage), and may limit the number of clients the server can support.

Also, some existing systems typically allocate just one file descriptor, to be shared among all clients receiving a particular media stream, for accessing the media file containing the media being streamed. This can lead to a great deal of contention among the client streams as each one attempts to seek to (i.e., find) and extract a different media segment or sample.

Yet further, when streaming a multi-track media program to a client, existing media streaming systems attempt to maintain synchronization between the tracks so that the appropriate corresponding track media is streamed or played for each time unit of the program, but may be incapable of regaining synchronization if it is lost. For example, if the media for one track is received (e.g., from a storage device) at a slower rate than the media for another track, an existing media streaming system may simply continue streaming the media, even if the tracks get further and further out of synchronization. Other systems may simply halt a media stream if synchronization is lost, without attempting to correct the situation.

- Sharif-Ahmadi at [0003], [0008]-[0009]: Wireless networks generally have very different properties when compared to traditional wired networks. For example, the “backbone” of a wired network is more homogeneous than a wireless network, and a wired network is typically, a mesh of intelligent sub networks connected through routers and switches that control data traffic. In wired networks, users are generally stationary and therefore movement of users has little impact on network service. The key influence on user service in a wired network is the data traffic congestion on the network. This congestion problem is dealt with by using the Transmission Control Protocol/Internet Protocol (TCP/IP), a communications protocol that most network applications use.

Two parallel changes occurring in wireless network technologies are: i) the introduction of new wireless network types, so that the overall wireless network infrastructure is changing from being a single type network, for example a General Packet Radio Service (GPRS) network only, to an infrastructure comprising multiple network types, such as GPRS, Wi-Fi, Worldwide Interoperability for Microwave Access (WiMAX) and Universal Mobile Telecommunications System (UMTS); and, ii) wireless network users are no longer only using “background class” type of applications such as email, short message services (SMS) and downloads, but are now using more interactive applications such as web browsing, network gaming, and database access; streaming applications such

as multimedia applications, video on demand, and webcasting; and conversational applications such as Voice over Internet Protocol (VoIP), video telephony, and video gaming. Service providers, or carriers, are driving to increase the usage of these applications over wireless networks as to increase “average revenue per user” and subscription rates. The service providers also differentiate themselves from competitors through the services offered along with Quality of Service (QoS) for their own “certified” applications as compared to third party applications. However, use of these different types of applications results in different data traffic types traversing the network, each data type having different delivery (time) requirements and different error tolerances (in time sensitive vs. error sensitive spectrums of applications). For example, a VoIP packet is very time sensitive and has a short time to live, whereas a data packet is very error sensitive. TCP and UDP/IP protocols (widely used by many software applications) are both network and application agnostic. TCP does provide congestion control features which occur on wired networks but the protocol doesn't distinguish a wired network from a wireless network. Also neither of these protocols are application aware (they are not sensitive to the type of applications and time vs. error sensitivity). TCP/IP has been designed specifically to overcome the congestion problems in wired networks by detecting the congestion on the network and controlling the traffic between the two communicating parties. However, use of TCP/IP over wireless networks may be problematic. For example, delays in the wireless network may be caused by signal attenuation (not by congestion), causing TCP/IP to actually reduce performance of a wireless network.

Therefore, what is lacking in the prior art is the awareness and involvement of the networked (for example, mobile) device in the network by enabling the networked device to act as an intelligent and integrated element (similar to a router/switch) within the network. In the prior art, the networked device, particularly mobile devices, lack the ability to make decisions based on the types of wired or wireless network(s) available to it and the types of data it is communicating to other networked devices (given the differences between wireless and wired networks, data communications should be treated differently over the two network types).

- Deu-Ngoc at 1:41-2:3: When an application is initially invoked, the mobile device causes the associated communication service to be activated in the wireless network. In particular, a packet data session needs to be established for each application or service. For wireless networks which employ a General Packet Radio Service (GPRS), the packet data session may be a Packet Data Protocol (PDP) context. Here, an Application Point Name (APN) is utilized to determine how the mobile device communicates via the wireless network to a host site.

However, wireless networks do not allow for an unlimited number of PDP contexts to be simultaneously maintained for a mobile device. It has been discovered that some wireless networks limit the number of simultaneous PDP contexts for a mobile device to a relatively small number. The wireless network may even limit the number of PDP contexts for a mobile device to a single PDP context. At the present time, 3rd Generation (3G) wireless networks appear to most clearly exhibit such characteristics, which may be due to network software options or upgrades not being configured as appropriate.

In such environment, if a “push-type” data or message synchronization application is the primary application of the mobile device, for example, but the PDP context for this application is deactivated through use of one or more other applications (e.g. the user of the mobile device invokes a Web browser application), there may be user confusion or undesirable operation in the mobile device.

- Rao at [0003]: Communications over a network between two computers are typically processed in the order generated by the activity of a user and applications of the client and incoming network communications are processed in the order they are received. This is not always desirable, however. For example, in one case, although an application is running in the foreground and currently in active use by the user, a network packet generated or received for an application running in the background may be processed ahead of a network packet generated or received for the application running in the foreground. In another example, the client may be running a VoIP application to provide a telephone call to a remote computing device. One or more other applications on the client may be running that are not related to the real-time data communication of VoIP. The network packets for these applications may be processed ahead of the real-time network packets of the VoIP telephone call thereby increasing the latency and reducing the quality of the voice communication. It is desirable to provide application-aware, client-specific prioritization of packet traffic.
- Cassett at [0005]: As the functionality and the bandwidth requirement of wireless devices has grown far beyond the requirements of a cellular telephone, the need to manage the bandwidth, maintenance and service of the wireless network has become critical to maintaining quality of service to the user and to maintain and increase the profitability of the network carrier. Accordingly, it would be advantageous to provide apparatus and methods for providing consumer usage pattern reports for a wireless device.
- Michels at [0006]: One problem with current approaches to distributing APIs, including web-based APIs, is that there are no adequate mechanisms that enable the API provider to control, regulate, and/or monitor API distribution or application development based on their APIs.
- Pandya at [004]-[0006]: Indeed, conventional computer networks provide little in the way of solutions for managing network resources, and instead typically provide what is known as “best efforts” service to all network traffic. Best efforts service is the default behavior of TCP/IP networks, in which network nodes simply drop packets indiscriminately when faced with excessive network congestion. With best efforts service, no mechanism is provided to avoid the congestion that leads to dropped packets, and network traffic is not categorized to ensure reliable delivery of more important data. Also, users are not provided with information about network conditions or underperforming resources. This lack of management frequently results in repeated, unsuccessful network requests, user frustration and diminished productivity.

Problems associated with managing network resources are intensified by the dramatic increase in the demand for these resources. New applications for use in distributed networking environments are being developed at a rapid pace. These applications have widely varying performance requirements. Multimedia applications, for example, have a

very high sensitivity to jitter, loss and delay. By contrast, other types of applications can tolerate significant lapses in network performance. Many applications, particularly continuous media applications, have very high bandwidth requirements, while others have bandwidth requirements that are comparatively modest. A further problem is that many bandwidth-intensive applications are used for recreation or other low priority tasks.

In the absence of effective management tools, the result of this increased and varied competition for network resources is congestion, application unpredictability, user frustration and loss of productivity. When networks are unable to distinguish unimportant tasks or requests from those that are mission critical, network resources are often used in ways that are inconsistent with business objectives. Bandwidth may be wasted or consumed by low priority tasks. Customers may experience unsatisfactory network performance as a result of internal users placing a high load on the network.

- Fadell at [0003]-[0006]: “Data providers,” such as cellular network providers and Internet Service Providers, charge users to access and to post data from remote data resources such as web servers and mail servers. Data providers may charge based upon connection time or as a fixed recurring fee. In these instances, the data providers have traditionally allowed unlimited bandwidth (i.e. unlimited data size transfer). However, with the increase in connection speed affordability and in the size of files transferred, users have increased data consumption dramatically leading at times to congestion and utilization stress on data providers.

In addition, different protocols have been developed for allowing users to share files or other data between electronic devices. For example, the advent of peer-to-peer protocols and applications allowing peer-to-peer transfers of files (such as Limewire and Bearshare) have permitted a large network of users to transfer increasingly larger and larger amounts of data with few limits.

Recently, media files which are typically of very large relative size are also being increasingly transferred to portable electronic devices and computer systems. For example, with the advent of electronic purchasing of media, such as music and video, many users have stopped purchasing physical CDs and DVDs and have instead downloaded desired media to their devices. As another example, content providers now allow content to be rented electronically by enabling time-restricted downloading of media—downloaded media expires and can no longer be played back when a delay lapses (e.g., 30 days from date of rental, or 24 hours from beginning playback of the media). The portable electronic media device (e.g. Apple's iPod®) revolution has increased significantly the overall consumption of data provider resources.

What are needed are methods and apparatus to overcome these and related deficiencies of the prior art. The same or similar problems may exist in other networks and devices.

c. Combination of Known Methods/Techniques/Elements Yields Predictable Results

Generally, motivation to combine any of the references with other references exists within the references themselves, as well as within the knowledge of those of ordinary skill in the art at the relevant time. Many of the identified references address the same technical issues and suggest similar solutions in the field of management of resource usage, media sessions, and network connections across multiple flows of data traffic. For example:

- Bennett at [0004]: In one exemplary embodiment, the media device may establish concurrent media sessions. One of the concurrent sessions is established between the media device and a remote device for sending control commands from the remote device to the media device. The other concurrent session is used to transmit media to or from the media device. The second media session may be established with the remote device, or with some other device.
- Vadde at [0009]: Referring to the figures, embodiments of the disclosure enable data budgets to be invoked per application 110. In some embodiments, data traffic is monitored per application 110 along with attributes 112 such as time of day, location, type of network interface, and amount of data during an interval (e.g., month). Sample network interface types include cellular, wireless fidelity (WiFi), and the like. Usage patterns are developed that form the basis of policies 114 that are used to restrict data traffic per application 110 over specific networks, locations, times, and the like. The policies 114 may also be used to reduce battery usage, mobile operator charges, and/or processor usage by restricting data traffic. Further, aspects of the disclosure enable users 104 to save money on their monthly network operator bill (e.g., wireless bill).
- Riggs at 1:49-2:5: Embodiments disclosed herein can significantly overcome such deficiencies and/or other deficiencies in the prior art. For example, embodiments herein provide a media player that records events such as occurrence of playback commands and related playback information so that a respective publisher can be apprised of commands that are applied to content during playback. This enables the publisher to identify corresponding portions of such content that are most appealing to a viewer.

According to general embodiments, a media player initiates playback of content (e.g., a movie in a web browser). The media player receives selection of one or more playback commands (e.g., play, pause, fast forward, rewind, etc.) to be applied to the content being played back by the media player. For example, a user can generate such commands based on input to a keyboard, computer mouse, etc. Based on the selection, the media player creates a log report. The log report records the selections of the playback command and indicates additional playback information such as a corresponding time when the commands were applied. According to one configuration, the media player (or function associated with the media player) initiates distribution of the log report to notify a

publisher of playback information associated with the content played back on the media player.

- Rybak 575 at [0003]-[0004]: In one embodiment, the present disclosure is directed to a method for monitoring resource usage of a mobile communications device comprising the steps of acquiring a mobile communication plan profile associated with a subscriber, the plan profile including at least a value representing a limit of mobile communication resource usage within a specified calendar period; acquiring resource consumption data relative to the specified calendar period; calculating usage statistics based on the resource consumption data and the plan profile; and presenting the usage statistics to an entity.

In another embodiment, the present disclosure is directed to a mobile communications device comprising at least one storage area for containing a mobile communication service plan profile associated with a subscriber, the mobile communication service plan profile including at least a value representing a limit of mobile communication resource usage within a specified period; at least one storage area for containing resource consumption data relative to the specified period; and a wireless resource usage control module for calculating usage statistics based on the resource consumption data and the service plan profile.

- Rakoshitz at 2:56-3:15: In an alternative specific embodiment, the present invention provides a novel computer network system having a real-time bandwidth-profiling tool. The real-time bandwidth-profiling tool has a graphical user interface on a monitor. The graphical user interface includes at least a first portion and a second portion. The first portion displays a graphical chart representing the flow of information. The second portion displays text information describing the flow of information. The combination of the first portion and the second portion describe the information being profiled.

In still an alternative embodiment, the present invention provides a novel bandwidth-profiling tool. The present bandwidth profiling tool includes a variety of computer codes to form computer software or a computer program, which is stored in computer memory. The program includes a first code that is directed to measuring a data rate for a flow of information from an incoming source, which is coupled to a network of computers. The program also has a second code that is directed to categorizing the data rate from the flow of information based upon at least one of a plurality of traffic classes and a third code that is directed to outputting a visual representation of the data rate in graphical form on a display. A fourth code is used to direct the outputting of a text representation of the one of the plurality of traffic classes on the display. The present invention has a variety of other codes to perform the methods described herein, and outside the present specification.

- Hendrickson at 5:7-38: Yet another aspect of the invention comprises a method of gathering information concerning wireless mobile device usage. The method involves prescribing a panel of respective users of respective mobile wireless devices in which each respective mobile device includes electronic memory encoded with data gathering software and data transfer software. The data gathering software gathers information pertaining to device usage. The gathered information includes event data in association with respective location information indicative of device location during the occurrences

of such events. The data transfer software provides the gathered information for transmission. The method also includes collecting the gathered information provided by respective mobile devices of said panel of users.

A further aspect of the invention involves a system for collecting information by at least one control center concerning wireless mobile device usage. The system includes respective electronic memories of respective mobile devices of panelists of a panel comprised of respective mobile device users. The respective electronic memories are encoded with computer software for gathering data and for transferring the gathered data. The data gathering software gathers information pertaining to device usage. The gathered information includes event data in association with respective location information indicative of device location during the occurrences of such events. The data transfer software provides the gathered information for transmission. The system also includes electronic storage media encoded with computer software to control collection by the at least one control center of respective gathered information respectively provided by respective mobile devices of said panel of users.

- Srikantan at [0008], [0019]-[0020]: In this embodiment, one file track is generated to store the metadata of a single media track. For a media program comprising multiple tracks, a separate file track is generated for each track. For each client stream of the media, separate file track handles are established. Each file track handle acts as an interface between its client stream—different client streams may be at different time indices within the media—and the single instance of media metadata.

In one embodiment of the invention a media or data streaming server is configured to stream media or data to multiple clients. A media program or event that is to be streamed to multiple clients includes one or more tracks (e.g., audio, video), each of which may be stored in one or more media files. When a first request for the media program is received, the track's metadata is retrieved and stored in a file track. The metadata may include information regarding: timing (e.g., to synchronize the track's media with other program tracks), locations of media segments or samples (or other units of media) within a media file, hierarchies of media units (e.g., chunks, samples that comprise a chunk), edit tables, etc.

For each client to which the media track is to be streamed, separate file track handles are established to reference metadata within the file track. Thus, instead of storing separate copies of the track metadata for each client stream, each client's file track handle references (e.g., with pointers) the single file track to retrieve timing location, locate media segments in a media file, etc. Further, each file track handle is allocated a file descriptor into the track's media files, for seeking and retrieving media.

- Sharif-Ahmadi at [0042]-[0043]: The system and method according to the invention comprises a software platform that provides mixed mobile data traffic management over wired, wireless, or mixed networks. The system and method addresses the diverse requirements of different data types and their behaviour over different wireless networks, each network having different characteristics and changing network status. A mobile device is incorporated as part of the overall network instead of treated as an independent entity outside the network. In the prior art, the mobile node (i.e. the mobile device) is an

independent entity, disjoint from the network, blind to the types of network(s) available, and blind to the different types of data it is communicating with other networked devices. The present invention provides a comprehensive software solution that incorporates the mobile node as part of the network, enabling it to be an active participant within the network, and enabling it to manage and negotiate specific data needs with the network components.

The system and method according to the invention makes the mobile device aware of the network situation and application types and therefore their requirements; and also is aware of network policies at any given time, and therefore can make efficient decisions. The necessary “intelligence” is available so that there is no need to alter “any” application, the mobile device's Operating System (OS) code structure, or hardware. The solution is such that the network works with or without the system according to the invention (but the network is more efficient with such system) and other mobile devices not using the system can operate within the network. This is accomplished by adding the capability to the mobile device's OS to intercept system calls and alter the calls without initiator and destination involvement.

- Deu-Ngoc at 2:34-61: Methods and apparatus for prioritizing assignment of a packet data session for a plurality of applications of a mobile communication device, especially in wireless networks that limit the number of simultaneous packet data sessions available to the mobile device, are disclosed herein. The plurality of applications include at least a first (priority) application operative in connection with a first (priority) communication service and a second application operative in connection with a second communication service. The first (priority) service may be or include a “push” type data or message synchronization service. The mobile device causes a packet data session associated with the first (priority) application to be activated for accessing the first (priority) service. In response to identifying an indication of a request for information via the second application, the mobile device causes the packet data session associated with the first (priority) application to be deactivated, and causes a packet data session associated with the second application to be activated for accessing the second service. Subsequently, in response to identifying communication inactivity associated with the second application over a predetermined time period, the mobile device causes the packet data session associated with the second application to be deactivated, and causes a packet data session associated with the first (priority) application to be activated again with the wireless network for again accessing the first (priority) service. Thus, “pushed” information associated with the data or message synchronization service may be received without fail despite the use of other applications in the mobile device.
- Cole 458 at [0036]: The mobile device 110 implements a connection manager 260 (e.g., a software application) that manages the various communication interfaces 225 to determine which connections should be active at any given time. In general, the connection manager 260 evaluates availability, bandwidth, user preferences, application requirements, mobile device resources, etc. to select a particular communication interface 225. The connection manager 260 interfaces with the operating system 227 and/or device drivers to enable or disable various communication interfaces 225 to establish connectivity.

- Michels at [0006]-[0007]: One problem with current approaches to distributing APIs, including web-based APIs, is that there are no adequate mechanisms that enable the API provider to control, regulate, and/or monitor API distribution or application development based on their APIs.

The invention, in various embodiments, is directed to systems, methods, and/or devices that allow for a proxy (application or server) to operate as an intermediary between the program calling the API and the API itself which enables monitoring and control of access to the API. By monitoring and controlling developer access to the API, usage of the API can be more fairly distributed among developers, developer profiles of usage may be tracked and/or analyzed, and/or usage-based billing models may be employed.

- Chiu at 2:38-47: Because of the concurrent nature of web page access (i.e., activities may be performed in parallel), it is useful to group the activities in logical associations (as another activity). In this manner, for example, all activities relating to a particular GIF image access (i.e., socket connection time, server response time, actual GIF content delivery time, amount of data delivered, overhead data used, etc.) can be grouped, viewed and analyzed together despite the fact that there can be significant overlap with other logical associations, such as other image retrievals or server name resolutions.
- Elgamal at 1:38-2:2: In spite of the great strides that have been made in network security, there still is a need for further improvement. For example, with the proliferation of heterogeneous network environments in which different host computers use different operating system platforms, there is an increasing need for a security mechanism that is platform independent. Moreover, with the increasing sophistication and variety of application programs that seek access to a wide range of information over networks, there is an increasing need for a security mechanism that can work with many different types of applications that request a wide variety of different types of information from a wide variety of different types of server applications. Furthermore, as security becomes more important and the volume of confidential network transactions expands, it becomes increasingly important to ensure that security can be achieved efficiently, with minimal time and effort. The present invention meets these needs.

In one aspect, the invention provides a sockets application program interface bound to a security protocol which is layered between an application layer and transport layer. The socket interface is widely used in network environments. This facilitates integration of the invention into a wide range of host machines connected to a network. Placing the security protocol between the application layer and the transport layer enables many different types of application programs to employ the new security with only slight modification. Moreover, the security protocol can communicate with many different operating system platforms without requiring operating system changes.

d. Additional Motivations to Combine

In addition to the exemplary motivations, suggestions, or reasons to combine described above, Defendant identifies additional motivations to combine in the sections below. The exemplary motivations, suggestions, or reasons to combine described above and below are not

exclusive or exhaustive. Defendant may identify further examples as the case proceeds. In addition, Defendant provides additional reasons to combine various disclosures below.

(1) Network Traffic Management

The independent claims of the '918 Patent recite management of data traffic on a network. To the extent that Headwater contends that any of the references identified above does not disclose management of data traffic on a network, a person of ordinary skill in the art would have arrived at the purported invention based on their own background knowledge and/or one or more of the prior art references identified below.

- Bennett at [0017]: The mobile communication network 10 comprises a radio access network (RAN) 20, a core network (CN) 30, and an IP Multimedia Subsystem (IMS) 40. The RAN 20 supports radio communications with mobile terminals 100 over an air interface. A mobile terminal 100 is a networked communication device as that term is used herein. The mobile communication network 10 typically includes more than one RAN 20 though only one is shown in FIG. 1. The CN 30 provides a connection to the Internet 12 or other packet data network (PDN) for packet switched services such as web browsing and email, and may provide a connection to the Public Switched Telephone Network (PSTN) 14 and/or the Integrated Digital Services Network (ISDN) 16 for circuit-switched services such as voice and fax services. The CN 30 may, for example, comprise a General Packet Radio Services (GPRS) network, cdma2000 network or UMTS network. The CN 30 includes an access gateway 32 for interconnecting with the IMS 40. The access gateway 32 may comprise a GPRS Gateway Serving Node (GGSN) for GPRS networks or a Packet Data Serving Node (PDSN) for cdma2000 networks. The IMS 40 provides access independent, IP-based multi-media services to mobile terminals 100 and supports a variety of IP services including voice over IP (VoIP), video and audio streaming, email, web browsing, videoconferencing, instant messaging, presence and other services.
- Vadde at [0002], [0043]: Embodiments of the disclosure manage data traffic per application. Data transmitted and/or received by each of a plurality of applications executing on a computing device is monitored. One or more attributes associated with the monitored data are defined for each of the plurality of applications. Usage patterns for each of the plurality of applications are determined based at least on the monitored data and the defined attributes associated therewith. The determined usage patterns are provided to a user of the computing device for evaluation of each of the plurality of applications.

The embodiments illustrated and described herein as well as embodiments not specifically described herein but within the scope of aspects of the invention constitute exemplary means for determining a quantity of data transmitted and/or received by each

of the plurality of applications 110, and exemplary means for defining and applying a policy 114 for managing data traffic per application 110.

- Rybak 575 at [0018]: Additionally, a remote services server 106 may be interfaced with the enterprise network 102 for enabling a corporate user to access or effectuate any of the services from a remote location using a suitable mobile communications device 116. A secure communication link with end-to-end encryption may be established that is mediated through an external IP network, i.e., a public packet-switched network such as the Internet 108, as well as the wireless packet data service network 112 operable with mobile communications device 116 via suitable wireless network infrastructure that includes a base station (BS) 114.
- Rakoshitz at 9:39-62: Tool 208 performs incoming and/or outgoing management of information over the network of computers. In a specific embodiment, traffic management tool 208 performs inbound and outbound monitoring and control of flows by application, source address, destination address, URL, time of day, day of week, day of month, and other variations. In a specific embodiment, tool 208 also monitors, controls, and produces reports and alarms, which can enhance a whole spectrum of traffic monitoring and control activities ranging from bandwidth/latency control to capacity planning.
- Hendrickson at 20:58-21:14: Referring to the illustrative drawing of FIG. 15, there is shown a generalized example of computer software control flow of data gathering associated with a function call (or event) involving a user request for network accessible information in accordance with a presently preferred embodiment of the invention. A main computer program process 1400 shown in FIG. 15 is analogous to processes 1200 and 1300 in FIGS. B and C, respectively. The main process 1400 runs on a wireless device (not shown), and the exact nature of the process 1400 is unimportant to this example. At some point in the execution of the process 1400, an operating system call is made to a function which gathers network accessible information. In this example, the network is the internet, and the information is designated by a uniform resource locator (URL). The function of retrieving the information designated by the URL is performed by a native facility of the wireless device such as a native device library module. For example, the illustrative main process code 1400 in the example in FIG. 15 includes the hypothetical expression “Get[identify some URL]” which directs the process 1400 to call native device library 1402 which includes a computer program code process running on the device which serves to retrieve the network accessible information designated by the identified URL.
- Sharif-Ahmadi at [0002]: This invention relates to systems and methods of managing data traffic over networks, and more particularly to systems and methods for addressing the diverse requirements of different data types and their behaviour over different types of wired and wireless networks, each such network having different characteristics and changing network status.

A person of ordinary skill in the art would have been motivated to incorporate management of data traffic on a network because of reduced chance a rogue application causes problems with a

network, elimination of concerns about configuration and deployment issues, and/or enabling a mobile device to be an active participant within the network and to manage and negotiate specific data needs with the network components, among other benefits. For example, Bennett discusses reduced chance a rogue application causes problems with a network and elimination of concerns about configuration and deployment issues. Bennett at [0075]. Sharif-Ahmadi discusses enabling a mobile device to be an active participant within the network and to manage and negotiate specific data needs with the network components. Sharif-Ahmadi at [0041].

(2) Media Object Requests

The independent claims of the '918 Patent recite data transfer requests for media objects. To the extent that Headwater contends that any of the references identified above does not disclose data transfer requests for media objects, a person of ordinary skill in the art would have arrived at the purported invention based on their own background knowledge and/or one or more of the prior art references identified below.

- Bennett at [0025]: FIG. 3 illustrates the basic architecture of the media client 200. The media client 200 comprises a user agent (UA) 202, a signaling agent (SA) 204, and a media agent (MA 206) 206. The UA 202 communicates with the user application 150 and translates application commands into appropriate signaling and media operations. The SA 204 and MA 206 operate under the control and direction of the UA 202. The UA 202 has overall control over connection management, and delegates signaling and media management tasks to the SA 204 and MA 206, respectively. In the illustrated embodiment, the SA 204 implements SIP and SDP protocols to handle signaling tasks. The SA 204 uses UDP over IP for transport of messages. Other session control protocols, such as H.323 could also be used. The signaling tasks include setting up, modifying, and tearing down communication sessions, negotiating session parameters, interrogating remote devices to determine capabilities, and presence detection. The MA 206 implements the message session relay protocol (MSRP) and the Real-Time Transport Protocol (RTP) and includes one or more media players to process and output media to media rendering devices. The MA 206 manages media connections, routes media according to media type and user settings, and invokes media players to process media as required. The MA 206 uses TCP and/or UDP over IP for transport of RTP and MSRP messages.
- Vadde at [0013]: The memory area 108 stores, among other data, one or more applications 110. The applications 110, when executed by the processor 106, operate to

perform functionality on the computing device 102. Exemplary applications 110 include mail application programs, web browsers, calendar application programs, address book application programs, messaging programs, media applications, location-based services, search programs, and the like. The applications 110 may communicate with counterpart applications or services such as web services accessible via a network. For example, the applications 110 may represent downloaded client-side applications that correspond to server-side services executing in a cloud.

- Riggs at 1:25-35: To request media content such as digital video, audio, or some other sampled content from a server, a corresponding client typically provides the global address of the content in the form of a Uniform Resource Locator (URL). After receiving a request for content, a respective server then accesses the content and sends or “streams” it to the client as a continuous data stream that is played back by the client as the stream is received. Alternatively, the client can render the content for viewing by the user (e.g., via a media player application) upon completion of the receiving the content data from the server to the client.
- Rakoshitz at 14:61-67: Streaming multimedia applications, such as Real Audio/Video and Vxtreme, can hog a lot of bandwidth but are also delay and bandwidth sensitive. If they are not critical, they are controlled best by setting a high priority and a policy to limit admission of sessions so that bandwidth use is capped but admitted sessions have a reasonable quality.
- Sharif-Ahmadi at [0127]: The different classes of service, include the Interactive class of service, which refers to the type of application/traffic which is a request/response oriented and it requires users interaction. An example of this application is Internet Explorer where the request sent and a response received. The Background class of service, refers to the type of applications that it runs in background and does a burst type of transaction. Email is an example of this type of application, as there is no need for the user interaction the email runs in the background and receives the information. A Streaming class of service, refers to the type of application where there is a request for receiving a media, not necessary in real-time, similar to video or audio. Real-time class of service, also referred to as conversational, are the class of services that are very time-sensitive. They typically have a fixed time to live set by industry. As an example a voice over IP packet has only a 250 millisecond acceptable delay, if it received after that the packet will not be processed by the receiver. Examples of this type of application/service are Voice Over IP (VoIP), and video telephony.

A person of ordinary skill in the art would have been motivated to create data transfer requests for media objects because of the ability to utilize services such as Push-to-Talk over Cellular (PoC), presence and Instant Messaging (IM), video and audio streaming, voice over IP, videoconferencing, interactive gaming, white-boarding, and content sharing, among other benefits.

For example, Bennett discusses the ability to utilize services such as Push-to-Talk over Cellular

(PoC), presence and Instant Messaging (IM), video and audio streaming, voice over IP, videoconferencing, interactive gaming, white-boarding, and content sharing. Bennett at [0024].

VI. INVALIDITY UNDER 35 U.S.C. § 112

In addition to and including the grounds of invalidity set forth above, Defendant contends that the Asserted Claims of the Asserted Patents are invalid under 35 U.S.C. § 112 for at least the following reasons.

A. Indefiniteness under 35 U.S.C. § 112

Defendant reserves the right to supplement these contentions to identify specific claims that are invalid for indefiniteness as discovery continues, in response to any amendment Plaintiff may be permitted to make to its infringement contentions, and/or in connection with the claim construction process.

B. Lack of Enablement under 35 U.S.C. § 112

The Asserted Claims of the Asserted Patents are invalid because they are not enabled as required by 35 U.S.C. § 112. *See* pre-AIA 35 U.S.C. § 112(1) (“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.”); AIA § 112(a) (same). *See AK Steel Corp. v. Sollac*, 344 F.3d 1234, 1244 (Fed. Cir. 2003) (“The enablement requirement is satisfied when one skilled in the art, after reading the specification, could practice the claimed invention without undue experimentation.”) (*citing In re Wands*, 858 F.2d 731, 736–37 (Fed. Cir. 1988)). Because the Asserted Patents do not disclose sufficient information to enable a person having ordinary skill in the field of the alleged invention(s) to make and use the full scope of the alleged invention(s), as set forth in the claims, at the time of filing without undue experimentation, the Asserted Claims are invalid for lack of enablement.

In particular, at least the following terms or phrases (alone, either in their entirety or in part, in combination, and/or in context) are not enabled. To the extent other Asserted Claims contain one or more of these terms or phrases, either directly or through depending from a claim that does, those Asserted Claims are also invalid under 35 U.S.C. § 112.

1. '364 Patent

'364 Patent	
Claim	Term(s) or Phrase(s)
1, 6, 9, 10, 11, 24	"first service policy"
1	"first service policy associated with the first wireless network"
1, 4, 5, 7	"at least assisting in reducing data usage"
1	"the first service policy for enabling control of the first service activity on the first wireless network that is different from how the first service activity is controlled on the second wireless network"
1, 6, 13, 21, 23	"one or more agents"
1	"the one or more agents including an application interface agent"
1	"at least assisting in applying the first service policy"
1	"communicating with a software component"
1	"a software component associated with the first service activity"
1	"obtain a user input specifying at least an aspect of the first service policy"
1	"identify an intended, attempted, or successful data communication over the first wireless network"
1	"the intended, attempted, or successful data communication being associated with the first service activity"
2	"application program"
3	"at least assisting in arranging a setting of the software component"
3	"a setting of the software component to control an aspect of an e-mail transfer, a media content resolution, or a media compression level"
4	"causing an application level control associated with the software component"
5	"causing an application level service monitoring or reporting associated with the software component"

'364 Patent	
Claim	Term(s) or Phrase(s)
6	"policy control agent"
6, 8	"one or more low-level policy agents"
6	"obtain at least a portion of the first service policy"
6	"obtain information about the first service activity"
6	"determine a low-level policy rule or setting for at least one of the one or more low-level policy agents"
6	"a low-level policy rule or setting"
6	"the low-level policy rule or setting for assisting in applying the first service policy"
7	"causing an application level traffic shaping associated with the software component"
7	"application level traffic shaping"
7, 11, 14, 16, 19, 20, 27	"traffic shaping"
8	"application interface agent, a policy implementation agent, a service monitor agent, or a combination of these"
9	"obtain a usage measure associated with the first service activity"
9	"present, through the user interface, the usage measure or information associated with the usage measure"
10	"determine that a service usage pattern has occurred or that a service usage amount associated with the first service activity satisfies a condition relative to a threshold"
11	"identify a data flow, the data flow comprising one or more related data transfers between the software component and a network communication end point"
11	"apply an access control or traffic shaping to the data flow by operating on the data flow at one or more points in a device communication stack"
11, 14, 16, 19, 20	"apply an access control or traffic shaping to the data flow"
11	"device communication stack"
12	"assign a virtual or literal tag to the data flow"
12	"preserve an association of the data flow with the first service activity after one or more formatting, processing, or encryption functions operate on the data flow"

'364 Patent	
Claim	Term(s) or Phrase(s)
14, 15, 19	“block[ing] the data flow”
15	“allowing the data flow”
17	“information associated with the first service activity”
19	“delay, defer, throttle, or block the data flow”
20	“direct the data flow to a particular network end point, route, or tunnel”
22	“particular amount or a limit”
23	“acknowledgment of the particular condition associated with the first service activity”
24	“dependent on a network type, a roaming network connection condition, a wireless fidelity (WiFi) network condition, a background download condition, a user designation that the first service activity is non-critical, a geographic location, or a combination of these”
25, 26	“blocking the first service activity”
26	“allowing the first service activity”
28	“delaying the first service activity”
29	“first service activity is associated with an application on the wireless device, a network communication end point accessible to the wireless device, a traffic type, a content type, a download, an upload, or a combination of these”
30	“delaying, deferring, throttling, or blocking the first service activity”

2. '918 Patent

'918 Patent	
Claim	Term(s) or Phrase(s)
1, 15, 19	“configurable to receive and transmit data”
1, 14	“at least one first call accessible to each of a plurality of device applications”
1, 14	“callable by each of the plurality of device applications”
1	“open and use data packet flows via the network stack, the wireless modem, and the at least one wireless network”
1	“data packet flows”

'918 Patent	
Claim	Term(s) or Phrase(s)
1, 14	“at least one second call accessible to each of the plurality of device applications”
1, 14	“to make a data transfer request for a media object associated with a network resource identifier supplied by the calling device application”
1, 2, 3, 4, 8, 10, 11, 13, 14, 15, 19	“data transfer request”
1, 2, 3, 4, 8, 9, 10, 13, 14, 15, 19	“media object”
1, 14, 15, 19	“media service manager prompted by the second call”
1, 15, 19	“manage network data transfers for the media object by interfacing with the network stack to retrieve the media object associated with the network resource identifier via the wireless modem and the wireless network”
1, 5, 7, 11, 13	“one or more service classification and measurement agents”
1, 15, 19	“associate wireless network data usage for the media object network data transfers with the device application that requests the data transfer for the media object”
1	“associate wireless network data usage for respective data packet flows opened and used via the first network stack API with the device application opening such respective data packet flow”
1	“reconcile wireless network data usage for each of the plurality of device applications to track an aggregate wireless network data usage attributable to each of the plurality of device applications via both the first network stack API and the second API”
2	“identify at least one of an application name, an application identifier, or a process identifier for the application that makes the data transfer request”
2, 4, 15, 19	“process identifier”
2, 4	“associate wireless network data usage for the media object network data transfers with the device application that makes the data transfer request for the media object”
3, 15, 19	“a proxy to the source of the data to be transferred”
4	“store an entry comprising the at least one of the application name, the application identifier, or the process identifier for each of the device applications that makes a data transfer request”

'918 Patent	
Claim	Term(s) or Phrase(s)
4	"each stored entry further comprising information about the corresponding network resource identifier for the data transfer request"
5, 6, 7, 16, 17, 18	"requesting application storing function"
6, 17	"first requesting application storing function"
6, 17	"second media service manager of a different type than the first media service manager"
6, 15, 16, 17, 19	"service classification agent"
6, 17	"second requesting application storing function"
7, 18	"usage and classification database"
7, 18	"application association information stored by the first and second requesting application storing functions"
7, 18	"maintain the usage and classification database based in part on the received application association information"
8, 19	"manage network data transfers for the media object by interfacing with the at least one network stack"
8, 19	"map the data transfer request and network resource identifier to one or more data flow connections communicated through the device network[ing] stack"
8, 19	"data flow connections"
9	"media data"
9	"media data that is, as a result of the media service manager management of network data transfers for the media object"
10	"media object handle descriptor"
10	"call a proxy service to perform one or more network data transfers comprising the media object"
10	"accept, from the application, commands associated with the media object handle descriptor"
10	"control playback of the media data by the media player based on the commands"
11	"a requesting application storage agent to...store application identification information and network resource identification information"

'918 Patent	
Claim	Term(s) or Phrase(s)
11	"a network data flow storage agent to, for each network data flow associated with the media service manager, identify network data flow identification information"
11	"an association agent to match the network data flow identification information for a network data flow with application identification information for the network data transfer associated with the network data flow"
13	"associate one or more traffic flows"
13	"an enforcement agent to, based on the association between the one or more traffic flows and the device application, enforce an application-based usage control on network data usage by one or more of the device applications"
13	"application-based usage control"
14	"open and use data flows via a network stack coupled to the wireless modem"
14	"managing network data transfers for the media object by interfacing with the network stack to retrieve the media object associated with the network resource identifier via the wireless modem and the wireless network"
14	"associating wireless network data usage for the media object network data transfers with the device application that requests the data transfer for the media object"
14	"associating wireless network data usage for respective data packet flows opened and used via the first network stack API with the device application opening such respective data packet flow"
14	"reconciling wireless network data usage for each of the plurality of device applications to track an aggregate wireless network data usage attributable to each of the plurality of device applications via both the first network stack API and the second API"
15, 19	"open and use data flows via the network stack"
15, 19	"at least one first call to allow device applications to open and use data flows via the network stack, the wireless modem, and the at least one wireless network"
15, 19	"at least one second call to allow device applications to make a data transfer request for a media object associated with a network resource identifier supplied by the device application"

'918 Patent	
Claim	Term(s) or Phrase(s)
15	“to associate data usage for the media object network data transfers with the device application that makes the data transfer request for the media object comprises to identify and store at least one of an application name, an application identifier, or a process identifier for the application that makes the data transfer request, each stored entry further comprising information about the corresponding network resource identifier for the data transfer request”
18	“a usage and classification reconciliation agent”
19	“to associate data usage for the media object network data transfers with the device application that makes the data transfer request for the media object comprises to identify at least one of an application name, an application identifier, or a process identifier for the application that makes the data transfer request”

Defendant reserves the right to supplement these contentions to identify specific claims that are invalid for lack of enablement as discovery continues, in response to any amendment Plaintiff may be permitted to make to its infringement contentions, and/or after claim construction.

C. Lack of Written Description under 35 U.S.C. § 112

The Asserted Claims of the Asserted Patents are invalid because they fail to meet the written description requirement of 35 U.S.C. § 112. *See* 35 U.S.C. § 112(6) (“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”); AIA § 112(a) (same). “Specifically, the description must ‘clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed. . . . In other words, the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.’” *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (citing *Vas-*

Cath Inc. v. Mahurkar, 935 F.2d 1555, 1563 (Fed. Cir. 1991)) (internal citations omitted); *id.* at 1349 (“Although many original claims will satisfy the written description requirement, certain claims may not. For example, a generic claim may define the boundaries of a vast genus of chemical compounds, and yet the question may still remain whether the specification, including original claim language, demonstrates that the applicant has invented species sufficient to support a claim to a genus. The problem is especially acute with genus claims that use functional language to define the boundaries of a claimed genus. In such a case, the functional claim may simply claim a desired result, and may do so without describing species that achieve that result. But the specification must demonstrate that the applicant has made a generic invention that achieves the claimed result and do so by showing that the applicant has invented species sufficient to support a claim to the functionally-defined genus.”). Because the Asserted Patents does not describe the limitations or combination of limitations of the Asserted Claims in sufficient detail that a person of ordinary skill in the art would recognize that the inventor possessed the full scope of the alleged invention(s) at the time of filing, the Asserted Claims do not meet the written description requirement.

In particular, at least the following terms or phrases are not sufficiently described. To the extent other Asserted Claims contain one of these terms or phrases, either directly or through being dependent on a claim that does, those Asserted Claims are also invalid under 35 U.S.C. § 112.

1. '364 Patent

'364 Patent	
Claim	Term(s) or Phrase(s)
1, 6, 9, 10, 11, 24	“first service policy”
1	“first service policy associated with the first wireless network”

'364 Patent	
Claim	Term(s) or Phrase(s)
1, 4, 5, 7	“at least assisting in reducing data usage”
1	“the first service policy for enabling control of the first service activity on the first wireless network that is different from how the first service activity is controlled on the second wireless network”
1, 6, 13, 21, 23	“one or more agents”
1	“the one or more agents including an application interface agent”
1	“at least assisting in applying the first service policy”
1	“communicating with a software component”
1	“a software component associated with the first service activity”
1	“obtain a user input specifying at least an aspect of the first service policy”
1	“identify an intended, attempted, or successful data communication over the first wireless network”
1	“the intended, attempted, or successful data communication being associated with the first service activity”
2	“application program”
3	“at least assisting in arranging a setting of the software component”
3	“a setting of the software component to control an aspect of an e-mail transfer, a media content resolution, or a media compression level”
4	“causing an application level control associated with the software component”
5	“causing an application level service monitoring or reporting associated with the software component”
6	“policy control agent”
6, 8	“one or more low-level policy agents”
6	“obtain at least a portion of the first service policy”
6	“obtain information about the first service activity”
6	“determine a low-level policy rule or setting for at least one of the one or more low-level policy agents”
6	“a low-level policy rule or setting”
6	“the low-level policy rule or setting for assisting in applying the first service policy”

'364 Patent	
Claim	Term(s) or Phrase(s)
7	“causing an application level traffic shaping associated with the software component”
7	“application level traffic shaping”
7, 11, 14, 16, 19, 20, 27	“traffic shaping”
8	“application interface agent, a policy implementation agent, a service monitor agent, or a combination of these”
9	“obtain a usage measure associated with the first service activity”
9	“present, through the user interface, the usage measure or information associated with the usage measure”
10	“determine that a service usage pattern has occurred or that a service usage amount associated with the first service activity satisfies a condition relative to a threshold”
11	“identify a data flow, the data flow comprising one or more related data transfers between the software component and a network communication end point”
11	“apply an access control or traffic shaping to the data flow by operating on the data flow at one or more points in a device communication stack”
11, 14, 16, 19, 20	“apply an access control or traffic shaping to the data flow”
11	“device communication stack”
12	“assign a virtual or literal tag to the data flow”
12	“preserve an association of the data flow with the first service activity after one or more formatting, processing, or encryption functions operate on the data flow”
14, 15, 19	“block[ing] the data flow”
15	“allowing the data flow”
17	“information associated with the first service activity”
19	“delay, defer, throttle, or block the data flow”
20	“direct the data flow to a particular network end point, route, or tunnel”
22	“particular amount or a limit”
23	“acknowledgment of the particular condition associated with the first service activity”

'364 Patent	
Claim	Term(s) or Phrase(s)
24	“dependent on a network type, a roaming network connection condition, a wireless fidelity (WiFi) network condition, a background download condition, a user designation that the first service activity is non-critical, a geographic location, or a combination of these”
25, 26	“blocking the first service activity”
26	“allowing the first service activity”
28	“delaying the first service activity”
29	“first service activity is associated with an application on the wireless device, a network communication end point accessible to the wireless device, a traffic type, a content type, a download, an upload, or a combination of these”
30	“delaying, deferring, throttling, or blocking the first service activity”

2. '918 Patent

'918 Patent	
Claim	Term(s) or Phrase(s)
1, 15, 19	“configurable to receive and transmit data”
1, 14	“at least one first call accessible to each of a plurality of device applications”
1, 14	“callable by each of the plurality of device applications”
1	“open and use data packet flows via the network stack, the wireless modem, and the at least one wireless network”
1	“data packet flows”
1, 14	“at least one second call accessible to each of the plurality of device applications”
1, 14	“to make a data transfer request for a media object associated with a network resource identifier supplied by the calling device application”
1, 2, 3, 4, 8, 10, 11, 13, 14, 15, 19	“data transfer request”
1, 2, 3, 4, 8, 9, 10, 13, 14, 15, 19	“media object”
1, 14, 15, 19	“media service manager prompted by the second call”

'918 Patent	
Claim	Term(s) or Phrase(s)
1, 15, 19	“manage network data transfers for the media object by interfacing with the network stack to retrieve the media object associated with the network resource identifier via the wireless modem and the wireless network”
1, 5, 7, 11, 13	“one or more service classification and measurement agents”
1, 15, 19	“associate wireless network data usage for the media object network data transfers with the device application that requests the data transfer for the media object”
1	“associate wireless network data usage for respective data packet flows opened and used via the first network stack API with the device application opening such respective data packet flow”
1	“reconcile wireless network data usage for each of the plurality of device applications to track an aggregate wireless network data usage attributable to each of the plurality of device applications via both the first network stack API and the second API”
2	“identify at least one of an application name, an application identifier, or a process identifier for the application that makes the data transfer request”
2, 4, 15, 19	“process identifier”
2, 4	“associate wireless network data usage for the media object network data transfers with the device application that makes the data transfer request for the media object”
3, 15, 19	“a proxy to the source of the data to be transferred”
4	“store an entry comprising the at least one of the application name, the application identifier, or the process identifier for each of the device applications that makes a data transfer request”
4	“each stored entry further comprising information about the corresponding network resource identifier for the data transfer request”
5, 6, 7, 16, 17, 18	“requesting application storing function”
6, 17	“first requesting application storing function”
6, 17	“second media service manager of a different type than the first media service manager”
6, 15, 16, 17, 19	“service classification agent”
6, 17	“second requesting application storing function”

'918 Patent	
Claim	Term(s) or Phrase(s)
7, 18	“usage and classification database”
7, 18	“application association information stored by the first and second requesting application storing functions”
7, 18	“maintain the usage and classification database based in part on the received application association information”
8, 19	“manage network data transfers for the media object by interfacing with the at least one network stack”
8, 19	“map the data transfer request and network resource identifier to one or more data flow connections communicated through the device network[ing] stack”
8, 19	“data flow connections”
9	“media data”
9	“media data that is, as a result of the media service manager management of network data transfers for the media object”
10	“media object handle descriptor”
10	“call a proxy service to perform one or more network data transfers comprising the media object”
10	“accept, from the application, commands associated with the media object handle descriptor”
10	“control playback of the media data by the media player based on the commands”
11	“a requesting application storage agent to...store application identification information and network resource identification information”
11	“a network data flow storage agent to, for each network data flow associated with the media service manager, identify network data flow identification information”
11	“an association agent to match the network data flow identification information for a network data flow with application identification information for the network data transfer associated with the network data flow”
13	“associate one or more traffic flows”
13	“an enforcement agent to, based on the association between the one or more traffic flows and the device application, enforce an

'918 Patent	
Claim	Term(s) or Phrase(s)
	application-based usage control on network data usage by one or more of the device applications”
13	“application-based usage control”
14	“open and use data flows via a network stack coupled to the wireless modem”
14	“managing network data transfers for the media object by interfacing with the network stack to retrieve the media object associated with the network resource identifier via the wireless modem and the wireless network”
14	“associating wireless network data usage for the media object network data transfers with the device application that requests the data transfer for the media object”
14	“associating wireless network data usage for respective data packet flows opened and used via the first network stack API with the device application opening such respective data packet flow”
14	“reconciling wireless network data usage for each of the plurality of device applications to track an aggregate wireless network data usage attributable to each of the plurality of device applications via both the first network stack API and the second API”
15, 19	“open and use data flows via the network stack”
15, 19	“at least one first call to allow device applications to open and use data flows via the network stack, the wireless modem, and the at least one wireless network”
15, 19	“at least one second call to allow device applications to make a data transfer request for a media object associated with a network resource identifier supplied by the device application”
15	“to associate data usage for the media object network data transfers with the device application that makes the data transfer request for the media object comprises to identify and store at least one of an application name, an application identifier, or a process identifier for the application that makes the data transfer request, each stored entry further comprising information about the corresponding network resource identifier for the data transfer request”
18	“a usage and classification reconciliation agent”
19	“to associate data usage for the media object network data transfers with the device application that makes the data transfer request for the media object comprises to identify at least one of an application

'918 Patent	
Claim	Term(s) or Phrase(s)
	name, an application identifier, or a process identifier for the application that makes the data transfer request”

Defendant reserves the right to supplement these contentions to identify specific claims that are invalid for lack of written description as discovery continues, in response to any amendment Plaintiff may be permitted to make to its infringement contentions, and/or after claim construction.

VII. SUBJECT MATTER ELIGIBILITY CONTENTIONS - LACK OF PATENT ELIGIBILITY UNDER 35 U.S.C. § 101

Pursuant to OGP 4.4, Defendant’s subject matter eligibility contentions are set forth below and in the attached Exhibits C-01–C-02, D-01–D-02. Defendant incorporates by reference the discussion of the state of the art, set forth in Section II *supra*, the identification of prior art, set forth in Section III, *supra*, as well as the Exhibits attached hereto. Defendant intends to rely on those materials in challenging the subject-matter eligibility of the Asserted Claims, and may rely on additional information identified or learned during this case, including through discovery. These contentions are subject to revision and amendment pursuant to Federal Rule of Civil Procedure 26(e) to the extent appropriate in light of further investigation and discovery, any amendment Plaintiff may be permitted to make to its Infringement Contentions, the Court’s construction of the Asserted Claims, the positions taken during expert discovery, and/or any future prosecution history for the Asserted Claims or claims in related patents (including, but not limited to, during *inter partes* review, *ex parte* reexamination, or post-grant review of any claims).

Defendant’s subject matter eligibility contentions are made in the alternative, and should not be interpreted, relied upon, or in any way affect the non-infringement or other invalidity

arguments Defendant has asserted. Defendant does not infringe any of the Asserted Claims, which are also invalid under 35 U.S.C. §§ 102, 103, and/or 112. Further, these subject matter eligibility contentions are based on Plaintiff's infringement theories disclosed in its Infringement Contentions. To the extent that Defendant asserts prior art versions of its own accused products or their accused features and components as a factual basis and evidence under § 101, including of the industry at the relevant time or certain claim elements, Defendant doing so is not an admission that its products infringe any of the Asserted Claims.

Defendant's subject matter eligibility contentions include citations to representative and exemplary disclosures in the prior art identifying how each element of the Asserted Claims, both individually and in combination with the other elements, was well understood, routine, and conventional in the relevant industry at the relevant time. These citations provide notice regarding Defendant's subject matter eligibility contentions and are not intended to marshal all evidence regarding subject matter eligibility. Accordingly, Defendant may not cite every disclosure of a claim element in the prior art, and its disclosures regarding how the elements were well understood, routine, and conventional are exemplary only. Defendant reserves the right to rely on additional and similar disclosures within the references, including un-cited portions, and other evidence related to the cited disclosures, as well as to provide further explanation. Defendant further reserves the right to rely on additional, similar, or other disclosures that may become applicable in light of any claim constructions, changes in Plaintiff's infringement theories, information obtained during discovery, positions taken during expert discovery, and/or any future prosecution history for the Asserted Claims or claims in related patents. Defendant further reserves the right to present expert evidence and testimony in further support of these subject matter eligibility contentions or to otherwise demonstrate the Asserted

Claims are invalid under 35 U.S.C. § 101, including evidence and information of any and all bases for each exception to eligibility, including why the Asserted Claims are directed to an abstract idea, as well as a description of the industry at the relevant time and what was well understood, routine, and conventional in the industry.

Defendant contends that the Asserted Claims are invalid under 35 U.S.C. § 101 (pre-AIA and AIA) because they are directed to abstract ideas and do not contain an inventive concept sufficient to transform the abstract idea into a patent-eligible invention. *See Alice Corp. Pty. Ltd. v. CLS Bank Intern.*, 573 U.S. 208 (U.S. 2014). Judicial precedent has “long held that [§ 101] contains an important implicit exception” in that “[l]aws of nature, natural phenomena, and abstract ideas are not patentable.” *Id.* at 216.

35 U.S.C. § 101 lists four broad categories of patent-eligible subject matter but is subject to “an important implicit exception” that “[l]aws of nature, natural phenomena, and abstract ideas,” which form the “basic tools of scientific and technological work,” are not eligible for patent protection. *Id.* (internal quotation marks omitted). “The ‘abstract ideas’ category embodies ‘the longstanding rule that an idea of itself is not patentable.’” *Id.* at 218 (quoting *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) (quoting *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. 498 (1874))).

Alice set forth a two-step inquiry. “First, we determine whether the claims at issue are directed to one of those patent-ineligible concepts.” *Id.* at 217. In making this inquiry, the claims “must be considered as a whole.” *Alice*, 573 U.S. at 218 n.3 (quoting *Diamond v. Diehr*, 450 U.S. 175, 188 (1981)). If the claims recite an abstract idea, the second step requires a “search for an ‘inventive concept’— an element or combination of elements that is ‘sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.’” *Id.* at 217-218 (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S.

66, 73 (2016)). “A claim that recites an abstract idea must include ‘additional features’ to ensure ‘that the claim is more than a drafting effort designed to monopolize the abstract idea.’” *Id.* at 221 (quoting *Mayo*, 566 U.S. at 78) (alterations omitted).

The recited “additional features must be more than well-understood, routine, conventional activity.” *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 1335, 1339 (Fed. Cir. 2013) (internal quotations omitted). Rather, it must be “sufficient to ensure that the patent in practice amounts to *significantly* more than a patent upon the [ineligible concept] itself.” *ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 765 (Fed. Cir. 2019) (emphasis added) (quoting *Alice*, 573 U.S. at 217–18), *cert. denied*, 140 S. Ct. 983 (2020). “‘Simply appending conventional steps, specified at a high level of generality,’ [is] not ‘enough’ to supply an ‘inventive concept.’” *Alice*, 573 U.S. at 222; *see also Mayo*, 566 U.S. at 82. For example, “mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention,” because “[g]iven the ubiquity of computers . . . wholly generic computer implementation is not generally the sort of ‘additional feature’ that provides any ‘practical assurance that the process is more than a drafting effort designed to monopolize the abstract idea itself.’” *Alice*, 573 U.S. at 223-24. It is also not enough to “limit[] an abstract idea to one field of use,” or add “token postsolution components,” *Bilski v. Kappos*, 561 U.S. 593, 610-12 (Fed. Cir. 2010), or “limit the use of the idea to a particular technological environment,” *Alice*, 573 U.S. at 223. The Asserted Claims fail both steps of the *Alice* analytical framework and thus are patent-ineligible.

Representative claims may be used for the *Alice* analysis when the claims are “substantially similar and linked to the same abstract idea.” *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat’l Ass’n*, 776 F.3d 1343, 1348 (Fed. Cir. 2014); *Smart Sys. Innovations, LLC v. Chicago Transit Auth.*, 873 F.3d 1364, 1368 n.7 (Fed. Cir. 2017)

(concluding that claims “should rise or fall together” when they “contain only minor differences in terminology but require performance of the same basic process”) (internal quotation omitted). “[T]he representativeness inquiry must be ‘directly tethered to the claim language.’” *Id.* at *11 (quoting *Solutran, Inc. v. Elavon, Inc.*, 931 F.3d 1161, 1168 (Fed. Cir. 2019)). For purposes of subject matter eligibility, Claim 1 of each Asserted Patent is representative of all other Asserted Claims of each respective patent because each is directed to one or more of the patent-ineligible abstract ideas of applying rules, collecting and analyzing information, manipulation and reorganization of data, network communication for device interaction, flow classification and manipulation, and providing restricted access to resources, and further recites only generic computer components and functional, result-oriented limitations. *See* Ex. C-01, D-01 [“Exceptions” exhibits]. The remaining Asserted Claims are substantially similar because they each try to encompass one or more of the same abstract ideas and do so using substantially similar functional limitations and generic computer components to those recited in Claim 1 of each respective Asserted Patent.⁴ *See id.*; *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat’l Ass’n*, 776 F.3d 1343, 1348 (Fed. Cir. 2014). In short, these claims exhibit no

⁴ Moreover, there are at least three “substantial rationale[s]” for treating claim 1 as representative of the remaining claims. *PPS Data, LLC v. Jack Henry & Assocs., Inc.*, 404 F. Supp. 3d 1021, 1030 (E.D. Tex. 2019). First, the remaining claims, which depend from independent claim 1, are not legally distinctive because they merely limit independent claim 1 “to a particular field of use or technological environment,” which is inadequate to confer eligibility. *Intell. Ventures I LLC v. Cap. One Bank (USA)*, 792 F.3d 1363, 1366 (Fed. Cir. 2015). Second, the limitations recited in the remaining claims suffer from defects that are common across all claims. By way of non-limiting example, the Asserted Claims recite “result-focused” limitations; the claims all recite limitations “specified at a high level of generality;” and the limitations all fail to “do more than simply state the [abstract idea] while adding the words ‘apply it.’” *Am. Axle & Mfg., Inc. v. Neapco Holdings LLC*, 967 F.3d 1285, 1296 (Fed. Cir. 2020). Third, Plaintiff’s Infringement Contentions equate the inventive features of all claims in a single, collective allegation. *See, e.g.*, Ex. A to Plaintiff’s Infringement Contentions (relying on the same evidence cited with respect to the independent claim for all remaining dependent claims).

“meaningful difference” because they disclose “performance of the same basic process” with only immaterial variations. *Accenture Glob. Servs. v. Guidewire Software, Inc.*, 728 F.3d 1336, 1344 (Fed. Cir. 2013) (finding that because the claims contain only “minor differences in terminology [but] require performance of the same basic process,” they should rise or fall together). Should Plaintiff contend that any Asserted Claims are not represented by the representative claim, as Defendant identified above, Defendant reserves the right to supplement or amend these Subject Matter Ineligibility Contentions (including the attached exhibits) in response.

As set forth in Exhibits C-01–C-02, D-01–D-02, each of the Asserted Claims is directed to an abstract idea, not any technological invention or improvement, and does not recite additional elements or other inventive concepts that amount to more than these abstract ideas. Instead, the claims recite generic, conventional, and insignificant post-solution activity and elements that are not meaningful enough to render the patent claims eligible. They merely implement abstract ideas and human-performed steps in conventional computer technology, and without any significant post-solution activity or improvement in the performance and operation of the computer system itself. “[I]nvocations of computers and networks that are not even arguably inventive are insufficient to pass the test of an inventive concept in the application of an abstract idea.” *SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1170 (Fed. Cir. 2018) (quoting *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1355 (Fed. Cir. 2016)). Moreover, the specifications of the Asserted Patents do not “suggest that the invention involved overcoming some sort of technical difficulty” for any element or step. *ChargePoint*, 920 F.3d at 768.

Exhibit C-02, D-02 [“Descriptions” exhibit] attached hereto provides a description of the industry, at the relevant time, in which the Asserted Claims are alleged to be well understood,

routine, and conventional, as well as a description of how each element of each Asserted Claim, both individually and in combination with the other elements of that claim, was well understood routine, and/or conventional, in the relevant industry at the relevant time, including the legal and factual basis therefor. Exhibit C-01, D-01 [“Exceptions” exhibit] attached hereto identifies the exception to eligibility to which each Asserted Claim is directed and the factual and legal basis therefor. The limitations of the Asserted Claims, individually or as an ordered combination, do not provide an inventive concept; neither the claims nor the specifications of the Asserted Patents provide for implementing the abstract idea using anything other than conventional technology. Aside from the abstract idea, the Asserted Claims include only well-understood, routine, and conventional components and steps. The Asserted Claims do not improve any aspect of technology, as they recite nothing more than using generic known components to perform well-known functions. The well-understood, routine, and conventional nature of the components and steps of the Asserted Claims are demonstrated by the discussion of the state of the art, set forth in Section II, *supra*, in Exhibits C-01–C-02, D-01–D-02 attached hereto, and the identification of prior art and prior art itself, set forth in Section III, *supra*, including the charts attached to this document. The Asserted Claims fail to provide any sort of inventive concept that would transform the abstract ideas to which they are directed into patent eligible inventions. *See Accenture Global Serv., GMBH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1344-46 (Fed. Cir. 2013) (finding that recitations of a “data component,” “data cache,” “insurance transaction database,” a “task library,” a “client component,” a “server component,” and an “event processor” did not confer patent eligibility to claims directed to the abstract concept of “generating tasks to be performed in an insurance organization”); *see also Nuance*, 2018 WL 6584129, at *7 (“Moreover, the claims of the ’946 patent identify only generic computer

components, and the specification emphasizes the generic nature of the computer components required to implement the invention. [] “In this regard, computers are invoked as a tool in claim 1 of the ’946 patent, with no identification of a specific improvement in the capability of the claimed computing devices.”); *MyMedicalRecords, Inc. v. Walgreen Co.*, No. 2:13-CV-00631-ODW SH, 2014 WL 7339201, at *3 (C.D. Cal. Dec. 23, 2014) (“routine, conventional functions of a computer and server” held insufficient to confer patent eligibility to the abstract idea of records management and access).

Likewise, implementing these generic computer-based components over a computer and/or telecommunications network is an abstract and non-inventive concept. *See Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1348 (Fed. Cir. 2016) (“[a]n abstract idea on ‘an Internet computer network’ or on a generic computer is still an abstract idea”); *Two-Way Media Ltd. v. Comcast Cable Commc’ns, LLC*, 874 F.3d 1329, 133-38 (Fed. Cir. 2017) (“[c]laims directed to generalized steps to be performed on a computer using conventional computer activity are not patent eligible”); *Customedia Techs., LLC v. Dish Network Corp.*, 951 F.3d 1359, 1366 (Fed. Cir. 2020) (finding that receiver units are a generic computer component); *In re TLI Commc’ns LLC Pat. Litig.*, 823 F.3d 607, 614 (Fed. Cir. 2016) (same as to interfaces); *see also MyMedicalRecords*, 2014 WL 7339201, at *3. The same holds true for the additional features found in dependent claim elements. *See, e.g., Mortg. Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314 (Fed. Cir. 2016) (interface that prompted a borrower to enter personal loan evaluation information “could be the human broker taking the information by hand and calculating the credit grading by hand or by looking at a table”).

The Asserted Patents and their specifications generically claim computer components. Yet, they lack any meaningful technical explanation for the claimed benefit of the alleged

invention *at an inventive level*. See, e.g., *Enco Systems, Inc. v. DaVincia, LLC.*, 447 F. Supp. 3d 916, 923 (E.D. Mo. 2020), *aff'd sub nom.*, 845 F. App'x 953 (Fed. Cir. 2021), *cert. denied*, 142 S. Ct. 435 (2021). Accordingly, the Asserted Claims fail to supply an inventive concept (either individually or in combination with other elements of the claims) because they amount to nothing more than limiting an abstract idea to a particular technological environment or adding token post-solution components that are wholly conventional, routine, and well-understood.

Exhibits C-01–C-02, D-01–D-02 attached hereto further detail Defendant’s factual and legal bases for their Subject Matter Ineligibility Contentions.

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the above document was served on March 4, 2026 to all counsel of record via electronic mail.

/s/ Robert W. Unikel
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