11712 U.S.PTO 042505

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PTO/SB/05 (11-00)
Approved for use through 10/31/2002. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. 1.53(b))

Attorney Docket No.	112025-0063D1C2
First Inventor	Silvano Gai et al.
Title	Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm
Express Mail Label No.	EV 432393707 US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Mail Stop Patent Application, Commissioner for Patents, Box 1450, Alexandria, VA 22313-1450

1. ☒ Fee Transmittal Form (e.g., PTO/SB/17) *(Submit an original and a duplicate for fee processing)*
2. ☐ Applicant claims small entity status. See 37 CFR 1.27.
3. ☒ Specification [*Total Pages* 51]
   (preferred arrangement set forth below)
   - Descriptive title of the Invention
   - Cross References to Related Applications
   - Statement Regarding Fed sponsored R & D
   - Reference to sequence listing, a table, or a computer program listing appendix
   - Background of the Invention
   - Brief Summary of the Invention
   - Brief Description of the Drawings *(if filed)*
   - Detailed Description
   - Claim(s)
   - Abstract of the Disclosure
4. ☒ Drawing(s) (*35 U.S.C.113*) [*Total Sheets* 16]
5. Oath or Declaration [*Total Pages* 2]
   a. ☐ Newly executed (original or copy)
   b. ☒ Copy from a prior application (37 CFR 1.63 (d))
   (for a continuation/divisional with Box 18 completed)
   i. ☐ DELETION OF INVENTOR(S)
   Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☐ Application Data Sheet. See 37 CFR 1.76
7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program *(Appendix)*
8. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
   a. ☐ Computer Readable Form (CRF)
   b. Specification Sequence Listing on:
      i. ☐ CD-ROM or CD-R (2 copies); or
      ii. ☐ paper
   c. ☐ Statements verifying identity of above copies

113007 U.S.PTO 11/113600 042505

ACCOMPANYING APPLICATIONS PARTS

9. ☐ Assignment Papers (cover sheet & document(s))
10. ☐ 37 C.F.R.§3.73(b) Statement ☐ Power of Attorney *(when there is an assignee)*
11. ☐ English Translation Document *(if applicable)*
12. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
13. ☒ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*
15. ☐ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
16. ☒ Nonpublication Request under 35 U.S.C. 122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.
17. ☐ Other: _____

18. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:*

☒ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No: 10 / 259,959

Prior application information: *Examiner* Prieto, B *Group / Art Unit:* 2142

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

☒ *Customer Number or Bar Code Label* *(Insert C*[illegible] 24267 PATENT TRADEMARK OFFICE [illegible]*el here)* or ☐ *Correspondence address below*

Name	A. Sidney Johnston				
Address	Cesari and McKenna				
	88 Black Falcon Avenue				
City	Boston	*State*	MA	*Zip Code*	02210
Country	U. S. A.	*Telephone*	(617) 951-2500	*Fax*	(617) 951-3927

Name (Print/Type)	A. Sidney Johnston	*Registration No. (Attorney/Agent)*	29,548
Signature	A. Sidney Johnston	*Date*	April 25, 2005

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IPR2024-00505
Cisco Systems, Inc. v. Portsmouth Network Corp.
Cisco's Exhibit 1010
Ex. 1010, Page 1

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Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	($)	4,350

Complete if Known	
Application Number	Not Yet Assigned
Filing Date	April 25, 2005
First Named Inventor	Silvano Gai et al.
Examiner Name	Not Yet Assigned
Art Unit	Not Yet Assigned
Attorney Docket No.	112025-0063D1C2

METHOD OF PAYMENT (check all that apply)

☑ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☑ Deposit Account Deposit Account Number: 03-1237 Deposit Account Name: Cesari and McKenna, LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☑ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	1000
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
39 - 20 or HP =	19	x 50	= 950

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
15 - 3 or HP =	12	x 200	= 2400

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims Fee ($)	Fee Paid ($)

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
- 100 =	/ 50 =	(round up to a whole number)	x	=

4. OTHER FEE(S)

Non-English Specification, $130 fee (no small entity discount) Fees Paid ($) _____

Other (e.g., late filing surcharge): _____ _____

SUBMITTED BY

Signature	A. Sidney Johnston	Registration No. (Attorney/Agent) 29,548	Telephone 617-951-2500
Name (Print/Type)	A. Sidney Johnston		Date April 25, 2005

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: Silvano Gai et al.	)	
Serial No.: Not Yet Assigned	)	Examiner: Not Yet Assigned
Filed: April 25, 2005	)	Art Unit: 2142
For: Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm	)	

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
April 25, 2005

EXPRESS-MAIL DEPOSIT

"Express Mail" Mailing-Label Number: EV 432393707 US

The following papers are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service pursuant to 37 C.F.R. §1.10:

_X_ Patent Application (51 pages including 39 claims)
_X_ Oath or Declaration
_X_ Utility Patent Application Transmittal Letter
_X_ Check No. 30324 for $4350
_X_ Non-Publication Request
_X_ Preliminary Amendment
_X_ Fee Transmittal Letter
_X_ Formal Drawing (8 sheets)
_X_ Informal Drawings (8 Sheets)
_X_ Return Request Postcard
_X_ Formal Drawings Transmittal

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112025-0063D1C2
Seq. # 9803 CPOL# 488685

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Cesari and McKenna, LLP
88 Black Falcon Avenue
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April 25, 2005

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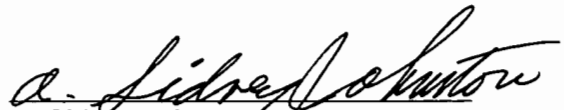
Sir:

FORMAL DRAWING TRANSMITTAL LETTER

If the Examiner in charge of the above-identified application approves, please substitute the enclosed drawing sheets containing formal versions of Figures 1-8 for the corresponding drawing sheets currently in the application.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,



A. Sidney Johnston
Reg. No. 29,548
CESARI AND MCKENNA, LLP
88 Black Falcon Avenue
Boston, MA 02210-2414
(617) 951-2500

Please type a plus sign (+) inside this box → [+]

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(Only for new nonprovisional applications under 37 C.F.R. 1.53(b))

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First Inventor	Silvano Gai et al.
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Express Mail Label No.	EV 432393707 US

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   - Brief Description of the Drawings *(if filed)*
   - Detailed Description
   - Claim(s)
   - Abstract of the Disclosure
4. ☒ Drawing(s) (*35 U.S.C.113*) [*Total Sheets* 16]
5. Oath or Declaration [*Total Pages* 2]
   a. ☐ Newly executed (original or copy)
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   Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☐ Application Data Sheet. See 37 CFR 1.76

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7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program *(Appendix)*
8. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
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113007 U.S.PTO 11/113600 042505

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☒ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No: 10 / 259,959

Prior application information: *Examiner* Prieto, B *Group / Art Unit:* 2142

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17. CORRESPONDENCE ADDRESS

☒ *Customer Number or Bar Code Label* *(Insert C*[illegible] 24267 PATENT TRADEMARK OFFICE *el here)* or ☐ *Correspondence address below*

Name	A. Sidney Johnston				
Address	Cesari and McKenna				
	88 Black Falcon Avenue				
City	Boston	*State*	MA	*Zip Code*	02210
Country	U. S. A.	*Telephone*	(617) 951-2500	*Fax*	(617) 951-3927

Name (Print/Type)	A. Sidney Johnston	*Registration No. (Attorney/Agent)*	29,548
Signature	A. Sidney Johnston	*Date*	April 25, 2005

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FEE TRANSMITTAL For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT	($)	4,350

Complete if Known	
Application Number	Not Yet Assigned
Filing Date	April 25, 2005
First Named Inventor	Silvano Gai et al.
Examiner Name	Not Yet Assigned
Art Unit	Not Yet Assigned
Attorney Docket No.	112025-0063D1C2

METHOD OF PAYMENT (check all that apply)

☑ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☑ Deposit Account Deposit Account Number: 03-1237 Deposit Account Name: Cesari and McKenna, LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☑ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayments

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	1000
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
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Multiple Dependent Claims Fee ($)	Fee Paid ($)

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Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
- 100 =	/ 50 =	(round up to a whole number)	x	=

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge):	

SUBMITTED BY

Signature	A. Sidney Johnston	Registration No. (Attorney/Agent) 29,548	Telephone 617-951-2500
Name (Print/Type)	A. Sidney Johnston		Date April 25, 2005

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: Silvano Gai et al.	)	
Serial No.: Not Yet Assigned	)	Examiner: Not Yet Assigned
Filed: April 25, 2005	)	Art Unit: 2142
For: Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm	)	

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
April 25, 2005

EXPRESS-MAIL DEPOSIT

"Express Mail" Mailing-Label Number: EV 432393707 US

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_X_ Patent Application (51 pages including 39 claims)
_X_ Oath or Declaration
_X_ Utility Patent Application Transmittal Letter
_X_ Check No. 30324 for $4350
_X_ Non-Publication Request
_X_ Preliminary Amendment
_X_ Fee Transmittal Letter
_X_ Formal Drawing (8 sheets)
_X_ Informal Drawings (8 Sheets)
_X_ Return Request Postcard
_X_ Formal Drawings Transmittal

PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Serial No.: Not Yet Assigned	)	Examiner: Not Yet Assigned
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For: Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm	)	Art Unit: 2142

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
April 25, 2005

"Express Mail" Mailing-Label Number: EV 432393707 US

Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

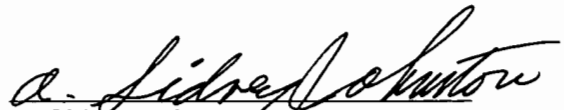
Sir:

FORMAL DRAWING TRANSMITTAL LETTER

If the Examiner in charge of the above-identified application approves, please substitute the enclosed drawing sheets containing formal versions of Figures 1-8 for the corresponding drawing sheets currently in the application.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,



A. Sidney Johnston
Reg. No. 29,548
CESARI AND MCKENNA, LLP
88 Black Falcon Avenue
Boston, MA 02210-2414
(617) 951-2500

UNITED STATES PATENT APPLICATION

of

Silvano Gai,

Keith McCloghrie

and

Dinesh G. Dutt

for

METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS

FIELD OF THE INVENTION

The present invention relates generally to computer networks, and more specifically, to a method and apparatus for rapidly reconfiguring a computer network following a network change.

BACKGROUND OF THE INVENTION

A computer network typically comprises a plurality of interconnected entities. An entity may consist of any device, such as a computer or end station, that "sources" (i.e., transmits) or "sinks" (i.e., receives) data frames. A common type of computer network is a local area network ("LAN") which typically refers to a privately owned network within a single building or campus. LANs typically employ a data communication protocol (LAN standard), such as Ethernet, FDDI or token ring, that defines the functions performed by data link and physical layers of a communications architecture (i.e., a protocol stack). In many instances, several LANs may be interconnected by point-to-point links, microwave transceivers, satellite hook-ups, etc. to form a wide area network ("WAN") or internet that may span an entire country or continent.

One or more intermediate devices are often used to couple LANs together and allow the corresponding entities to exchange information. For example, a switch may be utilized to provide a "switching" function for transferring information, such as data frames, among entities of a computer network. Typically, the switch is a computer and includes a plurality of ports that couple the switch to the other entities. Ports used to couple switches to each other are generally referred to as a trunk ports, whereas ports

used to couple a switch to LANs or end stations are generally referred to as local ports. The switching function includes receiving data at a source port from an entity and transferring that data to at least one destination port for receipt by another entity.

Switches typically learn which destination port to use in order to reach a particular entity by noting on which source port the last message originating from that entity was received. This information is then stored by each switch in a block of memory referred to as a *filtering database*. Thereafter, when a message addressed to a given entity is received on a source port, the switch looks up the entity in its filtering database and identifies the appropriate destination port to utilize in order to reach that entity. If no destination port is identified in the filtering database, the switch floods the message out all ports, except the port on which the message was received. Messages addressed to broadcast or multicast addresses are also flooded.

To prevent the information in the filtering database from becoming stale, each entry is "aged out" by a corresponding timer. Specifically, when an entry is first added to the filtering database, the respective timer is activated. Thereafter, each time the switch receives a subsequent message from this entity on the same source port, it simply resets the timer. Pursuant to standards set forth by the Institute of Electrical and Electronics Engineers (IEEE), the default value of the timer is five minutes. See IEEE Standard 802.1D. Thus, provided the switch receives a message from a particular entity at least every five minutes, the timer will keep being reset and the corresponding entry will not be discarded. If the switch stops receiving messages, the timer will expire and the corresponding entry will be discarded. Once the entry ages out, any

messages subsequently received for this entity must be flooded, until the switch receives another message from the entity and thereby learns the correct destination port.

Additionally, most computer networks include redundant communications paths so that a failure of any given link does not isolate any portion of the network. Such networks are typically referred to as meshed or partially meshed networks. The existence of redundant links, however, may cause the formation of circuitous paths or "loops" within the network. Loops are highly undesirable because data frames may traverse the loops indefinitely. Furthermore, as described above, many devices such as switches or bridges replicate (i.e., flood) frames whose destination port is not known or which are directed to broadcast or multicast addresses, resulting in a proliferation of data frames along loops. The resulting traffic effectively overwhelms the network.

Spanning Tree Algorithm

To avoid the formation of loops, devices, such as switches or bridges, execute a spanning tree algorithm. This algorithm effectively "severs" the redundant links within the network. Specifically, switches exchange special messages called *bridge protocol data unit* (BPDU) frames that allow them to calculate a spanning tree or active topology, which is a subset of the network that is loop-free (i.e., a tree) and yet connects every pair of LANs within the network (i.e., the tree is spanning). Using information contained in the BPDU frames, the switches calculate the tree in accordance with the algorithm and typically elect to sever or block all of the redundant links, leaving a single communications path.

In particular, execution of the spanning tree algorithm causes the switches to elect a single switch, among all the switches within each network, to be the "root" switch. Each switch has a unique numerical identifier (switch ID) and the root is the switch having the lowest switch ID numeric value. In addition, for each LAN coupled to more than one switch, a single "designated switch" is elected that will forward frames from the LAN toward the root. The designated switch is typically the one closest to the root. By establishing designated switches, connectivity to all LANs, where physically possible, is assured.

Each switch within the network also selects one port, known as its "root port" which gives the lowest cost path (e.g., the fewest number of hops, assuming all links have the same cost) from the switch to the root. The root ports and designated switch ports are selected for inclusion in the spanning tree and are placed in a *forwarding* state so that data frames may be forwarded to and from these ports and thus onto the corresponding paths or links. Ports not included within the spanning tree are placed in a *blocked* state. When a port is in the blocked state , data frames will not be forwarded to or received from the port. At the root, all ports are designated ports and are therefore placed in the forwarding state, except for some self-looping ports, if any. A self-looping port is a port coupled to another port at the same switch.

Each BPDU typically includes, in part, the following information: the identifier of the switch assumed to be the root (by the switch transmitting the BPDU), the root path cost to the assumed root and the identifier of the switch transmitting the BPDU. Upon receipt of a BPDU, its contents are examined and compared with similar

information (i.e., assumed root ID, lowest root path cost and switch ID) stored by the receiving switch. If the information from the received BPDU is "better" than the stored information, the switch adopts the better information and begins transmitting it (adding the cost associated with the receiving port to the root path cost) through its ports, except for the port on which the "better" information was received. Eventually, all switches will agree on the root and each will be able to identify which of its ports presents the lowest cost path to the root (i.e., its root port).

Depending on the configuration of a given network, the location of the root can significantly affect the distance that messages must travel. For example, many networks include a plurality of switches designated as *access* switches that provide connectivity to LANs, end stations, etc., and a plurality of *backbone* switches that, in turn, interconnect the various access switches. If the root is located at an access switch and the principal server utilized by the end stations (i.e., clients) is coupled to a backbone switch, the average distance between end stations and the primary server may be quite high, resulting in inefficient network operation. In addition, the backbone switches may become partitioned as ports between them are blocked. To reduce the average distance and avoid partitioning of the backbone switches, it is desirable to locate the root at a backbone switch. Switch IDs, moreover, include a fixed portion and a settable portion. By substantially decreasing the value of the settable portion of the identifier for a selected switch, a network administrator may "force" the network to choose the selected switch as the root.

To identify which switch should be the designated switch, switches again compare information in received BPDUs with their stored information. If the root path cost stored by a first switch is lower than the root path cost contained in BPDUs received from a second switch, then the first switch is the designated switch. If the root path cost for both the first and second switches is the same, the first switch compares the next informational element in the BPDU, i.e., the switch IDs. If the switch ID of the first switch is less than the ID of the second switch, then the first switch is the designated switch, otherwise the second switch is the designated switch.

In accordance with the spanning tree algorithm, the root switch generates and transmits BPDUs from its ports every *hello time* which is a settable parameter. Pursuant to IEEE standards, the default hello time is two seconds. In response to receiving BPDUs, switches transmit their own BPDUs. Thus every two seconds BPDUs are propagated through the network. BPDU information, moreover, like entity address information, is subject to being aged out and discarded. Typically, a timer is associated with the BPDU information stored for each port of a switch. The timer is set to a value referred to as the *maximum age* which is loaded into BPDUs generated by the root switch and copied by the other switches. An example of a default maximum age value is twenty seconds. As BPDUs are received, their contents are examined. If the contents match the information already stored for that port, the timer is reset. Accordingly, by receiving consistent BPDUs every hello time, which is significantly less than the maximum age, the current BPDU information is maintained and the accuracy of the spanning tree or active topology is confirmed.

If a switch stops receiving BPDUs on its root port, indicating a possible link or device failure, the corresponding timer will expire and the information will be discarded. In response, the switch will select a new root port based upon the next best information it has, and begin transmitting BPDUs through its other ports. Similarly, as links or devices are repaired or added, a switch may receive BPDUs containing better information than that stored for a particular port, thereby causing the switch to replace the previously stored information, as described above.

As BPDU information is up-dated and/or timed-out, the spanning tree is recalculated and ports may transition from the blocked state to the forwarding state and vice versa. That is, as a result of new BPDU information, a previously blocked port may learn that it is now the root port or the designated port for a given LAN. Rather than transition directly from the blocked state to the forwarding state, ports transition through two intermediate states: a listening state and a learning state. In the listening state, a port waits for information indicating that it should return to the blocked state. If, by the end of a preset time, no such information is received, the port transitions to the learning state. In the learning state, a port still blocks the receiving and forwarding of frames, but received frames are examined and the corresponding location information is stored, as described above. At the end of a second preset time, the port transitions from the learning state to the forwarding state, thereby allowing frames to be forwarded and received at the port. The time spent in each of the listening and the learning states is referred to as the *forwarding delay*.

As ports transition between the blocked and forwarding states, entities may appear to move from one port to another. To prevent switches from distributing messages based upon incorrect information, switches quickly age-out and discard the "old" information in their filtering databases. More specifically, upon detection of a change in the spanning tree, switches transmit Topology Change Notification Protocol Data Unit (TCN-PDU) frames toward the root. The format of the TCN-PDU frame is well known (see IEEE 802.1D standard) and, thus, will not be described herein. The TCN-PDU is propagated hop-by-hop until it reaches the root which confirms receipt of the TCN-PDU by setting a topology change flag in all BPDUs subsequently transmitted by the root for a period of time. Other switches, receiving these BPDUs, note that the topology change flag has been set, thereby alerting them to the change in the active topology. In response, switches significantly lower the aging time associated with their filtering databases which, as described above, contain destination information corresponding to the entities within the network. Specifically, switches replace the default aging time of five minutes with the forwarding delay time, which is generally fifteen seconds according to the IEEE standards. Information contained in the filtering databases is thus quickly discarded.

Although the spanning tree algorithm is able to maintain a loop-free tree despite network changes, recalculation of the spanning tree is a time consuming process. For example, as described above, the *maximum age* of BPDUs (i.e., the length of time that BPDU information is kept) is typically twenty seconds and the forwarding delay time (i.e., the length of time that ports are to remain in each of the listening and learning

states) is fifteen seconds. As a result, recalculation of the spanning tree following a network change takes approximately fifty seconds (e.g., twenty seconds for BPDU information to time out, fifteen seconds in the listening state and another fifteen seconds in the learning state).

During this recalculation period, message delivery is often delayed as ports transition between states. That is, ports in the listening and learning states do not forward or receive messages. To the network users, these delays are perceived as service interruptions, which may present significant problems, especially on high-reliable networks. In addition, certain applications, protocols or processes may time-out and shut down during the reconfiguration process, resulting in even greater disruption to the system. Another disadvantage relates to subsequent message distribution. Following the reconfiguration process, messages are flooded across the network until the "new" destination ports are learned and the aging time returned to five minutes. Such flooding of messages often consumes substantial communications and processor resources.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a method and apparatus for reducing the time necessary to reconfigure the network following a change, such as a link failure or recovery.

It is a further object of the present invention to provide a method and apparatus for defining a series of back-up ports which may immediately begin forwarding data messages following a failure at an active port.

It is another object of the present invention to provide a method and apparatus for defining primary and back-up root devices such that the back-up becomes the new root upon failure of the primary.

Another object of the present invention is to provide a method and apparatus for balancing message traffic across several links of a computer network.

Yet another object of the present invention is to provide a method and apparatus that is compatible with non-enabled devices.

Briefly, the invention relates to a method and apparatus for rapidly reconfiguring a computer network. The network preferably includes a plurality of devices executing the spanning tree algorithm so as to elect a root and place the ports of the devices in either a forwarding or blocked state. In accordance with the method, one or more devices are configured and arranged so that one trunk port is in the forwarding state and other trunk ports are in the blocked state. Additionally, one or more of the blocked ports are designated as back-up ports. Upon detection of a failure at the active forwarding port, the state of one of the back-up ports immediately transitions from blocked to forwarding, thereby becoming the new active port for the device. Advantageously, the selected back-up port does not transition through any intermediary states (such as the listening or learning states) in moving from blocked to forwarding. Accordingly, the time required to transition to a new active port capable of forwarding data messages is substantially reduced.

Upon transition to the new forwarding port, the device begins transmitting "dummy" multicast messages through the new port. These dummy multicast messages

carry the source address of each entity that is directly coupled to the device with the new active port or downstream thereof (relative to the root) and are received by other devices in the computer network. Upon receipt, the other devices examine the contents of these messages and note the port on which they were received, which may differ from the port on which messages from these entities were previously received (i.e., before the failure and subsequent replacement of the device's active port). It is through this process that other devices within the network learn to utilize the new forwarding port, rather than the failed port, when directing messages to these entities. Notably, the transition to a new forwarding port is accomplished without other devices having to discard the contents of their filtering databases and, thus, the flooding of messages following a network change is substantially reduced.

In the illustrated embodiment, the method and apparatus manifests, in part, as a series of novel commands that may be entered at the devices. The devices, moreover, may be classified as either *access* switches or *backbone* switches. Access switches are preferably coupled to entities (e.g., LANs, end stations, etc.) whereas backbone switches provide the interconnections between access switches. A first command, Become_Root_Primary, is preferably entered at a first backbone switch and significantly lowers the value of the first backbone switch's numeric ID, thereby forcing it to become the root upon execution of the spanning tree algorithm. This command also modifies certain parameters associated with the spanning tree algorithm to further reduce reconfiguration time. A second command, Become_Root_Secondary, preferably entered at a second backbone switch, adjusts the second backbone switch's

ID to a value between a default value and the value specified in the Become_Root_Primary command. The Become_Root_Secondary command thus causes the second backbone switch to become the new root upon a failure of the first backbone switch.

A third command, Enable_Uplinkfast, is preferably entered at each access switch. This command substantially increases the values of access switches' IDs, effectively precluding any access switch from becoming the root. This command also increases the path costs associated with each port of the access switches. By raising the path costs, access switches are less likely to become designated switches. As a result, only one trunk port (i.e., the root port) for each access switch is generally placed in the forwarding state. The remaining trunk ports which normally connect the access switch to the corresponding backbone switches are blocked.

The Enable_Uplinkfast command also designates the blocked trunk ports of the corresponding access switch, except self-looping ports, as possible back-up root ports. Upon failure of the current root port, this command additionally configures the access switch to immediately transition one of its blocked trunk ports to the forwarding state and to also begin transmitting dummy multicast messages through the new port, as mentioned above. Upon detection of a new or repaired link or device representing a better path toward the root, this command additionally configures the access switch to transition to the new path without suffering a loss of connectivity. Reconfiguration of the network may thus be accomplished substantially sooner than the time required by the conventional spanning tree algorithm while still avoiding the formation of loops.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and further advantages of the invention may be better understood by referring to the following description in conjunction with the accompanying drawings, in which:

Fig. 1 is a highly schematic diagram of a computer network in accordance with the present invention;

Fig. 2 is a partial block diagram of a device in accordance with a preferred embodiment of the present invention;

Figs. 3A-E are flow diagrams of methods used to rapidly reconfigure the computer network; and

Fig. 4 is a block diagram of a dummy multicast message in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Fig. 1 illustrates a partially meshed computer network 100 in accordance with the present invention. The network 100 preferably comprises a plurality of local area networks (LANs) 102-109 each of which is coupled to one or more access switches 114-116. Access switches 114-116 are interconnected with each other through a plurality of backbone switches 120-125. Specifically, access switches 114-116 are generally connected to the backbone switches 120-125 through a series of links 128, such as point-to-point links, although they may be connected via a shared media (e.g., LAN 109). The backbone switches 120-125 are similarly interconnected by links 128. Each access switch 114-116 and backbone switch 120-125, moreover, includes a

plurality of ports which, if coupled to a LAN 102-109, are referred to as local ports 118 and if coupled to links 128 are referred to as trunk ports 119.

Network 100 further includes a plurality of servers 112a-112c, such as file servers, print servers, etc., each coupled to the local port 118 of one or more access or backbone switches. Each LAN 102-109 includes one or more hosts or end stations (not shown) that may source or sink data frames to one another or to the servers 112a-112c over the network 100. One or more routers 130 and 131 may also be provided to add functionality to network 100. Preferably, each router 130, 131 is coupled to a backbone switch, such as backbone switches 120 and 121, by a corresponding link 128.

Links 128 represent communications paths between various components of the network 100, that carry messages, such as data frames, between switches 114-116, 120-125 and routers 130, 131. In addition, each switch and router, such as access switch 114, identifies its local and trunk ports 118 and 119 by numbers (e.g., port number one, port number two, port number three, etc.) Switches 114-116, 120-125 and routers 130, 131 are thus able to associate specific ports with the LANs, switches, routers, servers, etc. that are coupled thereto or otherwise accessible through a given port.

It should be understood that the network 100 of Fig. 1 is meant for illustrative purposes only and that the present invention will operate with other network designs having possibly far more complex topologies. For example, one or more distribution switches may be interleaved between the backbone switches and the access switches, two access switches may be directly connected, etc. It will also be understood to those skilled in the art that there is no distinction from the spanning tree point of view

between local and trunk ports or point-to-point links and shared links (e.g., LANs). The distinction between local and trunk ports is made for purposes of explanation only.

As shown, network 100 includes redundant communication paths interconnecting the access and backbone switches 114-116 and 120-125. The existence of such redundant links prevents portions of the network 100 from becoming isolated should any constituent link or device fail. Such redundancy, however, also results in the creation of loops, which, as described above, are highly undesirable. To avoid the creation of loops, these switches execute the spanning tree algorithm, as described herein.

Fig. 2 is a partial block diagram of a switch 214 in accordance with the present invention which corresponds to access switch 114 of Fig. 1. A switch suitable for use with the present invention is described in commonly owned U.S. Patent Application Serial No. 08/623,142 filed March 28, 1996 and entitled INTERSWITCH LINK MECHANISM FOR CONNECTING HIGH-PERFORMANCE NETWORK SWITCHES which is hereby incorporated by reference in its entirety. Switch 214 includes a plurality of ports 230 each of which is preferably identified by a number (e.g., port numbers one through eight). Frame transmission and reception objects (not shown) may be associated with each port 230 such that frames received at a given port 230 may be captured, and frames to be transmitted by switch 214 may be delivered to a given port. Frame reception and transmission objects are preferably message storage structures, such as queues.

Switch 214 further includes a protocol entity 232. The protocol entity 232 preferably includes a rapid reconfiguration entity 234, at least one spanning tree state machine engine 236 and a forwarding entity 238. The rapid reconfiguration entity 234 is coupled to a reconfiguration memory 240. Memory 240 includes a plurality of cells 240a-240e for storing the unique numeric switch identifier (ID) corresponding to switch 214, the assigned path cost corresponding to each port 230 and the values corresponding to the hello time, maximum age and forward delay parameters of the spanning tree algorithm. As set forth above, a switch ID includes a fixed portion and a settable portion.

Each spanning tree engine 236 is similarly coupled to a spanning tree table 242 having a plurality of rows and columns. Each row or entry 243 of table 242 is preferably associated with a port 230 of the switch 214. The columns or cells, moreover, include a root ID cell 242a, a root path cost cell 242b and a corresponding timer cell 242c. It should be understood that table 242 may include additional cells.

The forwarding entity 238 is coupled to a filtering database 244 configured to store address information corresponding to the entities of network 100. Specifically, filtering database 244 has a plurality of columns or cells, including a destination address cell, a destination port cell and a corresponding timer cell. Each row or entry in the filtering database 244 preferably corresponds to a particular entity.

It will be understood to those skilled in the art that memory 240 and tables 242 and 244 may be implemented as content addressable memory (CAM) devices and that entities 234 and 238 and state machine engine 236 may comprise registers and

combinational logic configured and arranged to produce sequential logic circuits. In the illustrated embodiment, entities 234 and 238 and state machine engine 236 preferably comprise programmable processing elements containing software programs pertaining to the methods described herein and executable by the processing elements. Other computer readable media may also be used to store and execute the program instructions.

The method and apparatus of the present invention is preferably implemented, in part, through the operation of a plurality of novel commands entered at the various switches of the network 100 (Fig. 1), typically by a user or network administrator.

Fig. 3A is a flow diagram of a Become_Root_Primary command 300 that is preferably entered at a first backbone switch (e.g., backbone switch 120). Selection of the particular backbone switch as the primary root may depend on where the most utilized server, such as server 112b, is located. That is, to reduce the average distance that messages must travel, the Become_Root_Primary command 300 is preferably entered at the backbone switch coupled to the most heavily utilized server, as shown at block 310. In response to the Become_Root_Primary command 300, the rapid reconfiguration entity 234 of the selected backbone switch 120, at block 312, modifies the settable portion of the corresponding switch ID stored at reconfiguration memory 240. In particular, the value of the switch ID is significantly lowered to ensure that the selected backbone switch 120 will be elected the root switch upon execution of the spanning tree algorithm. For example, the switch ID may be reduced from the default value of "32768" specified by the IEEE standards to "8192". In addition, the

Become_Root_Primary command, at block 314, also modifies the hello time, maximum age and forward delay parameters of the spanning tree algorithm as a function of network diameter as set forth in Table 1. Network diameter is defined by the IEEE 802.1D standard as the maximum number of devices between any two points of attachment of end stations and is an argument of the Become_Root_Primary command 300.

Table 1

Network Diameter	2	3	4	5	6	7
hello time	1.0	1.0	1.0	1.0	1.0	1.0
maximum age	6.0	7.0	8.5	10.0	11.5	13.0
forward delay	4.0	4.8	5.8	6.8	7.8	8.8

These values are then stored at memory 240 by reconfiguration entity 234. To implement the Become_Root_Primary command 300, entity 234 may maintain the information of Table 1 in memory, such as memory 240.

In case the first backbone switch 120 should ever fail, a second command is preferably entered to establish a back-up root. Referring to the flow diagram of Fig. 3B, a Become_Root_Secondary command 320 is preferably entered at a second backbone switch (e.g., backbone switch 121), as shown at block 322. The Become_Root_Secondary command 320 similarly modifies the settable portion of the switch ID of the second backbone switch 121 that is stored at the respective reconfiguration memory 240, as shown by block 324. Specifically, the value of the switch ID is modified so as to be between the default IEEE 802.1D value (i.e., "32768") and the value specified by the Become_Root_Primary command 300 (i.e.,

"8192"). For example, the switch ID may be set to "16384". The Become_Root_Secondary command 320 also utilizes network diameter as an argument and modifies the hello time, maximum age and forward delay parameters stored at the respective memory 240 of switch 121 in accordance with Table 1, as reflected by block 326.

It should be understood that other similar commands may be entered to designate third and fourth in line root switches.

Turning next to Fig. 3C, an Enable_Uplinkfast command 330 is preferably entered at each access switch 114-116 within the network 100, as shown at block 332. This command 330, at block 334, preferably increases the respective switch ID of each of the access switches 114-116 to preclude any of the access switches 114-116 from becoming the root. Specifically, the Enable_Uplinkfast command 330 preferably increases the settable portion of the switch ID stored at respective memory 240 from the IEEE default value of "32768" to "49152". At block 336, the Enable_Uplinkfast command 330 also significantly increases the path costs of all the ports of the respective access switch. For example, the path costs stored at memory 240 for each port are preferably increased from the IEEE default value of "10" (for 100 Mbps ports) to "3000". The Enable_Uplinkfast command 330, at block 338, also configures rapid reconfiguration entity 234 to rapidly transition a blocked port to the forwarding state and to generate and transmit dummy multicast messages, as described below.

Upon start-up, the ports 230 of each switch, such as switch 214, are initially placed in the blocked state and spanning tree engine 236 begins formulating and

transmitting bridge protocol data unit (BPDU) frames from each port 230. Presumably, switch 214 has yet to receive any BPDUs; switch 214 thus assumes that it is the root and transmits BPDUs from every port 230 containing its switch ID as the root ID and a root path cost of zero. Spanning tree engine 236 obtains the switch ID and a maximum age value for loading in BPDUs from entity 234 and copies the information contained in transmitted BPDUs into its associated spanning tree table 242.

As BPDUs are received at the ports 230 of switch 214, they are passed to the spanning tree engine 236 and processed. Specifically, engine 236 compares information contained in the received BPDUs with the information stored in table 242. If the information from the received BPDU is better (e.g., a presumed root with a lower ID) than the stored information, engine 236 enters the received information into table 242. Engine 236 also sets the corresponding timer according to the maximum age value in the received BPDU and stops forwarding BPDUs through this port 230. Execution of the spanning tree algorithm will converge with the election of a single root by all of the switches in the network 100.

As discussed above, location of the root may affect the average distance (i.e., the average number of hops) a message travels and/or cause undesirable partitioning of backbone switches. The conventional spanning tree algorithm, however, simply selects the switch having the lowest ID to become the root, regardless of where in the network 100 this switch is located. As a result, an access switch is often elected to be the root, causing messages to travel a much higher average distance than if a backbone switch

had been elected the root for many network configurations, such as partially meshed distributed networks.

Since the numeric switch ID of the first backbone switch 120 is lowered to a value below that of all other switches in the network 100 (through the Become_Root_Primary command 300), first backbone switch 120 is elected the root switch. Thus, all ports of the first backbone switch 120 are placed in the forwarding state. In addition, since the maximum age and forwarding delay parameters are copied by each switch from BPDUs originating from the root through operation of the spanning tree algorithm, the values selected from the Become_Root_Primary command 300 (see Table 1) are effectively propagated to all switches 114-116 and 121-125 within network 100 (Fig. 1).

For all LANs coupled to both an access switch and a backbone switch, operation of the above commands 300, 320, 330 also results in the respective backbone switch becoming the designated switch, rather than the access switch. In particular, by significantly increasing the path costs (e.g., from "10" to "3000") for all ports of the access switches 114-116, the Enable_Uplinkfast command 330 essentially prevents access switches from becoming designated switches on shared media or trunk links when the second switch is a backbone switch. With reference to LAN 109 which is coupled to both access switch 116 and backbone switch 125, for example, only one switch port connected to LAN 109 will be deemed the designated switch port by the spanning tree algorithm. Determination of the designated switch, moreover, depends in part on the path costs at the relevant ports of the two switches coupled to LAN 109.

Since the path costs at access switch 116 have been increased to "3000", whereas the path costs at backbone switch 125 remain at the default value of "100" for ports operating at a data rate of 10 Mb/s or "10" for ports operating at 100 Mb/s, the port at backbone switch 125 coupled to LAN 109 will be deemed the designated switch port and placed in the forwarding state. Furthermore, unless the port at access switch 116 coupled to LAN 109 represents the root port for switch 116, it will be placed in the blocked state.

Significantly, for each access switch 114-116, only one port (local or trunk) that represents a path from the access switch to the root (i.e., provides connectivity to the root through links, shared media, switches, etc.) will be forwarding. All other ports (local or trunk) that represent paths from the access switch to the root will be blocked. In other words, only one port at each access switch 114-116 that provides connectivity to the root will be forwarding.

As messages (i.e., data frames) are subsequently received at the ports 230, they are passed to forwarding entity 238, assuming the respective port 230 is in the forwarding state. The forwarding entity 238 first examines the destination address of the message and performs a look up function at the filtering database 244. Assuming an entry is found and a corresponding destination port (e.g., port number four) is identified, the message is switched out onto this port, assuming this port is in the forwarding state. If no entry is found in the filtering database 244, the message is flooded out all ports 230 in the forwarding state, except the port 230 on which the message was received. The forwarding entity 238 next examines the source address of

the message and performs another look-up at filtering database 244. If no entry is found for the source address, a new entry is formed and the source port (e.g., port number eight) on which the message was received is entered as the destination port in the corresponding port column. In addition, a timer associated with this entry is set to the aging time with which forwarding entity 238 is configured (e.g., five minutes).

Should a change occur in the network 100, such as a failure disabling the link coupled to a root port of an access switch, the affected access switch will be able to rapidly reconfigure the network 100 without the significant interruption or message flooding experienced through conventional operation of the spanning tree algorithm. With reference to switch 114, for example, assume that port number three, which is coupled to backbone switch 122, is the root port for switch 114 and thus in the forwarding state. Pursuant to the Enable_Uplinkfast command 330, port numbers two and four, which also connect switch 114 to the backbone switches (i.e., backbone switches 122 and 124), are in the blocked state. If the link 128 coupled to the port number three at switch 114 fails, either one of these two other ports (i.e., port numbers two or four) will immediately transition to the forwarding state and begin receiving and sending messages.

First, the time taken to detect such a change is substantially reduced by operation of the novel commands of the present invention. In particular, as shown in Fig. 3A and as provided in Table 1, the Become_Root_Primary command 300 at block 314 causes the maximum age value to be significantly lowered from the default value of twenty seconds. For example, if the network diameter is five, the maximum age is

reduced to ten seconds. As described above, this value is loaded into BPDUs originating at the root (i.e., backbone switch 120), causing it to be propagated to and stored by each switch at its respective reconfiguration memory 240. Accordingly, access switches 114-116 and backbone switches 120-125 detect failures much sooner since the corresponding BPDU information times out sooner. To prevent BPDU information from being inadvertently discarded due to the reduction in maximum age values, the hello time is also reduced to one second. This increases the frequency with which the root transmits BPDUs.

Rather than wait for the corresponding BPDU information to time out, a link failure may alternatively be detected by a link integrity test which operates at the physical layer of the protocol stack. The link integrity test typically exchanges test messages across the respective link 128 at a relatively high rate (e.g., every ten milliseconds). Thus, the link integrity test is able to detect a failure much sooner than the spanning tree algorithm, which simply waits for the respective BPDU information to time out and be discarded.

Fig. 3D is a flow diagram of a rapid reconfiguration process 340 following a link failure according to the present invention. In response to the detection of a failure at port number three (the root port), indicated at block 342, rapid reconfiguration entity 234 at switch 214 selects a backup port to become the new root port, as shown at box 344. Rapid reconfiguration entity 234 may use the spanning tree algorithm to select the next root port. That is, the blocked trunk port 119 (e.g., port number four) representing the next lowest root path cost (after the now failed root port) may be

selected as the new forwarding port by entity 234. Self-looping ports, such as port numbers five and six at switch 114 are not considered possible back-up ports, even though at least one of these ports will be in the blocked state, since these ports will not provide connectivity to the root.

It should be understood that other methods may be used to select the new root port. For example, the blocked trunk port having the lowest port number (e.g., port number two) may be selected.

Rapid reconfiguration entity 234, at block 346, then directs the spanning tree state machine engine 236 to immediately transition the selected back-up port (e.g., port number four) to the forwarding state. That is, the spanning tree engine 236 does not transition the selected back-up port between the listening or learning states. Instead, the selected back-up port transitions directly to the forwarding state under the direction of rapid reconfiguration entity 234, and switch 114 immediately begins transmitting and receiving messages through this newly activated trunk port 119 (e.g., port number four).

Since none of the other trunk ports 119 which connect switch 114 to the backbone switches (i.e. to the root) are in the forwarding state no circuitous path or loop will result from the transition directly to the forwarding state. That is, by preventing access switches 114-116 from becoming the root and configuring the access switches 114-116 to block all but one of their ports 118, 119 to the backbone switches (i.e., all but one path to the root), through the operation of the above commands, a back-up port may be safely transitioned directly to the forwarding state. Ports 118, 119

that provide connectivity downstream relative to the root (i.e., to the leaves of the spanning tree) need not be blocked, since they cannot cause loops.

Nonetheless, the transition at access switch 114 from initial root port number three to back-up root port number four may cause entities to appear to "move" relative to other devices. Thus, the identity of the new root port (e.g., port number four) must be propagated to the other devices, such as access switches 115-116 and backbone switches 120-125 to prevent messages from being lost or misdirected. Switch 114, via rapid reconfiguration entity 234, preferably informs the other devices of its new forwarding port by transmitting dummy multicast packets through the new port, as indicated at block 348. Fig. 4 is a highly schematic illustration of a dummy multicast message 400 preferably utilized by rapid reconfiguration entity 234. Dummy multicast message 400 includes a destination address (DA) field 410 and a source address (SA) field 412 that may be compatible with the Media Access Control (MAC) layer of the protocol stack. In the preferred embodiment, dummy multicast message 400 complies with the IEEE 802.3 standard and includes conventional logical link control (LLC) and SubNetwork Access Protocol (SNAP) encapsulation, which are well known to those skilled in the art. Rapid reconfiguration entity 234 preferably loads DA field 410 with a multicast address that causes message 400 to be received by all devices (e.g., access switches 114-116 and backbone switches 120-125) within the network 100.

Next, rapid reconfiguration entity 234 (Fig. 2) loads SA field 412 with the address of an entity directly coupled to switch 114. For example, in a first multicast message 400, entity 234 loads the address of server 112a into the source address field

412. Although multicast message 400 may further include a data field 414, its contents are preferably not asserted by entity 234. Multicast message 400, having the address of server 112a loaded in SA field 412, is then forwarded through the new root port (i.e., port number four) of switch 114. Multicast message 400 is first received at backbone switch 124 which examines its contents. In particular, backbone switch 124 notes that the message is from server 112a, but that it was received on a different source port than switch 124 previously associated with server 112a. That is, prior to the failure at port number three at access switch 114, backbone switch 124 likely associated all entities directly coupled to switch 114 (including server 112a) with its port coupled to backbone switch 121, which, in turn, accessed such entities via backbone switches 120 and 122.

Since the multicast message 400 having the source address of server 112a was received by backbone switch 124 at a new source port, this new location information is entered by backbone switch 124 into its filtering database, replacing the previous information that was stored therein. Thereafter, if backbone switch 124 receives a message intended for server 112a, it will use this new destination port and the message will be received at port number four of switch 114, which is now capable of receiving and forwarding messages. Accordingly, the dummy multicast message 400 effectively apprises backbone switch 124 of the change in forwarding ports that occurred at access switch 114. Backbone switch 124 distributes the multicast message 400 through all of its forwarding ports so that other devices, as necessary, may learn of the new forwarding port (i.e., port number four) at access switch 114.

Rapid reconfiguration entity 234 similarly generates one or more separate multicast messages 400 for each remaining entity directly coupled to access switch 114 (i.e., entities or end stations on LANs 102-104). In each message 400, entity 234 loads SA field 414 with the address of the corresponding entity. Each of these messages are similarly forwarded by access switch 114 through the new forwarding port (i.e., port number four). In addition, entity 234 generates and transmits one or more multicast messages 400 for entities reachable through switch 114 on ports other than its root port. For example, if port number seven at switch 114 were coupled to another access switch, entity 234 would transmit multicast messages 400 carrying the source address of entities directly coupled to this additional access switch as well. Thus, at least one multicast message 400 is generated and transmitted for each entity directly coupled to or downstream of access switch 114 (relative to the root). As set forth above, upon receipt of these multicast messages 400, the other devices within network 100 update their corresponding filtering databases with the new destination ports, as necessary.

In the preferred embodiment, entity 234 is configured to limit the rate at which dummy multicast messages 400 are transmitted to fifteen messages per one hundred milliseconds or less. This limit on message throughput prevents any access switch from consuming a significant portion of the communications resources of the network 100 with the transmission of dummy multicast messages 400.

The present invention also provides for rapid reconfiguration when a new link (or switch), representing a better path the root for a given switch, is added or recovered. In particular, Fig. 3E is a flow diagram of a rapid configuration process

350 corresponding to a link recovery or addition in accordance with the present invention. For example, assume that backbone switch 121 (Fig. 1) is the root and that port number three at access switch 114 is the root port, since the link 128 coupled to port number four (which represents a better path cost to root 121) is failed. If the link 128 coupled to port number four is subsequently recovered, switch 114 will detect the change, as indicated at box 352, through the receipt of BPDUs on this port. The recovery of link 128 may also be detected by the link integrity test, as described above.

As shown at block 354, rapid reconfiguration entity 234 monitors the receipt of messages (e.g., BPDUs) at port number four for a period of time (e.g., thirty seconds) to ensure that the corresponding port at the upstream switch (e.g., backbone switch 124) has transitioned to the forwarding state. In particular, since backbone switch 124 still transitions its ports between the listening and learning intermediary states, entity 234 at switch 114 preferably waits a period equal to twice the forwarding delay before starting the transition process. If entity 234 were to immediately transition to a new port, a loss of connectivity might result as the corresponding upstream port may not be forwarding. While port number four is being monitored, moreover, port number three remains in the forwarding state and messages may continue to be forwarded and received during this time. Next, after allowing all messages queued on the current root port (i.e., port number three) to be sent, rapid reconfiguration entity 234 transitions the current root port to the blocked state, as indicated at block 356. At or about the same instant, rapid reconfiguration entity 234, at box 358, directs the spanning tree state machine engine 236 to transition the recovered port (i.e., port number four) directly

from the blocked state to the forwarding state without transition through the listening or learning intermediary states. Following this transition, switch 114 may immediately begin transmitting and receiving frames, including data messages, from this recovered port.

Next, rapid configuration entity 234 informs the network 100 (Fig. 1) of the new forwarding port, as reflected by block 360. In particular, as described above, entity 234 generates and transmits dummy multicast messages 400 for all entities directly coupled to switch 114 or downstream thereof (relative to the root) through the new forwarding port (i.e., port number four). The transition to a recovered port, which represents a better path to the root, is thus accomplished without the loss of connectivity that otherwise occurs under operation of the conventional spanning tree algorithm. Additionally, the disadvantages caused by the flooding of messages is also avoided.

Since the Enable_Uplinkfast command 330 is preferably not entered at the backbone switches 120-125, these switches do not designate blocked ports as potential back-up ports that may be immediately transitioned to the forwarding state. Nonetheless, through the Become_Root_Primary and Become_Root_Secondary commands 300, 320, the time required to reconfigure the network following a change at a backbone switch is also reduced. First, as described above, these two commands 300, 320 significantly reduce the maximum age value utilized by all switches in the network 100, thereby reducing the time it takes to detect a change. Additionally, the forward delay time is lowered as reflected in Table 1. By reducing the time spent in

the listening and learning states, the speed at which network 100 is reconfigured following a change is substantially improved.

It should be understood that switch 114, in addition to generating and transmitting dummy multicast messages 400 following the detection of a change, may also transmit TCN-PDUs toward the root. As described above, by transmitting TCN-PDUs, switch 114 will cause devices, such as switches 114-116 and 120-125, to shorten the age out time associated with their filtering databases 244. By quickly discarding the contents of their filtering databases 244, the possibility of data messages being misdirected or lost is significantly reduced. Furthermore, the transmission of dummy multicast messages 400, as described above, quickly informs devices of newly activated ports, thereby reducing the flooding that otherwise occurs when the contents of filtering databases 244 are discarded.

The above commands 300, 320, 330 also reduce the disruptions that may occur upon failure of the root. A failure at the root (e.g., backbone switch 120) will suspend the transmission of BPDUs within the network 100. The BPDU information stored at the remaining devices, such as access switches 114-116 and backbone switches 121-123, will then time out, based on the particular maximum age value obtained from Table 1. In response, these devices will begin recalculating the spanning tree for the network 100. Since the Become_Root_Secondary 320 command was entered at backbone switch 121, its corresponding numeric identifier was significantly lowered, causing backbone switch 121 to become the new root. The Become_Root_Secondary command 320 thus ensures that, upon a failure of the primary root (i.e., backbone

switch 120), the next switch elected to be the root will also be a backbone switch. By carefully selecting the second backbone switch 121, the average distance traveled by messages within the network 100 may be optimized and partitioning of backbone switches avoided. BPDUs originating from the new root (e.g., backbone switch 121), moreover, will contain the improved parameters set forth in Table 1, by virtue of the Become_Root_Secondary command 320. Thus, switches 114-116 and 120-125 will be able to rapidly reconfigure the network 100 in the face of changes following the election of the new root (e.g., the backbone switch 121).

Virtual Local Area Networks

A computer network, such as network 100 (Fig. 1), may also be segregated into a series of network groups. For example, U.S. Patent No. 5,394,402, issued on February 28, 1995 to Floyd E. Ross (the "'402 Patent"), which is hereby incorporated by referenced in its entirety, discloses an arrangement that is capable of associating any port of a switch with any particular segregated network group. Specifically, according to the '402 Patent, any number of physical ports of a particular switch may be associated with any number of groups within the switch by using a virtual local area network (VLAN) arrangement that *virtually* associates the port with a particular VLAN designation. More specifically, Ross discloses a switch or hub for a segmented virtual local area network with shared media access that associates VLAN designations with at least one local port and further associates those VLAN designations with messages transmitted from any of the ports to which the VLAN designation has been assigned.

The VLAN designation for each local port is stored in a memory portion of the switch such that every time a message is received by the switch on a local port the VLAN designation of that port is associated with the message. Association is accomplished by a flow processing element which looks up the VLAN designation in a memory based on the local port where the message originated. In addition to the '402 patent, an IEEE standards committee is preparing a standard for Virtual Bridged Local Area Networks. See IEEE Standard 802.1Q (draft).

In many cases, it may be desirable to interconnect a plurality of these switches in order to extend the VLAN associations of ports in the network. Ross, in fact, states that an objective of his VLAN arrangement is to allow all ports and entities of the network having the same VLAN designation to interchange messages by associating a VLAN designation with each message. Thus, those entities having the same VLAN designation function as if they are all part of the same LAN. Message exchanges between parts of the network having different VLAN designations are specifically prevented in order to preserve the boundaries of each VLAN segment. For convenience, each VLAN designation is often associated with a different color, such as red, blue, green, etc.

A separate spanning tree or active topology may be defined for each VLAN designation defined within the network. See Cisco IOS VLAN Services document. That is, a first spanning tree may be associated with the red VLAN designation and a second spanning tree associated with the blue VLAN designation. Thus, a given port

may be in the forwarding state for a first VLAN designation (e.g., red), but blocked for second VLAN designation (e.g., blue).

In a preferred embodiment, the Become_Root_Primary and Become_Root_Secondary commands 300, 320 are associated with one or more VLAN designations. That is, for the red VLAN designation, the Become_Root_Primary command 300 may be entered at backbone switch 120, whereas, for the blue VLAN designation, it may be entered at backbone switch 121. Thus, the root for the spanning tree associated with the red VLAN designation will be at backbone switch 120 and the root for the blue VLAN designation will be at backbone switch 121. By establishing a different root for the various VLAN designations, improved load balancing may be achieved on the network. For example, if the red and blue VLAN designations each generate high message traffic, then, by designating different roots for these VLAN designations, the paths or links followed by messages with the red VLAN designation will be different than the paths or links followed by messages with the blue VLAN designation. Other low-traffic generating VLANs (e.g., yellow and green) may be divided between the two high traffic VLANs. That is, the red and yellow VLAN designations may share backbone switch 120 as their root, while the blue and green VLAN designations may share backbone switch 121 as their root. This provides an even greater measure of load balancing within the network 100.

In particular, the Become_Root_Primary and Become_Root_Secondary commands 330, 320 may include a VLAN list as a second argument in addition to the network diameter. For example, at first backbone switch 120, the

Become_Root_Primary command 300 may be entered with a network diameter of four and a VLAN list identifying the red, yellow, orange and violet VLAN designations as its arguments. At second backbone switch 121, the Become_Root_Primary command 300 may be entered with a network diameter of four and a VLAN list containing the blue, green and magenta VLAN designations as its arguments. In response, switch 120 will become the root for the red, yellow, orange and violet VLAN designations, while switch 121 will become the root for the blue, green and magenta VLAN designations.

Further load balancing may be achieved by having access switches select root ports on a per-VLAN basis. This may be accomplished by modifying the path costs for each trunk port of the access switches on a per-VLAN basis. In particular, the Enable_Uplinkfast command may be modified to adjust the path costs for each trunk port at the respective switch on a per-VLAN basis by adding a port number, VLAN designation and respective path cost string as an argument to the Enable_Uplinkfast command. For example, the Enable_Uplinkfast command 330 may be entered at access switch 114 with the following argument string: port number two, red, 3100; port number two, blue, 3200; port number three, red, 3200; port number three, blue, 3100; port number four, red, 3300; port number four, blue, 3300. Since port number two has the lowest path cost for the red VLAN designation, this port will generally become the root port for the red VLAN. For the blue VLAN designation, port number three has the lowest path cost and thus will become the root port for the blue VLAN. Accordingly, all messages associated with the red VLAN designation will be forwarded and received at port number two and all messages associated with the blue VLAN

designation will be forwarded and received at port number three. By dividing the message streams among different trunk ports 119, improved load balancing may be achieved.

Referring again to Fig. 4, in formulating dummy multicast messages following the detection of a change, access switches 114-116 may append a VLAN tag 416 to message 400. The VLAN tag 416 is preferably loaded with the VLAN designation corresponding to the entity whose address is loaded into SA field 412. Although VLAN tag 416 may be appended to the message 400, as shown, it is preferably inserted after the source address field 412. It will be understood to those skilled in the art that tag 416 may be inserted at other locations.

As switches typically support the creation of up to "1024" different VLAN designations, substantial memory may be needed to store a different path cost for each VLAN per port. In the preferred embodiment, path costs are permitted to take only one of two possible values, one of which is a default value. Accordingly, a "128" byte vector can be utilized per trunk port to represent the path costs for each VLAN designation. That is, each bit of the vector represents one VLAN designation. By parsing each bit, rapid reconfiguration entity 234 can determine the path cost for each VLAN designation. More specifically, if the bit is asserted, then the path cost for the corresponding VLAN designation will be set to the new value (e.g., "3100"). If a bit is not asserted, then the path cost for the corresponding VLAN designation will remain at the default value (e.g., "3000").

The foregoing description has been directed to specific embodiments of this invention. It will be apparent, however, that other variations and modifications may be made to the described embodiments, with the attainment of some or all of their advantages. Therefore, it is the object of the appended claims to cover all such variations and modifications as come within the true spirit and scope of the invention.

What is claimed is:

CLAIMS

1. A method for operating a router, comprising:

executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

selecting a third port as a back-up designated port;

detecting a link failure; and

transitioning, in response to detecting the failure, the designated port into a blocked state and also transitioning the back-up designated port into a forwarding state.

2. The method as in claim 1, further comprising:

transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

3. A method for operating a router, comprising:

executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

selecting a third port as a back-up root port;

detecting a link failure; and

transitioning, in response to detecting the failure, the root port into a blocked state and also transitioning the back-up root port into a forwarding state.

4. The method as in claim 1, further comprising:

transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

5. A method for operating a router, comprising:

executing a spanning tree protocol to select a first router as a root router, and to select a second router as a back-up root router;

detecting a link failure; and

transitioning, in response to detecting the failure, all designated ports of the root router into a blocked state, and also transitioning the back-up router into a root router.

6. The method as in claim 5, further comprising:

transmitting BPDU messages by the new root router to inform devices connected to the network of the identity of the new root router.

7. A method for operating a computer network, comprising:

executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router; and

transmitting a BPDU message at each expiration of a hello timer for maintaining communication along links of the spanning tree, and to enable a router to learn if a link of the spanning tree has failed.

8. The method as in claim 7, further comprising:

detecting at a first port of an individual router a BPDU transmitted by a designated port of the individual router;

setting the first port as a backup port for the designated port.

9. The method as in claim 7, further comprising:

detecting at a first port of an individual router a BPDU transmitted by a root port of the individual router;

setting the first port as a backup port for the root port.

10. A method for operating a computer network, comprising:

issuing a become_root_primary command to a first router;

setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router;

issuing a become_root_secondary command to a second router;

setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;

transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

11. The method as in claim 10, further comprising:

issuing an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port.

12. The method as in claim 10, further comprising:

executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router;

transmitting a BPDU message by each port in forwarding state at each expiration of a hello timer for maintaining communication along links of the spanning tree;

transitioning, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods, the backup designated port to forwarding and transitioning the selected designated port to blocking; and

transitioning, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods, the backup root port to forwarding and transitioning the selected root port to blocking.

13. The method as in claim 10, further comprising:

detecting a BPDU message by a root port of the secondary root router;

transitioning, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router.

14. A router, comprising:

means for executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

means for selecting a third port as a back-up designated port;

means for detecting a link failure; and

means for transitioning, in response to detecting the failure, the designated port into a blocked state and also transitioning the back-up designated port into a forwarding state.

15. The router as in claim 14, further comprising:

means for transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

16. A router, comprising:

means for executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port, the root port for communication with a root router

and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

means for selecting a third port as a back-up root port;

means for detecting a link failure; and

means for transitioning, in response to detecting the failure, the root port into a blocked state and also transitioning the back-up root port into a forwarding state.

17. The router as in claim 16, further comprising:

means for transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

18. A router, comprising:

means for executing a spanning tree protocol to select a first router as a root router, and to select a second router as a back-up root router;

means for detecting a link failure; and

means for transitioning, in response to detecting the failure, all designated ports of the root router into a blocked state, and also transitioning the back-up router into a root router.

19. The router as in claim 18, further comprising:

means for transmitting BPDU messages by the new root router to inform devices connected to the network of the identity of the new root router.

20. A computer network, comprising:

means for executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router; and

means for transmitting a BPDU message at each expiration of a hello timer for maintaining communication along links of the spanning tree, and to enable a router to learn if a link of the spanning tree has failed.

21. The computer network as in claim 20, further comprising:

means for detecting at a first port of an individual router a BPDU transmitted by a designated port of the individual router;

means for setting the first port as a backup port for the designated port.

22. The computer network as in claim 20, further comprising:

means for detecting at a first port of an individual router a BPDU transmitted by a root port of the individual router;

means for setting the first port as a backup port for the root port.

23. A computer network, comprising:

means for issuing a become_root_primary command to a first router;

means for setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router;

means for issuing a become_root_secondary command to a second router;

means for setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;

means for transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

24. The computer network as in claim 23, further comprising:

means for issuing an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port.

25. The computer network as in claim 23, further comprising:

means for executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router;

means for transmitting a BPDU message by each port in forwarding state at each expiration of a hello timer for maintaining communication along links of the spanning tree;

means for transitioning, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods, the backup designated port to forwarding and transitioning the selected designated port to blocking; and

means for transitioning, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods, the backup root port to forwarding and transitioning the selected root port to blocking.

26. The computer network as in claim 23, further comprising:

means for detecting a BPDU message by a root port of the secondary root router;

means for transitioning, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router.

27. A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first port as a root port and to select a second port as a designated port, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

a third port selected as a back-up designated port;

a port to detect a link failure; and

a rapid reconfiguration entity to transition, in response to detecting the failure, the designated port into a blocked state and also to transition the back-up designated port into a forwarding state.

28. The router as in claim 27, further comprising:

the back-up designated port transmitting a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

29. A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first port as a root port and to select a second port as a designated port, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

a third port selected as a back-up root port;

a port to detect a link failure; and

a rapid reconfiguration entity to transition, in response to detecting the failure, the root port into a blocked state and also transitioning the back-up root port into a forwarding state.

30. The router as in claim 29, further comprising:

the back-up root port transmitting BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

31. A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first router as a root router, and to select a second router as a back-up root router;

a port to detect a link failure; and

a rapid reconfiguration entity to transition, in response to detecting the failure, all designated ports of the root router into a blocked state, and also to transition the back-up router into a root router.

32. The router as in claim 31, further comprising:

a port to transmit BPDU messages by the new root router to inform devices connected to the network of the identity of the new root router.

33. A computer network, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router; and

a port to transmit a BPDU message at each expiration of a hello timer for maintaining communication along links of the spanning tree, and to enable a router to learn if a link of the spanning tree has failed.

34. The computer network as in claim 33, further comprising:

a first port of an individual router to detect a BPDU transmitted by a designated port of the individual router;

a rapid reconfiguration entity to set the first port as a backup port for the designated port.

35. The computer network as in claim 33, further comprising:

a first port of an individual router to detect a BPDU transmitted by a root port of the individual router;

a rapid reconfiguration entity to set the first port as a backup port for the root port.

36. A computer network, comprising:

a first port to enter a become_root_primary command to a first router;

a rapid reconfiguration entity to set, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router;

a second port to enter a become_root_secondary command to a second router;

a rapid reconfiguration entity to set, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;

the rapid reconfiguration entity to transition, in response to failure of the first router while serving as the root router, the second router to become the root router.

37. The computer network as in claim 36, further comprising:

a third port to enter an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port.

38. The computer network as in claim 36, further comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router;

each port in forwarding state to transmit a BPDU message at each expiration of a hello timer to maintain communication along links of the spanning tree;

a rapid reconfiguration entity to transition, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods, the backup designated port to forwarding and transitioning the selected designated port to blocking; and

the rapid reconfiguration entity to transition, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods, the backup root port to forwarding and transitioning the selected root port to blocking.

39. The computer network as in claim 36, further comprising:

a root port of the secondary root router to detect a BPDU message;

a rapid reconfiguration entity to transition, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router.

ABSTRACT

A method for operating a computer network includes: a become_root_primary command is issued to a first router to set an ID so that a spanning tree protocol (STP) selects the first router as a primary root router; a become_root_secondary command is issued to a second router to set an ID so that STP selects the second router as a secondary root router; transitioning, in response to failure of the first router, the second router to become the root router. An enable_uplinkfast command is issued to a router, and the router selects a backup designated port for a designated port, and selects a backup root port for a root port. Ports transmit BPDU messages as heartbeat messages, and a failure to detect the BPDU messages results in a backup port assuming the role of a port not detecting the BPDU messages.

Ex. 1010, Page 62

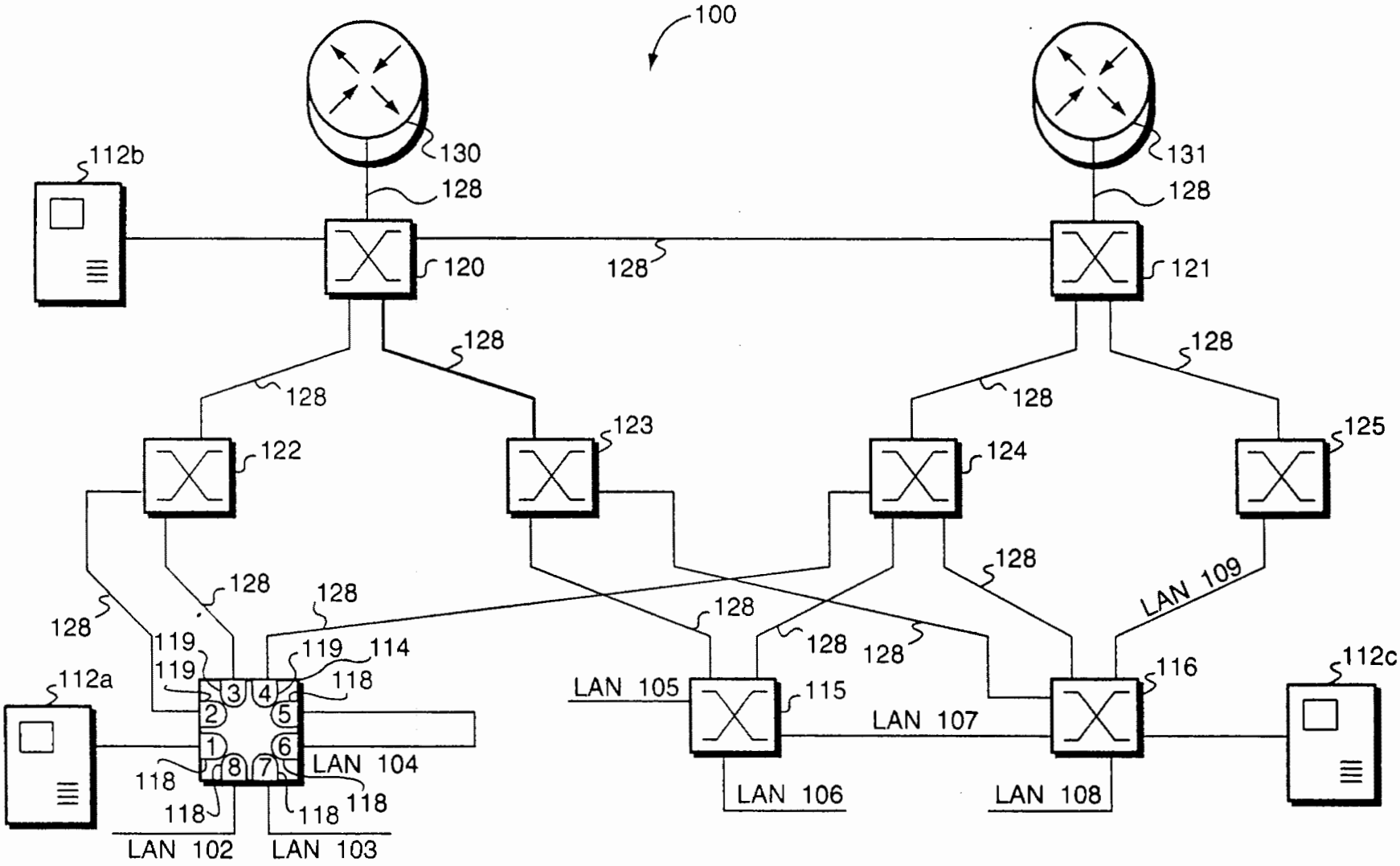

100
130
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LAN 109
112a
112c
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LAN 105
LAN 107
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LAN 108
LAN 102
LAN 103
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FIG. 1

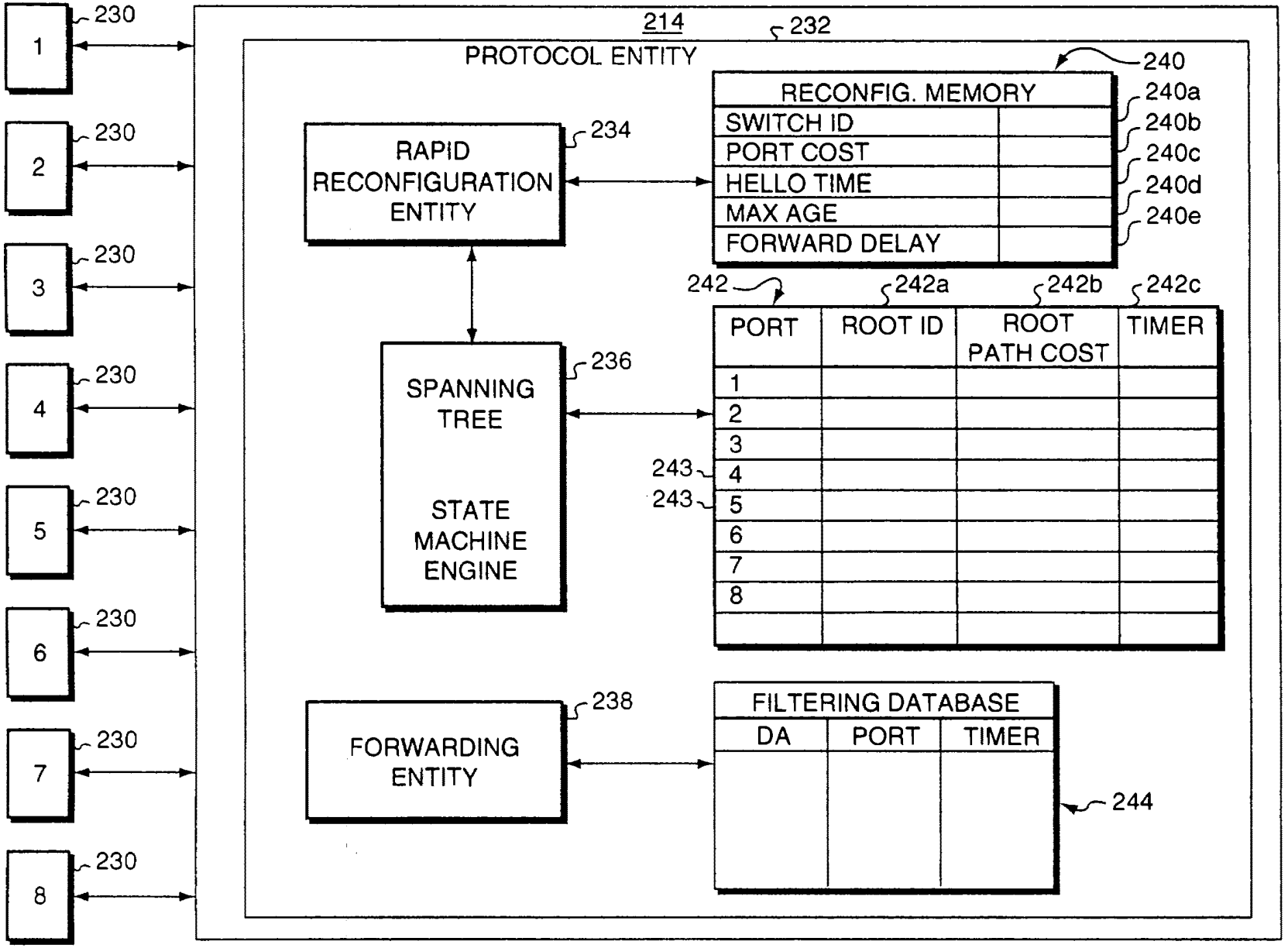

1
2
3
4
5
6
7
8
230
214
232
PROTOCOL ENTITY
240
RECONFIG. MEMORY
SWITCH ID
PORT COST
HELLO TIME
MAX AGE
FORWARD DELAY
240a
240b
240c
240d
240e
RAPID RECONFIGURATION ENTITY
234
SPANNING TREE
STATE MACHINE ENGINE
236
242
242a
242b
242c
PORT
ROOT ID
ROOT PATH COST
TIMER
243
FORWARDING ENTITY
238
FILTERING DATABASE
DA
PORT
TIMER
244

FIG. 2

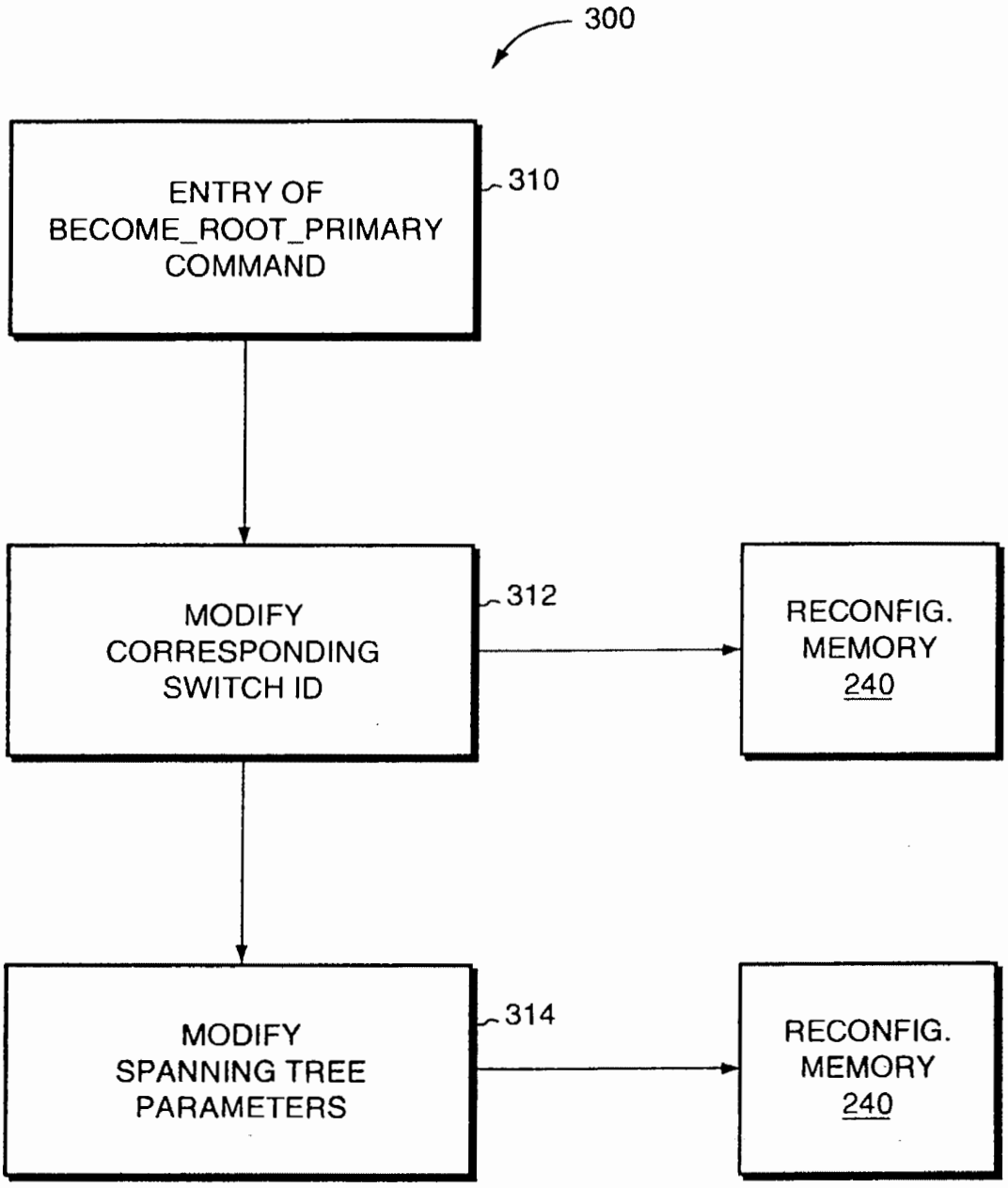

300
ENTRY OF BECOME_ROOT_PRIMARY COMMAND
310
MODIFY CORRESPONDING SWITCH ID
312
RECONFIG. MEMORY 240
MODIFY SPANNING TREE PARAMETERS
314
RECONFIG. MEMORY 240

FIG. 3A

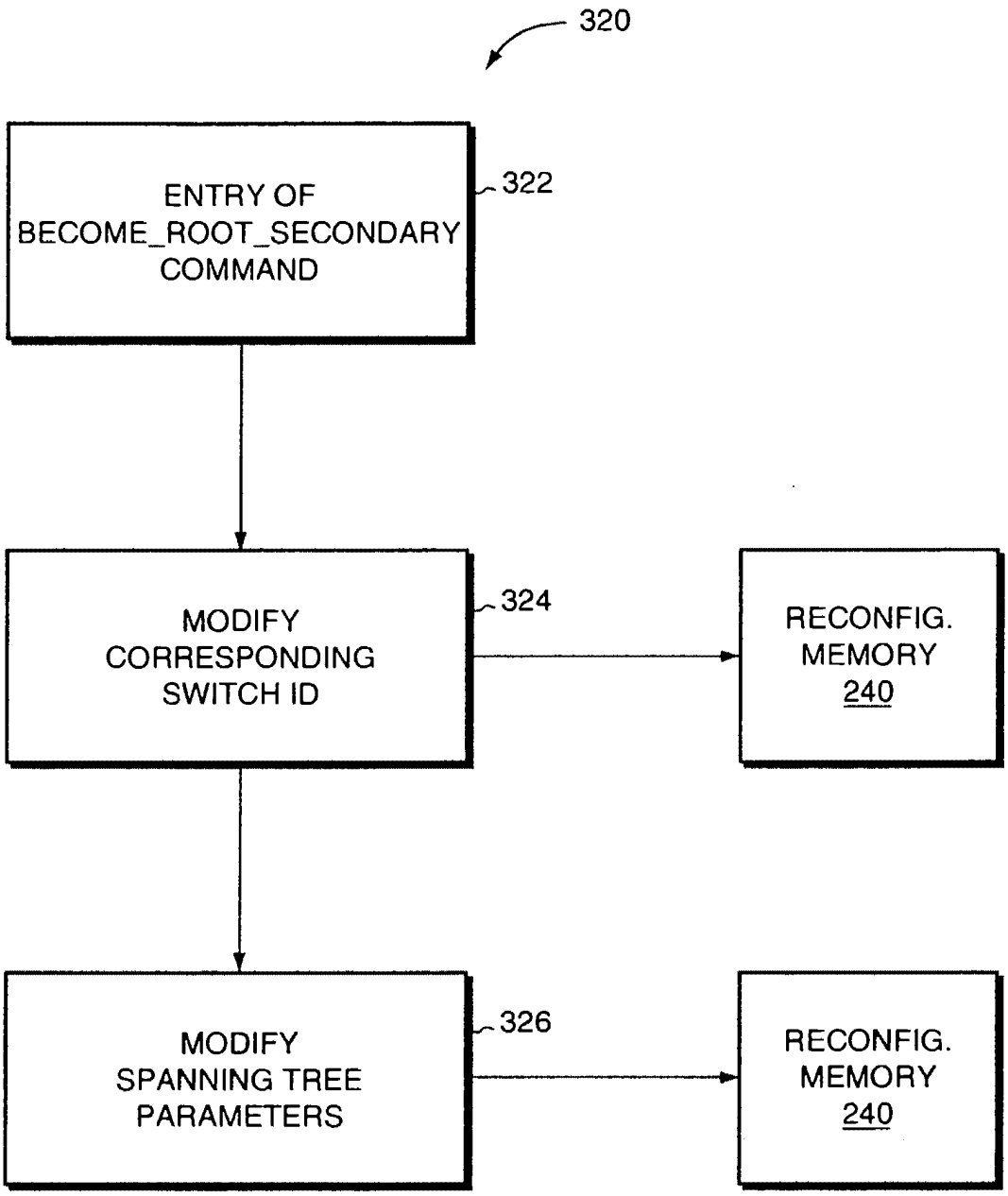

320
ENTRY OF BECOME_ROOT_SECONDARY COMMAND
322
MODIFY CORRESPONDING SWITCH ID
324
RECONFIG. MEMORY 240
MODIFY SPANNING TREE PARAMETERS
326
RECONFIG. MEMORY 240

FIG. 3B

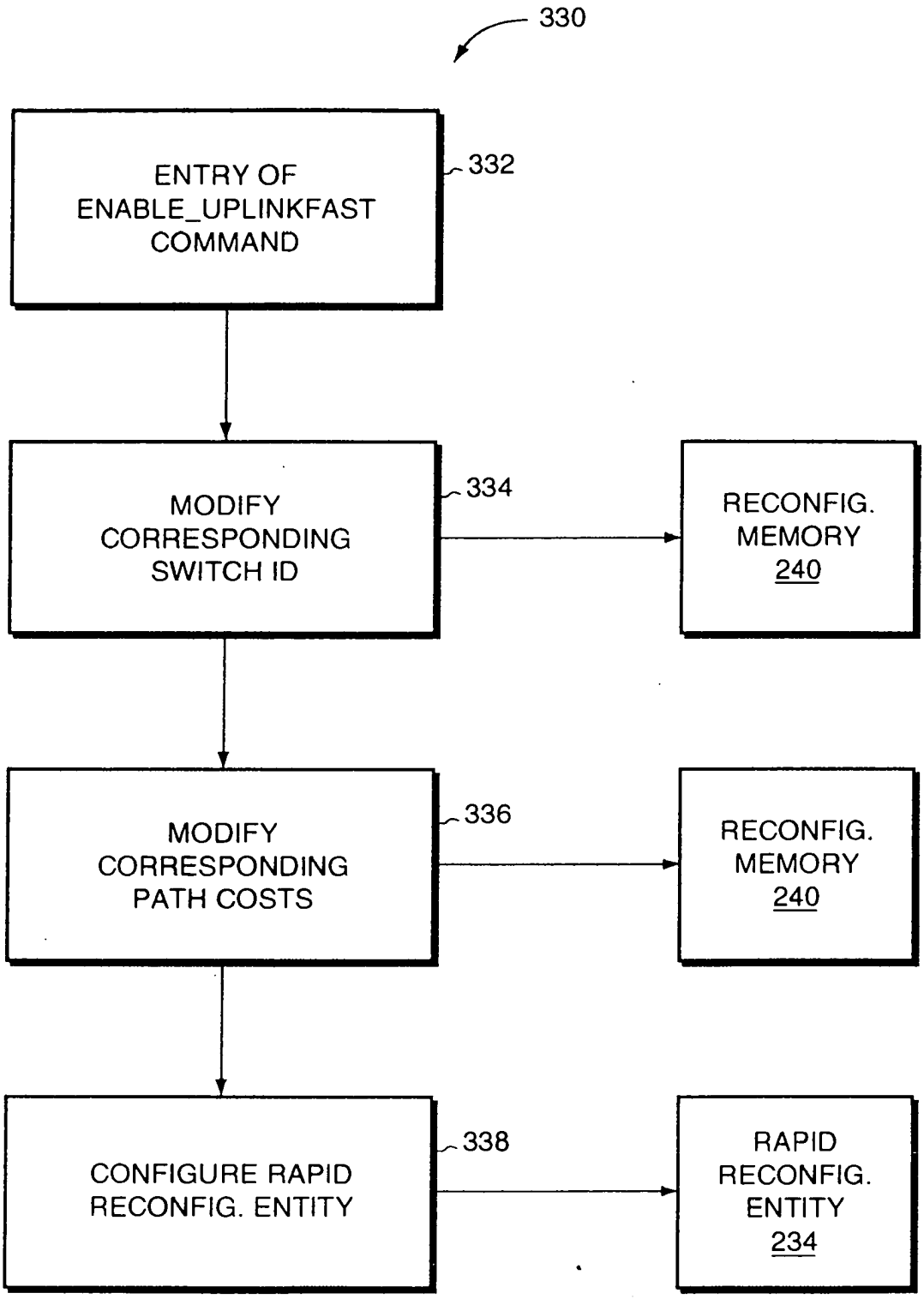

330
ENTRY OF ENABLE_UPLINKFAST COMMAND
332
MODIFY CORRESPONDING SWITCH ID
334
RECONFIG. MEMORY 240
MODIFY CORRESPONDING PATH COSTS
336
RECONFIG. MEMORY 240
CONFIGURE RAPID RECONFIG. ENTITY
338
RAPID RECONFIG. ENTITY 234

FIG. 3C

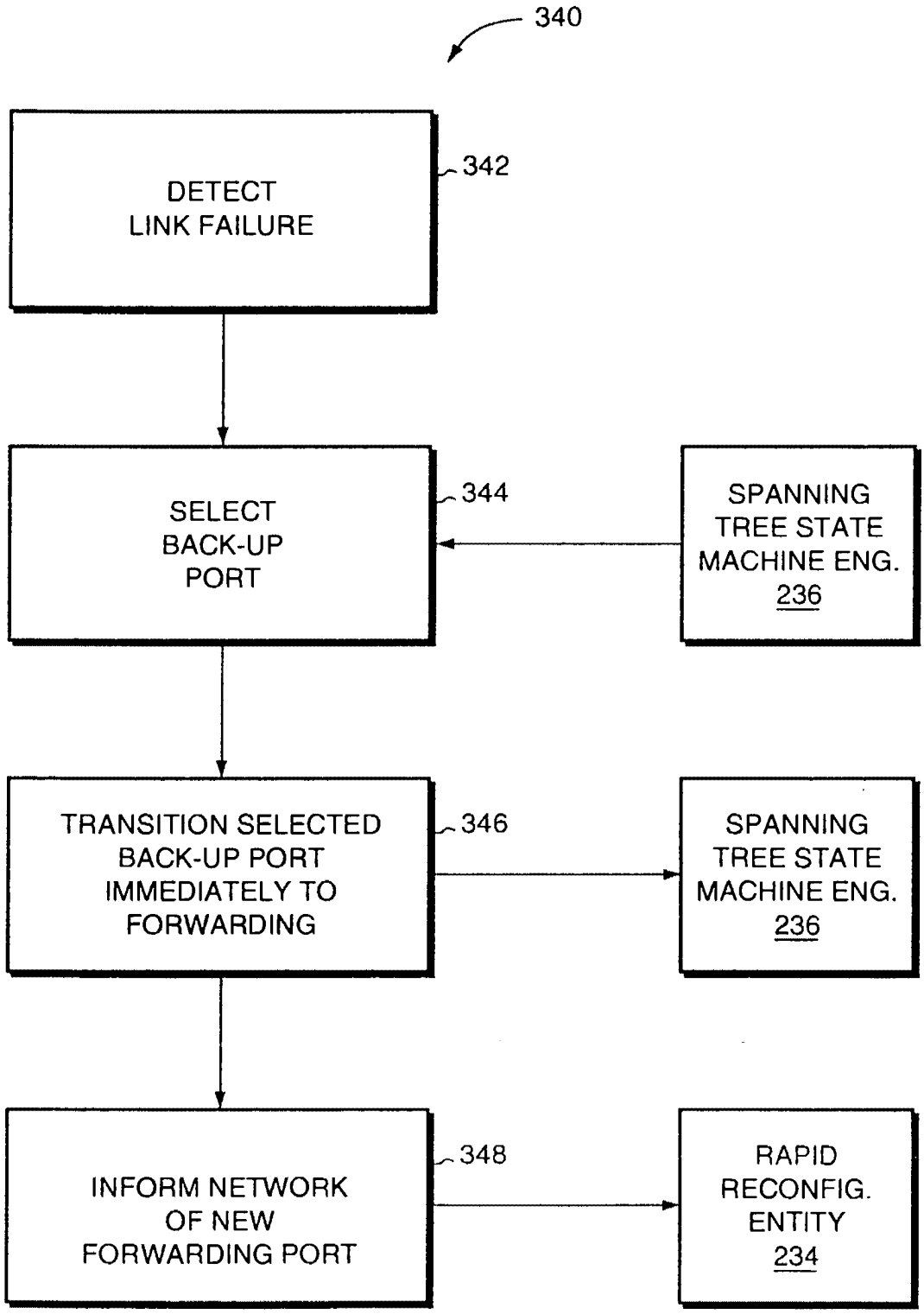

340
DETECT LINK FAILURE
342
SELECT BACK-UP PORT
344
SPANNING TREE STATE MACHINE ENG. 236
TRANSITION SELECTED BACK-UP PORT IMMEDIATELY TO FORWARDING
346
SPANNING TREE STATE MACHINE ENG. 236
INFORM NETWORK OF NEW FORWARDING PORT
348
RAPID RECONFIG. ENTITY 234

FIG. 3D

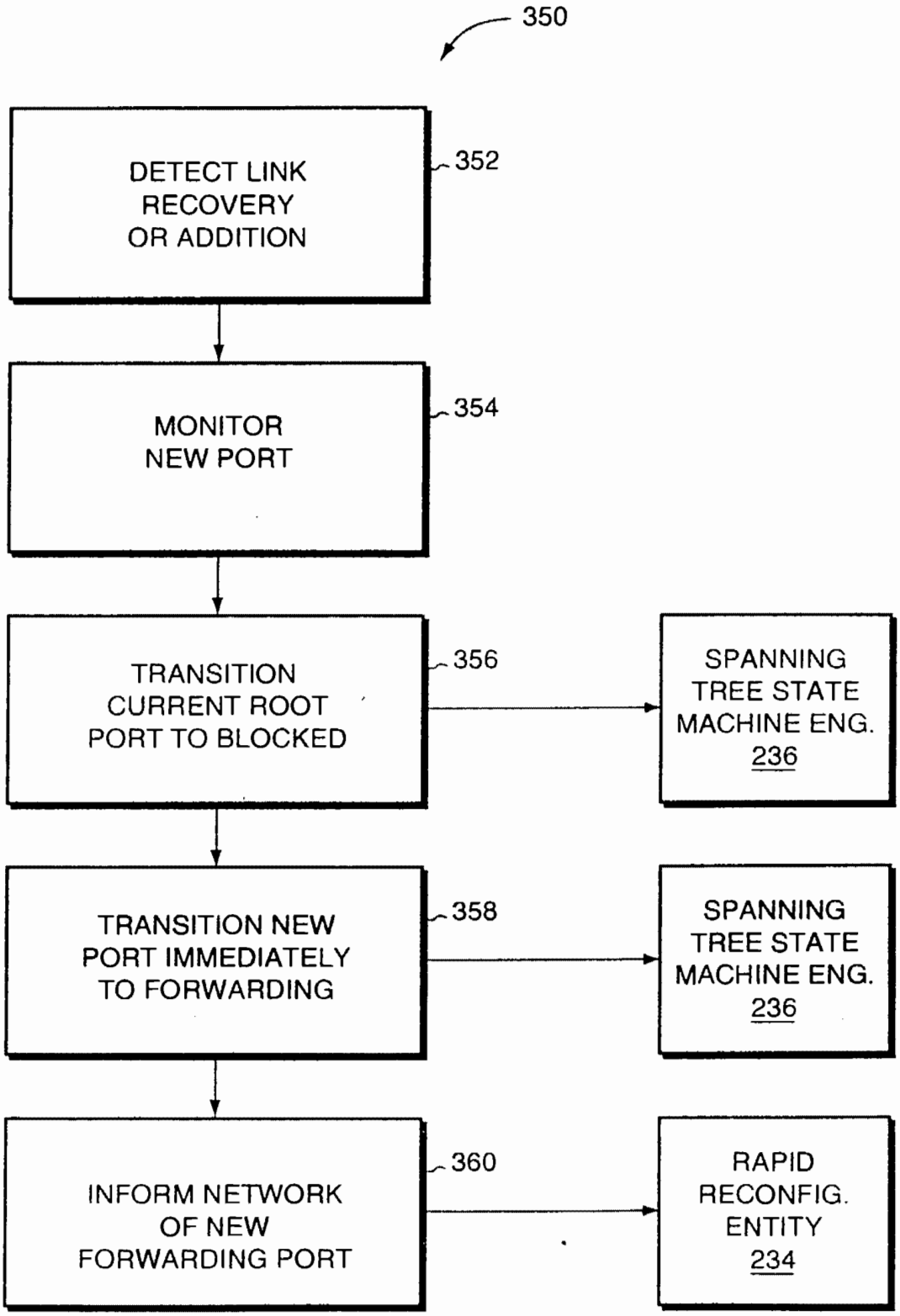

350
DETECT LINK RECOVERY OR ADDITION
352
MONITOR NEW PORT
354
TRANSITION CURRENT ROOT PORT TO BLOCKED
356
SPANNING TREE STATE MACHINE ENG. 236
TRANSITION NEW PORT IMMEDIATELY TO FORWARDING
358
SPANNING TREE STATE MACHINE ENG. 236
INFORM NETWORK OF NEW FORWARDING PORT
360
RAPID RECONFIG. ENTITY 234

FIG. 3E

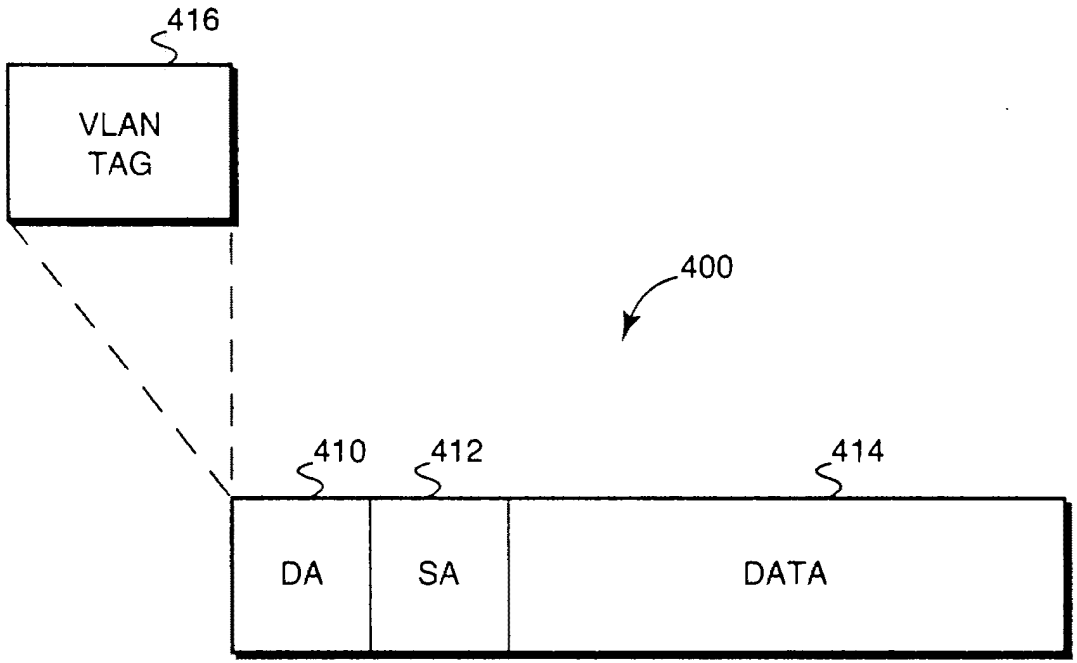


FIG. 4

DECLARATION FOR PATENT APPLICATION

As a below-named inventor, I hereby declare that:

My residence, post-office address, and citizenship are as stated below next to my name.

I believe I am an original, first, and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled FAST RECONFIGURATION OF SPANNING TREES, the specification of which is attached hereto and identified by Cesari and McKenna File No. 112025-0063.

I hereby state that I have reviewed and understand the contents of the above-identified application specification, including the claims, as amended by any amendment specifically referred to herein.

I acknowledge the duty to disclose all information known to me that is material to patentability in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code §119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate filed by me on the same subject matter having a filing date before that of the application on which priority is claimed: None.

I hereby claim the benefit under Title 35, United States Code §119(e) of the following U.S. provisional application: None.

I hereby claim the benefit under Title 35, United States Code §120, of the United States Application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United State Code, §112, I acknowledge the duty to disclose all information that is material to patentability in accordance with Title 37, Code of Federal Regulations, §1.56, and which became available to me between the filing date of the prior application and the national or PCT international filing date of this application: None.

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

BEST AVAILABLE COPY

Silvano Gai — 24 December 1997 (Date)

Residence: Via Tiglione 4
14040 Vigliano d'Asti
Italy

Citizenship: Italy

Post Office Address: Same as above

Keith McCloghrie — 23 December 97 (Date)

Residence: 1190 Hyde Avenue
San Jose, CA 95129

Citizenship: United Kingdom

Post Office Address: Same as above

Dinesh G. Dutt — 23 December '97 (Date)

Residence: 3770 Flora Vista Avenue, #505
Santa Clara, CA 95051

Citizenship: INDIA

Post Office Address: Same as above

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PATENT APPLICATION FEE DETERMINATION RECORD
Effective December 8, 2004

11113600

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	39	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	39 minus 20=	* 19
INDEPENDENT CLAIMS	15 minus 3 =	* 12
MULTIPLE DEPENDENT CLAIM PRESENT		☐

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

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
BASIC FEE	150.00	OR	BASIC FEE	300.00
X$ 25=		OR	X$50=	950
X100=		OR	X200=	2400
+180=		OR	+360=	
TOTAL		OR	TOTAL	3650

CLAIMS AS AMENDED - PART II

AMENDMENT A

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

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B

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

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C

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

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

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

PATENT APPLICATION SERIAL NO. _____

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

04/27/2005 EHAILE1 00000035 11113600

01 FC:1011	300.00	OP
02 FC:1111	500.00	OP
03 FC:1311	200.00	OP
04 FC:1201	2400.00	OP
05 FC:1202	950.00	OP

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PTO-1556
(5/87)

*U.S. Government Printing Office: 2002 — 489-267/69033

PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: Silvano Gai et al.	)	
Serial No.: Not Yet Assigned	)	Examiner: Prieto, Beatriz
Filed: April 25, 2005	)	Art Unit: 2142
For: Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm	)	

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
April 25, 2005

"Express Mail" Mailing-Label Number: EV 432393707 US

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

PRELIMINARY AMENDMENT

Please enter the following amendments before considering the above-identified patent application:

IN THE SPECIFICATION:

Please insert the following new paragraphs before line 1 of page 1 of the Specification:

--

RELATED APPLICATIONS

This Application for United States Patent is a Continuation of U.S. Application Serial No. 10/259,958 filed on 9/27/2002 and now issued as U.S. Patent No. _____ on _____; which is a continuation of U.S. Application Serial No. 09/450,891 filed 11/29/1999 and now issued as U.S. Patent No. 6,535,491 on March 18, 2003; which is a Divisional of U.S. Application Serial No. 08/998,412 filed on 12/24/1997 and now issued as U. S. Patent No. 6,032,194 on February 29, 2000.

Also, this Application for United States Patent is related to: U.S. Application Serial No. 09/450,066 filed 11/29/99 and now issued as U.S. Patent No. 6,388,995 on May 14, 2002; which is a Continuation of U.S. Application Serial No. 08/998,412 filed on 12/24/1997 and now issued as U. S. Patent No. 6,032,194 on February 29, 2000.

--

REMARKS

This Preliminary Amendment inserts a RELATED APPLICATIONS section in the Specification before Line 1 Page 1 of the Specification.

All independent claims are believed to be in condition for allowance.

All dependent claims are dependent from independent claims which are believed to be in condition for allowance. Accordingly, all dependent claims are believed to be in condition for allowance.

Favorable action is respectfully solicited.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

A. Sidney Johnston
Reg. No. 29,548
CESARI AND MCKENNA, LLP
88 Black Falcon Avenue
Boston, MA 02210-2414
(617) 951-2500

PTO/SB/35 (11-00)
Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office; U. S. DEPARTMENT OF COMMERCE
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REQUEST AND CERTIFICATION UNDER 35 U.S.C. 122(b)(2)(B)(i)

First Named Inventor	Silvano Gai et al.
Title	Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm
Atty Docket Number	112025-0063D1C2

I hereby certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral agreement, that requires publication at eighteen months after filing. I hereby request that the attached application not be published under 35 U.S.C. 122(b).

April 25, 2005
Date


Signature

A. Sidney Johnston, Reg. No 29,548
Typed or printed name

This request must be signed in compliance with 37 CFR 1.33(b) and submitted with the application **upon filing.**

Applicant may rescind this nonpublication request at any time. If applicant rescinds a request that an application not be published under 35 U.S.C. 122(b), the application will be scheduled for publication at eighteen months from the earliest claimed filing date for which a benefit is claimed.

If applicant subsequently files an application directed to the invention disclosed in the attached application in another country, or under a multilateral international agreement, that requires publication of applications eighteen months after filing, the applicant **must** notify the United States Patent and Trademark Office of such filing within forty-five (45) days after the date of the filing of such foreign or international application. **Failure to do so will result in abandonment of this application (35 U.S.C. 122(b)(2)(B)(iii)).**

Burden Hour Statement: This collection of information is required by 37 CFR 1.213(a). The information is used by the public to request that an application not be published under 35 U.S.C. 122(b) (and the PTO to process that request). Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This form is estimated to take 6 minutes to complete. This time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

PATENT APPLICATION FEE DETERMINATION RECORD
Effective December 8, 2004

11/113600

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	39	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	39 minus 20=	* 19
INDEPENDENT CLAIMS	15 minus 3 =	* 12
MULTIPLE DEPENDENT CLAIM PRESENT		☐

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

SMALL ENTITY TYPE ☐			OR	OTHER THAN SMALL ENTITY	
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X$ 25=			OR	X$50=	950
X100=			OR	X200=	2400
+180=			OR	+360=	
TOTAL			OR	TOTAL	3650

4-25-05

CLAIMS AS AMENDED - PART II

AMENDMENT A	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 39	Minus	** 20	= 19
Independent	* 15	Minus	*** 3	= 12
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

SMALL ENTITY			OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE			RATE	ADDITIONAL FEE
X$ 25=			OR	19 X$50=	950.00
X100=			OR	12 X200=	2400.00
+180=			OR	+360=	0
TOTAL ADDIT. FEE			OR	TOTAL ADDIT. FEE	3450

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

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

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

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

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** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
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PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: Silvano Gai et al.	)	
Serial No.: 11/113,600	)	Examiner: Not Yet Assigned
Filed: April 25, 2005	)	Art Unit: 2661
For: Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm	)	

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
July 18, 2005

CERTIFICATE OF MAILING

I hereby certify that the following paper is being deposited with the United States Postal Service as first-class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on July 18, 2005.

Elaine Cruz

The following papers are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service pursuant to 37 C.F.R. §1.10:

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PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: Silvano Gai et al.	)	
	)	Examiner: Not Yet Assigned
Serial No.: 11/113,600	)	
Filed: April 25, 2005	)	Art Unit: 2661
For: Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm	)	

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
July 18, 2005

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Elaine Cruz

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

INFORMATION-DISCLOSURE STATEMENT

In keeping with the duty of candor and good faith owed to the Patent and Trademark Office, Applicants wish to bring to the Examiner's attention the references listed on the accompanying form PTO-1449.

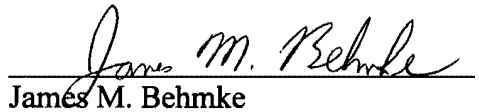
Copies of cited art are not enclosed pursuant to 37 C.F.R. §1.98(d)(1) because

they were submitted in the parent U.S. Patent Application Serial No. 10/259,959, filed September 27, 2002, which is a continuation of U.S. Patent Application Serial No. 09/450,891, filed November 29, 1999, now issued as U.S. Patent No. 6,535,491 on March 18, 2003, which is a divisional of U.S. 08/998,412, filed December 24, 1997, now issued as U.S. Patent No. 6,032,194 on February 29, 2000.

To the extent required by 37 C.F.R. §1.98(a)(3), Applicants have described what they consider to be the relevance of any foreign-language reference. The Office may find additionally relevant material in these or other references.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,



James M. Behmke
Reg. No. 51,448
CESARI AND MCKENNA, LLP
88 Black Falcon Avenue
Boston, MA 02210-2414
(617) 951-2500

OIPE JC16 JUL 20 2005 PATENT & TRADEMARK OFFICE

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 1 of 4

Complete if Known	
Application Number	11/113,600
Filing Date	April 25, 2005
First Named Inventor	Silvano Gai et al.
Group Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	112025-0063D1C2

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Document Number	Kind Code[2] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	4,922,486		Lidinksy, et al.	05-01-1990	
	2	5,018,137		Backes, et al.	05-21-1991	
	3	5,150,360		Perlman, et al.	09-22-1992	
	4	5,280,480		Pitt et al.	01-18-1994	
	5	5,740,171		Mazzola, et al.	04-14-1998	
	6	5,742,604		Edsall, et al.	04-21-1998	
	7	5,764,636		Edsall	06-09-1998	
	8	5,606,669		Bertin, et al.	02-25-1997	
	9	5,878,232		Marimuthu	03-02-1999	
	10	4,811,337		Hart	03-07-1989	
	11	5,790,808		Seaman	08-04-1998	
	12	6,081,512		Muller, et al.	06-27-2000	
	13	5,761,435		Fukuda, et al.	06-02-1998	
	14	5,138,615		Lamport, et al.	08-11-1992	
	15	6,202,114		Dutt, et al.	03-13-2001	
	16	5,398,242		Perlman	03-14-1995	
	17	5,400,333		Perlman	03-21-1995	
	18	5,844,902		Perlman	12-01-1998	
	19	5,323,394		Perlman	06-21-1994	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Office[3]	Number[4]	Kind Code[5] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	1	EP	0 324 277		Hart, J.H.	07-1989		

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] Unique citation designation number. [2] See attached Kinds of U.S. Patent Documents. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6] Applicant is to place a check mark hee if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

OIPE JC106 JUL 20 2005 PATENT & TRADEMARK OFFICE

Please type a plus sign (+) inside this box → +

PTO/SB/08A (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 2 of 4

Complete if Known	
Application Number	11/113,600
Filing Date	April 25, 2005
First Named Inventor	Silvano Gai et al.
Group Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	112025-0063D1C2

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Document Number	Kind Code[2] (*if known*)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	20	5,327,424		Perlman	07-05-1994	
	21	6,236,659		Pascoe	05-22-2001	
	22	5,870,386		Perlman, et al.	02-09-1999	
	23	5,959,968		Chin, et al.	09-28-1999	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Office[3]	Number[4]	Kind Code[5] (*if known*)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

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OIPE JC10 JUL 20 2005 PATENT & TRADEMARK OFFICE

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 3 of 4

Complete if Known	
Application Number	11/113,600
Filing Date	April 25, 2005
First Named Inventor	Silvano Gai et al.
Group Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	112025-0063D1C2

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	1	HOROWITZ, S., Dual-Layer Spanning Tree, A Spanning Tree Proposal for IEEE 802.1Q, May 14, 1997, pp. 45-48.	
	2	SEAMAN, M. and DELANEY, D., Single or Multiple Filtering Databases, May 8, 1997.	
	3	Lucent Technologies Inc.'s Initial Disclosure of Prior Art Under Civil Local Rule 16-7, Case No. C98-20836 JW (PVT) ENE.	
	4	IEEE Standard 802.1D, Draft Standard for Local Area Networks MAC (Media Access Control) Bridges: Technical and Editorial Corrections, March 6, 1997, pp. 3-10.85-122 and 151-158.	
	5	PERLMAN, RADIA, Interconnections: Bridges and Routers, (c) 1992, pp. 54-64.	
	6	HART, JOHN, Extending the IEEE 802.1 MAC Bridge Standard to Remote Bridges, IEE Netowrk, January 1988, pp. 10-15, Vol. 2, No. 1.	
	7	BHANDARI, I, OFEK, Y, BULENT, Y., AND YUNG, M., Fault-Tolerant Convergance Routing, IEEE, 1994, pp. 229-238.	
	8	PERLMAN, R., An Algorithm for Distributed Computation of Spanning Tree in an Extended LAN, ACM ISSN 0146-4833, 1985, pp. 44-53.	
	9	CHENG, C., A protocol to maintain a Mimimum Spanning Tree in a Dynamic Topology, Cimet I.A; Kumar P.R., ACM 0-8979-279 9/88/088/0330, 1998, pp. 330-338.	
	10	Cisco Systems, Inc.: Catalyst 5000 Series Release Notes for Software Release 2.1, Doc. No. 78-1785-02, 1996, pp. 1-12	
	11	Cisco Systems, Inc.: Release Notes for Catalyst 2820 Series and Catalyst 1900 Series Firmware Version 5.35, Doc. N. 78-3817-05, August 1997, pp. 1-8	

Examiner Signature		Date Considered	

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PATENT & TRADEMARK OFFICE

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Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 4 of 4

Complete if Known	
Application Number	11/113,600
Filing Date	April 25, 2005
First Named Inventor	Silvano Gai et al.
Group Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	112025-0063D1C2

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	12	Configuration and Monitoring Switch Node Software, Bay Networks, BCC Version 3.0, May 1997	
	13	SK-NET Switch 6616 Ethernet/FDDI Switch Configuration Guide, SysKonnect Inc., March 1995, pp. 1-42	
	14	A More Robust Tree: Active Topology Maintenance in Reconfiguring Bridged Local Area Networks (STP), Seaman, M., 3Com Corp., March 1996	
	15	Murakami, K, et al., A MAPOS Version I Extension - Switch-Switch Protocol, NTT Lab, June 1997, Request for Comments, pp. 1-23	

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] Unique citation designation number. [2] Applicant is to place a check mark here if English language Translation is attached.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/113,600	04/25/2005	Silvano Gai	112025-0063D1C2	8858

24267 7590 04/17/2008

CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

EXAMINER	
CHU, WUTCHUNG	

ART UNIT	PAPER NUMBER
2619	

MAIL DATE	DELIVERY MODE
04/17/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	11/113,600	GAI ET AL.	
	Examiner	Art Unit	
	WUTCHUNG CHU	2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/25/2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/20/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim1-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Backes et al. (US5018137).

Regarding claims 1, 3, 5, 14, 16, 18, 27, 29, and 31, Backes discloses a transparent load sharing for parallel networks **(see col. 3 line 46 – col. 4 line 24)** comprising:

- executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol **(see figure 2 box 220 and box 230 and col. 5 lines 13-39)**;

- selecting a third port as a back-up designated port **(see figure 2 box 230 and box 240 and col. 7 lines 19-38)**; detecting a link failure **(see col. 10 lines 23-31)**; and

- transitioning, in response to detecting the failure, the designated port into a blocked state and also transitioning the back-up designated port into a forwarding state **(see col. 10 lines 32-45)**.

Regarding claims 2, 6, 15, 28, and 32, Backes teaches further comprising:

transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port **(see col. 10 lines 32-45)**.

Regarding claims 4, 17, 19, and 30, Backes teaches further comprising:

transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port **(see col. 7 lines 18-21)**.

Regarding claims 7, 20, and 33, Backes teaches a method for operating a computer network, comprising:

executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router **(see figure 2 box 220 and box 230 and col. 5 lines 13-39)**; and

transmitting a BPDU message at each expiration of a hello timer for maintaining communication along links of the spanning tree, and to enable a router to learn ifa link of the spanning tree has failed **(see col. 6 lines 15-20)**.

Regarding claims 8, 21, and 34, Backes teaches further comprising:

- detecting at a first port of an individual router a BPDU transmitted by a designated port of the individual router **(see col. 7 lines 6-21)**;
- setting the first port as a backup port for the designated port **(see col. 7 lines 6-21)**.

Regarding claims 9, 22, and 35, Backes teaches further comprising:

- detecting at a first port of an individual router a BPDU transmitted by a root port of
  the individual router **(see col. 7 lines 6-21)**;
- setting the first port as a backup port for the root port **(see col. 7 lines 6-21)**.

Regarding claims 10, 23, and 36, Backes teaches method for operating a computer network, comprising:

- issuing a become_root_primary command to a first router **(see col. 7 lines 8-43)**;
- setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router **(see col. 7 lines 8-43)**;
- issuing a become_root_secondary command to a second router **(see col. 7 lines 55 – col. 8 line 33)**;

- setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router **(see col. 7 lines 55 – col. 8 line 33)**;

- transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router **(see col. 10 lines 32-45)**.

Regarding claims 11, 24, and 37, Backes teaches further comprising:

issuing an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port **(see col. 7 lines 55-65)**.

Regarding claims 12, 25, and 38, Backes teaches further comprising:

- executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router **(see figure 2 box 220 and box 230 and col. 5 lines 13-39)**;

- transmitting a BPDU message by each port in forwarding state at each expiration of a hello timer for maintaining communication along links of the spanning tree **(see col. 6 lines 10-15)**;

- transitioning, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods **(see col. 6 lines 10-15)**, the backup designated port to forwarding and transitioning the selected designated port to blocking **(see col. 10 lines 32-45)**; and

- transitioning, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods **(see col. 6 lines 10-15)**, the backup root port to forwarding and transitioning the selected root port to blocking **(see col. 10 lines 32-45)**.

Regarding claims 13, 26, and 39, Backes teaches further comprising:

- detecting a BPDU message by a root port of the secondary root router **(see col. 10 lines 14-22)**;

- transitioning, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router **(see col. 10 lines 23-45)**.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Marimuthu (5878232); Muller et al. (US6816467); muller et al. (US6081512).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WUTCHUNG CHU whose telephone number is (571)270-1411. The examiner can normally be reached on Monday - Friday 1000 - 1500EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on 571 272 7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/WC/
Wutchung Chu

/Edan Orgad/

Supervisory Patent Examiner, Art Unit 2619

Notice of References Cited	Application/Control No. 11/113,600	Applicant(s)/Patent Under Reexamination GAI ET AL.	
	Examiner WUTCHUNG CHU	Art Unit 2619	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,081,512	06-2000	Muller et al.	370/256
*	B	US-6,816,467	11-2004	Muller et al.	370/256
*	C	US-5,878,232	03-1999	Marimuthu, Peram	709/249
*	D	US-5,018,137	05-1991	Backes et al.	370/401
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	WUTCHUNG CHU	2619

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	04/13/2008								
	1	✓								
	2	✓								
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	4	✓								
	5	✓								
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	7	✓								
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	36	✓								

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	11113600	GAI ET AL.
	Examiner	Art Unit
	WUTCHUNG CHU	2619

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	04/13/2008								
	37	✓								
	38	✓								
	39	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	WUTCHUNG CHU	2619

SEARCHED

Class	Subclass	Date	Examiner
370	256, 390, 432,	4/13/2008	WC

SEARCH NOTES

Search Notes	Date	Examiner
inventorship search	4/13/2008	WC
East search	4/13/2008	WC
consulted with SPE Edan Orgad	4/13/2008	WC
manual search for class 370/432	4/13/2008	WC

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

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BIB DATA SHEET

CONFIRMATION NO. 8858

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/113,600	04/25/2005	370	2619	112025-0063D1C2

APPLICANTS

Silvano Gai, Vigliano d'Asti, ITALY;
Keith McCloghrie, San Jose, CA;
Dinesh G. Dutt, Santa Clara, CA;

**** CONTINUING DATA ***************************

This application is a CON of 10/259,958 09/29/2002 PAT P,P14,234 *
which is a CON of 09/450,891 11/29/1999 PAT 6,535,491
which is a DIV of 08/998,412 12/24/1997 PAT 6,032,194
(*)Data provided by applicant is not consistent with PTO records.

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

05/17/2005

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /WUTCHUNG CHU/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		ITALY	8	39	15

ADDRESS

CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210
UNITED STATES

TITLE

Method and apparatus for rapidly reconfiguring computer networks

FILING FEE RECEIVED		
4350	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1320	spanning with tree with protocol	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2008/04/13 22:08
L2	324	1 and root and router	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2008/04/13 22:09
L3	9340107	(@rlad<"19971224" or @ad<"19971224" or @ptad<"19971224")	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2008/04/13 22:09
L4	66	2 and 3	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2008/04/13 22:09
L5	6	4 and bpdu	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2008/04/13 22:11
L6	3459	spanning with tree	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2008/04/13 22:14
L7	324	2 and 6	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2008/04/13 22:14
L8	62	4 and fail$5	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2008/04/13 22:15
L9	3	8 and bpdu	US-PGPUB; USPAT; EPO; JPO; IBM_TDB	OR	ON	2008/04/13 22:15

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 1 of 4

Complete if Known	
Application Number	11/113,600
Filing Date	April 25, 2005
First Named Inventor	Silvano Gai et al.
Group Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	112025-0063D1C2

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Document Number	Kind Code[2] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	4,922,486		Lidinksy, et al.	05-01-1990	
	2	5,018,137		Backes, et al.	05-21-1991	
	3	5,150,360		Perlman, et al.	09-22-1992	
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Examiner Initials*	Cite No.[1]	Foreign Patent Document Office[3]	Number[4]	Kind Code[5] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	1	EP	0 324 277		Hart, J.H.	07-1989		

Examiner Signature	/Wutchung Chu/	Date Considered	04/13/2008

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Sheet 2 of 4

Complete if Known	
Application Number	11/113,600
Filing Date	April 25, 2005
First Named Inventor	Silvano Gai et al.
Group Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	112025-0063D1C2

U.S. PATENT DOCUMENTS

Examiner Initials *	Cite No.[1]	U.S. Patent Document Number	Kind Code[2] (*if known*)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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	21	6,236,659		Pascoe	05-22-2001	
	22	5,870,386		Perlman, et al.	02-09-1999	
	23	5,959,968		Chin, et al.	09-28-1999	

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Examiner Initials*	Cite No.[1]	Foreign Patent Document Office[3]	Number[4]	Kind Code[5] (*if known*)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

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Sheet 3 of 4

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Application Number	11/113,600
Filing Date	April 25, 2005
First Named Inventor	Silvano Gai et al.
Group Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	112025-0063D1C2

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	1	HOROWITZ, S., Dual-Layer Spanning Tree, A Spanning Tree Proposal for IEEE 802.1Q, May 14, 1997, pp. 45-48.	
	2	SEAMAN, M. and DELANEY, D., Single or Multiple Filtering Databases, May 8, 1997.	
	3	Lucent Technologies Inc.'s Initial Disclosure of Prior Art Under Civil Local Rule 16-7, Case No. C98-20836 JW (PVT) ENE.	
	4	IEEE Standard 802.1D, Draft Standard for Local Area Networks MAC (Media Access Control) Bridges: Technical and Editorial Corrections, March 6, 1997, pp. 3-10.85-122 and 151-158.	
	5	PERLMAN, RADIA, Interconnections: Bridges and Routers, (c) 1992, pp. 54-64.	
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	8	PERLMAN, R., An Algorithm for Distributed Computation of Spanning Tree in an Extended LAN, ACM ISSN 0146-4833, 1985, pp. 44-53.	
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Examiner Signature	/Wutchung Chu/	Date Considered	04/13/2008

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Sheet 4 of 4

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Application Number	11/113,600
Filing Date	April 25, 2005
First Named Inventor	Silvano Gai et al.
Group Art Unit	Not yet assigned
Examiner Name	Not yet assigned
Attorney Docket Number	112025-0063D1C2

OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	12	Configuration and Monitoring Switch Node Software, Bay Networks, BCC Version 3.0, May 1997	
	13	SK-NET Switch 6616 Ethernet/FDDI Switch Configuration Guide, SysKonnect Inc., March 1995, pp. 1-42	
	14	A More Robust Tree: Active Topology Maintenance in Reconfiguring Bridged Local Area Networks (STP), Seaman, M., 3Com Corp., March 1996	
	15	Murakami, K, et al., A MAPOS Version I Extension - Switch-Switch Protocol, NTT Lab, June 1997, Request for Comments, pp. 1-23	

Examiner Signature	/Wutchung Chu/	Date Considered	04/13/2008

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Inventor Information for 11/113600

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DUTT, DINESH G.	SANTA CLARA	CALIFORNIA

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PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: Silvano Gai et al.	)	
Serial No.: 11/113,600	)	Examiner: CHU, WUTCHUNG
Filed: April 25, 2005	)	Art Unit: 2619
For: Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm	)	

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
July 17, 2008

BY EFS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

AMENDMENT

This Amendment is filed in response to the Office Action mailed April 17, 2008. The Applicant respectfully requests reconsideration. All objections and rejections are respectfully traversed.

IN THE SPECIFICATION:

Please replace the first two paragraphs of the specification, beginning at page 1, line 1, with the following replacement versions thereof. No new matter is added.

—

RELATED APPLICATIONS

This Application for United States Patent is a Continuation of U.S. Application Serial No. 10/259,958~~9~~ filed on 9/27/2002 and now issued as U.S. Patent No. 6,976,088——— on Dec. 13, 2005———; which is a continuation of U.S. Application Serial No. 09/450,891 filed 11/29/1999 and now issued as U.S. Patent No. 6,535,491 on March 18, 2003; which is a Divisional of U.S. Application Serial No. 08/998,412 filed on 12/24/1997 and now issued as U. S. Patent No. 6,032,194 on February 29, 2000.

Also, this Application for United States Patent is related to: U.S. Application Serial No. 09/450,066 filed 11/29/99 and now issued as U.S. Patent No. 6,388,995 on May 14, 2002; which is a Continuation of U.S. Application Serial No. 08/998,412 filed on 12/24/1997 and now issued as U. S. Patent No. 6,032,194 on February 29, 2000.

—

IN THE CLAIMS:

1. (CURRENTLY AMENDED) A method for operating a router, comprising:

executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state;

detecting a link failure; and

transitioning, in response to detecting the failure, the designated port into ~~a~~ the blocked state and also transitioning the back-up designated port into ~~a~~ the forwarding state.

2. (ORIGINAL) The method as in claim 1, further comprising:

transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

3. (CURRENTLY AMENDED) A method for operating a router, comprising:

executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

selecting a third port as a back-up root port and placing the back-up root port in a blocked state;

detecting a link failure; and

transitioning, in response to detecting the failure, the root port into ~~a~~ the blocked state and also transitioning the back-up root port into ~~a~~ the forwarding state.

4. (ORIIGNAL) The method as in claim 1, further comprising:

transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

5. (ORIGINAL) A method for operating a router, comprising:

executing a spanning tree protocol to select a first router as a root router, and to select a second router as a back-up root router;

detecting a link failure; and

transitioning, in response to detecting the failure, all designated ports of the root router into a blocked state, and also transitioning the back-up router into a root router.

6. (ORIGINAL) The method as in claim 5, further comprising:

transmitting BPDU messages by the new root router to inform devices connected to the network of the identity of the new root router.

7-9. (CANCELLED)

10. (ORIGINAL) A method for operating a computer network, comprising:

issuing a become_root_primary command to a first router;

setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router;

issuing a become_root_secondary command to a second router;

setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;

transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

11. (ORIGINAL) The method as in claim 10, further comprising:

issuing an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port.

12. (ORIGINAL) The method as in claim 10, further comprising:

executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router;

transmitting a BPDU message by each port in forwarding state at each expiration of a hello timer for maintaining communication along links of the spanning tree;

transitioning, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods, the backup designated port to forwarding and transitioning the selected designated port to blocking; and

transitioning, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods, the backup root port to forwarding and transitioning the selected root port to blocking.

13. (ORIGINAL) The method as in claim 10, further comprising:

detecting a BPDU message by a root port of the secondary root router;

transitioning, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router.

14. (CURRENTLY AMENDED) A router, comprising:

means for executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

means for selecting a third port as a back-up designated port and placing the back-up root port in a blocked state;

means for detecting a link failure; and

means for transitioning, in response to detecting the failure, the designated port into ~~a~~ the blocked state and also transitioning the back-up designated port into ~~a~~ the forwarding state.

15. (ORIGINAL) The router as in claim 14, further comprising:

means for transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

16. (CURRENTLY AMENDED) A router, comprising:

means for executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

means for selecting a third port as a back-up root port and placing the back-up root port in a blocked state;

means for detecting a link failure; and

means for transitioning, in response to detecting the failure, the root port into ~~a~~ the blocked state and also transitioning the back-up root port into ~~a~~ the forwarding state.

17. (ORIGINAL) The router as in claim 16, further comprising:

means for transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

18. (ORIGINAL) A router, comprising:

means for executing a spanning tree protocol to select a first router as a root router, and to select a second router as a back-up root router;

means for detecting a link failure; and

means for transitioning, in response to detecting the failure, all designated ports of the root router into a blocked state, and also transitioning the back-up router into a root router.

19. (ORIGINAL) The router as in claim 18, further comprising:

means for transmitting BPDU messages by the new root router to inform devices connected to the network of the identity of the new root router.

20-22. (CANCELLED)

23. (ORIGINAL) A computer network, comprising:

means for issuing a become_root_primary command to a first router;

means for setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router;

means for issuing a become_root_secondary command to a second router;

means for setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;

means for transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

24. (ORIGINAL) The computer network as in claim 23, further comprising:

means for issuing an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one

router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port.

25. (ORIGINAL) The computer network as in claim 23, further comprising:

means for executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router;

means for transmitting a BPDU message by each port in forwarding state at each expiration of a hello timer for maintaining communication along links of the spanning tree;

means for transitioning, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods, the backup designated port to forwarding and transitioning the selected designated port to blocking; and

means for transitioning, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods, the backup root port to forwarding and transitioning the selected root port to blocking.

26. (ORIGINAL) The computer network as in claim 23, further comprising:

means for detecting a BPDU message by a root port of the secondary root router;

means for transitioning, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router.

27. (CURRENTLY AMENDED) A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port

and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

a third port selected as a back-up designated port and placed in a blocked state;

a port to detect a link failure; and

a rapid reconfiguration entity to transition, in response to detecting the failure, the designated port into ~~a~~ the blocked state and also to transition the back-up designated port into ~~a~~ the forwarding state.

28. (ORIGINAL) The router as in claim 27, further comprising:

the back-up designated port transmitting a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

29. (CURRENTLY AMENDED) A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

a third port selected as a back-up root port and placed in a blocked state;

a port to detect a link failure; and

a rapid reconfiguration entity to transition, in response to detecting the failure, the root port into ~~a~~ the blocked state and also transitioning the back-up root port into ~~a~~ the forwarding state.

30. (ORIGINAL) The router as in claim 29, further comprising:

the back-up root port transmitting BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

31. (ORIGINAL) A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first router as a root router, and to select a second router as a back-up root router;

a port to detect a link failure; and

a rapid reconfiguration entity to transition, in response to detecting the failure, all designated ports of the root router into a blocked state, and also to transition the back-up router into a root router.

32. (ORIGINAL) The router as in claim 31, further comprising:

a port to transmit BPDU messages by the new root router to inform devices connected to the network of the identity of the new root router.

33-35. (CANCELLED)

36. (ORIGINAL) A computer network, comprising:

a first port to enter a become_root_primary command to a first router;

a rapid reconfiguration entity to set, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router;

a second port to enter a become_root_secondary command to a second router;

a rapid reconfiguration entity to set, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;

the rapid reconfiguration entity to transition, in response to failure of the first router while serving as the root router, the second router to become the root router.

37. (ORIGINAL) The computer network as in claim 36, further comprising:

a third port to enter an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port.

38. (ORIGINAL) The computer network as in claim 36, further comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router;

each port in forwarding state to transmit a BPDU message at each expiration of a hello timer to maintain communication along links of the spanning tree;

a rapid reconfiguration entity to transition, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods, the backup designated port to forwarding and transitioning the selected designated port to blocking; and

the rapid reconfiguration entity to transition, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods, the backup root port to forwarding and transitioning the selected root port to blocking.

39. (ORIGINAL) The computer network as in claim 36, further comprising:

a root port of the secondary root router to detect a BPDU message;

a rapid reconfiguration entity to transition, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router.

REMARKS

This Amendment is filed in response to the Office Action mailed April 17, 2008. The Applicant respectfully requests reconsideration. All objections and rejections are respectfully traversed.

Claims 1-6, 10-19, 23-32, 36-39 are now pending in the case.

Claims 1, 3, 14, 16, 27, 29 have been amended.

Now new claims have been added.

Correction to the Specification

The Applicant herein corrects a typographical error in the specification. Specifically, page 1 of the specification originally incorrectly recited that this application is a "Continuation of U.S. Application Serial No. 10/259,95**8**." (emphasis added). The Applicant corrects the serial number to read "10/259,95**9**."

Correction of this typographical error does not introduce any new matter. The Applicant's Utility Patent Application Transmittal form, dated April 25, 2005, the date the application was filed, correctly recites that the present application is a continuation of Application Serial No. is 10/259,95**9**. Further, the Applicant, in an Information Disclosure statement dated July 18, 2005 correctly referred to "the parent U.S. patent Application Serial No. 10/259,95**9**" (emphasis added). Accordingly, correction of the typographical error in the serial number does not add any new matter, and merely reflects the Applicant's earlier made priority claim.

Claim Rejections - 35 U.S.C. §102

At paragraphs 1-2 of the Office Action, claims 1-29 were rejected under 35 U.S.C. §102(b) over Backes et al., U.S. Patent No. 5,018,137 (hereinafter "Backes").

Claims 1, 3, 5, 14, 16, 18, 27, 29 and 31:

The Applicant's claim 1, representative in part of claims 1, 3, 5, 14, 16, 18, 27, 29 and 31, sets forth (emphasis added):

> 1. A method for operating a router, comprising:
>
> executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;
>
> ***selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state***;
>
> detecting a link failure; and
>
> ***transitioning, in response to detecting the failure, the designated port into the blocked state and also transitioning the back-up designated port into the forwarding state***.

Backes discusses a technique for utilizing multiple "trunked" (i.e. parallel) networks to reach a bridge, rather than use a single network to reach the bridge, while not creating loops within a spanning tree. *See* page 3, lines 46-50. Specifically, Backes first chooses one bridge to be a root bridge. *See* col. 6, lines 61-65. Then, Backes selects "one bridge connected to each network as a designated bridge for that network…[and] [t]he remaining bridges connected to that network which are not selected as the designated bridge are deemed daughter bridges." *See* col. 3, lines 60-65 and col. 7, lines 18-39. Each of the daughter bridges senses whether trunked networks (i.e., two or more parallel networks) exist between it and the designated bridge. *See* col. 7, lines 44-47 and 55-58 and Fig. 2, step 240. For example, trunked (parallel) networks 190, 196 exist between bridges 145, 155. *See* Fig. 1 and col. 7, lines 51-54. Backes causes each daughter bridge to, rather than block connections to all but one of these parallel networks, use connections with all of them all in parallel. That is, "[t]his operation distributes the messages sent from the selected trunked daughter bridge and to the corresponding designated bridge among the connected trunked networks…." *See* col. 4, lines 14-18 and col. 8, lines 3-46.

The Applicant respectfully urges that Backes is silent concerning the Applicant's claimed "***selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state***" and "***transitioning, in response to detecting the failure, the designated port into the blocked state and also transitioning the back-up designated port into the forwarding state***."

While the Applicant claims ***a back-up designated port*** that is placed ***in a blocked state,*** and that in response to a failure is ***transitioned to a forwarding state***, Backes suggests all connections between a designated bridge and a daughter bridge should be used in parallel, rather than blocking some of them, and activating one of these after failure. Backes makes it quite clear all his connections are being used, and not blocked, stating his "operation distributes the messages sent from the selected trunked daughter bridge and to the corresponding designated bridge among the connected trunked networks...." *See* col. 4, lines 14-16.

The differences between Backes and what the Applicant claims cause Backes to fail to anticipate the claims on many levels. First, Backes fails to teach "***a back-up designated port***", as all of Backes's connections to daughter bridges are actively being used and may not properly be considered a back-up**.** Second, Backes does not suggest placing a back-up designated port "***in a blocked state.***" If anything, Backes suggests the opposite, teaching all connections between a designated bridge and a daughter bridge should be used, and traffic spread among them. Finally, Backes does not teach "***transitioning, in response to detecting the failure... the back-up designated port into the forwarding state.***" As Backes is already using his parallel connections, there is nothing reserved to transition to a forwarding state in response to failure.

Accordingly, the Applicant respectfully urges that Backes is legally insufficient to anticipate the present claims under 35 U.S.C. §102(b) because of the absence of the Applicant's claimed novel "***selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state***" and "***transitioning, in response to detecting the failure, the designated port into the blocked state and also transitioning the back-up designated port into the forwarding state***."

Claims 2, 4, 6, 15, 17, 19, 28, 30 and 32:

The Applicant notes that claims 2, 4, 6, 15, 17, 19, 28, 30and 32 are dependent claims that depend from independent claims believed to be allowable for at least the reasons discussed above. Claims 2, 4, 6, 15, 17, 19, 28, 20 and 32 are believed to be allowable due to their dependency, as well as for other separate reasons.

Claims 7-9, 20-22, and 33-35:

The Applicant notes claims 7-9, 20-22, and 33-35 are no longer pending in the case and accordingly believes their rejection is moot.

Claims 10, 23 and 36:

The Applicant's claim 10, representative in part of claims 10, 23 and 36, sets forth (emphasis added):

> 10. A method for operating a computer network, comprising:
>
> issuing a become_root_primary command to a first router;
>
> ***setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router***;
>
> issuing a become_root_secondary command to a second router;
>
> ***setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router***;
>
> transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

Backes discloses "[p]referably, the selection of the root bridge would be done by the bridges themselves .... A preferred method of selection calls for each bridge to compare the root identifier field 420 of the BDPUs it receives to a stored root identifier." *See* page 7, lines 6-12.

The Applicant respectfully urges that Backes is silent concerning the Applicant's claimed "***setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router***" and "***setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router***."

While the Applicant claims special commands that allow one to set an ID in a first router to promote a spanning tree protocol to select the first router as a primary root router and to set an ID in a second router to promote spanning tree protocol to select the first router as a secondary root router, Backes, in sharp contrast, teaches root bridge should be "done by the bridges themselves" absent other involvement. No special commands are described in Backes that may be used to influence selection of a root bridge.

Accordingly, the Applicant respectfully urges that Backes is legally insufficient to anticipate the present claims under 35 U.S.C. §102 because of the absence of the Applicant's claimed novel "***setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router***" and "***setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router***."

Claims 11-13, 24-26 and 37-39:

The Applicant notes that claims 11-13, 24-26 and 37-39 are dependent claims that depend from independent claims believed to be allowable for at least the reasons discussed above. Claims 11-13, 24-26 and 37-39 are believed to be allowable due to their dependency, as well as for other separate reasons.

In the event that the Examiner deems personal contact desirable in disposition of this case, the Examiner is encouraged to call the undersigned attorney at (617) 951-2500.

In summary, all the independent claims are believed to be in condition for allowance and therefore all dependent claims that depend there from are believed to be in condition for allowance. The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

__/James A. Blanchette/_____
James A. Blanchette
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Electronic Acknowledgement Receipt

EFS ID:	3637873
Application Number:	11113600
International Application Number:	
Confirmation Number:	8858
Title of Invention:	Method and apparatus for rapidly reconfiguring computer networks
First Named Inventor/Applicant Name:	Silvano Gai
Customer Number:	24267
Filer:	James A. Blanchette
Filer Authorized By:	
Attorney Docket Number:	112025-0063D1C2
Receipt Date:	17-JUL-2008
Filing Date:	25-APR-2005
Time Stamp:	21:14:10
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1		AMEND_July_17_2008.pdf	78884 0bd460defcc5340d9920cf5816f512b418f9d4be	yes	19

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment - After Non-Final Rejection	1	1
	Claims	2	13
	Applicant Arguments/Remarks Made in an Amendment	14	19
Warnings:			
Information:			
	Total Files Size (in bytes):	78884	

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/113,600	04/25/2005	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	07/17/2008	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 30	Minus	** 39	= 0	X $ =		OR	X $50=	0
	Independent (37 CFR 1.16(h))	* 12	Minus	***15	= 0	X $ =		OR	X $210=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/ANTHONY WILLIAMS/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: Silvano Gai et al.	)	
	)	Examiner: CHU, WUTCHUNG
Serial No.: 11/113,600	)	
Filed: April 25, 2005	)	Art Unit: 2619
For: METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS USING A SPANNING TREE ALGORITHM	)	

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
(617) 951-2500
August 11, 2008

CERTIFICATE OF EFS WEB TRANSMISSION

I hereby certify that the following paper is being EFS WEB transmitted to the Patent and Trademark Office on August 11, 2008.

Merisa Jakupovic

Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ATTN: Application Processing Division - Customer Correction Branch

Sir:

REQUEST TO CORRECT FILING RECEIPT

Please correct the Filing Receipt to remove the statement "is a CON of 10/259,958 09/29/2002 PAT P,P14,234." The present application is unrelated to that

patent. The statement therefore needs to be replaced with "is a CON of 10/259,95**9** 09/27/2002 PAT 6,976,088."

It appears a typographical error in the Applicant's "Preliminary Amendment," filed on April 25, 2005, has become incorporated into the filing receipt. The Applicant files a Corrective Preliminary Amendment herewith to address that typographical error. This paper is filed to correct the error in the Filing Receipt.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§1.16 and 1.17 that may be required, or credit any overpayment, to our Deposit Account No. 03-1237.

Respectfully submitted,

James A. Blanchette
Reg. No. 51,477
Cesari and McKenna
88 Black Falcon Avenue
Boston, MA 02210
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APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY.DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
11/113,600	04/25/2005	2661	4350	112025-0063D1C2	8	39	15

CONFIRMATION NO. 8858

24267
CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

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CESARI & McKENNA

FILING RECEIPT

OC000000016053930

Date Mailed: 05/19/2005

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).**

Applicant(s)

Silvano Gai, Vigliano d'Asti, ITALY;
Keith McCloghrie, San Jose, CA;
Dinesh G. Dutt, Santa Clara, CA;

Power of Attorney: None

Domestic Priority data as claimed by applicant is a CON of 10/259,959 09/27/2002 PAT 6,976,088

This application ~~is a CON of 10/259,958 09/29/2002 PAT P,P14,234 *~~
which is a CON of 09/450,891 11/29/1999 PAT 6,535,491
which is a DIV of 08/998,412 12/24/1997 PAT 6,032,194
(*)Data provided by applicant is not consistent with PTO records.

Foreign Applications

If Required, Foreign Filing License Granted: 05/17/2005

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US11/113,600

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

Early Publication Request: No

Title

Method and apparatus for rapidly reconfiguring computer networks

Preliminary Class

370

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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Electronic Acknowledgement Receipt

EFS ID:	3758637
Application Number:	11113600
International Application Number:	
Confirmation Number:	8858
Title of Invention:	Method and apparatus for rapidly reconfiguring computer networks
First Named Inventor/Applicant Name:	Silvano Gai
Customer Number:	24267
Filer:	James A. Blanchette/Merisa Jakupovic
Filer Authorized By:	James A. Blanchette
Attorney Docket Number:	112025-0063D1C2
Receipt Date:	11-AUG-2008
Filing Date:	25-APR-2005
Time Stamp:	14:03:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	20R0428.PDF	68381 47cd5af320b2f3df22f96b661ad1539148950e96	no	2

Warnings:	
Information:	

2	Miscellaneous Incoming Letter	20R0430.PDF	187975 27907780ae0fe7ffd90eaee8076101b3a9179738	no	2

Warnings:	
Information:	
Total Files Size (in bytes):	256356

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/113,600	04/25/2005	Silvano Gai	112025-0063D1C2	8858

24267 7590 10/21/2008

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EXAMINER	
AHMED, SALMAN	

ART UNIT	PAPER NUMBER
2419	

MAIL DATE	DELIVERY MODE
10/21/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	11/113,600	GAI ET AL.	
	Examiner	Art Unit	
	SALMAN AHMED	2419	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,10-19 and 23-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6, 10-19, 23-43 and 36-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/25/2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-6, 10-19, 23-43 and 36-39 are pending.

Claims 1-6, 10-19, 23-43 and 36-39 are rejected.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-6, 10-19, 23-43 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Backes et al. (US5018137, hereinfter Backes) in view of Seaman (US PAT 5790808) and Souza et al.: GIGAswitch System: A High-performance Packet-switching Platform- Digital Technical Journal, 1994, hereinafter Souza.

Regarding claims 1, 3, 5, 14, 16, 18, 27, 29 and 31 Backes discloses a transparent load sharing for parallel networks (see col. 3 line 46 - col. 4 line 24) comprising: executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol (see figure 2 box 220 and box 230 and col. 5 lines 13-39).

Regarding claims 10, 23, and 36, Backes teaches method for operating a computer network, comprising: issuing a become_root_primary command to a first router (see col. 7 lines 8-43); setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router (see col. 7 lines 8-43); issuing a become_root_secondary command to a second router (see col. 7 lines 55 - col. 8 line 33); setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router (see col. 7 lines 55 - col. 8 line 33).

Backes does not explicitly teach place both the root port and the designated port in a forwarding state. Backers does not explicitly teach transitioning in response to event all designated ports of the root router into blocked state and transitioning a back-up router into a root router. Backers does not explicitly teach transitioning, in response

to failure of the first router while serving as the root router, the second router to become the root router.

Seaman in the same field of endeavor teaches placing both the root port and the designated port in a forwarding state (column 5 lines 45-46, The port stays in the forwarding state 36 until the algorithm selects the port as not the designated or root port). Seaman in the same field of endeavor teaches In the preferred system, the protocol entity executes the Spanning Tree Algorithm as set out in the IEEE 802.1D standard for bridged local area networks. A bridge in the first network state acts to forward data received at the port, and the second network state acts to block data received at the port. Also, according to the Spanning Tree Algorithm, a transition from the first network state is executed upon receipt of information indicating that a change to the blocking second network state should be executed. The present invention can also be characterized as an improvement to a bridge having a plurality of ports and including a bridge protocol entity for interconnecting according to a Spanning Tree Algorithm a plurality of local area networks coupled to respective ones of the plurality of ports. The improvement comprises logic communicating with the bridge protocol entity, and coupled with the plurality of ports, which establishes active network states for the plurality of ports. changing a port from the first network state to the second network state in a network system after receipt of information from the protocol resources indicating such change; and changing a port from the second network state to the first network state in a network system after expiry of a waiting interval if information from the protocol resources indicating such change is received after expiry of a forgetting

interval after a change into the second network state, else changing directly into the first network state. Finally, Seaman teaches transitioning a back-up router into a root router (See figures 3A-3D). transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router (See figures 3A-3D).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Backes' teaching to incorporate the steps of placing both the root port and the designated port in a forwarding state as suggested by Seaman. The motivation is that (as suggested by Seaman, column 3 lines 33-37) managing ports on network systems, such that data is transmitted through a port in a first network state and such that data is blocked at a port in a second network state enables proper transmission of data through the ports. Further motivation is that by reassigning root routers due to router failure guarantees seamless continuation of reliable communication. 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/market place incentives if the variations are predictable to one of ordinary skill in the art.

Backes teaches ports being assigned as designated ports but Backes and Seaman do not explicitly teach selecting a port as a back-up port and placing the back-up port in a blocked state; detecting a link failure; and transitioning, in response to detecting the failure, the port into a blocked state and also transitioning the back-up port into a forwarding state.

Souza in the same field of endeavor teaches If a LAN is connected to ports on two different FDDI line cards, the 802.1d spanning tree places one of the ports in backup state; failure of the operational port causes the backup port to come on-line.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Backes and Seaman' teaching with the steps of placing one of the ports in backup state; failure of the operational port causes the backup port to come on-line as suggested by Souza. The motivation is that such method of placing one of the ports in backup state; failure of the operational port causes the backup port to come on-line guarantees reliable communication. 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/market place incentives if the variations are predictable to one of ordinary skill in the art.

Regarding claims 2, 6, 15, 28, and 32, Backes teaches further comprising: transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port (see col. 10 lines 32-45).

Regarding claims 4, 17, 19, and 30, Backes teaches further comprising: transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port (see col. 7 lines 18-21).

Regarding claims 11, 24, and 37, Backes teaches further comprising: issuing an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router

selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port (see col. 7 lines 55-65).

Regarding claims 12, 25, and 38, Backes teaches further comprising: •executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router (see figure 2 box 220 and box 230 and col. 5 lines 13-39); transmitting a BPDU message by each port in forwarding state at each expiration of a hello timer for maintaining communication along links of the spanning tree (see col. 6 lines 10-15); transitioning, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods (see col. 6 lines 10- 15), the backup designated port to forwarding and transitioning the selected designated port to blocking (see col. 10 lines 32-45); and transitioning, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods (see col. 6 lines 10-15), the backup root port to forwarding and transitioning the selected root port to blocking (see col. 10 lines 32-45).

Regarding claims 13, 26, and 39, Backes teaches further comprising: detecting a BPDU message by a root port of the secondary root router (see col. 10 lines 14-22); transitioning, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router (see col. 10 lines 23-45).

Response to Arguments

4. Applicant's arguments, see pages 14-19 of the Remarks section, filed 7/17/2008, with respect to the rejections of the claims have been fully considered, but are moot in view of new ground of rejections presented in this office action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SALMAN AHMED whose telephone number is (571)272-8307. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Salman Ahmed/

Examiner, Art Unit 2419

Notice of References Cited	Application/Control No. 11/113,600	Applicant(s)/Patent Under Reexamination GAI ET AL.	
	Examiner SALMAN AHMED	Art Unit 2419	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-4,443,663 A	04-1984	Ellis et al.	379/191
*	B	US-4,447,673 A	05-1984	Elliott et al.	379/253
*	C	US-4,451,702 A	05-1984	Brightman et al.	379/193
*	D	US-4,471,169 A	09-1984	Lenk et al.	379/253
*	E	US-4,475,011 A	10-1984	Brightman et al.	379/253
*	F	US-4,479,034 A	10-1984	Brightman et al.	379/255
*	G	US-4,555,595 A	11-1985	Brightman et al.	379/284
*	H	US-5,351,146 A	09-1994	Chan et al.	398/58
*	I	US-5,377,180 A	12-1994	Laurent, Raymond	370/218
*	J	US-5,764,636 A	06-1998	Edsall, Tom	370/401
*	K	US-5,761,435 A	06-1998	Fukuda et al.	709/238
*	L	US-5,790,808 A	08-1998	Seaman, Michael J.	709/223
*	M	US-5,878,232 A	03-1999	Marimuthu, Peram	709/249

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N	EP 851634 A2	07-1998	European Patent	MARIMUTHU, PERAM	H04L 12/46
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Souza et al.: GIGAswitch System: A High-performance Packet-switching Platform- Digital Technical Journal, 1994
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 11/113,600	Applicant(s)/Patent Under Reexamination GAI ET AL.	
	Examiner SALMAN AHMED	Art Unit 2419	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2003/0110344 A1	06-2003	Szczepanek et al.	711/100
*	B	US-6,816,467 B1	11-2004	Muller et al.	370/256
*	C	US-6,976,088 B1	12-2005	Gai et al.	709/238
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	Ahmed, Salman	2419

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	04/13/2008	09/29/2008	10/17/2008						
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
	7	✓	-							
	8	✓	-							
	9	✓	-							
	10	✓	✓							
	11	✓	✓							
	12	✓	✓							
	13	✓	✓							
	14	✓	✓							
	15	✓	✓							
	16	✓	✓							
	17	✓	✓							
	18	✓	✓							
	19	✓	✓							
	20	✓	-							
	21	✓	-							
	22	✓	-							
	23	✓	✓							
	24	✓	✓							
	25	✓	✓							
	26	✓	✓							
	27	✓	✓							
	28	✓	✓							
	29	✓	✓							
	30	✓	✓							
	31	✓	✓							
	32	✓	✓							
	33	✓	-							
	34	✓	-							
	35	✓	-							
	36	✓	✓							

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	Ahmed, Salman	2419

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	04/13/2008	09/29/2008	10/17/2008						
	37	✓	✓							
	38	✓	✓							
	39	✓	✓							

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	Ahmed, Salman	2419

SEARCHED

Class	Subclass	Date	Examiner
370	256, 390, 432,	4/13/2008	WC

SEARCH NOTES

Search Notes	Date	Examiner
inventorship search	4/13/2008	WC
East search	4/13/2008	WC
consulted with SPE Edan Orgad	4/13/2008	WC
manual search for class 370/432	4/13/2008	WC
Updated Search	10/17/2008	SA

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L9	67	(port same fault state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 10:56
L15	31	((third adj port) and forward $4 and block$4) and cisco.asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 11:12
L16	4	((third adj port) and forward $4 and block$4).clm. and cisco.asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 11:12
L18	59	(back adj2 up adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 11:20
L19	1	((back adj2 up adj2 port) with designated) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 11:20
L20	2	"7283529".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 12:35
L21	32	LER.ti.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 12:41

L22	553	LER.ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 12:44
L23	1	(LER and table and ip).ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 12:44
L24	12	(LER and table).ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 12:45
S1	2	"5018137".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 14:18
S2	2	"6032194".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 14:48
S3	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 14:52
S4	1	"PP14234".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 14:57
S5	2	"6976088 ".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:06

S6	2	(S1 or S2 or S3 or S5) and (third adj port)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:07
S7	19	(port same root same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:13
S8	775	(port same state same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:27
S9	28	(port same state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:28
S12	3	(port same fault same state) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:39
S13	570	(port same fault same state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:40
S14	18	(port same fault same state same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:40
S15	76	(port same fault same state same active) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:42

S17	59	(back adj2 up adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:51
S19	38	("4811337" | "4922486" | "5018137" | "5138615" | "5150360" | "5280480" | "5323394" | "5398242" | "5400333" | "5606669" | "5740171" | "5742604" | "5761435" | "5764636" | "5790808" | "5844902" | "5878232" | "6081512" | "6202114").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 17:22
S20	6	(port same3 ((backadj2 up) with port) same3 block$3 same3 (activ$5 or (de adj2 activ$5)) same3 fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 17:37
S21	77	(port same (state with block $5) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 17:51
S22	4	(port same (state with block $5) same fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 17:51
S24	165	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 18:11
S25	7	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 18:11
S26	158	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (@rlad<"19971224" or @ad<"19971224") not S25	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 18:13

S27	9	((((stand adj2 by) or (back adj2 up) or redundant) adj2 port) same fail$5) and (@rlad<"19971224" or @ad<"19971224") not S25	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 18:15
S28	132	((((stand adj2 by) or (back adj2 up) or redundant) adj2 port)) and (@rlad<"19971224" or @ad<"19971224") not S25	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 18:18

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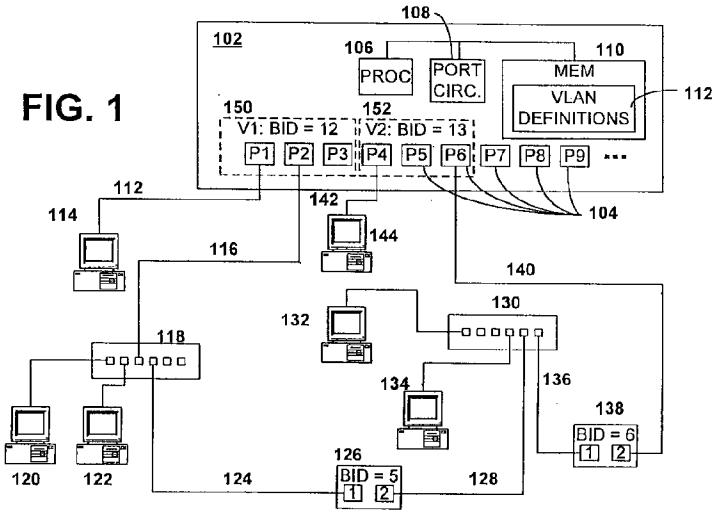
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(54) Method and apparatus for dynamically reconfiguring virtual lans of a network device

(57) A system and method of configuring VLANs of a multiple port bridging device by merging potentially conflicting VLANs is disclosed. One or more VLANs are first defined by the user, and equivalent and subset VLANs are merged. The spanning tree procedure is then performed to determine a root identifier and a root port for each VLAN. The root identifier of each VLAN is compared with the other VLANs, and if equal, the root ports of the two VLANs are compared. If the root identifiers are the same and if the root ports are different for any two VLANs, the two VLANs are merged into a new VLAN. To merge two VLANs, all of the ports of both VLANs are combined to define a new VLAN. Preferably, each VLAN is compared with every other VLAN in this manner. The spanning tree procedure is then executed for the new VLAN, which is then compared to the other VLANs in the same manner. Furthermore, if the root identifiers and the root ports are equal, then it is determined if any shared port of the two VLANs is blocked for one and not the other. If so, the two VLANs are merged into a new VLAN..

FIG. 1



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Description

The present invention relates generally to the field of networking devices, and more particularly to a system and method for method and apparatus for dynamically reconfiguring virtual LANs to obtain a functional spanning tree for efficient network operation.

There are many different types of networks and network systems for sharing files and resources for otherwise enabling communication between two or more computers. The term "network device" generally refers to a computer linked to a network via a network interface card (NIC), or to other devices that perform specialized functions in the network, such as repeaters or hubs, bridges, switches, routers and brouters, to name a few examples. Networks may be categorized based on various features and functions, such as message capacity, range over which nodes are distributed, node or computer types, node relationships, topology or logical and/or physical layout, architecture or structure based on cable type and data packet format, access possibilities, etc. For example, the range of a network refers to the distance over which nodes are distributed, such as local-area networks (LANs) within an office or floor of a building, wide-area networks (WANs) spanning across a college campus, or a city or a state and global-area networks (GANs) spanning across national boundaries.

A network may be expanded by using one or more repeaters, bridges, switches or similar type devices. A repeater is a device that moves all packets from one network segment to another by regenerating, re-timing, and amplifying the electrical signals. A bridge is a device that operates at the Data-Link Layer of the OSI (Open Systems Interconnection) Reference Model and passes packets from one network to another and increases efficiency by filtering packets to reduce the amount of unnecessary packet propagation on each network segment. A switch is a network device similar in function to a multiple port bridge, but includes a plurality of ports for coupling to several similar networks for directing network traffic among the networks. A repeater or a switch may also include a second set of ports for coupling to higher speed network devices, such as one or more uplink ports.

Expansion of a network often results in loops that cause undesired duplication and transmission of network packets, such as broadcast storms, as well as address conflict problems. A standard spanning tree procedure has been defined for network bridging devices, such as bridges, routers and switches, to enable the bridging devices of a network to dynamically discover a subset of any topology that forms a loop-free or "spanning" tree. A spanning tree procedure by the American National Standards Institute and the Institute of Electrical and Electronics Engineers, Inc is published in a specification known as the ANSI/IEEE Std. 802.1D. The spanning tree procedure results in a network path between any two devices in the network system, which is updated dynamically in response to modifications of the network system. Each bridging device transmits configuration messages, otherwise referred to as configuration bridge protocol data units (BPDUs), which are used by other bridging devices in the network to determine the spanning tree. The configuration messages used to determine the spanning tree are based on 48-bit media-access control (MAC) addresses, which, according to industry standards, are guaranteed to be unique. The bridging device having the lowest MAC address is selected as the root of the spanning tree, and the other bridging devices determine a cost, or distance away from, the root device.

Some bridging devices, such as multiple port bridges, switches, routers or the like include the capability for a user to define one or more virtual LANs (VLANs). Separate VLANs enable separate address space to be associated with each VLAN. The user or network administrator defines one or more VLANs by grouping one or more ports together in a VLAN definition, where the bridging device effectively separates each VLAN from the other ports. One or more ports may be shared among two or more VLANs, which causes traffic to flow between the VLANs with shared ports. Such shared ports are allowed, but may cause looping problems, address conflicts and/or broadcast storms. Also, the user may intentionally or inadvertently connect two or more ports of two mutually-exclusive VLANs together through external hardware forming an external loop. Such loops are not necessarily handled by the standard spanning tree procedure and may result in undesired packet duplication and transmission, address conflicts or broadcast storms.

It is desired to detect problematic links or loops in VLAN definitions and hardware connections, respectively, that would otherwise cause network problems and undermine the purpose of the spanning tree. It is further desired to modify the network configuration to result in a trouble-free and functional network system.

A method according to the present invention of configuring VLANs of a multiple port bridging device, includes steps of predefining a plurality of VLANs, performing the spanning tree procedure to determine a root identifier and a root port for each VLAN, comparing the root identifier of each VLAN with at least one other VLAN, and if the root identifier of any two VLANs are equal, comparing the root ports of the two VLANs, and if the root identifiers are the same and if the root ports are different for any two VLANs, merging the two VLANs into a new VLAN. Preferably, each VLAN is compared with every other VLAN in this manner. To merge the VLANs, all of the ports of both VLANs are combined to define the new VLAN. The spanning tree procedure is then executed for the new VLAN, which is then compared to the other VLANs in the same manner. Also, any predefined VLANs that are equivalent to each other are merged, and any subset VLANs are merged with larger VLANs that include all of the ports of the respective subset VLANs. If the root identifiers and the root ports are equal, a method according to the present invention may further include steps of determining if

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any shared port of the two VLANs is blocked for one and not the other, and if so, merging the two VLANs into a new VLAN.

A network device according to the present invention includes a plurality of ports, a VLAN definition circuit that defines a plurality of VLANs by grouping one or more of the ports, spanning tree circuitry that determines a spanning tree definition for each of the VLANs including determination of a root identifier and a root port, and processing circuitry that compares the spanning tree definition of the VLANs, and that merges any two VLANs if the root identifier of both are the same and if the root port of both of the two VLANs are not the same. The processing circuitry further merges two VLANs if the root identifier and the root port of both VLANs are the same and if a shared port is blocking for one and not blocking for the other. The processing circuitry merges VLANs by determining a new VLAN that includes all the ports of the merged VLANs. The circuitry of the network device, including the spanning tree circuitry, the processing circuitry and the VLAN definition circuit comprises a processor, memory and port circuitry coupled together in any desired and suitable fashion for performing the network functions.

It is appreciated that a method and apparatus for dynamically reconfiguring virtual LANs of a network device prevents network problems, such as looping data packets, address conflicts and/or broadcast storms, that would otherwise result from the given VLAN definition and/or the particular network configuration. Such VLAN merging prevents network problems intended to be addressed by the spanning tree procedure, but re-introduced with the VLAN definition or hardware configuration. Conflicts arising any two VLANs not resolved by the standard spanning tree procedure are resolved by merging the VLANs into one and recalculating a spanning tree for the new VLAN. Such merging eliminates the potential problems to achieve a working network without introducing any new network problems. The management information base (MIB) may be extended to reflect the original VLAN definitions and the results of any VLAN mergers. A user or network administrator may reconfigure the VLANs or the hardware as desired.

A better understanding of the present invention can be obtained when the following detailed description of the preferred embodiment is considered in conjunction with the following drawings, in which:

Figure 1 is a block diagram illustrating a network system including a multiple port network device implemented according to the present invention;

Figure 2 is a simplified block diagram illustrating the network device of Figure 1 with a VLAN definition showing a subset VLAN;

Figure 3 is a simplified block diagram illustrating the network device of Figure 1 with a VLAN definition showing VLANs with a shared port and different root ports;

Figure 4 is a simplified block diagram illustrating the network device of Figure 1 with a VLAN definition showing VLANs with a shared port and the same root port;

Figure 5 is a simplified block diagram illustrating the network device of Figure 1 with a VLAN definition showing VLANs with multiple shared ports, the same root port and one shared port with different status for the VLANs;

Figure 6 is a simplified block diagram illustrating the network device of Figure 1 with a VLAN definition showing multiple VLANs with a shared ports;

Figure 7 is a flowchart diagram illustrating a reconfiguration procedure implemented according to the present invention;

Figure 8 is a simplified block diagram illustrating the network device of Figure 1 with the original VLAN definitions of Figure 3 merged into a new VLAN definition; and

Figure 9 is a simplified block diagram illustrating the network device of Figure 1 with the original VLAN definitions of Figure 5 merged into a new VLAN definition.

Referring now to Figure 1, a block diagram is shown of a network system 100 including a multiple port network device 102 implemented according to the present invention, which has a plurality of ports 104 labeled P1, P2, P3, ... P*n*. The network device 102 may have as many ports 104 as desired, where each port 104 operates according to any type of network protocol, such as Ethernet or the like. Also, the ports 104 may include some ports operating according to one protocol and others operation according to a different protocol. For example, several of the ports 104 may operate at 10 megabits per second (Mbps) according to Ethernet 10Base-T while the remaining ports operate at 100 Mbps according to Ethernet 100Base-TX. The ports 104 enable connection of the network device 102 to a plurality of other network devices through network segments, such as twisted-pair cables, fiber optic cables, coaxial cables, etc. or even wireless connections as known to those skilled in the art. The other network devices include bridges, switches, repeaters, routers, brouters, etc., or any type of Data Terminal Equipment (DTE) device, which is any source or destination of data including a computer system with a network interface card (NIC) or the like.

The network device 102 is preferably a multiple port bridge or switch, which includes processing logic or a processor 106, port circuitry 108 and memory 110, which includes any combination of non-volatile and programmable memory, such as read only memory (ROM), random access memory (RAM), etc. The processor 106, the port circuitry 108 and the memory 110 may be implemented and coupled in any desired manner. For example, the memory 110 may be

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a central memory and coupled to both the processor 106 and the port circuitry 108 as desired, or the memory 110 is distributed within the network device 102, such as separate memory modules for the processor 106, the port circuitry 108 and even for any one or more of the individual ports P1-P*n*.

The processor 106 generally performs the processing functions and procedures including initialization and configuration of the network switch 102. The processor 106 executes routines stored the memory 110 for performing its various functions. For example, the processor 106 performs the spanning tree functions according to the ANSI/IEEE Std. 802.1D standard, including initialization procedures according to section 4.7.1 and spanning tree configuration according to section 4.8.1. The processor 106 also performs ongoing management functions during operation, including dynamically reconfiguration of virtual LAN (VLAN) definitions according to the present invention as described more fully below. The port circuitry 108 is coupled to each of the ports 104 for controlling packet data flow between the ports 104 and for enabling the processor 106 to control operation of the ports 104 as desired.

The memory 110 includes a programmable VLAN definition section 112 for defining any grouping of the ports 104 as desired. The processor 106 executes routines for assisting a user or system administrator to program the memory 110. As shown in Figure 1, at least two separate VLANs are defined, including a VLAN V1 150 including ports P1, P2 and P3, and a VLAN V2 152 including ports P4, P5 and P6. Thus, the VLANs V1 and V2 include mutually-exclusive sets of the ports 104. In the preferred embodiment, the VLAN definition section 112 includes a VLAN port mask for each port, where each port mask includes a bit for every port of the network device 102. A bit in the port mask is set to a logic high level (such as logic one) to include the respective port in a VLAN and cleared to a logic low level (such as logic zero) to mask the port. In this manner, each port's port mask defines a VLAN for that port by identifying every other port 104 belonging in the same VLAN group. Of course, each port 104 may be defined as its own VLAN, or all of the ports 104 may be included in one global VLAN.

A network segment 112 couples a DTE device 114 to port P1. A network segment 116 couples a network device 118 to port P2. The network device 118 is preferably a repeater or the like with multiple ports for coupling one or more DTE devices 120, 122 via separate network segments. One port of the repeater 118 is coupled to one port of another network device 126 through a network segment 124. The network device 126 is a bridge, which includes another port coupled to another repeater 130 via a network segment 128. The repeater 130 couples one or more DTE devices 132, 134 through separate network segments, and is coupled to one port of another bridge 138 via a network segment 136. The bridge 138 includes another port coupled to port P6 of the network device 102 via a network segment 140. A DTE device 144 is coupled to port P4 through a network segment 142. The configuration shown in Figure 1 illustrates a hardware loop between ports P2 and P6 of the network device 102, where the hardware loop includes the devices 118, 126, 130 and 138 and the network segments 116, 124, 128, 136 and 140.

Figure 2 is a simplified block diagram illustrating the network device 102 with a different VLAN definition. In particular, a first VLAN V1 202 includes ports P1, P2 and P3 and a second VLAN V2 204 includes ports P1-P6. In this manner, V1 is a subset of V2. A subset VLAN definition may cause problems if any of the shared ports P1, P2 or P3 are configured as blocking for one VLAN and non-blocking (listening/learning/forwarding) for another. For each port 104 and for each VLAN definition, the network device 102 determines a port status based on user-defined parameters and the results of the spanning tree operation. If a port is blocked, then the network device 102 generally ignores any data packets received at the port and does not send any data packets via that port. A port is set to a listening status mode during configuration to send and receive configuration packets, otherwise known as bridge protocol data units (BPDUs). A port is set to a learning status mode to perform the learning bridge functions of examining and storing network addresses of devices coupled to the port. A port is set to a forwarding mode for sending and receiving data packets.

Figure 3 is another simplified block diagram of the network device 102 with another VLAN definition, where a VLAN V1 302 includes ports P1-P4 and a VLAN V2 304 includes ports P4-P7. In this manner, port P4 is shared between both VLANs V1 and V2. Ports P2 and P5 are coupled to an external network 306, which includes a bridge device 308 with a simplified bridge identifier (ID) of 5. Normally, each bridging device is assigned at least one bridge ID (or BID in the Figures), which is an industry-wide, 48-bit unique address. The network switch 102 has assigned a bridge ID of 12 to VLAN V1 and a bridge ID of 13 to V2. If the bridge ID of 5 of the bridge device 308 is the lowest according to the spanning tree procedure, then the bridge device 308 is the ROOT bridge for the network 306 including the network device 102. Port P2 becomes the ROOT port for the VLAN V1 and port P5 becomes the ROOT port for the VLAN V2 of the network device 102. Since V1 and V2 have a shared port and different root ports, a loop exists across the VLANs V1 and V2, which further causes potential problems, such as duplicate packets, address conflicts, broadcast storms, etc.

Figure 4 is another simplified block diagram of the network device 102 with the same VLAN definition shown in Figure 3, where V1 includes ports P1-P4 and V2 includes ports P4-P7. However, the network system 306 is coupled to the shared port P4. Thus, port P4 becomes the ROOT port for both VLANs V1 and V2.

Figure 5 is another simplified block diagram of the network device 102 with another VLAN definition, where a VLAN V1 502 includes ports P1-P5 and a VLAN V2 504 includes ports P3-P7. In this case, the ports P3-P5 are shared among the VLANs V1 and V2. After initialization and configuration, port P3 is determined to be the ROOT port for both V1 and V2. Port P4 is configured as blocking for both V1 and V2 as shown with an "X" symbol therein. However, port P5 is set

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to blocking for V1 and forwarding for V2. Although it is generally allowed that two or more ports be shared among several VLANs, network problems arise if a shared port is blocking for one VLAN and not blocking for any other one of the sharing VLANs.

Figure 6 is another simplified block diagram of the network device 102 yet with another VLAN definition, where a VLAN V1 602 includes ports P2-P4, a VLAN V2 604 includes ports P3-P7 and a VLAN V3 606 includes ports P4, P8 and P9. In this manner, port P3 is shared between VLANs V1 and V2, and port P4 is shared between all three VLANs V1-V3. In general, such multiple port sharing is allowed, but may cause problems as previously described with configurations according to the standard spanning tree procedure. For example, address conflict and/or duplicate packet problems arise if port P3 is blocking for V1 and forwarding for V2.

Figure 7 is a flowchart diagram illustrating a reconfiguration procedure performed by the network device 102 to overcome any of the VLAN configuration problems described above. The reconfiguration procedure modifies the user-defined VLAN definitions, as performed by the processor 106; the port circuitry 108, or any combination thereof. At a first step 702, the VLAN assignments are read from the memory 110, such as defined in the VLAN definition section 112. At next step 704, any equivalent VLANs are merged together, where equivalent VLANs are those having the same port assignments. Also, any subset VLANs are merged together with their corresponding superset VLANs. Two VLANs V*i* and V*j* are merged according to the following equations (1) and (2):

$$V i' (\text{fwd\_mask}) := V i (\text{fwd\_mask}) \text{ OR } V j (\text{fwd\_mask}) \quad (1)$$

$$V j' (\text{fwd\_mask}) := V j (\text{fwd\_mask}) \text{ OR } V i (\text{fwd\_mask}) \quad (2)$$

where fwd_mask denotes the port mask of the indicated VLAN, the VLANs V*i*' and V*j*' are the "new" VLAN definitions, the ":=" operator means "set equal to", and the "OR" operator is the logic OR bit-wise operation. As indicated by the equations (1) and (2), the new VLAN definitions are the same for both new VLANs, and includes a superset of the ports of the original VLAN definitions. Once merged, only one of the VLAN assignments is active and used for purposes of determining the spanning tree, while the other VLAN definition is kept in the management information base (MIB) of the network device 102 for management purposes, but is not used for purposes of determining the spanning tree. The port mask assignments of each of the affected ports is modified in the VLAN definitions 112, where the new VLAN port mask definition is used for each affected and included port. It is also noted that the original VLAN definitions are also kept for purposes of network management.

Using Figure 2 as an example, V1 has a port mask fwd_mask = 000007h (where "h" denotes hexadecimal notation) and V2 has a port mask fwd_mask = 00003Fh. After the merge operation, the port masks for both of the new VLANs V1' and V2' is fwd_mask = 00003Fh. The new port mask definition V1' is active and used for purposes of the spanning tree, and the "new" port mask definition for V2' is kept for purposes of management, marked as a merged VLAN, but is not active and thus is not used for determining the spanning tree. The port masks for each of the ports P1-P6 are also set equal to the new fwd_mask = 00003Fh.

At next step 706, the network device 102 assigns a unique bridge ID for each active VLAN. At next step 708, each port of each active VLAN is initialized according to the spanning tree initialization procedure as defined in section 4.8.1 of ANSI/IEEE Std. 802.1D. At next step 710, the spanning tree configuration procedure as defined in section 4.7.1 of ANSI/IEEE Std. 802.1D is performed for each port of each active VLAN. After the configuration procedure according to the standard spanning tree procedure, each VLAN has been assigned a root identifier (ROOT ID) and a ROOT port. For example, as shown in Figure 3, the VLAN V1 is assigned a ROOT ID of 5 and port 2 is its ROOT port, and the VLAN V2 is assigned a ROOT ID of 5 and port 5 is its ROOT port.

At next steps 712 and 714, each active VLAN is compared with every other VLAN to identify any potential network problems as previously described. Any problematic pair of VLANs are merged into a new VLAN definition as described below, and the new VLAN is then compared with every remaining VLAN until all remaining and active VLANs have been tested and configured. At step 714, a new pair of active VLANs are selected. At next step 716, the ROOT ID of the selected VLANs are compared. If the ROOT IDs of the selected pair are not equal, operation returns to step 712 to select another pair of active VLANs. In the case of unequal ROOT IDs, the two VLANs are not linked together and contains no problematic loops, and thus the spanning tree is satisfactory. If, however, the ROOT IDs of the selected pair are equal, operation proceeds to step 718, where it is queried whether the ROOT ports of the selected pair are equal. If the ROOT IDs of the selected pair are equal but the ROOT ports are not, as illustrated in Figure 3, operation proceeds to step 722 to merge the two VLANs.

The equations (1) and (2) provided above are used to merge the two VLANs in step 722. For example, as shown in Figure 3, the VLAN V1 has a port mask fwd_mask = 00000Fh and the VLAN V2 has a port mask fwd_mask = 000078h. Each of the new VLANs V1' and V2' have a new port mask fwd_mask = 00007Fh as a result of the merge operation. As described above, the VLAN V1' is selected for continued spanning tree operations and the VLAN V2' is marked as merged and not used. The port mask definitions for each of the ports P1-P7 are modified and set equal to

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00007Fh, and the resulting VLAN V1' 802 is shown in Figure 8. At next step 724, a bridge ID is assigned for the new VLAN V1', which may be a completely new bridge ID or one of the bridge IDs assigned to the original VLANs V1 and V2. As shown in Figure 8, the new VLAN V1' is assigned the bridge ID = 12 of the original VLAN V1. At next step 726, all of the ports of the new VLAN are initialized in a similar manner as described for step 708, and the spanning tree configuration for the new VLAN is performed in a similar manner as described for step 710.

As shown in Figure 8, the new configuration for the new VLAN V1' results in one of the ROOT ports to be selected as the ROOT port for the new VLAN V1' 802, since only one ROOT port may be selected for any given VLAN. From step 728, operation returns to step 712 to compare another pair of VLANs, where the new VLAN is also eventually compared with every other VLAN. Referring back to step 718, if the ROOT IDs and the ROOT ports are equal, such as shown in Figures 4 and 5, operation proceeds to step 720. At step 720, it is queried whether any shared port is blocked for one VLAN and not for any other VLAN. If not, such as shown in Figure 4, then operation returns to step 712 to select another pair of VLANs for comparison. If, however, a shared port is blocked for one VLAN and not for another, such as the port P5 of the configuration shown in Figure 5, then operation proceeds to step 722 to merge the VLANs. For example, in Figure 5, the port P5 is blocked for VLAN V1 but is in the forwarding state for the VLAN V2. In this case, the VLANs V1 and V2 are merged resulting in a new VLAN V1' 902, as shown in Figure 9. After the initialization and configuration steps 726, 728 are performed, the ROOT port is likely to remain the same depending upon the bridge ID assigned to the new VLAN. The port originally having different status settings for different VLANs, which was the port P5 in Figure 5, is given a new status setting, such as forwarding, blocking, etc., for the new VLAN V1' shown in Figure 9.

After all of the active VLANs and newly merged VLANs have been compared as determined in step 712, operation is complete for the original VLAN definition. In one embodiment, however, the VLAN definition may be modified during operation. If the VLAN definitions are reconfigured during operation, the procedure shown in Figure 7 is repeated for each new VLAN defined, and for each new VLAN as a result of merged VLANs, if any.

A bridge MIB (RFC 1493) for the network device 102 may be extended for management purposes as desired. The bridge MIB is preferably stored in the memory 110. The MIB extensions enables a user or network administrator to determine merged VLANs and reconfigure the VLAN definitions or make hardware modifications as desired. An example of possible MIB extensions are as follows:

1. *dot1dBase* group base extensions, which include the bridge address, number of ports present in the bridge etc.

2. *dot1dStp* group extensions to cover all the virtual bridges and their spanning trees.

3. *dot1dTp* group for each virtual bridge

4. *dot1dStatic* group extensions if Static addresses have to be configured on a VLAN basis.

An example VLAN Management MIB is as follows:

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```
-- VLAN Config Table
-- This table is used to statically configure N VLANs at
-- initialization. The vlanPortConfigTable is then used
-- to add/delete ports to this VLAN.


vlanConfigTable     OBJECT-TYPE
    SYNTAX      SEQUENCE OF vlanConfigEntry
    ACCESS      not-accessible
    STATUS      mandatory
    DESCRIPTION
    "A table containing a list of VLANS configured for this
    device."
    ::= { vlanConfigConfig 2 }

vlanConfigEntry     OBJECT-TYPE
    SYNTAX      VlanConfigEntry
    ACCESS      not-accessible
    STATUS      mandatory
    DESCRIPTION
    "A list of VLANs, their Ids etc."
    INDEX { vlanConfigIndex }
    ::= { vlanConfigTable 1 }

VlanConfigEntry ::= SEQUENCE {
    vlanIfIndex               INTEGER,
    vlanConfigBridgeAddress   MacAddress,
    vlanConfigNumofEntries    INTEGER,
    vlanConfigReconfigStatus  INTEGER,
    vlanConfigReconfigCookie  INTEGER,
    vlanConfigName        DisplayString

    }

vlanIndex       OBJECT-TYPE
    SYNTAX          INTEGER
    ACCESS          read-only
    STATUS          mandatory
    DESCRIPTION
    "The unique identifier for this VLAN configuration
entry."
```

```
    ::= { vlanConfigEntry 1 }

vlanConfigBridgeAddress  OBJECT-TYPE
    SYNTAX      MacAddress
    ACCESS      read-only
    STATUS      mandatory
    DESCRIPTION
     " The MAC address that is used by this VLAN. It is taken
from the pool of addresses available for the bridge. "
    ::= { vlanConfigEntry 2 }

vlanConfigNumofEntries        OBJECT-TYPE
    SYNTAX      INTEGER
    ACCESS      read-only
    STATUS      mandatory
    DESCRIPTION
    " The total number of ports configured for this VLAN.
    Please note that this number includes only number of
    ports configured by the user. If VLANs are merged, the
    total number of ports present in a VLAN will be different
    from this number "
    ::= { vlanConfigEntry 3 }


vlanConfigReconfigStatus OBJECT-TYPE
    SYNTAX      INTEGER{
                userDefined(1),
                reconfigured(2)
                }
    ACCESS      read-only
    STATUS      mandatory
    DESCRIPTION
     " This Object indicates if VLAN merging has occurred. If
     the value of this object is reconfigured(2), then the
     vlanConfigReconfigCookie provides a unique means of
     identifying all VLAN entries that have been merged"
    ::= { vlanConfigEntry 4 }

vlanConfigReconfigCookie OBJECT-TYPE
    SYNTAX      INTEGER
    ACCESS      read-only
    STATUS      mandatory
    DESCRIPTION
     " A unique value that identifies all VLAN entries that
     have been merged "
    ::= { vlanConfigEntry 5 }


vlanConfigName OBJECT-TYPE
    SYNTAX      DisplayString
    ACCESS      read-write
```


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```
        STATUS      mandatory
        DESCRIPTION
         " A textual description field for this VLAN. "
        ::= { vlanConfigEntry 6 }

    vlanPortConfigTable OBJECT-TYPE
        SYNTAX      SEQUENCE OF vlanPortConfigEntry
        ACCESS      not-accessible
        STATUS      mandatory
        DESCRIPTION
        "A table containing a list of ports configured for a
    VLAN."
        ::= { vlanConfig 2 }

    vlanPortConfigEntry OBJECT-TYPE
        SYNTAX      VlanPortConfigEntry
        ACCESS      not-accessible
        STATUS      mandatory
        DESCRIPTION
        "A list of ports, their Ids etc."
        INDEX { vlanPortVlanIndex, vlanPortIndex }
        ::= { vlanConfigTable 1 }

    -- VLAN Port Config Table
    -- This table is used to add/remove ports from a VLAN

    VlanPortConfigEntry ::= SEQUENCE {
        vlanPortVlanIndex              INTEGER,
        vlanPortIndex         INTEGER,
        vlanPortName          DisplayString,
        vlanPortConfigStatus EntryStatus
        }

    vlanPortVlanIndex         OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-only
        STATUS          mandatory
        DESCRIPTION
        "The index of the VLAN. This value is the same as the
        value of vlanIndex in the vlanConfigTable."
        ::= { vlanPortConfigEntry 1 }

    vlanPortIndex  OBJECT-TYPE
        SYNTAX          INTEGER
        ACCESS          read-only
        STATUS          mandatory
        DESCRIPTION
        "The port number of the port that is a member of this
        VLAN. This value should be the same as the if Index value
        for this interface"
        ::= { vlanPortConfigEntry 2 }
```


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```
vlanPortName    OBJECT-TYPE
    SYNTAX      DisplayString
    ACCESS      read-write
    STATUS      mandatory
    DESCRIPTION
     " A textual description place-holder for this port. "
    ::= { vlanPortConfigEntry 3 }

vlanPortConfigStatus      OBJECT-TYPE
   SYNTAX EntryStatus
   ACCESS read-write
   STATUS mandatory
   DESCRIPTION
     "The row control mechanism for this entry. "
   ::= { vlanPortConfigEntry 4}
-- Reset Reconfiguration
-- Starts reinitialization of All VLANs whose port masks have
merged

vlanConfigResetReconfig  OBJECT-TYPE
    SYNTAX      INTEGER{
          invalid (1),
          reset (2)
          }
    ACCESS      read-write
    STATUS      mandatory
    DESCRIPTION
     "Setting this value to reset(2) will restart spanning
     tree process on all merged VLANS. "
    ::= { vlanConfig 3 }

--  Traps

vlanConfigReconfig TRAP-TYPE
    ENTERPRISE   vlanConfig
    VARIABLES   {vlanConfigReconfigCookie,
vlanIfIndex(first), vlanIfIndex(second)….}
    DESCRIPTION
    "A vlanConfigReconfig TRAP is sent to the management
    station when the bridge reconfigures the port masks after
    it detects a VLAN misconfiguration"
        ::= 1
```

It is now appreciated that a method and apparatus for dynamically reconfiguring virtual LANs of a network device prevents network problems, such as looping data packets, address conflicts and/or broadcast storms, caused by particular VLAN definitions and/or hardware configuration. Equivalent and subset VLANs are first combined since they could potentially cause network problems. The spanning tree procedure is then performed, including initialization and configuration. After the initial spanning tree procedure is performed, the VLANs are compared to identify problematic configurations. Mutually-exclusive VLANs with the same root identifier have been connected together externally forming a loop, so that the VLANs are merged. VLANs with shared ports having different root ports are also merged. VLANs with shared ports and the same root port are merged if any shared port is blocking for one VLAN and not the other. Such VLAN merging prevents network problems that are not addressed by the spanning tree procedure because of overlap-

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ping VLAN definitions and/or hardware configurations. Also, VLAN merging results in a working network without introducing new problems.

Although a system and method according to the present invention has been described in connection with the preferred embodiment, it is not intended to be limited to the specific form set forth herein, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents, as can be reasonably included within the spirit and scope of the invention as defined by the appended claims.

Claims

1. A method of configuring virtual LANs of a multiple port bridging device, comprising the steps of:

   predefining a plurality of virtual LANs by grouping ports together for each predefined virtual LAN;
   performing a spanning tree procedure to determine a root identifier and a root port for each virtual LAN;
   comparing the root identifier of each virtual LAN with at least one other virtual LAN;
   if the root identifier of any two virtual LANs are equal, comparing the root ports of the two virtual LANs; and
   if the root identifiers are the same and if the root ports are different for any two virtual LANs, merging the two virtual LANs into a new virtual LAN.

2. The method of claim 1, wherein said step of merging comprises the step of combining all of the ports of the two virtual LANs to form the new virtual LAN.

3. The method of claim 1, prior to said step of performing a spanning tree procedure, further comprising the step of:

   merging any predefined virtual LANs that are equivalent; and
   merging any predefined virtual LANs that is a subset of a larger virtual LAN with the larger virtual LAN.

4. The method of claim 1, after said step of merging, further comprising the step of:

   performing a spanning tree procedure for the new virtual LAN.

5. The method of claim 4, further comprising the steps of:

   comparing the root identifier of the new virtual LAN with at least one other virtual LAN;
   if the root identifier of the new virtual LAN is the same as the root identifier of any other virtual LAN, comparing the root ports of the two virtual LANs; and
   if the root identifiers are the same and if the root ports are different for the two virtual LANs, merging the two virtual LANs into another new virtual LAN.

6. The method of claim 4, further comprising the steps of:

   comparing the root identifier of the new virtual LAN with at least one other virtual LAN;
   if the root identifier of the new virtual LAN is the same as the root identifier of any other virtual LAN, comparing the root ports of the two virtual LANs;
   if the root identifiers and the root ports are the same for the two virtual LANs, determining if any shared port of the two virtual LANs is blocked for one of the two virtual LANs and not the other; and
   if a shared port of the two virtual LANs is blocked for one of the two virtual LANs and not the other, merging the two virtual LANs into another new virtual LAN.

7. The method of claim 1, further comprising the steps of:

   if the root identifiers and the root ports are the same for any two virtual LANs, determining if any shared port of the two virtual LANs is blocked for one of the two virtual LANs and not the other; and
   if a shared port of the two virtual LANs is blocked for one of the two virtual LANs and not the other, merging the two virtual LANs into a new virtual LAN.

8. A network device, comprising:

   a plurality of ports;

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a virtual LAN definition circuit that defines a plurality of virtual LANs of said plurality of ports;

spanning tree circuitry coupled to said virtual LAN definition circuit that determines a spanning tree definition for each of said plurality of virtual LANs including determination of a root identifier and a root port; and

processing circuitry coupled to said spanning tree circuitry and said virtual LAN definition circuit that compares said spanning tree definition of each of said plurality of virtual LANs with at least one other of said plurality of virtual LANs, and that merges any two virtual LANs if said root identifier of both of said any two virtual LANs are the same and if said root port of both of said two virtual LANs are not the same.

9. The network device of claim 8, further comprising:

said processing circuitry further merges said any two virtual LANs if said root identifier and said root port of both of said any two virtual LANs are the same and if a shared port between said any two virtual LANs is blocking for one and not blocking for the other.

10. The network device of claim 8, further comprising:

said processing circuitry merging said any two virtual LANs by determining a new virtual LAN that includes all the ports of both of said any two virtual LANs.

11. The network device of claim 8, wherein said spanning tree circuitry comprises:

a processor;
memory coupled to said processor; and
port circuitry coupled to said processor.

12. The network device of claim 8, wherein said processing circuitry comprises a processor coupled to memory.

13. The network device of claim 8, wherein said processing circuitry operates the network device as a network switch.

14. A network system, comprising:

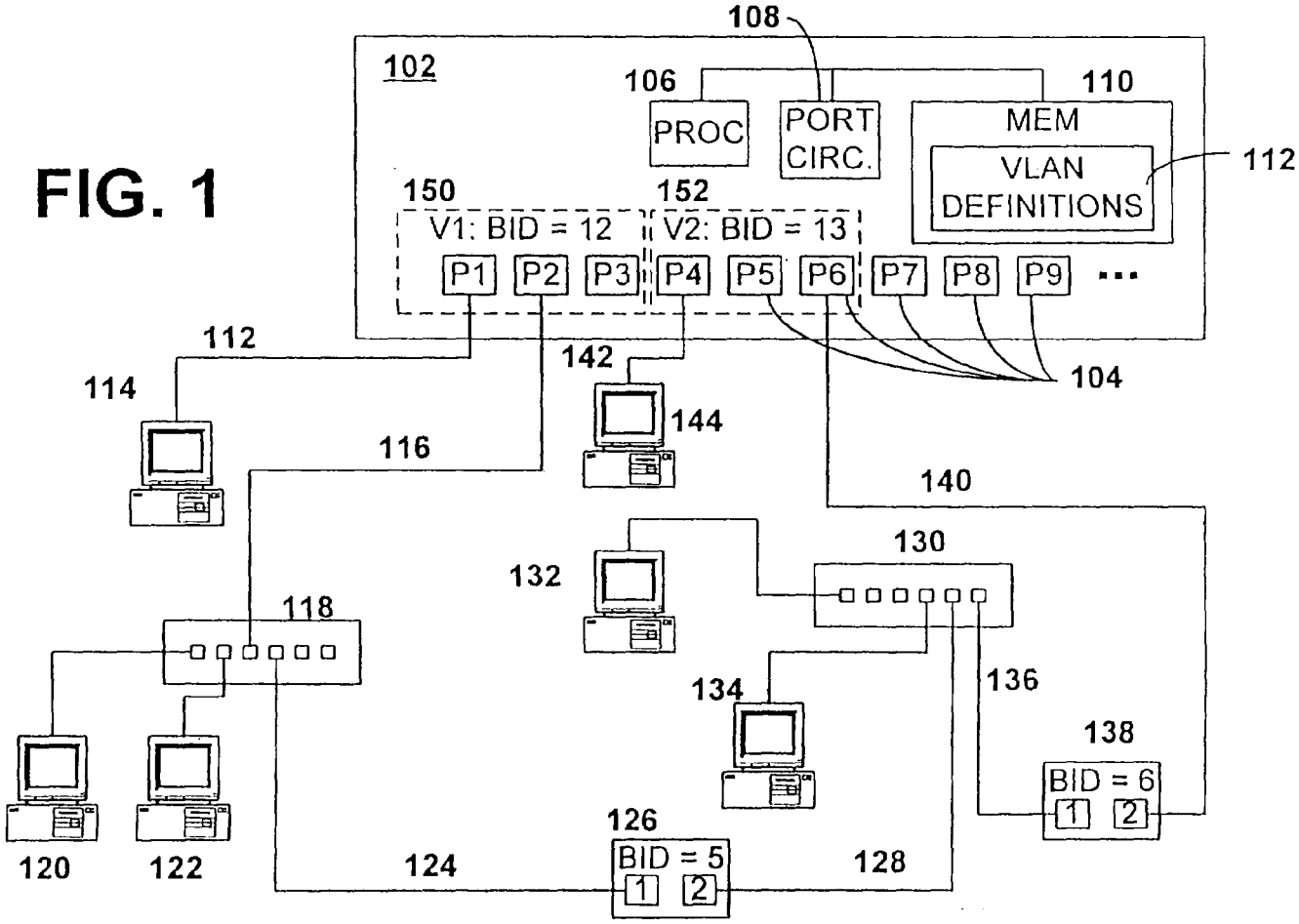
a multiple port bridging device, comprising:

a plurality of ports;
a virtual LAN definition circuit that defines a plurality of virtual LANs of said plurality of ports;
spanning tree circuitry coupled to said virtual LAN definition circuit that determines a spanning tree definition for each of said plurality of virtual LANs including determination of a root identifier and a root port; and
processing circuitry coupled to said spanning tree circuitry and said virtual LAN definition circuit that compares said spanning tree definition of each of said plurality of virtual LANs with at least one other of said plurality of virtual LANs, and that merges any two virtual LANs if said root identifier of both of said any two virtual LANs are the same and if said root port of both of said two virtual LANs are not the same and if said root identifier and said root port of both of said any two virtual LANs are the same and if a shared port between said any two virtual LANs is blocking for one and not blocking for the other; and

a plurality of network devices coupled to said multiple port bridging device through at least one of said plurality of ports.

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FIG. 1



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FIG. 2

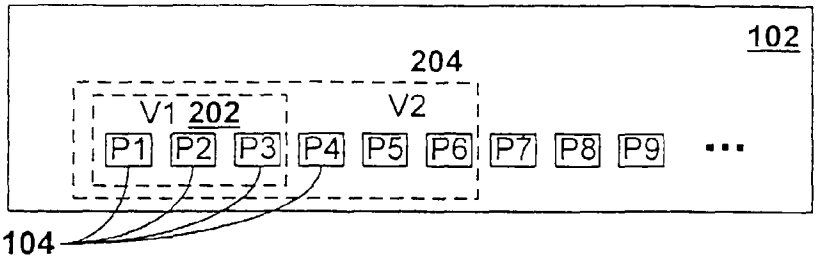


FIG. 3

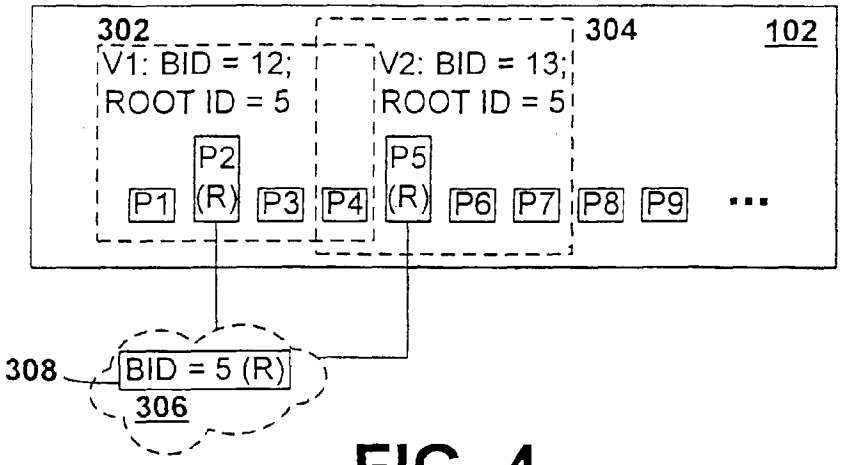
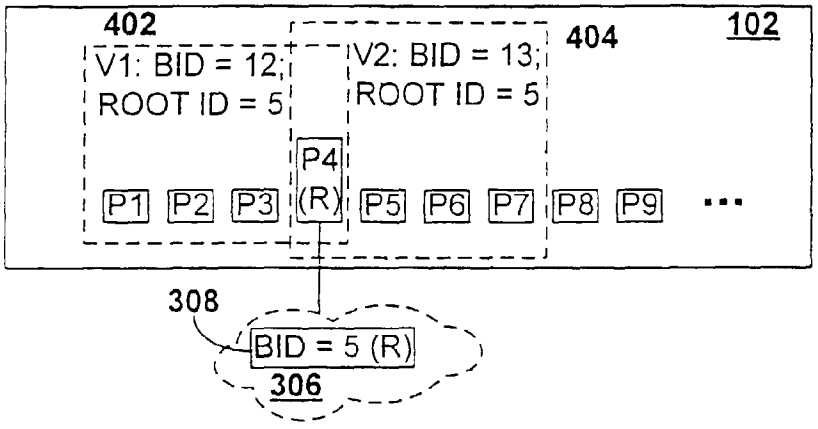


FIG. 4



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FIG. 5

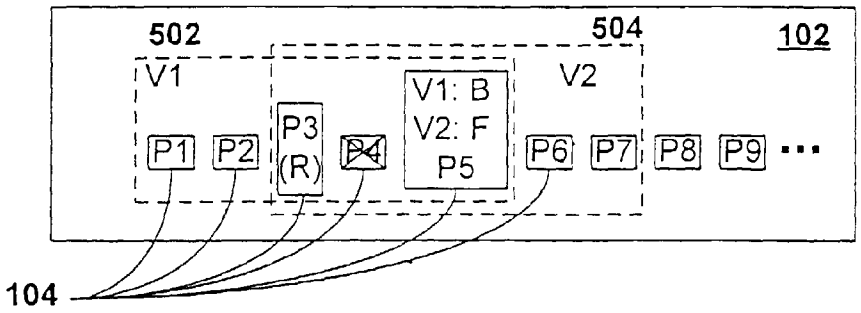
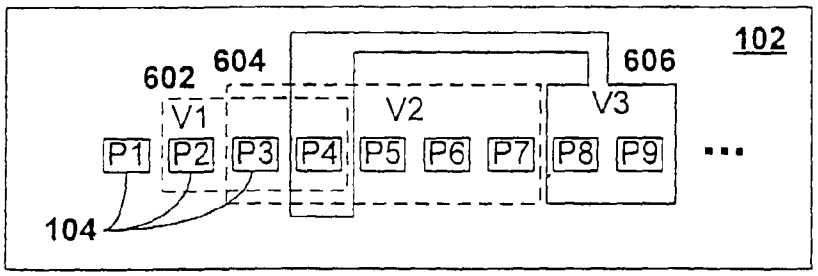


FIG. 6



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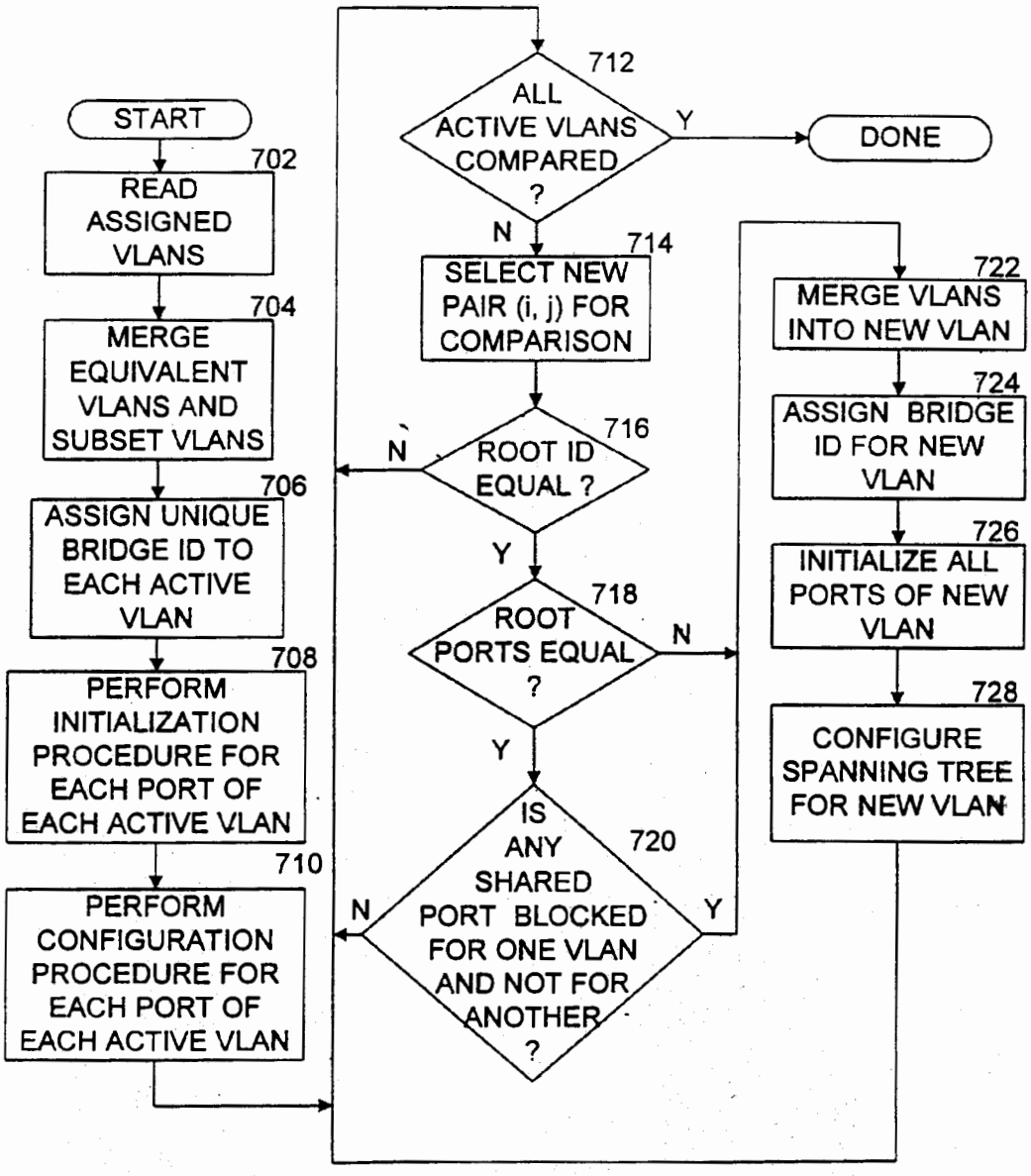


FIG. 7

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FIG. 8

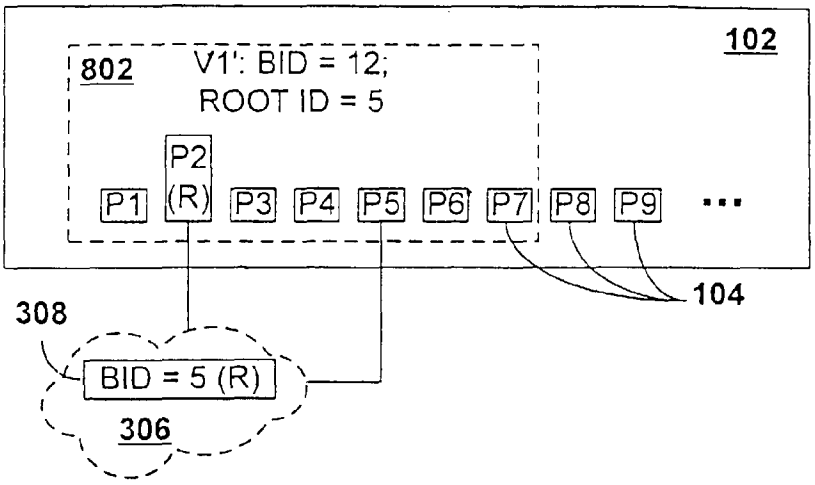
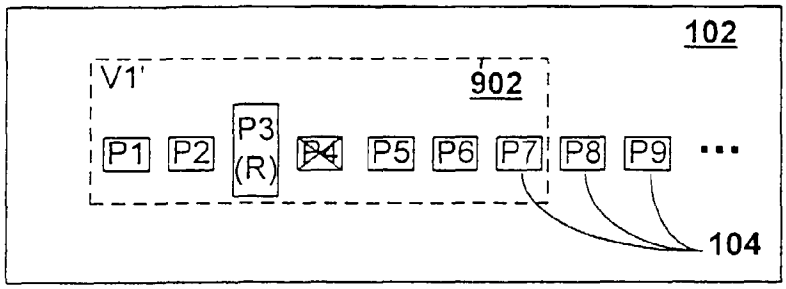


FIG. 9



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redundant-port OR standby-port OR backup-p - 1997 Search

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PH Smith... - US Patent 4,825,028, 1989 - Google Patents
... START * 92 SET STANDBY PORT SET ON/OFF PORT DELAY ONE SECOND READ BULK CURRENT DELAY FIVE SECONDS RESET STANDBY PORT FIG. 7A -9 4 -96 -98 ...
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PS Smith, PH Smith... - US Patent 4,873,408, 1989 - Google Patents
... US Patent Oct. 10, 1989 sheet 6 of 10 4,873,408 SET STANDBY PORT SET ON/OFF PORT DELAY ONE SECOND ... DELAY FIVE SECONDS RESET STANDBY PORT FROM BLOCK 100 FIG. 7A ...
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K Lo, K Liu, C Light, PC Ltd - Advances in Power System Control, Operation and Management, ..., 1991 - ieeexplore.ieee.org
... is used to effect the changeover of the EMS systems by the following procedure : - disconnect the MMI devices and trans- ceivers from the backup port of the ...
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Measuring the Web
T Bray - Computer Networks and ISDN Systems, 1996 - Elsevier
... strip redundant port numbers (80 for http, 70 for gopher), convert hostnames to IP addresses, strip trailing slashes (this is sometimes [very rarely] wrong ...
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MA Taylor - US Patent 5,678,005, 1997 - Google Patents
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... suppliers. The multiplexers selected have dual ports, with automatic switching to the backup port. should the main route fail. The ...
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... However, there remains the matter of justifying the presence of the redundant Port 4 of our proposed modified configuration of Figure 38. ...
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... carrier group alarm signal generated by control module 54, and (f) and A/B SEL selection signal which indicates the one of the redundant port group highways ...
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RJ Souza, PG Krishnakumar, CM Oezveren, RJ Simcoe, ... - Digital Technical Journal, 1994 - hpl.hp.com
... two different FDDI line cards, the 802.1d spanning tree places one of the ports

in backup state; failure of the operational port causes the backup port to come ...
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JL Faulkerson - US Patent 4,804,949, 1989 - Google Patents
... 65 has all the bus signals available to it, and the peripheral card device can be configured to define a unique port address or a redundant port address. ...
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R Williams - US Patent 5,559,883, 1996 - freepatentsonline.com
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... connect, without regard to the type of switches that are elsewhere in the system, so long as each facility to be protected is also received at a redundant port ...
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JR Spencer, AJ Booth - US Patent 5,278,977, 1994 - freepatentsonline.com
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A flexible bit-pattern associative router for interconnectionnetworks
DH Summerville, JG Delgado-Frias, S Vassiliadis - Parallel and Distributed Systems, IEEE Transactions on, 1996 - ieeexplore.ieee.org
Page 1. IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS, VOL. 7, NO. 5, MAY 1996 477 A Flexible Bit-Pattern Associative Router ...
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DL Skret - US Patent 4,980,913, 1990 - freepatentsonline.com
... A dual port transponder may have a mix of destination nodes some of which are available over either redundant port, and some of which are port specific. ...
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DC Richardson - EP Patent 0,579,040, 1994 - freepatentsonline.com
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... messages (at 1806). Otherwise the transceiver checks the backup port (at 1808) and services it (at 1810). Thus, the transceiver ...
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SP Weir - US Patent 5,583,856, 1996 - freepatentsonline.com
... External connections include 8 Port Group Buffer interfaces 900 (with either redundant or non-redundant port group buffer cabling), 1 Power and Alarm interface ...
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... External connections include 8 Port Group Buffer interfaces 900 (with either redundant or non-redundant port group buffer cabling), 1 Power and Alarm interface ...
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A user-orientated telephone instrument including high-fidelity speech encoding, encryption capability and many function presently provided by centralized call ...
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Key authors: R Baron - A Athan - T Bray - W Kim - A Tevanian

redundant-port OR standby-port OF Search

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PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: Silvano Gai et al.	)	
Serial No.: 11/113,600	)	Examiner: AHMED, SALMAN
Filed: April 25, 2005	)	Art Unit: 2419
For: Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm	)	

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
January 21, 2009

BY EFS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

AMENDMENT

This Amendment is filed in response to the Office Action mailed Oct. 21, 2008. The Applicant respectfully requests reconsideration. All objections and rejections are respectfully traversed.

IN THE CLAIMS:

1. (CURRENTLY AMENDED) A method for operating a router, comprising:

executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state;

detecting a link failure; and

transitioning, in response to detecting the failure, the designated port into the blocked state and also transitioning the back-up designated port into the forwarding state, without transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

2. (ORIGINAL) The method as in claim 1, further comprising:

transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

3. (CURRENTLY AMENDED) A method for operating a router, comprising:

executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port

to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

selecting a third port as a back-up root port and placing the back-up root port in a blocked state;

detecting a link failure; and

transitioning, in response to detecting the failure, the root port into the blocked state and also transitioning the back-up root port into the forwarding state, without transitioning the back-up root port through any intermediary states in moving from the blocked state to the forwarding state.

4. (ORIIGNAL) The method as in claim 1, further comprising:

transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

5-9. (CANCELLED)

10. (ORIGINAL) A method for operating a computer network, comprising:

issuing a become_root_primary command to a first router;

setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router;

issuing a become_root_secondary command to a second router;

setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;

transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

11. (ORIGINAL) The method as in claim 10, further comprising:

issuing an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port.

12. (ORIGINAL) The method as in claim 10, further comprising:

executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router;

transmitting a BPDU message by each port in forwarding state at each expiration of a hello timer for maintaining communication along links of the spanning tree;

transitioning, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods, the backup designated port to forwarding and transitioning the selected designated port to blocking; and

transitioning, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods, the backup root port to forwarding and transitioning the selected root port to blocking.

13. (ORIGINAL) The method as in claim 10, further comprising:

detecting a BPDU message by a root port of the secondary root router;

transitioning, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router.

14. (CURRENTLY AMENDED) A router, comprising:

means for executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

means for selecting a third port as a back-up designated port and placing the back-up root port in a blocked state;

means for detecting a link failure; and

means for transitioning, in response to detecting the failure, the designated port into the blocked state and also transitioning the back-up designated port into the forwarding state, without transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

15. (ORIGINAL) The router as in claim 14, further comprising:

means for transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

16. (CURRENTLY AMENDED) A router, comprising:

means for executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

means for selecting a third port as a back-up root port and placing the back-up root port in a blocked state;

means for detecting a link failure; and

means for transitioning, in response to detecting the failure, the root port into the blocked state and also transitioning the back-up root port into the forwarding state, without transitioning the back-up root port through any intermediary states in moving from the blocked state to the forwarding state.

17. (ORIGINAL) The router as in claim 16, further comprising:

means for transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

18-22. (CANCELLED)

23. (ORIGINAL) A computer network, comprising:

means for issuing a become_root_primary command to a first router;

means for setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router;

means for issuing a become_root_secondary command to a second router;

means for setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;

means for transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

24. (ORIGINAL) The computer network as in claim 23, further comprising:

means for issuing an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port.

25. (ORIGINAL) The computer network as in claim 23, further comprising:

means for executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router;

means for transmitting a BPDU message by each port in forwarding state at each expiration of a hello timer for maintaining communication along links of the spanning tree;

means for transitioning, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods, the backup designated port to forwarding and transitioning the selected designated port to blocking; and

means for transitioning, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods, the backup root port to forwarding and transitioning the selected root port to blocking.

26. (ORIGINAL) The computer network as in claim 23, further comprising:

means for detecting a BPDU message by a root port of the secondary root router;

means for transitioning, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router.

27. (CURRENTLY AMENDED) A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

a third port selected as a back-up designated port and placed in a blocked state;

a port to detect a link failure; and

a rapid reconfiguration entity to transition, in response to detecting the failure, the designated port into the blocked state and also to transition the back-up designated port into the forwarding state, without transition of the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

28. (ORIGINAL) The router as in claim 27, further comprising:

the back-up designated port transmitting a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

29. (CURRENTLY AMENDED) A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

a third port selected as a back-up root port and placed in a blocked state;

a port to detect a link failure; and

a rapid reconfiguration entity to transition, in response to detecting the failure, the root port into the blocked state and also transitioning the back-up root port into the forwarding state, without transition of the back-up root port through any intermediary states in moving from the blocked state to the forwarding state.

30. (ORIGINAL) The router as in claim 29, further comprising:

the back-up root port transmitting BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

31-35. (CANCELLED)

36. (ORIGINAL) A computer network, comprising:

a first port to enter a become_root_primary command to a first router;

a rapid reconfiguration entity to set, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router;

a second port to enter a become_root_secondary command to a second router;

a rapid reconfiguration entity to set, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;

the rapid reconfiguration entity to transition, in response to failure of the first router while serving as the root router, the second router to become the root router.

37. (ORIGINAL) The computer network as in claim 36, further comprising:

a third port to enter an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port.

38. (ORIGINAL) The computer network as in claim 36, further comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router;

each port in forwarding state to transmit a BPDU message at each expiration of a hello timer to maintain communication along links of the spanning tree;

a rapid reconfiguration entity to transition, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods, the backup designated port to forwarding and transitioning the selected designated port to blocking; and

the rapid reconfiguration entity to transition, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods, the backup root port to forwarding and transitioning the selected root port to blocking.

39. (ORIGINAL) The computer network as in claim 36, further comprising:

a root port of the secondary root router to detect a BPDU message;

a rapid reconfiguration entity to transition, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router.

REMARKS

This Amendment is filed in response to the Office Action mailed Oct. 21, 2008. The Applicant respectfully requests reconsideration. All objections and rejections are respectfully traversed.

Claims 1-4, 10-17, 23-30, 36-39 are now pending in the application.

Claims 5-6, 18-19, and 31-32 have recently been cancelled.

Claims 1, 3, 14, 16, 27, and 29 have been amended.

No new claims have been added.

Claim Rejections - 35 U.S.C. §103

At paragraphs 1-3 of the Office Action, claims 1-6, 10-19, 23-32, and 36-39 were rejected under 35 U.S.C. §103(a) over Backes et al., U.S. Patent No. 5,018,137 (hereinafter "Backes") in view of Seaman, U.S. Patent No. 5,790,808 (hereinafter "Seaman"), in further view of Souza et al., "GIGASwitch System: A High-performance Packet-switching Platform" (hereinafter "Souza").

Claims 1, 3, 14, 16, 27, 29 and 31:

The Applicant's claim 1, representative in part of claims 1, 3, 14, 16, 27, 29 and 31, sets forth (emphasis added):

> 1. A method for operating a router, comprising:
>
> executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;
>
> ***selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state***;
>
> detecting a link failure; and

transitioning, in response to detecting the failure, the designated port into the blocked state and also ***transitioning the back-up designated port into the forwarding state, without transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.***

Backes discusses a technique for utilizing multiple "trunked" (i.e. parallel) networks to reach a bridge, rather than use a single network to reach the bridge, while not creating loops within a spanning tree. *See* Backes col. 3, lines 46-50. Specifically, Backes first chooses one bridge to be a root bridge. *See* Backes col. 6, lines 61-65. Then, Backes selects "one bridge connected to each network as a designated bridge for that network…[and] [t]he remaining bridges connected to that network which are not selected as the designated bridge are deemed daughter bridges." *See* Backes col. 3, lines 60-65 and col. 7, lines 18-39. Each of the daughter bridges senses whether trunked networks (i.e., two or more parallel networks) exist between it and the designated bridge. *See* Backes col. 7, lines 44-47 and 55-58 and Fig. 2, step 240. Backes causes each daughter bridge to, rather than block connections to all but one of these parallel networks, use connections with all of them all in parallel. *See* Backes col. 4, lines 14-18 and col. 8, lines 3-46.

Seaman discusses a technique for transitioning ports among Spanning Tree Algorithm and Protocol states. *See* Seaman col. 2, lines 14-19 and col. 4, line 66 to col. 5 line 1. Seaman describes "a plurality of transitional states, including the forgetting state [Fig. 2] 32, the blocking state 33, the listening state 34, and the learning state 35. All of these transition states except the forgetting state 32 are included within the 802.1D standard." *See* Seaman col. 5, lines 5-11 and Fig. 2. As can be seen from Fig. 2, to transition from the blocking state 32 to the forwarding state 36 is a lengthy process. One must first make a transition 42 to the listening state 34, then make a second transition 43 to the learning state 35, before making yet another transition 45 to the forwarding state 36. *See also* Seaman col. 5, lines 15-44 (describing the transition process).

Souza discusses using "2-port FDDI line cards to construct a 22-port IEEE 802.1d FDDI bridge." *See* Souza page 1, abstract. Souza describes that "[i]f a LAN is connected to ports on two different FDDI line cards, the 802.1d spanning tree places one of the ports in backup state; failure of the operational port causes the backup port to come on-line." *See* Souza page 12, Section "Reliability and Availability", 1st paragraph thereof.

The Applicant respectfully urges that the combination of Backes, Seaman and Souza does not teach or suggest the Applicant's claimed novel "***selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state***" and "***transitioning the back-up designated port into the forwarding state, without transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.***"

As the Applicant discusses in the background of the specification, one issue with conventional spanning tree techniques is that recalculation of a spanning tree is typically a time consuming process. During this time, message delivery typically is delayed as ports transitions between states. To network users, these delays are perceived as service interruptions. Further, certain applications, protocols or other processes may undesirably "time-out" due to these delays. The Applicant novelly addresses these and other problems, in part, by defining certain back-up ports that may rapidly begin forwarding messages after a failure, absent the usually time consuming transitions between intermediary states. For example, a novel back-up designated port may transition from the blocking state, into the forwarding state, without transitioning port through any intermediary states in moving from the blocked state to the forwarding state.

There appears to be agreement that Backes does not teach "***selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state***" and "***transitioning the back-up designated port into the forwarding state, without transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.***" *See* Office Action page 3-4 and bottom of page 5. The Office action then turns to Seaman and Souza.

However, the deficiencies of Backes are not remedied by combination with Seaman and Souza. Seaman actively teaches away from what the Applicant claims. Rather than teach a back-up designated port and transitioning such a back-up designated port from a blocked state into a forwarding state, without transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state, Seaman directs that when transitioning a port from a blocked state to a forwarding state the port should transition through multiple intermediary states, including a listening state and a learning state. As can be seen from Fig. 2 of Seaman, to transition from Seaman's blocking state 32 to his forwarding state 36, one must first make a transition 42 to the listening state 34, then make a second transition 43 to the learning state 35, before finally making the transition 45 to the forwarding state 36. *See* also Seaman col. 5, lines 15-44 (describing the transition process). One of skill in the art reading such description in Seaman would be dissuaded from implementing a system as the Applicant claim, due to the contrary teaching.

Further, Souza does not suggest a back-up designated port and transitioning such a back-up designated port from a blocked state into a forwarding state, without transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state. Souza merely mentions that with multiple ports "the 802.1d spanning tree places one of the ports in backup state; failure of the operational port causes the backup port to come on-line." *See* Souza page 12, Section "Reliability and Availability", 1st paragraph thereof. Since Souza uses the 802.1d protocol, which includes listening and learning intermediary states, when transitioning to the forwarding state, Souza would necessarily pass through the 802.1d intermediary states, similar to as in Seaman. Thus, Souza operates in a quite different manner than is claimed.

Accordingly, the Applicant respectfully urges that the combination of Backes, Seaman and Souza is legally insufficient to make obvious the present claims under 35 U.S.C. §103(a) because of the absence of the Applicant's claimed novel "***selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state***" and "***transitioning the back-up designated port into the forwarding state, without transitioning***

the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state."

Claims 2, 4, 6, 15, 17, 19, 28, 30 and 32:

The Applicant notes that claims 2, 4, 6, 15, 17, 19, 28, 30and 32 are dependent claims that depend from independent claims believed to be allowable for at least the reasons discussed above. Claims 2, 4, 6, 15, 17, 19, 28, 20 and 32 are believed to be allowable due to their dependency, as well as for other separate reasons.

Claims 10, 23 and 36:

The Applicant's claim 10, representative in part of claims 10, 23 and 36, sets forth (emphasis added):

> 10. A method for operating a computer network, comprising:
>
> ***issuing a become_root_primary command to a first router***;
>
> ***setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router***;
>
> ***issuing a become_root_secondary command to a second router***;
>
> ***setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router***;
>
> transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

Backes discloses "[p]referably, the selection of the root bridge would be done by the bridges themselves …. A preferred method of selection calls for each bridge to compare the root identifier field 420 of the BDPUs it receives to a stored root identifier." *See* page 7, lines 6-12.

The Applicant respectfully urges that Backes, Seaman and Souza are silent concerning the Applicant's claimed "***issuing a become_root_primary command to a first router***" and "***setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router***" and likewise "***issuing a become_root_secondary command to a second router*** " and "***setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router***."

While the Applicant claims a first special command that may be issued to a router to cause the router to set an ID to promote a spanning tree protocol to select the router as a primary root router, and a second special command that may be issued to a router to cause the router to set an ID to promote spanning tree protocol to select the router as a secondary root router, Backes makes no mention of such special commands. Backes simply states that bridges "compare the root identifier field 420 of the BDPUs it receives to a stored root identifier" to select a root bridge. *See* Backes page 7, lines 6-12. No mechanism is describes for dynamically changing a stored root identifier to make a bridge more or less likely to be selected.

Further, combination with Seaman and Souza do not remedy the deficiencies of Backes. Neither reference makes any mention of any special commands to cause a router to set an ID to promote a spanning tree protocol to select it as a primary or secondary root router.

Accordingly, the Applicant respectfully urges that the combination of Backes, Seaman and Souza is legally insufficient to make obvious the present claims under 35 U.S.C. §103(a) because of the absence of the Applicant's claimed novel "***issuing a become_root_primary command to a first router***" and "***setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router***" and likewise "***issuing a become_root_secondary command to a second router*** " and "***setting, in re-***

sponse to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router."

Claims 11-13, 24-26 and 37-39:

The Applicant notes that claims 11-13, 24-26 and 37-39 are dependent claims that depend from independent claims believed to be allowable for at least the reasons discussed above. Claims 11-13, 24-26 and 37-39 are believed to be allowable due to their dependency, as well as for other separate reasons.

In the event that the Examiner deems personal contact desirable in disposition of this case, the Examiner is encouraged to call the undersigned attorney at (617) 951-2500.

In summary, all the independent claims are believed to be in condition for allowance and therefore all dependent claims that depend there from are believed to be in condition for allowance. The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

__/James A. Blanchette/_____

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Electronic Acknowledgement Receipt

EFS ID:	4653962
Application Number:	11113600
International Application Number:	
Confirmation Number:	8858
Title of Invention:	Method and apparatus for rapidly reconfiguring computer networks
First Named Inventor/Applicant Name:	Silvano Gai
Customer Number:	24267
Filer:	James A. Blanchette
Filer Authorized By:	
Attorney Docket Number:	112025-0063D1C2
Receipt Date:	21-JAN-2009
Filing Date:	25-APR-2005
Time Stamp:	23:41:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Amend_Jan_21_2009.pdf	86124 4d6ecd91a8e9a202e3e2159198d34795bee27093	yes	18

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	11
	Applicant Arguments/Remarks Made in an Amendment	12	18
Warnings:			
Information:			
	Total Files Size (in bytes):	86124	

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/113,600	04/25/2005	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	01/21/2009	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 24	Minus	** 39	= 0	X $ =		OR	X $52=	0
	Independent (37 CFR 1.16(h))	* 9	Minus	***15	= 0	X $ =		OR	X $220=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/NICOLE C. LAWRENCE/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/113,600	04/25/2005	Silvano Gai	112025-0063D1C2	8858

24267 7590 04/22/2009

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EXAMINER	
AHMED, SALMAN	

ART UNIT	PAPER NUMBER
2419	

MAIL DATE	DELIVERY MODE
04/22/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	11/113,600	GAI ET AL.	
	Examiner	Art Unit	
	SALMAN AHMED	2419	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,10-17,23-30 and 36-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4, 10-17, 23-30, 36-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/25/2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 3, 14, 16, 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shobatake (US5506847) in view of Seaman (US PAT 5790808) and Souza et al.: GIGAswitch System: A High-performance Packet-switching Platform-Digital Technical Journal, 1994, hereinafter Souza and Biegel et al. (US PAT 5608720, hereinafter Biegel).

Regarding claims 1, 3, 14, 16, 27 and 29 Shobatake discloses executing a spanning tree protocol (column 49 lines 39-50, in the ATM-LAN of the present

embodiment, the node connection method is limited to achieve the function by which "the ATM-LAN only once transfers a cell on the broadcast channel to all the devices except for those output the cell from the time when the power is turned on". In other words, in the ATM-LAN, a node is connected by a topology which does not have a loop. In the case where a topology which does not have a loop is employed as the node connection method, it is easy to define a spanning tree in the ATM-LAN from the time when the power is turned on, by its physical connection method. Consequently, the broadcast channel which utilizes the spanning tree and starts it operation from the time when the power is turned on, can be easily achieved) to select a first port as a root port and to select a second port as a designated port, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree (column 2 lines 9-14, in the ATM-LAN system having the basic structure described above, the nodes are connected in the form of a tree. Each node has a plurality of ports, each having a switch for connecting the port to any root side or any leaf side of the tree) established by executing the spanning tree protocol (column 49 lines 39-50, in the ATM-LAN of the present embodiment, the node connection method is limited to achieve the function by which "the ATM-LAN only once transfers a cell on the broadcast channel to all the devices except for those output the cell from the time when the power is turned on". In other words, in the ATM-LAN, a node is connected by a topology which does not have a loop. In the case where a topology which does not have a loop is employed as the node connection method, it is easy to define a spanning tree in the ATM-LAN from the time when the power is turned on, by

its physical connection method. Consequently, the broadcast channel which utilizes the spanning tree and starts it operation from the time when the power is turned on, can be easily achieved).

Shobatake does not explicitly teach place both the root port and the designated port in a forwarding state. Shobatake does not explicitly teach transitioning in response to event all designated ports of the root router into blocked state and transitioning a back-up router into a root router. Shobatake does not explicitly teach transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

Seaman in the same field of endeavor teaches placing both the root port and the designated port in a forwarding state (column 5 lines 45-46, The port stays in the forwarding state 36 until the algorithm selects the port as not the designated or root port). Seaman in the same field of endeavor further teaches place both the root port and the designated port in a forwarding state; transitioning in response to event all designated ports of the root router into blocked state and transitioning a back-up router into a root router; transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router (column 5 lines 45-46, in the preferred system, the protocol entity executes the Spanning Tree Algorithm as set out in the IEEE 802.1D standard for bridged local area networks. A bridge in the first network state acts to forward data received at the port, and the second network state acts to block data received at the port. Also, according to the Spanning Tree Algorithm, a transition from the first network state is executed upon receipt of information indicating

that a change to the blocking second network state should be executed. The present invention can also be characterized as an improvement to a bridge having a plurality of ports and including a bridge protocol entity for interconnecting according to a Spanning Tree Algorithm a plurality of local area networks coupled to respective ones of the plurality of ports. The improvement comprises logic communicating with the bridge protocol entity, and coupled with the plurality of ports, which establishes active network states for the plurality of ports. changing a port from the first network state to the second network state in a network system after receipt of information from the protocol resources indicating such change; and changing a port from the second network state to the first network state in a network system after expiry of a waiting interval if information from the protocol resources indicating such change is received after expiry of a forgetting interval after a change into the second network state, else changing directly into the first network state. Finally, Seaman teaches transitioning a back-up router into a root router (See figures 3A-3D). Transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router (See figures 3A-3D)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Shobatake's teaching to incorporate the steps of placing both the root port and the designated port in a forwarding state; place both the root port and the designated port in a forwarding state; transitioning in response to event all designated ports of the root router into blocked state and transitioning a back-up router into a root router; transitioning, in response to failure of the first router while serving as

the root router, the second router to become the root router as suggested by Seaman. The motivation is that (as suggested by Seaman, column 3 lines 33-37) managing ports on network systems, such that data is transmitted through a port in a first network state and such that data is blocked at a port in a second network state enables proper transmission of data through the ports. Further motivation is that by reassigning root routers due to router failure guarantees seamless continuation of reliable communication. 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/market place incentives if the variations are predictable to one of ordinary skill in the art.

Shobatake teaches ports being assigned as designated ports but Shobatake and Seaman do not explicitly teach selecting a port as a back-up port and placing the back-up port in a blocked state; detecting a link failure; and transitioning, in response to detecting the failure, the port into a blocked state and also transitioning the back-up port into a forwarding state.

Souza in the same field of endeavor teaches if a LAN is connected to ports on two different FDDI line cards, the 802.1d spanning tree places one of the ports in backup state; failure of the operational port causes the backup port to come on-line (section: “Reliability and Availability”).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Shobatake and Seaman’s teaching with the steps of placing one of the ports in backup state; failure of the operational port causes the

backup port to come on-line as suggested by Souza. The motivation is that such method of placing one of the ports in backup state; failure of the operational port causes the backup port to come on-line guarantees reliable communication. 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/market place incentives if the variations are predictable to one of ordinary skill in the art.

Shobatake, Seaman and Souza do not explicitly teach moving from blocked stage to the forwarding stage without transitioning through any intermediary states.

Biegel in the same or similar field of endeavor teaches in Figure 3 elements 503 and 506, and column 37 lines 42-45, an entity which implements a state machine in an subagent in the operational standby state (interpreted as blocking state) can be required to bypass some intermediate states and proceed directly to a major stable state (interpreted as forwarding state).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Shobatake, Seaman and Souza's teaching with the steps of moving from blocked stage to the forwarding stage without transitioning through any intermediary states as suggested by Biegel. The motivation is that such method of bypassing intermediate states streamlines state transition process which results in more efficient state machine. Known work (i.e. bypassing intermediate states) in one field of endeavor (i.e. Biegel prior art) may prompt variations of it for use in either the same field or a different one (i.e. Shobatake, Seaman and Souza prior art) based on design incentives (i.e. streamlines state transition process which results in more efficient state

machine) or other market forces/market place incentives if the variations are predictable to one of ordinary skill in the art.

4. Claims 2, 4, 15, 17, 28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shobatake (US5506847) in view of Seaman (US PAT 5790808), Souza et al. GIGAswitch System: A High-performance Packet-switching Platform-Digital Technical Journal, 1994, hereinafter Souza, Biegel et al. (US PAT 5608720, hereinafter Biegel) and Backes et al. (US5018137, hereinfter Backes).

Regarding claims 2, 15 and 28 Shobatake, Seaman, Souza and Biegel teaches all the limitations of claims 1, 3, 14, 16, 27 and 29 above.

Regarding claims 2, 15 and 28 Shobatake does not explicitly teach transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port..

Backes in the same or similar field of endeavor teaches transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port (see col. 10 lines 32-45).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Shobatake, Seaman, Souza and Biegel's teaching with the steps of transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port as suggested by Biegel. The motivation is that such method enables a node to convey the most up-to-date topology status information to downstream nodes

enabling rapid traversal of topology change information; thus making the network reliable. 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/market place incentives if the variations are predictable to one of ordinary skill in the art.

Regarding claims 4, 17 and 30, Shobatake, Seaman, Souza and Biegel teaches all the limitations of claims 1, 3, 14, 16, 27 and 29 above.

Regarding claims 4, 17 and 30, Shobatake does not explicitly teach transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

Backes in the same or similar field of endeavor teaches transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port (see col. 7 lines 18-21).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Shobatake, Seaman, Souza and Biegel's teaching with the steps of transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port as suggested by Biegel. The motivation is that such method enables a node to convey the most up-to-date topology status information to upstream nodes enabling rapid traversal of topology change information; thus making the network reliable. 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/market place incentives if the variations are predictable to one of ordinary skill in the art.

5. Claims 10-13, 23-26 and 36-39, are rejected under 35 U.S.C. 103(a) as being unpatentable over Backes et al. (US5018137, hereinfter Backes) in view of Seaman (US PAT 5790808) and Souza et al.: GIGAswitch System: A High-performance Packet-switching Platform- Digital Technical Journal, 1994, hereinafter Souza.

Regarding claims 10, 23, and 36, Backes teaches method for operating a computer network, comprising: issuing a become_root_primary command to a first router (see col. 7 lines 8-43); setting, in response to the become_root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router (see col. 7 lines 8-43); issuing a become_root_secondary command to a second router (see col. 7 lines 55 - col. 8 line 33); setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router (see col. 7 lines 55 - col. 8 line 33).

Backes does not explicitly teach place both the root port and the designated port in a forwarding state. Backers does not explicitly teach transitioning in response to event all designated ports of the root router into blocked state and transitioning a back-up router into a root router. Backers does not explicitly teach transitioning, in response

to failure of the first router while serving as the root router, the second router to become the root router.

Seaman in the same field of endeavor teaches placing both the root port and the designated port in a forwarding state (column 5 lines 45-46, The port stays in the forwarding state 36 until the algorithm selects the port as not the designated or root port). Seaman in the same field of endeavor teaches transitioning in response to event all designated ports of the root router into blocked state and transitioning a back-up router into a root router; transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router (column 5 lines 45-46, in the preferred system, the protocol entity executes the Spanning Tree Algorithm as set out in the IEEE 802.1D standard for bridged local area networks. A bridge in the first network state acts to forward data received at the port, and the second network state acts to block data received at the port. Also, according to the Spanning Tree Algorithm, a transition from the first network state is executed upon receipt of information indicating that a change to the blocking second network state should be executed. The present invention can also be characterized as an improvement to a bridge having a plurality of ports and including a bridge protocol entity for interconnecting according to a Spanning Tree Algorithm a plurality of local area networks coupled to respective ones of the plurality of ports. The improvement comprises logic communicating with the bridge protocol entity, and coupled with the plurality of ports, which establishes active network states for the plurality of ports. changing a port from the first network state to the second network state in a network

system after receipt of information from the protocol resources indicating such change; and changing a port from the second network state to the first network state in a network system after expiry of a waiting interval if information from the protocol resources indicating such change is received after expiry of a forgetting interval after a change into the second network state, else changing directly into the first network state. Finally, Seaman teaches transitioning a back-up router into a root router (See figures 3A-3D). transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router (See figures 3A-3D)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Backes' teaching to incorporate the steps of placing both the root port and the designated port in a forwarding state; transitioning in response to event all designated ports of the root router into blocked state and transitioning a back-up router into a root router; transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router as suggested by Seaman. The motivation is that (as suggested by Seaman, column 3 lines 33-37) managing ports on network systems, such that data is transmitted through a port in a first network state and such that data is blocked at a port in a second network state enables proper transmission of data through the ports. Further motivation is that by reassigning root routers due to router failure guarantees seamless continuation of reliable communication. 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/market place incentives if the variations are predictable to one of ordinary skill in the art.

Backes teaches ports being assigned as designated ports but Backes and Seaman do not explicitly teach selecting a port as a back-up port and placing the back-up port in a blocked state; detecting a link failure; and transitioning, in response to detecting the failure, the port into a blocked state and also transitioning the back-up port into a forwarding state.

Souza in the same field of endeavor teaches If a LAN is connected to ports on two different FDDI line cards, the 802.1d spanning tree places one of the ports in backup state; failure of the operational port causes the backup port to come on-line (section: “Reliability and Availability”).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Backes and Seaman’ teaching with the steps of placing one of the ports in backup state; failure of the operational port causes the backup port to come on-line as suggested by Souza. The motivation is that such method of placing one of the ports in backup state; failure of the operational port causes the backup port to come on-line guarantees reliable communication. 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/market place incentives if the variations are predictable to one of ordinary skill in the art.

Regarding claims 11, 24, and 37, Backes teaches further comprising: issuing an enable_uplinkfast command to at least one router connected in the computer

network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port (see col. 7 lines 55-65).

Regarding claims 12, 25, and 38, Backes teaches further comprising: •executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router (see figure 2 box 220 and box 230 and col. 5 lines 13-39); transmitting a BPDU message by each port in forwarding state at each expiration of a hello timer for maintaining communication along links of the spanning tree (see col. 6 lines 10-15); transitioning, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods (see col. 6 lines 10- 15), the backup designated port to forwarding and transitioning the selected designated port to blocking (see col. 10 lines 32-45); and transitioning, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods (see col. 6 lines 10-15), the backup root port to forwarding and transitioning the selected root port to blocking (see col. 10 lines 32-45).

Regarding claims 13, 26, and 39, Backes teaches further comprising: detecting a BPDU message by a root port of the secondary root router (see col. 10 lines 14-22); transitioning, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router (see col. 10 lines 23-45).

Response to Arguments

6. Applicant's arguments see pages 12-18 of the Remarks section, filed 1/21/2009, with respect to the rejections of the claims have been fully considered.

Claims 1, 3, 14, 16, 27, 29 and 31:

Applicant has amended claims 1, 3, 14, 16, 27, 29 and 31, Applicant's amendment necessitated a new ground of rejections presented in this office action. As such, any further response to Applicant's argument (see pages 12-15 of remark section) is moot.

Claims 2, 4, 6, 15, 17, 19, 28, 30 and 32:

Dependent claims 2, 4, 6, 15, 17, 19, 28, 30 and 32 are also rejected with new ground of rejections presented in this office action.

Claims 10, 23 and 36:

Applicant argues that (page 17 first paragraph) Backes, Seaman and Souza are silent concerning the Applicant's claimed "issuing a become_root_primary command to a first router" and "setting, in response to the become root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router" and likewise "issuing a become_root secondary command to a second router " and "setting, in response to the become root secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router."

However, Examiner respectfully disagrees with the Applicant's assertion. The cited prior art do indeed teach the cited limitations. Specifically, Backes teaches (see

col. 7 line 8 - col. 8 line 33) the selection of the root bridge would be done by the bridges themselves using bridge processor 340 under control of program memory 360 and with the aid of working memory 370. A preferred method of selection calls for each bridge to compare the root identifier field 420 of the BDPUs it receives (i.e. "issuance of a become_root_primary command to a first router") to a stored root identifier. If the received message has a root identifier field with a better priority than the stored root identifier, the root identifier value in the received message would become the new stored root identifier (i.e. "setting, in response to the become root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router"). With this method, all bridges will eventually have the same stored root identifier. As shown in FIG. 2, the next step is to evaluate the BPDUs from the other bridges to choose a designated bridge and daughter bridges for each network (step 230). This too is part of the spanning tree algorithm. In the preferred embodiment of this invention, such evaluation is done by each bridge using the appropriate bridge processing unit 340 under control of program memory 360 and working memory 370. Preferably, while the bridges are exchanging BPDU's, all bridges connected to the same network compare root path costs, which are concurrently being determined in a manner described above (i.e. "issuing a become_root secondary command to a second router"). The bridge with the lowest root path cost is deemed to be the designated bridge for that network (i.e. "setting, in response to the become root secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router"). If multiple bridges

have the same root path cost, then some technique, such as use of the bridge identifier is used to select the designated bridge (emphasis added). All of the bridges connected to a network which do not have another path to the root, and are not selected to be a designated bridge are deemed to be daughter bridges. According to one variation of this invention, this selecting step involves exchanging configuration messages (i.e. interpreted as commands), such as BPDUs, among the bridges during the repeating configuration periods, as described with regard to step 210.

As such, Examiner respectfully disagrees with Applicant's assertion (see page 17 paragraph 2) that Backes makes no mention of special commands. Examiner respectfully asserts that exchanged BPDUs are interpreted as cited commands.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., dynamically changing a stored root identifier to make a bridge more or less likely to be selected) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

It is for the same reasons Examiner respectfully disagrees with Applicant's assertion that (page 17 last paragraph) the combination of Backes, Seaman and Souza is legally insufficient to make obvious the present claims under 35 U.S.C. § 103(a) because of the absence of the Applicant's claimed novel "issuing a become_root_primary command to a first router" and "setting, in response to the become root_primary command, an ID in the first router to assist an execution of a

spanning tree protocol to select the first router as a primary root router" and likewise "issuing a become_root secondary command to a second router " and "setting, in response to the become root secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router."

Claims 11-13, 24-26 and 37-39:

Dependent claims 11-13, 24-26 and 37-39 are not patentable for the same reasons cited above.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SALMAN AHMED whose telephone number is (571)272-8307. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Salman Ahmed/

Examiner, Art Unit 2419

Notice of References Cited	Application/Control No. 11/113,600	Applicant(s)/Patent Under Reexamination GAI ET AL.	
	Examiner SALMAN AHMED	Art Unit 2419	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,506,847 A	04-1996	Shobatake, Yasuro	370/338
*	B	US-5,608,720 A	03-1997	Biegel et al.	370/249
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	Ahmed, Salman	2419

SEARCHED

Class	Subclass	Date	Examiner
370	256, 390, 432,	4/13/2008	WC

SEARCH NOTES

Search Notes	Date	Examiner
inventorship search	4/13/2008	WC
East search	4/13/2008	WC
consulted with SPE Edan Orgad	4/13/2008	WC
manual search for class 370/432	4/13/2008	WC
Updated Search	10/17/2008	SA
Updated search	4/16/2009	SA

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	2	"5790808 ".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 09:53
L3	32	(root adj port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:12
L4	1139	(root with port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:12
L5	38	(root with port) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:12
L6	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:15
L8	1	(root with port) and (leaf adj port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:29
L9	67	(root with port) and (leaf with port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:30

L10	5	(root with port) and (leaf with port) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:30
L11	20	(port with blocked with forwarding with state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 11:03
L12	2	(port same blocked same forwarding same state same (bypass$4 or directly)) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 14:07
L13	3	(port same blocked same forwarding same state) and (@rlad<"19971224" or @ad<"19971224") not L11	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 14:08
L14	263	(port same block$3 same forward$3 same state) and (@rlad<"19971224" or @ad<"19971224") not L13	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 14:10
L15	27	(port same block$3 same forward$3 same state same (bypass$4 or directly)) and (@rlad<"19971224" or @ad<"19971224") not L13	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 14:10
L16	34	(port same block$3 same forward$3 same state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 15:31
L17	8	((chang$5 or transition$3) with forward$4 with block$4 with state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 15:43

L18	1	((omit$5 or bypass$4) with intermediate with state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 16:01
L19	3	((omit$5 or bypass$4) with intermediate with state) and (state adj machine) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 16:02

4/16/2009 5:57:30 PM
C:\Documents and Settings\sahmed\My Documents\EAST\Workspaces\11113600-Oct-16-2008-Chu_case.wsp

Day : Thursday
Date: 4/16/2009

PALM INTRANET

Time: 18:50:39

Inventor Name Search Result

Your Search was:

Last Name = MCCLOGHRIE
First Name = KEITH

Application#	Patent#	Status	Date Filed	Title	Inventor Name
08582074	6035105	150	01/02/1996	MULTIPLE VLAN ARCHITECTURE SYSTEM	MCCLOGHRIE, KEITH
08997297	6188694	150	12/23/1997	SHARED SPANNING TREE PROTOCOL	MCCLOGHRIE, KEITH
08998412	6032194	150	12/24/1997	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS	MCCLOGHRIE, KEITH
09106519	6920112	150	06/29/1998	SAMPLING PACKETS FOR NETWORK MONITORING	MCCLOGHRIE, KEITH
09145600	6697360	150	09/02/1998	METHOD AND APPARATUS FOR AUTO-CONFIGURING LAYER THREE INTERMEDIATE COMPUTER NETWORK DEVICES	MCCLOGHRIE, KEITH
09179036	6167445	150	10/26/1998	METHOD AND APPARATUS FOR DEFINING AND IMPLEMENTING HIGH-LEVEL QUALITY OF SERVICE POLICIES IN COMPUTER NETWORKS	MCCLOGHRIE, KEITH
09206067	6286052	150	12/04/1998	METHOD AND APPARATUS FOR IDENTIFYING NETWORK DATA TRAFFIC FLOWS AND FOR APPLYING QUALITY OF SERVICE TREATMENTS TO THE FLOWS	MCCLOGHRIE, KEITH
09277329	6219699	150	03/26/1999	MULTIPLE VLAN ARCHITECTURE SYSTEM	MCCLOGHRIE, KEITH
09295187	6651096	150	04/20/1999	METHOD AND APPARATUS FOR ORGANIZING, STORING AND EVALUATING ACCESS CONTROL LISTS	MCCLOGHRIE, KEITH
09372480	6675220	150	08/11/1999	TECHNIQUES FOR THE HARDWARE IMPLEMENTATION OF RANDOM EARLY DETECTION MECHANISMS	MCCLOGHRIE, KEITH

09450066	6388995	150	11/29/1999	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTERS NETWORKS EXECUTING THE SPANNING TREE ALGORITHM	MCCLOGHRIE, KEITH
09450891	6535491	150	11/29/1999	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS USING A SPANNING TREE ALGORITHM	MCCLOGHRIE, KEITH
09452344	6678241	150	11/30/1999	FAST CONVERGENCE WITH TOPOLOGY SWITCHING	MCCLOGHRIE, KEITH
09482326	6839766	150	01/14/2000	METHOD AND APPARATUS FOR COMMUNICATING COPS PROTOCOL POLICIES TO NON-COPS-ENABLED NETWORK DEVICES	MCCLOGHRIE, KEITH
09580384	Not Issued	168	05/26/2000	MULTIPLE VLAN ARCHITECTURE SYSTEM	MCCLOGHRIE, KEITH
09583177	7111073	150	05/30/2000	APPARATUS FOR ESTIMATING DELAY AND JITTER BETWEEN NETWORK ROUTERS	MCCLOGHRIE, KEITH
09599311	6658458	150	06/22/2000	CASCADING ASSOCIATIVE MEMORY ARRANGEMENT	MCCLOGHRIE, KEITH
09609302	6885642	150	06/30/2000	METHOD AND APPARATUS FOR ESTIMATING DELAY AND JITTER BETWEEN NETWORK ROUTERS COUPLED TO BACKBONE NETWORK	MCCLOGHRIE, KEITH
09629585	6751746	150	07/31/2000	METHOD AND APPARATUS FOR UNINTERRUPTED PACKET TRANSFER USING REPLICATION OVER DISJOINT PATHS	MCCLOGHRIE, KEITH
09638180	6912203	150	07/31/2000	METHOD AND APPARATUS FOR ESTIMATING DELAY AND JITTER BETWEEN MANY NETWORK ROUTERS USING MEASUREMENTS BETWEEN A PREFERRED SET OF ROUTERS	MCCLOGHRIE, KEITH
09657023	6219739	150	09/07/2000	Spanning tree with fast link-failure convergence	MCCLOGHRIE, KEITH
09667296	6304901	150	09/22/2000	Multiple VLAN architecture system	MCCLOGHRIE, KEITH
09728138	7185073	150	12/01/2000	METHOD AND APPARATUS FOR DEFINING AND	MCCLOGHRIE, KEITH

				IMPLEMENTING HIGH-LEVEL QUALITY OF SERVICE POLICIES IN COMPUTER NETWORKS	
09746233	6868068	150	12/21/2000	METHOD AND APPARATUS FOR ESTIMATING DELAY AND JITTER BETWEEN NETWORK ROUTERS	MCCLOGHRIE, KEITH
09746558	6757901	150	12/21/2000	METHOD AND SYSTEM FOR SETTING EXPRESSIONS IN NETWORK MANAGEMENT NOTIFICATIONS AT AN AGENT	MCCLOGHRIE, KEITH
09748534	6813250	150	12/22/2000	SHARED SPANNING TREE PROTOCOL	MCCLOGHRIE, KEITH
09748758	7275094	150	12/21/2000	SYSTEM AND METHOD FOR CONFIGURING CONTENTS OF NETWORK MANAGEMENT NOTIFICATIONS	MCCLOGHRIE, KEITH
09750661	6795858	150	12/29/2000	METHOD AND APPARATUS FOR METRIC BASED SERVER SELECTION	MCCLOGHRIE, KEITH
09752016	Not Issued	71	12/29/2000	Method and apparatus for estimating delay and jitter between network routers	MCCLOGHRIE, KEITH
09911122	6434624	150	07/23/2001	METHOD AND APPARATUS FOR IDENTIFYING NETWORK DATA TRAFFIC FLOWS AND FOR APPLYING QUALITY OF SERVICE TREATMENTS TO THE FLOWS	MCCLOGHRIE, KEITH
10056309	7054926	150	01/23/2002	METHOD AND APPARATUS FOR MANAGING NETWORK DEVICES USING A PARSABLE STRING THAT CONFORMS TO A SPECIFIED GRAMMAR	MCCLOGHRIE, KEITH
10125208	7227859	150	04/17/2002	METHOD FOR ENSURING VLAN INTEGRITY FOR VOICE OVER INTERNET PROTOCOL TELEPHONES	MCCLOGHRIE, KEITH
10125269	7366164	150	04/17/2002	METHOD FOR REGULATING POWER FOR VOICE OVER INTERNET PROTOCOL TELEPHONES	MCCLOGHRIE, KEITH
10125324	Not Issued	41	04/17/2002	Method for bring-up of voice over internet protocol telephones	MCCLOGHRIE, KEITH
10191605	6651101	150	07/09/2002	METHOD AND APPARATUS	MCCLOGHRIE,

				FOR IDENTIFYING NETWORK DATA TRAFFIC FLOWS AND FOR APPLYING QUALITY OF SERVICE TREATMENTS TO THE FLOWS	KEITH
10259959	6976088	150	09/27/2002	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING BRIDGED NETWORKS USING A SPANNING TREE ALGORITHM	MCCLOGHRIE, KEITH
10752341	7428237	150	01/06/2004	FAST CONVERGENCE WITH TOPOLOGY SWITCHING	MCCLOGHRIE, KEITH
10770383	Not Issued	61	02/02/2004	Method and apparatus for auto-configuring layer three intermediate computer network devices	MCCLOGHRIE, KEITH
10820257	7373543	150	04/08/2004	METHOD AND APPARATUS FOR UNINTERRUPTED PACKET TRANSFER USING REPLICATION OVER DISJOINT PATHS	MCCLOGHRIE, KEITH
10847947	7249359	150	05/17/2004	METHOD AND SYSTEM FOR SETTING EXPRESSIONS IN NETWORK MANAGEMENT NOTIFICATIONS	MCCLOGHRIE, KEITH
10847949	6996827	150	05/17/2004	METHOD AND SYSTEM FOR SETTING EXPRESSIONS IN NETWORK MANAGEMENT NOTIFICATIONS	MCCLOGHRIE, KEITH
10960162	Not Issued	61	10/06/2004	Method and apparatus for communicating COPS protocol policies to non-COPS-enabled network devices	MCCLOGHRIE, KEITH
11075189	Not Issued	41	03/07/2005	Verifying packets received over a physical link	MCCLOGHRIE, KEITH
11107500	Not Issued	71	04/15/2005	Controlling access to managed objects in networked devices	MCCLOGHRIE, KEITH
11109539	Not Issued	41	04/18/2005	Method and apparatus for simple network management protocol bulk information processing	MCCLOGHRIE, KEITH
11113600	Not Issued	71	04/25/2005	Method and apparatus for rapidly reconfiguring computer networks	MCCLOGHRIE, KEITH
11168071	Not Issued	61	06/28/2005	Method and apparatus for estimating delay and jitter between many network routers using measurements between a preferred set of routers	MCCLOGHRIE, KEITH
11173737	Not	71	06/30/2005	Methods and systems for	MCCLOGHRIE,

	Issued			monitoring objects	KEITH
11272984	7484222	150	11/14/2005	METHOD AND SYSTEM FOR SETTING EXPRESSIONS IN NETWORK MANAGEMENT NOTIFICATIONS	MCCLOGHRIE, KEITH
11744103	Not Issued	30	05/03/2007	Method for Ensuring VLAN Integrity for Voice Over Internet Protocol Telephones	MCCLOGHRIE, KEITH

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Last Name	First Name	
MCCLOGHRIE	KEITH	Search

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	Ahmed, Salman	2419

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	Ahmed, Salman	2419

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	04/13/2008	09/29/2008	04/16/2009						
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	38	✓	✓	✓						
	39	✓	✓	✓						

Day : Thursday
Date: 4/16/2009

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Time: 18:51:03

Inventor Name Search Result

Your Search was:

Last Name = MCCLOGHRIE
First Name = KEITH

Application#	Patent#	Status	Date Filed	Title	Inventor Name
60285507	Not Issued	159	04/19/2001	Method for bring up of voice over IP phones	MCCLOGHRIE, KEITH

Inventor Search Completed: No Records to Display.

Search Another: Inventor **Last Name** MCCLOGHRIE **First Name** KEITH Search

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L20	2	"6188694".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:07
L21	2	"6032194".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:09
L22	2	"6202114".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:29
L23	2	"6388995".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:32
L24	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:34
L25	2	"6678241".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:37
L26	2	"6219739".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:37

L29	1	((first adj port) and (second adj port) and (third adj port) and (forwarding) and blocked and state).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:41
L30	2	"6976088".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:53

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Day : Thursday
Date: 4/16/2009

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Time: 18:49:21

Inventor Name Search Result

Your Search was:

Last Name = GAI
First Name = SILVANO

Application#	Patent#	Status	Date Filed	Title	Inventor Name
11084587	Not Issued	71	03/18/2005	Ethernet extension for the data center	GAI, SILVANO
11085768	7395332	150	03/21/2005	METHOD AND APPARATUS FOR HIGH-SPEED PARSING OF NETWORK MESSAGES	GAI, SILVANO
11094877	Not Issued	41	03/30/2005	Network device architecture for consolidating input/output and reducing latency	GAI, SILVANO
11113600	Not Issued	71	04/25/2005	Method and apparatus for rapidly reconfiguring computer networks	GAI, SILVANO
11152991	Not Issued	41	06/14/2005	Forwarding table reduction and multipath network forwarding	GAI, SILVANO
11256030	Not Issued	41	10/21/2005	Mirror consistency checking techniques for storage area networks and network based virtualization	GAI, SILVANO
11256292	Not Issued	41	10/21/2005	Mirroring mechanisms for storage area networks and network based virtualization	GAI, SILVANO
11256450	Not Issued	61	10/21/2005	Techniques for improving mirroring operations implemented in storage area networks and network based virtualization	GAI, SILVANO
11400671	Not Issued	61	04/06/2006	Fibre channel over ethernet	GAI, SILVANO
11434471	7412557	150	05/15/2006	APPARATUS AND METHOD FOR PREVENTING LOOPS IN A COMPUTER NETWORK	GAI, SILVANO
11490806	Not Issued	41	07/20/2006	Methods and apparatus for improved determination of network metrics	GAI, SILVANO
11595600	Not Issued	41	11/10/2006	System for dynamically tracking the location of network devices to enable emergency services	GAI, SILVANO
12140224	Not Issued	30	06/16/2008	APPARATUS AND METHOD FOR APPLYING NETWORK	GAI, SILVANO

				POLICY AT A NETWORK DEVICE	
12199678	Not Issued	30	08/27/2008	Methods and Apparatus for Implementing Virtualization of Storage within a Storage Area Network	GAI, SILVANO
12343843	Not Issued	25	12/24/2008	FIBRE CHANNEL SWITCH THAT ENABLES END DEVICES IN DIFFERENT FABRICS TO COMMUNICATE WITH ONE ANOTHER WHILE RETAINING THEIR UNIQUE FIBRE CHANNEL DOMAIN_IDs	GAI, SILVANO
12364416	Not Issued	19	02/02/2009	Mirroring Mechanisms For Storage Area Networks and Network Based Virtualization	GAI, SILVANO
12365076	Not Issued	19	02/03/2009	Techniques for Improving Mirroring Operations Implemented In Storage Area Networks and Network Based Virtualization	GAI, SILVANO
12365079	Not Issued	19	02/03/2009	Mirror Consistency Checking Techniques For Storage Area Networks And Network Based Virtualization	GAI, SILVANO
12396302	Not Issued	20	03/02/2009	FIBRE CHANNEL FABRIC AND SWITCHES WITH FLEXIBLE PREFIX ADDRESSING	GAI, SILVANO
60488116	Not Issued	159	07/16/2003	Fibre channel fabric and switches with flexible prefix addressing	GAI, SILVANO
60621396	Not Issued	159	10/22/2004	FC over ethernet	GAI, SILVANO
60944443	Not Issued	159	06/15/2007	APPARATUS AND METHOD FOR APPLYING NETWORK POLICY AT A NETWORK DEVICE	GAI, SILVANO
61210193	Not Issued	20	03/13/2009	Unified computing system	GAI, SILVANO

Inventor Search Completed: No Records to Display.

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Day : Thursday
Date: 4/16/2009

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Time: 18:51:32

Inventor Name Search Result

Your Search was:

Last Name = DUTT
First Name = DINESH

Application#	Patent#	Status	Date Filed	Title	Inventor Name
09213105	6643260	150	12/18/1998	METHOD AND APPARATUS FOR IMPLEMENTING A QUALITY OF SERVICE POLICY IN DATA COMMUNICATIONS NETWORK	DUTT, DINESH
09657023	6219739	150	09/07/2000	Spanning tree with fast link-failure convergence	DUTT, DINESH
11084587	Not Issued	71	03/18/2005	Ethernet extension for the data center	DUTT, DINESH
11094877	Not Issued	41	03/30/2005	Network device architecture for consolidating input/output and reducing latency	DUTT, DINESH
11146457	7437507	150	06/06/2005	ONLINE RESTRIPING TECHNIQUE FOR DISTRIBUTED NETWORK BASED VIRTUALIZATION	DUTT, DINESH
11256030	Not Issued	41	10/21/2005	Mirror consistency checking techniques for storage area networks and network based virtualization	DUTT, DINESH
11256292	Not Issued	41	10/21/2005	Mirroring mechanisms for storage area networks and network based virtualization	DUTT, DINESH
11256450	Not Issued	61	10/21/2005	Techniques for improving mirroring operations implemented in storage area networks and network based virtualization	DUTT, DINESH
11842866	Not Issued	25	08/21/2007	BACKWARD CONGESTION NOTIFICATION	DUTT, DINESH
12206475	Not Issued	25	09/08/2008	Online Restriping Technique for Distributed Network Based Virtualization	DUTT, DINESH
12364416	Not Issued	19	02/02/2009	Mirroring Mechanisms For Storage Area Networks and Network Based Virtualization	DUTT, DINESH
12365076	Not	19	02/03/2009	Techniques for Improving	DUTT, DINESH

	Issued			Mirroring Operations Implemented In Storage Area Networks and Network Based Virtualization	
12365079	Not Issued	19	02/03/2009	Mirror Consistency Checking Techniques For Storage Area Networks And Network Based Virtualization	DUTT, DINESH
09450891	6535491	150	11/29/1999	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS USING A SPANNING TREE ALGORITHM	DUTT, DINESH G
09940753	7272651	150	08/28/2001	RSVP TRANSMITTER PROXY	DUTT, DINESH G.
09964702	Not Issued	61	09/27/2001	System and method for mapping an index into an IPv6 address	DUTT, DINESH G.
10114394	Not Issued	41	04/01/2002	Label switching in fibre channel networks	DUTT, DINESH G.
10156971	6798746	150	05/28/2002	METHOD AND APPARATUS FOR IMPLEMENTING A QUALITY OF SERVICE POLICY IN A DATA COMMUNICATIONS NETWORK	DUTT, DINESH G.
10259959	6976088	150	09/27/2002	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING BRIDGED NETWORKS USING A SPANNING TREE ALGORITHM	DUTT, DINESH G.
10391683	6868065	150	03/18/2003	METHOD AND APPARATUS FOR IMPLEMENTING A QUALITY OF SERVICE POLICY IN A DATA COMMUNICATIONS NETWORK	DUTT, DINESH G.
10392157	6870812	150	03/18/2003	METHOD AND APPARATUS FOR IMPLEMENTING A QUALITY OF SERVICE POLICY IN A DATA COMMUNICATIONS NETWORK	DUTT, DINESH G.
10609442	7499410	150	06/26/2003	FIBRE CHANNEL SWITCH THAT ENABLES END DEVICES IN DIFFERENT FABRICS TO COMMUNICATE WITH ONE ANOTHER WHILE RETAINING THEIR UNIQUE FIBRE CHANNEL DOMAIN_IDS	DUTT, DINESH G.

10637732	7277433	150	08/07/2003	SWITCH FOR IMPLEMENTING READ ONLY ZONES IN A FIBRE CHANNEL FABRIC	DUTT, DINESH G.
10726269	Not Issued	41	12/01/2003	Apparatus and method for performing fast fibre channel write operations over relatively high latency networks	DUTT, DINESH G.
10778672	7512123	150	02/13/2004	FIBRE CHANNEL FABRIC AND SWITCHES WITH FLEXIBLE PREFIX ADDRESSING	DUTT, DINESH G.
10791143	Not Issued	168	03/01/2004	Fibre channel switch that enables end devices in different fabrics to communicate with one another while retaining their unique fibre channel domain_IDs	DUTT, DINESH G.
10791307	Not Issued	161	03/01/2004	Switch for implementing read only zones in a fibre channel fabric	DUTT, DINESH G.
10791660	Not Issued	168	03/01/2004	Apparatus and method for performing fast fibre channel write operations over relatively high latency networks	DUTT, DINESH G.
11113600	Not Issued	71	04/25/2005	Method and apparatus for rapidly reconfiguring computer networks	DUTT, DINESH G.
11129100	7475142	150	05/13/2005	CIFS FOR SCALABLE NAS ARCHITECTURE	DUTT, DINESH G.
11177880	7356573	150	07/08/2005	APPARATUS AND METHODS FOR DATA TAPPING IN A STORAGE AREA NETWORK	DUTT, DINESH G.
11356914	Not Issued	30	02/16/2006	Apparatus and methods for controlling a data tapping session in a storage area network	DUTT, DINESH G.
11361119	7506124	150	02/24/2006	APPARATUS AND METHODS FOR FACILITATING DATA TAPPING WITH HOST CLUSTERING IN A STORAGE AREA NETWORK	DUTT, DINESH G.
11494036	Not Issued	93	07/26/2006	EPOCH-BASED MUD LOGGING	DUTT, DINESH G.
11499372	Not Issued	30	08/03/2006	Processing a SCSI reserve in a network implementing network-based virtualization	DUTT, DINESH G.
11827474	Not Issued	30	07/11/2007	Fibre channel intelligent target management system	DUTT, DINESH G.
11844910	Not Issued	30	08/24/2007	IMPLEMENTING READ-ONLY ZONES IN A SWITCHING FABRIC	DUTT, DINESH G.

11967731	Not Issued	30	12/31/2007	DETECTING ROOTKITS OVER A STORAGE AREA NETWORK	DUTT, DINESH G.
12343843	Not Issued	25	12/24/2008	FIBRE CHANNEL SWITCH THAT ENABLES END DEVICES IN DIFFERENT FABRICS TO COMMUNICATE WITH ONE ANOTHER WHILE RETAINING THEIR UNIQUE FIBRE CHANNEL DOMAIN_IDs	DUTT, DINESH G.
12396302	Not Issued	20	03/02/2009	FIBRE CHANNEL FABRIC AND SWITCHES WITH FLEXIBLE PREFIX ADDRESSING	DUTT, DINESH G.
60779381	Not Issued	159	03/02/2006	Apparatus and methods for facilitating data tapping in a storage area network	DUTT, DINESH G.
08998412	6032194	150	12/24/1997	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS	DUTT, DINESH G.
09450066	6388995	150	11/29/1999	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTERS NETWORKS EXECUTING THE SPANNING TREE ALGORITHM	DUTT, DINESH G.
10034160	Not Issued	41	12/26/2001	Methods and apparatus for encapsulating a frame for transmission in a storage area network	DUTT, DINESH GANAPATHY
10409427	Not Issued	61	04/07/2003	Port analyzer adapter	DUTT, DINESH GANAPATHY
10655452	7474666	150	09/03/2003	SWITCH PORT ANALYZERS	DUTT, DINESH GANAPATHY
12324703	Not Issued	25	11/26/2008	SWITCH PORT ANALYZERS	DUTT, DINESH GANAPATHY

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Your Search was:

Last Name = GAI
First Name = SILVANO

Application#	Patent#	Status	Date Filed	Title	Inventor Name
08997297	6188694	150	12/23/1997	SHARED SPANNING TREE PROTOCOL	GAI, SILVANO
08998412	6032194	150	12/24/1997	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS	GAI, SILVANO
09002115	6202114	150	12/31/1997	SPANNING TREE WITH FAST LINK-FAILURE CONVERGENCE	GAI, SILVANO
09145600	6697360	150	09/02/1998	METHOD AND APPARATUS FOR AUTO-CONFIGURING LAYER THREE INTERMEDIATE COMPUTER NETWORK DEVICES	GAI, SILVANO
09179036	6167445	150	10/26/1998	METHOD AND APPARATUS FOR DEFINING AND IMPLEMENTING HIGH-LEVEL QUALITY OF SERVICE POLICIES IN COMPUTER NETWORKS	GAI, SILVANO
09206067	6286052	150	12/04/1998	METHOD AND APPARATUS FOR IDENTIFYING NETWORK DATA TRAFFIC FLOWS AND FOR APPLYING QUALITY OF SERVICE TREATMENTS TO THE FLOWS	GAI, SILVANO
09295187	6651096	150	04/20/1999	METHOD AND APPARATUS FOR ORGANIZING, STORING AND EVALUATING ACCESS CONTROL LISTS	GAI, SILVANO
09450066	6388995	150	11/29/1999	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTERS NETWORKS EXECUTING THE SPANNING TREE ALGORITHM	GAI, SILVANO
09450891	6535491	150	11/29/1999	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER	GAI, SILVANO

				NETWORKS USING A SPANNING TREE ALGORITHM	
09452344	6678241	150	11/30/1999	FAST CONVERGENCE WITH TOPOLOGY SWITCHING	GAI, SILVANO
09535810	6892237	150	03/28/2000	METHOD AND APPARATUS FOR HIGH-SPEED PARSING OF NETWORK MESSAGES	GAI, SILVANO
09560499	6904014	150	04/27/2000	METHOD AND APPARATUS FOR PERFORMING HIGH-SPEED TRAFFIC SHAPING	GAI, SILVANO
09561839	6714985	150	04/28/2000	METHOD AND APPARATUS FOR EFFICIENTLY REASSEMBLING FRAGMENTS RECEIVED AT AN INTERMEDIATE STATION IN A COMPUTER NETWORK	GAI, SILVANO
09593566	6831898	150	08/16/2000	MULTIPLE PACKET PATHS TO IMPROVE RELIABILITY IN AN IP NETWORK	GAI, SILVANO
09599311	6658458	150	06/22/2000	CASCADING ASSOCIATIVE MEMORY ARRANGEMENT	GAI, SILVANO
09657023	6219739	150	09/07/2000	Spanning tree with fast link-failure convergence	GAI, SILVANO
09728138	7185073	150	12/01/2000	METHOD AND APPARATUS FOR DEFINING AND IMPLEMENTING HIGH-LEVEL QUALITY OF SERVICE POLICIES IN COMPUTER NETWORKS	GAI, SILVANO
09747676	7076594	150	12/22/2000	APPARATUS AND METHOD PREVENTING ONE WAY CONNECTIVITY LOOPS IN A COMPUTER NETWORK	GAI, SILVANO
09748534	6813250	150	12/22/2000	SHARED SPANNING TREE PROTOCOL	GAI, SILVANO
09879553	6950400	150	06/12/2001	METHOD AND APPARATUS FOR PERFORMING HIGH-SPEED TRAFFIC SHAPING	GAI, SILVANO
09884239	6665611	150	06/19/2001	SYSTEM FOR DISCOVERING AND MAINTAINING GEOGRAPHIC LOCATION INFORMATION IN A COMPUTER NETWORK TO ENABLE EMERGENCY SERVICES	GAI, SILVANO
09908341	7149499	150	07/18/2001	SYSTEM FOR DYNAMICALLY TRACKING THE LOCATION OF NETWORK DEVICES TO ENABLE EMERGENCY SERVICES	GAI, SILVANO

09911122	6434624	150	07/23/2001	METHOD AND APPARATUS FOR IDENTIFYING NETWORK DATA TRAFFIC FLOWS AND FOR APPLYING QUALITY OF SERVICE TREATMENTS TO THE FLOWS	GAI, SILVANO
09940753	7272651	150	08/28/2001	RSVP TRANSMITTER PROXY	GAI, SILVANO
10034160	Not Issued	41	12/26/2001	Methods and apparatus for encapsulating a frame for transmission in a storage area network	GAI, SILVANO
10056238	7433948	150	01/23/2002	METHODS AND APPARATUS FOR IMPLEMENTING VIRTUALIZATION OF STORAGE WITHIN A STORAGE AREA NETWORK	GAI, SILVANO
10074616	7225188	150	02/13/2002	SYSTEM AND METHOD FOR PERFORMING REGULAR EXPRESSION MATCHING WITH HIGH PARALLELISM	GAI, SILVANO
10191605	6651101	150	07/09/2002	METHOD AND APPARATUS FOR IDENTIFYING NETWORK DATA TRAFFIC FLOWS AND FOR APPLYING QUALITY OF SERVICE TREATMENTS TO THE FLOWS	GAI, SILVANO
10205668	7474613	150	07/25/2002	METHODS AND APPARATUS FOR CREDIT-BASED FLOW CONTROL	GAI, SILVANO
10259959	6976088	150	09/27/2002	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING BRIDGED NETWORKS USING A SPANNING TREE ALGORITHM	GAI, SILVANO
10313305	7443845	150	12/06/2002	APPARATUS AND METHOD FOR A LIGHTWEIGHT, RELIABLE, PACKET-BASED TRANSPORT PROTOCOL	GAI, SILVANO
10313306	Not Issued	161	12/06/2002	Apparatus and method for a scalable network attach storage system	GAI, SILVANO
10313745	Not Issued	41	12/06/2002	Apparatus and method for a high availability data network using replicated delivery	GAI, SILVANO
10367341	Not Issued	93	02/13/2003	SECURITY GROUPS	GAI, SILVANO
10374490	Not Issued	71	02/25/2003	Method and apparatus for reliably and asymmetrically distributing security information within a fibre	GAI, SILVANO

				channel fabric	
10409427	Not Issued	61	04/07/2003	Port analyzer adapter	GAI, SILVANO
10463362	Not Issued	41	06/17/2003	Methods and devices for the coordination of flow control between a TCP/IP network and other networks	GAI, SILVANO
10609442	7499410	150	06/26/2003	FIBRE CHANNEL SWITCH THAT ENABLES END DEVICES IN DIFFERENT FABRICS TO COMMUNICATE WITH ONE ANOTHER WHILE RETAINING THEIR UNIQUE FIBRE CHANNEL DOMAIN_IDS	GAI, SILVANO
10684681	6874016	150	10/14/2003	INFORMATION SEARCHING DEVICE	GAI, SILVANO
10697896	7194354	150	10/30/2003	SYSTEM FOR DISCOVERING AND MAINTAINING GEOGRAPHIC LOCATION INFORMATION IN A COMPUTER NETWORK TO ENABLE EMERGENCY SERVICES	GAI, SILVANO
10726269	Not Issued	41	12/01/2003	Apparatus and method for performing fast fibre channel write operations over relatively high latency networks	GAI, SILVANO
10752341	7428237	150	01/06/2004	FAST CONVERGENCE WITH TOPOLOGY SWITCHING	GAI, SILVANO
10770383	Not Issued	61	02/02/2004	Method and apparatus for auto-configuring layer three intermediate computer network devices	GAI, SILVANO
10778672	7512123	150	02/13/2004	FIBRE CHANNEL FABRIC AND SWITCHES WITH FLEXIBLE PREFIX ADDRESSING	GAI, SILVANO
10791137	Not Issued	161	03/01/2004	Apparatus and method for a high availability data network using replicated delivery	GAI, SILVANO
10791143	Not Issued	168	03/01/2004	Fibre channel switch that enables end devices in different fabrics to communicate with one another while retaining their unique fibre channel domain_IDs	GAI, SILVANO
10791297	Not Issued	161	03/01/2004	Security groups for VLANs	GAI, SILVANO
10791660	Not Issued	168	03/01/2004	Apparatus and method for performing fast fibre channel write operations over relatively high	GAI, SILVANO

				latency networks	
11074261	7130272	150	03/07/2005	METHOD AND APPARATUS FOR PERFORMING HIGH-SPEED TRAFFIC SHAPING	GAI, SILVANO
11078992	Not Issued	93	03/10/2005	FIBRE CHANNEL OVER ETHERNET	GAI, SILVANO

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PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: Silvano Gai et al.	)	
Serial No.: 11/113,600	)	Examiner: AHMED, SALMAN
Filed: April 25, 2005	)	Art Unit: 2419
For: Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm	)	

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
August 24, 2009

BY EFS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

AMENDMENT

This Amendment is filed in response to the Final Office Action mailed April 22, 2009 in connection with a Request for Continued Examination and a Petition for a 1-Month Extension of Time. The Applicant respectfully requests reconsideration. All objections and rejections are respectfully traversed.

IN THE CLAIMS:

1. (CURRENTLY AMENDED) A method for operating a router, comprising:

executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state;

detecting a link failure; and

transitioning by the spanning tree protocol, in response to detecting the failure, the designated port into the blocked state and ~~also transitioning~~ the back-up designated port into the forwarding state, without the spanning tree protocol transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

2. (ORIGINAL) The method as in claim 1, further comprising:

transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

3. (CURRENTLY AMENDED) A method for operating a router, comprising:

executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a

forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

selecting a third port as a back-up root port and placing the back-up root port in a blocked state;

detecting a link failure; and

transitioning by the spanning tree protocol, in response to detecting the failure, the root port into the blocked state and ~~also transitioning~~ the back-up root port into the forwarding state, without the spanning tree protocol transitioning the back-up root port through any intermediary states in moving from the blocked state to the forwarding state.

4. (ORIIGNAL) The method as in claim 1, further comprising:

transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

5-9. (CANCELLED)

10. (CURRENTLY AMENDED) A method for operating a computer network, comprising:

issuing a become_root_primary command to a first router;

setting, in response to the become_root_primary command, ~~an~~a numeric switch identifier (ID) stored in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router;

issuing a become_root_secondary command to a second router;

setting, in response to the become_root_secondary command, ~~an~~ a numeric switch ID stored in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;

transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

11. (ORIGINAL) The method as in claim 10, further comprising:

issuing an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port.

12. (ORIGINAL) The method as in claim 10, further comprising:

executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router;

transmitting a BPDU message by each port in forwarding state at each expiration of a hello timer for maintaining communication along links of the spanning tree;

transitioning, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods, the backup designated port to forwarding and transitioning the selected designated port to blocking; and

transitioning, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods, the backup root port to forwarding and transitioning the selected root port to blocking.

13. (ORIGINAL) The method as in claim 10, further comprising:

detecting a BPDU message by a root port of the secondary root router;

transitioning, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router.

14. (CURRENTLY AMENDED) A router, comprising:

means for executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

means for selecting a third port as a back-up designated port and placing the back-up root port in a blocked state;

means for detecting a link failure; and

means for transitioning of the spanning tree protocol, in response to detecting the failure, the designated port into the blocked state and ~~also transitioning~~ the back-up designated port into the forwarding state, without transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

15. (ORIGINAL) The router as in claim 14, further comprising:

means for transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

16. (PREVIOUSLY PRESENTED) A router, comprising:

means for executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

means for selecting a third port as a back-up root port and placing the back-up root port in a blocked state;

means for detecting a link failure; and

means for transitioning of the spanning tree protocol, in response to detecting the failure, the root port into the blocked state and ~~also transitioning~~ the back-up root port into the forwarding state, without transitioning the back-up root port through any intermediary states in moving from the blocked state to the forwarding state.

17. (ORIGINAL) The router as in claim 16, further comprising:

means for transmitting, by the back-up root port, BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

18-22. (CANCELLED)

23. (CURRENTLY AMENDED) A computer network, comprising:

means for issuing a become_root_primary command to a first router;

means for setting, in response to the become_root_primary command, ~~an~~ a numeric switch identifier (ID) stored in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router;

means for issuing a become_root_secondary command to a second router;

means for setting, in response to the become_root_secondary command, ~~an~~ a numeric switch ID stored in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;

means for transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

24. (ORIGINAL) The computer network as in claim 23, further comprising:

means for issuing an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port.

25. (ORIGINAL) The computer network as in claim 23, further comprising:

means for executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router;

means for transmitting a BPDU message by each port in forwarding state at each expiration of a hello timer for maintaining communication along links of the spanning tree;

means for transitioning, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods, the backup designated port to forwarding and transitioning the selected designated port to blocking; and

means for transitioning, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods, the backup root port to forwarding and transitioning the selected root port to blocking.

26. (ORIGINAL) The computer network as in claim 23, further comprising:

means for detecting a BPDU message by a root port of the secondary root router;

means for transitioning, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router.

27. (CURRENTLY AMENDED) A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

a third port selected as a back-up designated port and placed in a blocked state;

a port to detect a link failure; and

a rapid reconfiguration entity of the spanning tree protocol to transition, in response to detecting the failure, the designated port into the blocked state and also to transition the back-up designated port into the forwarding state, without transition of the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

28. (ORIGINAL) The router as in claim 27, further comprising:

the back-up designated port transmitting a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

29. (CURRENTLY AMENDED) A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

a third port selected as a back-up root port and placed in a blocked state;

a port to detect a link failure; and

a rapid reconfiguration entity of the spanning tree protocol to transition, in response to detecting the failure, the root port into the blocked state and also transitioning the back-up root port into the forwarding state, without transition of the back-up root port through any intermediary states in moving from the blocked state to the forwarding state.

30. (ORIGINAL) The router as in claim 29, further comprising:

the back-up root port transmitting BPDU messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

31-35. (CANCELLED)

36. (CURRENTLY AMENDED) A computer network, comprising:

a first port to enter a become_root_primary command to a first router;

a rapid reconfiguration entity to set, in response to the become_root_primary command, ~~an~~a numeric switch identifier (ID) stored in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router;

a second port to enter a become_root_secondary command to a second router;

a rapid reconfiguration entity to set, in response to the become_root_secondary command, ~~an~~ a numeric switch ID stored in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;

the rapid reconfiguration entity to transition, in response to failure of the first router while serving as the root router, the second router to become the root router.

37. (ORIGINAL) The computer network as in claim 36, further comprising:

a third port to enter an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port.

38. (ORIGINAL) The computer network as in claim 36, further comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router;

each port in forwarding state to transmit a BPDU message at each expiration of a hello timer to maintain communication along links of the spanning tree;

a rapid reconfiguration entity to transition, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods, the backup designated port to forwarding and transitioning the selected designated port to blocking; and

the rapid reconfiguration entity to transition, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods, the backup root port to forwarding and transitioning the selected root port to blocking.

39. (ORIGINAL) The computer network as in claim 36, further comprising:

a root port of the secondary root router to detect a BPDU message;

a rapid reconfiguration entity to transition, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router.

REMARKS

This Amendment is filed in response to the Final Office Action mailed April 22, 2009 in connection with a Request for Continued Examination and a Petition for a 1-Month Extension of Time. The Applicant respectfully requests reconsideration. All objections and rejections are respectfully traversed.

Claims 1-4, 10-17, 23-30, 36-39 are now pending in the application.

Claims 1, 3, 10, 14, 16, 23, 27, 29 and 36 have been amended.

No new claims have been added.

Claim Rejections - 35 U.S.C. §103

Claims 1, 3, 14, 16, 27 and 29:

At paragraphs 1-3 of the Final Office Action, claims 1, 3, 14, 16, 27 and 29 were rejected under 35 U.S.C. §103(a) over Shobatake, U.S. Patent No. 5,506,847 (hereinafter "Shobatake") in view of Seaman, U.S. Patent No. 5,790,808 (hereinafter "Seaman"), in further view of Souza et al., "GIGASwitch System: A High-performance Packet-switching Platform" (hereinafter "Souza"), in still further view of Biegel et al., U.S. Patent No. 5,608,720 (hereinafter "Biegel").

The Applicant's claim 1, representative in part of claims 1, 3, 14, 16, 27 and 29, sets forth (emphasis added):

> 1. (CURRENTLY AMENDED) A method for operating a router, comprising:
> executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;
> selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state;
> detecting a link failure; and
> ***transitioning by the spanning tree protocol***, in response to detecting the failure, ***the designated port into the blocked state and the back-up desig-***

nated port into the forwarding state, without the spanning tree protocol transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

Shobatake discusses an ATM LAN and suggests one should "define a spanning tree in the ATM-LAN from the time when the power is turned on, by its physical connection method." *See* Shobatake col. 49, lines 45-49.

Seaman discusses a technique for transitioning ports among Spanning Tree Algorithm and Protocol states. *See* Seaman col. 2, lines 14-19 and col. 4, line 66 to col. 5, line 1. Seaman describes "a plurality of transitional states, including the forgetting state [Fig. 2] 32, the blocking state 33, the listening state 34, and the learning state 35. All of these transition states except the forgetting state 32 are included within the 802.1D standard." *See* Seaman col. 5, lines 5-11 and Fig. 2. As can be seen from Fig. 2, to transition from the blocking state 32 to the forwarding state 36 is a lengthy process. One must first make a transition 42 to the listening state 34, then make a second transition 43 to the learning state 35, before making yet another transition 45 to the forwarding state 36. *See also* Seaman col. 5, lines 15-44 (describing the transition process).

Souza discusses using "2-port FDDI line cards to construct a 22-port IEEE 802.1d FDDI bridge." *See* Souza page 1, abstract. Souza describes that "[i]f a LAN is connected to ports on two different FDDI line cards, the 802.1d spanning tree places one of the ports in backup state; failure of the operational port causes the backup port to come on-line." *See* Souza page 12, Section "Reliability and Availability", 1st paragraph thereof.

Biegel discusses a software architecture for a control system of a network element. *See* Biegel col. 1, lines 21-31. The control system includes several portions referred to as "subagents." *See* Biegel col. 1, lines 25-26, col. 10, lines 29-35 and Fig. 5, "Transport Access Subagent", Common Core Shelf Subagent", etc. A "subagent" may be in one of several different states. *See* Biegel col. 6, line 22 and Fig. 33. One such state is "[t]he Operational Cold Standby State 506 [that] is an intermediate state that signifies that diagnostics have been performed and passed." *See* Biegel col. 37, lines 22-25. "[A]n entity which implements a

state machine in a subagent in the operational standby state can be required to bypass some intermediate states and proceed directly to a major stable state." *See* Biegel col. 27, lines 42-45.

The Applicant respectfully urges that the combination of Shobatake, Seaman, Souza and Biegel does not teach or suggest the Applicant's claimed novel "***transitioning by the spanning tree protocol ... the designated port into the blocked state and the back-up designated port into the forwarding state, without the spanning tree protocol transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state***."

As the Applicant discusses in the background of the specification, one issue with conventional spanning protocol (STP) techniques is that recalculation of a spanning tree is typically a time consuming process. "Rather than transition directly from the blocked state to the forwarding state, [with a traditional spanning tree protocol,] ports transition through two intermediate states: a listening state and a learning state. In the listening state, a port waits for information indicating that it should return to the blocked state.... In the learning state, a port still blocks the receiving and forwarding of frames, but received frames are examined and the corresponding location information is stored...." *See* specification page 7, lines 9-11. Typically "ports in the listening and learning states do not forward or receive messages. To the network users, these delays are perceived as service interruptions, which may present significant problems, especially on high-reliable networks." *See* specification page 9, lines 5-9 The Applicant novelly addresses these and other problems, in part, by defining certain back-up ports that a spanning tree protocol may rapidly transition to the forwarding state, absent the usually time consuming transitions between intermediary states (for example, absent transition by the spanning tree protocol through the listening state and the learning state.)

There appears to be agreement that Shobatake does not teach "***transitioning by the spanning tree protocol ... the designated port into the blocked state and the back-up designated port into the forwarding state, without the spanning tree protocol transitioning the back-up designated port through any intermediary states in moving from the blocked state***

to the forwarding state." *See* Final Office Action page 6, 2nd paragraph and page 7, 2nd paragraph. However, combination with Seaman, Souza and Biegel does not remedy the deficiencies of Shobatake.

Seaman teaches away from what the Applicant claims. The Applicant respectfully directs the Examiner's attention to MPEP §2141.02 that provides:

> A prior art reference must be considered in its entirety, i.e. as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 2002 (Fed. Cir. 1983), *cert denied,* 469 U.S. 851 (1984)

The Applicant further respectfully directs the Examiner to MPEP §2144.05 III that provides (emphasis added):

> **A *prima facie* case of obviousness may also be rebutted by showing that the art, in any material respect, teaches away from the claimed invention** *in re Geisler,* 116 F3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997)

Rather than teach a spanning tree protocol transitioning a back-up designated port from a blocked state into a forwarding state, without the spanning tree protocol transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state, Seaman directs that when transitioning a port from a blocked state to a forwarding state the port **should transition through multiple intermediary states**, including a listening state and a learning state. As can be seen from Fig. 2 of Seaman, to transition from Seaman's blocking state 32 to his forwarding state 36, one must first make a transition 42 to the listening state 34, then make a second transition 43 to the learning state 35, before finally making the transition 45 to the forwarding state 36. *See* also Seaman col. 5, lines 15-44 (describing the transition process). One of skill in the art reading such description in Seaman would be dissuaded from implementing a system as the Applicant claims, due to the contrary teaching. Indeed, they would be led to construct a system that would likely suffer the very shortcomings discussed by the Applicant in the background section of the Application.

Further, Souza also teaches away from a spanning tree protocol transitioning a back-up designated port from a blocked state into a forwarding state, without the spanning tree protocol transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state. Souza states that with multiple ports "the 802.1d spanning tree places one of the ports in backup state; failure of the operational port causes the backup port to come on-line." *See* Souza page 12, Section "Reliability and Availability", 1st paragraph thereof. Since Souza uses the 802.1d protocol, where a spanning tree protocol transitions through listening and learning intermediary states when transitioning to the forwarding state, on following the teachings of Souza would again be led astray from what the Applicant claims.

Finally, further combination with Biegel does not remedy the teaching away of Seaman and Souza. Biegel makes no mention of a spanning tree protocol, much less suggest a spanning tree protocol should transition a port among states in a particular manner that differs what is done in a conventional spanning tree protocol implementation. Biegel merely discusses a software architecture in which a portion of software referred to as a "subagent" may move between several different states. *See* Biegel Fig. 5, "Transport Access Subagent", Common Core Shelf Subagent", etc, col. 6, line 22 and Fig. 33. Biegel's "subagent" is not akin to a port. Nor is it being transitioned among states by a spanning tree protocol.

The Final Office Action suggests that Biegel's "major stable state" is akin to the claimed "forwarding state" the Applicant's spanning tree protocol transitions a port directly into. The Applicant respectfully requests reconsideration. Biegel in no way suggests his "subagent" is conducting any forwarding in the "major stable state" and, accordingly, it may not fairly be considered a "forwarding state."

Accordingly, the Applicant respectfully urges that the combination of Shobatake, Seaman, Souza and Biegel is legally insufficient to make obvious the present claims under 35 U.S.C. §103(a) because of the absence of the Applicant's claimed novel "***transitioning by the spanning tree protocol … the designated port into the blocked state and the back-up designated port into the forwarding state, without the spanning tree protocol transitioning***

the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state."

Claims 2, 4, 15, 17, 28 and 30:

At paragraph 4 of the Final Office Action, claims 2, 4, 15, 17, 28 and 30 were rejected under 35 U.S.C. §103(a) over Shobatake, in view of Seaman, in further view of Souza, in still further view of Biegel, in even further view of Backes et al., U.S. Patent No. 5,018,137 (hereinafter "Backes").

The Applicant notes that claims 2, 4, 15, 17, 28 and 30 are dependent claims that depend from independent claims believed to be allowable for at least the reasons discussed above. Claims 2, 4, 15, 17, 28 and 30 are believed to be allowable due to their dependency, as well as for other separate reasons.

Claims 10-13, 23-26 and 36-39:

The Applicant's claim 10, representative in part of claims 10-13, 23-26 and 36-39, sets forth (emphasis added):

> 10. (CURRENTLY AMENDED) A method for operating a computer network, comprising:
>
> issuing a become_root_primary command to a first router;
>
> ***setting, in response to the become_root_primary command, a numeric switch identifier (ID) stored in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router***;
>
> issuing a become_root_secondary command to a second router;
>
> ***setting, in response to the become_root_secondary command, a numeric switch ID stored in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router;***
>
> transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

Backes discloses "[p]referably, the selection of the root bridge would be done by the bridges themselves .... A preferred method of selection calls for each bridge to compare the root identifier field 420 of the BDPUs it receives to a stored root identifier." *See* page 7, lines 6-12.

The Applicant respectfully urges that Backes, Seaman and Souza are silent concerning the Applicant's claimed "***setting, in response to the become_root_primary command, a numeric switch identifier (ID) stored in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router***" and "***setting, in response to the become_root_secondary command, a numeric switch ID stored in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router.***"

While the Applicant claims, setting, in response to a first special command, a numeric switch ID stored in the first router to promote a spanning tree protocol to select the first router as a primary root router, and setting, in response to a second special command, a numeric switch ID stored in the second router to promote spanning tree protocol to select the second router as a secondary root router, Backes makes no mention of any mechanism for setting switch identifiers stored in routers. Backes simply states that bridges "compare the root identifier field 420 of the BDPUs it receives to a stored root identifier" to select a root bridge *See* Backes page 7, lines 6-12. No mention is made of any mechanism for setting the stored root identifier in the first place, much less special commands that may be issued to do so. Further, combination with Seaman and Souza do not remedy the deficiencies of Backes. Neither reference makes any mention of setting a numeric switch ID stored in a router, in response to any special command.

Accordingly, the Applicant respectfully urges that the combination of Backes, Seaman and Souza is legally insufficient to make obvious the present claims under 35 U.S.C. §103(a) because of the absence of the Applicant's claimed novel "***setting, in response to the become_root_primary command, a numeric switch identifier (ID) stored in the first router to assist an execution of a spanning tree protocol to select the first***

router as a primary root router" and "***setting, in response to the become_root_secondary command, a numeric switch ID stored in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router.***"

In the event that the Examiner deems personal contact desirable in disposition of this case, the Examiner is encouraged to call the undersigned attorney at (617) 951-2500.

In summary, all the independent claims are believed to be in condition for allowance and therefore all dependent claims that depend there from are believed to be in condition for allowance. The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

__/James A. Blanchette/_____

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:
Silvano Gai

Serial No.: 11/113,600

Filed: April 25, 2005

For: METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS

Examiner: Ahmed, Salman

Art Unit: 2419

Confirmation No.: 8858

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
August 24, 2009

BY EFS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

PETITION FOR EXTENSION OF TIME

Please extend the time for response to the Office Action dated April 22, 2009, by one month to August 22, 2009.

The PTO is authorized to charge $130.00, comprising the fee of $130.00 specified by 37 C.F.R. § 1.17(a)(1) for other than a small entity, to deposit account number 03-1237.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

/James A. Blanchette/

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PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	11/113,600	Filing Date	2005-04-25	Docket Number (if applicable)	112025-0063D1C2	Art Unit	2419
First Named Inventor	Silvano Gai			Examiner Name	AHMED, SALMAN		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☒ Other Petition for Extension of Time

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 031237

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/James A. Blanchette/	Date (YYYY-MM-DD)	2009-08-24
Name	James A. Blanchette	Registration Number	51477

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	11113600
Filing Date:	25-Apr-2005
Title of Invention:	Method and apparatus for rapidly reconfiguring computer networks
First Named Inventor/Applicant Name:	Silvano Gai
Filer:	James A. Blanchette
Attorney Docket Number:	112025-0063D1C2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	1251	1	130	130

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
		Total in USD ($)		**940**

Electronic Acknowledgement Receipt

EFS ID:	5944966
Application Number:	11113600
International Application Number:	
Confirmation Number:	8858
Title of Invention:	Method and apparatus for rapidly reconfiguring computer networks
First Named Inventor/Applicant Name:	Silvano Gai
Customer Number:	24267
Filer:	James A. Blanchette
Filer Authorized By:	
Attorney Docket Number:	112025-0063D1C2
Receipt Date:	24-AUG-2009
Filing Date:	25-APR-2005
Time Stamp:	22:55:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$940
RAM confirmation Number	9684
Deposit Account	031237
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		AMEND_Aug_24_2009.pdf	89060 fecd8993998ad59d6f813f886c9c98be82d76e96	yes	19

Multipart Description/PDF files in .zip description

Document Description	Start	End
Request for Continued Examination (RCE)	1	1
Claims	2	11
Applicant Arguments/Remarks Made in an Amendment	12	19

Warnings:

Information:

2	Extension of Time	21W5325.PDF	18028 0e0617612e8b0dedddbb8f91234c107543488698	no	2

Warnings:

Information:

3	Request for Continued Examination (RCE)	RCE.pdf	37059 8a07c9416027ac8fbacbbb5d3ead2210ba385b1c	no	3

Warnings:

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Information:

4	Fee Worksheet (PTO-875)	fee-info.pdf	31957 81f6a01e3b3f1c61c361033464a408d25d40e39a	no	2

Warnings:

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Total Files Size (in bytes):	176104

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/113,600	04/25/2005	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	08/24/2009	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 24	Minus	** 39	= 0	X $ =		OR	X $52=	0
	Independent (37 CFR 1.16(h))	* 9	Minus	***15	= 0	X $ =		OR	X $220=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/CATHERINE d. SMITH/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/113,600	04/25/2005	Silvano Gai	112025-0063D1C2	8858

24267 7590 10/30/2009

CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

EXAMINER	
AHMED, SALMAN	

ART UNIT	PAPER NUMBER
2476	

MAIL DATE	DELIVERY MODE
10/30/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	11/113,600	GAI ET AL.	
	Examiner	Art Unit	
	SALMAN AHMED	2476	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 August 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,10-17,23-30 and 36-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-4,14-17 and 27-30* is/are allowed.

6)☒ Claim(s) *10-13,23-26 and 36-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/25/2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 10-13, 23-26 and 36-39, are rejected under 35 U.S.C. 103(a) as being unpatentable over Backes et al. (US5018137, hereinfter Backes) in view of Seaman (US PAT 5790808) and Souza et al.: GIGAswitch System: A High-performance Packet-switching Platform- Digital Technical Journal, 1994, hereinafter Souza.

Regarding claims 10, 23, and 36, Backes teaches method for operating a computer network, comprising: issuing a become_root_primary command to a first router (see col. 7 lines 8-43); setting, in response to the become_root_primary

command, a numeric switch identifier ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router (see col. 7 lines 8-43); issuing a become_root_secondary command to a second router (see col. 7 lines 55 - col. 8 line 33); setting, in response to the become_root_secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router (see col. 7 lines 55 - col. 8 line 33). Backes teaches (see col. 7 line 8 - col. 8 line 33) the selection of the root bridge would be done by the bridges themselves using bridge processor 340 under control of program memory 360 and with the aid of working memory 370. A preferred method of selection calls for each bridge to compare the root identifier field 420 of the BDPUs it receives (i.e. "issuance of a become_root_primary command to a first router") to a stored root identifier. If the received message has a root identifier (interpreted as numeric switch identifier ID) field with a better priority than the stored root identifier (interpreted as numeric switch identifier ID), the root identifier (interpreted as numeric switch identifier ID) value in the received message would become the new stored root identifier (i.e. "setting, in response to the become root_primary command, a numeric switch identifier ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router"). With this method, all bridges will eventually have the same stored root identifier. As shown in FIG. 2, the next step is to evaluate the BPDUs from the other bridges to choose a designated bridge and daughter bridges for each network (step 230). This too is part of the spanning tree algorithm. In the preferred embodiment of this invention, such evaluation is done by each bridge

using the appropriate bridge processing unit 340 under control of program memory 360 and working memory 370. Preferably, while the bridges are exchanging BPDU's, all bridges connected to the same network compare root path costs, which are concurrently being determined in a manner described above (i.e. "issuing a become_root secondary command to a second router"). The bridge with the lowest root path cost is deemed to be the designated bridge for that network (i.e. "setting, in response to the become root secondary command, a numeric switch identifier ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router"). If multiple bridges have the same root path cost, then some technique, such as use of the bridge identifier (i.e. numeric switch identifier ID) is used to select the designated bridge (emphasis added). All of the bridges connected to a network which do not have another path to the root, and are not selected to be a designated bridge are deemed to be daughter bridges. According to one variation of this invention, this selecting step involves exchanging configuration messages (i.e. interpreted as commands), such as BPDUs, among the bridges during the repeating configuration periods, as described with regard to step 210. Examiner further submits, BDPUs received and used for selecting root bridge using root identifier field, is interpreted as “become_root_primary commend”. BDPUs received and used for designating daughter bridges using root identifier field is interpreted as “become_root_secondary command. In regards to limitation “numeric switch identifier ID”, stored *root identifier* and *bridge identifier* are interpreted as respective numeric switch identifier ID as required by claimed limitation.

Backes does not explicitly teach place both the root port and the designated port in a forwarding state. Backers does not explicitly teach transitioning in response to event all designated ports of the root router into blocked state and transitioning a back-up router into a root router. Backers does not explicitly teach transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router.

Seaman in the same field of endeavor teaches placing both the root port and the designated port in a forwarding state (column 5 lines 45-46, The port stays in the forwarding state 36 until the algorithm selects the port as not the designated or root port). Seaman in the same field of endeavor teaches transitioning in response to event all designated ports of the root router into blocked state and transitioning a back-up router into a root router; transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router (column 5 lines 45-46, in the preferred system, the protocol entity executes the Spanning Tree Algorithm as set out in the IEEE 802.1D standard for bridged local area networks. A bridge in the first network state acts to forward data received at the port, and the second network state acts to block data received at the port. Also, according to the Spanning Tree Algorithm, a transition from the first network state is executed upon receipt of information indicating that a change to the blocking second network state should be executed. The present invention can also be characterized as an improvement to a bridge having a plurality of ports and including a bridge protocol entity for interconnecting according to a Spanning Tree Algorithm a plurality of local area

networks coupled to respective ones of the plurality of ports. The improvement comprises logic communicating with the bridge protocol entity, and coupled with the plurality of ports, which establishes active network states for the plurality of ports. changing a port from the first network state to the second network state in a network system after receipt of information from the protocol resources indicating such change; and changing a port from the second network state to the first network state in a network system after expiry of a waiting interval if information from the protocol resources indicating such change is received after expiry of a forgetting interval after a change into the second network state, else changing directly into the first network state. Finally, Seaman teaches transitioning a back-up router into a root router (See figures 3A-3D). transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router (See figures 3A-3D)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Backes' teaching to incorporate the steps of placing both the root port and the designated port in a forwarding state; transitioning in response to event all designated ports of the root router into blocked state and transitioning a back-up router into a root router; transitioning, in response to failure of the first router while serving as the root router, the second router to become the root router as suggested by Seaman. The motivation is that (as suggested by Seaman, column 3 lines 33-37) managing ports on network systems, such that data is transmitted through a port in a first network state and such that data is blocked at a port in a second network state enables proper transmission of data through the ports. Further motivation is that by

reassigning root routers due to router failure guarantees seamless continuation of reliable communication. 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/market place incentives if the variations are predictable to one of ordinary skill in the art.

Backes teaches ports being assigned as designated ports but Backes and Seaman do not explicitly teach selecting a port as a back-up port and placing the back-up port in a blocked state; detecting a link failure; and transitioning, in response to detecting the failure, the port into a blocked state and also transitioning the back-up port into a forwarding state.

Souza in the same field of endeavor teaches If a LAN is connected to ports on two different FDDI line cards, the 802.1d spanning tree places one of the ports in backup state; failure of the operational port causes the backup port to come on-line (section: “Reliability and Availability”).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Backes and Seaman’ teaching with the steps of placing one of the ports in backup state; failure of the operational port causes the backup port to come on-line as suggested by Souza. The motivation is that such method of placing one of the ports in backup state; failure of the operational port causes the backup port to come on-line guarantees reliable communication. 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/market place incentives if the variations are predictable to one of ordinary skill in the art.

Regarding claims 11, 24, and 37, Backes teaches further comprising: issuing an enable_uplinkfast command to at least one router connected in the computer network, and in response to the enable_uplinkfast command the at least one router selecting a backup designated port for a designated port, and the at least one router selecting a backup root port for a root port (see col. 7 lines 55-65).

Regarding claims 12, 25, and 38, Backes teaches further comprising: •executing a spanning tree protocol to select a first router as a root router, and to select a designated router for each link of a spanning tree, and to select a root port and a designated port for each designated router (see figure 2 box 220 and box 230 and col. 5 lines 13-39); transmitting a BPDU message by each port in forwarding state at each expiration of a hello timer for maintaining communication along links of the spanning tree (see col. 6 lines 10-15); transitioning, in response to a failure to receive the BPDU message at a selected designated port after a selected number of timeout periods (see col. 6 lines 10- 15), the backup designated port to forwarding and transitioning the selected designated port to blocking (see col. 10 lines 32-45); and transitioning, in response to a failure to receive the BPDU message at a selected root port after a selected number of timeout periods (see col. 6 lines 10-15), the backup root port to forwarding and transitioning the selected root port to blocking (see col. 10 lines 32-45).

Regarding claims 13, 26, and 39, Backes teaches further comprising: detecting a BPDU message by a root port of the secondary root router (see col.

10 lines 14-22); transitioning, in response to a failure to detect the BPDU message by the root port of the secondary root router after a selected number of timeout periods, the secondary root router to be the root router (see col. 10 lines 23-45).

Allowable Subject Matter

4. Claims 1-4, 14-17 and 27-30 are allowed.

Response to Arguments

5. Applicant's arguments see pages 12-18 of the Remarks section, filed 1/21/2009, with respect to the rejections of the claims have been fully considered.

Claims 10-13, 23-26 and 36-39:

Applicant argues that (page 18 paragraph 2) Backes, Seaman and Souza are silent concerning the Applicant's claimed "setting, in response to the become_root__primary command, a numeric switch identifier (ID) stored in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router" and "setting, in response to the become_root_secondary command, a numeric switch ID stored in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router."

However, Examiner respectfully disagrees with the Applicant's assertion. The cited prior art do indeed teach the cited limitations. Specifically, Backes teaches (see col. 7 line 8 - col. 8 line 33) the selection of the root bridge would be done by the bridges themselves using bridge processor 340 under control of program memory 360 and with the aid of working memory 370. A preferred method of selection calls for each bridge to compare the root identifier field 420 of the BDPUs it receives (i.e. "issuance of a

become_root_primary command to a first router") to a stored root identifier. If the received message has a root identifier field with a better priority than the stored root identifier, the root identifier value in the received message would become the new stored root identifier (i.e. "setting, in response to the become root_primary command, an ID in the first router to assist an execution of a spanning tree protocol to select the first router as a primary root router"). With this method, all bridges will eventually have the same stored root identifier. As shown in FIG. 2, the next step is to evaluate the BPDUs from the other bridges to choose a designated bridge and daughter bridges for each network (step 230). This too is part of the spanning tree algorithm. In the preferred embodiment of this invention, such evaluation is done by each bridge using the appropriate bridge processing unit 340 under control of program memory 360 and working memory 370. Preferably, while the bridges are exchanging BPDU's, all bridges connected to the same network compare root path costs, which are concurrently being determined in a manner described above (i.e. "issuing a become_root secondary command to a second router"). The bridge with the lowest root path cost is deemed to be the designated bridge for that network (i.e. "setting, in response to the become root secondary command, an ID in the second router to assist an execution of a spanning tree protocol to select the second router as a secondary root router"). If multiple bridges have the same root path cost, then some technique, such as use of the bridge identifier is used to select the designated bridge (emphasis added). All of the bridges connected to a network which do not have another path to the root, and are not selected to be a designated bridge are deemed to be daughter bridges. According to one variation of this

invention, this selecting step involves exchanging configuration messages (i.e. interpreted as commands), such as BPDUs, among the bridges during the repeating configuration periods, as described with regard to step 210. Examiner further submits, BDPUs received and used for selecting root bridge using root identifier field, is interpreted as "become_root_primary commend". BDPUs received and used for designating daughter bridges using root identifier field is interpreted as "become_root_secondary command. In regards to limitation "numeric switch identifier ID", stored *root identifier* and *bridge identifier* are interpreted as respective numeric switch identifier ID as required by claimed limitation.

Applicant argues that (see page 18, paragraph 3) Backes makes no mention of any mechanism for setting switch identifiers stored in routers.

However Examiner respectfully disagrees with Applicant's assertion. Backes does indeed teach setting switch identifiers stored in routers. Specifically Backes teaches if the received message has a root identifier (interpreted as numeric switch identifier ID) field with a better priority than the stored root identifier (interpreted as numeric switch identifier ID), the root identifier (interpreted as numeric switch identifier ID) value in the received message would become the new stored root identifier. As such, Examiner respectfully disagrees with Applicant's assertion (see page 18 paragraph 3) that Backes makes no mention of special commands. Examiner respectfully asserts that exchanged BPDUs are interpreted as cited commands.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies

(i.e., setting the route identifier in the first place) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Dependent claims 11-13, 24-26 and 37-39 are not patentable for the same reasons cited above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SALMAN AHMED whose telephone number is (571)272-8307. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on (571)272-3795. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Salman Ahmed/

Primary Examiner, Art Unit 2476

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	Ahmed, Salman	2476

SEARCHED

Class	Subclass	Date	Examiner
370	256, 390, 432,	4/13/2008	WC

SEARCH NOTES

Search Notes	Date	Examiner
inventorship search	4/13/2008	WC
East search	4/13/2008	WC
consulted with SPE Edan Orgad	4/13/2008	WC
manual search for class 370/432	4/13/2008	WC
Updated Search	10/17/2008	SA
Updated search	4/16/2009	SA
Updated search	10/27/2009	SA

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	Ahmed, Salman	2476

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	04/13/2008	09/29/2008	04/16/2009	10/27/2009					
	1	✓	✓	✓	=					
	2	✓	✓	✓	=					
	3	✓	✓	✓	=					
	4	✓	✓	✓	=					
	5	✓	✓	-	-					
	6	✓	✓	-	-					
	7	✓	-	-	-					
	8	✓	-	-	-					
	9	✓	-	-	-					
	10	✓	✓	✓	✓					
	11	✓	✓	✓	✓					
	12	✓	✓	✓	✓					
	13	✓	✓	✓	✓					
	14	✓	✓	✓	=					
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	32	✓	✓	-	-					
	33	✓	-	-	-					
	34	✓	-	-	-					
	35	✓	-	-	-					
	36	✓	✓	✓	✓					

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	Ahmed, Salman	2476

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	04/13/2008	09/29/2008	04/16/2009	10/27/2009					
	37	✓	✓	✓	✓					
	38	✓	✓	✓	✓					
	39	✓	✓	✓	✓					

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2	"5018137".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L2	2	"6032194".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L3	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L4	1	"PP14234".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L5	2	"6976088 ".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L6	2	(L1 or L2 or L3 or L5) and (third adj port)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L7	19	(port same root same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

L8	780	(port same state same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L9	28	(port same state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L10	0	(port same fault same state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L11	3	(port same fault same state) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L12	575	(port same fault same state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L13	20	(port same fault same state same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L14	78	(port same fault same state same active) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L15	0	(port same fault same state same active) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

L16	59	(back adj2 up adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L17	0	(back adj2 up adj2 port) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L18	38	("4811337" | "4922486" | "5018137" | "5138615" | "5150360" | "5280480" | "5323394" | "5398242" | "5400333" | "5606669" | "5740171" | "5742604" | "5761435" | "5764636" | "5790808" | "5844902" | "5878232" | "6081512" | "6202114").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L19	6	(port same3 ((backadj2 up) with port) same3 block$3 same3 (activ$5 or (de adj2 activ$5)) same3 fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L20	77	(port same (state with block $5) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L21	4	(port same (state with block $5) same fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L22	0	(((stand adj2 by) or (back adj2 port) or redundant) same port same (state with block$5) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L23	172	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

L24	10	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L25	162	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (@rlad<"19971224" or @ad<"19971224") not L24	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L26	9	((((stand adj2 by) or (back adj2 up) or redundant) adj2 port) same fail$5) and (@rlad<"19971224" or @ad<"19971224") not L24	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L27	132	((((stand adj2 by) or (back adj2 up) or redundant) adj2 port)) and (@rlad<"19971224" or @ad<"19971224") not L24	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L28	0	(backup same (designated adj2 port) same root) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L29	67	(port same fault state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L30	40	((third adj port) and forward $4 and block$4) and cisco. asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L31	5	((third adj port) and forward $4 and block$4).clm. and cisco.asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

L32	0	(back adj2 up adj2 designated adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L33	59	(back adj2 up adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L34	1	((back adj2 up adj2 port) with designated) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L35	2	"7283529".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L36	33	LER.ti.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L37	608	LER.ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L38	1	(LER and table and ip).ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L39	12	(LER and table).ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

L40	3	"7209491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L41	2	"7283529".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L42	2	"7246173".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L43	2	"5790808 ".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L44	32	(root adj port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L45	1142	(root with port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L46	38	(root with port) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L47	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

L48	0	(root with port) and (leaf adj port) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L49	1	(root with port) and (leaf adj port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L50	67	(root with port) and (leaf with port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L51	5	(root with port) and (leaf with port) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L52	20	(port with blocked with forwarding with state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L53	2	(port same blocked same forwarding same state same (bypass$4 or directly)) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L54	3	(port same blocked same forwarding same state) and (@rlad<"19971224" or @ad<"19971224") not L52	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L55	263	(port same block$3 same forward$3 same state) and (@rlad<"19971224" or @ad<"19971224") not L54	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

L56	27	(port same block$3 same forward$3 same state same (bypass$4 or directly)) and (@rlad<"19971224" or @ad<"19971224") not L54	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L57	34	(port same block$3 same forward$3 same state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L58	8	((chang$5 or transition$3) with forward$4 with block$4 with state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L59	1	((omit$5 or bypass$4) with intermediate with state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L60	3	((omit$5 or bypass$4) with intermediate with state) and (state adj machine) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L61	2	"6188694".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L62	2	"6032194".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L63	2	"6202114".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

L64	2	"6388995".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L65	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L66	2	"6678241".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L67	2	"6219739".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L68	0	((spanning adj tree) and (first adj port) and (second adj port) and (third adj port) and backup and (forwarding) and blocked and state).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L69	0	((first adj port) and (second adj port) and (third adj port) and backup and (forwarding) and blocked and state).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L70	1	((first adj port) and (second adj port) and (third adj port) and (forwarding) and blocked and state).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
L71	2	"6976088".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

EAST Search History (Interference)

<This search history is empty>

10/27/2009 5:28:55 PM
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PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: Silvano Gai et al.	)	
Serial No.: 11/113,600	)	Examiner: Ahmed, Salman
Filed: April 25, 2005	)	Art Unit: 2476
For: Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm	)	

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
February 1, 2010

CERTIFICATE OF EFS WEB TRANSMISSION

I hereby certify that the following paper is being EFS WEB transmitted to the Patent and Trademark Office on February 1, 2010.

/Merisa Jakupovic/
Merisa Jakupovic

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

AMENDMENT

This Amendment is filed in response to the Office Action dated Oct. 30, 2009. The Applicant respectfully requests reconsideration. All objections and rejections are respectfully traversed.

IN THE CLAIMS:

1. (PREVIOUSLY PRESENTED) A method for operating a router, comprising:

executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state;

detecting a link failure; and

transitioning by the spanning tree protocol, in response to detecting the failure, the designated port into the blocked state and the back-up designated port into the forwarding state, without the spanning tree protocol transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

2. (ORIGINAL) The method as in claim 1, further comprising:

transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

3. (PREVIOUSLY PRESENTED) A method for operating a router, comprising:

executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port

to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

selecting a third port as a back-up root port and placing the back-up root port in a blocked state;

detecting a link failure; and

transitioning by the spanning tree protocol, in response to detecting the failure, the root port into the blocked state and the back-up root port into the forwarding state, without the spanning tree protocol transitioning the back-up root port through any intermediary states in moving from the blocked state to the forwarding state.

4. (CURRENTLY AMENDED) The method as in claim ~~1~~ 3, further comprising:

transmitting, by the back-up root port, bridge protocol data unit (BPDU) messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

5-13. (CANCELLED)

14. (PREVIOUSLY PRESENTED) A router, comprising:

means for executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

means for selecting a third port as a back-up designated port and placing the back-up root port in a blocked state;

means for detecting a link failure; and

means for transitioning of the spanning tree protocol, in response to detecting the failure, the designated port into the blocked state and the back-up designated port into the forwarding state, without transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

15. (ORIGINAL) The router as in claim 14, further comprising:

means for transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

16. (PREVIOUSLY PRESENTED) A router, comprising:

means for executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

means for selecting a third port as a back-up root port and placing the back-up root port in a blocked state;

means for detecting a link failure; and

means for transitioning of the spanning tree protocol, in response to detecting the failure, the root port into the blocked state and the back-up root port into the forwarding state, without transitioning the back-up root port through any intermediary states in moving from the blocked state to the forwarding state.

17. (CURRENTLY AMENDED) The router as in claim 16, further comprising:

means for transmitting, by the back-up root port, bridge protocol data unit (BPDU) messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

18-26. (CANCELLED)

27. (PREVIOUSLY PRESENTED) A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

a third port selected as a back-up designated port and placed in a blocked state;

a port to detect a link failure; and

a rapid reconfiguration entity of the spanning tree protocol to transition, in response to detecting the failure, the designated port into the blocked state and also to transition the back-up designated port into the forwarding state, without transition of the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

28. (ORIGINAL) The router as in claim 27, further comprising:

the back-up designated port transmitting a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

29. (PREVIOUSLY PRESENTED) A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

a third port selected as a back-up root port and placed in a blocked state;

a port to detect a link failure; and

a rapid reconfiguration entity of the spanning tree protocol to transition, in response to detecting the failure, the root port into the blocked state and also transitioning the back-up root port into the forwarding state, without transition of the back-up root port through any intermediary states in moving from the blocked state to the forwarding state.

30. (CURRENTLY AMENDED) The router as in claim 29, further comprising:

the back-up root port transmitting bridge protocol data unit (BPDU) messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

31-39. (CANCELLED)

40. (NEW) The method as in claim 1, wherein the detecting is in response to failure of a link integrity test at the second port.

41. (NEW) The method as in claim 1, wherein configuration bridge protocol data unit (BPDU) messages are received at the second port, and the detecting is in response to an interruption in receipt of BPDU messages at the second port.

42. (NEW) The method as in claim 1, wherein the intermediary states include one or more of a listening state and a learning state.

43. (NEW) The method as in claim 1, further comprising:

receiving a command;

setting, in response to the command, a numeric switch identifier (ID) of the router.

44. (NEW) The method as in claim 3, wherein the detecting is in response to failure of a link integrity test at the first port.

45. (NEW) The method as in claim 3, wherein configuration bridge protocol data unit (BPDU) messages are received at the first port, and the detecting is in response to an interruption in receipt of BPDU messages at the first port.

46. (NEW) The method as in claim 3, further comprising:

receiving a command;

setting, in response to the command, a numeric switch identifier (ID) of the router.

47. (NEW) The method as in claim 3, wherein the intermediary states include one or more of a listening state and a learning state.

REMARKS

This Amendment is filed in response to the Office Action dated Oct. 30, 2009. The Applicant respectfully requests reconsideration. All objections and rejections are respectfully traversed.

Claims 1-4, 14-17, 27-30 and 40-47 are now pending in the application.

Claims 4, 17 and 30 have been amended.

New dependent claims 40-47 have been added.

Allowable Subject Matter

At paragraph 4 of the Office Action, claims 1-4, 14-17 and 27-30 were allowed. The minor amendments made to claims 4, 17 and 30 are not believed to affect their allowance.

Further, new claims 40-47 depend from allowed independent claims 1 and 3. As such, the new claims are believed to be allowable at least due to their dependency.

Claim Rejections - 35 U.S.C. §103

At paragraphs 1-3 of the Office Action, claims 10-13, 23-26 and 36-39 were rejected under 35 U.S.C. §103(a) over Backes et al., U.S. Patent No. 5,018,137 (hereinafter "Backes") in view of Seaman, U.S. Patent No. 5,790,808 (hereinafter "Seaman"), in further view of Souza et al., "GIGASwitch System: A High-performance Packet-switching Platform" (hereinafter "Souza").

Claims 10-13, 23-26 and 36-39 are no longer pending in the application, and, accordingly, their rejection is believed to be moot.

In the event that the Examiner believes there are some remaining issues that would delay issue of a notice of allowance, the Applicant invites the Examiner to call the

undersigned attorney at (617) 951-2500, in hopes any such issues can be resolved in an expedited manner.

In summary, all the independent claims are believed to be in condition for allowance and therefore all dependent claims that depend there from are believed to be in condition for allowance. The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

/James A. Blanchette/

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Electronic Acknowledgement Receipt

EFS ID:	6923391
Application Number:	11113600
International Application Number:	
Confirmation Number:	8858
Title of Invention:	Method and apparatus for rapidly reconfiguring computer networks
First Named Inventor/Applicant Name:	Silvano Gai
Customer Number:	24267
Filer:	James A. Blanchette/Merisa Jakupovic
Filer Authorized By:	James A. Blanchette
Attorney Docket Number:	112025-0063D1C2
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Filing Date:	25-APR-2005
Time Stamp:	16:40:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		22F1583.PDF	45117 ff9870e6be192c5926fffe0aaf1bdc9943985a63	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	9
Warnings:			
Information:			
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/113,600	04/25/2005	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 02/01/2010	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 24	Minus	** 39	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 9	Minus	***15	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/LAMONT MCLAUCHLIN/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/113,600	04/25/2005	Silvano Gai	112025-0063D1C2	8858

24267 7590 03/16/2010

CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

EXAMINER	
AHMED, SALMAN	

ART UNIT	PAPER NUMBER
2476	

MAIL DATE	DELIVERY MODE
03/16/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	11/113,600	GAI ET AL.	
	Examiner	Art Unit	
	SALMAN AHMED	2476	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/1/2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,14-17,27-30 and 40-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4, 14-17, 27-30 and 40-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Applicant states "spanning tree protocol" in various parts of claim 1, without specifying the version related to the protocol standard. There are various Spanning tree protocol standards in the art and some of these standards were revised and modified after the Instant Application was filed. Some of these standards are as follows:

4. STP: Spanning Tree Protocol: IEEE 802.1D (1990 & 1998) STP is the oldest version of spanning tree.

5. RSTP: Rapid Spanning Tree Protocol: IEEE 802.1D (2004) After a while the convergence time of STP was considered to be too large. Rapid spanning tree was developed as a faster converging alternative.

6. PVST: Per VLAN Spanning Tree Protocol: PVST is not an open standard. PVST is a protocol that runs one STP process for each VLAN.

7. MSTP: Multiple Spanning Tree Protocol: IEEE 802.1s and later merged into IEEE 802.1Q-2003.

8. Therefore, without specifying specific protocol version, the claim will continue to cover the modified current versions as well as newly introduced versions of “Spanning

Tree Protocols", conveying that the claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Therefore, the claim is being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. The use of "protocols" or "standards", protocols and standards change over time, hence, it is inappropriate to have the scope of a claim change with time. Since organizations implementing standards meet regularly and have the authority to modify standards, any connection a claim may have to these standards may varying scope over time. The other aspect arising from this is enablement. If the standard changes, the disclosure may no longer support the limitation. If the scope of the invention sought to be patented cannot be determined from the language of the claims, a second paragraph rejection is appropriate (In re Wiggins, 179 USPQ 421).

10. Similar issue exists for claims 14, 16, 27 and 29.

11. Therefore, claims 1, 14, 16, 27 and 29 including all of their dependent claims are rejected under 35 USC 112 second paragraph.

Response to Arguments

12. Applicant's arguments, see pages 8-9 of the Remarks section, filed 2/1/2010, with respect to the rejections of the claims have been fully considered and are moot in view of new ground of rejections presented in this office action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SALMAN AHMED whose telephone number is (571)272-8307. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on (571)272-3795. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Salman Ahmed/

Primary Examiner, Art Unit 2476

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	Ahmed, Salman	2476

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	04/13/2008	09/29/2008	04/16/2009	10/27/2009	03/10/2010				
	1	✓	✓	✓	=	✓				
	2	✓	✓	✓	=	✓				
	3	✓	✓	✓	=	✓				
	4	✓	✓	✓	=	✓				
	5	✓	✓	-	-	-				
	6	✓	✓	-	-	-				
	7	✓	-	-	-	-				
	8	✓	-	-	-	-				
	9	✓	-	-	-	-				
	10	✓	✓	✓	✓	-				
	11	✓	✓	✓	✓	-				
	12	✓	✓	✓	✓	-				
	13	✓	✓	✓	✓	-				
	14	✓	✓	✓	=	✓				
	15	✓	✓	✓	=	✓				
	16	✓	✓	✓	=	✓				
	17	✓	✓	✓	=	✓				
	18	✓	✓	-	-	-				
	19	✓	✓	-	-	-				
	20	✓	-	-	-	-				
	21	✓	-	-	-	-				
	22	✓	-	-	-	-				
	23	✓	✓	✓	✓	-				
	24	✓	✓	✓	✓	-				
	25	✓	✓	✓	✓	-				
	26	✓	✓	✓	✓	-				
	27	✓	✓	✓	=	✓				
	28	✓	✓	✓	=	✓				
	29	✓	✓	✓	=	✓				
	30	✓	✓	✓	=	✓				
	31	✓	✓	-	-	-				
	32	✓	✓	-	-	-				
	33	✓	-	-	-	-				
	34	✓	-	-	-	-				
	35	✓	-	-	-	-				
	36	✓	✓	✓	✓	-				

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	Ahmed, Salman	2476

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	04/13/2008	09/29/2008	04/16/2009	10/27/2009	03/10/2010				
	37	✓	✓	✓	✓	-				
	38	✓	✓	✓	✓	-				
	39	✓	✓	✓	✓	-				
	40					✓				
	41					✓				
	42					✓				
	43					✓				
	44					✓				
	45					✓				
	46					✓				
	47					✓				

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	2	"5018137".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 14:18
S2	2	"6032194".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 14:48
S3	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 14:52
S4	1	"PP14234".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 14:57
S5	2	"6976088 ".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:06
S6	2	(S1 or S2 or S3 or S5) and (third adj port)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:07
S7	19	(port same root same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:13
S8	775	(port same state same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:27
S9	28	(port same state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:28

S11	0	(port same fault same state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:39
S12	3	(port same fault same state) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:39
S13	570	(port same fault same state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:40
S14	18	(port same fault same state same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:40
S15	76	(port same fault same state same active) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:42
S16	0	(port same fault same state same active) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:42
S17	59	(back adj2 up adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:51
S18	0	(back adj2 up adj2 port) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 15:52
S19	38	("4811337" | "4922486" | "5018137" | "5138615" | "5150360" | "5280480" | "5323394" | "5398242" | "5400333" | "5606669" | "5740171" | "5742604" | "5761435" | "5764636" | "5790808" | "5844902" | "5878232" | "6081512" | "6202114").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 17:22

S20	6	(port same3 ((backadj2 up) with port) same3 block$3 same3 (activ$5 or (de adj2 activ$5)) same3 fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 17:37
S21	77	(port same (state with block $5) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 17:51
S22	4	(port same (state with block $5) same fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 17:51
S23	0	(((stand adj2 by) or (back adj2 port) or redundant) same port same (state with block$5) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 18:10
S24	165	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 18:11
S25	7	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 18:11
S26	158	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (@rlad<"19971224" or @ad<"19971224") not S25	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 18:13
S27	9	((((stand adj2 by) or (back adj2 up) or redundant) adj2 port) same fail$5) and (@rlad<"19971224" or @ad<"19971224") not S25	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 18:15
S28	132	((((stand adj2 by) or (back adj2 up) or redundant) adj2 port)) and (@rlad<"19971224" or @ad<"19971224") not S25	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/16 18:18

S29	0	(backup same (designated adj2 port) same root) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 10:08
S30	67	(port same fault state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 10:56
S31	31	((third adj port) and forward $4 and block$4) and cisco. asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 11:12
S32	4	((third adj port) and forward $4 and block$4).clm. and cisco.asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 11:12
S33	0	(back adj2 up adj2 designated adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 11:20
S34	59	(back adj2 up adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 11:20
S35	1	((back adj2 up adj2 port) with designated) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 11:20
S36	2	"7283529".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 12:35
S37	32	LER.ti.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 12:41
S38	553	LER.ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 12:44

S39	1	(LER and table and ip).ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 12:44
S40	12	(LER and table).ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 12:45
S41	3	"7209491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 14:34
S42	2	"7283529".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 14:46
S43	2	"7246173".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/10/17 14:46
S44	2	"5790808 ".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 09:53
S45	32	(root adj port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:12
S46	1139	(root with port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:12
S47	38	(root with port) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:12
S48	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:15

S49	0	(root with port) and (leaf adj port) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:28
S50	1	(root with port) and (leaf adj port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:29
S51	67	(root with port) and (leaf with port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:30
S52	5	(root with port) and (leaf with port) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 10:30
S53	20	(port with blocked with forwarding with state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 11:03
S54	2	(port same blocked same forwarding same state same (bypass$4 or directly)) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 14:07
S55	3	(port same blocked same forwarding same state) and (@rlad<"19971224" or @ad<"19971224") not S53	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 14:08
S56	263	(port same block$3 same forward$3 same state) and (@rlad<"19971224" or @ad<"19971224") not S55	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 14:10
S57	27	(port same block$3 same forward$3 same state same (bypass$4 or directly)) and (@rlad<"19971224" or @ad<"19971224") not S55	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 14:10
S58	34	(port same block$3 same forward$3 same state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 15:31

S59	8	((chang$5 or transition$3) with forward$4 with block$4 with state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 15:43
S60	1	((omit$5 or bypass$4) with intermediate with state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 16:01
S61	3	((omit$5 or bypass$4) with intermediate with state) and (state adj machine) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 16:02
S62	2	"6188694".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:07
S63	2	"6032194".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:09
S64	2	"6202114".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:29
S65	2	"6388995".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:32
S66	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:34
S67	2	"6678241".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:37
S68	2	"6219739".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:37

S69	0	((spanning adj tree) and (first adj port) and (second adj port) and (third adj port) and backup and (forwarding) and blocked and state).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:40
S70	0	((first adj port) and (second adj port) and (third adj port) and backup and (forwarding) and blocked and state).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:41
S71	1	((first adj port) and (second adj port) and (third adj port) and (forwarding) and blocked and state).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:41
S72	2	"6976088".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/04/16 18:53
S73	2	"5018137".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S74	2	"6032194".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S75	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S76	1	"PP14234".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S77	2	"6976088 ".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S78	2	(S73 or S74 or S75 or S77) and (third adj port)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

S79	19	(port same root same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S80	780	(port same state same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S81	28	(port same state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S82	0	(port same fault same state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S83	3	(port same fault same state) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S84	575	(port same fault same state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S85	20	(port same fault same state same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S86	78	(port same fault same state same active) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S87	0	(port same fault same state same active) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S88	59	(back adj2 up adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

S89	0	(back adj2 up adj2 port) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S90	38	("4811337" | "4922486" | "5018137" | "5138615" | "5150360" | "5280480" | "5323394" | "5398242" | "5400333" | "5606669" | "5740171" | "5742604" | "5761435" | "5764636" | "5790808" | "5844902" | "5878232" | "6081512" | "6202114").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S91	6	(port same3 ((backadj2 up) with port) same3 block$3 same3 (activ$5 or (de adj2 activ$5)) same3 fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S92	77	(port same (state with block $5) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S93	4	(port same (state with block $5) same fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S94	0	(((stand adj2 by) or (back adj2 port) or redundant) same port same (state with block$5) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S95	172	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S96	10	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S97	162	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (@rlad<"19971224" or @ad<"19971224") not S96	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

S98	9	((((stand adj2 by) or (back adj2 up) or redundant) adj2 port) same fail$5) and (@rlad<"19971224" or @ad<"19971224") not S96	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S99	132	((((stand adj2 by) or (back adj2 up) or redundant) adj2 port)) and (@rlad<"19971224" or @ad<"19971224") not S96	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S100	0	(backup same (designated adj2 port) same root) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S101	67	(port same fault state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S102	40	((third adj port) and forward $4 and block$4) and cisco.asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S103	5	((third adj port) and forward $4 and block$4).clm. and cisco.asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S104	0	(back adj2 up adj2 designated adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S105	59	(back adj2 up adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S106	1	((back adj2 up adj2 port) with designated) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S107	2	"7283529".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

S108	33	LER.ti.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S109	608	LER.ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S110	1	(LER and table and ip).ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S111	12	(LER and table).ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S112	3	"7209491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S113	2	"7283529".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S114	2	"7246173".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S115	2	"5790808 ".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S116	32	(root adj port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S117	1142	(root with port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

S118	38	(root with port) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S119	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S120	0	(root with port) and (leaf adj port) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S121	1	(root with port) and (leaf adj port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S122	67	(root with port) and (leaf with port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S123	5	(root with port) and (leaf with port) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S124	20	(port with blocked with forwarding with state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S125	2	(port same blocked same forwarding same state same (bypass$4 or directly)) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S126	3	(port same blocked same forwarding same state) and (@rlad<"19971224" or @ad<"19971224") not S124	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S127	263	(port same block$3 same forward$3 same state) and (@rlad<"19971224" or @ad<"19971224") not S126	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

S128	27	(port same block$3 same forward$3 same state same (bypass$4 or directly)) and (@rlad<"19971224" or @ad<"19971224") not S126	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S129	34	(port same block$3 same forward$3 same state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S130	8	((chang$5 or transition$3) with forward$4 with block$4 with state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S131	1	((omit$5 or bypass$4) with intermediate with state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S132	3	((omit$5 or bypass$4) with intermediate with state) and (state adj machine) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S133	2	"6188694".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S134	2	"6032194".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S135	2	"6202114".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S136	2	"6388995".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S137	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25

S138	2	"6678241".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S139	2	"6219739".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S140	0	((spanning adj tree) and (first adj port) and (second adj port) and (third adj port) and backup and (forwarding) and blocked and state).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S141	0	((first adj port) and (second adj port) and (third adj port) and backup and (forwarding) and blocked and state).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S142	1	((first adj port) and (second adj port) and (third adj port) and (forwarding) and blocked and state).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S143	2	"6976088".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/10/27 17:25
S144	755	(spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/09 16:54
S145	762	(spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/09 16:55
S146	13	((spanning adj2 tree) same (state) same (transition)) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/09 16:56
S147	20	(spanning adj2 tree) and (learning adj2 state) and (listening adj2 state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/10 12:55

S148	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/10 13:05
S149	2	"6976088".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/10 13:06
S150	2	"6771610".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/10 13:18
S151	0	portfast and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/03/10 14:05

3/10/2010 5:18:04 PM
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11113600	GAI ET AL.
	Examiner	Art Unit
	Ahmed, Salman	2476

SEARCHED

Class	Subclass	Date	Examiner
370	256, 390, 432,	4/13/2008	WC

SEARCH NOTES

Search Notes	Date	Examiner
inventorship search	4/13/2008	WC
East search	4/13/2008	WC
consulted with SPE Edan Orgad	4/13/2008	WC
manual search for class 370/432	4/13/2008	WC
Updated Search	10/17/2008	SA
Updated search	4/16/2009	SA
Updated search	10/27/2009	SA
Updated search	3/10/2010	SA

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

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United States Patent and Trademark Office
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
11/113,600	04/25/2005	2476	4350	112025-0063D1C2	39	15

CONFIRMATION NO. 8858

REPLACEMENT FILING RECEIPT

24267
CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

OC00000041501763

Date Mailed: 05/06/2010

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Silvano Gai, Vigliano d'Asti, ITALY;
Keith McCloghrie, San Jose, CA;
Dinesh G. Dutt, Santa Clara, CA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 10/259,959 09/27/2002 PAT 6,976,088

Foreign Applications

If Required, Foreign Filing License Granted: 05/17/2005

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 11/113,600**

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

Early Publication Request: No

Title

Method and apparatus for rapidly reconfiguring computer networks

Preliminary Class

370

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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NOT GRANTED

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PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: Silvano Gai et al.	)	
	)	Examiner: Ahmed, Salman
Serial No.: 11/113,600	)	
Filed: April 25, 2005	)	Art Unit: 2419
For: METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS USING A SPANNING TREE ALGORITHM	)	

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
(617) 951-2500
August 11, 2008

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/Merisa Jakupovic/
Merisa Jakupovic

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P.O. Box 1450
Alexandria, VA 22313-1450

ATTN: Application Processing Division - Customer Correction Branch

Sir:

REQUEST TO CORRECT FILING RECEIPT

Please correct the Filing Receipt to add the statements "which is a CON of 09/450,891 11/29/1999 PAT 6,535,491; which is a DIV of 08/998,412 12/24/1997 PAT

6,032,194" to the statement "This application is a CON of 10/259,959 09/27/2002 PAT 6,976,088."

The Application Serial No. 10/259,959 is related to those patent applications. This paper is filed to correct the error in the Filing Receipt.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§1.16 and 1.17 that may be required, or credit any overpayment, to our Deposit Account No. 03-1237.

Respectfully submitted,

/James A. Blanchette/

James A. Blanchette
Reg. No. 51,477
Cesari and McKenna
88 Black Falcon Avenue
Boston, MA 02210
(617) 951-2500

Scg # 9803

112025.0063D1C2

CPOL # 488685

JAB. MRR. CJB

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CONFIRMATION NO. 8858

REPLACEMENT FILING RECEIPT

24267
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Applicant(s)

Silvano Gai, Vigliano d'Asti, ITALY;
Keith McCloghrie, San Jose, CA;
Dinesh G. Dutt, Santa Clara, CA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

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Foreign Applications WHICH IS A CON OF 09/450,891 11/29/1999 PAT 6,535,491
WHICH IS A DIV OF 08/998,412 12/24/1997 PAT 6,032,194

If Required, Foreign Filing License Granted: 05/17/2005

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 11/113,600**

Projected Publication Date: Request for Non-Publication Acknowledged

Non-Publication Request: Yes

Early Publication Request: No

Title

Method and apparatus for rapidly reconfiguring computer networks

Preliminary Class

370

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Electronic Acknowledgement Receipt

EFS ID:	7608365
Application Number:	11113600
International Application Number:	
Confirmation Number:	8858
Title of Invention:	Method and apparatus for rapidly reconfiguring computer networks
First Named Inventor/Applicant Name:	Silvano Gai
Customer Number:	24267
Filer:	James A. Blanchette/Merisa Jakupovic
Filer Authorized By:	James A. Blanchette
Attorney Docket Number:	112025-0063D1C2
Receipt Date:	13-MAY-2010
Filing Date:	25-APR-2005
Time Stamp:	16:30:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Corrected Filing Receipt	22R5085.PDF	19011 5135a420f918abe0d3b9b8204eeb86a979b9f628	no	2

Warnings:	
Information:	

2	Request for Corrected Filing Receipt	22R5104.PDF	407766 45ed092927bc8ae4bc6e938cf55c3286850 8f759	no	3

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Total Files Size (in bytes):	426777

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New International Application Filed with the USPTO as a Receiving Office

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PATENTS
112025-0063D1C2
Seq. # 9803 CPOL# 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of: Silvano Gai et al.	)	
Serial No.: 11/113,600	)	Examiner: Ahmed, Salman
Filed: April 25, 2005	)	Art Unit: 2476
For: Method and Apparatus for Rapidly Reconfiguring Computer Networks Using a Spanning Tree Algorithm	)	

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
June 14, 2010

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/Merisa Jakupovic/
Merisa Jakupovic

Commissioner for Patents
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Alexandria, VA 22313-1450

Sir:

AMENDMENT

This Amendment is filed in response to the Office Action dated March 16, 2010. The Applicant respectfully requests reconsideration. All objections and rejections are respectfully traversed.

IN THE CLAIMS:

1. (CURRENTLY AMENDED) A method for operating a router, comprising:

~~executing a spanning tree protocol to~~ selecting a first port as a root port in a spanning tree and ~~to~~ selecting a second port as a designated port in the spanning tree and ~~to place~~ placing both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of ~~a~~ the spanning tree ~~established by executing the spanning tree protocol~~;

selecting a third port as a back-up designated port in the spanning tree and placing the back-up designated port in a blocked state;

detecting a link failure; and

transitioning ~~by the spanning tree protocol~~, in response to detecting the failure, the designated port into the blocked state and the back-up designated port into the forwarding state, without ~~the spanning tree protocol~~ transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

2. (ORIGINAL) The method as in claim 1, further comprising:

transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

3. (CURRENTLY AMENDED) A method for operating a router, comprising:

~~executing a spanning tree protocol to~~ selecting a first port as a root port in a spanning tree and ~~to~~ selecting a second port as a designated port in the spanning tree and ~~to place~~placing both the root port and the designated port in a forwarding state, the root port for commu-

nication with a root router and the designated port to communicate with at least one router in a lower leaf of ~~a~~ the spanning tree ~~established by executing the spanning tree protocol~~;

selecting a third port as a back-up root port in the spanning tree and placing the back-up root port in a blocked state;

detecting a link failure; and

transitioning ~~by the spanning tree protocol~~, in response to detecting the failure, the root port into the blocked state and the back-up root port into the forwarding state, without ~~the spanning tree protocol~~ transitioning the back-up root port through any intermediary states in moving from the blocked state to the forwarding state.

4. (PREVIOUSLY PRESENTED) The method as in claim 3, further comprising:

transmitting, by the back-up root port, bridge protocol data unit (BPDU) messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

5-13. (CANCELLED)

14. (CURRENTLY AMENDED) A router, comprising:

means for ~~executing a spanning tree protocol to~~ selecting a first port as a root port in a spanning tree and ~~to~~ selecting a second port as a designated port in the spanning tree and ~~to place~~ placing both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of the~~a~~ spanning tree ~~established by executing the spanning tree protocol~~;

means for selecting a third port as a back-up designated port and placing the back-up root port in a blocked state;

means for detecting a link failure; and

means for transitioning ~~of the spanning tree protocol~~, in response to detecting the failure, the designated port into the blocked state and the back-up designated port into the forwarding state, without transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

15. (ORIGINAL) The router as in claim 14, further comprising:

means for transmitting by the back-up designated port a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

16. (CURRENTLY AMENDED) A router, comprising:

means for ~~executing a spanning tree protocol to~~ selecting a first port as a root port and ~~to~~ selecting a second port as a designated port and ~~to place~~ placing both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of the~~a~~ spanning tree ~~established by executing the spanning tree protocol~~;

means for selecting a third port as a back-up root port and placing the back-up root port in a blocked state;

means for detecting a link failure; and

means for transitioning ~~of the spanning tree protocol~~, in response to detecting the failure, the root port into the blocked state and the back-up root port into the forwarding state, without transitioning the back-up root port through any intermediary states in moving from the blocked state to the forwarding state.

17. (PREVIOUSLY PRESENTED) The router as in claim 16, further comprising:

means for transmitting, by the back-up root port, bridge protocol data unit (BPDU) messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

18-26. (CANCELLED)

27. (CURRENTLY AMENDED) A router, comprising:

a spanning tree state machine ~~to execute a spanning tree protocol~~ to select a first port as a root port in a spanning tree and to select a second port as a designated port in the spanning tree and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of ~~a~~ the spanning tree ~~established by executing the spanning tree protocol~~;

a third port selected as a back-up designated port and placed in a blocked state;

a port to detect a link failure; and

a spanning tree rapid reconfiguration entity ~~of the spanning tree protocol~~ to transition, in response to detecting the failure, the designated port into the blocked state and also to transition the back-up designated port into the forwarding state, without transition of the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state.

28. (ORIGINAL) The router as in claim 27, further comprising:

the back-up designated port transmitting a sequence of messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

29. (CURRENTLY AMENDED) A router, comprising:

a spanning tree state machine ~~to execute a spanning tree protocol~~ to select a first port as a root port in a spanning tree and to select a second port as a designated port in the spanning tree and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of the~~a~~ spanning tree ~~established by executing the spanning tree protocol~~;

a third port selected as a back-up root port in the spanning tree and placed in a blocked state;

a port to detect a link failure; and

a spanning tree rapid reconfiguration entity ~~of the spanning tree protocol~~ to transition, in response to detecting the failure, the root port into the blocked state and also transitioning the back-up root port into the forwarding state, without transition of the back-up root port through any intermediary states in moving from the blocked state to the forwarding state.

30. (PREVIOUSLY PRESENTED) The router as in claim 29, further comprising:

the back-up root port transmitting bridge protocol data unit (BPDU) messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

31-39. (CANCELLED)

40. (PREVIOUSLY PRESENTED) The method as in claim 1, wherein the detecting is in response to failure of a link integrity test at the second port.

41. (PREVIOUSLY PRESENTED) The method as in claim 1, wherein configuration bridge protocol data unit (BPDU) messages are received at the second port, and the detecting is in response to an interruption in receipt of BPDU messages at the second port.

42. (PREVIOUSLY PRESENTED) The method as in claim 1, wherein the intermediary states include one or more of a listening state and a learning state.

43. (PREVIOUSLY PRESENTED) The method as in claim 1, further comprising:
receiving a command;
setting, in response to the command, a numeric switch identifier (ID) of the router.

44. (PREVIOUSLY PRESENTED) The method as in claim 3, wherein the detecting is in response to failure of a link integrity test at the first port.

45. (PREVIOUSLY PRESENTED) The method as in claim 3, wherein configuration bridge protocol data unit (BPDU) messages are received at the first port, and the detecting is in response to an interruption in receipt of BPDU messages at the first port.

46. (PREVIOUSLY PRESENTED) The method as in claim 3, further comprising:
receiving a command;
setting, in response to the command, a numeric switch identifier (ID) of the router.

47. (PREVIOUSLY PRESENTED) The method as in claim 3, wherein the intermediary states include one or more of a listening state and a learning state.

REMARKS

This Amendment is filed in response to the Office Action dated March 16, 2010. The Applicant respectfully requests reconsideration. All objections and rejections are respectfully traversed.

Claims 1-4, 14-17, 27-30 and 40-47 are now pending in the application.

Claims 1, 3, 14, 16 and 27 and have been amended.

No new claims have been added.

Claim Rejections – 35 U.S.C. §112, Second Paragraph

At paragraph 1-11 of the Office Action, claims 1-4, 14-17, 27-30 and 40-47 were rejected under 35 U.S.C. §112, second paragraph. Specifically, the Examiner suggests that reference to "spanning tree protocol" may render the claims indefinite, because "protocols and standards change over time, hence, it is inappropriate to have the scope of the claim change with time." *See* Office Action paragraph 9.

The Applicant has rephrased claims 1, 3, 14, 16 and 27 to no longer use the phrase "spanning tree protocol". Accordingly, the Applicant respectfully urges the rejection is now moot.

Since no other rejections are remaining in the application, the Applicant respectfully requests issue of a Notice of Allowance as soon as practicable.

In the event that the Examiner believes there are further issues that would further delay issue of a Notice of Allowance, the Applicant invites the Examiner to call the undersigned attorney at (617) 951-2500, in hopes any such issues can be resolved in an expedited manner, for example by Examiner Amendment.

In summary, all the independent claims are believed to be in condition for allowance and therefore all dependent claims that depend there from are believed to be in condition for allowance. The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,

/James A. Blanchette/

James A. Blanchette
Reg. No. 51,477
CESARI AND MCKENNA, LLP
88 Black Falcon Avenue
Boston, MA 02210-2414
(617) 951-2500

Electronic Acknowledgement Receipt

EFS ID:	7809037
Application Number:	11113600
International Application Number:	
Confirmation Number:	8858
Title of Invention:	Method and apparatus for rapidly reconfiguring computer networks
First Named Inventor/Applicant Name:	Silvano Gai
Customer Number:	24267
Filer:	James A. Blanchette/Merisa Jakupovic
Filer Authorized By:	James A. Blanchette
Attorney Docket Number:	112025-0063D1C2
Receipt Date:	14-JUN-2010
Filing Date:	25-APR-2005
Time Stamp:	16:55:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		22V1901.PDF	46383 6a1c3c3a2bd160fb9293d3dc1cc1cbfafdd89fe9	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	9
Warnings:			
Information:			
	Total Files Size (in bytes):	46383	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/113,600	04/25/2005	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 06/14/2010

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 20	Minus	** 39	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 6	Minus	***15	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

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Legal Instrument Examiner:
/Renee Collins/

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/113,600	04/25/2005	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 07/18/2010

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 14	Minus	** 39	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 6	Minus	***15	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

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Legal Instrument Examiner:
/DONNA D. SMALLS LOGAN/

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NOTICE OF ALLOWANCE AND FEE(S) DUE

24267 7590 07/30/2010

CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

EXAMINER	
AHMED, SALMAN	
ART UNIT	PAPER NUMBER
2476	

DATE MAILED: 07/30/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/113,600	04/25/2005	Silvano Gai	112025-0063D1C2	8858

TITLE OF INVENTION: METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$0	$0	$1510	11/01/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

24267 7590 07/30/2010

CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/113,600	04/25/2005	Silvano Gai	112025-0063D1C2	8858

TITLE OF INVENTION: METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$0	$0	$1510	11/01/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
AHMED, SALMAN	2476	370-256000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

❑ Payment by credit card. Form PTO-2038 is attached.

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/113,600	04/25/2005	Silvano Gai	112025-0063D1C2	8858

24267 7590 07/30/2010

CESARI AND MCKENNA, LLP
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EXAMINER	
AHMED, SALMAN	
ART UNIT	PAPER NUMBER
2476	

DATE MAILED: 07/30/2010

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 627 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 627 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	11/113,600	GAI ET AL.	
	Examiner	Art Unit	
	SALMAN AHMED	2476	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Amendment filed on 6/14/2010*.

2. ☒ The allowed claim(s) is/are *1, 3, 14, 16, 27, 29 and 40-47 (Currently renumbered to 1, 6, 7, 12, 13, 14, 2-5 and 8-11 respectively)*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with James A. Blanchette on 7/6/2010.

The application has been amended as follows:

1. (CURRENTLY AMENDED) A method for operating a router, comprising:

~~selecting~~executing a spanning tree protocol to select a first port as a root port ~~in a spanning tree~~ and ~~selecting~~to select a second port as a designated port ~~in the spanning tree~~ and ~~placing~~to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

selecting a third port as a back-up designated port ~~in the spanning tree~~ and placing the back-up designated port in a blocked state;

detecting a link failure; ~~and~~

transitioning by the spanning tree protocol, in response to detecting the failure, the designated port into the blocked state and the back-up designated port into the forwarding state, without the spanning tree protocol transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state~~.~~; and

transmitting, by the back-up designated port, one or more messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

2. (CANCELLED)

3. (CURRENTLY AMENDED) A method for operating a router, comprising:

~~selecting~~executing a spanning tree protocol to select a first port as a root port ~~in a spanning tree~~ and ~~selecting~~to select a second port as a designated port ~~in the spanning tree~~ and ~~placing~~to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

selecting a third port as a back-up root port ~~in the spanning tree~~ and placing the back-up root port in a blocked state;

detecting a link failure; ~~and~~

transitioning by the spanning tree protocol, in response to detecting the failure, the root port into the blocked state and the back-up root port into the forwarding state, without the spanning tree protocol transitioning the back-up root port through any intermediary states in moving from the blocked state to the forwarding state~~.~~; and

transmitting, by the back-up root port, one or more bridge protocol data unit (BPDU) messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

4-13. (CANCELLED)

14. (CURRENTLY AMENDED) A router, comprising:

means for ~~selecting~~executing a spanning tree protocol to select a first port as a root port ~~in a spanning tree~~ and ~~selecting~~to select a second port as a designated port ~~in the spanning tree and placing~~and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated

port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

means for selecting a third port as a back-up designated port and placing the back-up root port in a blocked state;

means for detecting a link failure; ~~and~~

means for transitioning of the spanning tree protocol, in response to detecting the failure, the designated port into the blocked state and the back-up designated port into the forwarding state, without transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state~~.~~; and

means for transmitting, from the back-up designated port, one or more messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

15. (CANCELLED)

16. (CURRENTLY AMENDED) A router, comprising:

means for ~~selecting~~executing a spanning tree protocol to select a first port as a root port and ~~selecting~~to select a second port as a designated port and ~~placing~~to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

means for selecting a third port as a back-up root port and placing the back-up root port in a blocked state;

means for detecting a link failure; ~~and~~

means for transitioning of the spanning tree protocol, in response to detecting the failure, the root port into the blocked state and the back-up root port into the forwarding state, without transitioning the back-up root port through any intermediary states in moving from the blocked state to the forwarding state~~.~~; and

means for transmitting, by the back-up root port, bridge protocol data unit (BPDU) messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

17-26. (CANCELLED)

27. (CURRENTLY AMENDED) A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first port as a root port ~~in a spanning tree~~ and to select a second port as a designated port ~~in the spanning tree~~ and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

a third port selected as a back-up designated port and placed in a blocked state;

a port to detect a link failure; ~~and~~

a ~~spanning tree~~ rapid reconfiguration entity of the spanning tree protocol to transition, in response to detecting the failure, the designated port into the blocked state and also to transition the back-up designated port into the forwarding state, without transition of the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state~~.~~; and

the back-up designated port to transmit one or more messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

28. (CANCELLED)

29. (CURRENTLY AMENDED) A router, comprising:

a spanning tree state machine to execute a spanning tree protocol to select a first port as a root port ~~in a spanning tree~~ and to select a second port as a designated port ~~in the spanning tree~~ and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated

port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol;

a third port selected as a back-up root port ~~in the spanning tree~~ and placed in a blocked state;

a port to detect a link failure; ~~and~~

a ~~spanning tree~~ rapid reconfiguration entity of the spanning tree protocol to transition, in response to detecting the failure, the root port into the blocked state and also to transition~~ing~~ the back-up root port into the forwarding state, without transition of the back-up root port through any intermediary states in moving from the blocked state to the forwarding state~~.~~; and

the back-up root port to transmit one or more bridge protocol data unit (BPDU) messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

30-39. (CANCELLED)

40. (PREVIOUSLY PRESENTED) The method as in claim 1, wherein the detecting is in response to failure of a link integrity test at the second port.

41. (PREVIOUSLY PRESENTED) The method as in claim 1, wherein configuration bridge protocol data unit (BPDU) messages are received at the second port, and the detecting is in response to an interruption in receipt of BPDU messages at the second port.

42. (PREVIOUSLY PRESENTED) The method as in claim 1, wherein the intermediary states include one or more of a listening state and a learning state.

43. (CURRENTLY AMENDED) The method as in claim 1, further comprising:

receiving a command; and

setting, in response to the command, a numeric switch identifier (ID) of the router.

44. (PREVIOUSLY PRESENTED) The method as in claim 3, wherein the detecting is in response to failure of a link integrity test at the first port.

45. (PREVIOUSLY PRESENTED) The method as in claim 3, wherein configuration bridge protocol data unit (BPDU) messages are received at the first port, and the detecting is in response to an interruption in receipt of BPDU messages at the first port.

46. (CURRENTLY AMENDED) The method as in claim 3, further comprising:

receiving a command; and

setting, in response to the command, a numeric switch identifier (ID) of the router.

47. (PREVIOUSLY PRESENTED) The method as in claim 3, wherein the intermediary states include one or more of a listening state and a learning state.

Allowable Subject Matter

1. Claims 1, 3, 14, 16, 27, 29 and 40-47 are allowed.

Reason for Allowance

1. The following is an examiner's statement of reasons for allowance:

The prior art of record does not teach the following:

In regards to claims 1, 14 and 27 the prior art does not teach the claimed combination of features executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root

port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol; selecting a third port as a back-up designated port and placing the back-up designated port in a blocked state; detecting a link failure; transitioning by the spanning tree protocol, in response to detecting the failure, the designated port into the blocked state and the back-up designated port into the forwarding state, without the spanning tree protocol transitioning the back-up designated port through any intermediary states in moving from the blocked state to the forwarding state; and transmitting, by the back-up designated port, one or more messages, the messages to tell devices downstream in the spanning tree that the router has a new designated port.

In regards to claims 3, 16 and 29 the prior art does not teach the claimed combination of features executing a spanning tree protocol to select a first port as a root port and to select a second port as a designated port and to place both the root port and the designated port in a forwarding state, the root port for communication with a root router and the designated port to communicate with at least one router in a lower leaf of a spanning tree established by executing the spanning tree protocol; selecting a third port as a back-up root port and placing the back-up root port in a blocked state; detecting a link failure; transitioning by the spanning tree protocol, in response to detecting the failure, the root port into the blocked state and the back-up root port into the forwarding state, without the spanning tree protocol transitioning the back-up root port through any intermediary states in moving from the blocked state to the forwarding

state.; and transmitting, by the back-up root port, one or more bridge protocol data unit (BPDU) messages to inform a router at a higher leaf of the spanning tree that the router has a new root port.

The prior art alone or in combination fails to jointly suggest or teach the claimed combination of features as taught by the instant application. Therefore claims 1, 3, 14, 16, 27, 29 and 40-47 are to be deemed allowable over prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SALMAN AHMED whose telephone number is (571)272-8307. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on (571)272-3795. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Salman Ahmed/

Primary Examiner, Art Unit 2476

Notice of References Cited	Application/Control No. 11/113,600	Applicant(s)/Patent Under Reexamination GAI ET AL.	
	Examiner SALMAN AHMED	Art Unit 2476	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,790,808 A	08-1998	Seaman, Michael J.	709/223
*	B	US-6,032,194 A	02-2000	Gai et al.	709/239
*	C	US-6,081,512 A	06-2000	Muller et al.	370/256
*	D	US-6,188,694 B1	02-2001	Fine et al.	370/402
*	E	US-6,219,739 B1	04-2001	Dutt et al.	710/311
*	F	US-6,262,977 B1	07-2001	Seaman et al.	370/256
*	G	US-6,330,229 B1	12-2001	Jain et al.	370/256
*	H	US-6,388,995 B1	05-2002	Gai et al.	370/256
*	I	US-6,535,490 B1	03-2003	Jain, Vipin K.	370/256
*	J	US-6,535,491 B2	03-2003	Gai et al.	370/256
*	K	US-6,611,502 B1	08-2003	Seaman, Michael John	370/256
*	L	US-6,680,917 B1	01-2004	Seaman, Michael John	370/256
*	M	US-6,697,339 B1	02-2004	Jain, Vipin K.	370/256

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Cisco Documentation "Understanding Spanning-Tree Protocol", Copyright 1989-1997.
	V	Definitions of Managed Objects for Bridges; Decker et al. December 1991.
	W	Definitions of Managed Objects for Bridges; Decker et al. December 1993.
	X	IEEE Standards for Local and Metropolitan Area Networks: Media Access Control (MAC) Bridges; March 8, 1991

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 11/113,600	Applicant(s)/Patent Under Reexamination GAI ET AL.	
	Examiner SALMAN AHMED	Art Unit 2476	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,771,610 B1	08-2004	Seaman, Michael J.	370/256
*	B	US-2004/0221087 A1	11-2004	Benedetto et al.	710/316
*	C	US-6,813,250 B1	11-2004	Fine et al.	370/256
*	D	US-6,882,630 B1	04-2005	Seaman, Michael John	370/256
*	E	US-6,937,576 B1	08-2005	Di Benedetto et al.	370/256
*	F	US-6,934,263 B1	08-2005	Seaman, Michael J.	370/256
*	G	US-6,976,088 B1	12-2005	Gai et al.	709/238
*	H	US-2007/0124498 A1	05-2007	Kaluve et al.	709/242
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Hot-spot spanning tree algorithm for a bridged LAN/MAN; Nen-Fu Huang; computer communications volume 18 number 5 May 1995
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2	"6813250".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:19
L2	2	"5018137".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L3	2	"6032194".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L4	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L5	1	"PP14234".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L6	2	"6976088 ".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L7	2	(L2 or L3 or L4 or L6) and (third adj port)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L8	19	(port same root same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L9	781	(port same state same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L10	28	(port same state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L11	3	(port same fault same state) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L12	577	(port same fault same state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L13	20	(port same fault same state same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L14	78	(port same fault same state same active) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L15	59	(back adj2 up adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L16	38	("4811337" | "4922486" | "5018137" | "5138615" | "5150360" | "5280480" | "5323394" | "5398242" | "5400333" | "5606669" | "5740171" | "5742604" | "5761435" | "5764636" | "5790808" | "5844902" | "5878232" | "6081512" | "6202114").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L17	6	(port same3 ((backadj2 up) with port) same3 block$3 same3 (activ$5 or (de adj2 activ$5)) same3 fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L18	77	(port same (state with block $5) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L19	4	(port same (state with block $5) same fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L20	175	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L21	10	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L22	165	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (@rlad<"19971224" or @ad<"19971224") not L21	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L23	9	((((stand adj2 by) or (back adj2 up) or redundant) adj2 port) same fail$5) and (@rlad<"19971224" or @ad<"19971224") not L21	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L24	133	((((stand adj2 by) or (back adj2 up) or redundant) adj2 port)) and (@rlad<"19971224" or @ad<"19971224") not L21	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L25	67	(port same fault state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L26	42	((third adj port) and forward $4 and block$4) and cisco.asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L27	5	((third adj port) and forward $4 and block$4).clm. and cisco.asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L28	59	(back adj2 up adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L29	1	((back adj2 up adj2 port) with designated) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L30	2	"7283529".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L31	33	LER.ti.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L32	639	LER.ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L33	1	(LER and table and ip).ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L34	12	(LER and table).ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L35	3	"7209491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L36	2	"7283529".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L37	2	"7246173".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L38	2	"5790808 ".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L39	32	(root adj port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L40	1147	(root with port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L41	38	(root with port) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L42	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L43	1	(root with port) and (leaf adj port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L44	67	(root with port) and (leaf with port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L45	5	(root with port) and (leaf with port) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L46	20	(port with blocked with forwarding with state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L47	2	(port same blocked same forwarding same state same (bypass$4 or directly)) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L48	3	(port same blocked same forwarding same state) and (@rlad<"19971224" or @ad<"19971224") not L46	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L49	263	(port same block$3 same forward$3 same state) and (@rlad<"19971224" or @ad<"19971224") not L48	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L50	27	(port same block$3 same forward$3 same state same (bypass$4 or directly)) and (@rlad<"19971224" or @ad<"19971224") not L48	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L51	34	(port same block$3 same forward$3 same state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L52	8	((chang$5 or transition$3) with forward$4 with block$4 with state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L53	1	((omit$5 or bypass$4) with intermediate with state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L54	3	((omit$5 or bypass$4) with intermediate with state) and (state adj machine) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L55	2	"6188694".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L56	2	"6032194".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L57	2	"6202114".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L58	2	"6388995".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L59	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L60	2	"6678241".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L61	2	"6219739".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L62	1	((first adj port) and (second adj port) and (third adj port) and (forwarding) and blocked and state).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L63	2	"6976088".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L64	2	"5018137".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L65	2	"6032194".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L66	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L67	1	"PP14234".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L68	2	"6976088 ".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L69	2	(L64 or L65 or L66 or L68) and (third adj port)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L70	19	(port same root same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L71	781	(port same state same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L72	28	(port same state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L73	0	(port same fault same state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L74	3	(port same fault same state) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L75	577	(port same fault same state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L76	20	(port same fault same state same blocked) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L77	78	(port same fault same state same active) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L78	59	(back adj2 up adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L79	38	("4811337" | "4922486" | "5018137" | "5138615" | "5150360" | "5280480" | "5323394" | "5398242" | "5400333" | "5606669" | "5740171" | "5742604" | "5761435" | "5764636" | "5790808" | "5844902" | "5878232" | "6081512" | "6202114").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L80	6	(port same3 ((backadj2 up) with port) same3 block$3 same3 (activ$5 or (de adj2 activ$5)) same3 fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L81	77	(port same (state with block $5) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L82	4	(port same (state with block $5) same fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L83	175	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L84	10	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L85	165	((((stand adj2 by) or (back adj2 up) or redundant) with port) same fail$5) and (@rlad<"19971224" or @ad<"19971224") not L84	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L86	9	((((stand adj2 by) or (back adj2 up) or redundant) adj2 port) same fail$5) and (@rlad<"19971224" or @ad<"19971224") not L84	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L87	133	((((stand adj2 by) or (back adj2 up) or redundant) adj2 port)) and (@rlad<"19971224" or @ad<"19971224") not L84	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L88	0	(backup same (designated adj2 port) same root) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L89	67	(port same fault state same blocked) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L90	42	((third adj port) and forward $4 and block$4) and cisco. asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L91	5	((third adj port) and forward $4 and block$4).clm. and cisco.asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L92	59	(back adj2 up adj2 port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L93	1	((back adj2 up adj2 port) with designated) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L94	2	"7283529".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L95	33	LER.ti.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L96	639	LER.ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L97	1	(LER and table and ip).ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L98	12	(LER and table).ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L99	3	"7209491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L100	2	"7283529".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L101	2	"7246173".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L102	2	"5790808 ".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L103	32	(root adj port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L104	1147	(root with port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L105	38	(root with port) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L106	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L107	1	(root with port) and (leaf adj port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L108	67	(root with port) and (leaf with port) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L109	5	(root with port) and (leaf with port) and (spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L110	20	(port with blocked with forwarding with state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L111	2	(port same blocked same forwarding same state same (bypass$4 or directly)) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L112	3	(port same blocked same forwarding same state) and (@rlad<"19971224" or @ad<"19971224") not L110	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L113	263	(port same block$3 same forward$3 same state) and (@rlad<"19971224" or @ad<"19971224") not L112	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L114	27	(port same block$3 same forward$3 same state same (bypass$4 or directly)) and (@rlad<"19971224" or @ad<"19971224") not L112	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L115	34	(port same block$3 same forward$3 same state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L116	8	((chang$5 or transition$3) with forward$4 with block$4 with state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L117	1	((omit$5 or bypass$4) with intermediate with state) and (spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L118	3	((omit$5 or bypass$4) with intermediate with state) and (state adj machine) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L119	2	"6188694".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L120	2	"6032194".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L121	2	"6202114".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L122	2	"6388995".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L123	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L124	2	"6678241".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L125	2	"6219739".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L126	1	((first adj port) and (second adj port) and (third adj port) and (forwarding) and blocked and state).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L127	2	"6976088".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L128	766	(spanning adj tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L129	773	(spanning adj2 tree) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L130	13	((spanning adj2 tree) same (state) same (transition)) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L131	20	(spanning adj2 tree) and (learning adj2 state) and (listening adj2 state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L132	2	"6535491".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L133	2	"6976088".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L134	2	"6771610".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L135	1007	(block$3 with forward$3 with state) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L136	18	(block$3 with forward$3 with state with transition$3) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L137	6	(block$3 with forward$3 with mode with transition$3) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30

L138	116	(block$3 with forward$3 with transition$3) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L139	16	(block$3 with forward$3 with transition$3) and ((state adj2 transition) or (state adj2 diagram)) and (@rlad<"19971224" or @ad<"19971224")	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L140	13	"802.11D".clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L141	56	"802.1D".clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:30
L142	10	"802.1D".clm. and blocking.clm. and forwarding.clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/07/08 07:32

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Inventor Name Search Result

Your Search was:

Last Name = DUTT
First Name = DINESH

Application#	Patent#	PG Pub#	Status	Date Filed	Title	Examiner Name	Inventor Name
09213105	6643260		150	12/18/1998	METHOD AND APPARATUS FOR IMPLEMENTING A QUALITY OF SERVICE POLICY IN DATA COMMUNICATIONS NETWORK	HARPER,KEVIN	DUTT, DINESH
09657023	6219739		150	09/07/2000	Spanning tree with fast link-failure convergence	WILEY,DAVID	DUTT, DINESH
11084587	Not Issued	20060101140	41	03/18/2005	Ethernet extension for the data center	SAMUEL,DEWANDA	DUTT, DINESH
11094877	Not Issued	20060087989	93	03/30/2005	NETWORK DEVICE ARCHITECTURE FOR CONSOLIDATING INPUT/OUTPUT AND REDUCING LATENCY	CHOU,ALBERT	DUTT, DINESH
11146457	7437507	20060277361	150	06/06/2005	ONLINE RESTRIPING TECHNIQUE FOR DISTRIBUTED NETWORK BASED VIRTUALIZATION	DINH,NGOC	DUTT, DINESH
11256030	Not Issued	20070094464	161	10/21/2005	Mirror consistency checking techniques for storage area networks and network based virtualization	PATEL,KAUSHIKKUMAR	DUTT, DINESH
11256292	Not Issued	20070094465	161	10/21/2005	Mirroring mechanisms for storage area networks and network based virtualization	PATEL,KAUSHIKKUMAR	DUTT, DINESH
11256450	Not Issued	20070094466	161	10/21/2005	Techniques for improving mirroring operations implemented in storage area networks and network based virtualization	RUTZ,JARED	DUTT, DINESH
11842866	Not Issued	20090052326	61	08/21/2007	BACKWARD CONGESTION NOTIFICATION	TRAN,TUNG	DUTT, DINESH
12206475	Not Issued	20090006746	93	09/08/2008	ONLINE RESTRIPING TECHNIQUE FOR DISTRIBUTED NETWORK BASED VIRTUALIZATION	ELMORE,STEPHEN	DUTT, DINESH
12364416	Not Issued	20090228651	30	02/02/2009	Mirroring Mechanisms For Storage Area Networks and Network Based Virtualization	RUTZ,JARED	DUTT, DINESH
12365076	Not Issued	20090259816	30	02/03/2009	Techniques for Improving Mirroring Operations Implemented In Storage Area Networks and Network Based Virtualization	BRAGDON,REGINALD	DUTT, DINESH
12365079	Not Issued	20090259817	30	02/03/2009	Mirror Consistency Checking Techniques For Storage Area Networks And Network Based Virtualization	BRAGDON,REGINALD	DUTT, DINESH
12798131	Not Issued	0	20	03/30/2010	Forwarding multi-destination packets in a network with virtual port channels	,	DUTT, DINESH
09450891	6535491	20020147800	150	11/29/1999	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS USING A SPANNING TREE ALGORITHM	PRIETO,BEATRIZ	DUTT, DINESH G
09940753	7272651		150	08/28/2001	RSVP TRANSMITTER PROXY	REILLY,SEAN	DUTT, DINESH G.
09964702	7609689		150	09/27/2001	SYSTEM AND METHOD FOR MAPPING AN INDEX INTO AN IPV6 ADDRESS	LEE,ANDREW	DUTT, DINESH G.
10114394	7616637		150	04/01/2002	LABEL SWITCHING IN FIBRE CHANNEL NETWORKS	MAIS,MARK	DUTT, DINESH G.
10156971	6798746		150	05/28/2002	METHOD AND APPARATUS FOR IMPLEMENTING A QUALITY OF SERVICE POLICY IN A DATA COMMUNICATIONS NETWORK	HARPER,KEVIN	DUTT, DINESH G.
10259959	6976088		150	09/27/2002	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING BRIDGED NETWORKS USING A SPANNING TREE ALGORITHM	PRIETO,BEATRIZ	DUTT, DINESH G.
10391683	6868065	0	150	03/18/2003	METHOD AND APPARATUS FOR IMPLEMENTING A QUALITY OF SERVICE POLICY IN A DATA COMMUNICATIONS NETWORK	HARPER,KEVIN	DUTT, DINESH G.
10392157	6870812	0	150	03/18/2003	METHOD AND APPARATUS FOR IMPLEMENTING A QUALITY OF SERVICE POLICY IN A DATA COMMUNICATIONS NETWORK	HARPER,KEVIN	DUTT, DINESH G.
10609442	7499410	20050036499	150	06/26/2003	FIBRE CHANNEL SWITCH THAT ENABLES END DEVICES IN DIFFERENT FABRICS TO COMMUNICATE WITH ONE	SCHEIBEL,ROBERT	DUTT, DINESH G.

					ANOTHER WHILE RETAINING THEIR UNIQUE FIBRE CHANNEL DOMAIN_IDS		
10637732	7277433	20050041657	150	08/07/2003	SWITCH FOR IMPLEMENTING READ ONLY ZONES IN A FIBRE CHANNEL FABRIC	HO,DUC	DUTT, DINESH G.
10726269	Not Issued	20050117522	71	12/01/2003	Apparatus and method for performing fast fibre channel write operations over relatively high latency networks	UNELUS,ERNEST	DUTT, DINESH G.
10778672	7512123		150	02/13/2004	FIBRE CHANNEL FABRIC AND SWITCHES WITH FLEXIBLE PREFIX ADDRESSING	HO,DUC	DUTT, DINESH G.
10791143	Not Issued	20050025075	168	03/01/2004	Fibre channel switch that enables end devices in different fabrics to communicate with one another while retaining their unique fibre channel domain_IDs	SCHEIBEL,ROBERT	DUTT, DINESH G.
10791307	Not Issued		161	03/01/2004	Switch for implementing read only zones in a fibre channel fabric	HO,DUC	DUTT, DINESH G.
10791660	Not Issued	20050192967	168	03/01/2004	Apparatus and method for performing fast fibre channel write operations over relatively high latency networks	UNELUS,ERNEST	DUTT, DINESH G.
11113660	Not Issued		71	04/25/2005	Method and apparatus for rapidly reconfiguring computer networks	AHMED,SALMAN	DUTT, DINESH G.
11129160	7475142	20050223014	150	05/13/2005	CIFS FOR SCALABLE NAS ARCHITECTURE	DINH,KHANH	DUTT, DINESH G.
11177880	7356573	20070011276	150	07/08/2005	APPARATUS AND METHODS FOR DATA TAPPING IN A STORAGE AREA NETWORK	LIN,WEN TAI	DUTT, DINESH G.
11356914	Not Issued	20070192526	41	02/16/2006	Apparatus and methods for controlling a data tapping session in a storage area network	LI,GUANG	DUTT, DINESH G.
11361119	7506124	20070011424	150	02/24/2006	APPARATUS AND METHODS FOR FACILITATING DATA TAPPING WITH HOST CLUSTERING IN A STORAGE AREA NETWORK	FARROKH,HASHEM	DUTT, DINESH G.
11494036	7568078	20080028167	150	07/26/2006	EPOCH-BASED MUD LOGGING	ELMORE,REBA	DUTT, DINESH G.
11499372	Not Issued	20080034167	30	08/03/2006	Processing a SCSI reserve in a network implementing network-based virtualization	VO,THANH	DUTT, DINESH G.
11827474	Not Issued	20090019142	30	07/11/2007	Fibre channel intelligent target management system	JOO,JOSHUA	DUTT, DINESH G.
11844910	Not Issued	20070286191	93	08/24/2007	IMPLEMENTING READ-ONLY ZONES IN A SWITCHING FABRIC	HO,DUC	DUTT, DINESH G.
11967731	Not Issued	20090172816	30	12/31/2007	DETECTING ROOTKITS OVER A STORAGE AREA NETWORK	BARRON JR,GILBERTO	DUTT, DINESH G.
12343843	Not Issued	20090141657	41	12/24/2008	FIBRE CHANNEL SWITCH THAT ENABLES END DEVICES IN DIFFERENT FABRICS TO COMMUNICATE WITH ONE ANOTHER WHILE RETAINING THEIR UNIQUE FIBRE CHANNEL DOMAIN_IDs	SCHEIBEL,ROBERT	DUTT, DINESH G.
12396302	Not Issued	20090162058	41	03/02/2009	FIBRE CHANNEL FABRIC AND SWITCHES WITH FLEXIBLE PREFIX ADDRESSING	HO,DUC	DUTT, DINESH G.
12506975	Not Issued	20090287892	30	07/21/2009	EPOCH-BASED MUD LOGGING	ELMORE,REBA	DUTT, DINESH G.
12566013	Not Issued	20100008375	20	09/24/2009	LABEL SWITCHING IN FIBRE CHANNEL NETWORKS	,	DUTT, DINESH G.
12771853	Not Issued		19	04/30/2010	Load Balancing Over DCE Multipath ECMP Links for HPC and FCoE	,	DUTT, DINESH G.
60779381	Not Issued		159	03/02/2006	Apparatus and methods for facilitating data tapping in a storage area network	,	DUTT, DINESH G.
08998412	6032194		150	12/24/1997	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS	PRIETO,BEATRIZ	DUTT, DINESH G.
09450066	6388995	20020052936	150	11/29/1999	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTERS NETWORKS EXECUTING THE SPANNING TREE ALGORITHM	PRIETO,BEATRIZ	DUTT, DINESH G.
10034160	7599360	20030118053	150	12/26/2001	METHODS AND APPARATUS FOR ENCAPSULATING A FRAME FOR TRANSMISSION IN A STORAGE AREA NETWORK	PHAM,BRENDA	DUTT, DINESH GANAPATHY
10409427	Not Issued	20040153854	93	04/07/2003	PORT ANALYZER ADAPTER	RIYAMI,ABDULLA	DUTT, DINESH GANAPATHY
10655452	7474666	20050053073	150	09/03/2003	SWITCH PORT ANALYZERS	HO,DUC	DUTT, DINESH GANAPATHY

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Inventor Name Search Result

Your Search was:

Last Name = DUTT
First Name = DINESH

Application#	Patent#	PG Pub#	Status	Date Filed	Title	Examiner Name	Inventor Name
12324703	Not Issued	20090103566	30	11/26/2008	SWITCH PORT ANALYZERS	HO,DUC	DUTT, DINESH GANAPATHY

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Inventor Name Search Result

Your Search was:

Last Name = GAI
First Name = SILVANO

Application#	Patent#	PG Pub#	Status	Date Filed	Title	Examiner Name	Inventor Name
08997297	6188694		150	12/23/1997	SHARED SPANNING TREE PROTOCOL	NGUYEN,PHUONGCHAU	GAI, SILVANO
08998412	6032194		150	12/24/1997	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS	PRIETO,BEATRIZ	GAI, SILVANO
09002115	6202114		150	12/31/1997	SPANNING TREE WITH FAST LINK-FAILURE CONVERGENCE	WILEY,DAVID	GAI, SILVANO
09145600	6697360		150	09/02/1998	METHOD AND APPARATUS FOR AUTO-CONFIGURING LAYER THREE INTERMEDIATE COMPUTER NETWORK DEVICES	PHUNKULH,BOB	GAI, SILVANO
09179036	6167445		150	10/26/1998	METHOD AND APPARATUS FOR DEFINING AND IMPLEMENTING HIGH-LEVEL QUALITY OF SERVICE POLICIES IN COMPUTER NETWORKS	WINDER,PATRICE	GAI, SILVANO
09206067	6286052		150	12/04/1998	METHOD AND APPARATUS FOR IDENTIFYING NETWORK DATA TRAFFIC FLOWS AND FOR APPLYING QUALITY OF SERVICE TREATMENTS TO THE FLOWS	VU,VIET	GAI, SILVANO
09295187	6651096		150	04/20/1999	METHOD AND APPARATUS FOR ORGANIZING, STORING AND EVALUATING ACCESS CONTROL LISTS	TRAN,PHILIP	GAI, SILVANO
09450066	6388995	20020052936	150	11/29/1999	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTERS NETWORKS EXECUTING THE SPANNING TREE ALGORITHM	PRIETO,BEATRIZ	GAI, SILVANO
09450891	6535491	20020147800	150	11/29/1999	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS USING A SPANNING TREE ALGORITHM	PRIETO,BEATRIZ	GAI, SILVANO
09452344	6678241		150	11/30/1999	FAST CONVERGENCE WITH TOPOLOGY SWITCHING	NGUYEN,BRIAN	GAI, SILVANO
09535810	6892237		150	03/28/2000	METHOD AND APPARATUS FOR HIGH-SPEED PARSING OF NETWORK MESSAGES	NGUYEN,PHUOC	GAI, SILVANO
09560499	6904014		150	04/27/2000	METHOD AND APPARATUS FOR PERFORMING HIGH-SPEED TRAFFIC SHAPING	NGUYEN,PHUONGCHAU	GAI, SILVANO
09561839	6714985		150	04/28/2000	METHOD AND APPARATUS FOR EFFICIENTLY REASSEMBLING FRAGMENTS RECEIVED AT AN INTERMEDIATE STATION IN A COMPUTER NETWORK	COLLINS,SCOTT	GAI, SILVANO
09593566	6831898		150	08/16/2000	MULTIPLE PACKET PATHS TO IMPROVE RELIABILITY IN AN IP NETWORK	WILSON,ROBERT	GAI, SILVANO
09599311	6658458		150	06/22/2000	CASCADING ASSOCIATIVE MEMORY ARRANGEMENT	COULTER,KENNETH	GAI, SILVANO
09657023	6219739		150	09/07/2000	Spanning tree with fast link-failure convergence	WILEY,DAVID	GAI, SILVANO
09728138	7185073		150	12/01/2000	METHOD AND APPARATUS FOR DEFINING AND IMPLEMENTING HIGH-LEVEL QUALITY OF SERVICE POLICIES IN COMPUTER NETWORKS	WINDER,PATRICE	GAI, SILVANO
09747676	7076594	20040221087	150	12/22/2000	APPARATUS AND METHOD PREVENTING ONE WAY CONNECTIVITY LOOPS IN A COMPUTER NETWORK	PHAN,RAYMOND	GAI, SILVANO
09748534	6813250		150	12/22/2000	SHARED SPANNING TREE PROTOCOL	NGUYEN,PHUONGCHAU	GAI, SILVANO
09879553	6950400		150	06/12/2001	METHOD AND APPARATUS FOR PERFORMING HIGH-SPEED TRAFFIC SHAPING	NGUYEN,PHUONGCHAU	GAI, SILVANO
09884239	6665611		150	06/19/2001	SYSTEM FOR DISCOVERING AND MAINTAINING GEOGRAPHIC LOCATION INFORMATION IN A COMPUTER NETWORK TO ENABLE EMERGENCY SERVICES	MARC COLEMAN,MARTHE	GAI, SILVANO

09908341	7149499		150	07/18/2001	SYSTEM FOR DYNAMICALLY TRACKING THE LOCATION OF NETWORK DEVICES TO ENABLE EMERGENCY SERVICES	D AGOSTA,STEPHEN	GAI, SILVANO
09911122	6434624		150	07/23/2001	METHOD AND APPARATUS FOR IDENTIFYING NETWORK DATA TRAFFIC FLOWS AND FOR APPLYING QUALITY OF SERVICE TREATMENTS TO THE FLOWS	VU,VIET	GAI, SILVANO
09940753	7272651		150	08/28/2001	RSVP TRANSMITTER PROXY	REILLY,SEAN	GAI, SILVANO
10034160	7599360	20030118053	150	12/26/2001	METHODS AND APPARATUS FOR ENCAPSULATING A FRAME FOR TRANSMISSION IN A STORAGE AREA NETWORK	PHAM,BRENDA	GAI, SILVANO
10056238	7433948	20030172149	150	01/23/2002	METHODS AND APPARATUS FOR IMPLEMENTING VIRTUALIZATION OF STORAGE WITHIN A STORAGE AREA NETWORK	SERRAO,RANODHI	GAI, SILVANO
10074616	7225188		150	02/13/2002	SYSTEM AND METHOD FOR PERFORMING REGULAR EXPRESSION MATCHING WITH HIGH PARALLELISM	FILIPCZYK,MARCIN	GAI, SILVANO
10191605	6651101		150	07/09/2002	METHOD AND APPARATUS FOR IDENTIFYING NETWORK DATA TRAFFIC FLOWS AND FOR APPLYING QUALITY OF SERVICE TREATMENTS TO THE FLOWS	VU,VIET	GAI, SILVANO
10205668	7474613	20040027987	150	07/25/2002	METHODS AND APPARATUS FOR CREDIT-BASED FLOW CONTROL	JUNTIMA,NITTAYA	GAI, SILVANO
10259959	6976088		150	09/27/2002	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING BRIDGED NETWORKS USING A SPANNING TREE ALGORITHM	PRIETO,BEATRIZ	GAI, SILVANO
10313305	7443845	20040109443	150	12/06/2002	APPARATUS AND METHOD FOR A LIGHTWEIGHT, RELIABLE, PACKET-BASED TRANSPORT PROTOCOL	PHAN,MAN	GAI, SILVANO
10313306	Not Issued	20040139167	161	12/06/2002	Apparatus and method for a scalable network attach storage system	DINH,KHANH	GAI, SILVANO
10313745	Not Issued		61	12/06/2002	Apparatus and method for a high availability data network using replicated delivery	ROBERTS,BRIAN	GAI, SILVANO
10367341	7567510	20040160903	150	02/13/2003	SECURITY GROUPS	MILLS,DONALD	GAI, SILVANO
10374490	Not Issued		71	02/25/2003	Method and apparatus for reliably and asymmetrically distributing security information within a fibre channel fabric	SHAW,YIN CHEN	GAI, SILVANO
10409427	Not Issued	20040153854	93	04/07/2003	PORT ANALYZER ADAPTER	RIYAMI,ABDULLA	GAI, SILVANO
10463362	Not Issued	20050141419	41	06/17/2003	Methods and devices for the coordination of flow control between a TCP/IP network and other networks	SKRIPNIKOV,ALEX	GAI, SILVANO
10609442	7499410	20050036499	150	06/26/2003	FIBRE CHANNEL SWITCH THAT ENABLES END DEVICES IN DIFFERENT FABRICS TO COMMUNICATE WITH ONE ANOTHER WHILE RETAINING THEIR UNIQUE FIBRE CHANNEL DOMAIN_IDS	SCHEIBEL,ROBERT	GAI, SILVANO
10684681	6874016		150	10/14/2003	INFORMATION SEARCHING DEVICE	COULTER,KENNETH	GAI, SILVANO
10697896	7194354	0	150	10/30/2003	SYSTEM FOR DISCOVERING AND MAINTAINING GEOGRAPHIC LOCATION INFORMATION IN A COMPUTER NETWORK TO ENABLE EMERGENCY SERVICES	BEHNCKE,CHRISTINE	GAI, SILVANO
10726269	Not Issued	20050117522	71	12/01/2003	Apparatus and method for performing fast fibre channel write operations over relatively high latency networks	UNELUS,ERNEST	GAI, SILVANO
10752341	7428237		150	01/06/2004	FAST CONVERGENCE WITH TOPOLOGY SWITCHING	ABELSON,RONALD	GAI, SILVANO
10770383	7640287	0	150	02/02/2004	METHOD AND APPARATUS FOR AUTO-CONFIGURING LAYER THREE INTERMEDIATE COMPUTER NETWORK DEVICES	HAMZA,FARUK	GAI, SILVANO
10778672	7512123		150	02/13/2004	FIBRE CHANNEL FABRIC AND SWITCHES WITH FLEXIBLE PREFIX ADDRESSING	HO,DUC	GAI, SILVANO
10791137	Not Issued		161	03/01/2004	Apparatus and method for a high availability data network using replicated delivery	DUDA,ADAM	GAI, SILVANO
10791143	Not Issued	20050025075	168	03/01/2004	Fibre channel switch that enables end devices in different fabrics to	SCHEIBEL,ROBERT	GAI, SILVANO

					communicate with one another while retaining their unique fibre channel domain_IDs		
10791297	Not Issued	20050190758	161	03/01/2004	Security groups for VLANs	MILLS,DONALD	GAI, SILVANO
10791660	Not Issued	20050192967	168	03/01/2004	Apparatus and method for performing fast fibre channel write operations over relatively high latency networks	UNELUS,ERNEST	GAI, SILVANO
11074261	7130272		150	03/07/2005	METHOD AND APPARATUS FOR PERFORMING HIGH-SPEED TRAFFIC SHAPING	NGUYEN,PHUONGCHAU	GAI, SILVANO
11078992	7564869	20060098681	150	03/10/2005	FIBRE CHANNEL OVER ETHERNET	CHOU,ALBERT	GAI, SILVANO

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Last Name = GAI
First Name = SILVANO

Application#	Patent#	PG Pub#	Status	Date Filed	Title	Examiner Name	Inventor Name
11084587	Not Issued	20060101140	41	03/18/2005	Ethernet extension for the data center	SAMUEL,DEWANDA	GAI, SILVANO
11085768	7395332	20050165966	150	03/21/2005	METHOD AND APPARATUS FOR HIGH-SPEED PARSING OF NETWORK MESSAGES	NGUYEN,PHUOC	GAI, SILVANO
11094877	Not Issued	20060087989	93	03/30/2005	NETWORK DEVICE ARCHITECTURE FOR CONSOLIDATING INPUT/OUTPUT AND REDUCING LATENCY	CHOU,ALBERT	GAI, SILVANO
11113600	Not Issued		71	04/25/2005	Method and apparatus for rapidly reconfiguring computer networks	AHMED,SALMAN	GAI, SILVANO
11152991	Not Issued	20060098589	93	06/14/2005	FORWARDING TABLE REDUCTION AND MULTIPATH NETWORK FORWARDING	HOANG,THAI	GAI, SILVANO
11256030	Not Issued	20070094464	161	10/21/2005	Mirror consistency checking techniques for storage area networks and network based virtualization	PATEL,KAUSHIKKUMAR	GAI, SILVANO
11256292	Not Issued	20070094465	161	10/21/2005	Mirroring mechanisms for storage area networks and network based virtualization	PATEL,KAUSHIKKUMAR	GAI, SILVANO
11256450	Not Issued	20070094466	161	10/21/2005	Techniques for improving mirroring operations implemented in storage area networks and network based virtualization	RUTZ,JARED	GAI, SILVANO
11400671	Not Issued	20060251067	61	04/06/2006	Fibre channel over ethernet	AGA,SORI	GAI, SILVANO
11434471	7412557	20060206656	150	05/15/2006	APPARATUS AND METHOD FOR PREVENTING LOOPS IN A COMPUTER NETWORK	PHAN,RAYMOND	GAI, SILVANO
11490806	Not Issued	20080019282	30	07/20/2006	Methods and apparatus for improved determination of network metrics	MIAN,OMER	GAI, SILVANO
11595600	Not Issued	20070055746	161	11/10/2006	System for dynamically tracking the location of network devices to enable emergency services	D AGOSTA,STEPHEN	GAI, SILVANO
12140224	Not Issued	20090037977	30	06/16/2008	APPARATUS AND METHOD FOR APPLYING NETWORK POLICY AT A NETWORK DEVICE	BARRON JR,GILBERTO	GAI, SILVANO
12199678	Not Issued	20080320134	30	08/27/2008	Methods and Apparatus for Implementing Virtualization of Storage within a Storage Area Network	SERRAO,RANODHI	GAI, SILVANO
12343843	Not Issued	20090141657	41	12/24/2008	FIBRE CHANNEL SWITCH THAT ENABLES END DEVICES IN DIFFERENT FABRICS TO COMMUNICATE WITH ONE ANOTHER WHILE RETAINING THEIR UNIQUE FIBRE CHANNEL DOMAIN_IDs	SCHEIBEL,ROBERT	GAI, SILVANO
12364416	Not Issued	20090228651	30	02/02/2009	Mirroring Mechanisms For Storage Area Networks and Network Based Virtualization	RUTZ,JARED	GAI, SILVANO
12365076	Not Issued	20090259816	30	02/03/2009	Techniques for Improving Mirroring Operations Implemented In Storage Area Networks and Network Based Virtualization	BRAGDON,REGINALD	GAI, SILVANO
12365079	Not Issued	20090259817	30	02/03/2009	Mirror Consistency Checking Techniques For Storage Area Networks And Network Based Virtualization	BRAGDON,REGINALD	GAI, SILVANO
12396302	Not Issued	20090162058	41	03/02/2009	FIBRE CHANNEL FABRIC AND SWITCHES WITH FLEXIBLE PREFIX ADDRESSING	HO,DUC	GAI, SILVANO
12485337	Not Issued	20090252038	20	06/16/2009	FIBRE CHANNEL OVER ETHERNET	,	GAI, SILVANO
12509894	Not Issued	20090300350	20	07/27/2009	SECURITY GROUPS	,	GAI, SILVANO
12822551	Not Issued		17	06/24/2010	END-TO-END FIBRE CHANNEL OVER ETHERNET	,	GAI, SILVANO
60488116	Not Issued		159	07/16/2003	Fibre channel fabric and switches with flexible prefix addressing	,	GAI, SILVANO
60621396	Not Issued		159	10/22/2004	FC over ethernet	,	GAI, SILVANO
60944443	Not Issued		159	06/15/2007	APPARATUS AND METHOD FOR APPLYING NETWORK POLICY AT	,	GAI, SILVANO

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61210193	Not Issued		159	03/13/2009	Unified computing system	,	GAI, SILVANO

Inventor Search Completed: No Records to Display.

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Last Name = MCCLOGHRIE
First Name = KEITH

Application#	Patent#	PG Pub#	Status	Date Filed	Title	Examiner Name	Inventor Name
08582074	6035105		150	01/02/1996	MULTIPLE VLAN ARCHITECTURE SYSTEM	PAN,DANIEL	MCCLOGHRIE, KEITH
08997297	6188694		150	12/23/1997	SHARED SPANNING TREE PROTOCOL	NGUYEN,PHUONGCHAU	MCCLOGHRIE, KEITH
08998412	6032194		150	12/24/1997	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS	PRIETO,BEATRIZ	MCCLOGHRIE, KEITH
09106519	6920112		250	06/29/1998	SAMPLING PACKETS FOR NETWORK MONITORING	PHUNKULH,BOB	MCCLOGHRIE, KEITH
09145600	6697360		150	09/02/1998	METHOD AND APPARATUS FOR AUTO-CONFIGURING LAYER THREE INTERMEDIATE COMPUTER NETWORK DEVICES	PHUNKULH,BOB	MCCLOGHRIE, KEITH
09179036	6167445		150	10/26/1998	METHOD AND APPARATUS FOR DEFINING AND IMPLEMENTING HIGH-LEVEL QUALITY OF SERVICE POLICIES IN COMPUTER NETWORKS	WINDER,PATRICE	MCCLOGHRIE, KEITH
09206067	6286052		150	12/04/1998	METHOD AND APPARATUS FOR IDENTIFYING NETWORK DATA TRAFFIC FLOWS AND FOR APPLYING QUALITY OF SERVICE TREATMENTS TO THE FLOWS	VU,VIET	MCCLOGHRIE, KEITH
09277329	6219699		150	03/26/1999	MULTIPLE VLAN ARCHITECTURE SYSTEM	PAN,DANIEL	MCCLOGHRIE, KEITH
09295187	6651096		150	04/20/1999	METHOD AND APPARATUS FOR ORGANIZING, STORING AND EVALUATING ACCESS CONTROL LISTS	TRAN,PHILIP	MCCLOGHRIE, KEITH
09372480	6675220		150	08/11/1999	TECHNIQUES FOR THE HARDWARE IMPLEMENTATION OF RANDOM EARLY DETECTION MECHANISMS	JEAN,FRANTZ	MCCLOGHRIE, KEITH
09450066	6388995	20020052936	150	11/29/1999	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTERS NETWORKS EXECUTING THE SPANNING TREE ALGORITHM	PRIETO,BEATRIZ	MCCLOGHRIE, KEITH
09450891	6535491	20020147800	150	11/29/1999	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS USING A SPANNING TREE ALGORITHM	PRIETO,BEATRIZ	MCCLOGHRIE, KEITH
09452344	6678241		150	11/30/1999	FAST CONVERGENCE WITH TOPOLOGY SWITCHING	NGUYEN,BRIAN	MCCLOGHRIE, KEITH
09482326	6839766		150	01/14/2000	METHOD AND APPARATUS FOR COMMUNICATING COPS PROTOCOL POLICIES TO NON-COPS-ENABLED NETWORK DEVICES	VAUGHN JR,WILLIAM	MCCLOGHRIE, KEITH
09580384	Not Issued		168	05/26/2000	MULTIPLE VLAN ARCHITECTURE SYSTEM	PAN,DANIEL	MCCLOGHRIE, KEITH
09583177	7111073		150	05/30/2000	APPARATUS FOR ESTIMATING DELAY AND JITTER BETWEEN NETWORK ROUTERS	LAFORGIA,CHRISTIAN	MCCLOGHRIE, KEITH
09599311	6658458		150	06/22/2000	CASCADING ASSOCIATIVE MEMORY ARRANGEMENT	COULTER,KENNETH	MCCLOGHRIE, KEITH
09609302	6885642		150	06/30/2000	METHOD AND APPARATUS FOR ESTIMATING DELAY AND JITTER BETWEEN NETWORK ROUTERS COUPLED TO BACKBONE NETWORK	VANDERPUYE,KENNETH	MCCLOGHRIE, KEITH
09629585	6751746		150	07/31/2000	METHOD AND APPARATUS FOR UNINTERRUPTED PACKET TRANSFER USING REPLICATION OVER DISJOINT PATHS	LE,DIEU MINH	MCCLOGHRIE, KEITH
09638180	6912203		150	07/31/2000	METHOD AND APPARATUS FOR ESTIMATING DELAY AND JITTER BETWEEN MANY NETWORK ROUTERS USING MEASUREMENTS BETWEEN A PREFERRED SET OF ROUTERS	TRAN,THIEN	MCCLOGHRIE, KEITH
09657023	6219739		150	09/07/2000	Spanning tree with fast link-failure convergence	WILEY,DAVID	MCCLOGHRIE, KEITH

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09728138	7185073		150	12/01/2000	METHOD AND APPARATUS FOR DEFINING AND IMPLEMENTING HIGH-LEVEL QUALITY OF SERVICE POLICIES IN COMPUTER NETWORKS	WINDER,PATRICE	MCCLOGHRIE, KEITH
09746233	6868068	0	150	12/21/2000	METHOD AND APPARATUS FOR ESTIMATING DELAY AND JITTER BETWEEN NETWORK ROUTERS	VANDERPUYE,KENNETH	MCCLOGHRIE, KEITH
09746558	6757901		150	12/21/2000	METHOD AND SYSTEM FOR SETTING EXPRESSIONS IN NETWORK MANAGEMENT NOTIFICATIONS AT AN AGENT	PATEL,HARESH	MCCLOGHRIE, KEITH
09748534	6813250		150	12/22/2000	SHARED SPANNING TREE PROTOCOL	NGUYEN,PHUONGCHAU	MCCLOGHRIE, KEITH
09748758	7275094	0	150	12/21/2000	SYSTEM AND METHOD FOR CONFIGURING CONTENTS OF NETWORK MANAGEMENT NOTIFICATIONS	BARQADLE,YASIN	MCCLOGHRIE, KEITH
09750661	6795858		150	12/29/2000	METHOD AND APPARATUS FOR METRIC BASED SERVER SELECTION	LIM,KRISNA	MCCLOGHRIE, KEITH
09752016	Not Issued		161	12/29/2000	Method and apparatus for estimating delay and jitter between network routers	LAFORGIA,CHRISTIAN	MCCLOGHRIE, KEITH
09911122	6434624		150	07/23/2001	METHOD AND APPARATUS FOR IDENTIFYING NETWORK DATA TRAFFIC FLOWS AND FOR APPLYING QUALITY OF SERVICE TREATMENTS TO THE FLOWS	VU,VIET	MCCLOGHRIE, KEITH
10056309	7054926		150	01/23/2002	METHOD AND APPARATUS FOR MANAGING NETWORK DEVICES USING A PARSABLE STRING THAT CONFORMS TO A SPECIFIED GRAMMAR	NGUYEN,PHUOC	MCCLOGHRIE, KEITH
10125208	7227859		150	04/17/2002	METHOD FOR ENSURING VLAN INTEGRITY FOR VOICE OVER INTERNET PROTOCOL TELEPHONES	ABELSON,RONALD	MCCLOGHRIE, KEITH
10125269	7366164		150	04/17/2002	METHOD FOR REGULATING POWER FOR VOICE OVER INTERNET PROTOCOL TELEPHONES	HOANG,THAI	MCCLOGHRIE, KEITH
10125324	7729367		150	04/17/2002	METHOD FOR BRING-UP OF VOICE OVER INTERNET PROTOCOL TELEPHONES	LAI,ANDREW	MCCLOGHRIE, KEITH
10191605	6651101		150	07/09/2002	METHOD AND APPARATUS FOR IDENTIFYING NETWORK DATA TRAFFIC FLOWS AND FOR APPLYING QUALITY OF SERVICE TREATMENTS TO THE FLOWS	VU,VIET	MCCLOGHRIE, KEITH
10259959	6976088		150	09/27/2002	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING BRIDGED NETWORKS USING A SPANNING TREE ALGORITHM	PRIETO,BEATRIZ	MCCLOGHRIE, KEITH
10752341	7428237		150	01/06/2004	FAST CONVERGENCE WITH TOPOLOGY SWITCHING	ABELSON,RONALD	MCCLOGHRIE, KEITH
10770383	7640287	0	150	02/02/2004	METHOD AND APPARATUS FOR AUTO-CONFIGURING LAYER THREE INTERMEDIATE COMPUTER NETWORK DEVICES	HAMZA,FARUK	MCCLOGHRIE, KEITH
10820257	7373543		150	04/08/2004	METHOD AND APPARATUS FOR UNINTERRUPTED PACKET TRANSFER USING REPLICATION OVER DISJOINT PATHS	LE,DIEU MINH	MCCLOGHRIE, KEITH
10847947	7249359		150	05/17/2004	METHOD AND SYSTEM FOR SETTING EXPRESSIONS IN NETWORK MANAGEMENT NOTIFICATIONS	PATEL,HARESH	MCCLOGHRIE, KEITH
10847949	6996827		150	05/17/2004	METHOD AND SYSTEM FOR SETTING EXPRESSIONS IN NETWORK MANAGEMENT NOTIFICATIONS	CAO,DIEM	MCCLOGHRIE, KEITH
10960162	Not Issued	20050060393	41	10/06/2004	Method and apparatus for communicating COPS protocol policies to non-COPS-enabled network devices	CHEEMA,UMAR	MCCLOGHRIE, KEITH
11075189	7613127	20060198328	150	03/07/2005	VERIFYING PACKETS RECEIVED OVER A PHYSICAL LINK	WONG,XAVIER	MCCLOGHRIE, KEITH
11107560	Not Issued		95	04/15/2005	CONTROLLING ACCESS TO MANAGED OBJECTS IN NETWORKED DEVICES	GORNEY,BORIS	MCCLOGHRIE, KEITH
11109539	7716355	20060235971	150	04/18/2005	METHOD AND APPARATUS FOR PROCESSING SIMPLE NETWORK MANAGEMENT PROTOCOL	SHEPPERD,ERIC	MCCLOGHRIE, KEITH

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11168071	Not Issued	20050243822	95	06/28/2005	METHOD AND APPARATUS FOR ESTIMATING DELAY AND JITTER BETWEEN MANY NETWORK ROUTERS USING MEASUREMENTS BETWEEN A PREFERRED SET OF ROUTERS	HSU,ALPUS	MCCLOGHRIE, KEITH
11173737	Not Issued	20070005641	30	06/30/2005	Methods and systems for monitoring objects	ANWARI,MACEEH	MCCLOGHRIE, KEITH
11272984	7484222		150	11/14/2005	METHOD AND SYSTEM FOR SETTING EXPRESSIONS IN NETWORK MANAGEMENT NOTIFICATIONS	CAO,DIEM	MCCLOGHRIE, KEITH
11744103	Not Issued	20070201667	30	05/03/2007	Method for Ensuring VLAN Integrity for Voice Over Internet Protocol Telephones	VU,HUY	MCCLOGHRIE, KEITH

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First Name = KEITH

Application#	Patent#	PG Pub#	Status	Date Filed	Title	Examiner Name	Inventor Name
12776963	Not Issued	0	20	05/10/2010	Method for Bring-Up of Voice Over Internet Protocol Telephones	,	MCCLOGHRIE, KEITH
60285507	Not Issued		159	04/19/2001	Method for bring up of voice over IP phones	,	MCCLOGHRIE, KEITH

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AN Tantawy - IEEE Journal on Selected Areas in Communications, 1993
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A virtual topology management protocol for ATM LAN emulation
X Chen, DT Tantiprasut - Bell Labs Technical Journal, 1997 - interscience.wiley.com
... Protocol Operation The **802.1**(**d**) bridging protocol operates in three Figure 8. Average distance with fixed number of nodes (30). 5.0 4.5 4.0 3.5 3.0 2.5 2.0 **...** All root and designated ports are then set to the **forwarding state**, and all other ports are set to the **blocking state**. **...**
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[PDF] Definitions of Managed Objects for Bridges
P Langille, A Rijsinghani, K McCloghrie - 1993 - 64.170.98.42
... PDUs by this node on any port when it is the root of the **spanning tree** or trying **...** by this node, in units of hundredths of a second." REFERENCE "IEEE **802.1D**-1990: Section **...** a second, controls how fast a port changes its spanning state when moving towards the **Forwarding state**. **...**
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NF Huang, GK Ma, YJ Wu - Computer Communications, 1995 - Elsevier
... The IEEE **802.1D spanning tree** algorithm consists of three phases in the construction of a **spanning tree**: 1. Find the root bridge of the **spanning tree ...** Each bridge port will be in one of the following four states '.**forwarding state**, learning state, listening state and **blocking state**. **...**
Related articles

Network Working Group E. Decker Request for Comments: 1286 cisco Systems, Inc. P. Langill Digital Equipment Corporation
A Rijsinghani, K McCloghrie - 1991 - portal.acm.org
... The granularity of this timer is specified by **802.1d**/D9 to be 1 second. **...** DESCRIPTION "A topologyChange trap is sent by a bridge when any of its configured ports transitions from the Learning state to the **Forwarding state**, or from the **Forwarding state** to the **Blocking state**. **...**
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A Rijsinghani, K McCloghrie - 1993 - portal.acm.org
... object can take the value of a unicast address, a group address or the broadcast address." REFERENCE "IEEE **802.1D**-1990: Section **...** when any of its configured ports transitions from the Learning state to the **Forwarding state**, or from the **Forwarding state** to the **Blocking state**. **...**
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A May - 1991 - voiplab.niu.edu.tw
... Abstract: IEEE **802.1D**-1990, IEEE Standards for Local and Metropolitan Area Netuwks: Media Access Control (MAC) Bridges. **...** A **Spanning Tree** Algorithm and Protocol ensures a loop-free topology and provides redundancy. **...**
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	Ahmed, Salman	2476

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Class	Subclass	Date	Examiner
370	256, 390, 432,	4/13/2008	WC
370	256, 401, 254, 255, 428	7/8/2010	SA
709	239, 242	7/8/2010	SA

SEARCH NOTES

Search Notes	Date	Examiner
inventorship search	4/13/2008	WC
East search	4/13/2008	WC
consulted with SPE Edan Orgad	4/13/2008	WC
manual search for class 370/432	4/13/2008	WC
Updated Search	10/17/2008	SA
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Updated search	10/27/2009	SA
Updated search	3/10/2010	SA
Updated EAST search	7/8/2010	SA
Updated IEEE, GOOGLE and Inventorship search	7/8/2010	SA

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner
	See attached interference search	7/8/2010	SA

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Application/Control No.	Applicant(s)/Patent Under Reexamination
11113600	GAI ET AL.
Examiner	**Art Unit**
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ORIGINAL		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
370	256	H 0 4 L 12 / 28 (2006.01.01)	

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
370	401				

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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7	14		30	10	46										
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NONE		**Total Claims Allowed:**	
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... Prior to issuing the frame with routing **spanning tree** function (algorithm and related proto- information, the "source ... As the explorer frame traverses ing" or **"blocking" state**. ... are configured the network, the bridge enters routing information such 55 in a **"forwarding" state** transmit ' a ...
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Single-route broadcast for LAN interconnection
NA Narayanan, JA Cobban, P Cousineau, WK ... - US Patent ..., 1995 - Google Patents
... frames at the same time, maintaining all the remaining source by the is source routing bridge when the algorithm is in routing bridges in a **blocking state** to prevent them the **FORWARDING state** and for sending out conten- 60 from forwarding local **spanning tree** protocol tion ...
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K Chen, DT Tanlipsout - Bell Labs Technical Journal, 1997 - interscience.wiley.com
... All other ports connected to that same LAN are blocked. All root and designated ports are then set to the **forwarding state**, and all other ports are set to the **blocking state**. The multiple **spanning tree** protocol requires mod- ifications to this basic process. ...
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... between the transmission of Configuration bridge PDUs by this node on any port when it is the root of the **spanning tree** or trying ... value, measured in units of hundredths of a second, controls how fast a port changes its spanning state when moving towards the **Forwarding state**. ...
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... ID **spanning tree** algorithm. During the reconfiguration procedure, it is still allowed to transmit user frames based on the original **spanning tree**, because the port state is never changed from the **blocking state** to the **forwarding state** directly. ...
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... dot1dBridge DESCRIPTION "The newRoot trap indicates that the sending agent has become the new root of the **Spanning Tree**; the trap is ... any of its configured ports transitions from the Learning state to the **Forwarding state**, or from the **Forwarding state** to the **Blocking state**. ...
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... 45 3.8 3.9 4 . The **Spanning Tree** Algorithm and Protocol ..... 49 4.1 4.2 4.3 Overview ..... 50 ... 115 Fig 3-2 Bridge Ports ..... Fig 4-2 **Spanning Tree** ....
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... View Ctrl + b Ctrl + c Model Name 9T122_08 Close Ctrl +c Navigate Alarms Performance Notes... Utilities Bridge Model Information Special Database **Spanning Tree** Information Static Database Table Transparent Bridge Info 8 9T122_08 Model Name Bridging ...
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Fault recovery port-based fast spanning tree algorithm (FRP-FAST) for the fault-tolerant Ethernet on the arbitrary switched network topology

Sejun Song;
Emerging Technologies and Factory Automation, 2001.
Proceedings. 2001 8th IEEE International Conference on
Digital Object Identifier: 10.1109/ETFA.2001.996385
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IEEE CONFERENCES

IEEE Standard for Information Technology- Telecommunications and Information Exchange Between Systems- Local and Metropolitan Area Networks- Common Specifications Part 3: Media Access Control (MAC) Bridges

ANSI/IEEE Std 802.1D, 1998 Edition
Digital Object Identifier: 10.1109/IEEESTD.1998.95619
Publication Year: 1998 , Page(s): i - 355

IEEE STANDARDS

Cross-over spanning trees Enhancing metro ethernet resilience and load balancing

Huynh, Minh; Mohapatra, Prasant; Goose, Stuart;
Broadband Communications, Networks and Systems, 2007. BROADNETS 2007. Fourth International Conference on
Digital Object Identifier: 10.1109/BROADNETS.2007.4550433
Publication Year: 2007 , Page(s): 251 - 260

IEEE CONFERENCES

(Amendment to IEEE Std 802.1Q, 1998 Edition) Draft Standard for Information technology Telecommunications and information between systems Local and metropolitan networks Common specifications Media Access Control (MAC) Bridges: Technical and editorial Corrections (Superseded by 802.1t-2001) (Incorporated into 802.1Q-2003)

IEEE Std P802.1t/D10
Publication Year: 2000

IEEE STANDARDS

Local and Metropolitan Area Networks--Virtual Bridged Local Area Networks Amendment: Management Information Base (MIB) definitions for VLAN Bridges

IEEE Unapproved Draft Std P802.1ap/D3.0, Oct 2007
Publication Year: 2007

IEEE STANDARDS

IEEE Draft Standard for Local and Metropolitan Area Networks--Virtual Bridged Local Area Networks Amendment: Management Information Base (MIB) definitions for VLAN Bridges

IEEE Unapproved Draft Std P802.1ap/D4.3, Oct 2008
Publication Year: 2008

IEEE STANDARDS

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A scheme for high-performance LAN interconnection across public MAN's

Tantawy, A.N.; Zitterbart, M.;
Selected Areas in Communications, IEEE Journal on
Volume: 11 , Issue: 8
Digital Object Identifier: 10.1109/49.245903
Publication Year: 1993 , Page(s): 1133 - 1144

IEEE JOURNALS

Resilient Ethernet Ring for Survivable IP Metro Backbone

Yichun Zhan; Meng Ji; Shaohua Yu;
Communications and Networking in China, 2006. ChinaCom '06. First International Conference on
Digital Object Identifier: 10.1109/CHINACOM.2006.344914
Publication Year: 2006 , Page(s): 1 - 5

IEEE CONFERENCES

IEEE Standard for Information Technology--Telecommunications and Information Exchange Between Systems--Local and Metropolitan Area Networks--Specific Requirements--Part 5 Token Ring Access Method and Physical Layer Specifications--Amendment 1: Dedicated Token Ring Operation and Fibre Optic Media

IEEE Std 802.5r and IEEE 802.5j, 1998 Edition (ISO/IEC 8802-5:1998/Amd.1)
Digital Object Identifier: 10.1109/IEEESTD.1998.339588
Publication Year: 1998 , Page(s): 1 - 420

IEEE STANDARDS

ISO/IEC Standard for Information Technology--Telecommunications and Information Exchange Between Systems--IEEE Standard for Local and Metropolitan Area Networks--Common Specifications--Part 5: Remote Media Access Control (MAC) Bridging

IEEE Std 802.1G, 1998 Edition (ISO/IEC15802-5:1998)
Digital Object Identifier: 10.1109/IEEESTD.1998.309583
Publication Year: 1998 , Page(s): 1 - 237

IEEE STANDARDS

Draft Standard for Local and Metropolitan Area Networks-- Virtual Bridged Local Area Networks Amendment: Management Information Base (MIB) definitions for VLAN Bridges

IEEE Unapproved Draft Std P802.1ap/D4.0 Aug. 2008
Publication Year: 2008

IEEE STANDARDS

IEEE Standard for Local and metropolitan area networks- Virtual Bridged Local Area Networks Amendment 8: Management Information Base (MIB) Definitions for VLAN Bridges

IEEE Std 802.1ap-2008 (Amendment to IEEE Std 802.1Q-2005)
Digital Object Identifier: 10.1109/IEEESTD.2009.4799517
Publication Year: 2009 , Page(s): c1 - 323

IEEE STANDARDS

IEEE Standard for Information Technology - Telecommunications and Information Exchange Between Systems - Local and Metropolitan Area Network - Common Specifications

IEEE Std 802.1f-2001
Digital Object Identifier: 10.1109/IEEESTD.2001.92770
Publication Year: 2001

IEEE STANDARDS

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

24267 7590 07/30/2010

CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission via EFS-WEB

I hereby certify that this Fee(s) Transmittal is being deposited ~~with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885~~, on the date indicated below.

Merisa Jakupovic	(Depositor's name)
Merisa Jakupovic	(Signature)
November 1, 2010	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/113,600	04/25/2005	Silvano Gai	112025-0063D1C2	8858

TITLE OF INVENTION: METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$0	$0	$1510	11/01/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
AHMED, SALMAN	2476	370-256000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Cesari and McKenna, LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Cisco Technology, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): San Jose, CA

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☒ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 03-1237 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature James Blanchette Date November 1, 2010

Typed or printed name James A. Blanchette Registration No. 51,477

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Electronic Patent Application Fee Transmittal

Application Number:	11113600
Filing Date:	25-Apr-2005
Title of Invention:	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS
First Named Inventor/Applicant Name:	Silvano Gai
Filer:	James A. Blanchette/Merisa Jakupovic
Attorney Docket Number:	112025-0063D1C2

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	1501	1	1510	1510
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**1510**

Electronic Acknowledgement Receipt

EFS ID:	8742545
Application Number:	11113600
International Application Number:	
Confirmation Number:	8858
Title of Invention:	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS
First Named Inventor/Applicant Name:	Silvano Gai
Customer Number:	24267
Filer:	James A. Blanchette/Merisa Jakupovic
Filer Authorized By:	James A. Blanchette
Attorney Docket Number:	112025-0063D1C2
Receipt Date:	01-NOV-2010
Filing Date:	25-APR-2005
Time Stamp:	15:03:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1510
RAM confirmation Number	1220
Deposit Account	031237
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

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Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	23A9609.PDF	16326 cbac13925aafd5dc5bb6335d75dde101006b8186	no	2
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	23A9888.PDF	199389 17fa4d29906dbaee37b56aa5c027f230410bdd6f	no	1
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	30288 2825ad9bf41dfba6cd98ae0ed071748bb5939d79	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	246003		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENTS
112025–0063D1C2
Seq. 9803; CPOL 488685

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:
Silvano Gai

Serial No.: 11/113,600

Filed: April 25, 2005

For: METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS

Examiner: Ahmed, Salman

Art Unit: 2476

Confirmation No.: 8858

Cesari and McKenna, LLP
88 Black Falcon Avenue
Boston, MA 02210
November 1, 2010

CERTIFICATE OF EFS WEB TRANSMISSION

I hereby certify that the following paper is being EFS WEB transmitted to the Patent and Trademark Office on November 1, 2010.

/Merisa Jakupovic/
Merisa Jakupovic

Mail Stop Issue Fee
Commissioner for Patents
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Sir:

ISSUE-FEE TRANSMITTAL

In response to the Notice of Allowance and Issue Fee Due mailed July 30, 2010, for the above-identified application, enclosed are the following:

—Issue Fee Transmittal Form PTOL-85b; and

—authorization to charge $1,510 to cover the issue fee to our Deposit Account No. 03-1237.

Please charge any additional fee occasioned by this paper to the aforementioned Deposit Account No. 03-1237.

Respectfully submitted,

/James A. Blanchette/

James A. Blanchette
Reg. No. 51,477
CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210
Telephone: (617) 951-2500
Facsimile: (617) 951-3927

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/113,600	12/07/2010	7848264	112025-0063D1C2	8858

24267 7590 11/17/2010

CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 1110 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Silvano Gai, Vigliano d'Asti, ITALY;
Keith McCloghrie, San Jose, CA;
Dinesh G. Dutt, Santa Clara, CA;

PTO/AIA/80 (07-17)
Approved for use through 01/31/2018. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

[X] Practitioners associated with Customer Number: 115932

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

[X] The address associated with Customer Number: 115932

OR

[ ]

Firm or individual name		
Address		
City	State	Zip
Country		
Telephone	Email	

Assignee name and address: Cisco Technology, Inc.
170 West Tasman Drive
San Jose, CA 95134

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature	Date 12-21-2017
Name Dan Lang	Telephone 408-525-3737
Title Vice President and Assistant Secretary	

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PTO/AIA/96 (08-12)
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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: CISCO TECHNOLOGY, INC.

Application No./Patent No.: 7,848,264 Filed/Issue Date: 12-07-2010

Titled: METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS

CISCO TECHNOLOGY, INC., a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 008987, Frame 0471, or for which a copy thereof is attached.

B. ☑ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

   1. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

   2. From: _____ To: _____

      The document was recorded in the United States Patent and Trademark Office at

      Reel _____, Frame _____, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/AIA/96 (08-12)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

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Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☑ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Brian McKnight/	December 30, 2020
Signature	Date
Brian McKnight	Attorney for Applicant
Printed or Typed Name	Title or Registration Number

Electronic Acknowledgement Receipt

EFS ID:	41527454
Application Number:	11113600
International Application Number:	
Confirmation Number:	8858
Title of Invention:	METHOD AND APPARATUS FOR RAPIDLY RECONFIGURING COMPUTER NETWORKS
First Named Inventor/Applicant Name:	Silvano Gai
Customer Number:	24267
Filer:	Brian Kevin McKnight/April Skovmand
Filer Authorized By:	Brian Kevin McKnight
Attorney Docket Number:	112025-0063D1C2
Receipt Date:	30-DEC-2020
Filing Date:	25-APR-2005
Time Stamp:	18:59:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		112025-0063D1C2_POA-373.pdf	290296 ddec71aac4861260ca4bf89d6e1b3bea4358a7ab	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Power of Attorney	1	1
	Assignee showing of ownership per 37 CFR 3.73	2	3
Warnings:			
Information:			
	Total Files Size (in bytes):	290296	

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/113,600	04/25/2005	Silvano Gai	112025-0063D1C2

CONFIRMATION NO. 8858

POA ACCEPTANCE LETTER

115932
Cisco Technology, Inc.
c/o Polsinelli PC
1000 Louisiana Street
Suite 6400
Houston, TX 77002

OC000000122413025

Date Mailed: 01/06/2021

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/30/2020.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/ctuazon/