Arista Networks, Inc. (Petitioner)
v.
Cisco Systems, Inc. (Patent Owner)

Demonstratives
Trial No. IPR2016-00309
U.S. Patent No. 7,224,668

Before Hon. Bryan F. Moore, Matthew R. Clements, and Peter P. Chen
Administrative Patent Judges

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U.S. Patent No. 7,224,668

668 Patent Overview

US007224668B1

(12) **United States Patent**
Smethurst et al.

(10) **Patent No.: US 7,224,668 B1**
(45) **Date of Patent: May 29, 2007**

(54) **CONTROL PLANE SECURITY AND TRAFFIC FLOW MANAGEMENT**

(75) Inventors: **Adrian C. Smethurst**, Groton, MA (US); **Michael F. Keohane**, Shrewsbury, MA (US); **R. Wayne Ogozaly**, Hollis, NH (US)

(73) Assignee: **Cisco Technology, Inc.**, San Jose, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1000 days.

(21) Appl. No.: **10/307,154**

(22) Filed: **Nov. 27, 2002**

(51) **Int. Cl.**
G06F 11/00 (2006.01)
H04L 12/50 (2006.01)
H04L 12/28 (2006.01)

(52) **U.S. Cl.** **370/229**; 370/352; 370/360; 370/401; 370/402

(58) **Field of Classification Search** 370/229, 370/360, 387, 352, 357, 401, 402; 379/88.22, 379/207.02, 221.08; 709/224, 238
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,304,568	B1	10/2001	Kim
2001/0026612	A1	10/2001	Duspiva et al.
2002/0097672	A1	7/2002	Barbas et al.

OTHER PUBLICATIONS

Park, K. and Lee, H., "On the Effectiveness of Route-Based Packet Filtering for Distributed DoS Attack Prevention in Power-Law Internets," *SIGCOMM' 01*:1-12 (2001).

Re: [RPSEC] Draft Status, from a protocol developer's angle. [online], Jul. 26, 2002 [retrieved on Sep. 18, 2002]. Retreived from the Internet <URL:https://www1.ietf.org/mailman-archive/working-groups/rpsec/current/msg00167.html>.

Durham, D., et al., "Elimination of Distributed Denial of Service Attacks using Programmable Network Processors," *Intel Research and Development*:1-4 (2002).

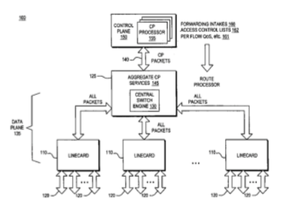
Flexible Firewalls for Network Processors. [online] [retrieved on Sep. 18, 2002]. Retrieved from the Internet <URL:mhtml:file://C:\tibnet\dad\clients\cisco\utexas.mht>.

Primary Examiner—Afsar Qureshi
(74) *Attorney, Agent, or Firm*—Hamilton, Brook, Smith & Reynolds, P.C.

(57) **ABSTRACT**

An internetworking device that provides improved immunity to Denial of Service attacks, and in general, improved Quality of Service (QoS). An internetworking element or other route processor is composed of two main parts, including a data forwarding plane and a control plane; the control plane runs routing, signaling and control protocols that are responsible for determining the packet forwarding behavior by the data plane. Independent control plane processes may be provided; however, they are considered to be a single network entity that is a uniquely addressable port. Packets thus intended for the control plane always pass through a designated point. As a result, a set of port services unique to the control plane may be applied to the control plane port. These control plane port services thus can be utilized to control all packet traffic entering and exiting the control plane processes as a whole.

72 Claims, 6 Drawing Sheets



1

ARISTA 1001

(57) **ABSTRACT**

An internetworking device that provides improved immunity to Denial of Service attacks, and in general, improved Quality of Service (QoS). An internetworking element or other route processor is composed of two main parts, including a data forwarding plane and a control plane; the control plane runs routing, signaling and control protocols that are responsible for determining the packet forwarding behavior by the data plane. Independent control plane processes may be provided; however, they are considered to be a single network entity that is a uniquely addressable port. Packets thus intended for the control plane always pass through a designated point. As a result, a set of port services unique to the control plane may be applied to the control plane port. These control plane port services thus can be utilized to control all packet traffic entering and exiting the control plane processes as a whole.

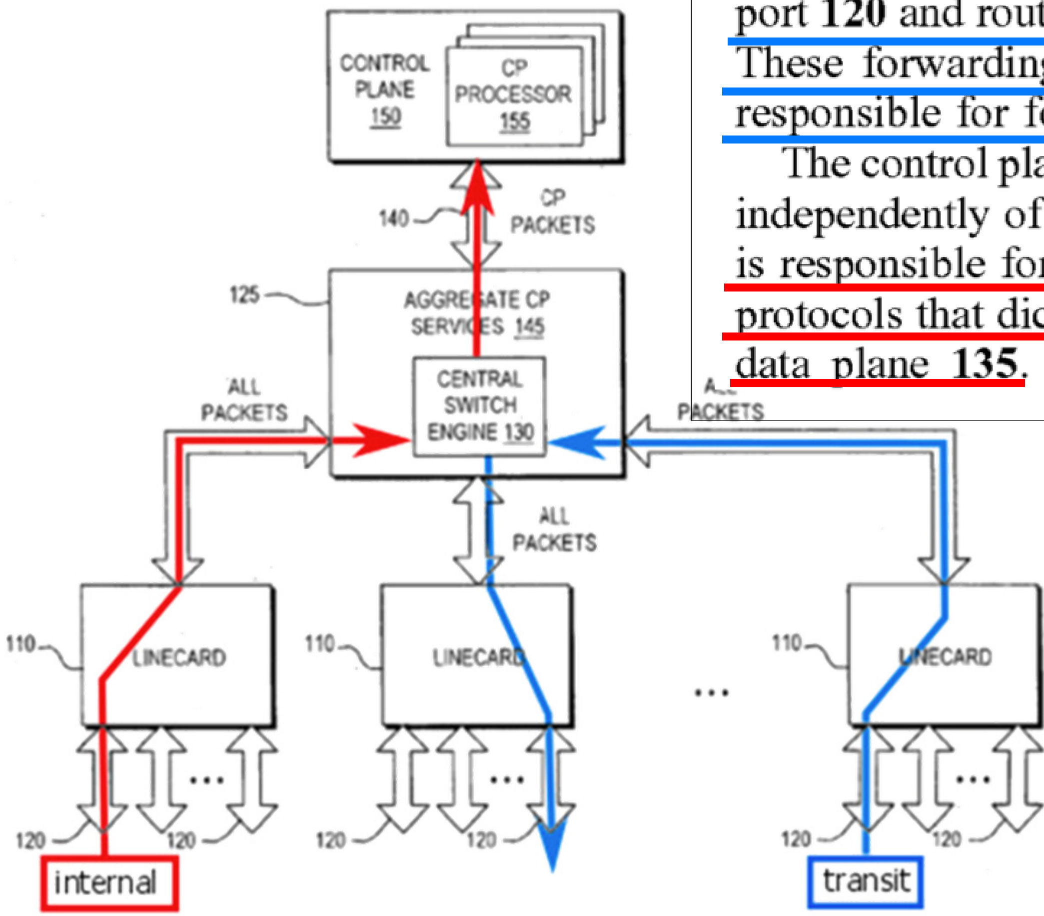
Ex. 1001 (668 Patent)

668 Patent Overview

More specifically, the line cards **110** and central switch engine **130** operate to accept packets received on a given port **120** and route them through to another output port **120**. These forwarding or data plane **135** components are thus responsible for forwarding network transit packets.

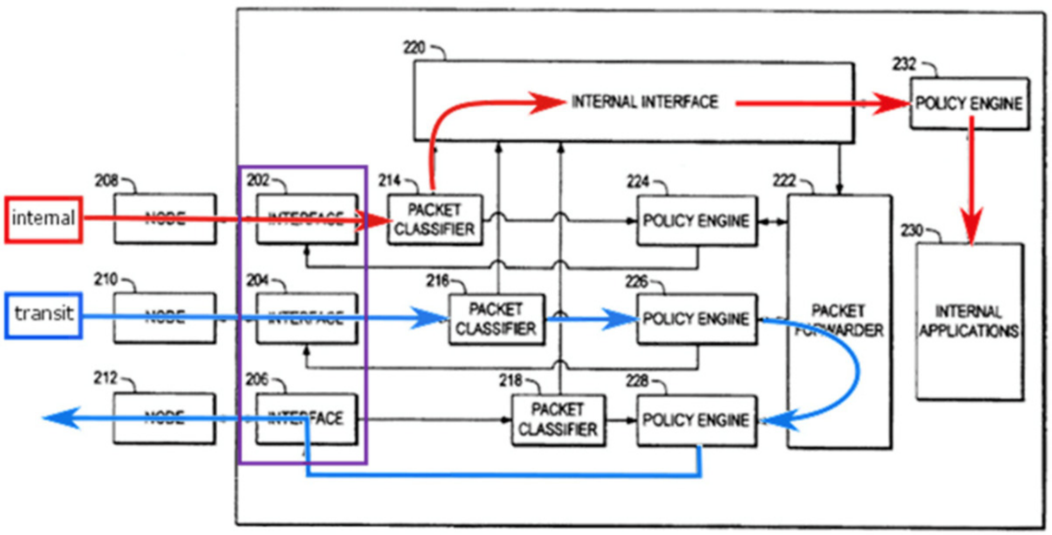
The control plane **150** on the other hand, functions largely independently of the data plane **135**. The control plane **150** is responsible for processing routing, signaling and control protocols that dictate the packet forwarding behavior of the data plane **135**. Such protocols typically manipulate for-

Ex. 1001 (668 Patent) at 5:5-15;
Petition (Paper No. 1) at 4



Ex. 1001 (668 Patent) at Fig. 1 (annotated);
Reply to POR (Paper No. 33) at 1

Amara Teaches "Control Plane Port Services" That Are "Independent Of The Physical Port Interfaces And Services Applied Thereto"



Ex. 1004 (Amara) at Fig. 3 (annotated); Reply to POR (Paper No. 33) at 1

668 Patent, Claim 1

1. An internetworking device comprising:

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b. **port services, for operating on packets entering and exiting the physical network interface ports**, the port services providing an ability to control and monitor packet flows, as defined by control plane configurations;

***

d. wherein: i. a control plane port entity provides access to the collection of control plane processes, so that a set of control plane port services can be applied thereto; and ii**. the control plane port services operate on packets received from specific, predetermined physical ports and destined to the collection of control plane processes in a way that is independent of the physical port interfaces and services applied thereto**.

Grounds Instituted in *Inter Partes* Review

	References	Basis	Instituted Claims
1	Amara[1] & CoreBuilder[2]	35 U.S.C. § 103	1–6, 8, 9, 15–22, 24–27, 33–36, 55–58, 60–63, and 69–72
2	Amara, CoreBuilder, & Moberg[3]	35 U.S.C. § 103	7, 23, and 59
3	Amara, CoreBuilder, & Hendel[4]	35 U.S.C. § 103	10, 12, 13, 28, 30, 31, 64, 66, and 67

Institution Decision (Paper No. 8) at 23

1. U.S. Patent No 6,674,743 B2 (Ex. 1004)
2. CoreBuilder 3500 Implementation Guide, 3Com MSD Technical Publications, November 1999 (Ex. 1009)
3. U.S. Patent No. 6,460,146 B1 (Ex. 1005)
4. U.S. Patent No. 6,115,378 (Ex. 1007)

Disputed Issues For First Instituted Ground

	References	Basis	Claims Challenged by Cisco
1	Amara & CoreBuilder	35 U.S.C. § 103	1, 2-6, 8, 9, 15-18, 19, 20-22, 24-27, 33-36, 55, 56-58, 60-63, and 69-72

Claims Not Separately Contested
2-6, 8, 9, 15-18, 20-22, 24-27, 33-36, 56-58, 60-63, and 69-72

POR (Paper No. 18) at 11-31

Cisco Contests Only a Few Elements Of Claims 1–6, 8, 9, 15–22, 24–27, 33–36, 55–58, 60–63, and 69–72

Claim 1	Claim 19	Claim 55	
1. An internetworking device comprising:	19. A method for processing packets in an internetworking device comprising the steps of:	55. A computer readable storage medium containing instructions readable by a computer to configure the computer to perform a method for processing packets in an internetworking device comprising:	Uncontested
a. a plurality of physical network interface ports, each for providing a physical connection point to a network for the internetworking device, the ports being configurable by control plane processes;	a. configuring a plurality of physical network interface ports, each port for providing a physical connection point into a network, and the ports being configurable by control plane processes;	a. configuring a plurality of physical network interface ports, each port for providing a physical connection point into a network, and the ports being configurable by control plane processes;	Uncontested
b. port services, for operating on packets entering and exiting the physical network interface ports, the port services providing an ability to control and monitor packet flows, as defined by control plane configurations;	b. executing port services on packets entering and exiting the physical network interface ports, the port services for controlling and monitoring packet flows as defined by control plane configurations;	b. executing port services on packets entering and exiting the physical network interface ports, the port services for controlling and monitoring packet flows as defined by control plane configurations;	Contested
c. a control plane, comprising a plurality of internetworking control plane processes, the control plane processes for providing high-level control and configuration of the ports and the port services;	c. executing a plurality of control plane processes, the control plane processes providing high level control and configuration of the ports and port services,	c. executing a plurality of control plane processes, the control plane processes providing high level control and configuration of the ports and port services,	Uncontested
d. wherein:	and additionally comprising the steps of:	and additionally comprising the steps of:	Uncontested
i. a control plane port entity provides access to the collection of control plane processes, so that a set of control plane port services can be applied thereto; and	i. accessing the collection of control plane processes as a control plane port entity, so that a set of control plane port services are applied thereto as a set; and	i. accessing the collection of control plane processes as a control plane port entity, so that a set of control plane port services are applied thereto as a set; and	Uncontested
ii. the control plane port services operate on packets received from specific, predetermined physical ports and destined to the collection of control plane processes in a way that is independent of the physical port interfaces and services applied thereto.	ii. operating on packets received from specific, predetermined physical ports and destined to the collection of control plane processes in a way that is independent of the individual physical port interface configuration and port services applied thereto.	ii. operating on packets received from specific, predetermined physical ports and destined to the collection of control plane processes in a way that is independent of the individual physical port interface configuration and port services applied thereto.	Contested

POR (Paper No. 18) at 15-30

Amara & CoreBuilder: Cisco's Arguments

1. Independent claims require that **both** "port services" and "control plane port services" be applied to packets destined for the control plane; not disclosed by Amara (POR (Paper No. 18) at 15-28)
2. Because CoreBuilder does not disclose logging packets, the combination of Amara & CoreBuilder does not teach the limitation "control and monitor packet flows" (POR (Paper No. 18) at 29-30)
3. CoreBuilder is not prior art (POR (Paper No. 18) at 30-31)

Claims Do Not Require Both "Port Services" And "Control Plane Port Services" For Control Plane Packets

- "services applied thereto" refers to "physical port interfaces," not "packets"

> ii. the control plane port services operate on packets received from specific, predetermined physical ports and destined to the collection of control plane processes in a way that is independent of the physical port interfaces and services applied thereto.

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Ex. 1001 (668 Patent) (annotated);
Reply to POR (Paper No. 33) at 3

668 Patent, Claim 1

1. An internetworking device comprising:

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b. **port services, for operating on packets entering and exiting the physical network interface ports**, the port services providing an ability to control and monitor packet flows, as defined by control plane configurations;

***

d. wherein: i. a control plane port entity provides access to the collection of control plane processes, so that a set of control plane port services can be applied thereto; and

ii**. the control plane port services operate on packets received from specific, predetermined physical ports and destined to the collection of control plane processes in a way that is independent of the physical port interfaces and services applied thereto**.

Claims Do Not Require Both "Port Services" And "Control Plane Port Services" For Control Plane Packets

Cisco:

"Furthermore, the only embodiments described in the specification—aggregate control plane services and distributed control plane services—apply port services to control plane packets."

POR (Paper No. 18) at 19

Specification: Embodiments where port services are "typically" (by definition, not always) applied to packets

In embodiments of the invention, based upon information acquired through its control plane processes, packet forwarding behavior of the data plane elements is thus dictated. Data planes thus typically otherwise include a plurality of ports that define physical connection points to the network. Port services are then typically applied to operate on packets entering into or exiting from each individual physical port.

Ex. 1001 (668 Patent) at 3:35-41;
Reply to POR (Paper No. 33) at 6

Claims Do Not Require Both "Port Services" And "Control Plane Port Services" For Control Plane Packets

Cisco:

"Furthermore, the only embodiments described in the specification—aggregate control plane services and distributed control plane services—apply port services to control plane packets."

POR (Paper No. 18) at 19

Specification: Describes physical port interfaces which do not apply port services to packets

Also, when control plane policies are defined within input port features, a significant performance impact typically results for transit (that is non-control plane) traffic. Because additional control plane classes and policies that need to be executed for transit packets as well as control plane destined packets, overall transit traffic performance is markedly reduced. An interface which previously had no configuration, would be forced to execute control plane policies for every packet it receives. This performance impact, rather

Ex. 1001 (668 Patent) at 2:63-66;
Reply to POR (Paper No. 33) at 5 n. 4

Amara & CoreBuilder: Cisco's Arguments

1. Independent claims require that **both** "port services" and "control plane port services" be applied to packets destined for the control plane; not disclosed by Amara (POR (Paper No. 18) at 15-28)
2. Because CoreBuilder does not disclose logging packets, the combination of Amara & CoreBuilder does not teach the limitation "control and monitor packet flows" (POR (Paper No. 18) at 29-30)
3. CoreBuilder is not prior art (POR (Paper No. 18) at 30-31)

Amara & CoreBuilder Teach The Disputed Limitation

Undisputed: Amara discloses "port services providing an ability to control and monitor packet flows"

simply routing them on the basis of destination address. In particular, some packets may be selected for special treatment in order to provide "policy-based services." "Policy-based services" encompass any disposition of packets that involves more than simply routing them based on their destination addresses. For example, routers and remote access servers may perform packet filtering, in which certain packets are dropped, diverted, and/or logged. The router or

Ex. 1004 (Amara) at 1:31-38;
Reply to POR (Paper No. 33) at 11

port, destination port, and protocol type. Policy engine **126** also applies a set of rules specifying the manner in which a given packet should be handled if the selector fields of the given packet match certain predefined criteria. Such handling can include without limitation dropping the packet, logging the packet, encrypting or decrypting the packet, performing network address translation and/or port address

Ex. 1004 (Amara) at 5:16-21;
Petition (Paper No. 1) at 13

668 Patent, Claim 1

1. An internetworking device comprising:

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b. port services, for operating on packets entering and exiting the physical network interface ports, **the port services providing an ability to control and monitor packet flows, as defined by control plane configurations**;

***

Amara & CoreBuilder Teach The Disputed Limitation

Undisputed:	Amara discloses "port services providing an ability to control and monitor packet flows"
Undisputed:	CoreBuilder teaches "defin[ing] control plane configurations"

Administration Console Overview

The Administration Console is an internal character-oriented, menu-driven, user interface for performing system administration such as displaying statistics or changing option settings. You can view the Administration Console from a terminal, a PC, a Macintosh, or from a UNIX workstation. You can access the Administration Console through a terminal or modem serial port, or through an Ethernet port using an Internet Protocol (IP) interface.

Figure 1 shows a sample output of menu options that can be viewed from the various devices.

```
Menu options (CoreBuilder-2B4200):: ------------------------------------------

     display                - Display bridge information
     ipFragmentation        - Enable/Disable IP Fragmentation
     ipxSnapTranslation     - Enable/Disable IP 802.3-FDDI SNAP Translation
     addressThreshold       - Set the bridge address threshold
     agingTime              - Set the bridge aging time
     stpState               - Enable/Disable Spanning Tree on a bridge
     stpPriority            - Set the Spanning Tree bridge priority
     stpMaxAge              - Set the Spanning Tree bridge maximum age
     stpHelloTime           - Set the Spanning Tree bridge hello time
     stpForwardDelay        - Set the Spanning Tree bridge forward delay
     stpGroupAddress        - Set the Spanning Tree bridge group address
     gvrpState              - Enable/disable GVRP
     port                   - Administer bridge ports
     packetFilter           - Administer packet filters
     vlan                   - Administer VLANs
     trunk                  - Administer trunks
```

Ex. 1009 (CoreBuilder) at 32 (excerpts);
Petition (Paper No. 1) at 16

668 Patent, Claim 1

1. An internetworking device comprising:

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b. port services, for operating on packets entering and exiting the physical network interface ports, **the port services providing an ability to control and monitor packet flows, as defined by control plane configurations**;

***

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Undisputed:	Amara discloses "port services providing an ability to control and monitor packet flows"
Undisputed:	CoreBuilder teaches "defin[ing] control plane configurations"
Undisputed:	CoreBuilder teaches packet filtering, which Amara describes as including packet logging

Packet Filtering Overview

The packet filtering feature allows a switch to make a permit-or-deny decision for each packet based on the packet contents. Use packet filters to control traffic on your network segments to:

- Improve LAN performance.
- Implement LAN security controls.
- Shape traffic flow to emulate virtual LAN (VLAN) behavior. See Chapter 9.

Ex. 1009 (CoreBuilder) at 210;
Petition (Paper No. 1) at 17

668 Patent, Claim 1

1. An internetworking device comprising:

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- Implement LAN security controls.
- Shape traffic flow to emulate virtual LAN (VLAN) behavior. See Chapter 9.

Ex. 1009 (CoreBuilder) at 210;
Petition (Paper No. 1) at 17

destination addresses. For example, routers and remote access servers may perform packet filtering, in which certain packets are dropped, diverted, and/or logged. The router or

Ex. 1004 (Amara) at 1:36-38;
Reply to POR (Paper No. 33) at 11

668 Patent, Claim 1

1. An internetworking device comprising:

***

b. port services, for operating on packets entering and exiting the physical network interface ports, **the port services providing an ability to control and monitor packet flows, as defined by control plane configurations**;

***

Cisco's Response

89. However, the Petition did not discuss how Amara's ability to log packets is "*defined by control plane configurations*." CoreBuilder does not address Amara's deficiency. Rather, to the extent CoreBuilder discloses configuring packet filters, such configuration does not apply to Amara's logging of packets because CoreBuilder's packet filters simply do not log packets: CoreBuilder never mentions logging in its description of packet filters. (CoreBuilder, p. 209–250.) Thus, CoreBuilder does not teach or suggests configuring policies for "*monitor[ing] packet flows*" contrary to the requirements of the challenged independent claims.

Ex. 2006 (Almeroth Declaration) at ¶ 89

Amara & CoreBuilder Teach The Disputed Limitation

57. Furthermore, a POSITA would have considered CoreBuilder's Administration Console to be equivalent to one of the internal applications 230. In particular, Amara's internal applications 230 are used to control and configure Amara's device 200 and at least some of them are accessible by Telnet. Amara, 2:28-31, 4:34-38. Likewise, CoreBuilder's Administration Console, which is embedded in the system software, is used to control and configure the CoreBuilder router and is accessible by Telnet. *See* Section III(B), above. Accordingly, a POSITA would have considered the Administration Console to be equivalent to one of the internal applications 230 and, based on CoreBuilder, would have understood that such applications could provide an administrator with the ability to configure the ports. A POSITA would have used this known technique taught by CoreBuilder to provide an administrator with the ability to configure the ports by modifying Amara's device 200 such that one of the internal applications 230 would be able to be used by an administrator to perform the configuration of the ports.

Ex. 1002 (Lin Declaration) at ¶ 57

Amara & CoreBuilder Teach The Disputed Limitation

57. Furthermore, a POSITA would have considered CoreBuilder's Administration Console to be equivalent to one of the internal applications 230. In particular, Amara's internal applications 230 are used to control and configure Amara's device 200 and at least some of them are accessible by Telnet. Amara, 2:28-31, 4:34-38. Likewise, CoreBuilder's Administration Console, which is embedded in the system software, is used to control and configure the CoreBuilder router and is accessible by Telnet. *See* Section III(B), above. Accordingly, a POSITA would have considered the Administration Console to be equivalent to one of the internal applications 230 and, based on CoreBuilder, would have understood that such applications could provide an administrator with the ability to configure the ports. A POSITA would have used this known technique taught by CoreBuilder to provide an administrator with the ability to configure the ports by modifying Amara's device 200 such that one of the internal applications 230 would be able to be used by an administrator to perform the configuration of the ports.

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Ex. 1002 (Lin Declaration) at ¶ 57

Amara & CoreBuilder: Cisco's Arguments

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2. Because CoreBuilder does not disclose logging packets, the combination of Amara & CoreBuilder does not teach the limitation "control and monitor packet flows" (POR (Paper No. 18) at 29-30)
3. CoreBuilder is not prior art (POR (Paper No. 18) at 30-31)

Cisco: Declaration Of 3Com Employee Patricia Crawford Fails To Establish That Corebuilder Is Prior Art

First, Ms. Crawford's declaration provides nothing more than mere speculation that Ex. 1009 was actually published in November 1999. The Crawford declaration never establishes that Ex. 1009 was ever shipped with a 3Com product, nor that it was otherwise publically available as of November 1999. Moreover, even if the Ex. 1009 could have been shipped with Release 3.0 of the CoreBuilder 3500 Switch, the Crawford declaration never establishes "persons of ordinary skill in the art, exercising reasonable diligence, could have located it." For example, the Crawford declaration never establishes that a single 3Com CoreBuilder 3500, release 3.0 was actually ever sold.

POR (Paper No. 18) at 30-31

CoreBuilder Is Prior Art

Cisco:

"Ms. Crawford's declaration provides nothing more than mere speculation that Ex. 1009 was actually published in November 1999."

POR (Paper No. 18) at 31

1009 was going to be shipped with the CoreBuilder 3500 Switch. I also note that the cover of Exhibit 1009 specifies "Published November 1999." Under the normal procedure at 3Com at the time, when a publication date was included on the front page of 3Com documentation, the publication date indicates the date when the documentation was first shipped with the corresponding product. Thus, the cover indicates that Exhibit 1009 was first shipped with the CoreBuilder 3500 Switch in November, 1999. In addition, page 26 of Exhibit 1009 indicates that it was included on the CD-ROM that shipped with the CoreBuilder 3500 switch. Under the normal procedure at 3Com at the time, this description would not have been included as part of Exhibit 1009 unless the document was going to be included on the CD-ROM that shipped with the CoreBuilder 3500 switch.

Ex. 1010 (Crawford Declaration) at ¶ 8

Software and Documentation

CoreBuilder 3500 Switching Software Printed Documentation Kit	3C35984
CoreBuilder 3500 Switching Software Version 3.0	3C35935B

Ex. 1023 (Internet Archive Dated 6/21/2000) at 3, 10; Reply to POR (Paper No. 33) at 15

CoreBuilder Is Prior Art

Cisco:

"Ms. Crawford's declaration provides nothing more than mere speculation that Ex. 1009 was actually published in November 1999."

"The Crawford declaration never establishes that Ex. 1009 was ever shipped with a 3Com product."

POR (Paper No. 18) at 31

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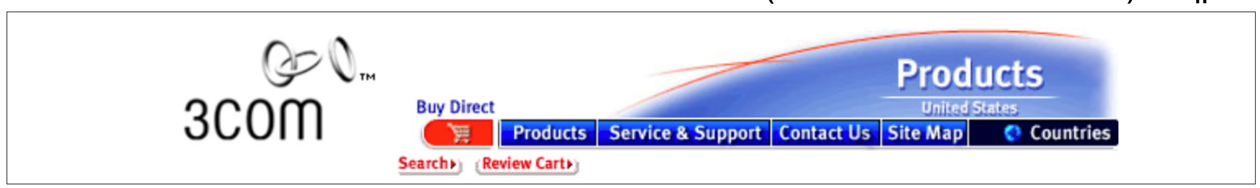
Ex. 1010 (Crawford Declaration) at ¶ 8



Software and Documentation

CoreBuilder 3500 Switching Software Printed Documentation Kit	3C35984
CoreBuilder 3500 Switching Software Version 3.0	3C35935B

Ex. 1023 (Internet Archive Dated 6/21/2000) at 3, 10; Reply to POR (Paper No. 33) at 15

CoreBuilder Is Prior Art

Cisco:
The "Crawford declaration never establishes that a single 3Com CoreBuilder 3500, release 3.0 was actually ever sold."

POR (Paper No. 18) at 31

Crawford Declaration:

5. As a Technical Writer and SQA Engineer at 3Com, I was personally familiar with the 3Com CoreBuilder 3500 Layer 3 Switch. This product was sold to customers beginning in approximately 1997 and continued to be sold at least until I left 3Com in 2000.

Ex. 1010 (Crawford Declaration) at ¶ 5

CoreBuilder Is Prior Art

Cisco:

"At most, Ms. Crawford's declaration could stand for the procedures and processes that were in place at the time she was a technical writer—over 1 year prior to the date Ex. 1009 was allegedly "shipped."

POR (Paper No. 18) at 31-32

Crawford Declaration:

7. After my transition to a SQA Engineer, I remained familiar with the process used to ensure that proper documentation was shipped with 3Com products. The overall process stayed the same at least until I left 3Com in 2000. I was also aware that Release 3.0 of the Guide

Ex. 1010 (Crawford Declaration) at ¶7

CoreBuilder Is Prior Art

Cisco:
"[E]ven if the Ex. 1009 could have been shipped with Release 3.0 of the CoreBuilder 3500 Switch, the Crawford declaration never establishes 'persons of ordinary skill in the art, exercising reasonable diligence, could have located it.'"

POR (Paper No. 18) at 31

Crawford Declaration:

5. As a Technical Writer and SQA Engineer at 3Com, I was personally familiar with the 3Com CoreBuilder 3500 Layer 3 Switch. This product was sold to customers beginning in approximately 1997 and continued to be sold at least until I left 3Com in 2000.

Ex. 1010 (Crawford Declaration) at ¶ 5

the packaged products shipped to the customers. Documentation was shipped with products without any confidentiality restrictions. That is, customers were not under any obligations that limited their ability to disseminate or otherwise use the information in the documentation.

Ex. 1010 (Crawford Declaration) at ¶ 4

CoreBuilder Is Prior Art

Cisco:
"[E]ven if the Ex. 1009 could have been shipped with Release 3.0 of the CoreBuilder 3500 Switch, the Crawford declaration never establishes 'persons of ordinary skill in the art, exercising reasonable diligence, could have located it.'"

POR (Paper No. 18) at 31

Software and Documentation

CoreBuilder 3500 Switching Software Printed Documentation Kit	3C35984
CoreBuilder 3500 Switching Software Version 3.0	3C35935B

Ex. 1023 (Internet Archive Dated 6/21/2000) at 3, 10 (excerpts);
Reply to POR (Paper No. 33) at 15

Cisco's Case Law is Distinguishable

Cisco:
"Alleged publication dates in and of themselves are insufficient evidence of public availability. *See Open Text S.A. v. Box, Inc.*, No. 13-CV-04910-JD, 2015 WL 4940798 at *7 (N.D. Cal. Aug. 19, 2015) (finding that printing dates may indicate when the document was created, but they do not prove the necessary predicate to establishing "public accessibility")"

POR (Paper No. 18) at 32

> When defendants previously moved for summary judgment of invalidity, they attached a declaration from Melissa Mack, an operations manager at Ipswitch, the company that made WS_FTP, to try and establish that the WS_FTP Pro 5.0 User's Guide was publicly accessible, *see* Declaration of Melissa Mack ¶ 5, Dkt. No. 315-19, but no testimony from Ms. Mack was introduced at trial.

Open Text S.A. v. Box, Inc., No. 13-CV-04910-JD, 2015 WL 4940798 at *7 (N.D. Cal. Aug. 19, 2015)(denying judgment as a matter of law of invalidity following trial); Reply to POR (Paper No. 33) at 16

Disputed Issues For Second Instituted Ground

	References	Basis	Instituted Claims
2	Amara, CoreBuilder, & Moberg	35 U.S.C. § 103	7, 23, and 59

Amara, CoreBuilder & Moberg: Cisco's Arguments

1. Moberg cannot be relied upon as prior art (POR (Paper No. 18) at 34-42)
   a) Under §102(a)
   b) Under §102(e)
2. Moberg does not disclose distributing "control plane processes" to a secondary processor (POR (Paper No. 18) at 43-46)

Cisco: Moberg Is Not Prior Art

reasons. First, Moberg is not prior art under § 102(a) because the inventors of the ’668 patent conceived of the invention prior to October 1, 2002, and the inventors and their patent attorney exercised reasonable diligence in constructively reducing the invention to practice during the entirety of the 59 day critical period (September 30, 2002 to November 27, 2002). *See Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1577 (Fed. Cir. 1996). Second, Moberg cannot be used to establish unpatentability even as § 102(e) art because, at the time of the invention, the ’668 patent and Moberg patent were both subject to assignment to Cisco, thus disqualifying Moberg under § 103(c).

POR (Paper No. 18) at 34-35

Cisco: Moberg Is Not Prior Art

Cisco must prevail on both 102(a) and 102(e) grounds to establish that Moberg is not prior art

and their patent attorney exercised reasonable diligence in constructively reducing the invention to practice during the entirety of the 59 day critical period (September 30, 2002 to November 27, 2002). *See Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1577 (Fed. Cir. 1996). Second, Moberg cannot be used to establish unpatentability even as § 102(e) art because, at the time of the invention, the '668 patent and Moberg patent were both subject to assignment to Cisco, thus disqualifying Moberg under § 103(c).

POR (Paper No. 18) at 34-35;
Reply to POR (Paper No. 33) at 17-22

Amara, CoreBuilder & Moberg: Cisco's Arguments

1. Moberg cannot be relied upon as prior art (POR (Paper No. 18) at 34-42)
   a) Under §102(a)
   b) Under §102(e)
2. Moberg does not disclose distributing "control plane processes" to a secondary processor (POR (Paper No. 18) at 43-46)

Moberg Is Prior Art Under 102(a)

Timeline

- **12/4/1998: Moberg Filing Date (Ex. 1005)**

- **10/1/2002: Moberg Publication Date (Prior art under 35 U.S.C. § 102(a)) (Ex. 1005)**
- **11/27/2002: 668 Patent Priority Date (Ex. 1001)**

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

35 U.S.C. § 102

Moberg Is Prior Art Under 102(a)

Timeline

- **12/4/1998: Moberg Filing Date (Ex. 1005)**

[redacted]

- **10/1/2002: Moberg Publication Date (Prior art under 35 U.S.C. § 102(a)) (Ex. 1005)**
- **11/27/2002: 668 Patent Priority Date (Ex. 1001)**

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

35 U.S.C. § 102

[redacted]

102(a): Evidence Of Diligence In Reduction To Practice Must Be Continuous

During the period in which reasonable diligence must be shown, there must be continuous exercise of reasonable diligence. *In re McIntosh*, 230 F.2d 615, 619 (CCPA 1956); *see also Burns v. Curtis*, 172 F.2d 588, 591 (CCPA 1949) (referring to "reasonably continuous activity"). A party alleging diligence must account for the entire critical period. *Griffith v. Kanamuru*, 816 F.2d 624, 626 (Fed. Cir. 1987); *Gould v. Schawlow*, 363 F.2d 908, 919 (CCPA 1966).

Microsoft Corp. v. Surfcast Inc., Case IPR2013-00292 (Paper No. 93) at 17-18 (PTAB Oct. 14, 2014);

Reply to POR (Paper No. 33) at 20

102(a): Even Short Periods Of Inactivity Are Sufficient To Show Lack Of Diligence

Even a short period of unexplained inactivity is sufficient to defeat a claim of diligence. *Morway v. Bondi*, 203 F.2d 742, 749 (CCPA 1953); *Ireland v. Smith*, 97 F.2d 95, 99–100 (CCPA 1938). In *In re Mulder*, 716 F.2d 1542, 1542–46 (Fed. Cir. 1983), the Federal Circuit affirmed a determination of lack of reasonable diligence, where the evidence of record was lacking for a two-day critical period. Likewise, in *Rieser v. Williams*, 255 F.2d 419, 424 (CCPA 1958), there was no diligence where no activity was shown during the first 13 days of the critical period.

Microsoft Corp. v. Surfcast Inc., Case IPR2013-00292 (Paper No. 93) at 18 (PTAB Oct. 14, 2014);

Reply to POR (Paper No. 33) at 20

102(a): 668 Prosecutor's Inactivity Establishes Lack Of Diligence In Reduction To Practice

[redacted]

102(a): 668 Prosecutor's Inactivity Establishes Lack Of Diligence In Reduction to Practice

"[I]t is not necessary that an inventor or his attorney should drop all other work and concentrate on the particular invention involved; and if the attorney has a reasonable backlog of work which he takes up in chronological order and carries out expeditiously, that is sufficient." *Rines v. Morgan*, 116 U.S.P.Q. 145 (C.C.P.A. 1957). However, that has not been shown in this case. Here, the evidence reflects an entire week of inactivity in addition to numerous gaps, and Dr. Bone acknowledges that he worked on later-assigned matters, and worked on them out-of-order. Reply 9 (citing Ex. 1102).

On this record, and under a rule-of-reason analysis, we cannot conclude that there was reasonably continuous activity toward reducing the invention to practice sufficient to support a determination of reasonable diligence.

Microsoft Corp. v. Surfcast Inc., Case IPR2013-00292 (Paper No. 93) at 20-21 (PTAB Oct. 14, 2014);

Reply to POR (Paper No. 33) at 19

Amara, CoreBuilder & Moberg: Cisco's Arguments

1. Moberg cannot be relied upon as prior art (POR (Paper No. 18) at 34-42)
   a) Under §102(a)
   b) Under §102(e)
2. Moberg does not disclose distributing "control plane processes" to a secondary processor (POR (Paper No. 18) at 43-46)

102(e): Cisco Has Not Established Common Ownership/Obligation Of Assignment By The 668 Inventors At Time Of Invention

Timeline

- **12/4/1998: Moberg Filing Date (Prior art under 35 U.S.C. § 102(e)) (Ex. 1005)**

[redacted]

- **11/27/2002: 668 Patent Priority Date (Ex. 1001)**

A person shall be entitled to a patent unless –

(e) the invention was described in — (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent,

35 U.S.C. § 102

35 U.S.C. § 103(c):

(1) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the claimed invention was made, owned by the same person or subject to an obligation of assignment to the same person.

[redacted]

102(e): Cisco Has Not Established Common Ownership/Obligation of Assignment By The 668 Inventors At Time of Invention

Timeline

- **12/4/1998: Moberg Filing Date (Prior art under 35 U.S.C. § 102(e)) (Ex. 1005)**

[redacted]

- **11/27/2002: 668 Patent Priority Date (Ex. 1001)**

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in — (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent,
>
> 35 U.S.C. § 102

> **35 U.S.C. § 103(c):**
> (1) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the claimed invention was made, owned by the same person or subject to an obligation of assignment to the same person.

[redacted]

102(e): Cisco Has Not Established Common Ownership/Obligation Of Assignment By The 668 Inventors At Time Of Invention

Timeline

- **12/4/1998: Moberg Filing Date (Prior art under 35 U.S.C. § 102(e)) (Ex. 1005)**
- [redacted]
- **11/26/2002: 668 Inventors Assign Invention to Cisco (Ex. 1011 at 66-67)**
- **11/27/2002: 668 Patent Priority Date (Ex. 1001)**

A person shall be entitled to a patent unless –

(e) the invention was described in — (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent,

35 U.S.C. § 102

35 U.S.C. § 103(c):

(1) Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the claimed invention was made, owned by the same person or subject to an obligation of assignment to the same person.

[redacted]

102(e): Cisco Has Not Established Common Ownership/Obligation Of Assignment By The 668 Inventors At Time Of Invention

Timeline

- **12/4/1998: Moberg Filing Date (Prior art under 35 U.S.C. § 102(e)) (Ex. 1005)**

[redacted]

- **11/26/2002: 668 Inventors Assign Invention to Cisco (Ex. 1011 at 66-67)**
- **11/27/2002: 668 Patent Priority Date (Ex. 1001)**

35 U.S.C. § 103(c): "owned by the same person"

- 668 Patent and Moberg were **not** under common ownership [redacted]
- Although 668 and Moberg were commonly owned by 11/27/2002, that date is too late to swear behind Moberg under 102(a)
  - So Moberg qualifies as 102(a) prior art if Cisco relies on common ownership date

Reply to POR (Paper No. 33) at 21

[redacted]

102(e): Cisco Has Not Established Common Ownership/Obligation Of Assignment By The 668 Inventors At Time Of Invention

Timeline

- **12/4/1998: Moberg Filing Date (Prior art under 35 U.S.C. § 102(e)) (Ex. 1005)**

[redacted]

- **11/26/2002: 668 Inventors Assign Invention to Cisco (Ex. 1011 at 66-67)**
- **11/27/2002: 668 Patent Priority Date (Ex. 1001)**

35 U.S.C. § 103(c): "subject to an obligation of assignment to the same person"

- Cisco asserts that [redacted]
    - But provided **no evidence** [redacted]

[redacted]R (Paper No. 33) at 21-22

102(e): Absent Evidence Establishing An Exception, Inventors (And Not Their Employees) Own Their Inventions

The general rule is that an individual owns the patent rights to the subject matter of which he is an inventor, even though he conceived it or reduced it to practice in the course of his employment. There are two exceptions to this rule: first, an employer owns an employee's invention if the employee is a party to an express contract to that effect; second, where an employee is hired to invent something or solve a particular problem, the property of the invention related to this effort may belong to the employer.

Banks v. Unisys Corp., 228 F.3d 1357, 1359 (Fed. Cir. 2000);
Reply to POR (Paper No. 33) at 21

Amara, CoreBuilder & Moberg: Cisco's Arguments

1. Moberg cannot be relied upon as prior art (POR (Paper No. 18) at 34-42)
   a) Under §102(a)
   b) Under §102(e)
2. Moberg does not disclose distributing "control plane processes" to a secondary processor (POR (Paper No. 18) at 44-46)

Claims 7, 23, And 59 Recite "Control Plane Processes" Executed "As Distributed Processing Across Multiple Processors"

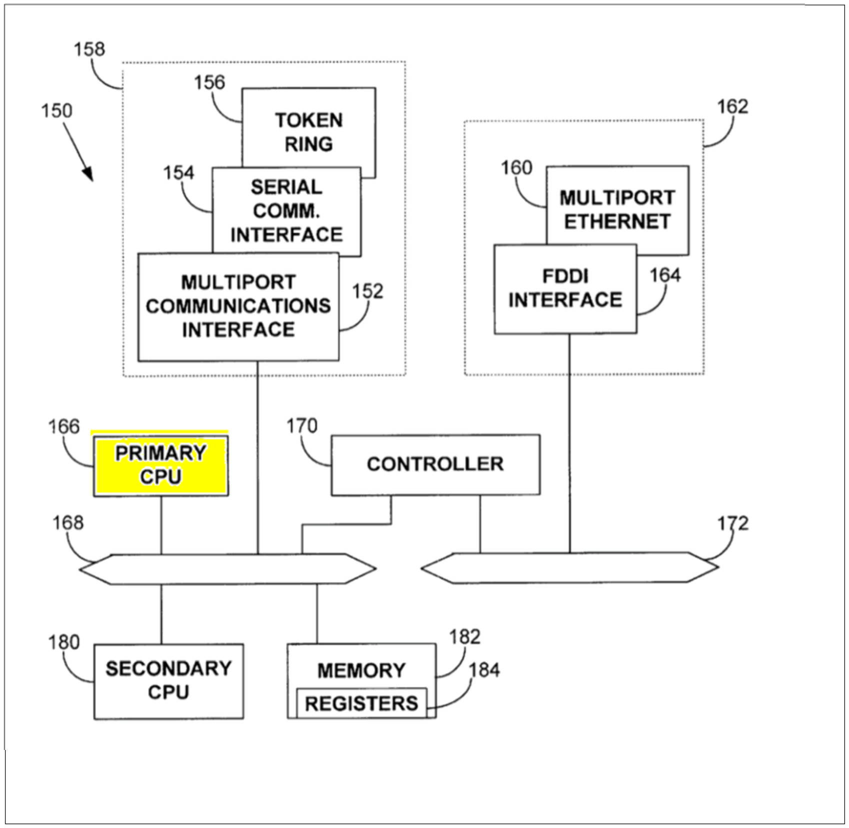
7. A device as in claim **1** wherein the control plane processes are distributed across multiple processors.

23. A method as in claim **19** wherein the control plane processes execute as distributed processing across multiple processors.

59. A medium as in claim **55** wherein the control plane processes execute as distributed processing across multiple processors.

Ex. 1001 (668 Patent)

Moberg Discloses "Control Plane Processes" Executed By a Processor

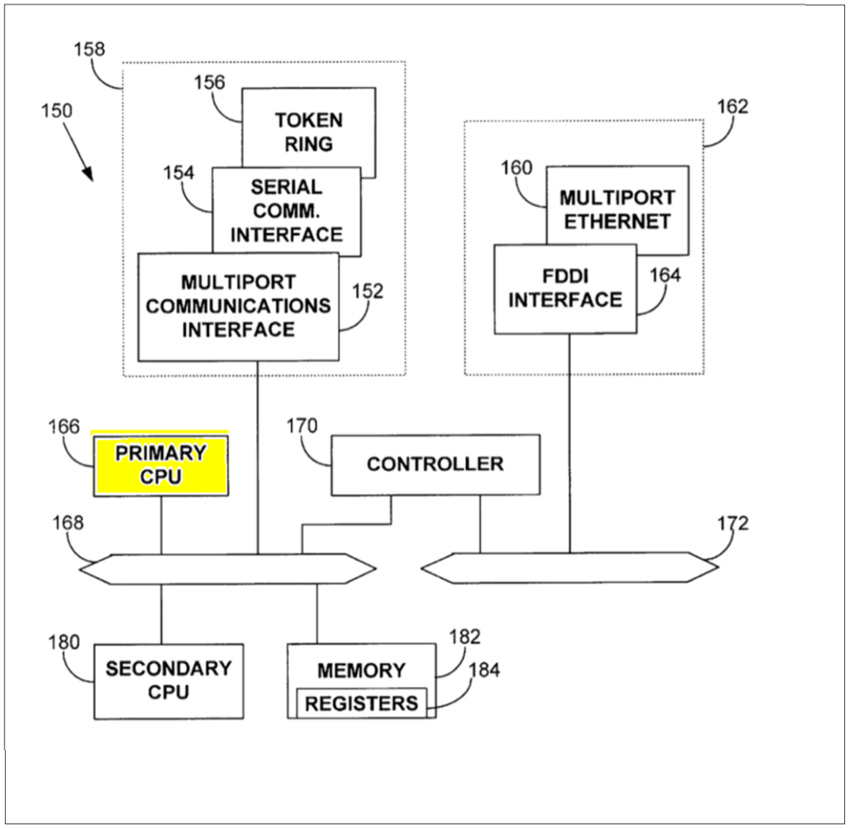


Ex. 1005 (Moberg) at Fig. 3;
Ex. 1002 (Lin Declaration) at ¶ 71

FIG. 3 is a block diagram of an example of a router suitable for implementing an embodiment of the present invention. The router **150** is shown to include a primary central processing unit (CPU) **166**, low and medium speed interfaces **158**, and high speed interfaces **162**. The primary CPU **166**, may be responsible for such router tasks as routing table computations and network management. It

Ex. 1005 (Moberg) at 4:40-46;
Petition (Paper No. 1) at 40

Moberg Discloses "Control Plane Processes" Executed By a Processor



Ex. 1005 (Moberg) at Fig. 3;
Ex. 1002 (Lin Declaration) at ¶ 71

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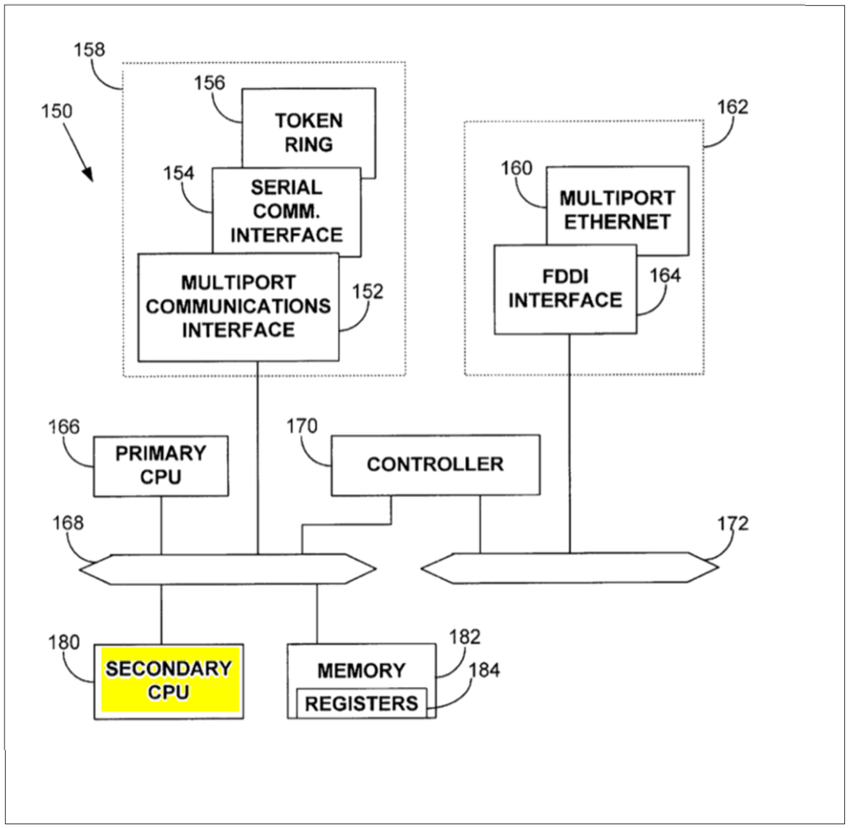
Ex. 1005 (Moberg) at 4:40-46;
Petition (Paper No. 1) at 40

Tasks such as routing table computations and network management would be typically reserved for the "slow path" processing by the control plane.

Ex. 2006 (Almeroth Decl.) at ¶ 92

Moberg Discloses That Primary CPU Processes May Be Distributed To A Secondary Processor



Ex. 1005 (Moberg) at Fig. 3;
Ex. 1002 (Lin Declaration) at ¶ 71

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Ex. 1005 (Moberg) at 4:40-46;
Petition (Paper No. 1) at 40

without a substantial amount of down time for re-booting. It would also be desirable for such a router to offer an option of the secondary processor being able to off load work from the primary processor, thus making use of both processors simultaneously. The present invention addresses such needs.

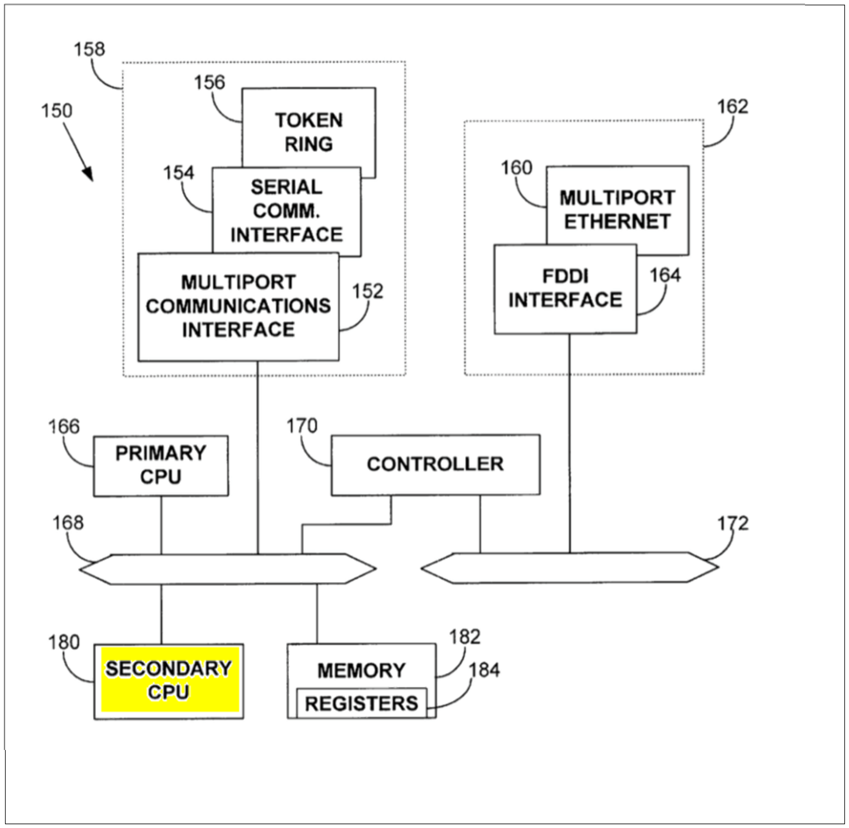
Ex. 1005 (Moberg) at 2:25-30;
Petition (Paper No. 1) at 40

Amara, CoreBuilder & Moberg: Cisco's Arguments

Moreover, this discussion by Dr. Lin mischaracterizes Moberg entirely. As noted above, Dr. Lin asserts that the "routing table computations" and "network management" router tasks described in Moberg are handled by primary and secondary CPUs. (Lin Decl., ¶ 74, citing Moberg, 4:45–46.) However, to the extent these may even be considered "control plane processes," Moberg does not teach or suggest that they are distributed across multiple processors. (Almeroth Decl., ¶¶ 91–94.) In fact, the portion cited from Moberg only identifies these tasks in relation to a "primary CPU." (Almeroth Decl., ¶ 93.) Indeed, functions such as routing table computations and network management would be typically reserved for the "slow path" processing by the control plane. (Almeroth Decl., ¶ 93; '668 patent ("The control plane 150 is responsible for processing routing, signaling, and

POR (Paper No. 18) at 44-45

Nothing in Moberg Limits What Processes May Be Offloaded To The Secondary Processor



Ex. 1005 (Moberg) at Fig. 3;
Ex. 1002 (Lin Declaration) at ¶ 71

> without a substantial amount of down time for re-booting. It would also be desirable for such a router to offer an option of the secondary processor being able to off load work from the primary processor, thus making use of both processors simultaneously. The present invention addresses such needs.

Ex. 1005 (Moberg) at 2:25-30;
Petition (Paper No. 1) at 40

> The secondary processor establishes communication with the primary processor (step **600**). Health monitoring of the primary processor is then initiated (step **602**). It is then determined whether there is any processing which the primary processor is off loading to the secondary processor (step **604**). This determination may be made by reviewing

Ex. 1005 (Moberg) at 8:9-14;
Reply to POR (Paper No. 33) at 16;
see also Institution Decision (Paper No. 8) at 19

> According to an embodiment of the present invention, the subsystem initialization also includes initializing a redundancy subsystem. The redundancy subsystem may be a list of projects or functions that are to be assigned to and performed by the secondary processor. These functions and projects may include functions and projects typically performed by the primary processor. The software designer may

Ex. 1005 (Moberg) at 6:10-14;
Ex. 1002 (Lin Declaration) at ¶ 72

Disputed Issues For Third Instituted Ground

	References	Basis	Claims Challenged by Cisco
3	Amara, CoreBuilder, & Hendel	35 U.S.C. § 103	10, 12, 13, 28, 30, 31, 64, 66, and 67

Claims Not Separately Contested
12, 13, 30, 31, 66, and 67

As To Third Ground, Cisco Contests Only Claims 10, 28, And 64 On Grounds Separate From The Independent Claims

10. A device as in claim **1** wherein the control plane port services are implemented as distributed control plane port services, and wherein the distributed control plane port services are applied only to the packets received from the specific, pre-determined physical ports.

28. A method as in claim **19** additionally comprising the step of applying distributed control plane port services only to the packets received from the specific, pre-determined physical ports.

64. A medium as in claim **55** additionally comprising:

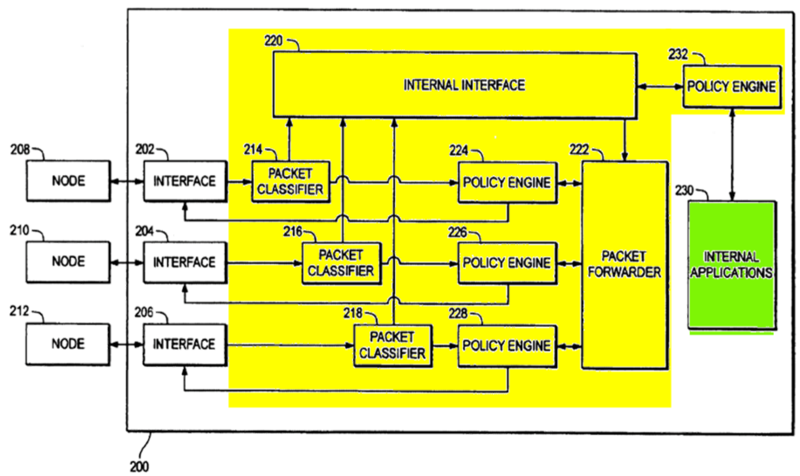
applying distributed control plane port services only to the packets received from the specific, pre-determined physical ports.

Ex. 1001 (668 Patent)

Amara/CoreBuilder & Hendel: Overview

Amara teaches a packet forwarding device with a system for applying policy services to packets under the control of a central configuration (*see, e.g.,* Reply to POR (Paper No. 33) at 22-24)

FIG. 3



Ex. 1004 (Amara) at Fig. 3;
Petition (Paper No. 1) at 12; *see also*
Reply to POR (Paper No. 33) at 22-23

Packet forwarder **222** performs a routing functionality, forwarding the external packets from packet classifiers **214–218** and the internally-generated packets from internal interface **220** to one or more of interfaces **202–206**, via policy engines **224–228**, based on the destination addresses of the packets.

Policy engine **232** applies a policy to the internal packets, i.e., the internally-generated packets generated by internal applications **230** and the internally-destined packets used by internal applications **230**. Policy engines **224–228** apply policies to the external packets forwarded by packet classifiers **214–218**, respectively. Policy engines **224–228** typically also apply policies to the external packets forwarded by packet forwarder **222**.

In this way, device **200** applies policies to the internal packets and to the external packets. In general, the policies

Ex. 1004 (Amara) at 6:2-18;
Petition (Paper No. 1) at 13-15

Running on device **100** are internal applications **114**, which typically serve to to control or configure device **100**.

Ex. 1004 (Amara) at 4:33-34;
Petition (Paper No. 1) at 13

Amara/CoreBuilder & Hendel: Overview

Hendel teaches a packet forwarding device with a scalable architecture that distributes policy service systems like Amara's as subsystems, under control of a central configuration (*see, e.g.*, Reply to POR (Paper No. 33) at 22-24)

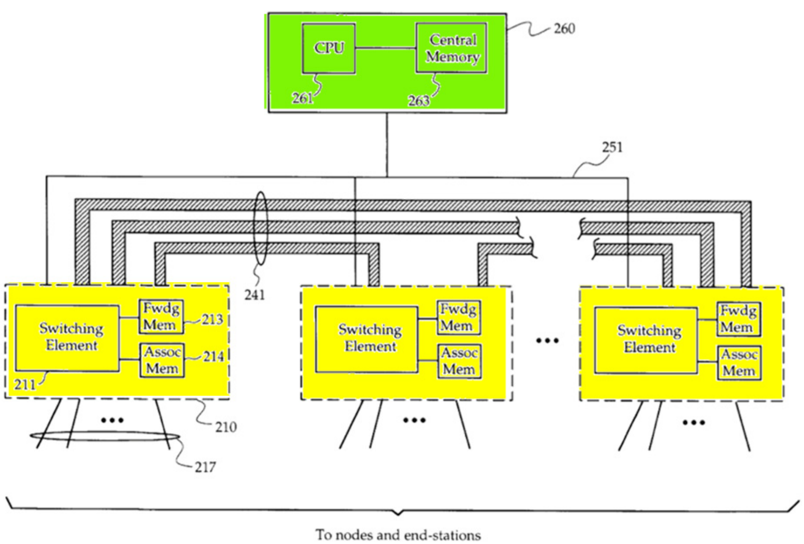


FIGURE 2 201

Ex. 1007 (Hendel) at Fig. 2
Petition (Paper No. 1) at 52; see also
Reply to POR (Paper No. 33) at 22-23

The invention's MLDNE has network element functions that are distributed, i.e., different parts of a function are performed by different MLDNE subsystems. These network element functions include forwarding, learning, queuing, and buffering. As will be appreciated from the discussion below and FIG. **2**, MLDNE has a scalable architecture which allows for easily increasing the number of subsystems **210** as a way of increasing the number of external connections, thereby allowing greater flexibility in defining the surrounding network environment.

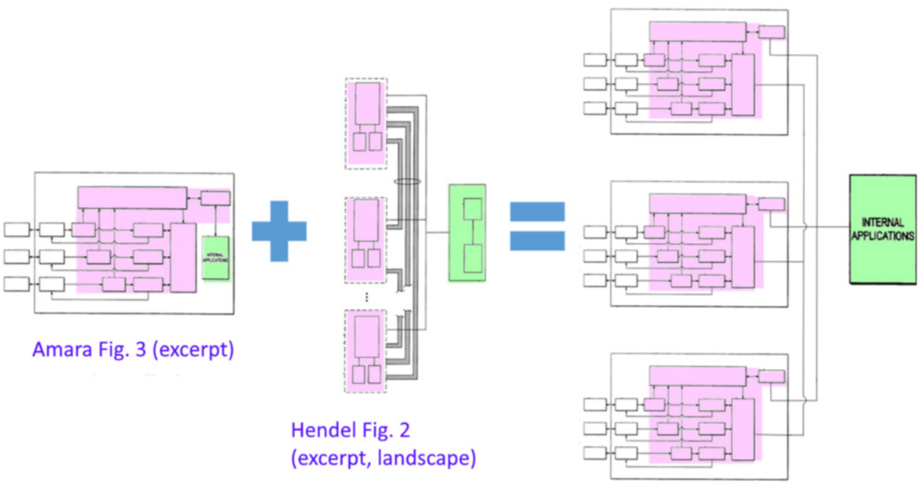
Ex. 1007 (Hendel) at 7:14-18;
Reply to POR (Paper No. 33) at 23

The CPS **260** includes a central processing unit (CPU) **261** coupled to a CM **263** and other memory (not shown). CM **263** includes a copy of the entries contained in the individual forwarding memories **213** of the various subsystems. The CPS has a direct control and communication interface to each MLDNE subsystem **210**. However, the role

Ex. 1007 (Hendel) at 7:60-65;
Petition (Paper No. 1) at 52

Amara/CoreBuilder & Hendel: Overview

A POSITA would be motivated to implement the advantages of Hendel's distributed architecture with Amara/CoreBuilder



Amara Fig. 3 (excerpt)
Hendel Fig. 2 (excerpt, landscape)
(combination)

Reply to POR (Paper No. 33) at 23

99. Further, a POSITA would have been motivated to implement Hendel's distributed architecture in the combination of Amara and CoreBuilder. Amara and Hendel both describe internetworking devices that apply policies to packets that enter the device through physical interface ports. *See* Amara at 6:9-14; Hendel at 6:22-24; 12:65-67. Amara and Hendel both describe the forwarding operations and policies being controlled and configured centrally. *See* Amara at 4:34-35; Hendel at 7:64-8:2. Further, Amara and Hendel both involve servicing packets to achieve Quality of Service. *See* Amara at 5:16-21; Hendel at 13:39-43. Therefore, a POSITA would have considered Amara's device and Hendel's device as being similar and would have considered implementing advantageous features of Hendel into the Amara/CoreBuilder combination.

Ex. 1002 (Lin Declaration) at ¶ 99

Amara, CoreBuilder & Hendel: Cisco's Arguments

1. Arista has provided no evidence of a motivation to combine Hendel with Amara & CoreBuilder (POR (Paper No. 18) at 50-54)
   a) There is no "actual evidence" of processing bottlenecks which would motivate a POSITA to use Hendel to distribute Amara's control plane services (POR (Paper No. 18) at 51)
   b) Control plane traffic is a small amount of overall traffic, and does not necessarily grow at same pace as data plane traffic (POR (Paper No. 18) at 52)
   c) Hendel provides no reason to distribute control plane port services, because it is unconcerned with the speed of control plane packets (POR (Paper No. 18) at 54)

Cisco: No "Actual Evidence" That Would Motivate A POSITA To Combine (POR at 50-52)

Petitioner bases its motivation to make this combination solely on statements from its expert, Dr. Lin, who states that "Amara's device could experience processing bottlenecks with only a single policy engine 232 for internal applications…" and that "at a certain point, the ratio of physical interface ports to a single policy engine 232….will be unsustainable." (Lin Decl., ¶ 101.) But Dr. Lin testified at deposition that he has **no actual evidence** of such bottlenecks ever occurring or evidence of the "certain point" at which the ratio would be "unsustainable." (Lin Depn., 179:24–180:2.) The Board should therefore give Dr. Lin's testimony no weight because "[e]xpert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight." 37 CFR §42.65(a).

POR (Paper No. 18) at 51

Arista's Expert Properly Relied On Evidence From The Prior Art To Show Motivation To Combine

Cisco:
"But Dr. Lin testified at deposition that he has **no actual evidence** of such bottlenecks ever occurring or evidence of the 'certain point' at which the ratio would be 'unsustainable.' (Lin Depn., 179:24–180:2.)"

POR (Paper No. 18) at 51

Q. Do you have any evidence of a single-policy engine being overloaded?

A. I think the evidence is sort of self-evident. To me, it's self-evident. If -- if a policy engine can handle some amount of traffic, no vendor is going to come up with a policy engine that's many times more powerful than they need because it costs money. So to me, it's self-evident that if you increase the number of ports, increase the traffic, increase the speed, that single-policy engine may not be sustainable.

Q. So just to be clear, you have no evidence to support your opinion; correct?

MR. PHILLIPS: Objection. Mischaracterization.

THE WITNESS:· Again, to me, I've cited references regarding the scaleability motivation. To me, it is based on my own research and experience that to me it's self-evident that -- that as you increase the number of ports, and increase the traffic, and increasing speed, that a single-policy engine may not be sustainable.

Ex. 2005 (Lin Tr.) at 179:24-180:20

Amara, CoreBuilder & Hendel: Cisco's Arguments

1. Arista has provided no evidence of a motivation to combine Hendel with Amara & CoreBuilder (POR (Paper No. 18) at 50-54)
   a) There is no "actual evidence" of processing bottlenecks which would motivate a POSITA to use Hendel to distribute Amara's control plane services (POR (Paper No. 18) at 51)
   b) Control plane traffic is a small amount of overall traffic, and does not necessarily grow at same pace as data plane traffic (POR (Paper No. 18) at 52)
   c) Hendel provides no reason to distribute control plane port services, because it is unconcerned with the speed of control plane packets (POR (Paper No. 18) at 54)

Cisco: Control Plane Traffic <5% Of All Traffic

The Board should also disregard Dr. Lin's testimony for another reason—Dr. Lin fails to account for the fact that control plane traffic is a very small amount of the overall traffic a network device receives. (Almeroth Decl., ¶ 98.) First, Dr. Lin's suggestion that control plane traffic will grow as more ports are added to a device is unsupported, and misleading. Dr. Lin admits that control plane traffic is a small amount of the traffic in network devices such as routers and switches. (Lin Depn., 131:13–19.) Indeed, in Amara, control plane traffic represents less than 5% of the overall traffic a device receives. (Amara, 5:36–39.) But control plane traffic does not necessarily grow at the same pace as data plane traffic. (Almeroth Decl.,

POR (Paper No. 18) at 52

Nothing In Hendel Suggests Distributing Functions Only For Traffic Categories Above Some Threshold

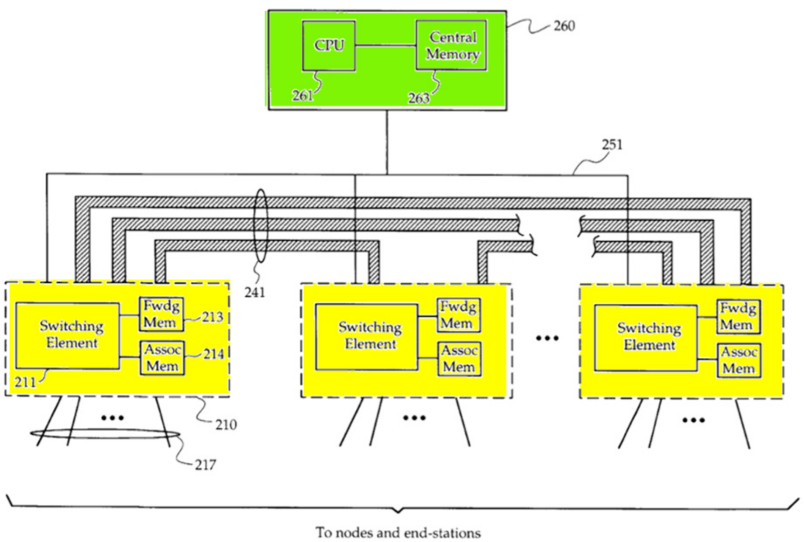


FIGURE 2 201

Ex. 1007 (Hendel) at Fig. 2
Petition (Paper No. 1) at 52; *see also*
Reply to POR (Paper No. 33) at 24

> The invention's MLDNE has network element functions that are distributed, i.e., different parts of a function are performed by different MLDNE subsystems. These network element functions include forwarding, learning, queuing, and buffering. As will be appreciated from the discussion below and FIG. **2**, MLDNE has a scalable architecture which allows for easily increasing the number of subsystems **210** as a way of increasing the number of external connections, thereby allowing greater flexibility in defining the surrounding network environment.

Ex. 1007 (Hendel) at 7:10-18;
Reply to POR (Paper No. 33) at 23

Amara, CoreBuilder & Hendel: Cisco's Arguments

1. Arista has provided no evidence of a motivation to combine Hendel with Amara & CoreBuilder (POR (Paper No. 18) at 50-54)
   a) There is no "actual evidence" of processing bottlenecks which would motivate a POSITA to use Hendel to distribute Amara's control plane services (POR (Paper No. 18) at 51)
   b) Control plane traffic is a small amount of overall traffic, and does not necessarily grow at same pace as data plane traffic (POR (Paper No. 18) at 52)
   c) Hendel provides no reason to distribute control plane port services, because it is unconcerned with the speed of control plane packets (POR (Paper No. 18) at 54)

Cisco: Hendel States Speed Not An Issue For Control Plane Packets

Finally, Petitioner never explains why a POSITA would distribute its policy engine 232 (*e.g*., the alleged control plane port services) to Hendel's subsystems when Hendel explicitly states that it is unconcerned about the throughput of its control plane: "The communication between the CPS and the individual subsystems **need not be as fast or reliable** as the internal links between subsystems, because, as appreciated below, the CPS is not normally relied upon to forward the majority of traffic through the MLDNE." (Hendel, 7:53–57.) Given Hendel's lack of concern for the speed of processing control plane packets there would simply be no need to distribute control plane port services to Hendel's subsystems. (Almeroth Decl., ¶ 100.)

POR (Paper No. 18) at 54

Hendel Teaches Distributing All Policy Services For Scalability

The invention's MLDNE has network element functions that are distributed, i.e., different parts of a function are performed by different MLDNE subsystems. These network element functions include forwarding, learning, queuing, and buffering. As will be appreciated from the discussion below and FIG. **2**, MLDNE has a scalable architecture which allows for easily increasing the number of subsystems **210** as a way of increasing the number of external connections, thereby allowing greater flexibility in defining the surrounding network environment.

Ex. 1007 (Hendel) at 7:10-18;
Reply to POR (Paper No. 33) at 23-24

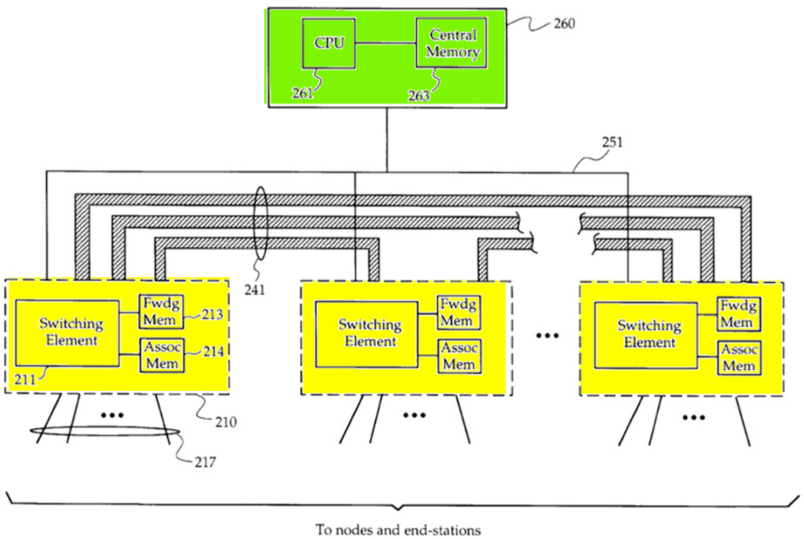


FIGURE 2

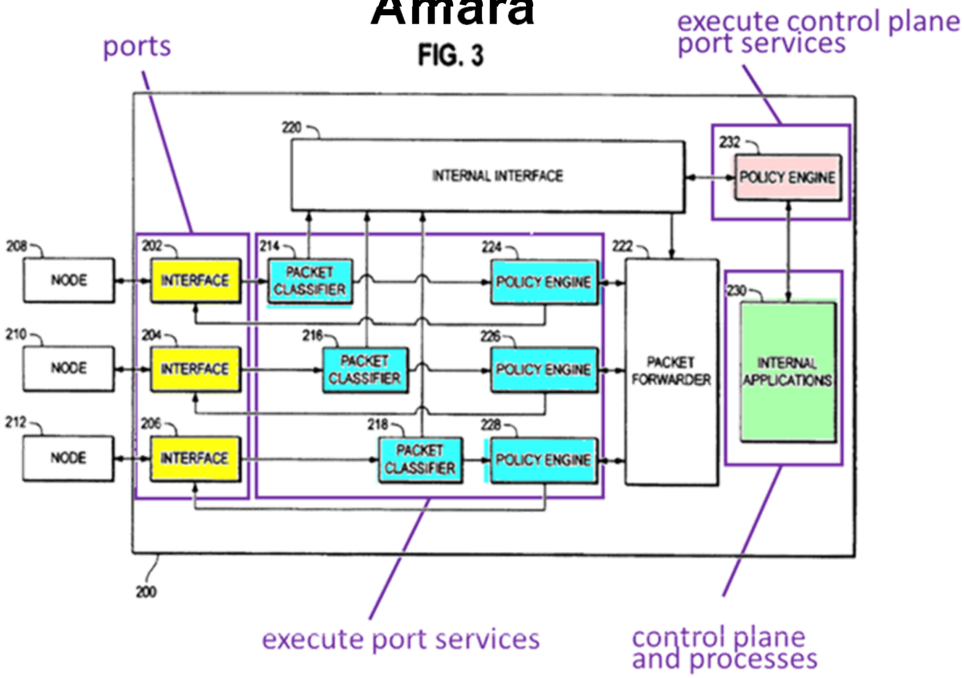
Ex. 1007 (Hendel) at Fig. 2
Petition (Paper No. 1) at 12; *see also*
Reply to POR (Paper No. 33) at 24

The CPS **260** includes a central processing unit (CPU) **261** coupled to a CM **263** and other memory (not shown). CM **263** includes a copy of the entries contained in the individual forwarding memories **213** of the various subsystems. The CPS has a direct control and communication interface to each MLDNE subsystem **210**. However, the role of the CPS **260** in packet processing includes setting up data path resources such as packet buffers inside each subsystem, entering and managing type 2 entries in the forwarding memories, and some other special cases such as routing with options which cannot be routinely handled by and between the subsystems.

Ex. 1007 (Hendel) at 7:60-8:4
Reply to POR (Paper No. 33) at 24

Even Under Cisco's Construction, Amara Teaches Applying Both "Normal" and "Control Plane" Port Services To Control Plane Packets

Amara



Ex. 1004 (Amara) at Fig. 3 (annotated);
Reply to POR (Paper No. 33) at 9

respectively. Packet classifiers **214–218** classify the packets received by nodes interfaces **202–206**, respectively, as either internally-destined packets or external packets, based on the packets destination addresses. Packet classifiers **214–218** forward the internally-destined packets to an internal interface **220**, and packet classifiers **214–218** forward the external packets to a packet forwarder **222** via policy engines **224–228**, respectively.

Ex. 1004 (Amara) at 5:54-62; Petition (Paper No. 1) at 12-13

668 Patent

17. A device as in claim 1 wherein the services applied to the control plane port are selected from the group consisting of Quality of Service (QoS) functions, packet classification, packet marking, packet queuing, packet rate-limiting flow, control, or other access policies for packets destined to the control plane port.

Ex. 1001 (668 Patent)

Reply to POR (Paper No. 33) at 9

Cisco Has Failed To Show A Nexus Between Its Purported Evidence of "Copying" And The Claimed Invention

However, as the district court observed, '[j]ust as with the commercial success analysis, a nexus between the copying and the novel aspects of the claimed invention must exist for evidence of copying to be given significant weight in an obviousness analysis.'

Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC,
683 F.3d 1356, 1364 (Fed. Cir. 2012);
Reply to POR (Paper No. 33) at 27

Cisco Has Failed To Show A Nexus Between Its Purported Evidence of "Copying" And The Claimed Invention

Cisco's Purported Evidence Re: Copying of CLI

Examples of Arista's copying of Cisco's CoPP CLI are shown below:

Cisco's Command-Line Expressions	Arista's Command-Line Expressions
class-map type control-plane Ex. 2028,Cisco Nexus 5000 Series NX-OS Security Configuration Guide (12/28/2011), p. 226.	**class-map type control-plane** Ex. 2031, Arista EOS 4.15.3F User Manual, p. 1235
policy-map type control-plane Ex. 2028, Cisco Nexus 5000 Series NX-OS Security Configuration Guide (12/28/2011), p. 236.	**policy-map type control-plane** *Id.*, p. 1248
show policy-map control-plane Ex. 2029, Security Configuration Guide: Securing the Control Plane	**show policy-map type control-plane** *Id.*, p. 1273.

POR (Paper No. 18) at 64

668 Claims Do Not Recite A Command Line Interface

1. An internetworking device comprising:

a. a plurality of physical network interface ports, each for providing a physical connection point to a network for the internetworking device, the ports being configurable by control plane processes;

b. port services, for operating on packets entering and exiting the physical network interface ports, the port services providing an ability to control and monitor packet flows, as defined by control plane configurations;

c. a control plane, comprising a plurality of internetworking control plane processes, the control plane processes for providing high-level control and configuration of the ports and the port services;

d. wherein:

i. a control plane port entity provides access to the collection of control plane processes, so that a set of control plane port services can be applied thereto; and

ii. the control plane port services operate on packets received from specific, predetermined physical ports and destined to the collection of control plane processes in a way that is independent of the physical port interfaces and services applied thereto.

Ex. 1001 (668 Patent);
Reply to POR (Paper No. 33) at 27

Cisco Has Failed To Show A Nexus Between Its Purported Evidence of "Copying" And The Claimed Invention

Jury Clears Arista In Cisco's $335M IP Infringement Suit

Share us on: By Dorothy Atkins

Law360, San Jose (December 14, 2016, 3:05 PM EST) -- A California federal jury handed Arista Networks Inc. victory Wednesday in a $335 million copyright and patent infringement suit brought by Cisco Systems Inc., finding Arista's popular Ethernet switches are shielded from infringement claims by the scènes à faire doctrine.

Ex. 1026

Cisco's Expert Stated In Another Forum That Packet Filtering Satisfies "An Ability To Control And Monitor Packet Flows"

Q And have you found any evidence that the port services in the Arista products provide the ability to control and monitor packet flows?

A Yes. If you turn to the next slide, there's some additional port services that are described there. And also in the context of what they're able to do. And that's CDX-13C at 87. This comes from the Arista user manual, CX-221. And here it's talking specifically about ACLs, and it's talking about how ACLs associated with a port or one or more ports can affect the inbound flow of packets into the ethernet interface, port channel interfaces or switch control planes.

Ex. 1018 (Hearing Testimony of Dr. Kevin Almeroth, ITC Inv. No. 337-TA-945) at 1048:6-17; Reply to POR (Paper No. 33) at 13