IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

DUNTI NETWORK TECHNOLOGIES, LLC, ***Plaintiff,*** **v.** **HEWLETT PACKARD ENTERPRISE COMPANY AND HP ENTERPRISE SERVICES, LLC,** ***Defendants.***	**Civil Action No._____** **JURY TRIAL DEMANDED**

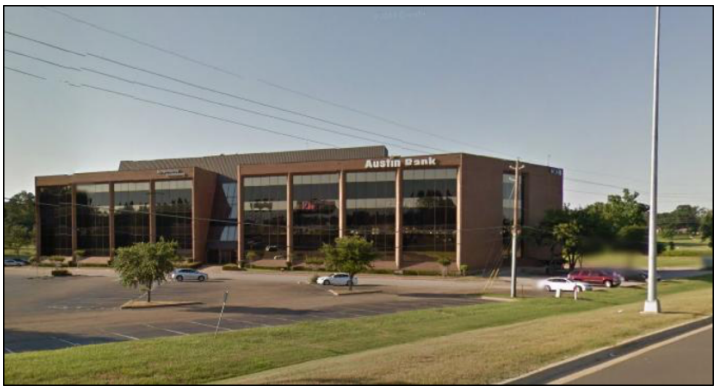
COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Dunti Network Technologies, LLC ("Dunti"), is the owner and assignee of patents critical to the efficiency, security, and scalability of modern communications networks. In recent years, defendants Hewlett Packard Enterprise Company ("HPEC") and HP Enterprise Services, LLC ("HPES") (collectively, "HP" or "Defendant") have adopted Dunti's patented technologies—developed more than a decade ago right here in Texas—*en masse*. HP has profited handsomely from its use of Dunti's patented inventions, and Dunti deserves to be compensated for this use. But HP has not paid Dunti its fair share. This lawsuit, which alleges infringement of Dunti's U.S. Patent Nos. 6,587,462 ("the '462 patent"); 6,788,701 ("the '701 patent"); 6,804,235 ("the '235 patent"); 6,643,286 ("the '286 patent"); 7,778,259 ("the '259 patent"); and 6,912,196 ("the '196 patent") (collectively, "the patents-in-suit"), is brought to ensure that HP pays Dunti what it fairly owes.

THE PARTIES

1. Dunti, based in Longview, Texas, is committed to advancing the current state of innovation in the field of secure, optimized data transmission across communication networks. In addition to the ongoing efforts of the lead inventor, Dunti employs a resident of Longview,

Texas as a Technology Analyst. Dunti is a Texas limited liability company with its principal place of business at 911 NW Loop 281, Suite 211-44, Longview, TX 75604.



2. Dunti is a small, Texas-based company. Dunti depends on patent protection to effectively license its innovative technologies and build its business. Like HP, Dunti relies on its intellectual property.

3. On information and belief, Defendant HPEC is a Delaware corporation, with its North American headquarters at 11445 Compaq Center West Drive, Houston, Texas 77070, and a worldwide headquarters at 3000 Hanover Street, Palo Alto, California 94304. On information and belief, HPEC can be served through its registered agent, CT Corporation System, 1999 Bryan St., Ste. 900, Dallas, Texas 75201.

4. On information and belief, HPES is a Delaware limited liability company having a principal place of business at 5400 Legacy Drive, Plano, Texas 75024. On information and belief, HPES can be served through its registered agent, CT Corporation System, 1999 Bryan St., Ste. 900, Dallas, Texas 75201.

5. On information and belief, and according to HP's website, infringing products are offered for sale and sold throughout the United States and Canada, including in this District, through various channels. HP offers its infringing products through its distribution channel, which includes numerous distribution points in Texas. Further, HP advertises its infringing products throughout the Eastern District of Texas.

6. On information and belief, HP has offices in Texas where it sells, develops, and/or markets the accused products.

7. On information and belief, HP employs thousands of employees in the Eastern District of Texas[1] and HPES is headquartered in Plano, Texas.

8. On information and belief, HP has acquired companies relevant to the accused products, including Electronic Data Systems ("EDS"), which was also based in Plano, Texas.[2]

JURISDICTION AND VENUE

9. This action arises under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has exclusive subject matter jurisdiction over this action under 28 U.S.C. §§ 1331 and 1338(a).

10. Upon information and belief, this Court has personal jurisdiction over Defendants HPEC and HPES in this action because HPEC and HPES have committed acts within the Eastern District of Texas giving rise to this action and have established minimum contacts with this forum such that the exercise of jurisdiction over HPEC and HPES would not offend traditional notions of fair play and substantial justice. Defendants HPEC and HPES, directly and through subsidiaries or intermediaries (including distributors, retailers, and others), have committed and continue to commit acts of infringement in this District by, among other things, offering to sell and selling products and/or services that infringe the asserted patents. Moreover, both HPEC and HPES are registered to do business in the state of Texas, and each has appointed CT Corporation System, 1999 Bryan St., Suite 900, Dallas, TX, 75201-3136, as its agent for service of process.

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[1] *See Abstrax, Inc. v. Hewlett-Packard Co.*, Case No. 14-cv-158 Dkt. No. 86 (E.D. Tex. Nov. 11, 2014) (finding significant ties to the district including 5000 HP employees located in the district at HP's Plano, Texas facility); *Mirror Worlds Techs., LLC v. Dell Inc., et al.*, Case No. 13-cv-00941 Dkt. No. 179 (E.D. Tex. Sept. 29, 2014) (denying HP's motion to transfer venue and concluding that HP [along with other defendants] collectively employ thousands of people in or near the Eastern District of Texas).

[2] EDS is now the core of HPES. *See EDS, an HP Company, Becoming HP Enterprise Services*, HP PRESS RELEASE (September 23, 2009) ("The name change marks the next major step in a year-long integration of EDS into HP and emphasizes the growing global role of enterprise technology services in HP's portfolio.").

This Court also has personal jurisdiction over Defendants HPEC and HPES because HPEC and HPES each have a principal place of business in Texas.

11. Venue is proper in this district under 28 U.S.C. §§ 1391(b)-(d) and 1400(b). Each of Defendants HPEC and HPES is registered to do business in Texas, and upon information and belief, has transacted business in the Eastern District of Texas and has committed acts of direct and indirect infringement in the Eastern District of Texas. In addition, HPEC and HPES have a principal place of business in Texas.

DUNTI'S LANDMARK NETWORK COMMUNICATION SYSTEMS

12. Dunti is the owner and assignee of ten patents on pioneering network technologies, including the six patents-in-suit (collectively, "the Dunti patents").

13. Electrical engineer and entrepreneur Rupaka Mahalingaiah is a named inventor on each of the Dunti Patents and the founder of Dunti Corp. and Dunti LLC. For more than 30 years, Rupaka has worked at the cutting edge of computing and networking technologies.

14. Even today, female engineers are rare in the American workforce, comprising just over ten percent of all engineers in recent government surveys.[3] When Rupaka began her career in the 1980s, female engineers were rarer still—and *foreign-born, female, computer* engineers were almost inconceivable. Yet through many years of hard work, creativity, and innovation, Rupaka did more than just defy the odds (and overcome large-scale industry pushback and skepticism)—she became an American engineering success story by any measure.

15. After earning a Bachelor's Degree in Electronic Engineering from Bangalore University and a Master's Degree in Electrical Engineering from Virginia Tech, Rupaka began working at Concurrent Computer Corporation, a company that specialized in multi-processing systems used for real-time computing (i.e., computer systems that are subject to strict time

[3] According to the Bureau of Labor Statistics Current Population Survey, women comprised just 10.3% of American engineers in 2003, and 11.7% in 2011. *See, e.g.*, http://www.nsf.gov/statistics/wmpd/2013/pdf/tab9-2_updated_2013_11.pdf (accessed Sept. 6, 2016).

constraints and must respond to inputs within milliseconds). While real-time computing performance is common today, real-time systems were state of the art at that time.

16. After several years at Concurrent, Rupaka joined Teradata, a hardware/software company built around research conducted at the California Institute of Technology (Caltech) specializing in database and parallel processor computing. At Teradata, Rupaka was responsible for architecting a next-generation, database supercomputer.

17. After briefly working at a networking startup in Austin, Rupaka joined Advanced Micro Devices ("AMD"), where she was one of the lead architects on K7/K7+, which became AMD's wildly successful Athlon processor. The original Athlon processor was the first desktop processor to reach speeds of one gigahertz. The Athlon processor's revolutionary architecture and design made these unprecedented speeds possible by allowing the processor to achieve substantially higher clocking speeds and to keep the processing pipeline full. The result was a faster, more efficient chip design.

18. Although she was only at AMD for three years, her contributions during that time were enduring, helping to generate billions of dollars in revenue and resulting in over 30 patents.[4] Her innovations at AMD have inspired others and been cited by nearly one-thousand United States patents and published patent applications as prior art before the United States Patent and Trademark Office, including by:

- International Business Machines Corporation;
- Oracle Corporation;
- Fujitsu Ltd.;
- Sun Microsystems, Inc.;
- Intel Corporation;
- Qualcomm Inc.;
- Cisco Technology, Inc.;
- Texas Instruments Inc.;
- ARM Holdings, PLC;
- Samsung Electronics Co. Ltd.;
- Freescale Semiconductor, Inc.;

[4] In total, Rupaka is a named inventor on nearly 50 issued U.S. patents.

- SK Hynix, Inc.;
- Rambus, Inc.;
- Hitachi, Ltd.; and
- Apple, Inc.

19. Rupaka left AMD in 1997 to become an entrepreneur, shifting her focus from architecting fast, efficient processors to architecting fast, efficient networks. She recognized the inefficiencies, lack of fault tolerance, and security vulnerabilities in then-state-of-the-art network designs, so she set out to solve the separate but related problems of (1) network inefficiency and (2) the lack of network security. It was at this time that Rupaka began to develop the technologies that would be the foundation Dunti's next-generation networking systems.

20. In early 1999, Rupaka and Viren Kapadia began working together to perfect and expand on her network security and efficiency innovations.

21. Combining Rupaka's expertise in processor design and Viren's expertise in network communications, they created a new holistic network architecture that solved many of the problems inherent to computer networks of that time and that would become widely used in modern data centers. This new architecture combined efficient addressing schemes with built-in security and priority mechanisms to allow for faster, more efficient, and more secure networks that were backwards compatible with the networks of the time.

22. Recognizing the importance of what they had developed, Rupaka set out to build and commercialize this new network architecture, hiring a team of engineers to create several operational prototypes of the Dunti network module—the Dunti Trupta.[5]

23. With the working module prototypes in hand, Rupaka hired PricewaterhouseCoopers ("PWC") to audit the Dunti Trupta system and design. PWC engineers used the prototypes to set up a metropolitan area network and spent days running tests on the Dunti Trupta module prototypes and the network to verify their designs. At the end of the audit, PWC provided an audit report verifying the viability of the new network architectures and the modules for implementing those architectures.

[5] "Trupta" means "complete" in Sanskrit.

24. Unfortunately, Rupaka set out to fund her technical innovations at the worst possible time—at the height of the dot-com and telecom crashes in late 2000 and early 2001. With venture capital all but extinct market wide, Rupaka was unable to widely commercialize her Dunti inventions in this period.

25. But Rupaka's groundbreaking innovations in network architecture and module design did not go unnoticed, gaining the attention of the Department of Defense, the Department of Energy, and the Department of Homeland Security—all of which awarded her Small Business Innovation Research ("SBIR") grants to develop other computing and networking technologies. In addition, in 2005, the Department of Defense asked Rupaka to present her technological innovations to the Defense Advanced Research Projects Agency ("DARPA") to further the agency's mission—to transform revolutionary concepts and even seeming impossibilities into practical capabilities.

26. The Dunti patents and applications have been cited by 418 United States patents and published patent applications as prior art before the United States Patent and Trademark Office. Companies whose patents cite the Dunti patents include:

- Avaya, Inc.;
- Hitachi Ltd.;
- Advanced Micro Devices, Inc.;
- Microsoft Corporation;
- Hewlett Packard Enterprise Development LP.;
- Cisco Technology, Inc.;
- F5 Networks, Inc.;
- AT&T Corporation;
- CA, Inc.;
- Brocade Communication Systems, Inc.;
- Intel Corporation;
- International Business Machines Corporation;
- Alcatel Lucent S.A.;
- Apple, Inc.;
- Marvell International, Ltd.;
- ZTE Corporation;
- Broadcom Corporation;
- Vodafone Group PLC;

- Nokia Corporation;
- NEC Corporation;
- Terascale Supercomputing, Inc.;
- Siemens AG;
- British Telecommunications PLC;
- Fujitsu, Ltd.;
- Ciena Corporation; and
- Texas Instruments, Inc.

TECHNOLOGY BACKGROUND

27. A communication network is generally regarded as an interconnected set of subnetworks that uses various networking protocols at various networking layers to communicate information—in the form of data packets—across the network. Each networking layer provides some particular functionality using layer-specific networking protocols, such as the well-known IP and Ethernet protocols.

28. For example, the IP protocol is generally considered a layer 3 protocol. The IP protocol uses IP addresses—which are 32-bit addresses—to send and receive data over the internet by delivering packets from a sending (i.e., source) device to a receiving (i.e., destination) device.

29. As another example, the Ethernet protocol is generally considered a layer 2 protocol. The Ethernet protocol uses MAC addresses—which are 48-bit addresses that are unique to every internet-connected device—to send and receive data over the physical network.

30. Data is, therefore, sent from a source device to a destination device using IP addresses at layer 3 and MAC addresses at layer 2. But before that data is sent, the various networking layers divide the data into packets and wrap the data by placing the packets into datagrams that include additional control information, such as a header containing IP and MAC addresses. Data can be wrapped multiple times before being sent across the network.

31. Links of a network are connected by various hardware components, such as routers and switches.

32. Traditionally, routers operate at layer 3 and direct traffic across the internet by looking at the destination IP address in the IP-addressed packet, determining the best route for the packet, and then sending the packet to the next hop along the path to the destination. To determine the best route for a packet, a router compares the destination address against an internal routing table. Routing tables are dynamic and can accommodate multiple modules having IP addresses that change as the network is reconfigured with new routers, switches, or other network components. Thus, routers can adapt to network conditions by using complex routing algorithms and by updating the routing tables accordingly.

33. Unlike routers, switches traditionally operate at layer 2 and use MAC addresses to forward packets to the next hop without first determining the best route. Switches receive data packets on a particular input port and then send them to a particular output port (or ports). This operation can be quickly repeated each time a packet is received. Because of this, data travels faster through switches than it does through routers.

LIMITATIONS OF THEN-STATE-OF-THE-ART SYSTEMS

34. The next-generation technologies described in the Dunti patents addressed a number of limitations of then-state-of-the-art systems.

35. First, the next-generation technologies described in the Dunti patents addressed problems associated with using a single addressing domain, such as IP addressing, for all internet-connected devices.

36. For example, as explained in the Dunti patents, using a common IP addressing domain for every node in a network made up of hundreds, thousands, or even more sub-networks can pose several problems. The first major version of IP, called IPv4, uses 32-bit IP addresses; thus, the maximum number of possible IPv4 addresses in the IP addressing domain is approximately 4.3 billion. Given the explosive growth of the Internet and the constantly increasing number of internet-connected devices, the inventors of the Dunti patents recognized that the IPv4 addressing domain would soon become insufficient, and by 2011, this was indeed

the case. They also recognized that simply increasing the size of the IP addressing domain (and therefore, the number of available IP addresses) by adding bits to the addressing domain would increase the amount of decoding required and, as a result, the amount of time required for routing.

37. Second, the next-generation technologies described in the Dunti patents addressed problems associated with slow routing-table lookups.

38. For example, a packet can travel through many hops before arriving at its destination, with each hop requiring a complex address-translation operation. As described above, because of the complex routing-table lookups required at each hop to make routing decisions, routing can be a relatively slow process. Switches, on the other hand, are relatively fast, but, unlike routers, they are not able to adapt to changes in traffic conditions.

39. Third, the next-generation technologies described in the Dunti patents addressed problems associated with security and prioritization of data packets as they traverse a network.

40. For example, common network security mechanisms have traditionally included firewalls implemented in hardware and software, and authentication systems implemented in software, such as encryption and passwords. Firewalls, which analyze incoming packets to determine if a packet should be placed on the internal network, add latency at the interface between the external and internal networks and generally operate at a single point in the communication path rather than over the entire communication path. In addition, they can be difficult to configure because each firewall must be updated and configured separately as needs change.

41. Encryption adds overhead to the packet and involves time-consuming decryption at the receiving end. Using passwords takes up less transmission bandwidth than encryption, but passwords can sometimes be broken either because of a user's improper choice of password or through a brute-force attack.

DUNTI'S NEXT-GENERATION NETWORKING SOLUTIONS

42. The next-generation networking technology described in the Dunti patents covers various aspects of networking systems that work together to provide networks that are faster, more efficient, more scalable, and more secure.

43. For example, some of the Dunti patents describe, among other things, using multiple separate and independent addressing domains to overcome the mathematical and practical limitations of the traditional IP packet addressing domains to allow for the transmission of data packets more quickly and efficiently than was possible with any prior art systems. They describe architectures, systems, and methods for transparently mapping addresses across multiple addressing domains, as shown, for example, in the figure below. Because an addressing domain in one network is separate from an addressing domain in another network, a module in the first network and a module in the second network can each have the same identifier, which allows addressing (such as IP addresses) to be reused among networks. These new designs allow for the segmentation of a given network, permitting multiple networks and/or multiple services to share the same infrastructure.

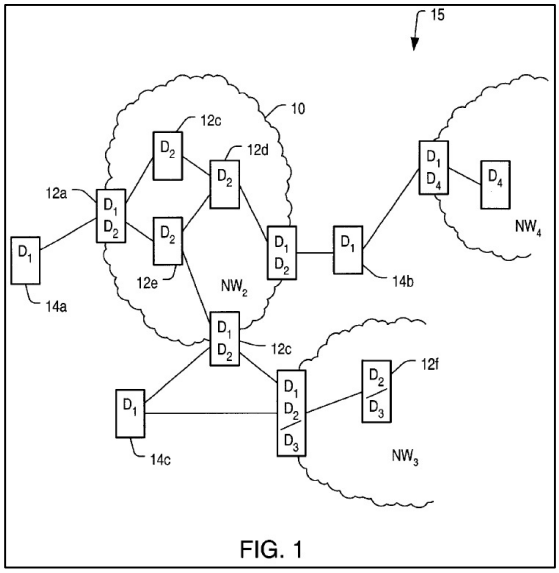


FIG. 1

'462 Patent, Fig. 1.

44. As another example, some of the Dunti patents describe using intelligent network infrastructure and hierarchical networks to more efficiently transfer data packets across a network, as shown, for example, in the figure below. By structuring a network and informing each module of its relative location within the network, modules internal to a particular network can operate as switches, quickly forwarding packets towards their final destination. As a result, only modules at the edges of a given network are required to analyze or decode the destination address of the packet.

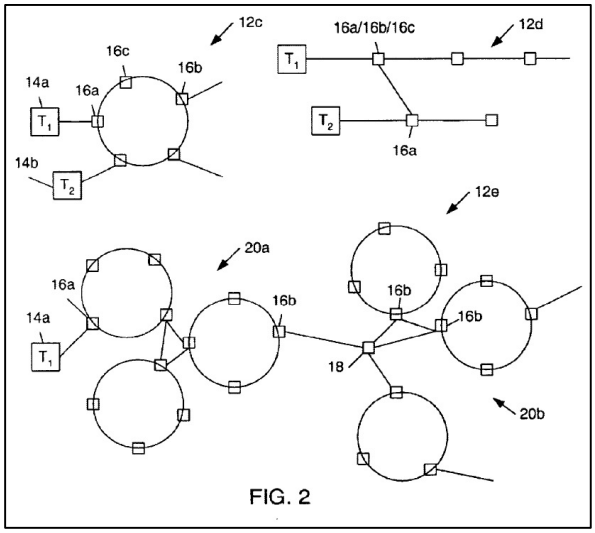


FIG. 2

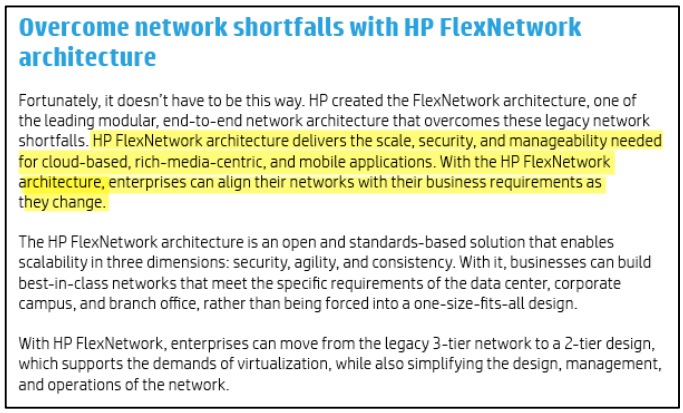
’286 Patent, Fig. 2.

45. The continued growth of the number of internet-connected devices and internet-based services, as well as a recent shift toward cloud-based services, has led to wide adoption of Dunti’s next-generation networking technology in the industry. For example, Dunti’s next-generation networking technology has particular applicability to data-center networking and has been widely implemented by many major networking companies as part of their data center fabric solutions to provide faster, more efficient, more scalable, and more secure data centers. Dunti’s next-generation networking technology also applies to the backbone ring networks that connect multiple data center physical locations into a single virtual data center.

HP'S INFRINGING PRODUCTS AND SERVICES

46. On information and belief, HP offers a high-performance data-center networking solution called the FlexNetwork Architecture, which addresses the demands of a modern data center for "more agile, efficient, and scalable networking solutions." *HP FlexFabric Reference Architecture Overview*, HP TECHNICAL WHITE PAPER, at 2 (2012). The FlexNetwork Architecture is a "flexible, virtualization-optimized data center network architecture that requires fewer devices, interconnections, layers, and discrete appliances." *Id.* The FlexNetwork Architecture "leverages a set of switch virtualization technologies that allow enterprises to dramatically simplify the design and operations of their data center, campus, and branch office Ethernet networks" and "provides direct, higher capacity connections between users and network resources." *HP Switch Virtualization Technologies*, HP BUSINESS WHITE PAPER, at 5 (2013).

47. On information and belief, this FlexNetwork architecture overcomes network shortfalls to provide "scale, security, and manageability" for networks, as shown below.



Overcome network shortfalls with HP FlexNetwork architecture

Fortunately, it doesn't have to be this way. HP created the FlexNetwork architecture, one of the leading modular, end-to-end network architecture that overcomes these legacy network shortfalls. HP FlexNetwork architecture delivers the scale, security, and manageability needed for cloud-based, rich-media-centric, and mobile applications. With the HP FlexNetwork architecture, enterprises can align their networks with their business requirements as they change.

The HP FlexNetwork architecture is an open and standards-based solution that enables scalability in three dimensions: security, agility, and consistency. With it, businesses can build best-in-class networks that meet the specific requirements of the data center, corporate campus, and branch office, rather than being forced into a one-size-fits-all design.

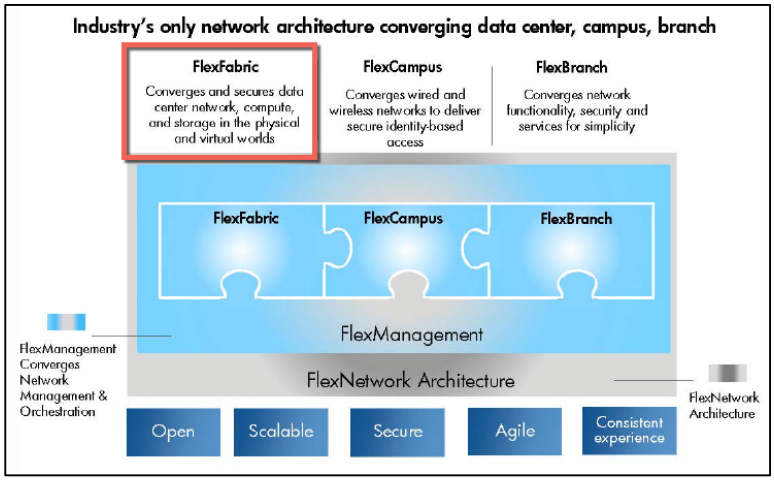
With HP FlexNetwork, enterprises can move from the legacy 3-tier network to a 2-tier design, which supports the demands of virtualization, while also simplifying the design, management, and operations of the network.

HP Switch Virtualization Technologies, HP BUSINESS WHITE PAPER, at 4 (2013) (highlighting added).

48. On information and belief, as part of the FlexNetwork rollout, Kash Shaihk, former Director of Marketing at HPE, stressed that HP's FlexNetwork architecture is "all about embracing industry standards," adding that the FlexNetwork architecture "will be supporting the TRILL standard . . . ." Kerner, Sean Michael, *HP Launches FlexNetwork Architecture*, ENTERPRISE NETWORKING PLANET (May 9, 2011), available at

http://www.enterprisenetworkingplanet.com/datacenter/HP-Launches-FlexNetwork-Architecture-3933026.htm (accessed Sept. 6, 2016).

49. On information and belief, HP FlexFabric, one of the FlexNetwork architecture's interrelated modular building blocks, was designed to optimize data center networks, converging and securing data as it flows through the network.



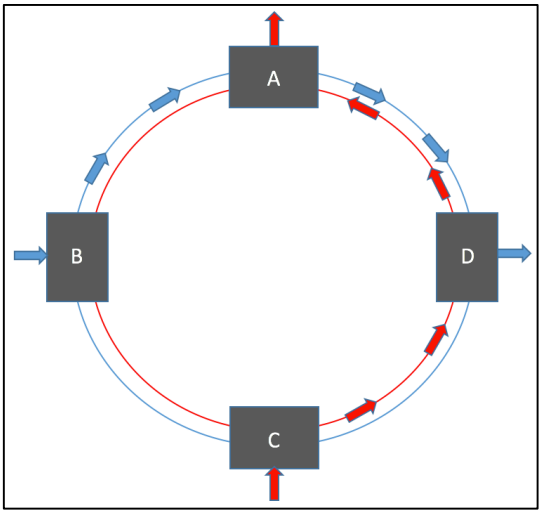
HP FlexFabric Reference Architecture Overview, HP TECHNICAL WHITE PAPER, at 6 (2012) (red box added).

50. On information and belief, HP provides to its customers both hardware and software products that implement HP FlexFabric technology and/or the Transparent Interconnection of Lots of Links ("TRILL") protocol as part of its FlexNetwork architecture, including, for example, the HP 5900 series switches, the HP 5920 series switches, the HP 5930 series switches, the HP 5950 series switches, the HP 5700 series switches, the HP 7900 series switches, the HP 10500 series switches, the HP 11900 series switches, and the HP 12900 series switches.

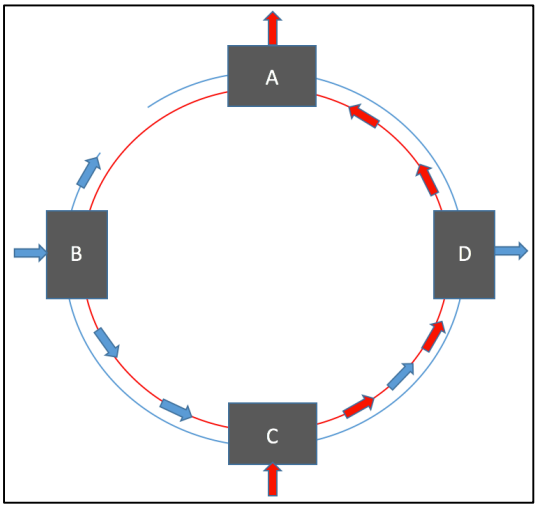
51. In addition to the FlexNetwork Architecture, on information and belief, HP also offers a number of products and services that implement IEEE 802.17 Resilient Packet Ring ("RPR") networks. For example, at least the HPE FlexNetwork 6600 series routers, the HPE HSR6600 series routers, the HPE HSR6800 series routers, the HP A6600 series routers, and the HP 8800 series routers implement an RPR network.

52. RPR networks, which transport data traffic over widespread optical fiber rings, can be used to connect data centers that are spread across multiple physical locations or to connect smaller networks to larger and/or backbone networks.

53. RPR networks include dual, counter-rotating rings that are implemented using a series of switches located around the rings where traffic enters and exits the network.



54. The dual-ring topology provides robustness by including the capability of automatic reconfiguration after a link failure. If a node on the ring or a link between two nodes is disrupted or fails, traffic can be looped back around the ring in the opposite direction to the destination node and avoid the disruption/failure.



COUNT I
INFRINGEMENT OF U.S. PATENT NO. 6,587,462

55. Dunti restates and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

56. U.S. Patent No. 6,587,462 ("the '462 patent"), entitled "Address Mapping Mechanism Enabling Multi-Domain Addressing in Communication Networks, was filed on February 16, 2001. Dunti is the owner by assignment of the '462 patent. A true and correct copy of the '462 patent is attached hereto as Exhibit A. The '462 patent claims a specific architecture, systems, and methods for transparently mapping addresses across multiple addressing domains and/or protocols.

57. The '462 patent has been cited by at least fifteen United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '462 patent as relevant prior art:

- Hewlett Packard Enterprise Development LP;
- International Business Machines Corporation;
- Terascale Supercomputing, Inc.;
- NEC Corporation; and
- Microsoft Corporation.

58. The '462 patent teaches, for example, a networking system with multiple independent addressing domains. Because an addressing domain in a first network is separate from an addressing domain in a second network, the first and second networks need not have a common addressing mechanism in which each module of both the first and second networks requires a unique identification number. Instead, a module in the first network and a module in the second network can each have the same identifier, which allows addressing to be reused among networks.

59. The end modules and termination devices, however, must have a common addressing scheme, in which each end module and termination device has its own unique identifier. Thus, while the end modules and termination devices connected to the end modules have unique and corresponding lower layer addresses, the intermediate modules in the networks

can have an independent set of identifiers separate from those of the end modules and termination devices.

60. Set up in this way, sending a data packet from a termination device to another termination device, separated by a network with an internal addressing domain that is different from external addressing domains, uses a simple mapping function. The entry end module adds to the data packet the separate addressing protocols unique to the internal modules, such that the packet includes the IP source and destination addresses, the Ethernet source and destination addresses, and the internal source and destination addresses of the network. The internal addresses are added when the data packet enters the network and are stripped when the data packet leaves the network.

61. HP makes, uses, sells, and/or offers for sale in the United States products and/or services relating to network communications.

62. HP makes, uses, sells, offers to sell, and/or imports the HP FlexFabric data center switches, including but not limited to the HP 5900 series switches, the HP 5920 series switches, the HP 5930 series switches, the HP 5950 series switches, the HP 5700 series switches, the HP 7900 series switches, the HP 10500 series switches, the HP 11900 series switches, and the HP 12900 series switches (collectively, "the HP FlexFabric Switches").

63. HP makes, uses, sells, offers to sell, and/or imports the HP Intelligent Management Center Enterprise Software Platform ("HP Intelligent Management Center").

64. HP makes, uses, sells, offers to sell, and/or imports the HP FlexFabric Switches and the HP Intelligent Management Center (collectively, the HP '462 Accused Products").

65. HP makes, uses, sells, and/or offers to sell networks comprised of the HP '462 Accused Products ("an HP '462 Accused Product Network").

66. On information and belief, an HP '462 Accused Product Network implements at least HP's FlexFabric technology and/or the TRILL protocol.

HP emphasizes standards with FlexNetwork

Shaikh stressed that HP's FlexNetwork architecture is all about embracing industry standards. He added that the architecture will be supporting the TRILL standard as a replacement for spanning tree. Rival vendor Cisco has its own implementation of TRILL called FabricPath.

Kerner, Sean Michael, *HP Launches FlexNetwork Architecture*, ENTERPRISE NETWORKING PLANET (May 9, 2011), available at http://www.enterprisenetworkingplanet.com/datacenter/HP-Launches-FlexNetwork-Architecture-3933026.htm (accessed Sept. 6, 2016).

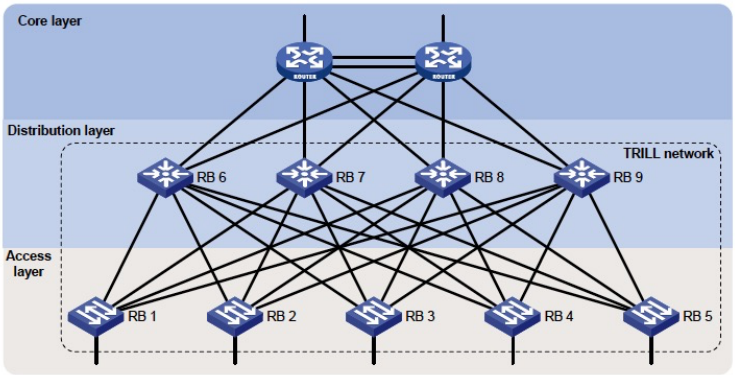
HPE FlexFabric 12900 Switch Series at a glance

Next-generation modular data center core switches designed to support virtualized data centers and the evolving needs of private and public cloud deployments. Delivers unprecedented levels of performance, buffering, scale, and availability with high-density 10, 40, and 100GbE connectivity. Software-defined networking (SDN) enabled with OpenFlow 1.3, full Layer 2 and 3 features, including advanced features such as Virtual Extensible LAN (VXLAN), Transparent Interconnection of Lots of Links (TRILL), and Intelligent Resilient Framework (IRF) that provide the ability to build large, resilient switching fabrics. Also supports fully redundant and hot-swappable components to complement its other enterprise-class capabilities.

HPE Networking Product Portfolio, HPE SALES DOCUMENTATION, at 7 (last rev. July 2016).

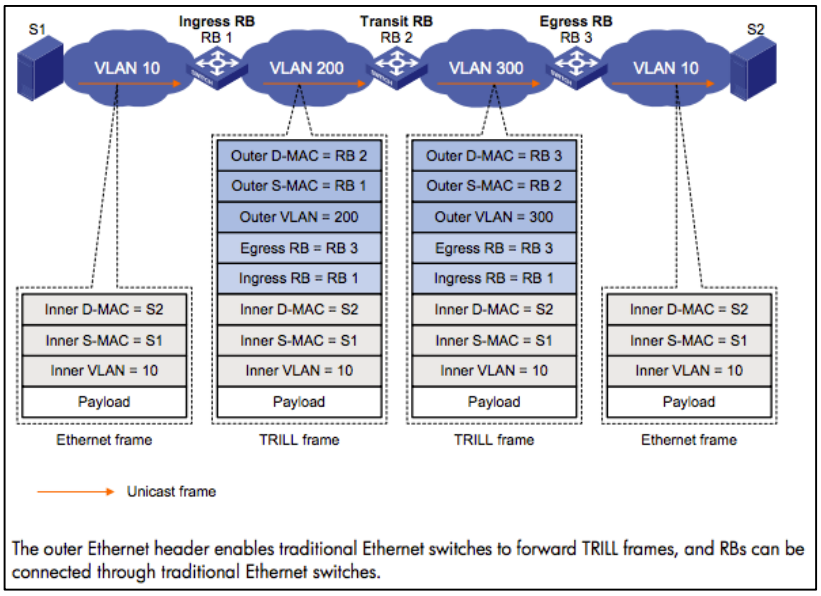
67. On information and belief, an HP '462 Accused Product Network comprises a communication system.

Figure 4 Network diagram



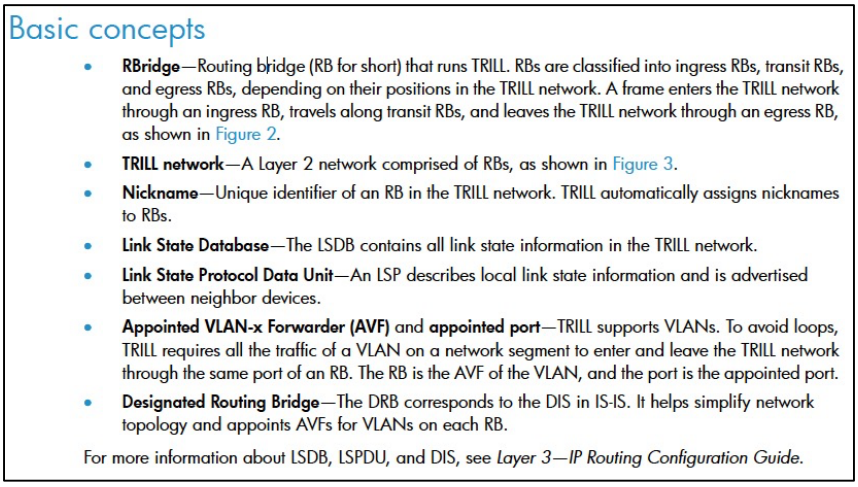
HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 11 (2012).

68. On information and belief, an HP '462 Accused Product Network comprises an entry end module, an exit end module, and at least one intermediate module between the entry end module and the exit end module. For example, the figure below shows an entry end module and an exit end module at the edges of a FlexFabric network and an intermediate module coupled between the entry and exit end modules. In a FlexFabric network, there can be multiple intermediate modules.



HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 3 (2012).

69. On information and belief, an HP '462 Accused Product Network comprises a first addressing domain for identifying each of the end modules and the intermediate module. For example, each RBridge within a FlexFabric network is assigned a unique RBridge Nickname.



Basic concepts

- **RBridge**—Routing bridge (RB for short) that runs TRILL. RBs are classified into ingress RBs, transit RBs, and egress RBs, depending on their positions in the TRILL network. A frame enters the TRILL network through an ingress RB, travels along transit RBs, and leaves the TRILL network through an egress RB, as shown in Figure 2.
- **TRILL network**—A Layer 2 network comprised of RBs, as shown in Figure 3.
- **Nickname**—Unique identifier of an RB in the TRILL network. TRILL automatically assigns nicknames to RBs.
- **Link State Database**—The LSDB contains all link state information in the TRILL network.
- **Link State Protocol Data Unit**—An LSP describes local link state information and is advertised between neighbor devices.
- **Appointed VLAN-x Forwarder (AVF)** and **appointed port**—TRILL supports VLANs. To avoid loops, TRILL requires all the traffic of a VLAN on a network segment to enter and leave the TRILL network through the same port of an RB. The RB is the AVF of the VLAN, and the port is the appointed port.
- **Designated Routing Bridge**—The DRB corresponds to the DIS in IS-IS. It helps simplify network topology and appoints AVFs for VLANs on each RB.

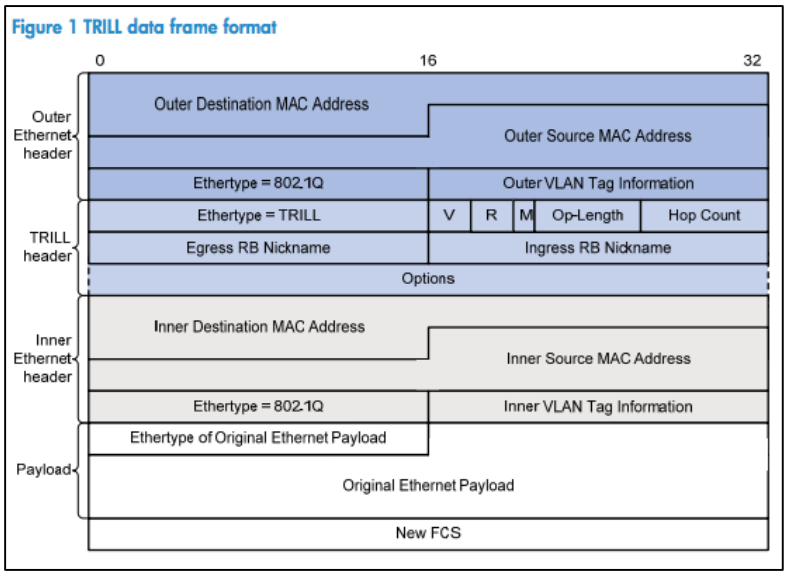
For more information about LSDB, LSPDU, and DIS, see *Layer 3—IP Routing Configuration Guide*.

HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 1 (2012).

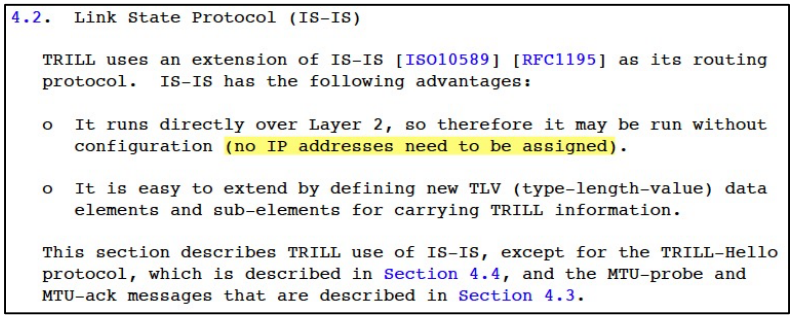
> Configuration of the **system-id** and **nickname** is optional but strongly advised for troubleshooting and understanding how the TRILL fabric works. Each equipment **must** have a unique system ID. If not configured, the switch will takes its own mac address as system ID. The nickname **should** also be different. If not configured, the fabric will allocate an unused one to the routing bridge. If two RBs have the same nickname, nickname of one will be changed automatically, based on system ID and possibly on given priority.
>
> System IDs are used by IS-IS and nicknames are used to route TRILL encapsulated frames towards the egress RB.

Configuring TRILL, HP CONFIGURATION GUIDE, at 3 (June 2015).

70. On information and belief, an HP '462 Accused Product Network comprises a second addressing domain, separate and independent from the first addressing domain, for identifying each of the end modules exclusive of identifying the intermediate module. For example, edge switches in an HP '462 Accused Product Network can be addressed using IP addresses, but IP addresses are not used to address intermediate RBridges when forwarding packets within a FlexFabric network.



HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 2 (2012).



4.2. Link State Protocol (IS-IS)

TRILL uses an extension of IS-IS [ISO10589] [RFC1195] as its routing protocol. IS-IS has the following advantages:

- o It runs directly over Layer 2, so therefore it may be run without configuration (no IP addresses need to be assigned).
- o It is easy to extend by defining new TLV (type-length-value) data elements and sub-elements for carrying TRILL information.

This section describes TRILL use of IS-IS, except for the TRILL-Hello protocol, which is described in Section 4.4, and the MTU-probe and MTU-ack messages that are described in Section 4.3.

Perlman, et al., *Routing Bridges (RBridges): Base Protocol Specification*, IETF RFC 6325, at 32 (July 2011) (highlighting added).

71. By making, using, testing, offering for sale, and/or selling communication network products and services, including but not limited to the HP '462 Accused Products, HP has injured Dunti and is liable to Dunti for directly infringing one or more claims of the '462 patent, including at least claim 1, pursuant to 35 U.S.C. § 271(a).

72. On information and belief, HP also indirectly infringes the '462 patent by actively inducing infringement under 35 U.S.C. § 271(b).

73. On information and belief, HP has had knowledge of the '462 patent since at least the date of service of this Complaint or shortly thereafter, and on information and belief, HP knew of the '462 patent and knew of its infringement, including by way of this lawsuit.

74. On information and belief, HP intended to induce patent infringement by third-party customers and users of the HP '462 Accused Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. HP specifically intended and was aware that the normal and customary use of the accused products would infringe the '462 patent. HP performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '462 patent and with the knowledge that the induced acts would constitute infringement. For example, HP provides the HP '462 Accused Products, which are capable of operating in a manner that infringes one or more claims of the '462 patent, including at least claim 1, and HP further provides documentation and training materials that cause customers of the HP '462 Accused Products to utilize the products and services in a manner that directly infringes one or

more claims of the ’462 patent. By providing instruction and training to customers on how to use the HP ’462 Accused Products, HP specifically intended to induce infringement of the ’462 patent, including at least claim 1. On information and belief, HP engaged in such inducement to promote the sales of the HP ’462 Accused Products and to actively induce its customers to infringe the ’462 patent. Accordingly, HP has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the ’462 patent, knowing that such use constitutes infringement of the ’462 patent.

75. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the ’462 patent.

76. As a result of HP’s infringement of the ’462 patent, Dunti has suffered monetary damages, and seeks recovery in an amount adequate to compensate for HP’s infringement, but in no event less than a reasonable royalty for the use made of the invention by HP together with interest and costs as fixed by the Court.

COUNT II
INFRINGEMENT OF U.S. PATENT NO. 6,788,701

77. Dunti restates and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

78. U.S. Patent No. 6,788,701 (“the ’701 patent”), entitled “Communication Network Having Modular Switches that Enhance Data Throughput,” was filed on May 14, 1999. Dunti is the owner by assignment of the ’701 patent. A true and correct copy of the ’701 patent is attached hereto as Exhibit B. The ’701 patent claims a specific architecture, system, and method for efficiently transferring packets of data across a communication network.

79. The ’701 patent has been cited by at least fifteen United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the ’701 patent as relevant prior art:

- Alcatel Lucent S.A.;
- Terascale Supercomputing, Inc.;

- Arbor Networks, Inc.;
- Apple, Inc.;
- International Business Machines Corporation;
- Marvell International, Ltd.; and
- Ericsson.

80. The ’701 patent teaches, for example, an addressing and distributed routing mechanism used by forwarding modules (i.e., switches) that are topologically related to one another based on their position within a network. The modules, due to an awareness of their position or location with respect to the network, enable adaptive fast forwarding of packets across the network. Instead of statically routing packets in the same manner each time, as in conventional switches, the modules include some features of conventional routers, but without the detriments of routers. The modules can forward packets of data relatively quickly (similar to conventional switches), and can dynamically change the forwarding path based on activity within the network (similar to conventional routers).

81. The switches described in the ’701 patent can be used to forward or route incoming packets received on an input port to one or more output ports. Each switch within the network is assigned a unique identification number that is used for routing within the network. When a switch within the network receives an incoming packet on an input port, it decodes part of the packet to direct the packet to the appropriate output port, as shown in Figure 6 below. The switches are aware of their position relative to the network and their neighboring modules, and they use that knowledge to determine which output port to use for forwarding the packet.

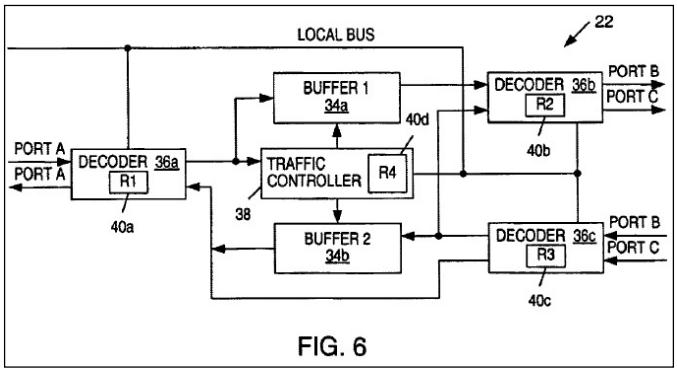


FIG. 6

’701 Patent, Fig. 6.

82. HP makes, uses, sells, and/or offers for sale in the United States products and/or services relating to network communications.

83. HP makes, uses, sells, offers to sell, and/or imports the HP FlexFabric data center switches, including but not limited to the HP 5900 series switches, the HP 5920 series switches, the HP 5930 series switches, the HP 5950 series switches, the HP 5700 series switches, the HP 7900 series switches, the HP 10500 series switches, the HP 11900 series switches, and the HP 12900 series switches (collectively, "the HP FlexFabric Switches").

84. HP makes, uses, sells, offers to sell, and/or imports the HP Intelligent Management Center Enterprise Software Platform ("HP Intelligent Management Center").

85. HP makes, uses, sells, offers to sell, and/or imports the HP FlexFabric Switches and the HP Intelligent Management Center (collectively, the HP '701 Accused Products").

86. HP makes, uses, sells, and/or offers to sell networks comprised of the HP '701 Accused Products ("an HP '701 Accused Product Network").

87. On information and belief, an HP '701 Accused Product Network implements at least HP's FlexFabric technology and/or the TRILL protocol.

HP emphasizes standards with FlexNetwork

Shaikh stressed that HP's FlexNetwork architecture is all about embracing industry standards. He added that the architecture will be supporting the TRILL standard as a replacement for spanning tree. Rival vendor Cisco has its own implementation of TRILL called FabricPath.

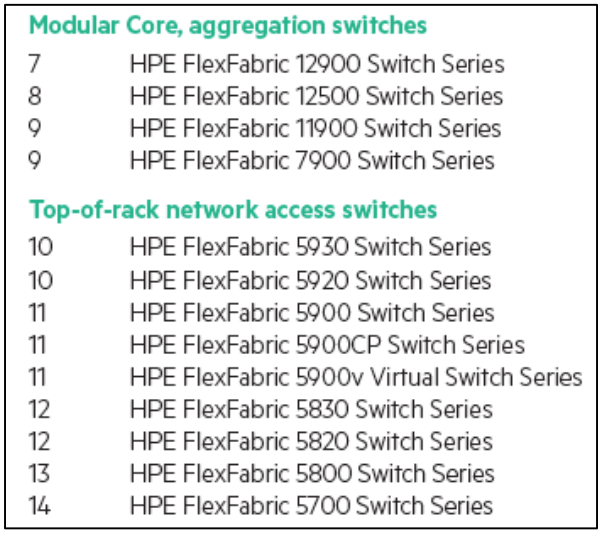
Kerner, Sean Michael, *HP Launches FlexNetwork Architecture*, ENTERPRISE NETWORKING PLANET (May 9, 2011), available at http://www.enterprisenetworkingplanet.com/datacenter/HP-Launches-FlexNetwork-Architecture-3933026.htm (accessed Sept. 6, 2016).

HPE FlexFabric 12900 Switch Series at a glance

Next-generation modular data center core switches designed to support virtualized data centers and the evolving needs of private and public cloud deployments. Delivers unprecedented levels of performance, buffering, scale, and availability with high-density 10, 40, and 100GbE connectivity. Software-defined networking (SDN) enabled with OpenFlow 1.3, full Layer 2 and 3 features, including advanced features such as Virtual Extensible LAN (VXLAN), Transparent Interconnection of Lots of Links (TRILL), and Intelligent Resilient Framework (IRF) that provide the ability to build large, resilient switching fabrics. Also supports fully redundant and hot-swappable components to complement its other enterprise-class capabilities.

HPE Networking Product Portfolio, HPE SALES DOCUMENTATION, at 7 (last rev. July 2016).

88. On information and belief, the HP '701 Accused Products comprise a switch.



Modular Core, aggregation switches

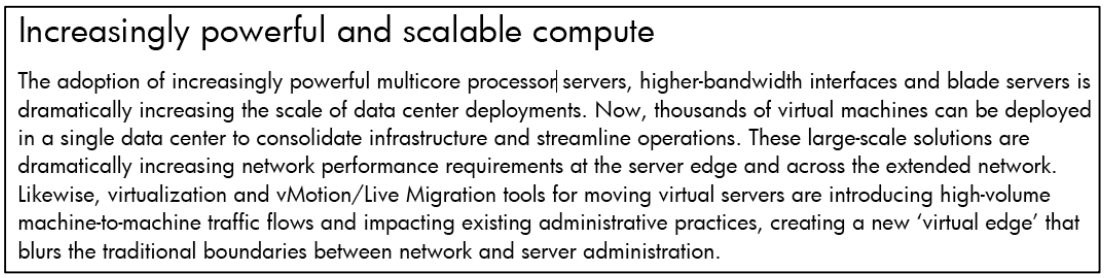
7	HPE FlexFabric 12900 Switch Series
8	HPE FlexFabric 12500 Switch Series
9	HPE FlexFabric 11900 Switch Series
9	HPE FlexFabric 7900 Switch Series

Top-of-rack network access switches

10	HPE FlexFabric 5930 Switch Series
10	HPE FlexFabric 5920 Switch Series
11	HPE FlexFabric 5900 Switch Series
11	HPE FlexFabric 5900CP Switch Series
11	HPE FlexFabric 5900v Virtual Switch Series
12	HPE FlexFabric 5830 Switch Series
12	HPE FlexFabric 5820 Switch Series
13	HPE FlexFabric 5800 Switch Series
14	HPE FlexFabric 5700 Switch Series

HPE Networking Product Portfolio, HPE SALES DOCUMENTATION, at Table of Contents, 2 (last rev. July 2016).

89. On information and belief, the HP '701 Accused Products within a FlexFabric network comprise a traffic manager which dispatches a series of read operations to a memory coupled within a data flow path. For example, the HP '701 Accused Products include memory and at least one processor.



Increasingly powerful and scalable compute

The adoption of increasingly powerful multicore processor servers, higher-bandwidth interfaces and blade servers is dramatically increasing the scale of data center deployments. Now, thousands of virtual machines can be deployed in a single data center to consolidate infrastructure and streamline operations. These large-scale solutions are dramatically increasing network performance requirements at the server edge and across the extended network. Likewise, virtualization and vMotion/Live Migration tools for moving virtual servers are introducing high-volume machine-to-machine traffic flows and impacting existing administrative practices, creating a new 'virtual edge' that blurs the traditional boundaries between network and server administration.

HP FlexFabric Reference Architecture Overview, HP TECHNICAL WHITE PAPER, at 2 (2012).

90. On information and belief, the HP '701 Accused Products within a FlexFabric network include, for example, a TRILL unicast forwarding table comprised in memory, which includes a source address and a destination address of a pair of network nodes routably coupled within the data flow path.

Suppose that the nicknames of RB 1 through RB 9 are 0x5801 through 0x5809, respectively.

Use **display trill unicast-route** to display the TRILL unicast routing table. For example:

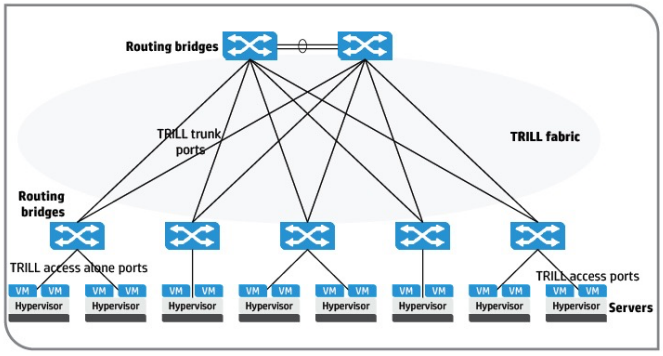
Display the TRILL unicast routing table on RB 1.

```
[RB1] display trill unicast-route
Destination     Interface                NextHop
-------------------------------------------------
0x5801          N/A                      N/A
0x5802          XGE1/0/2                 0x5806
                XGE1/0/3                 0x5807
                XGE1/0/4                 0x5808
                XGE1/0/5                 0x5809
0x5803          XGE1/0/2                 0x5806
                XGE1/0/3                 0x5807
                XGE1/0/4                 0x5808
                XGE1/0/5                 0x5809
0x5804          XGE1/0/2                 0x5806
                XGE1/0/3                 0x5808
                XGE1/0/4                 0x5808
                XGE1/0/5                 0x5809
0x5805          XGE1/0/2                 0x5806
                XGE1/0/3                 0x5807
                XGE1/0/4                 0x5808
                XGE1/0/5                 0x5809
0x5806          XGE1/0/2                 Direct
0x5807          XGE1/0/3                 Direct
0x5808          XGE1/0/4                 Direct
```

HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 13 (2012).

91. On information and belief, the HP '701 Accused Products comprise an input port and an output port.

Figure 2. TRILL fundamentals



Routing bridge (RBridge or RB)

Routing bridge is the device that runs TRILL. It has the benefits of both bridges and routers.

TRILL trunk ports

Used to handle TRILL frames, these ports are located inside a TRILL fabric.

TRILL access ports

Used to handle non-TRILL frames and hello packets, these ports are located at the edge of a TRILL fabric.

TRILL access alone ports

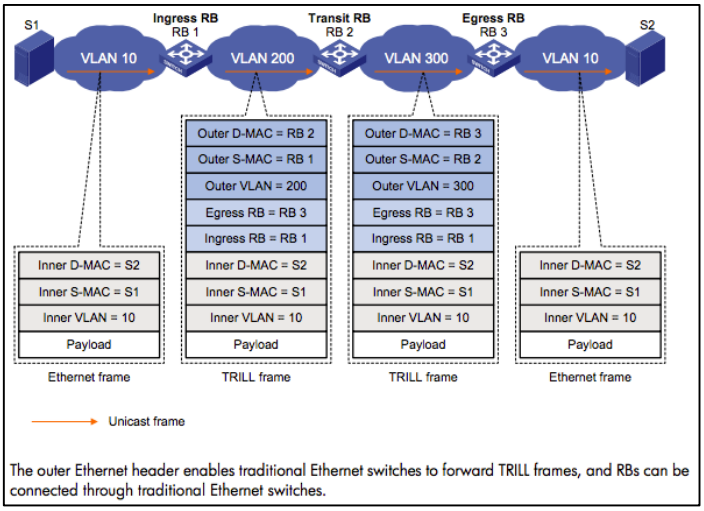
Used to handle non-TRILL frames, these ports are located at the edge of a TRILL fabric.

TRILL hybrid ports

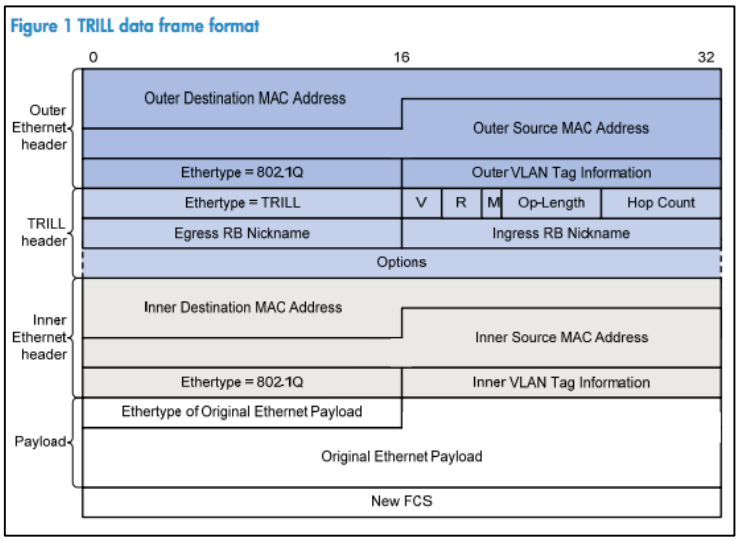
Combination of both TRILL trunk and TRILL access ports, used to handle TRILL frames, non-TRILL frames, and hello packets. It is used to connect two TRILL RBs across a non-TRILL enabled switch. It is not required or recommended in a standard data center deployment.

Guidelines for deploying TRILL in an HP data center, HP ARCHITECTURE GUIDE (Aug. 2015), at 3.

92. On information and belief, the memory in the HP '701 Accused Products comprises packets of data dispatched from the input port. For example, the HP '701 Accused Products encapsulate incoming data packets within a TRILL header. The incoming data packets are comprised in memory within an ingress RBridge as they are encapsulated within a TRILL header as forwarding decisions are made.

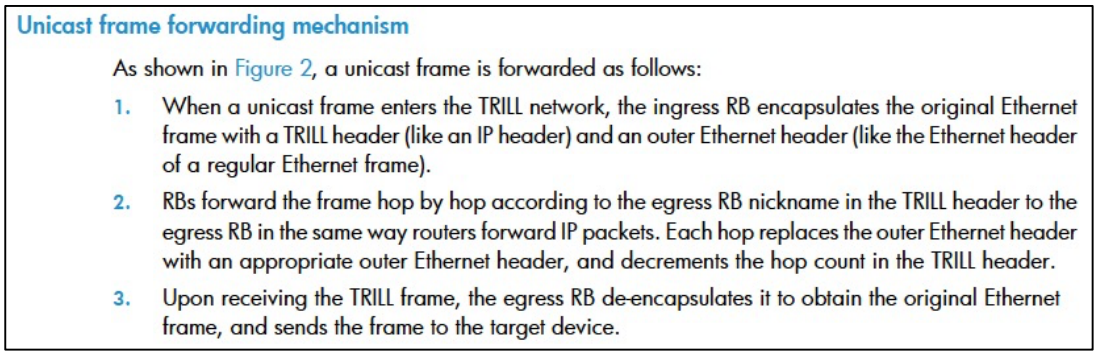


HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 3 (2012).



HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 2 (2012).

93. On information and belief, the HP '701 Accused Products comprise a decoder coupled to the input port for decoding only a single field of bits within a plurality of fields which comprise the destination address. For example, a TRILL header includes an Egress RBridge Nickname field and an Outer Ethernet Header includes an Outer Destination MAC Address field, both of which comprise a destination address. The Egress RBridge Nickname is decoded as forwarding decisions are made.



Unicast frame forwarding mechanism

As shown in Figure 2, a unicast frame is forwarded as follows:

1. When a unicast frame enters the TRILL network, the ingress RB encapsulates the original Ethernet frame with a TRILL header (like an IP header) and an outer Ethernet header (like the Ethernet header of a regular Ethernet frame).
2. RBs forward the frame hop by hop according to the egress RB nickname in the TRILL header to the egress RB in the same way routers forward IP packets. Each hop replaces the outer Ethernet header with an appropriate outer Ethernet header, and decrements the hop count in the TRILL header.
3. Upon receiving the TRILL frame, the egress RB de-encapsulates it to obtain the original Ethernet frame, and sends the frame to the target device.

HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 3 (2012).

94. By making, using, testing, offering for sale, and/or selling communication network products and services, including but not limited to the HP '701 Accused Products, HP has injured Dunti and is liable to Dunti for directly infringing one or more claims of the '701 patent, including at least claim 1, pursuant to 35 U.S.C. § 271(a).

95. On information and belief, HP also indirectly infringes the '701 patent by actively inducing infringement under 35 U.S.C. § 271(b).

96. On information and belief, HP has had knowledge of the '701 patent since at least the date of service of this Complaint or shortly thereafter, and on information and belief, HP knew of the '701 patent and knew of its infringement, including by way of this lawsuit.

97. On information and belief, HP intended to induce patent infringement by third-party customers and users of the HP '701 Accused Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. HP specifically intended and was aware that the normal and

customary use of the accused products would infringe the ’701 patent. HP performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the ’701 patent and with the knowledge that the induced acts would constitute infringement. For example, HP provides the HP ’701 Accused Products, which are capable of operating in a manner that infringes one or more claims of the ’701 patent, including at least claim 1, and HP further provides documentation and training materials that cause customers of the HP ’701 Accused Products to utilize the products and services in a manner that directly infringes one or more claims of the ’701 patent. By providing instruction and training to customers on how to use the HP ’701 Accused Products, HP specifically intended to induce infringement of the ’701 patent, including at least claim 1. On information and belief, HP engaged in such inducement to promote the sales of the HP ’701 Accused Products and to actively induce its customers to infringe the ’701 patent. Accordingly, HP has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the ’701 patent, knowing that such use constitutes infringement of the ’701 patent.

98. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the ’701 patent.

99. As a result of HP’s infringement of the ’701 patent, Dunti has suffered monetary damages, and seeks recovery in an amount adequate to compensate for HP’s infringement, but in no event less than a reasonable royalty for the use made of the invention by HP together with interest and costs as fixed by the Court.

COUNT III
INFRINGEMENT OF U.S. PATENT NO. 6,804,235

100. Dunti restates and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

101. U.S. Patent No. 6,804,235 (“the ’235 patent”), entitled “Address Mapping Mechanism Enabling Multi-Domain Addressing in Communication Networks,” was filed on February 27, 2003 and claims priority as a continuation of U.S. Patent Application No.

09/785,899, filed on February 16, 2001. Dunti is the owner by assignment of the ’235 patent. A true and correct copy of the ’235 patent is attached hereto as Exhibit C.

102. The ’235 patent has been cited by six United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the ’235 patent as relevant prior art:

- Texas Instruments, Inc.; and
- International Business Machines Corporation.

103. The ’235 patent teaches, for example, a communication system that transparently maps addresses across multiple addressing domains and/or protocols. The communication system described in the ’235 patent operates using a scalable addressing domain of an independent identification layer that is different from the addressing domain interfacing with the network. This independent identification layer is an improvement to the OSI reference model and can be considered an even lower layer addressing domain within the OSI reference model because the existing lower-level layer addressing information is further wrapped with the independent identification layer addressing information.

104. The independent identification layer can be used to represent, for example, unique identification numbers of intermediate modules within the communication system of the ’235 patent. The networking modules described in the ’235 patent can be classified as either end modules (i.e., entry and exit end modules) or as intermediate modules. End modules are coupled to other networks, addressing domains, or devices outside of the network. Entry end modules perform protocol wrapping functions as data packets enter the network, and exit end modules strip protocol used by the network as data packets exit the network. Identification addresses for the intermediate modules and end modules of a given network can utilize that network’s unique and independent identification layer.

105. As described in the ’235 patent, sending a data packet from a source device to a destination device, where the devices are separated by a network with an internal addressing domain that is different from the external addressing domains, requires only a simple mapping

function. One addressing domain can be used to forward data from a source device to a unique entry end module and from an exit end module to the destination device. Within the network, among the intermediate modules, a separate and independent addressing domain can be used.

106. When data packets enter a network from a device external to the network, the IP address and Ethernet address within the network layer and the lower-level data/physical layer addressing domains are further wrapped with the independent identification layer source address and corresponding destination addresses unique to that addressing domain. The wrapped information indicates where the data came from external to the network and, due to the wrapped independent identification layer, where within the network the data enters the network and exits the network. When data packets exit the network, an end module strips the wrapped information from the packets.

107. HP makes, uses, sells, and/or offers for sale in the United States products and/or services relating to network communications.

108. HP makes, uses, sells, offers to sell, and/or imports the HP FlexFabric data center switches, including but not limited to the HP 5900 series switches, the HP 5920 series switches, the HP 5930 series switches, the HP 5950 series switches, the HP 5700 series switches, the HP 7900 series switches, the HP 10500 series switches, the HP 11900 series switches, and the HP 12900 series switches (collectively, "the HP FlexFabric Switches").

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111. HP makes, uses, sells, and/or offers to sell networks comprised of the HP '235 Accused Products ("an HP '235 Accused Product Network").

112. On information and belief, an HP '235 Accused Product Network implements at least HP's FlexFabric technology and/or the TRILL protocol.

HP emphasizes standards with FlexNetwork

Shaikh stressed that HP's FlexNetwork architecture is all about embracing industry standards. He added that the architecture will be supporting the TRILL standard as a replacement for spanning tree. Rival vendor Cisco has its own implementation of TRILL called FabricPath.

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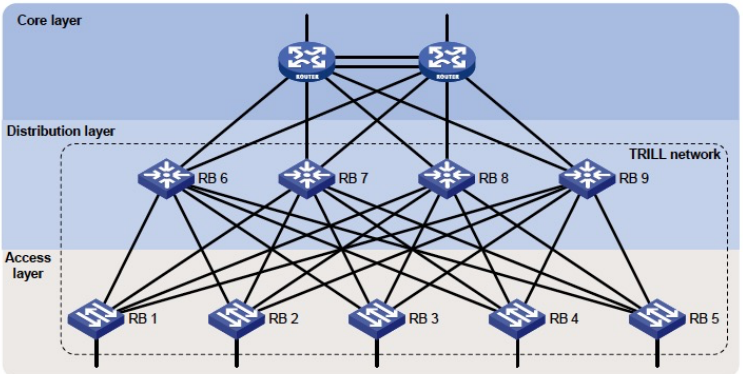
HPE Networking Product Portfolio, HPE SALES DOCUMENTATION, at 7 (last rev. July 2016).

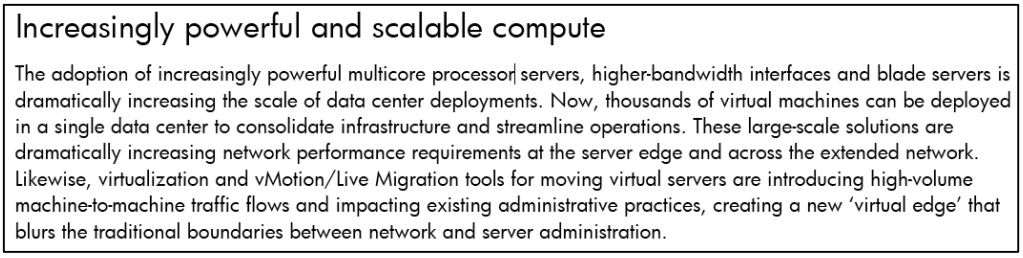
113. On information and belief, an HP '235 Accused Product Network comprises a communication network.

Figure 4 Network diagram



HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 11 (2012).

114. On information and belief, an HP '235 Accused Product Network comprises a plurality of interconnected modules adapted to direct packets of data through the network.

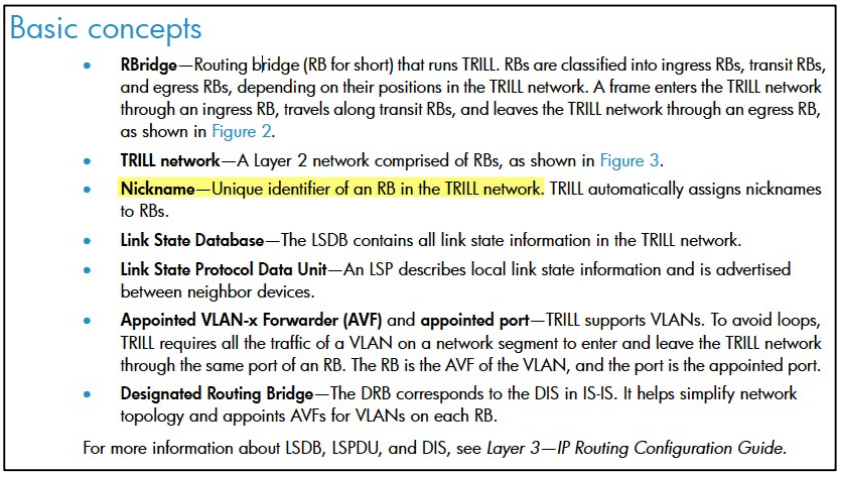


Increasingly powerful and scalable compute

The adoption of increasingly powerful multicore processor servers, higher-bandwidth interfaces and blade servers is dramatically increasing the scale of data center deployments. Now, thousands of virtual machines can be deployed in a single data center to consolidate infrastructure and streamline operations. These large-scale solutions are dramatically increasing network performance requirements at the server edge and across the extended network. Likewise, virtualization and vMotion/Live Migration tools for moving virtual servers are introducing high-volume machine-to-machine traffic flows and impacting existing administrative practices, creating a new 'virtual edge' that blurs the traditional boundaries between network and server administration.

HP FlexFabric Reference Architecture Overview, HP TECHNICAL WHITE PAPER, At 2 (2012).

115. On information and belief, modules within an HP '235 Accused Product Network are identified according to identification numbers contained within a first addressing domain of a first model layer independent and separate from a second addressing domain of a second model layer used to identify modules which forward and receive the packets of data outside the network. For example, each RBridge within a FlexFabric network is assigned a unique Nickname, which is a unique identification number that is independent of the MAC address, and can be assigned to different network topologies.



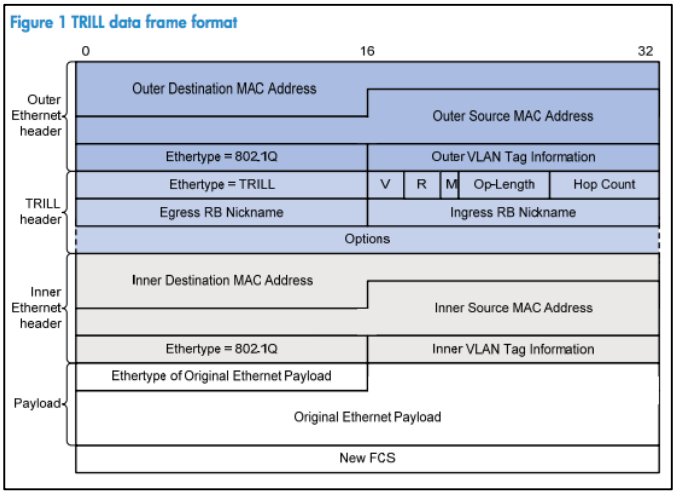
Basic concepts

- **RBridge**—Routing bridge (RB for short) that runs TRILL. RBs are classified into ingress RBs, transit RBs, and egress RBs, depending on their positions in the TRILL network. A frame enters the TRILL network through an ingress RB, travels along transit RBs, and leaves the TRILL network through an egress RB, as shown in Figure 2.
- **TRILL network**—A Layer 2 network comprised of RBs, as shown in Figure 3.
- **Nickname**—Unique identifier of an RB in the TRILL network. TRILL automatically assigns nicknames to RBs.
- **Link State Database**—The LSDB contains all link state information in the TRILL network.
- **Link State Protocol Data Unit**—An LSP describes local link state information and is advertised between neighbor devices.
- **Appointed VLAN-x Forwarder (AVF)** and **appointed port**—TRILL supports VLANs. To avoid loops, TRILL requires all the traffic of a VLAN on a network segment to enter and leave the TRILL network through the same port of an RB. The RB is the AVF of the VLAN, and the port is the appointed port.
- **Designated Routing Bridge**—The DRB corresponds to the DIS in IS-IS. It helps simplify network topology and appoints AVFs for VLANs on each RB.

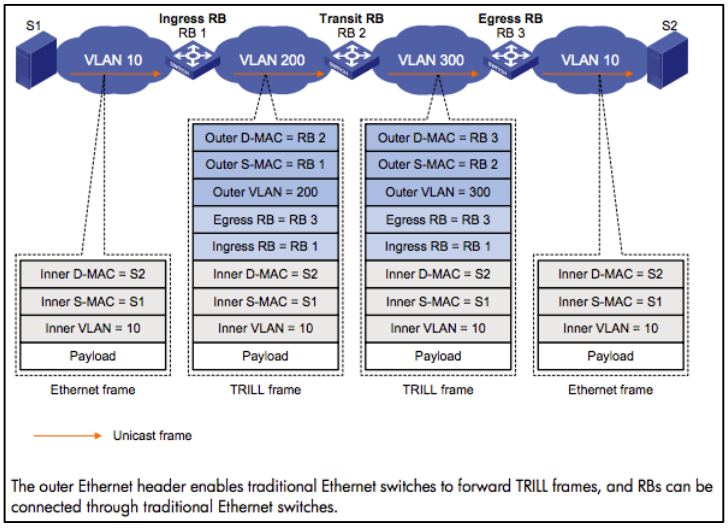
For more information about LSDB, LSPDU, and DIS, see *Layer 3—IP Routing Configuration Guide*.

HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 1 (2012) (highlighting added).

116. On information and belief, the first model layer used in an HP '235 Accused Product Network is an improvement to, and is lower than, a physical layer of the OSI reference model. For example, data packets entering a FlexFabric network, which already include headers from higher layers, are further wrapped/encapsulated within a TRILL header.

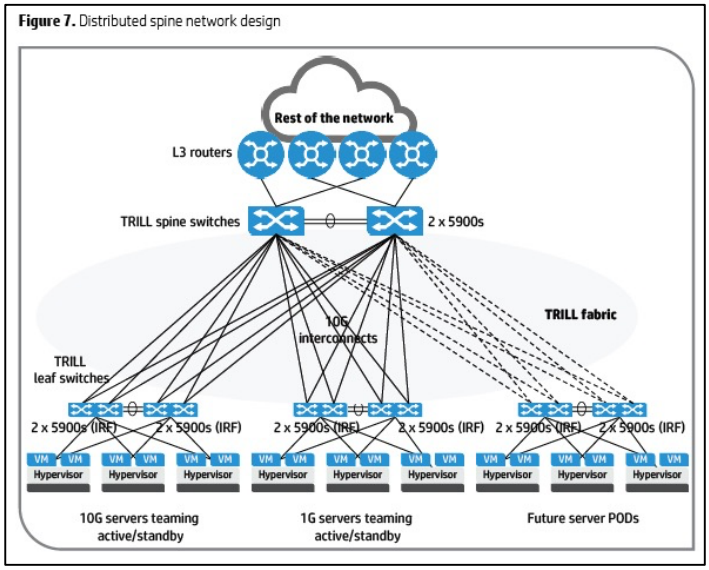


HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 2 (2012).



HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 3 (2012).

117. On information and belief, the second model layer used in an HP '235 Accused Product Network is higher than a physical layer of the OSI reference model. For example, the edge switches in an HP '235 Accused Product Network can use IP addresses to route data packets outside of a FlexFabric network, and the IP address layer is higher than a physical layer of the OSI model.



Guidelines for deploying TRILL in an HP data center, HP ARCHITECTURE GUIDE (Aug. 2015), at 6.

118. By making, using, testing, offering for sale, and/or selling communication network products and services, including but not limited to the HP ’235 Accused Products, HP has injured Dunti and is liable to Dunti for directly infringing one or more claims of the ’235 patent, including at least claim 1, pursuant to 35 U.S.C. § 271(a).

119. On information and belief, HP also indirectly infringes the ’235 patent by actively inducing infringement under 35 U.S.C. § 271(b).

120. On information and belief, HP has had knowledge of the ’235 patent since at least the date of service of this Complaint or shortly thereafter, and on information and belief, HP knew of the ’235 patent and knew of its infringement, including by way of this lawsuit.

121. On information and belief, HP intended to induce patent infringement by third-party customers and users of the HP ’235 Accused Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. HP specifically intended and was aware that the normal and customary use of the accused products would infringe the ’235 patent. HP performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the ’235 patent and with the knowledge that the induced acts would constitute infringement.

For example, HP provides the HP ’235 Accused Products, which are capable of operating in a manner that infringes one or more claims of the ’235 patent, including at least claim 1, and HP further provides documentation and training materials that cause customers of the HP ’235 Accused Products to utilize the products and services in a manner that directly infringes one or more claims of the ’235 patent. By providing instruction and training to customers on how to use the HP ’235 Accused Products, HP specifically intended to induce infringement of the ’235 patent, including at least claim 1. On information and belief, HP engaged in such inducement to promote the sales of the HP ’235 Accused Products and to actively induce its customers to infringe the ’235 patent. Accordingly, HP has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the ’235 patent, knowing that such use constitutes infringement of the ’235 patent.

122. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the ’235 patent.

123. As a result of HP’s infringement of the ’235 patent, Dunti has suffered monetary damages, and seeks recovery in an amount adequate to compensate for HP’s infringement, but in no event less than a reasonable royalty for the use made of the invention by HP together with interest and costs as fixed by the Court.

COUNT IV
INFRINGEMENT OF U.S. PATENT NO. 6,643,286

124. Dunti restates and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

125. U.S. Patent No. 6,643,286 (“the ’286 patent”), entitled “Modular Switches Interconnected Across a Communication Network to Achieve Minimal Address Mapping or Translation Between Termination Devices,” was filed on May 14, 1999. Dunti is the owner by assignment of the ’286 patent. A true and correct copy of the ’286 patent is attached hereto as Exhibit D. The ’286 patent claims a specific architecture, system, and method for efficiently

transferring packets of data across a communication network with hierarchical levels of high speed switches throughout the network.

126. The ’286 patent has been cited by fourteen issued United States patents and published patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the ’286 patent as relevant prior art.

- Google, Inc.;
- Ciena Corporation;
- Advanced Micro Devices, Inc.; and
- Fujitsu Ltd.

127. The ’286 patent teaches, for example, an addressing and distributed routing mechanism used by forwarding modules within a network that perform fast decoding to forward data packets, thereby reducing the number of full network address mapping/translation operations as the packet traverses the network. It claims a technical solution to a problem unique to computer networks—quickly and efficiently transmitting data packets through a computer network without needing to perform a full network address mapping/translation operation at every intermediate node.

128. The forwarding modules of the ’286 patent are topologically related to one another based on their position within the network and can perform adaptive fast forwarding of packets across the network due to an awareness of their position or location with respect to the network.

129. The adaptive fast forwarding occurs through decoding operations using a series of comparisons within only select switches. An entry end switch wraps entering data packets with internal control information that includes an originating identification number of the entry end switch and an identification number of the exit end switch. The wrapped packet can then be forwarded through the structured network without performing full network address translation operations at each hop. When the packet arrives at the exit end switch, the internal control information of the network is stripped from the packet, and a mapping table is used to forward

the packet to a destination termination device connected to the exit end switch. This full network address translation at the exit end switch bridges the gap between the structured network and any external protocol or domain.

130. HP makes, uses, sells, and/or offers for sale in the United States products and/or services relating to network communications.

131. HP makes, uses, sells, offers to sell, and/or imports the HP FlexFabric data center switches, including but not limited to the HP 5900 series switches, the HP 5920 series switches, the HP 5930 series switches, the HP 5950 series switches, the HP 5700 series switches, the HP 7900 series switches, the HP 10500 series switches, the HP 11900 series switches, and the HP 12900 series switches (collectively, "the HP FlexFabric Switches").

132. HP makes, uses, sells, offers to sell, and/or imports the HP Intelligent Management Center Enterprise Software Platform ("HP Intelligent Management Center").

133. HP makes, uses, sells, offers to sell, and/or imports the HP FlexFabric Switches and the HP Intelligent Management Center (collectively, the HP '286 Accused Products").

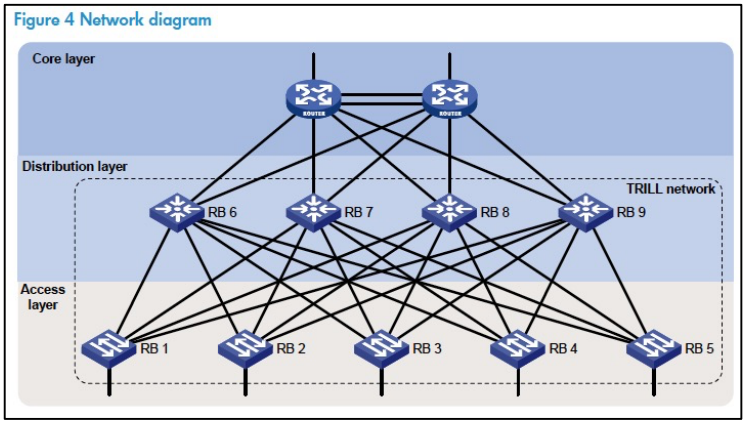
134. HP makes, uses, sells, and/or offers to sell networks comprised of the HP '286 Accused Products ("an HP '286 Accused Product Network").

135. On information and belief, an HP '286 Accused Product Network implements at least HP's FlexFabric technology and/or the TRILL protocol.

> **HP emphasizes standards with FlexNetwork**
>
> Shaikh stressed that HP's FlexNetwork architecture is all about embracing industry standards. He added that the architecture will be supporting the TRILL standard as a replacement for spanning tree. Rival vendor Cisco has its own implementation of TRILL called FabricPath.

Kerner, Sean Michael, *HP Launches FlexNetwork Architecture*, ENTERPRISE NETWORKING PLANET (May 9, 2011), available at http://www.enterprisenetworkingplanet.com/datacenter/HP-Launches-FlexNetwork-Architecture-3933026.htm (accessed Sept. 6, 2016).

136. On information and belief, an HP '286 Accused Product Network comprises a communication network.

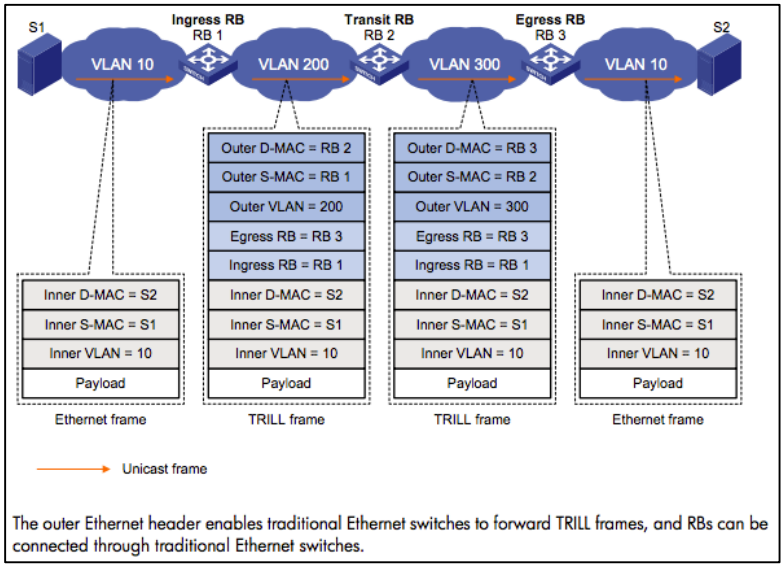


HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 11 (2012).

137. On information and belief, an HP '286 Accused Product Network comprises an entry end switch.

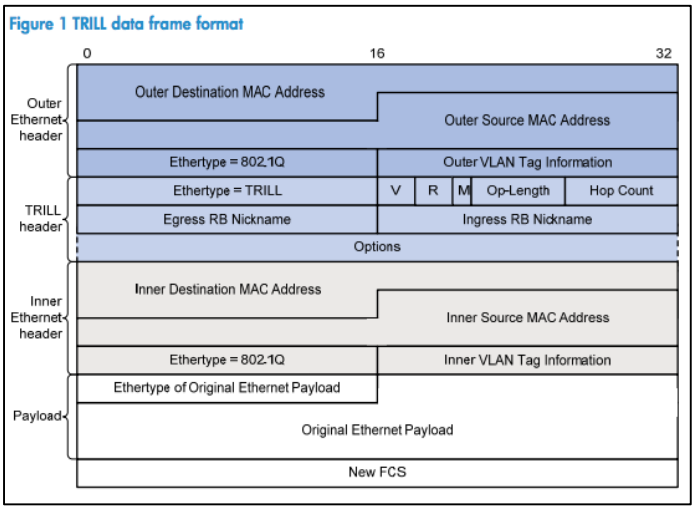
138. On information and belief, an HP '286 Accused Product Network comprises an exit end switch, which is selectably coupled to multiple termination devices including at least one exit termination device.

139. On information and belief, an HP '286 Accused Product Network comprises multiple intermediate switches coupled between the entry end switch and the exit end switch. For example, the figure below shows an entry end switch (i.e., ingress RBridge RB1), an exit end switch (i.e., egress RBridge RB3), and an intermediate switch (i.e., transit RBridge RB2) in between them. A FlexFabric network can include multiple intermediate RBridges and multiple hosts (e.g., S2) connected to an egress RBridge.



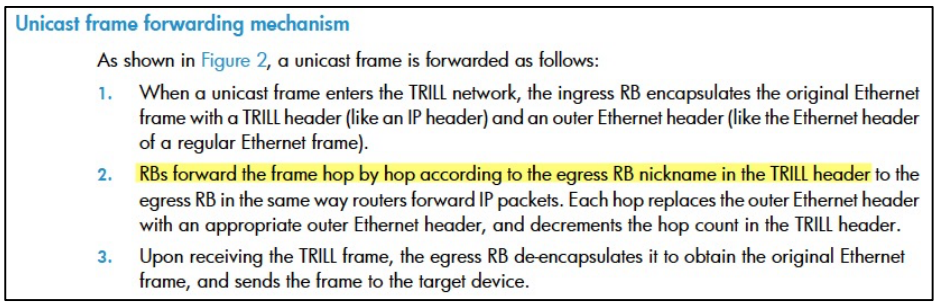
HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 3 (2012).

140. On information and belief, an entry end switch in an HP '286 Accused Product Network compiles a packet that contains a destination address of the exit end switch. For example, an entry end switch (i.e., ingress RBridge) encapsulates an incoming data packet within a TRILL header and an Outer Ethernet header. The TRILL header includes an "Egress RB Nickname" field, which contains the unique RBridge Nickname of the exit end switch (i.e., egress RBridge).



HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 2 (2012).

141. On information and belief, in an HP '286 Accused Product Network, the packet is forwarded through the plurality of intermediate switches with each intermediate switch having an identification number which points the packet to a successive one of the plurality of intermediate switches and finally to the exit end switch which performs the entirety of all translation needed by the communication network to route the packet from the exit end switch to the exit termination device. For example, each intermediate switch (i.e., intermediate RBridge) uses the Egress RBridge Nickname within the TRILL header to point the packet to the next RBridge.



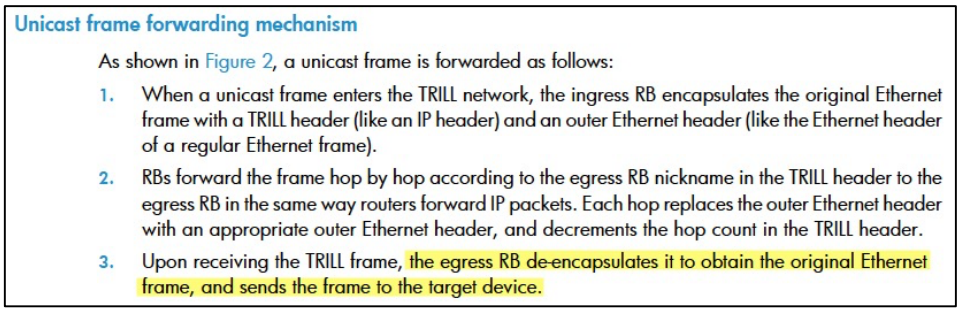
Unicast frame forwarding mechanism

As shown in Figure 2, a unicast frame is forwarded as follows:

1. When a unicast frame enters the TRILL network, the ingress RB encapsulates the original Ethernet frame with a TRILL header (like an IP header) and an outer Ethernet header (like the Ethernet header of a regular Ethernet frame).
2. RBs forward the frame hop by hop according to the egress RB nickname in the TRILL header to the egress RB in the same way routers forward IP packets. Each hop replaces the outer Ethernet header with an appropriate outer Ethernet header, and decrements the hop count in the TRILL header.
3. Upon receiving the TRILL frame, the egress RB de-encapsulates it to obtain the original Ethernet frame, and sends the frame to the target device.

HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 3 (2012) (highlighting added).

142. In addition, on information and belief, the exit end switch (i.e., egress RBridge) performs the entirety of all translation needed by the FlexFabric network to route the packet from the egress RBridge to the exit termination device (i.e., the packet's final destination) when it forwards the original frame to its destination outside the FlexFabric network.



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HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 3 (2012) (highlighting added).

143. By making, using, testing, offering for sale, and/or selling communication network products and services, including but not limited to the HP '286 Accused Products, HP has injured Dunti and is liable to Dunti for directly infringing one or more claims of the '286 patent, including at least claim 6, pursuant to 35 U.S.C. § 271(a).

144. On information and belief, HP also indirectly infringes the '286 patent by actively inducing infringement under 35 U.S.C. § 271(b).

145. On information and belief, HP has had knowledge of the '286 patent since at least the date of service of this Complaint or shortly thereafter, and on information and belief, HP knew of the '286 patent and knew of its infringement, including by way of this lawsuit.

146. On information and belief, HP intended to induce patent infringement by third-party customers and users of the HP '286 Accused Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. HP specifically intended and was aware that the normal and customary use of the accused products would infringe the '286 patent. HP performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '286 patent and with the knowledge that the induced acts would constitute infringement. For example, HP provides the HP '286 Accused Products, which are capable of operating in a manner that infringes one or more claims of the '286 patent, including at least claim 6, and HP further provides documentation and training materials that cause customers of the HP '286 Accused Products to utilize the products and services in a manner that directly infringes one or more claims of the '286 patent. By providing instruction and training to customers on how to use the HP '286 Accused Products, HP specifically intended to induce infringement of the '286 patent, including at least claim 6. On information and belief, HP engaged in such inducement to promote the sales of the HP '286 Accused Products and to actively induce its customers to infringe the '286 patent. Accordingly, HP has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '286 patent, knowing that such use constitutes infringement of the '286 patent.

147. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the ’286 patent.

148. As a result of HP’s infringement of the ’286 patent, Dunti has suffered monetary damages, and seeks recovery in an amount adequate to compensate for HP’s infringement, but in no event less than a reasonable royalty for the use made of the invention by HP together with interest and costs as fixed by the Court.

COUNT V
INFRINGEMENT OF U.S. PATENT NO. 7,778,259

149. Dunti restates and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

150. U.S. Patent No. 7,778,259 (“the ’259 patent”), entitled “Network Packet Transmission Mechanism,” was filed on June 11, 2004. Dunti is the owner by assignment of the ’259 patent. A true and correct copy of the ’259 patent is attached hereto as Exhibit E.

151. The ’259 patent has been cited by ten United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the ’259 patent as relevant prior art:

- International Business Machines Corporation;
- Toshiba Corporation;
- Nicira, Inc.; and
- The University of Zurich.

152. The ’259 patent teaches, for example, a communication network that efficiently transfers data packets by using an independent numbering mechanism with distinct identification addresses, referred to as transport IDs, for transporting packets across a network. This solution eliminates complex lookup operations at intermediate modules, resulting in faster transmission across the network.

153. Each packet in the network of the ’259 patent is embedded with unique destination transport ID information when the packet enters the network and carries this routing information along with the data. This transport ID-based packet transmission mechanism utilizes

the logical structure in the network, which enables simple distributed packet direction operations as the packet traverses the network.

154. HP makes, uses, sells, and/or offers for sale in the United States products and/or services relating to network communications.

155. HP makes, uses, sells, offers to sell, and/or imports the HP FlexFabric data center switches, including but not limited to the HP 5900 series switches, the HP 5920 series switches, the HP 5930 series switches, the HP 5950 series switches, the HP 5700 series switches, the HP 7900 series switches, the HP 10500 series switches, the HP 11900 series switches, and the HP 12900 series switches (collectively, "the HP FlexFabric Switches").

156. HP makes, uses, sells, offers to sell, and/or imports the HP Intelligent Management Center Enterprise Software Platform ("HP Intelligent Management Center").

157. HP makes, uses, sells, offers to sell, and/or imports the HP FlexFabric Switches and the HP Intelligent Management Center (collectively, the HP '259 Accused Products").

158. HP makes, uses, sells, and/or offers to sell networks comprised of the HP '259 Accused Products ("an HP '259 Accused Product Network").

159. On information and belief, an HP '259 Accused Product Network implements at least HP's FlexFabric technology and/or the TRILL protocol.

HP emphasizes standards with FlexNetwork

Shaikh stressed that HP's FlexNetwork architecture is all about embracing industry standards. He added that the architecture will be supporting the TRILL standard as a replacement for spanning tree. Rival vendor Cisco has its own implementation of TRILL called FabricPath.

Kerner, Sean Michael, *HP Launches FlexNetwork Architecture*, ENTERPRISE NETWORKING PLANET (May 9, 2011), available at http://www.enterprisenetworkingplanet.com/datacenter/HP-Launches-FlexNetwork-Architecture-3933026.htm (accessed Sept. 6, 2016).

HPE FlexFabric 12900 Switch Series at a glance

Next-generation modular data center core switches designed to support virtualized data centers and the evolving needs of private and public cloud deployments. Delivers unprecedented levels of performance, buffering, scale, and availability with high-density 10, 40, and 100GbE connectivity. Software-defined networking (SDN) enabled with OpenFlow 1.3, full Layer 2 and 3 features, including advanced features such as Virtual Extensible LAN (VXLAN), Transparent Interconnection of Lots of Links (TRILL), and Intelligent Resilient Framework (IRF) that provide the ability to build large, resilient switching fabrics. Also supports fully redundant and hot-swappable components to complement its other enterprise-class capabilities.

HPE Networking Product Portfolio, HPE SALES DOCUMENTATION, at 7 (last rev. July 2016).

160. On information and belief, the HP '259 Accused Products perform a method of transporting packets across a network.

Increasingly powerful and scalable compute

The adoption of increasingly powerful multicore processor servers, higher-bandwidth interfaces and blade servers is dramatically increasing the scale of data center deployments. Now, thousands of virtual machines can be deployed in a single data center to consolidate infrastructure and streamline operations. These large-scale solutions are dramatically increasing network performance requirements at the server edge and across the extended network. Likewise, virtualization and vMotion/Live Migration tools for moving virtual servers are introducing high-volume machine-to-machine traffic flows and impacting existing administrative practices, creating a new 'virtual edge' that blurs the traditional boundaries between network and server administration.

HP FlexFabric Reference Architecture Overview, HP TECHNICAL WHITE PAPER, At 2 (2012).

Modular Core, aggregation switches

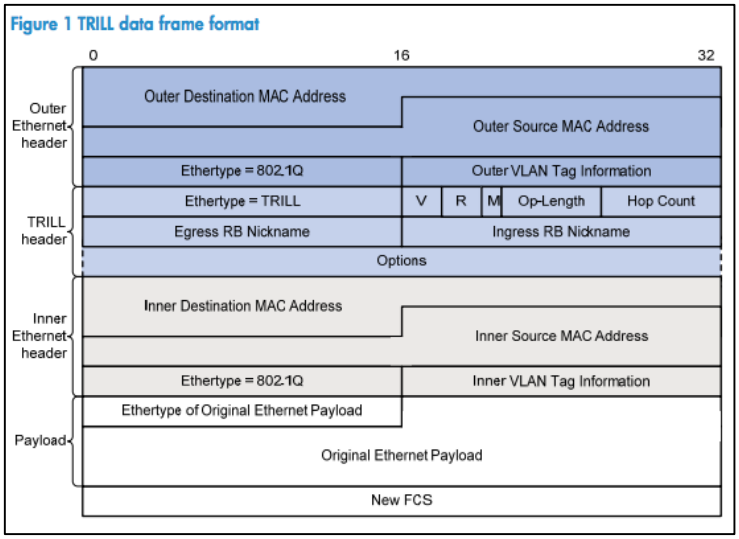
7	HPE FlexFabric 12900 Switch Series
8	HPE FlexFabric 12500 Switch Series
9	HPE FlexFabric 11900 Switch Series
9	HPE FlexFabric 7900 Switch Series

Top-of-rack network access switches

10	HPE FlexFabric 5930 Switch Series
10	HPE FlexFabric 5920 Switch Series
11	HPE FlexFabric 5900 Switch Series
11	HPE FlexFabric 5900CP Switch Series
11	HPE FlexFabric 5900v Virtual Switch Series
12	HPE FlexFabric 5830 Switch Series
12	HPE FlexFabric 5820 Switch Series
13	HPE FlexFabric 5800 Switch Series
14	HPE FlexFabric 5700 Switch Series

HPE Networking Product Portfolio, HPE SALES DOCUMENTATION, at Table of Contents, 2 (last rev. July 2016).

161. On information and belief, the HP '259 Accused Products embed a destination transport identification to a data packet when the data packet enters the network. For example, data packets entering a FlexFabric network are encapsulated within a TRILL header, which includes, for example, an "Egress RBridge Nickname" field that contains the RBridge Nickname of the exit end switch.



HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 2 (2012).

162. On information and belief, the HP '259 Accused Products connect a plurality of routing switches within a network with the routing switches grouped into two or more groups within the network based on network topology. For example, in a FlexFabric network, the HP '259 Accused Products are grouped into ingress RBridges, transit RBridges, and egress RBridges based on whether they are entry switches, intermediate switches, or exit switches.

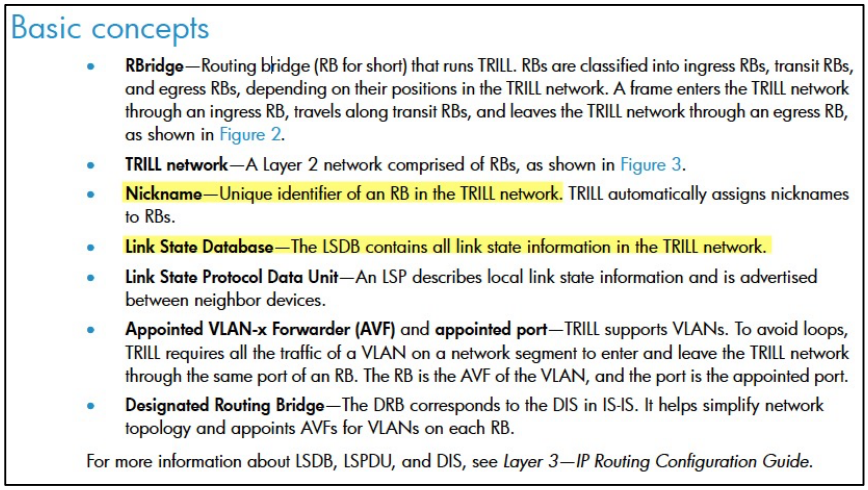
Basic concepts

- **RBridge**—Routing bridge (RB for short) that runs TRILL. RBs are classified into ingress RBs, transit RBs, and egress RBs, depending on their positions in the TRILL network. A frame enters the TRILL network through an ingress RB, travels along transit RBs, and leaves the TRILL network through an egress RB, as shown in Figure 2.
- **TRILL network**—A Layer 2 network comprised of RBs, as shown in Figure 3.
- **Nickname**—Unique identifier of an RB in the TRILL network. TRILL automatically assigns nicknames to RBs.
- **Link State Database**—The LSDB contains all link state information in the TRILL network.
- **Link State Protocol Data Unit**—An LSP describes local link state information and is advertised between neighbor devices.
- **Appointed VLAN-x Forwarder (AVF)** and **appointed port**—TRILL supports VLANs. To avoid loops, TRILL requires all the traffic of a VLAN on a network segment to enter and leave the TRILL network through the same port of an RB. The RB is the AVF of the VLAN, and the port is the appointed port.
- **Designated Routing Bridge**—The DRB corresponds to the DIS in IS-IS. It helps simplify network topology and appoints AVFs for VLANs on each RB.

For more information about LSDB, LSPDU, and DIS, see *Layer 3—IP Routing Configuration Guide*.

HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 1 (2012) (highlighting added).

163. On information and belief, the HP ’259 Accused Products assign a unique transport identification number to each routing switch indicative, at least in part, of the network topology. For example, each RBridge is assigned a unique RBridge Nickname, which includes a nickname priority value and a root priority value that are used in determining the topology of distribution trees within a FlexFabric network and are indicative, at least in part, of the network topology. In addition, the RBridge Nickname is part of a network topology database and adjacency tables that are built and maintained by the IS-IS protocol and, when used with the topology database and/or the adjacency tables, indicates, at least in part, the network topology.



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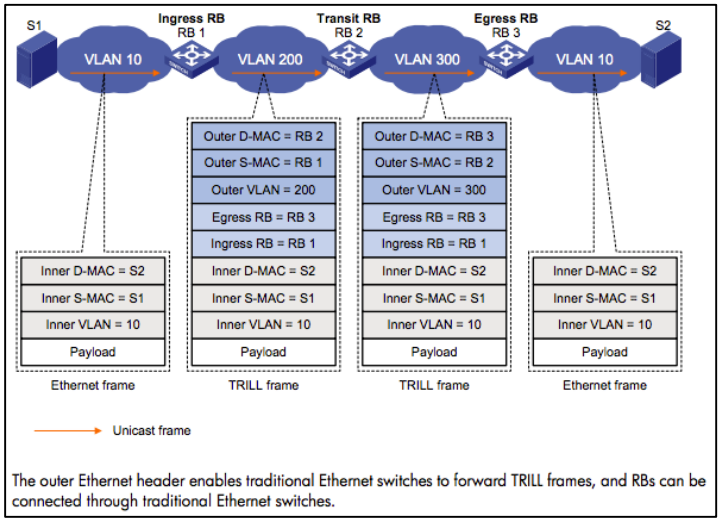
For more information about LSDB, LSPDU, and DIS, see *Layer 3—IP Routing Configuration Guide*.

HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 1 (2012) (highlighting added).

164. On information and belief, the HP ’259 Accused Products compare the destination transport identification of a packet with the transport identification of a routing switch. For example, data packets entering a FlexFabric network are encapsulated within a TRILL Header, which includes an “Egress RBridge Nickname” field that contains the RBridge Nickname of the egress RBridge. Switches running HP’s FlexFabric technology, such as the HP ’259 Accused Products, compare the value in the Egress RBridge Nickname field to values in the switches’ memory.



HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 3 (2012).

165. On information and belief, the HP '259 Accused Products forward data packets through a network based on the comparison of destination transport identification. For example, switches running HP's FlexFabric technology, such as the HP '259 Accused Products, forward encapsulated data packets using the Egress RBridge Nickname.

Unicast frame forwarding mechanism

As shown in Figure 2, a unicast frame is forwarded as follows:

1. When a unicast frame enters the TRILL network, the ingress RB encapsulates the original Ethernet frame with a TRILL header (like an IP header) and an outer Ethernet header (like the Ethernet header of a regular Ethernet frame).
2. RBs forward the frame hop by hop according to the egress RB nickname in the TRILL header to the egress RB in the same way routers forward IP packets. Each hop replaces the outer Ethernet header with an appropriate outer Ethernet header, and decrements the hop count in the TRILL header.
3. Upon receiving the TRILL frame, the egress RB de-encapsulates it to obtain the original Ethernet frame, and sends the frame to the target device.

HP 5920 & 5900 Switch Series TRILL Configuration Guide, HP CONFIGURATION GUIDE, at 3 (2012).

166. By making, using, testing, offering for sale, and/or selling communication network products and services, including but not limited to the HP '259 Accused Products, HP has injured Dunti and is liable to Dunti for directly infringing one or more claims of the '259 patent, including at least claim 9, pursuant to 35 U.S.C. § 271(a).

167. On information and belief, HP also indirectly infringes the ’259 patent by actively inducing infringement under 35 U.S.C. § 271(b).

168. On information and belief, HP has had knowledge of the ’259 patent since at least the date of service of this Complaint or shortly thereafter, and on information and belief, HP knew of the ’259 patent and knew of its infringement, including by way of this lawsuit.

169. On information and belief, HP intended to induce patent infringement by third-party customers and users of the HP ’259 Accused Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. HP specifically intended and was aware that the normal and customary use of the accused products would infringe the ’259 patent. HP performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the ’259 patent and with the knowledge that the induced acts would constitute infringement. For example, HP provides the HP ’259 Accused Products, which are capable of operating in a manner that infringes one or more claims of the ’259 patent, including at least claim 9, and HP further provides documentation and training materials that cause customers of the HP ’259 Accused Products to utilize the products and services in a manner that directly infringes one or more claims of the ’259 patent. By providing instruction and training to customers on how to use the HP ’259 Accused Products, HP specifically intended to induce infringement of the ’259 patent, including at least claim 9. On information and belief, HP engaged in such inducement to promote the sales of the HP ’259 Accused Products and to actively induce its customers to infringe the ’259 patent. Accordingly, HP has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the ’259 patent, knowing that such use constitutes infringement of the ’259 patent.

170. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the ’259 patent.

171. As a result of HP’s infringement of the ’259 patent, Dunti has suffered monetary damages, and seeks recovery in an amount adequate to compensate for HP’s infringement, but in

no event less than a reasonable royalty for the use made of the invention by HP together with interest and costs as fixed by the Court.

COUNT VI
INFRINGEMENT OF U.S. PATENT NO. 6,912,196

172. Dunti restates and incorporates by reference the preceding paragraphs of this Complaint as if fully set forth herein.

173. U.S. Patent No. 6,912,196 ("the '196 patent"), entitled "Communication Network and Protocol Which Can Efficiently Maintain Transmission Across a Disrupted Network," was filed on May 15, 2000. Dunti is the owner by assignment of the '196 patent. A true and correct copy of the '196 patent is attached hereto as Exhibit F. The '196 patent claims a specific packet architecture, communication system, and method for determining the location at which a network is disrupted, disabled, and/or severed.

174. The '196 patent has been cited by thirty-seven United States patents and patent applications as relevant prior art. Specifically, patents issued to the following companies have cited the '196 patent as relevant prior art:

- Alcatel Lucent S.A.;
- Fujitsu, Ltd.;
- Google, Inc.;
- International Business Machines Corporation;
- Samsung Electronics Co., Ltd.;
- Terascale Supercomputing, Inc.;
- Siemens AG; and
- NEC Corporation;

175. The '196 patent teaches, for example, an improved packet protocol and communication system that can determine where within a network a transmission error exists.

176. Figure 3 of the '196 patent, shown below, depicts a ring topology with multiple modules labeled "A" through "F" that communicate over two transmission channels that form a single transmission path. One channel is used for counter-clockwise data transmission, while the other channel is used for clockwise data transmission.

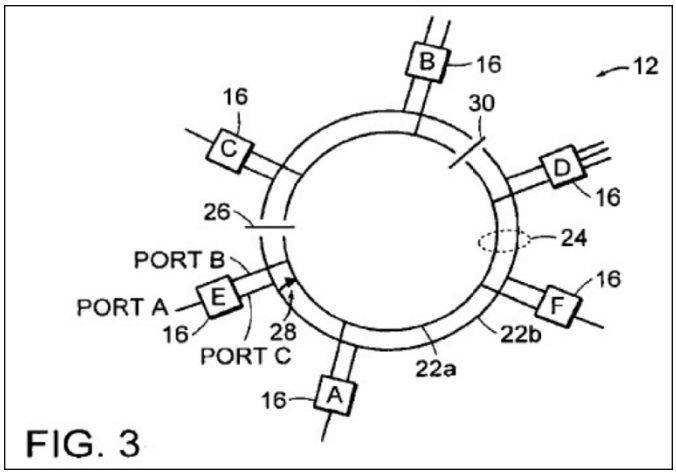


FIG. 3

'196 Patent, Fig. 3.

177. Figure 3 shows an example where the transmission path has been severed between modules C and E. In an attempted transmission from module A to module C (clockwise through module E), module E will detect the severance and notify the other modules by employing a loop-back path of the packet sent from module A back to module A. When module E detects the downstream severance, it sends control bits to the originating module A indicating the downstream error. Since receiving module E was the last module in the path before the severance, module E sends both control bits and error identification bits. The control bits are set to indicate a disruption immediately downstream of receiving module E. The error identification bits identify the receiving module E by the identification number assigned to that module.

178. HP makes, uses, sells, and/or offers for sale in the United States products and/or services relating to network communications.

179. HP makes, uses, sells, offers to sell, and/or imports routers that support the Resilient Packet Ring ("RPR") protocol, including but not limited to the HPE FlexNetwork 6600 series routers, the HPE HSR6600 series routers, the HPE HSR6800 series routers, the HP A6600 series routers, and the HP 8800 series routers (collectively, "the HP '196 Accused Products").

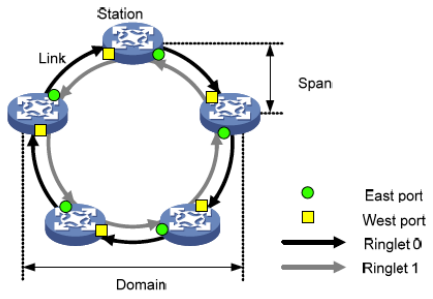
180. HP makes, uses, sells, and/or offers to sell networks comprised of the HP '196 Accused Products ("an HP '196 Accused Product Network").

181. On information and belief, an HP ’196 Accused Product Network implements at least the IEEE 802.17 Resilient Packet Ring (“RPR”) protocol.

182. On information and belief, an HP ’196 Accused Product Network comprises a communication system.

RPR is made up of dual unidirectional counter-rotating ringlets identified as Ringlet 0 and Ringlet 1, as shown in Figure 11.

Figure 11 Ring structure of RPR



HPE FlexNetwork 6600/HSR6600 Routers High Availability Configuration Guide, HPE TECHNICAL DOCUMENTATION, at 51 (2015).

183. On information and belief, an HP ’196 Accused Product Network comprises at least two transmission channels. For example, an RPR ring is made up of dual counter-rotating rings that are used to transmit data, as shown below:

Figure 12 Unicast transmission on an RPR ring

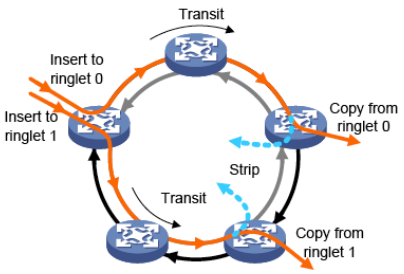


Figure 12 shows how a unicast data frame is transmitted on an RPR ringlet:

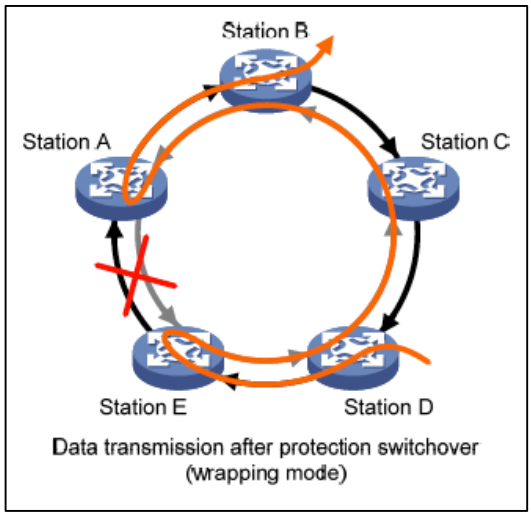
1. The source station inserts the unicast frame into the data stream on Ringlet 0 or Ringlet 1.
2. Transit stations transit the frame.
3. The frame is copied and stripped when it reaches the destination station or when its time to live (TTL) expires.

Different from traditional ring technologies where unicast frames are removed from the ring at the source station, RPR adopts destination stripping to remove unicast frames from the ring at the destination station. This increases bandwidth utilization and spatial bandwidth reuse efficiency.

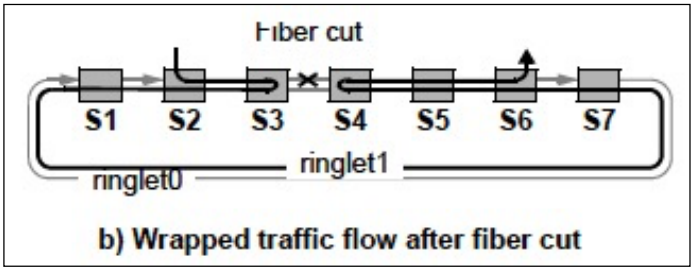
HPE FlexNetwork 6600/HSR6600 Routers High Availability Configuration Guide, HPE TECHNICAL DOCUMENTATION, at 52 (2015).

184. On information and belief, an HP '196 Accused Product Network comprises a receiving module connected to the transmission channels, which can be seen, for example, in Figure 12 shown directly above.

185. On information and belief, a receiving module in an HP '196 Accused Product Network includes a loop-back conductor that connects the two transmission channels. For example, each receiving module can receive packets on either the west or the east interface and can transmit packets out of either the west or the east interface, such that a packet received on the east interface can be looped back and sent out on the east interface. RPR networks use wrapping protection to avoid disrupted links.



HPE FlexNetwork 6600/HSR6600 Routers High Availability Configuration Guide, HPE TECHNICAL DOCUMENTATION, at 55 (2015).



IEEE Std 802.17-2011, *Part 17: Resilient Packet Ring (RPR) Access Method and Physical Layer Specifications*, IEEE STANDARDS ASSOCIATION (Sept. 20, 2011), at 279.

186. On information and belief, a receiving module in an HP '196 Accused Product Network returns a packet containing error bits if one or more of the transmission channels downstream of the receiving module is disturbed. For example, when a span is determined to be an edge (i.e., the transmission channel downstream of the module is disturbed), topology and protection ("TP") frames, which are control frames, are sent to report the edge. The payload of a TP frame includes two fields that indicate whether an edge is present on either the west span or the east span of a station.

11.3.1 Topology and protection (TP) frame format

The fixed-length TP frame is identified by the *controlType* field value of CT_TOPO_PROT and is broadcast to minimize transmission delays. The TP frame contents include information for signaling span protection state, for discovery of the physical topology of the ring, and for reporting station preferences information, as specified in Figure 11.6.

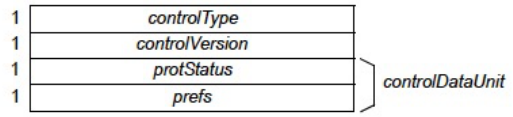


Figure 11.6—TP payload

IEEE Std 802.17-2011, *Part 17: Resilient Packet Ring (RPR) Access Method and Physical Layer Specifications*, IEEE STANDARDS ASSOCIATION (Sept. 20, 2011), at 292.

11.3.1.3 *protStatus*

The subfields of the 8-bit *protStatus* (protection status) field are shown in Figure 11.7 and described thereafter.

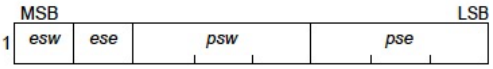


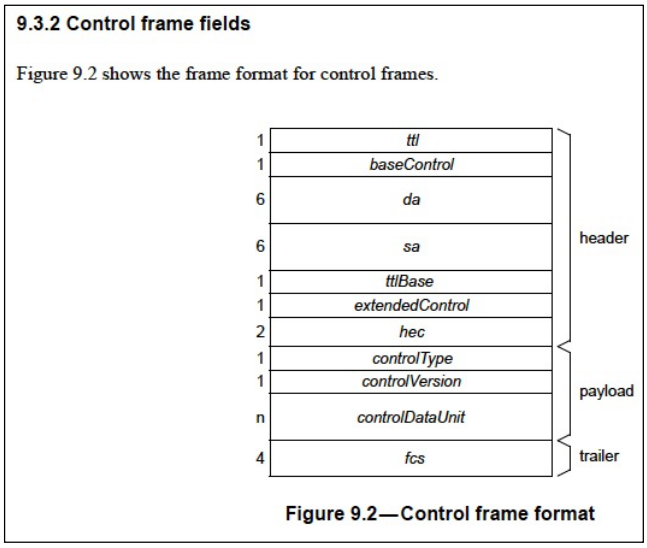
Figure 11.7—*protStatus* field format

11.3.1.3.1 *esw*: A (edge state, west) bit that indicates whether an edge is present on the west span of a station. A value of 0 indicates that there is no edge, whereas a value of 1 indicates that an edge is present.

11.3.1.3.2 *ese*: A (edge state, east) bit that indicates whether an edge is present on the east span of a station. A value of 0 indicates that there is no edge, whereas a value of 1 indicates that an edge is present.

IEEE Std 802.17-2011, *Part 17: Resilient Packet Ring (RPR) Access Method and Physical Layer Specifications*, IEEE STANDARDS ASSOCIATION (Sept. 20, 2011), at 292-93.

187. On information and belief, the error bits sent by a receiving module in an HP '196 Accused Product Network comprise a unique identification number assigned to the receiving module to note the receiving module was the last of a plurality of modules that received the packet destined for a destination module dissimilar from and located downstream of the receiving module. For example, a control frame in an RPR network includes the source address of the originating module, which is a unique identifier that identifies the module sending the error bits indicating that an edge is present at the module.



IEEE Std 802.17-2011, *Part 17: Resilient Packet Ring (RPR) Access Method and Physical Layer Specifications*, IEEE STANDARDS ASSOCIATION (Sept. 20, 2011), at 206.

188. By making, using, testing, offering for sale, and/or selling communication network products and services, including but not limited to the HP '196 Accused Products, HP has injured Dunti and is liable to Dunti for directly infringing one or more claims of the '196 patent, including at least claim 10, pursuant to 35 U.S.C. § 271(a).

189. On information and belief, HP also indirectly infringes the '196 patent by actively inducing infringement under 35 U.S.C. § 271(b).

190. On information and belief, HP has had knowledge of the '196 patent since at least the date of service of this Complaint or shortly thereafter, and on information and belief, HP knew of the '196 patent and knew of its infringement, including by way of this lawsuit.

191. On information and belief, HP intended to induce patent infringement by third-party customers and users of the HP '196 Accused Products and had knowledge that the inducing acts would cause infringement or was willfully blind to the possibility that its inducing acts would cause infringement. HP specifically intended and was aware that the normal and customary use of the accused products would infringe the '196 patent. HP performed the acts that constitute induced infringement, and would induce actual infringement, with the knowledge of the '196 patent and with the knowledge that the induced acts would constitute infringement. For example, HP provides the HP '196 Accused Products, which are capable of operating in a manner that infringes one or more claims of the '196 patent, including at least claim 10, and HP further provides documentation and training materials that cause customers of the HP '196 Accused Products to utilize the products and services in a manner that directly infringes one or more claims of the '196 patent. By providing instruction and training to customers on how to use the HP '196 Accused Products, HP specifically intended to induce infringement of the '196 patent, including at least claim 10. On information and belief, HP engaged in such inducement to promote the sales of the HP '196 Accused Products and to actively induce its customers to infringe the '196 patent. Accordingly, HP has induced and continues to induce users of the accused products to use the accused products in their ordinary and customary way to infringe the '196 patent, knowing that such use constitutes infringement of the '196 patent.

192. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '196 patent.

193. As a result of HP's infringement of the '196 patent, Dunti has suffered monetary damages, and seeks recovery in an amount adequate to compensate for HP's infringement, but in no event less than a reasonable royalty for the use made of the invention by HP together with interest and costs as fixed by the Court.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff Dunti respectfully requests that this Court enter:

A. A judgment in favor of Plaintiff Dunti that HP has infringed, either literally and/or under the doctrine of equivalents, the ’462 patent, the ’701 patent, the ’235 patent, the ’286 patent, the ’259 patent, and/or the ’196 patent;

B. An award of damages resulting from HP’s acts of infringement in accordance with 35 U.S.C. § 284;

C. A judgment and order requiring HP to provide accountings and to pay supplemental damages to Dunti, including, without limitation, prejudgment and post-judgment interest; and

D. Any and all other relief to which Dunti may show itself to be entitled.

JURY TRIAL DEMANDED

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Dunti requests a trial by jury of any issues so triable by right.

Dated: September 13, 2016

Respectfully submitted,

/s/ Matt Olavi_____
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