

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

PARITY NETWORKS LLC, <i>Plaintiff,</i> v. CISCO SYSTEMS, INC., <i>Defendant.</i>	§ § § § § § § § § §	CIVIL ACTION NO. 6:19-cv-00458 JURY TRIAL DEMANDED
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ORIGINAL COMPLAINT

Plaintiff Parity Networks LLC (“Plaintiff” or “Parity Networks”), by and through its attorneys, for its Original Complaint against Cisco Systems, Inc. (“Defendant” or “Cisco”), and demanding trial by jury, hereby alleges as follows:

I. NATURE OF THE ACTION

1. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 271, *et seq.*, to enjoin and obtain damages resulting from Defendant’s unauthorized use, sale, and offer to sell in the United States of products, methods, processes, services and/or systems that infringe Parity Networks’ United States patents, as described herein.

2. Cisco manufactures, provides, uses, sells, offers for sale, imports, and/or distributes infringing products and services; and encourages others to use its products and services in an infringing manner, including their customers, as set forth herein.

3. Parity Networks seeks past and future damages and prejudgment and post judgment interest for Cisco’s past infringement of the Patents-in-Suit, as defined below.

II. PARTIES

4. Plaintiff Parity Networks is a limited liability company organized and existing under the laws of the State of Texas. Parity Networks' registered agent for service of process in Texas is InCorp Services, Inc., 815 Brazos Street, Suite 500, Austin, Texas 78701.

5. On information and belief, Defendant Cisco is a corporation organized under the laws of California, having established places of business in this District at 12515-3 Research Park Loop, Austin, TX 78759 and 18615 Tuscany Stone, San Antonio, Texas 78258. Cisco's registered agent for service of process in Texas is Prentice Hall Corporation System, 211 E. 7th Street, Suite 620, Austin, TX 78701-3218.

III. JURISDICTION AND VENUE

6. This is an action for patent infringement which arises under the Patent Laws of the United States, namely, 35 U.S.C. §§ 271, 281, 283, 284 and 285.

7. This Court has exclusive jurisdiction over the subject matter of this action under 28 U.S.C. §§ 1331 and 1338(a).

8. On information and belief, venue is proper in this District pursuant to 28 U.S.C. §§ 1391(b), 1391(c), and 1400(b) because Defendant has a regular and established place of business in this district, transacted business in this District, and has committed and/or induced acts of patent infringement in this district.

9. On information and belief, Defendant Cisco is subject to this Court's specific and general personal jurisdiction pursuant to due process and/or the Texas Long Arm Statute, due at least to its substantial business in this forum, including: (i) at least a portion of the infringements alleged herein; and (ii) regularly doing or soliciting business, engaging in other persistent courses of conduct, and/or deriving substantial revenue from goods and services provided to individuals in Texas and in this Judicial District.

IV. FACTUAL ALLEGATIONS

PATENTS-IN-SUIT

10. Parity Networks is the owner of all right, title and interest in and to U.S. Patent No. 6,870,849 (the “849 Patent”), entitled “Apparatus and Method for Efficient Hashing in Networks” and issued on March 22, 2005.

11. Parity Networks is the owner of all right, title and interest in and to U.S. Patent No. 6,915,445 (the “445 Patent”), entitled “Fault-Protection Mechanism for Protecting Multi-Protocol-Label Switching (MPLS) Capability Within a Distributed Processor Router Operating in an MPLS Network” and issued on July 5, 2005.

12. Parity Networks is the owner of all right, title and interest in and to U.S. Patent No. 7,155,535 (the “535 Patent”), entitled “Software Apparatus for Distributing and Providing Fault-Tolerance to Path-Vector Routing Protocols” and issued on December 26, 2006.

13. Together, the foregoing patents are referred to herein as the “Patents-in-Suit.” Parity Networks is the assignee of the Patents-in-Suit and has all rights to sue for infringement and collect past and future damages for the infringement thereof.

DEFENDANT’S ACTS

14. Cisco is a world leader in data networking, and provides hardware and software directed to switching and routing network data to its customers in the United States, including in this District.

15. Among a few others, Cisco implements the following four network software systems on its switches and routers: Cisco IOS, Cisco IOS XR, Cisco IOS XE, and Cisco NX-OS. <https://www.cisco.com/c/en/us/products/ios-nx-os-software/index.html>.

16. In that regard, Cisco makes, uses and sells routers and switches running Cisco IOS network software. For example, Cisco makes, uses, sells and offers for sale the Cisco 900 Series

and 1000 Series Aggregation Service Routers (“ASRs”), also known as the Cisco ASR 900 Series Routers and ASR 1000 Series Routers.

17. Cisco ASR 900 Series routers are supported by Cisco IOS XE Software.

18. The Cisco ASR 903 Router is supported as of Cisco IOS XE Software Release 3.5.0S. The Cisco ASR 902 Router is supported as of Cisco IOS XE Software Release 3.12.0S. The Cisco ASR 907 Router is supported as of Cisco IOS XE Software Release 3.16.1aS. The Cisco ASR 914 Router is supported as of Cisco IOS XE Software Release 16.5.1v1.

19. ASR 900 Series routers support the Cisco IOS software activation feature. With this capability, Cisco IOS Software feature sets can be activated with software licenses, supporting a “pay as services grow” model.

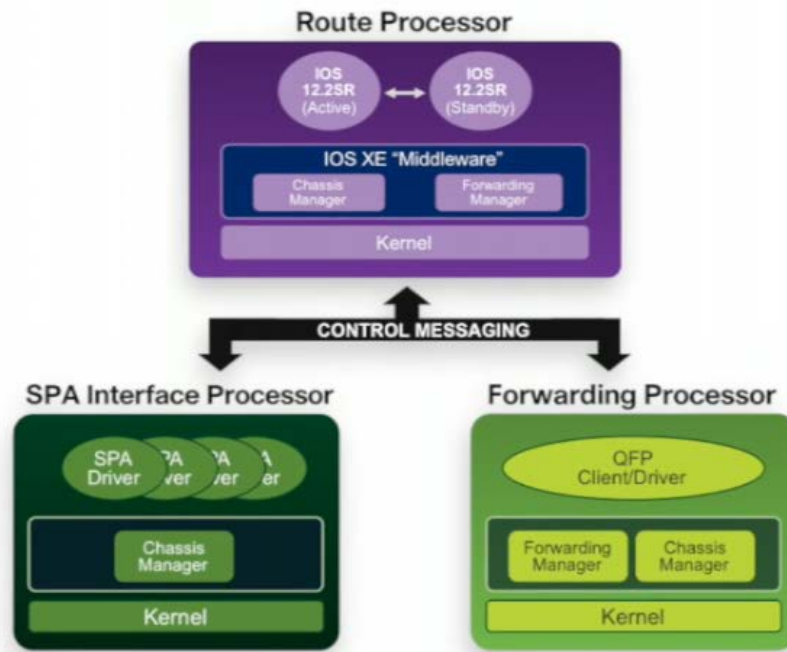
20. ASR 900 Series routers support Multiprotocol Label Switching (MPLS). MPLS is a high-performance packet forwarding technology that integrates the performance and traffic management capabilities of data link layer (Layer 2) switching with the scalability, flexibility, and performance of network-layer (Layer 3) routing.

21. ASR 900 Series routers support nonstop routing (NSR) Label Distribution Protocol (LDP). The NSR LDP Support feature allows the Label Distribution Protocol to continue to operate across a Router Processor (RP) failure in redundant systems, without losing peer sessions. Before the introduction of NSR, LDP sessions with peers reset if an RP failover (in a redundant system) or a Cisco In-Service Software Upgrade (ISSU) occurred. When peers reset, traffic is lost while the session is down. Protocol reconvergence occurs after the session is reestablished.

22. When NSR is enabled, RP failover and Cisco ISSU events are not visible to the peer device, and the LDP sessions that were established prior to failover do not flap. The protocol

state learned from the peers persists across an RP failover or Cisco ISSU event and does not need to be relearned.

23. The ASR 1000 Series Router is implemented with the IOS XE operating system, aspects of which are depicted below by Cisco.



<https://www.cisco.com/c/en/us/products/routers/asr-1000-series-aggregation-services-routers/index.html>. Cisco lists several products running IOS XE, including the ASR 1000 series. <https://www.cisco.com/c/en/us/products/ios-nx-os-software/ios-xe/index.html#~stickynav=2>

24. Cisco describes its IOS XE Software as designed to provide modular packaging, feature velocity, and powerful resiliency.

25. The Cisco ASR 1000 Series Router is described by Cisco as a critical part of the Cisco Borderless Network Architecture.

26. Cisco claims that the Cisco ASR 1000 Series Router is the industry's first aggregation services router and the first system within the Cisco portfolio to use the Cisco QuantumFlow Processor, a processor built for edge-based service delivery.

27. Cisco asserts that the QuantumFlow Processor is the industry's first fully integrated and programmable flow processor. The Cisco QuantumFlow Processor combines multi-threaded packet processing, massive parallel processing, customized quality of service (QoS), advanced memory management, and integrated services programmability. Routers and switches running Cisco IOS network software implement software and hardware queuing based at least in part on packet classification.

28. Cisco Express Forwarding (CEF) polarization can cause suboptimal use of redundant paths to a destination network. CEF polarization is the effect when a hash algorithm chooses a particular path and redundant paths remain completely unused.

29. Cisco IOS introduced a concept called unique-ID/universal-ID which helps avoid CEF polarization. This algorithm, called the universal algorithm (the default in current Cisco IOS versions), adds a 32-bit router-specific value to the hash function (called the universal ID - this is a randomly generated value at the time of the switch boot up that can be manually controlled). This seeds the hash function on each router with a unique ID, which ensures that the same source/destination pair hash into a different value on different routers along the path. This process provides a better network-wide load-sharing and circumvents the polarization issue.

30. In addition, Cisco makes, uses and sells routers based on the Cisco IOS XR software. Cisco IOS XR Software is a modular and fully distributed network operating system for service provider networks.

31. According to Cisco's documentation, Cisco IOS XR creates a highly available, highly secure routing platform, distributes processes across the control, data, and management planes with their own access controls, delivers routing-system scalability, service isolation, and manageability and supports network and service convergence. Cisco IOS XR supports a

35. The distributed route processor (DRP) card and its associated physical layer interface module (PLIM) provide additional routing capabilities for the Cisco CRS routing system. The DRP and DRP PLIM function as an additional route processor (RP) in the system.

36. A DRP runs any of the routing processes that run on the RP (for example, BGP, OSPF, IS-IS, MPLS, LDP, IP multicast, and so on). Software commands specify which processes are to run on the DRP instead of the RP. This action of assigning processes to a DRP is called process placement. By offloading processor-intensive routing tasks (such as BGP speakers and IS-IS) from the RP to the DRP, system performance can be improved.

37. In addition, Cisco implements the Cisco NX-OS, or Nexus Operating System, which supports MPLS. Cisco implements MPLS with the use of normalized labels for packets that are used substantially throughout MPLS-enabled networks. MPLS was introduced as a feature of Cisco NX-OS software for Nexus 7000 Series switches.

38. Cisco instructs its customers regarding the implementation and operation of the accused instrumentalities, including at <https://www.cisco.com/c/en/us/support/routers/index.html>.

39. On information of belief, Defendant Cisco also implements contractual protections in the form of license and use restrictions with its customers to preclude the unauthorized reproduction, distribution and modification of its software.

40. Moreover, on information and belief, Defendant Cisco implements technical precautions to attempt to thwart customers who would circumvent the intended operation of Cisco's products.

PRIOR KNOWLEDGE OF THE PATENTS-IN-SUIT

41. By letters dated October 5, 2016 and November 28, 2016, Cisco was provided and actually received notice of the Patents-in-Suit, and consequently has actual or constructive knowledge of each of them. True and correct copies of these letters are attached as **Exhibit 1** and

Exhibit 2. Cisco’s counsel responded on February 23, 2017, representing it would conduct an investigation and would provide a complete response “in due course.” A true and correct copy of Cisco’s response is attached hereto as **Exhibit 3.** More than two years later, it has not provided a response.

42. In addition, during the course of its own prosecution activities, Cisco and its affiliates have been apprised and gained prior knowledge of at least some of the Patents-in-Suit, including by way of family members. The following table summarizes several examples of instances in which Cisco or the USPTO identified the Patents-in-Suit as material to Cisco’s efforts to patent what it asserted to be its own intellectual property. The asterisk denotes a family to family citation.

Patent-in-Suit	Cisco Pat. or Pub. No.	Publication Date	Assignee	Title
6,870,849	US6091725A	2000-07-18	Cisco Systems, Inc.	Method for traffic management, traffic prioritization, access control, and packet forwarding in a datagram computer network
	US6111877A	2000-08-29	Cisco Technology, Inc.	Load sharing across flows
	US20140280813A1	2014-09-18	Cisco Technology, Inc.	Optimizing application performance in a network environment
6,915,445	US20070162612A1	2007-07-12	Cisco Technology, Inc.	Method and system for the automatic reroute of data over a local area network
	US7363534B1	2008-04-22	Cisco Technology, Inc.	Method and system for stateful switch-over in a high-availability point to point system

	US8588081B2	2013-11-19	Cisco Technology, Inc.	Monitoring a flow set to detect faults
7,155,535	US5519704A	1996-05-21	Cisco Systems, Inc.	Reliable transport protocol for internetwork routing
	US7415507B1	2008-08-19	Cisco Technology, Inc.	Logical routers
	US7860115B1	2010-12-28	Cisco Technology, Inc.	Withdrawing multiple advertised routes based on a single tag which may be of particular use in border gateway protocol
	US20150295815A1	2015-10-15	Cisco Technology, Inc., A Corporation Of California	Autonomous System (AS) Policy-Adaptive Confederations with Selective Advertisement of AS Numbers to Non-Members
	US8762568B1*	2014-06-24	Cisco Technology, Inc.	Method and apparatus for inter-zone restoration
	US7515525B2*	2009-04-07	Cisco Technology, Inc.	Cooperative TCP / BGP window management for stateful switchover
	US8072901B1*	2011-12-06	Cisco Technology, Inc.	Technique for efficient probing to verify policy conformance
	US7697416B2*	2010-04-13	Cisco Technology, Inc.	Constructing a repair path in the event of non-availability of a routing domain
	US8111616B2*	2012-02-07	Cisco Technology, Inc.	Constructing a repair path in the event of failure of an inter-routing domain system link
	US7957306B2*	2011-06-07	Cisco Technology, Inc.	Providing reachability information in a routing domain of an external

				destination address in a data communications network
	US7821970B2 *	2010-10-26	Cisco Technology, Inc.	Protection of transit links in a network

V. COUNTS OF PATENT INFRINGEMENT

COUNT ONE INFRINGEMENT OF U.S. PATENT NO. 6,870,849

43. Parity Networks incorporates by reference its allegations in Paragraphs 1-42 as if fully restated in this paragraph.

44. Parity Networks is the assignee and owner of all right, title and interest to the '849 Patent. Parity Networks has the legal right to enforce the patent, sue for infringement, and seek equitable relief and damages.

45. On information and belief, Defendant Cisco, without authorization or license from Parity Networks, has been and is presently directly infringing at least claim 1 of the '849 Patent, as infringement is defined by 35 U.S.C. § 271(a), including through making, using (including for testing purposes), selling and offering for sale methods and articles infringing one or more claims of the '849 Patent. Defendant Cisco is thus liable for direct infringement of the '849 Patent pursuant to 35 U.S.C. § 271(a).

46. Exemplary infringing products include Cisco routers based on the Cisco IOS software, including the Cisco ASR 1000 Series routers, which support Cisco Express Forwarding load balancing. Cisco Express Forwarding load balancing includes the universal algorithm, which allows each router on the network to make a different load sharing decision for each source-destination address pair. Cisco implements unique-ID/universal-ID which helps avoid CEF polarization. This algorithm, called the universal algorithm (the default in current Cisco IOS

versions), adds a 32-bit router-specific value to the hash function (called the universal ID - this is a randomly generated value at the time of the switch boot up that can be manually controlled). This seeds the hash function on each router with a unique ID, which ensures that the same source/destination pair hash into a different value on different routers along the path.

47. On information and belief, Defendant Cisco, without authorization or license from Parity Networks, has been and is presently indirectly infringing at least claim 1 of the '849 Patent, including actively inducing infringement of the '849 Patent under 35 U.S.C. § 271(b). Such inducements include without limitation, with specific intent to encourage the infringement, knowingly inducing consumers to use infringing articles and methods that Cisco knows or should know infringe one or more claims of the '849 Patent. Cisco instructs its customers to make and use the patented inventions of the '849 Patent by operating Cisco's products in accordance with Cisco's specifications. Cisco specifically intends its customers to infringe by implementing unique-ID/universal-ID which helps avoid CEF polarization. This algorithm, called the universal algorithm (the default in current Cisco IOS versions), adds a 32-bit router-specific value to the hash function (called the universal ID - this is a randomly generated value at the time of the switch boot up that can be manually controlled). This seeds the hash function on each router with a unique ID, which ensures that the same source/destination pair hash into a different value on different routers along the path.

48. On information and belief, Defendant Cisco, without authorization or license from Parity Networks, has been and is presently indirectly infringing at least claim 1 of the '849 Patent, including contributory infringement of the '849 Patent under 35 U.S.C. § 271(c) and/or § 271(f), either literally and/or under the doctrine of equivalents, by selling, offering for sale, and/or importing into the United States, the infringing products. Cisco knows that the infringing products

(i) constitute a material part of the inventions claimed in the '849 Patent; (ii) are especially made or adapted to infringe the '849 Patent; (iii) are not staple articles or commodities of commerce suitable for non-infringing use; and (iv) are components used for or in operating systems used to implement implementing unique-ID/universal-ID to avoid CEF polarization.

49. As a result of Cisco's infringement of the '849 Patent, Parity Networks has suffered monetary damages, and is entitled to an award of damages adequate to compensate it for such infringement under 35 U.S.C. § 284, but in no event, less than a reasonable royalty.

COUNT TWO
INFRINGEMENT OF U.S. PATENT NO. 6,915,445

50. Parity Networks incorporates by reference its allegations in Paragraphs 1-49 as if fully restated in this paragraph.

51. Parity Networks is the assignee and owner of all right, title and interest to the '445 Patent. Parity Networks has the legal right to enforce the patent, sue for infringement, and seek equitable relief and damages.

52. On information and belief, Defendant Cisco, without authorization or license from Parity Networks, has been and is presently directly infringing at least claim 27 of the '445 Patent, as infringement is defined by 35 U.S.C. § 271(a), including through making, using (including for testing purposes), selling and offering for sale methods and articles infringing one or more claims of the '445 Patent. Defendant Cisco is thus liable for direct infringement of the '445 Patent pursuant to 35 U.S.C. § 271(a).

53. Exemplary infringing products include Cisco routers based on the Cisco IOS software, including the Cisco ASR 900 Series routers, which support nonstop routing (NSR) Label Distribution Protocol (LDP). The NSR LDP Support feature allows the Label Distribution

Protocol (LDP) to continue to operate across a Router Processor (RP) failure in redundant systems, without losing peer sessions.

54. On information and belief, at least since the filing of the Original Complaint, Defendant Cisco, without authorization or license from Parity Networks, has been and is presently indirectly infringing at least claim 1 of the '445 Patent, including actively inducing infringement of the '445 Patent under 35 U.S.C. § 271(b). Such inducements include without limitation, with specific intent to encourage the infringement, knowingly inducing consumers to use infringing articles and methods that Cisco knows or should know infringe one or more claims of the '445 Patent. Cisco instructs its customers to make and use the patented inventions of the '445 patent by operating Cisco's products in accordance with Cisco's specifications. Cisco specifically intends its customers to infringe by designing and fabricating its switches and routers to implement multiple processors and nonstop routing (NSR) Label Distribution Protocol (LDP).

55. On information and belief, Defendant Cisco, without authorization or license from Parity Networks, has been and is presently indirectly infringing at least claim 1 of the '445 Patent, including contributory infringement of the '445 Patent under 35 U.S.C. § 271(c) and/or § 271(f), either literally and/or under the doctrine of equivalents, by selling, offering for sale, and/or importing into the United States, the infringing products. Cisco knows that the infringing products (i) constitute a material part of the inventions claimed in the '445 Patent; (ii) are especially made or adapted to infringe the '445 Patent; (iii) are not staple articles or commodities of commerce suitable for non-infringing use; and (iv) are components used for or in operating systems to implement multiple processors and nonstop routing (NSR) Label Distribution Protocol (LDP).

56. As a result of Cisco's infringement of the '445 Patent, Parity Networks has suffered monetary damages, and is entitled to an award of damages adequate to compensate it for such infringement under 35 U.S.C. § 284, but in no event, less than a reasonable royalty.

COUNT THREE
INFRINGEMENT OF U.S. PATENT NO. 7,155,535

57. Parity Networks incorporates by reference its allegations in Paragraphs 1-56 as if fully restated in this paragraph.

58. Parity Networks is the assignee and owner of all right, title and interest to the '535 Patent. Parity Networks has the legal right to enforce the patent, sue for infringement, and seek equitable relief and damages.

59. On information and belief, Defendant Cisco, without authorization or license from Parity Networks, has been and is presently directly infringing at least claim 1 of the '535 Patent, as infringement is defined by 35 U.S.C. § 271(a), including through making, using (including for testing purposes), selling and offering for sale methods and articles infringing one or more claims of the '535 Patent. Defendant Cisco is thus liable for direct infringement of the '535 Patent pursuant to 35 U.S.C. § 271(a).

60. Exemplary infringing products include Cisco routers based on the Cisco IOS software, including the Cisco CRS Series Router, wherein a primary and standby RP are provided and a DRP card and its associated PLIM provide additional routing capabilities for the Cisco CRS routing system and function as an additional RP.

61. On information and belief, at least since the filing of the Original Complaint, Defendant Cisco, without authorization or license from Parity Networks, has been and is presently indirectly infringing at least claim 1 of the '535 Patent, including actively inducing infringement of the '535 Patent under 35 U.S.C. § 271(b). Such inducements include without limitation, with

specific intent to encourage the infringement, knowingly inducing consumers to use infringing articles and methods that Cisco knows or should know infringe one or more claims of the '535 Patent. Cisco instructs its customers to make and use the patented inventions of the '535 Patent by operating Cisco's products in accordance with Cisco's specifications. Cisco specifically intends its customers to infringe by implementing its Cisco CRS Series Routers to include a primary and standby RP and a DRP card and its associated PLIM to provide additional routing capabilities for the Cisco CRS routing system and function as an additional RP.

62. On information and belief, Defendant Cisco, without authorization or license from Parity Networks, has been and is presently indirectly infringing at least claim 1 of the '535 Patent, including contributory infringement of the '535 Patent under 35 U.S.C. § 271(c) and/or § 271(f), either literally and/or under the doctrine of equivalents, by selling, offering for sale, and/or importing into the United States, the infringing products. Cisco knows that the infringing products (i) constitute a material part of the inventions claimed in the '535 Patent; (ii) are especially made or adapted to infringe the '535 Patent; (iii) are not staple articles or commodities of commerce suitable for non-infringing use; and (iv) are components used for or in operating systems to implement a primary and standby RP and a DRP card and its associated PLIM to provide additional routing capabilities for the Cisco CRS routing system and function as an additional RP.

63. As a result of Cisco's infringement of the '535 Patent, Parity Networks has suffered monetary damages, and is entitled to an award of damages adequate to compensate it for such infringement under 35 U.S.C. § 284, but in no event, less than a reasonable royalty.

VI. WILLFUL INFRINGEMENT

64. As set forth above and in the exhibits hereto, on multiple occasions, Cisco has been provided notice of infringement of the Patents-in-Suit by direct communications from Plaintiff's representatives.

65. Plaintiff further alleges that, in connection with the knowledge it gained in connection with its own prosecution activities, Defendant has received actual notice of at least the '849 Patent, the '445 Patent, and the '535 Patent.

66. Notwithstanding this knowledge, Defendant has knowingly or with reckless disregard willfully infringed one or more of the foregoing Patents-in-Suit. Defendant has thus had actual notice of infringement of one or more of the Patents-in-Suit, has continued to infringe and engaged in egregious conduct, including through failing to respond to Plaintiff's repeated efforts to discuss a license outside the context of litigation. Cisco has acted despite an objectively high likelihood that its actions constituted infringement of Plaintiff's valid patent rights.

67. This objective risk was either known or so obvious that it should have been known to Defendant. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. § 284.

VII. JURY DEMAND

68. Plaintiff Parity Networks demands a trial by jury of all matters to which it is entitled to trial by jury, pursuant to FED. R. CIV. P. 38.

VIII. PRAYER FOR RELIEF

WHEREFORE, Parity Networks prays for judgment and seeks relief against Defendant as follows:

- A. That the Court determine that one or more claims of the Patents-in-Suit is infringed by Defendant Cisco, either literally or under the doctrine of equivalents;
- B. That the Court award damages adequate to compensate Parity Networks for the patent infringement that has occurred, together with prejudgment and post-judgment interest and costs, and an ongoing royalty for continued infringement;
- C. That the Court permanently enjoin Defendant pursuant to 35 U.S.C. § 283;
- D. That the Court award enhanced damages pursuant to 35 U.S.C. §284; and

- E. That the Court award such other relief to Parity Networks as the Court deems just and proper.

DATED: August 8, 2019

Respectfully submitted,

/s/ Andrew G. DiNovo

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