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

WINTERSPRING DIGITAL LLC,	§ § §	
Plaintiff,	§ §	Case No.
v.	§ § §	**JURY TRIAL DEMANDED**
MARVELL INTERNATIONAL, LTD. and MARVELL TECHNOLOGY GROUP LTD.,	§ § § §	
Defendants.	§ §	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Winterspring Digital LLC ("Winterspring" or "Plaintiff") for its Complaint against Marvell International, Ltd. and Marvell Technology Group Ltd. (collectively, "Marvell" or "Defendants") alleges as follows:

THE PARTIES

1.   Winterspring is a limited liability company organized and existing under the laws of the State of Texas, with its principal place of business located at 104 East Houston Street, Marshall, Texas 75670

2.   Upon information and belief, Defendant Marvell International, Ltd. is a company organized and existed under the laws of Bermuda, with a principal place of business located at Victoria Place, 5th Floor, 31 Victoria Street, Hamilton HM 10 D0 NA, Bermuda. Upon information and belief, Defendant Marvell International, Ltd. does business in Texas and in the Eastern District of Texas, directly or through intermediaries.

3.   Upon information and belief, Defendant Marvell Technology Group Ltd. is a company organized and existing under the laws of Bermuda, with a principal place of business located at Victoria Place, 5th Floor, 31 Victoria Street, Hamilton HM 10 D0 NA, Bermuda. Upon

information and belief, Defendant Marvell Technology Group Ltd. does business in Texas and in the Eastern District of Texas, directly or through intermediaries.

JURISDICTION

4.   This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. §§ 1, *et seq*. This Court has jurisdiction over this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

5.   This Court has personal jurisdiction over Defendants. Defendants regularly conduct business and have committed acts of patent infringement and/or have induced acts of patent infringement by others in this Judicial District and/or have contributed to patent infringement by others in this Judicial District, the State of Texas, and elsewhere in the United States.

6.   Venue is proper in this Judicial District pursuant to 28 U.S.C. § 1391 because, among other things, Defendants are not residents in the United States, and thus may be sued in any judicial district pursuant to 28 U.S.C. § 1391(c)(3).

7.   Defendants are subject to this Court's jurisdiction pursuant to due process and/or the Texas Long Arm Statute due at least to its substantial business in this State and Judicial District, including (a) at least part of its past infringing activities, (b) regularly doing or soliciting business in Texas, and/or (c) engaging in persistent conduct and/or deriving substantial revenue from goods and services provided to customers in Texas.

PATENTS-IN-SUIT

8.   On January 16, 2007, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 7,164,692 (the "'692 Patent") entitled "Apparatus and Method for

Transmitting 10 Gigabit Ethernet LAN Signals Over a Transport System." A true and correct copy

of the '692 Patent is available at http://pdfpiw.uspto.gov/.piw?docid=7164692.

9.   On September 2, 2008, the United States Patent and Trademark Office duly and

legally issued U.S. Patent No. 7,420,975 (the "'975 Patent") entitled "Method and Apparatus For

High-Speed Frame Tagger."   A true and correct copy of the '975 Patent is available at

http://pdfpiw.uspto.gov/.piw?docid=7420975.

10.   On August 10, 2010, the United States Patent and Trademark Office duly and

legally issued U.S. Patent No. 7,774,468 (the "'468 Patent") entitled "Network Traffic Admission

Control."   A   true   and   correct   copy   of   the   '468   Patent   is   available   at

http://pdfpiw.uspto.gov/.piw?docid=7774468.

11.   Winterspring is the sole and exclusive owner of all right, title, and interest in the

'692, '975, and '468, Patents (the "Patents-in-Suit") and holds the exclusive right to take all actions

necessary to enforce its rights to the Patent-in-Suit, including the filing of this patent infringement

lawsuit.   Winterspring also has the right to recover all damages for past, present, and future

infringement of the Patents-in-Suit and to seek injunctive relief as appropriate under the law.

FACTUAL ALLEGATIONS

12.   The Patents-in-Suit generally cover systems and methods for routing data over a

network.

13.   The '692 Patent generally discloses an apparatus and method for transmitting LAN

signals over a transport system. A system sends or receives a signal to or from a transport system,

converts the signal to an intermediate form, re-clocks the intermediate signal, reconverts and then

transmits the signal. The technology described in the '692 Patent was developed by Jeffrey Lloyd

Cox and Samir Satish Seth. By way of example, this technology is implemented today in microchips, SoCs and ASICs that receive, convert, monitor, and send 10-Gigabit LAN signals.

14.   The '975 Patent discloses an apparatus and methods for examining a packet, determining a protocol type and tagging the packet. The technology described in the '975 Patent was developed by Velamur Krishnamachari and Dinesh Annayya from Cypress Semiconductor Corporation. By way of example, this technology is implemented today in microchips, SoCs and ASICs which implement packet tagging.

15.   The '468 Patent discloses systems and methods for traffic admission control using real time bandwidth allocation. The technology described in the '468 Patent was developed by Siddhartha Nag, and Srikanth S. Kumar. By way of example, this technology is implemented today in microchips, SoCs, and ASICs that perform traffic admission control using real time bandwidth allocation.

16.   Marvell has infringed and is continuing to infringe the Patents-in-Suit by making, using, offering to sell, selling, and/or importing network switches, routers, and software which implement the technology disclosed in the above patents-in-suit.

<div align="center">

COUNT I
(Infringement of the '692 Patent)

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17.   Paragraphs 1 through 16 are incorporated by reference as if fully set forth herein.

18.   Winterspring has not licensed or otherwise authorized Defendants to make, use, offer for sale, sell, or import any products that embody the inventions of the '692 Patent.

19.   Defendants have and continue to directly infringe the '692 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '692 Patent. Such products include ethernet

Network Adaptors and Controllers, PHYs, ethernet switches, and optical modules that receive, convert, monitor, and send 10GE LAN signals.

20.   For example, Defendants have and continue to directly infringe at least claim 10 of the '692 Patent by making, using, offering to sell, selling, and/or importing into the United States products that receive, convert, monitor, and send 10GE LAN signals.

21.   For example, the Marvell AQS-107 10G transceiver performs a method transferring 10GE LAN client signals from a transport system to a client system comprising receiving the 10GE LAN client signal transmitted over the transport system, converting the 10GE LAN client signal to an intermediate signal, recovering clock data from the intermediate signal, recovering a data stream from the intermediate signal, reconverting the intermediate signal to the 10GE LAN client signal; transferring the 10GE LAN client signal to a client system; and monitoring the intermediate form with a monitoring device wherein the monitoring device is a 10GE LAN media access controller.

Marvell® SFP+ Module

AQS-107 10G

Overview

Marvell's SFP+ module is based on Marvell AQrate PHYs, which are low-power, high performance, Multi-Gig transceivers that support the following network rates:10GBASE-T/5GBASE-T/ 2.5GBASE-T/ 1000BASE-T/100BASE-TX.

AQS-107 SFP+ modules deliver up to 10GbE network speed with Cat 6a cabling up to 30 meters.

Marvell's SFP+ module enables new use-cases while using the existing cabling infrastructure. The AQS-107 module is compatible with IEEE 802.3an/bz standard. The integrated Marvell PHY AQrate technology performs all the physical layer functions required to implement the supported Multi-Gig protocols.

Marvell's SFP+ module delivers an active rate-adaptation technology that allows end-users to connect seamlessly using existing SFP+ slots that are 10GbE fiber-optic only—offering a significant cost savings over standard fiber modules.

Product Features

· Supports links up to 30 meters for 10G operations using Cat 6a multi-segment cabling
· Supports 5G/2.5G/1G/100M BASE-T operations up to 100 meters using Cat 5e or better cabling
· SFF-8431 and SFF-8432 MSA-compliant
· IEEE 802.3bz compliant and meets the NBASE-T specification
· MDI/MDIX crossover
· I²C 2-wire interface for IDs and PHY register access
· Bail latch style ejector mechanism
· Hot-pluggable SFP footprint
· RoHS-6 compliant (lead-free)
· Low power (2.5W maximum)
· Die-cast housing
· Indentions provided for labels on the bottom and sides of die-cast housing

[1]

22.   Defendants have and continue to indirectly infringe one or more claims of the '692 Patent by knowingly and intentionally inducing others, including Marvell customers and end-users, to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling and/or importing into the United States microchips, SoCs, ASICs and other products that receive, convert, monitor, and send 10GE LAN signals.

23.   Defendants, with knowledge that these products, or the use thereof, infringe the '692 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continues to knowingly and intentionally induce, direct infringement of the '692 Patent by providing these products to end users for use in an infringing manner.

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[1] "Marvell SFP+ Module Product Brief" at Pg. 1. Available at: https://www.marvell.com/content/dam/marvell/en/public-collateral/ethernet-adaptersandcontrollers/marvell-ethernet-controllers-sfp-module-aqs107-product-brief.pdf.

24.   Defendants induced infringement by others, including end users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end users, infringe the '692 Patent, but while remaining willfully blind to the infringement.

25.   Winterspring has suffered damages as a result of Defendants' direct and indirect infringement of the '692 Patent in an amount to be proved at trial.

26.   Winterspring has suffered, and will continue to suffer, irreparable harm as a result of Defendants' infringement of the '692 Patent, for which there is no adequate remedy at law, unless Defendants' infringement is enjoined by this Court.

COUNT II
(Infringement of the '975 Patent)

27.   Paragraphs 1 through 16 are incorporated by reference as if fully set forth herein.

28.   Winterspring has not licensed or otherwise authorized Defendants to make, use, offer for sale, sell, or import any products that embody the inventions of the '975 Patent.

29.   Defendants have and continue to directly infringe the '975 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '975 Patent. Such products include but are not limited to network adaptors and controllers and ethernet switches that perform packet tagging.

30.   For example, Defendants have directly infringed at least claim 5 of the '975 Patent by making, using, offering to sell, selling, and/or importing into the United States products that perform packet tagging.

31.   For example, the Marvell FastLinQ 41000 Series Ethernet Adaptor includes an apparatus comprising a network processor interface suitable for coupling to a network processor

and a central processor interface suitable for coupling to a central processor. Upon information and belief, the Marvell FastLinQ 41000 Series Ethernet Adaptor further includes a protocol determination logic block to determine a protocol type of data in a packet, wherein the protocol determination logic compares the protocol information in a first pass to predetermined values to procedure a first result and, if the first result is positive, compares the protocol information in a second pass to predetermined values to produce a second result, the first and second results forming a set of results. Upon information and belief, the Marvell FastLinQ 41000 Series Ethernet Adaptor further comprises a tag select logic block to apply a tag to the packet indicating that the packet has an unknown protocol type if the first result is negative and if the first result is positive, the packet should be sent to either the central processor interface or the network processor interface based on the set of results.

**Marvell FastLinQ 41000 Series Adapters
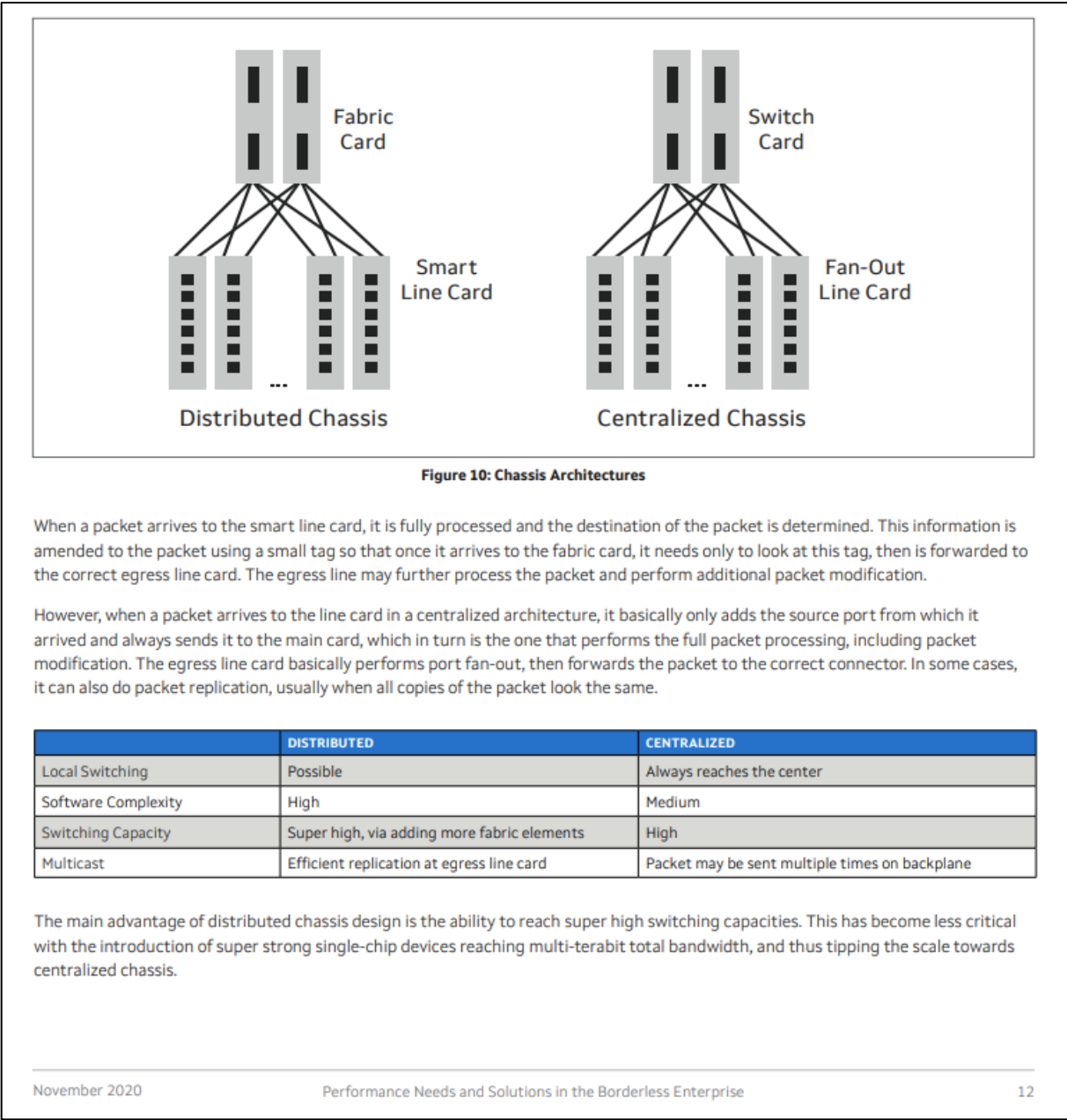Product Brief**

- Marvell Flow Filtering is supported on Linux® using the `ethtool -u/-U` commands. See the n-tuple Flow Filtering and Steering FastLinQ 41000/45000 Series Adapters Deployment Guide for more information.
- Universal RDMA technologies—RDMA over Converged Ethernet (RoCE), RoCEv2, and Internet wide area RDMA protocol (iWARP)
- Energy Efficient Ethernet (EEE) support for reduced idle power consumption in RJ-45-based networks (10GBASE-T variants only)
- MSI and MSI-X support
- IPv4 and IPv6 stateless offloads
- PCI-SIG® single root input/output virtualization (SR-IOV) with up to 192 virtual functions
- Comprehensive stateless offloads
- Auto negotiation: 1G/10G (BASE-T) and 10G/25G (on direct attach cable (DAC) cable using 10GBASE-KR/25GBASE-CR)
- FastLinQ SmartAN™ for simplified connectivity with 10G SFP+/25G SFP28 interfaced switches. (SFP+ interfaces can accept DAC or optical (discrete or active optic cable (AOC)) connections).
- RX/TX multiqueue
  - VMware® NetQueue
  - Windows® Hyper-V® Virtual Machine Queue
  - Linux Multiqueue
- Tunneling offloads
  - Windows Network Virtualization using Generic Routing Encapsulation (NVGRE)
  - Linux Generic Routing Encapsulation (GRE)
  - VMware, Windows, and Linux Virtual Extensible LAN (VXLAN)
  - Linux and VMware Generic Network Virtualization Encapsulation (GENEVE)
- Receive side scaling (RSS)
- RSSv2
- Transmit side scaling (TSS)

- Support for virtual LAN (vLAN) tagging
- Support for jumbo frames larger than 1,500 bytes (up to 9,600 bytes)
- Network teaming, failover, and load balancing
  - Switch independent NIC teaming/bonding
  - Switch dependent NIC teaming/bonding such as link aggregation control protocol (LACP) and generic trunking
- Data center bridging (DCB)
  - Data center bridging capability exchange protocol (DCBX) link layer discovery protocol (LLDP)
  - Priority-based flow control (PFC)
  - Traffic Class over VLAN's 3-bit priority code point (PCP) field or Traffic Class over the IP header's 3-bit differentiated services code point (DSCP) field
  - Enhanced Transmission Selection (ETS)
  - Explicit Congestion Notification (ECN or CN)
  - Data Center Quantized Congestion Notification (DCQCN)
- Non-offloaded Storage over Ethernet
  - iSCSI using OS-based software initiators
- Offloaded storage over Ethernet
  - Increases server performance with full hardware offload for storage traffic
  - Industry-leading FCoE-Offload performance of up to 3.6 million IOPS, suitable for high-density server virtualization and large databases
  - Industry-leading iSCSI-Offload performance of up to 2.9 million IOPS, suitable for a diverse set of applications leveraging the flexibility of iSCSI

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[2] "Marvell FastLinQ 41000 Series: Product Brief" at Pg. 2. Available at: https://www.marvell.com/content/dam/marvell/en/public-collateral/ethernet-adaptersandcontrollers/marvell-ethernet-adapters-fastlinq-41000-series-product-brief.pdf.

Figure 10: Chassis Architectures

When a packet arrives to the smart line card, it is fully processed and the destination of the packet is determined. This information is amended to the packet using a small tag so that once it arrives to the fabric card, it needs only to look at this tag, then is forwarded to the correct egress line card. The egress line may further process the packet and perform additional packet modification.

However, when a packet arrives to the line card in a centralized architecture, it basically only adds the source port from which it arrived and always sends it to the main card, which in turn is the one that performs the full packet processing, including packet modification. The egress line card basically performs port fan-out, then forwards the packet to the correct connector. In some cases, it can also do packet replication, usually when all copies of the packet look the same.

	DISTRIBUTED	CENTRALIZED
Local Switching	Possible	Always reaches the center
Software Complexity	High	Medium
Switching Capacity	Super high, via adding more fabric elements	High
Multicast	Efficient replication at egress line card	Packet may be sent multiple times on backplane

The main advantage of distributed chassis design is the ability to reach super high switching capacities. This has become less critical with the introduction of super strong single-chip devices reaching multi-terabit total bandwidth, and thus tipping the scale towards centralized chassis.

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[3]

32.   Defendants have and continue to indirectly infringed one or more claims of the '975

Patent by knowingly and intentionally inducing others, including Marvell customers and end-

users, to directly infringe, either literally or under the doctrine of equivalents, by making, using,

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[3] "White Paper: Performance Needs and Solutions in the Borderless Enterprise" at. 12. Available at: https://www.marvell.com/content/dam/marvell/en/public-collateral/switching/marvell-performance-needs-and-solutions-borderless-enterprise-whitepaper.pdf.

offering to sell, selling and/or importing into the United States microchips, SoCs, ASICs and other products that implement packet tagging.

33.   Defendants, with knowledge that these products, or the use thereof, infringed the '975 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continues to knowingly and intentionally induce, direct infringement of the '975 Patent by providing these products to end users for use in an infringing manner.

34.   Defendants induced infringement by others, including end users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end users, infringe the '975 Patent, but while remaining willfully blind to the infringement.

35.   Winterspring has suffered damages as a result of Defendants' direct and indirect infringement of the '975 Patent in an amount to be proved at trial.

36.   Winterspring has suffered, and will continue to suffer, irreparable harm as a result of Defendants' infringement of the '975 Patent, for which there is no adequate remedy at law, unless Defendants' infringement is enjoined by this Court.

COUNT III
(Infringement of the '468 Patent)

37.   Paragraphs 1 through 16 are incorporated by reference as if fully set forth herein.

38.   Winterspring has not licensed or otherwise authorized Defendants to make, use, offer for sale, sell, or import any products that embody the inventions of the '468 Patent.

39.   Defendants have and continue to directly infringe the '468 Patent, either literally or under the doctrine of equivalents, without authority and in violation of 35 U.S.C. § 271, by making, using, offering to sell, selling, and/or importing into the United States products that satisfy each and every limitation of one or more claims of the '468 Patent. Such products include but are not

limited to network adaptors and controllers and ethernet switches which allow for traffic admission control using real time bandwidth allocation.

40.   For example, Defendants have and continue to directly infringe at least claim 1 of the '468 Patent by making, using, offering to sell, selling, and/or importing into the United States products that hardware and software which allow for traffic admission control using real time bandwidth allocation.

41.   For example, the Marvell FastLinQ 41000 Series Ethernet Adaptor performs a method of a first edge node requesting from a director node, an amount of bandwidth over a first of a plurality of paths in a network between the first edge node and a second edge node, wherein the director node is configured to maintain information indicative of bandwidth available along each of the plurality of paths. Upon information and belief, in response to the requested amount of bandwidth being available along the first path, the Marvell FastLinQ 41000 Series Ethernet Adaptor performs the step of the first edge node receiving, from the director node, an allocation of bandwidth as a real-time bandwidth pool associated with network resources in the first path. Upon information and belief, the Marvell FastLinQ 41000 Series Ethernet Adaptor performs the step of the first edge node receiving a connection request to establish a first real-time communication session between one of a first plurality of communication devices coupled to the first edge node and one of a second plurality of communication devices coupled to the second edge node. Upon information and belief, in response to determining that network resources in the real-time bandwidth pool are available to permit communication over the first path, the Marvell FastLinQ 41000 Series Ethernet Adaptor performs the step of the first edge node responding to the connection request by allocating a portion of the real-time bandwidth pool to the first real-time communication session.

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Marvell® FastLinQ® 41000 Series
Multiport 10/25Gb Ethernet Adapters with Universal RDMA

The FastLinQ 41000 Series Intelligent Ethernet Adapter with Universal Remote Direct Memory Access (RDMA)—available in 10GBASE-T (RJ45), 10-Gigabit Ethernet (GbE) SFP+, and 25GbE SFP28—supports LAN (TCP/IP) traffic at 10/25GbE line-rate speeds. The adapters deliver true 10GbE and 25GbE speed, power, and performance. Integrated, advanced networking eliminates I/O bottlenecks and conserves CPU cycles.

The FastLinQ 41000 Series leverages Marvell's 15+ years of expertise in Ethernet by providing the highest levels of performance, efficiency, and scalability for Open Compute server and storage applications in Web 2.0, enterprise data centers, and cloud infrastructure.

For more effective use of the 10/25GbE bandwidth, the 41000 Series Intelligent Ethernet Adapter offers switch-independent NIC partitioning (NPAR), which enables segmentation of a single 10/25GbE port into multiple network partitions and dynamic allocation of bandwidth to each port. The segmentation allows IT organizations to optimize resources while lowering infrastructure and operational costs.

The evolution of data centers—triggered by high-density server virtualization, software-defined networking (SDN), and multitenant cloud computing platforms—demands a high-performance 10/25GbE solution that boosts CPU efficiency and reduces capital expenditures (CAPEX) and operational expenditures (OPEX) of the migration to 10/25GbE. The FastLinQ 41000 Series Adapters are the best choice for workload-intensive computing environments, providing reliable, high-performance 10/25GbE connectivity solutions.

- Single, dual, and quad port 10GbE and 25GbE Adapter options
- Delivers full line-rate 10/25GbE performance across single and dual ports
- Universal RDMA—Delivers the choice and flexibility with concurrent support for RoCE, RoCEv2, and iWARP technologies

42.   Defendants have and continue to indirectly infringe one or more claims of the '468 Patent by knowingly and intentionally inducing others, including Marvell customers and end-users, to directly infringe, either literally or under the doctrine of equivalents, by making, using, offering to sell, selling and/or importing into the United States microchips, SoCs, ASICs, and other products which allow for traffic admission control using real time bandwidth allocation.

43.   Defendants, with knowledge that these products, or the use thereof, infringe the '468 Patent at least as of the date of this Complaint, knowingly and intentionally induced, and continues to knowingly and intentionally induce, direct infringement of the '468 Patent by providing these products to end users for use in an infringing manner.

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[4] "Marvell FastLinQ 41000 Series: Product Brief" at Pg. 1. Available at: https://www.marvell.com/content/dam/marvell/en/public-collateral/ethernet-adaptersandcontrollers/marvell-ethernet-adapters-fastlinq-41000-series-product-brief.pdf.

44.   Defendants induced infringement by others, including end users, with the intent to cause infringing acts by others or, in the alternative, with the belief that there was a high probability that others, including end users, infringe the '468 Patent, but while remaining willfully blind to the infringement.

45.   Winterspring has suffered damages as a result of Defendants' direct and indirect infringement of the '468 Patent in an amount to be proved at trial.

46.   Winterspring has suffered, and will continue to suffer, irreparable harm as a result of Defendants' infringement of the '468 Patent, for which there is no adequate remedy at law, unless Defendants' infringement is enjoined by this Court.

DEMAND FOR JURY TRIAL

Plaintiff hereby demands a jury for all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Winterspring prays for relief against Defendants as follows:

a.   Entry of judgment declaring that Defendants have directly and/or indirectly infringed one or more claims of the Patents-in-Suit;

b.   An order pursuant to 35 U.S.C. § 283 permanently enjoining Defendants, their officers, agents, servants, employees, attorneys, and those persons in active concert or participation with it, from further acts of infringement of one or more of the Patents-in-Suit;

c.   An order awarding damages sufficient to compensate Winterspring for Defendants' infringement of the Patents-in-Suit, but in no event less than a reasonable royalty, together with interest and costs;

d.   Entry of judgment declaring that this case is exceptional and awarding Winterspring its costs and reasonable attorney fees under 35 U.S.C. § 285; and,

e.   Such other and further relief as the Court deems just and proper.

Dated: January 23, 2023   Respectfully submitted,

                          /s/ *Vincent J. Rubino, III*

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