UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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ARISTA NETWORKS, INC.,
Petitioner,

v.

CISCO SYSTEMS, INC.,
Patent Owner.

_____

Case IPR2015-00975
Patent 8,051,211 B2

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Before BRYAN F. MOORE, MATTHEW R. CLEMENTS, and
PETER P. CHEN, *Administrative Patent Judges*.

CHEN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318 and 37 C.F.R. § 42.73

I. INTRODUCTION

Petitioner, Arista Networks, Inc., filed a Petition for *inter partes* review of claims 1, 2, 6–9, 12, 13, and 17–20 of U.S. Patent No. 8,051,211 B2 (Ex. 1001, "the '211 patent"). Paper 2 ("Pet."). Patent Owner, Cisco Systems, Inc., filed a Preliminary Response. Paper 6 ("Prelim. Resp."). On October 6, 2015, we instituted an *inter partes* review of claims 1, 2, 6–9, 12, 13, and 17–20. Paper 7 ("Inst. Dec." or "Dec. to Inst.").

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 16, "PO Resp."), to which Petitioner filed a Reply (Paper 20, "Reply"). Pursuant to our authorization, Patent Owner filed a paper alleging certain arguments and evidence cited in Petitioner's Reply were beyond the scope permitted, and Petitioner filed a response to Patent Owner's assertions. Paper 29; Paper 30. An oral argument was held on July 27, 2016, consolidated with the oral hearing for IPR2015-00978. *See* Paper 35 ("Tr.").

A. Related Matters

The parties state that the '211 patent is the subject of *Cisco Systems, Inc. v. Arista Networks, Inc.*, No. 4:14-cv-05343-JSW (N.D. Cal.), filed December 5, 2014, and ITC Inv. No. 337-TA-945 (Network Devices, Related Software and Components Thereof (II)), filed December 19, 2014. Pet. 1; Paper 5 (Patent Owner's Mandatory Notice). Petitioner has also filed petitions requesting *inter partes* review of other patents owned by Patent Owner: IPR2015-00973 (U.S. Patent No. 6,377,577), IPR2015-00974 (U.S. Patent No. 7,224,668), IPR2015-00976 (U.S. Patent No. 7,023,853), IPR2015-00978 (U.S. Patent No. 7,340,597), IPR2015-01049 (U.S. Patent No. 6,377,577), IPR2015-01050 (U.S. Patent No. 7,023,853), IPR2015-

01710 (U.S. Patent No. 7,224,668), IPR2016-00018 (U.S. Patent No. 8,051,211), IPR2016-00119 (U.S. Patent No. 7,047,526), IPR2016-00244 (U.S. Patent No. 7,953,886), IPR2016-00301 (U.S. Patent No. 6,377,577), IPR2016-00303 (U.S. Patent No. 6,377,577), IPR2016-00304 (U.S. Patent No. 7,023,853), IPR2016-00306 (U.S. Patent No. 7,023,853), IPR2016-00308 (U.S. Patent No. 7,162,537), and IPR2016-00309 (U.S. Patent No. 7,224,668).

B. The '211 Patent

The '211 patent is titled "Multi-Bridge LAN Aggregation" and relates generally to computer networks, and more specifically, to a method and system for a multi-bridge local area network ("LAN"). Ex. 1001, 1:5–8. Individual LANs may be coupled together at the link layer with intermediate network devices known as bridges, to create a bridged LAN that connects more computers together, over a much wider geographical range than a single LAN. *Id*. at 1:29–40. Data on LANs is carried in frames. *Id*. at 1:21.

The '211 patent discloses a method and system for improving network reliability and availability on a multi-bridged LAN, with redundant physical connections between host computers and multiple intermediate devices such as bridges and routers, where the hosts are associated with single Internet protocol ("IP") addresses. *Id*. at 2:20–21, 4:22–25, 6:18–21, 6:48–62; *see* Prelim. Resp. 6–10; Pet. 3–4.

Figure 3A of the '211 patent is reproduced below.

Figure 3A

Figure 3A is a block diagram of computer network 300 with LANs 302–338 connected by multiple intermediate devices, such as bridges 340–344 and router 346, and hosts 354–358 that send and receive information on network 300. Ex. 1001, 4:34–39, 4:45–48. Host 356 is coupled to network 300 in a multi-bridge LAN aggregation, where if bridge 342 or LAN 312 were to fail, host 356 would communicate with LAN 310 via LAN 314 and bridge 344. *Id*. at 4:63–66. Bridge 344 and host 356 "are configured for link aggregation, allowing both LAN 312-314 to be simultaneously utilized for transmitting information to and from host 356 and allowing host 356 to be seen from LAN 310 as having a single IP address." *Id*. at 5:1–5.

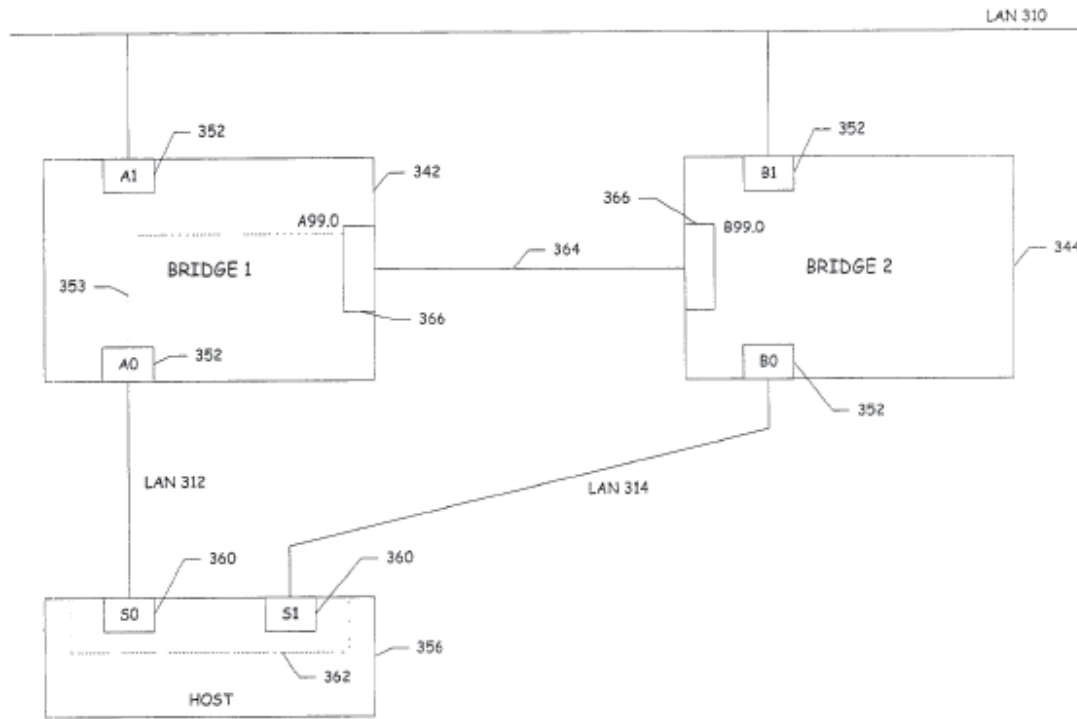Figure 3B of the '211 patent is reproduced below.

Figure 3B

Figure 3B is a block diagram of a portion of computer network 300, with LAN 310 coupled to intermediate network devices 342 and 344. Ex. 1001, 5:26–28. Intermediate network devices 342 and 344 are bridges and are also connected to host 356, which is "seen by LAN 310 as having a single IP address." *Id.* at 5:46–49, 6:18–21. In one embodiment, bridges 342 and 344 are Layer 2 Ethernet switches. *Id.* at 5:28–30. There are two paths between host 356 and LAN 310, and if either bridge 342 or bridge 344 fails, host 356 can still transmit and receive information from LAN 310. *Id.* at 6:10–14, 21–47.

Bridge 342 is configured with pass-through path 353 between port A0 and sub-port A99.0, and frames transmitted to port A0 are sent directly to

sub-port A99.0 without examination by bridge 320. *Id.* at 5:52–57. The

'211 patent continues, "[a]s used herein, tunneling is used to refer to

transmitting a frame without examination." *Id.* at 5:59–61. "[A] number of

different types of mux/demux technologies may be used in the present

invention. For example, Layer 3 tunnels, a number of dedicated Ethernets,

and/or an array of ATM emulated LANS." *Id*. at 7:22–26.

C. Illustrative Claim

Of the challenged claims, claims 1 and 12 of the '211 patent are

independent. Claim 1 is illustrative of the claimed subject matter:

> 1. A method comprising:
>
> aggregating a plurality of LANs, wherein
>
> said aggregating comprises aggregating a first LAN and a second LAN,
>
> said first LAN couples a host to a first intermediate device and said second LAN couples said host to a second intermediate network device, said plurality of LANs comprising said first LAN and said second LAN, and
>
> subsequent to said aggregating, said first LAN and said second LAN are both usable to simultaneously transmit information from said host to said second intermediate network device.

Ex. 1001, 13:13–26.

D. Asserted Grounds of Unpatentability

We instituted trial on the following specific grounds.

Reference(s)	Basis	Challenged Claims
Perloff[1]	35 U.S.C. § 102(e)	1 and 12

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[1] U.S. Patent No 6,910,149 B2, filed Sept. 24, 2001, issued June 21, 2005
(Ex. 1006, "Perloff").

Reference(s)	Basis	Challenged Claims
Perloff and Kunzinger[2]	35 U.S.C. § 103(a)	2, 6–9, 13, and 17–20

II. DISCUSSION

A. Claim Construction

In an *inter partes* review, we construe claim terms in an unexpired patent according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see also In re Cuozzo Speed Techs., LLC*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). Consistent with the broadest reasonable construction, claim terms are presumed to have their ordinary and customary meaning as understood by a person of ordinary skill in the art in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An inventor may provide a meaning for a term that is different from its ordinary meaning by defining the term in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

"subsequent to"

In our Decision to Institute, we construed "subsequent to" to mean "after." Dec. to Inst. 7–8. As it did in its Preliminary Response, Patent Owner again proposes that we should instead construe subsequent to" to mean "as a result of," citing to a few phrases in the Specification. PO Resp. 17–22. Petitioner asserts our construction from the Decision to Institute is

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[2] U.S. Patent No. 6,931,529 B2, filed Jan. 5, 2001, issued Aug. 16, 2005 (Ex. 1007, "Kunzinger").

correct. Pet. Reply 3–5. We agree with Petitioner, as the embodiments in the Specification cited by Patent Owner do not require a cause and effect relationship between the aggregation of LANs and the usability of LANs to simultaneously transmit information, or do not necessarily involve the claimed aggregation of LANs. *Id*. at 4; *see also* Ex. 1025 ¶ 11. Accordingly, we maintain our construction of "subsequent to" from the Decision to Institute, namely, "after."

<div align="center">

"tunneling"

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The term "tunneling" is recited in the challenged dependent claims. Petitioner notes the "explicit definition" in the Specification (Pet. 7), which states:

> As used herein, tunneling is used to refer to transmitting a frame without examination. For example, when a bridge receives a frame, it generally examines the frame to determine the corresponding LAN Segment to forward the frame to. Additionally, a bridge will process the frame according to a number of protocols. However, in accordance with the present invention, bridge 342 is configured to internally transmit a frame between bridge inter-connect port 366 and port A0 directly, without such examination.

Ex. 1001, 5:59–6:1. Petitioner states "the proper construction of the term 'tunneling' must be broad enough to include 'transmitting a frame without examination.'" Pet. 7.

Dependent claim 11 further defines tunneling to comprise encapsulating a frame, transmitting the frame, de-encapsulating the frame, and directly transmitting the frame. Ex. 1001, 14:11–20. Thus, read in light of the express definition in the Specification, these actions do not constitute "examination" in the '211 patent. The Specification does state that for one embodiment of the invention, "bridge-interconnect port 412 encapsulates

(e.g., includes a tag within, or appended to, frame 500) and de-encapsulates (e.g., *examines* fields in frame 500 and/or removes tags from frame 500) frame 500." *Id.* at 9:14–17 (emphasis added). Claim 11, however, includes encapsulation and de-encapsulation as part of tunneling. As a result, we understand that encapsulation and de-encapsulation of a frame are not "examination" of a frame, as the '211 patent uses that term.

Petitioner further states, "[s]hould the Board determine that construing 'tunneling' is necessary, it should not be limited to Layer 2 communication, and is broad enough to cover either Layer 2 or Layer 3 communication." Pet. Reply 6–10. With respect to network "layers," Patent Owner's expert, Dr. Kevin Jeffay, explains that

> Communication in a network proceeds according to a number of rules that control the format and processing of messages. Together, these rules define a protocol for communication. In most networks, multiple protocols operating in concert are required to communicate messages between hosts. These protocols are organized hierarchically as a series of hardware and software 'layers' and are colloquially referred to as a 'protocol stack.'

Ex. 2003 ¶ 49. According to Dr. Jeffay, the "Internet" model defines a 5-layer protocol stack, wherein layer 2 is the link layer and layer 3 is the network layer. *Id.* ¶¶ 49–55. Dr. Jeffay further testifies that Layer 3 interconnection devices are called routers. *Id.* ¶ 53.

Petitioner argues, *inter alia*, that the '211 patent expressly provides that "Layer 3 tunnels" "may be used in the present invention" as a "mux/demux" technology in a bridge. Pet. Reply 9, citing Ex. 1001, 7:20–26. The Specification also discloses another embodiment with intermediate network devices that are "Layer 2 (or L2) Ethernet switches." Ex. 1001, 5:28–29. The Specification further states that a router (described by Patent

Owner's declarant as a layer 3 connection device) is an intermediate network device. *Id.* at 1:48–49; Ex. 2003 ¶ 53. Accordingly, we construe tunneling to mean, "transmitting a frame without examination, including in layer 2 and layer 3 communications."

We do not expressly construe any other terms in the challenged claims.

B. Principles of Law

To prevail in its challenges to the patentability of the claims, a petitioner must establish facts supporting its challenges by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). A claim is unpatentable under 35 U.S.C. § 102 if a single prior art reference either expressly or inherently discloses every limitation of the claim. *Orion IP, LLC v. Hyundai Motor Am.*, 605 F.3d 967, 975 (Fed. Cir. 2010). A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007).

The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We analyze the instituted grounds of unpatentability, with Petitioner being required to prove unpatentability by a preponderance of the evidence, in accordance with the above-stated principles.

C. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we determine the level of ordinary skill in the pertinent art at the time of the invention. *Graham,* 383 U.S. at 17. "The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc., 950 F.2d 714, 718 (Fed. Cir. 1991).*

Petitioner's Declarant, Dr. Bill Lin, testifies that a person of ordinary skill in the art at the time of the '211 patent would have had would have had a "Masters of Science Degree (or a similar technical Masters Degree, or higher degree) in an academic area emphasizing computer networking or, alternatively, a Bachelor Degree (or higher degree) in an academic area emphasizing the design of electrical, computer, or software engineering and having several years of experience in computer network engineering and the design of computer networks." Ex. 1003 ¶ 9; Pet 4. Patent Owner's Declarant, Dr. Jeffay, testifies similarly that one of ordinary skill in the art at the time of the '211 patent would have had one of ordinary skill in the art would have "a B.S. degree, or its equivalent, in Computer Science, Computer Engineering, Electrical Engineering, or a related field, as well as a Master of Science degree, or equivalent, in one of those fields or approximately 2 years of academic or industry experience in network devices." Ex. 2003 ¶ 23; PO Resp. 22.

Based on our review of the '211 patent and the types of problems and solutions described in the '211 patent and cited prior art, we conclude a person of ordinary skill in the art at the time of the '211 patent would have had a Bachelor's degree in electrical engineering, computer engineering,

computer science, or related field, and at least two years of work experience in computer networks and network devices. We further note that the applied prior art reflects the appropriate level of skill at the time of the claimed invention. *See Okajima v. Bourdeau,* 261 F.3d 1350, 1355 (Fed. Cir. 2001).

D. Asserted Anticipation by Perloff

Petitioner contends that claims 1 and 12 are unpatentable under 35 U.S.C. § 102 as anticipated by Perloff. Pet. 38–45. Relying on the testimony of Dr. Bill Lin, who submitted two declarations herein, Petitioner explains how Perloff allegedly discloses each limitation of the claims. *Id.* (citing Ex. 1003); Pet. Reply 10–15 (citing Ex. 1025).

1. Perloff (Ex. 1006)

Perloff is titled "Multi-device Link Aggregation," and relates generally to communications in networks. Ex. 1006, 1:6. A multi-device link aggregation (MDLA) device is connected to another MDLA by an internal link. *Id.* at Abstract. The MDLA devices exchange protocol data units to detect devices connected to both MDLA devices and are "able to trick" the detected devices connected to both MDLA devices into behaving as though the two MDLA devices are a single device. *Id.* If one of the MDLA devices fails, traffic can be automatically forwarded by the other MDLA device. *Id.* Figure 4 of Perloff is reproduced below.
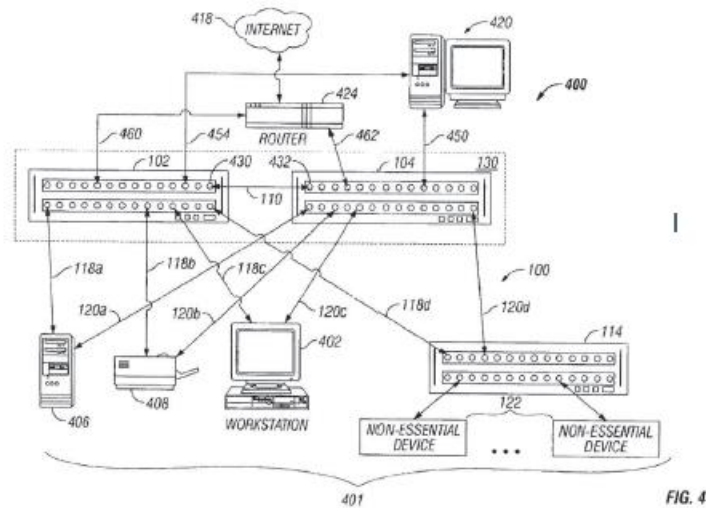
FIG. 4

Figure 4 depicts network 400 with first MDLA device 102 and second
MDLA device 104, which can be switches or routers, connected by MDLA
internal link 110. Ex. 1006, 4:35–37, 8:60–62. MDLA devices 102 and 104
are connected to common link aggregation partner devices 401 such as
server 406, printer 408, and computer 402. *Id.* at 8:21–25, Fig. 4. Computer
402 is connected to MDLA device 102 by first link 118c and to MDLA
device 104 by second link 120c. *Id.* Partner devices 401 are unaware of two
separate MDLA devices. *Id.* at 10:65–11:15.

Both MDLA devices are also connected to server 420. *Id.* at 8:36–40.
When there is a failure of one of the links to server 420, e.g., failure of link
454, data flows both along first link 118c from computer 402 to MDLA
device 102, and then through MDLA internal link 110 to second MDLA
device 104, and along second link 120c from computer 402 to second
MDLA device 104. *Id.* at 11:15–23.

2. Whether Petitioner's Reply Is Beyond the Scope of Patent Owner's Response

Preliminarily, Patent Owner asserts portions of Petitioner's Reply are beyond the scope permitted by 37 C.F.R. § 42.23(b). Paper 29. Patent Owner contends Petitioner's Reply (page 13, line 10, through page 15, line 6) exceeded the scope of the Patent Owner Response. Paper 29, 1. Patent Owner asserts Petitioner "shifted its position as to the type of information it contends is 'simultaneously transmit[ted]' and the timing of when such data is sent," namely, a data unit in Perloff called an LACPDU (link aggregation control protocol unit) that is transmitted during Perloff's normal operation mode. *Id*. at 1, citing Pet. 42–44, Pet. Reply 14.

Petitioner contends its Reply was permissible because the additional disclosure "is a direct and proper rebuttal to Patent Owner's arguments premised on reading the term 'subsequent' to mean 'as a result of.'" Paper 30, 1.

We have reviewed the parties' contentions on this issue, and determine that the cited portion of Petitioner's Reply (page 13, line 10, through page 15, line 6) was proper rebuttal argument in response to assertions in the Patent Owner Response.

3. Analysis

Petitioner contends that Perloff discloses all the limitations of independent claims 1 and 12. Pet. 38–44. Petitioner asserts Perloff discloses aggregating a plurality of LANs comprising a first LAN coupling a host to a first intermediate device and a second LAN coupling the host to a second intermediate device, and that subsequent to said aggregating, the first and second LANs are both usable to simultaneously transmit information

from the host to the second intermediate device. Pet. 38–44, citing Ex. 1003 ¶¶ 83–95.

Claim 12 recites a computer program product comprising non-transitory computer readable media storing a set of instructions executable on an intermediate network device and configured to aggregate a plurality of LANs. Ex. 1001, 14:21–38. Petitioner asserts Perloff discloses the implementation of its functional components in software, such as a computer program product in a machine readable medium. Pet. 45, citing Ex. 1003 ¶ 96; *see* Ex. 1001, 12:40–62.

Patent Owner argues Perloff "merely describes a prior art 'stacked' architecture distinguished" by the '211 patent. PO Resp. 27. Petitioner counters that the "stacked" architecture is irrelevant because Perloff "does not describe itself as a stacked switch." Pet. Reply 11. Perloff, according to Petitioner, merely describes that its invention can be applied to devices in a stack, as well as other situations. *Id.*, citing Ex. 1006, 11:59–64 ("Moreover, multi-device link aggregation (MDLA) according to embodiments of the invention, can be deployed in many situations and is equally applicable for both interconnected devices using standard network links (e.g., Ethernet) and for more specific interconnections, such as stacker-link for interconnecting devices in a stack."). We agree with Petitioner.

Patent Owner argues Perloff does not disclose that subsequent to aggregating the first and second LAN, both are usable to simultaneously transmit information from the host to the second intermediate device. PO Resp. 28–31. Patent Owner's argument is premised on its proposed construction of "subsequent to" to mean "as a result of" (PO Resp. 28–31), which we have rejected. *See* Section II.A above. Under the construction of

"subsequent to" to mean "after," Perloff does disclose that in a failure mode after MDLA devices have been aggregated, first link 118c and second link 120c are usable to transmit simultaneously packets from computer 402 to MDLA devices 102 and 104. Pet. 41–44, citing Ex. 1003 ¶¶ 91–95. Petitioner contends, "Perloff discloses an embodiment in which, after aggregation, there is simultaneous transmission to a second intermediate network device (104) from the host (402) on two links." Pet. Reply 11–12, citing Ex. 1025 ¶ 23. In particular, as shown in Figure 4 of Perloff, when there is a failure of one of the links to server 420, e.g., failure of link 454, data flows both along first link 118c from computer 402 to MDLA device 102, and then through MDLA internal link 110 to second MDLA device 104, and along second link 120c from computer 402 to second MDLA device 104. Ex. 1006, 11:15–23.[3] As a result, we are persuaded that Perloff discloses this limitation.

Patent Owner also argues that Perloff's simultaneous transmission is not "to" the second intermediate device. PO Resp. 31–33. Patent Owner argues Perloff does not disclose that links from the alleged host—i.e., Perloff's workstation 114 or 402—are usable simultaneously to transmit information "to" the second intermediate device (i.e., Perloff's MDLA device 104 in Figure 4 of Perloff). Rather, when failure occurs, the host "simply continues to transmit packets on the links to either MDLA device 102 or MDLA device 104. . . . Thus, Perloff does not disclose any

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[3] We agree with Petitioner's further assertion that Perloff meets this limitation under Perloff's normal operation mode, or even if we were to adopt Patent Owner's proposed construction of "as a result of" for "subsequent to." *See* Pet. Reply 12–14, citing Ex. 1025 ¶¶ 24, 26.

mechanism that causes workstation 402 to ignore MDLA [d]evice 102 and transmit packets on both links 'to' MDLA device 104." PO Resp. 32–33, citing Ex. 2003 ¶¶ 80–81.

Petitioner asserts Patent Owner's "overwrought construction" reads limitations from the '211 patent Specification into the claim, whose recitation of "transmit information from said host to said second intermediate network device" means "simply that that information goes from the host to the second intermediate network device." Pet. Reply 14–15. We agree that the claim language does not require the second intermediate device to be the sole device seen by the host. Ex. 1001, 13:23–26.

Petitioner further asserts that Figure 4 of Perloff shows information being transmitted from workstation 402 "to" second intermediate network device MDLA device 104. *Id.* at 14, citing Ex. 1025 ¶ 27. We agree with Petitioner's arguments and evidence, including the testimony of Dr. Lin, regarding Perloff's disclosure of the limitations of claims 1 and 12, and adopt them as our own. Accordingly, we are persuaded Petitioner has shown by a preponderance of the evidence the unpatentability of claims 1 and 12 as anticipated by Perloff.

E. Asserted Obviousness over Perloff and Kunzinger

Petitioner contends that dependent claims 2, 6–9, 13 and 17–20 are unpatentable under 35 U.S.C. § 103 as obvious over Perloff and Kunzinger. Pet. 45–60.

1. Kunzinger (Ex. 1007)

Kunzinger is titled "Establishing Consistent, End-to-End Protection for a User Datagram" and discloses a technique to establish tunnels to protect "datagrams (i.e., packets)" through an entire network path. Pet. 19–

21, 46–48; Ex. 1007, Abstract. Figure 4 of Kunzinger is reproduced below.
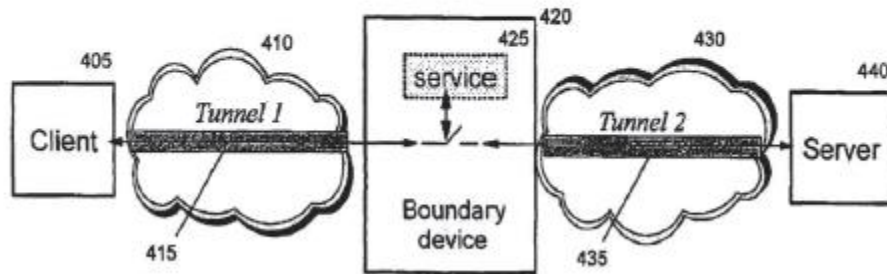
FIG. 4

Figure 4 depicts a remote access computing environment in which data is transmitted between host 405 and server 440 through intermediate security gateway 420 using secure tunnels 415 and 435 that securely transport data through Internet 410 and 430 respectively. Ex. 1007, 8:59–9:1. All component devices including hosts and gateways, implement the IP Security ("IPSec") Protocol established by the Internet Engineering Task Force (IEFT). *Id.* at 10:11–15. IPSec provides security services, including data encryption, data integrity, data origin authentication, and access control, protecting packets between two hosts, or between a host and a security gateway, or between two security gateways. *Id.* at 2:37–53.

Tunnels are used by IPSec to provide a secure exchange over a path through a non-secure network such as the Internet. *Id.* at 2:53–55. In addition:

> Tunneled packets in IPSec have an outer IP header whose source and destination addresses identify the endpoints of the tunnel, and an inner IP header whose source and destination addresses identify the originator and recipient of the packet. When IPSec is used in "tunnel" mode, the complete inner packet, which is comprised of both the inner header and the payload, is protected

as the packet travels through the tunnel. However, the outer
header remains in clear text form as the packet travels through
the tunnel. The protection applied to the complete inner packet
can be encryption alone, authentication alone, or both encryption
and authentication, as specified by the relevant security
association negotiated between the tunnel endpoints.

Id. at 3:7–18.

2. *Whether Petitioner's Reply Is Beyond the Scope of Patent Owner's Response*

Preliminarily, Patent Owner asserts portions of Petitioner's Reply are
beyond the scope permitted by 37 C.F.R. § 42.23(b). Paper 29. Patent
Owner contends Petitioner's Reply (page 18, line 9, through page 20, line 6)
exceeded the scope of the Patent Owner Response. Paper 29, 1. Patent
Owner asserts Petitioner "shifted what it contends is a 'frame' for purposes
of the claimed 'tunneling.'" *Id*. at 2, citing Pet. 47–48, Pet. Reply 20.[4]
Patent Owner contends Petitioner's Reply "argues that the 'frame' is the
outer frame an IPSec packet is transmitted in." *Id.*

Petitioner contends its Reply was permissible because "Petitioner did
not shift what it contends is the recited 'frame,' and the Petition does not
take the position that 'frame' refers to only the inner-header and payload."
Paper 30, 2. Petitioner contends its Petition "acknowledges that, in the
disclosure of Kunzinger, some portion of a frame is examined (outer header)
while another is not (inner header), and reads that on the claim." *Id.* We
have reviewed the parties' contentions on this issue, agree with Petitioner,
and determine that Petitioner's Reply (page 18, line 9, through page 20, line
6) did not modify Petitioner's contentions as to what constitutes a frame.

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[4] Paper 29 refers to "Pet. p. 20," which apparently should instead refer to
"Pet. Reply p. 20."

3. *Analysis*

Dependent claim 2 recites "tunneling said first LAN with a third LAN through said first intermediate network device," and dependent claim 13 recites a limitation of commensurate scope. Ex. 1001, 13:27–30, 14:39–45. Dependent claims 6–9 and 17–20 depend from claims 2 and 13, respectively. Relying on the declaration testimony of Dr. Lin (Ex. 1003), Petitioner explains how Perloff and Kunzinger teach or suggest the tunneling and other limitations of dependent claims 2, 6–9, 13, and 17–20. Pet. 45–60, citing Ex. 1003; *see also* Ex. 2005, 48:1–3 (deposition of Petitioner's declarant in which he confirmed the application of Kunzinger's IPSec tunnels to the network of Perloff).

For example, regarding claim 2, Petitioner contends Perloff's MDLA internal link 110 is the recited third LAN. Pet. 46, citing Ex. 1003 ¶ 98. Petitioner further contends Kunzinger discloses the recited tunneling of the first LAN with the third LAN, in describing implementation of tunnels from a host to another host over an internet or an intranet, using the IPSec protocol. Pet. 47, citing Ex. 1003 ¶ 49. In Kunzinger, the complete inner packet (inner header and payload) is protected, and thus the content of a packet being tunneled is not examined. Pet. 21, citing Ex. 1003 ¶ 51.

Petitioner asserts that in Figure 4 of Perloff (reproduced above), a tunnel as disclosed by Kunzinger would extend from workstation 402 and would tunnel first link 118c (the recited "first LAN") with internal MDLA link 110 (the recited "third LAN") through first MDLA device 102 (the recited "first intermediate device") to a host on Internet 418. Pet. 50–51.

Petitioner also provides a rationale for combining Perloff with Kunzinger, citing *KSR*. Pet. 51–53, 59–60, citing Ex. 1003 ¶¶ 104–105. In

particular, Petitioner explains why one of ordinary skill in the art would have

been motivated to combine Perloff and Kunzinger:

> A [person of ordinary skill in the art] would have modified
> Perloff to incorporate the tunnel of Kunzinger, because the
> combination amounts to the use of a known technique to improve
> similar devices in the same way. *See KSR*, 550 U.S. at 417 . . .
> Kunzinger describes that the IPSec protocol can be used to
> improve security of communications by a tunnel through an
> intranet. Ex. 1007, 1:23-35. Kunzinger is similar to Perloff
> because both concern operation of a communication network
> with multiple devices. Ex. 1003, ¶104. In addition, Kunzinger
> motivates creation of a tunnel from a host, such as the computer
> 402 of Perloff, to another host on the same intranet, such as the
> edge server 420 of Perloff. Ex. 1003, ¶104. . . . Kunzinger
> explains that intranets should not be assumed to be secure. Ex.
> 1007, 3:50-56. A POSITA would have recognized that the
> computer network of Perloff suffers from the same problems
> identified by Kunzinger. Ex. 1003, ¶104. Through Kunzinger's
> discussion of this problem and the benefit of the solutions
> proposed, which were understood as of the Critical Date, a
> POSITA would have been motivated to modify the computer
> network of Perloff to use tunneling between two hosts, as taught
> by Kunzinger. Ex. 1003, ¶104.

Pet. 51–52. Petitioner contends the combination of Perloff and Kunzinger

similarly teaches the limitations of dependent claims 6 (reciting details of

aggregating, Ex. 1001, 13:51–58; *see* Pet. 53-55, citing Ex. 1003 ¶¶ 106–

107), 7 (reciting details of tunneling, Ex. 1001, 13:59–62; *see* Pet. 55–56,

citing Ex. 1003 ¶ 108), 8 (reciting further details of tunneling, Ex. 1001,

13:63–67; *see* Pet. 57–58, citing Ex. 1003 ¶¶ 110–111), and 9 (reciting

further details of tunneling, Ex. 1001, 14:1–5; *see* Pet. 58–59, citing Ex.

1003 ¶¶ 110–111). Petitioner states that dependent claims 13 and 17–20

"are computer program product claims with limitations equivalent to those

in claims 2 and 6–9, respectively." Pet. 59; *see* Ex. 1001, 14:39–45, 15:9–35.

Patent Owner argues Kunzinger's tunnels "perform tunneling on network layer (layer 3) communications, and thus cannot transmit a frame, which is a layer 2 communication." PO Resp. 33. *See id.* at 36–42, 43–45. Patent Owner argues, "[t]he term 'frame' has a well-understood meaning . . . [a] frame is a link layer (layer 2) communication." *Id.* at 36. Patent Owner adds, "[t]he '211 patent uses the term[] 'frame' consistent with its plain and ordinary meaning – a layer 2 communication." (citing Ex. 2003 ¶ 89). Patent Owner further argues, "[i]n contrast to the tunneling of the '211 patent that operates on Layer 2 frames, the IPSec tunnel of Kunzinger only operates on Layer-3 communications at the network layer, which lack the information required to be considered a Layer 2 frame." *Id.* at 44 (citing Ex. 2003 ¶¶ 88, 93).

As set forth above, our construction of tunneling includes layer 3 communications. In addition, Petitioner notes the '211 patent itself expressly describes "layer 3 tunnels" in the mux/demux technology in a bridge. Pet. Reply 9, citing Ex. 1001, 7:20–26. Petitioner also argues that the '211 patent uses "frame" and "packet" interchangeably. Pet. Reply 8–9, citing Ex. 1001, 11:7–8. Petitioner further argues that Patent Owner's declarant (i) testified at his deposition in a related proceeding at the U.S. International Trade Commission that, "at a high level, we can partition the packets, and packets is a synonym for frame, so we will hear both terms" and (ii) used the terms frame and packet interchangeably in his declaration herein. Pet. Reply 7, citing Ex. 1019, 1292; Ex. 2003 ¶ 31. We agree with Petitioner's arguments and reasoning, and in light of our construction of

tunneling, we determine Kunzinger teaches that tunneling occurs with respect to layer 3 communications.

Patent Owner further argues that Perloff's MDLA (intermediate) device "necessarily performs examination" of transmitted frames, and the '211 patent "teaches a type of transmission where such examination is not done." PO Resp. 45; *see id.* at 45–52. Patent Owner continues, "[t]he MDLA devices in the proposed combination of Perloff and Kunzinger perform exactly the prohibited type of examination" during both layer 2 and layer 3 processing of IPsec tunnel transmissions. PO Resp. 46.

Petitioner asserts that in Kunzinger, tunneled packets have an outer header, an inner header, and a payload. When IPSec is used in tunnel mode, the complete inner packet comprising the inner header and payload, is protected (e.g., encrypted) and not examined, as the packet travels through the tunnel. Pet. Reply 19–20; Ex. 1007, 3:7–18. The outer packet header, however, is unencrypted ("in clear text form"). Ex. 1007, 3:13–14. As even Patent Owner acknowledges, the unencrypted outer header allows the IPSec packet to be properly routed over a network. PO Resp. 47, citing Ex. 2005, 67:3–68:1.

At the deposition of Petitioner's declarant, he testified that "the forward decisions will be based on the outer header." PO Resp. 49, citing Ex. 2005, 67:20–68:1. The '211 patent's definition of tunneling excludes examination of a frame for forwarding decisions:

> As used herein, tunneling is used to refer to transmitting a frame without examination. For example, when a bridge receives a frame, it generally examines the frame to determine the corresponding LAN Segment to forward the frame to. Additionally, a bridge will process the frame according to a number of protocols. However, in accordance with the present

> invention, bridge 342 is configured to internally transmit a frame
> between bridge inter-connect port 366 and port A0 directly,
> without such examination.

Ex. 1001, 5:59–6:1. Patent Owner argues Kunzinger's IPSec protocol "plainly constitutes examining the frame, as it is the traditional type of forwarding that is prohibited by the '211 patent's 'tunneling' feature." PO Resp. 52, citing Ex. 2003 ¶¶ 95–100.

At oral hearing, Petitioner confirmed, "What is clear from what we've argued is that undeniably there is a portion of the frame, again even if you're going to call it a layer 2 frame, that does not get looked at and cannot get looked at, again, because it is encrypted." Tr., 26:4–7. Petitioner also asserted (in its response (Paper 30) to Patent Owner's brief citing portions of the Reply allegedly beyond the scope of Patent Owner's Response) that "[t]he Petition also clearly acknowledges that, in the disclosure of Kunzinger, some portion of a frame is examined (outer header) while another is not (inner header)." Paper 30, 2 (citing Pet. 20, 21).

In other words, there is a portion of the frame, the outer header, which is indeed examined, as Patent Owner asserted at oral hearing:

> [T]he examination that's prohibited is the normal forwarding
> decisions that are performed by a layer 2 device, in other words,
> looking at the source and destination header information in the
> frame to determine how to forward that packet.
> Now, if we turn to our slide number 28. This is exactly as we
> talked about the type of examination that's occurring in
> Kunzinger and its IPSec tunnel. And when that IPSec packet
> goes through the tunnel, at every point it traverses in that tunnel
> the device that gets it at the network layer has to look at the outer
> header, that network packet of the IP's packet, to determine how
> to forward it.

Tr., 55:14–24. We agree with Patent Owner. Because the unencrypted outer header of the IPSec packet is examined for forwarding decisions, we are not persuaded that transmission of the IPSec packet in the proposed combination occurs without examination, as we have construed "tunneling" to require.

III. CONCLUSION

Based on the evidence and arguments, Petitioner has demonstrated by a preponderance of the evidence that claims 1 and 12 of the '211 patent are anticipated by Perloff. Petitioner has not demonstrated by a preponderance of evidence that claims 2, 6–9, 13, and 17–20 would have been obvious over Perloff and Kunzinger.

IV. ORDER

Accordingly, it is

ORDERED that claims 1 and 12 of the '211 patent are unpatentable;

FURTHER ORDERED that claims 2, 6–9, 13, and 17–20 of the '211 patent have not been shown to be unpatentable; and

FURTHER ORDERED that because this is a final written decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

PETITIONER:

Walter Renner
David Goren
Linhong Zhang
Todd Miller
Lauren Degnan
axf@fr.com
IPR40963-0008IP1@fr.com

PATENT OWNER:

Lori Gordon
Daniel Block
Jon Wright
Robert Sterne
Lgordon-ptab@skgf.com
Dblock-ptab@skgf.com
Jwright-ptab@skgf.com
Rsterne-ptab@skgf.com