

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

JUNIPER NETWORKS, INC.,
Petitioner,

v.

MONARCH NETWORKING SOLUTIONS LLC,
Patent Owner.

IPR2024-00485
Patent 8,451,844 B2

Before THU A. DANG, BRIAN J. McNAMARA, and
ROBERT J. WEINSCHENK, *Administrative Patent Judges*.

WEINSCHENK, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. *Background and Summary*

Juniper Networks, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–10 (“the challenged claims”) of U.S. Patent No. 8,451,844 B2 (Ex. 1001, “the ’844 patent”). Monarch Networking Solutions LLC (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”) to the Petition.

An *inter partes* review may not be instituted unless “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). Further, when instituting an *inter partes* review, we “will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” 37 C.F.R. § 42.108(a). Here, Petitioner demonstrates a reasonable likelihood of prevailing in showing that at least one of the challenged claims is unpatentable. Thus, we institute an *inter partes* review of the challenged claims on all the grounds of unpatentability in the Petition.

B. *Real Parties in Interest*

The parties identify themselves as the only real parties in interest. Pet. 3; Paper 4, 2.

C. *Related Matters*

The parties indicate that the ’844 patent is the subject of the following district court cases: 1) *Monarch Networking Solutions LLC v. Cisco Systems, Inc.*, No. 2:20-cv-00015 (E.D. Tex.); and 2) *Monarch Networking Solutions LLC v. Juniper Networks, Inc.*, No. 3:23-cv-05076 (N.D. Cal.).

Pet. 3; Paper 4, 2. The parties indicate that the '844 patent was the subject of a petition for *inter partes* review in IPR2020-01678. Pet. 4; Paper 4, 2.

D. The '844 Patent

The '844 patent relates to Internet Protocol ("IP") "telecommunications networks transporting data packets from a source equipment identified by a source address to a destination equipment identified by a destination address." Ex. 1001, 1:17–21. The '844 patent states that "public addresses [for Internet Protocol version 4 ('IPv4')] are going to run out," which led "to the definition of a new protocol known as the Internet Protocol version 6 (['IPv6'])." *Id.* at 1:61–65. According to the '844 patent, "[s]uch a changeover will necessarily lead to a period of transition during which IPv6 domains will have to interconnect with IPv4 domains." *Id.* at 2:49–51. To address this period of transition, the '844 patent describes "constructing an IPv6 address from an IPv4 address, a predetermined operator prefix, and a port number." *Id.* at 6:13–15. "This enables transformation of an IPv4 packet entering an IPv6 domain and an IPv6 packet leaving an IPv6 domain . . . without it being necessary to maintain a table of correspondence between the IPv4 and IPv6 addresses." *Id.* at 6:15–20.

E. Illustrative Claim

Of the challenged claims, claims 1, 3, 5, and 10 are independent. Claim 1 is reproduced below.

1. A method of receiving a data packet from an IPv4 domain in an IPv6 domain, said data packet comprising an IPv4

destination address and a destination port number, said method comprising the following steps:

constructing an IPv6 destination address by concatenating an operator prefix, said IPv4 destination address, and the destination port number;

generating an IPv6 data packet from the IPv6 constructed destination address and the received IPv4 packet; and

routing the generated IPv6 data packet in the IPv6 domain using the IPv6 constructed destination address, said constructed address belonging to a range of IPv6 addresses routable to an interconnection equipment of the IPv6 domain with the IPv4 destination address.

Ex. 1001, 14:29–42.

F. Evidence

Petitioner submits the following evidence:

Evidence	Exhibit No.
Declaration of Dr. Samrat Bhattacharjee (“Bhattacharjee Declaration”)	1003
Declaration of Sylvia Hall-Ellis, Ph.D. (“Hall-Ellis Declaration”)	1005
Declaration of Alexa Morris (“Morris-1 Declaration”)	1007
Declaration of Ron Bonica (“Bonica Declaration”)	1008
Declaration of Alexa Morris (“Morris-2 Declaration”)	1009
Xing Li, <i>Forwarding IPv4 Traffics in Pure IPv6 Backbone with Stateless Address Mapping</i> , 2006 IEEE/IFIP Network Operations and Management Symposium (2006) (“Li”)	1037
X. Li, <i>Bi-directional Address Borrowing (IVI)</i> , Network Working Group, Internet-Draft (June 21, 2008) (“Li-2”)	1038
Wu, CN 1525699A, published Sept. 1, 2004 (“Wu”)	1039

G. Asserted Grounds

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–10	103	Li, Li-2
1–10	103	Li
1–10	103	Li, Wu

II. ANALYSIS

A. *Level of Ordinary Skill in the Art*

Petitioner argues that a person of ordinary skill in the art would have had “a Bachelor of Science degree in electrical engineering, computer engineering, computer science, or a related subject, and three years of work experience in computer networking, including experience with the IPv4 and IPv6 protocols, or a related field.” Pet. 10 (citing Ex. 1003 ¶¶ 53–55). Petitioner’s description of the level of ordinary skill in the art is supported by the testimony of Petitioner’s declarant, Dr. Samrat Bhattacharjee. Ex. 1003 ¶¶ 53–55. Patent Owner does not dispute Petitioner’s description at this stage of the proceeding. Prelim. Resp. 19. We adopt Petitioner’s description for purposes of this Decision.

B. *Claim Construction*

In an *inter partes* review proceeding, a patent claim is construed using the same standard used in a civil action under 35 U.S.C. § 282(b), including construing the claim in accordance with the ordinary and customary meaning of the claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100(b). Petitioner notes that several claim terms previously were construed by a district court in another case. Pet. 10–14 (citing Ex. 1036). Patent Owner proposes construing the term “domain” to mean “a network or subnetwork and its address space that are under common control.” Prelim. Resp. 19–21.

Petitioner disagrees with Patent Owner’s proposed construction of the term “domain.” Pet. 31.

We determine that no claim terms require express construction for purposes of this Decision. As discussed below, even if we assume that the term “domain” means “a network or subnetwork and its address space that are under common control,” Petitioner shows sufficiently that at least one of the challenged claims is unpatentable. *See* Section II.E.1. As a result, we need not resolve the parties’ dispute about the meaning of the term “domain” for purposes of this Decision. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’”).

C. Obviousness of Claims 1–10 over Li and Li-2

Petitioner argues that claims 1–10 would have been obvious over Li and Li-2. Pet. 14–61. Because we determine below that Petitioner demonstrates a reasonable likelihood of prevailing on its other asserted ground based on Li and Wu, we also institute an *inter partes* review on this asserted ground. *See* Consolidated Trial Practice Guide, 64 (Nov. 2019), *available at* <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf> (“TPG”). Nonetheless, we provide a preliminary analysis of the parties’ arguments regarding this asserted ground “to provide guidance to the parties for the upcoming trial.” *Id.*

Petitioner argues that Li-2 is prior art “because it was publicly available before the ’844 patent’s priority date of June 30, 2008.” Pet. 20 (citing Ex. 1003 ¶¶ 67–69; Ex. 1008 ¶¶ 4–12; Ex. 1009 ¶¶ 10–11). According to Petitioner, Li-2 was uploaded to the Internet Engineering Task

Force’s (“IETF”) staging folder on June 21, 2008. *Id.* (citing Ex. 1009 ¶¶ 10–11). Petitioner contends that a person of ordinary skill in the art “would have monitored the IETF’s staging folder for new document uploads and browsed the staging folder for documents relevant to the networking field.” *Id.* at 21 (citing Ex. 1008 ¶¶ 9–10). In particular, Petitioner alleges that a person of ordinary skill in the art would have recognized that Li-2’s document name—draft-xli-ivi-00-7431-cancelled.txt—includes “xli” for the author, Dr. Xing Li, and “ivi” for IPv4 to IPv6 transition technology. *Id.* at 21–22 (citing Ex. 1008 ¶ 10). Petitioner also contends that “once a draft is uploaded to the IETF, it is added to the IETF Datatracker, which is a sophisticated tool that allows users to search drafts by several criteria, including working group, author, and technical area.” *Id.* at 22 (citing Ex. 1008 ¶ 11–12; Ex. 1009 ¶ 11).

Patent Owner argues that Petitioner does not show sufficiently that Li-2 is prior art to the challenged claims. Prelim. Resp. 31–38. Specifically, Patent Owner contends that “[t]he staging folder . . . contains many thousands of files” that are “not indexed or searchable” and thus “not reasonably accessible.” *Id.* at 35. Patent Owner also contends that “when an author cancels their submission (as Li-w was cancelled), ‘[a]fter a given period, it is removed from the Datatracker.’” *Id.* at 36.

As discussed above, Petitioner presents evidence that although Li-2 “never became an official Internet-Draft published in the IETF directory,” Li-2 remained in the IETF’s staging folder. Pet. 20–22; Ex. 1009 ¶¶ 10–11. But the evidence of record indicates that the IETF’s staging folder may contain thousands of documents. Prelim. Resp. 35; Ex. 1008 ¶ 4; Ex. 1044. This raises the issue of whether a person of ordinary skill in the art

exercising reasonable diligence could have located Li-2 simply by browsing the filenames of the numerous documents in the IETF’s staging folder.

Patent Owner may address this issue again and present any other arguments regarding this asserted ground in its Patent Owner Response.

Petitioner also presents evidence that the IETF’s Datatracker included Li-2 for “a given period” after the authors canceled Li-2. Pet 22; Ex. 1008 ¶ 11. But Petitioner does not indicate how long the IETF’s Datatracker would have included Li-2 (e.g., hours, days, weeks, years). See Pet. 22; Prelim. Resp. 36; Ex. 1008 ¶ 11. This raises the issue of whether Li-2 was present in the IETF’s Datatracker such that a person of ordinary skill in the art exercising reasonable diligence could have located Li-2. Patent Owner may address this issue again and present any other arguments regarding this asserted ground in its Patent Owner Response.

D. Obviousness of Claims 1–10 over Li

Petitioner argues that claims 1–10 would have been obvious over Li. Pet. 62–67. Because we determine below that Petitioner demonstrates a reasonable likelihood of prevailing on its other asserted ground based on Li and Wu, we also institute an *inter partes* review on this asserted ground. See TPG, 64. Nonetheless, we provide a preliminary analysis of the parties’ arguments regarding this asserted ground “to provide guidance to the parties for the upcoming trial.” *Id.*

Claim 1 recites “constructing an IPv6 destination address by concatenating an operator prefix, said IPv4 destination address, and the destination port number.” Ex. 1001, 14:33–35. The other challenged independent claims recite a similar limitation. *Id.* at 14:50–53, 15:5–7, 16:20–23. Petitioner acknowledges that “Li does not expressly disclose . . .

concatenating ‘the destination port number.’” Pet. 36. Petitioner argues, though, that “evidence of simultaneous invention . . . indicates that a [person of ordinary skill in the art] would have been motivated to modify Li to form an IPv6 address that includes the destination port number.” *Id.* at 62 (citing Ex. 1003 ¶ 164). Petitioner identifies Li-2 and several other documents that, even if not considered prior art, allegedly demonstrate simultaneous invention. *Id.* at 62–64 (citing Ex. 1027; Ex. 1028, 20–22; Ex. 1029, 1–4; Ex. 1038, 14; Ex. 1041, 21).

Patent Owner argues that Petitioner does not show sufficiently that there was simultaneous invention. Prelim. Resp. 45–49. Patent Owner contends that “a showing of simultaneous invention requires a showing that the purported simultaneous invention actually meets the limitations of the claims.” *Id.* at 47–48. But, according to Patent Owner, “Petitioner only address[es] the notion of forming an IPv6 address that includes a port number.” *Id.* at 47. Patent Owner asserts that Petitioner does not even allege that Li-2 or the other cited documents teach the rest of the limitations of the challenged independent claims. *Id.* at 46–47.

“[S]imultaneous invention may bear upon the obviousness analysis in two ways.” *Regents of the Univ. of Cal. v. Broad Inst., Inc.*, 903 F.3d 1286, 1295 (Fed. Circ. 2018). “First, it is evidence of the level of skill in the art.” *Id.* “Second, it constitutes objective evidence that persons of ordinary skill in the art understood the problem and a solution to that problem.” *Id.* Petitioner presents evidence indicating that a person of ordinary skill in the art understood the problem of IPv4 address exhaustion and the solution of using destination port numbers around the time of the ’844 patent. Pet. 62–64; Ex. 1003 ¶ 172; Ex. 1027, 7–8, 18–20; Ex. 1038, 14. But Petitioner does

not appear to explain how that evidence demonstrates simultaneous invention of all the limitations recited in the challenged claims. *See* Pet. 62–64; Prelim. Resp. 46–47. This raises the issue of “[t]he weight [Petitioner’s] evidence of simultaneous invention” should be given “in light of all the circumstances.” *See Regents*, 903 F.3d at 1296. Patent Owner may address this issue again and present any other arguments regarding this asserted ground in its Patent Owner Response.

E. Obviousness of Claims 1–10 over Li and Wu

Petitioner argues that claims 1–10 would have been obvious over Li and Wu. Pet. 67–74. For the reasons discussed below, Petitioner demonstrates a reasonable likelihood of prevailing in showing that claims 1–10 would have been obvious over Li and Wu.

1. Claim 1

Claim 1 recites “[a] method of receiving a data packet from an IPv4 domain in an IPv6 domain, said data packet comprising an IPv4 destination address and a destination port number.”¹ Ex. 1001, 14:29–32. Petitioner presents evidence that Li teaches receiving a data packet from an access network in an IPv4 domain at an edge router in an IPv6 domain. Pet. 28–32 (citing Ex. 1037, 6–7, Fig. 7). Petitioner also presents evidence that the received IPv4 data packet includes a destination address and a port number. *Id.* at 32–33 (citing Ex. 1037, 1, 3, 5–6).

Patent Owner argues that Petitioner does not show sufficiently that Li teaches receiving a data packet from an IPv4 domain in an IPv6 domain.

¹ We need not decide whether the preamble of claim 1 is limiting because Petitioner presents evidence that the prior art teaches the recitations in the preamble.

Prelim. Resp. 22–31. Specifically, Patent Owner contends that “the networks identified by Petitioner as purported separate domains are instead all part of a single provider domain.” *Id.* at 23. Patent Owner points out that Li’s Figure 1 depicts “an *intra-domain* configuration,” and asserts that “Figure 7, upon which Petitioner relies, depicts an identical network structure” in which “[t]he provider controls the networks.” *Id.* at 24–26. According to Patent Owner, “[t]hat Figures 1 and 7 illustrate an intra-domain solution is further confirmed by Figures 8, 10, and 11, which illustrate inter-domain deployments.” *Id.* at 26–29. Patent Owner also contends that “when Li details Figure 7, it explains that the “stub autonomous systems are connected to an IPv6 backbone, *as customer networks of the latter*, and only have accesses to IPv4 hosts within the scope *controlled by the provider*.” *Id.* at 30.

On this record, Patent Owner’s argument is unavailing. Li’s Figure 1 depicts a “basic scheme” for “[i]ntra-domain IPv4-overIPv6 transition.” Ex. 1037, 3, Fig. 1 (emphasis added). And Figure 1 labels the IPv4 networks as “IPv4 [s]ubnet[s].” *Id.* In contrast, Li’s Figure 7 depicts an extension of the basic scheme “to fit the requirements of forwarding IPv4 traffic in an *inter-domain* environment.” *Id.* at 6, Fig. 7 (emphasis added). Consistent with this distinction, Figure 7 includes IPv4 “access networks” with “independent AS numbers,” rather than IPv4 subnets. *Id.* Thus, the evidence of record indicates that Li’s Figure 7 depicts IPv4 access networks that are separate domains from the IPv6 provider.

Claim 1 recites “constructing an IPv6 destination address by concatenating an operator prefix, said IPv4 destination address, and the destination port number.” Ex. 1001, 14:33–35. Petitioner presents evidence

that Li teaches constructing an IPv6 destination address that includes an IPv6 global routing prefix (i.e., an operator prefix) and the IPv4 destination address. Pet. 33–35 (citing Ex. 1037, 3, Fig. 2). Petitioner also presents evidence that Wu teaches constructing an IPv6 destination address that includes the destination port number. *Id.* at 70–72 (citing Ex. 1039, 9–12, Fig. 1). As discussed in more detail below, Petitioner presents evidence that it would have been obvious to combine the cited teachings of Li and Wu so that Li’s constructed IPv6 destination address includes Wu’s destination port number. *Id.* at 68–69 (citing Ex. 1003 ¶ 207); *see* Section II.E.3. Other than the arguments discussed above, Patent Owner does not dispute that the Li and Wu combination teaches this limitation of claim 1.

Claim 1 recites “generating an IPv6 data packet from the IPv6 constructed destination address and the received IPv4 packet.” Ex. 1001, 14:36–37. Petitioner presents evidence that Li teaches generating an IPv6 data packet from the constructed IPv6 destination address and the received IPv4 packet. Pet. 36–37 (citing Ex. 1037, 3–4, 6). Other than the arguments discussed above, Patent Owner does not dispute that the Li and Wu combination teaches this limitation of claim 1.

Claim 1 recites “routing the generated IPv6 data packet in the IPv6 domain using the IPv6 constructed destination address, said constructed address belonging to a range of IPv6 addresses routable to an interconnection equipment of the IPv6 domain with the IPv4 destination address.” Ex. 1001, 14:38–42. Petitioner presents evidence that Li teaches routing the generated IPv6 data packet in the IPv6 backbone. Pet. 37–38 (citing Ex. 1037, 1). Petitioner also presents evidence that Li’s edge routers and relays serve a range of IPv6 addresses constructed from IPv4 destination

addresses. *Id.* at 38–39 (citing Ex. 1037, 3–4, 7). Other than the arguments discussed above, Patent Owner does not dispute that the Li and Wu combination teaches this limitation of claim 1.

Thus, on this record, Petitioner shows sufficiently that the Li and Wu combination teaches the limitations of claim 1.

2. Claims 2–10

Petitioner presents evidence that the Li and Wu combination teaches the limitations of claims 2–10. Pet. 39–61, 72–74. Other than the arguments discussed above for claim 1, Patent Owner does not present any additional arguments for these claims. On this record, Petitioner shows sufficiently that the Li and Wu combination teaches the limitations of claims 2–10.

3. Reason to Combine

Petitioner argues that a person of ordinary skill in the art would have had reason to combine the cited teachings of Li and Wu so that Li’s constructed IPv6 destination address includes Wu’s destination port number. Pet. 68–70 (citing Ex. 1003 ¶¶ 207–214). According to Petitioner, doing so would have been obvious because there was a “need to mitigate IPv4 address exhaustion,” and “[o]ne known way of addressing this exhaustion was to extend the IPv4 address space by sharing an IPv4 address among many hosts and using port numbers to uniquely identify those hosts.” *Id.* at 69 (citing Ex. 1003 ¶¶ 209–210). Petitioner also presents evidence that “the combination would have been of a known technique (i.e., Wu’s teaching of constructing an IPv6 address by concatenating a port number) to a known device (i.e., Li’s edge router that already constructs IPv6 addresses by concatenating information, including 32 bits of unused padding) to yield a predictable result (i.e., an edge router that can construct an IPv6 address

that includes a destination port number in place of 16 bits of the unused padding.” *Id.* at 69–70 (citing Ex. 1003 ¶ 211) (emphases omitted).

Patent Owner argues that Petitioner does not show sufficiently that it would have been obvious to combine the cited teachings of Li and Wu. Prelim. Resp. 49–51. In particular, Patent Owner contends that Li and Wu “address completely different communication problems in the context of IP networks.” *Id.* at 49. According to Patent Owner, “Li addresses the problem of allowing IPv4 hosts within an IPv4 network to communicate with other IPv4 hosts across an IPv6-only network,” whereas Wu “addresses the inverse of the problem in Li—the problem of allowing IPv6 hosts within a network to communicate with other IPv6 hosts across an IPv4 network.” *Id.* at 49–50. Patent Owner asserts that “suggest[ing] that an IPv4-focused tunneling solution can simply be transplanted to an IPv6 transit domain solution, as Petitioner does, ignores this inherent incompatibility.” *Id.* at 51.

On this record, Patent Owner’s argument is unavailing. First, the evidence of record indicates that Li and Wu are analogous art. Pet. 70; Ex. 1003 ¶¶ 213–214. For example, the ’844 patent, Li, and Wu are all directed to the same field of endeavor, namely, computer networking and routing data packets. Ex. 1001, 1:17–21; Ex. 1003 ¶ 213; Ex. 1037, 1; Ex. 1039, 9. Second, the evidence of record indicates that a person of ordinary skill in the art would have had a reasonable expectation of success in combining the cited teachings of Li and Wu. Pet. 69; Ex. 1003 ¶ 210. As discussed above, Petitioner relies on Wu’s teaching that an IPv6 destination address includes a destination port number. Pet. 68–69; Ex. 1003 ¶ 207. Even if Patent Owner is correct that Li and Wu address the interoperability of IPv4 and IPv6 networks from different perspectives, a person of ordinary

skill in the art would have reasonably expected that Wu's destination port number could be incorporated into the unused padding in Li's IPv6 destination address. Pet. 69–70; Ex. 1003 ¶¶ 210–211.

Thus, on this record, Petitioner shows sufficiently that it would have been obvious to combine the cited teachings of Li and Wu.

4. *Summary*

For the foregoing reasons, Petitioner demonstrates a reasonable likelihood of prevailing in showing that claims 1–10 would have been obvious over Li and Wu.

III. CONCLUSION

Petitioner demonstrates a reasonable likelihood of prevailing in showing that at least one of the challenged claims is unpatentable. Accordingly, we institute an *inter partes* review on all grounds of unpatentability in the Petition. At this stage of the proceeding, we have not made a final determination with respect to the patentability of any of the challenged claims.

IV. ORDER

It is hereby

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–10 of the '844 patent is instituted with respect to all grounds of unpatentability set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '844 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

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