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Paper: 32
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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, KEVIN F. TURNER, and
JON M. JURGOVAN, *Administrative Patent Judges*.

TURNER, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

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. We instituted an *inter partes* review of the challenged claims on August 8, 2024 (Paper 8; "Dec. on Inst.") on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–10	103[1]	Li[2], Li-2[3]
1–10	103	Li
1–10	103	Li, Wu[4]

See Pet. 6; Dec. on Inst. 15. Petitioner relied upon following Declarations: Dr. Samrat Bhattacharjee (Ex. 1003; "Bhattacharjee Decl."); Sylvia Hall-Ellis, Ph.D. (Ex. 1005); Ron Bonica (Ex. 1008); and Alexa Morris (Exs. 1007, 1009).

After institution, Patent Owner filed a Response (Paper 16, "PO Resp.") to the Petition, relying on the Declaration of William Henry

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[1] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103. Based on the effective filing date of the '844 Patent, we apply the pre-AIA version of § 103.

[2] Xing Li, *Forwarding IPv4 Traffics in Pure IPv6 Backbone with Stateless Address Mapping*, 2006 IEEE/IFIP Network Operations and Management Symposium (2006) (Ex. 1037; "Li").

[3] X. Li, *Bi-directional Address Borrowing (IVI)*, Network Working Group, Internet-Draft (June 21, 2008) (Ex. 1038; "Li-2").

[4] CN 1525699A, published Sept. 1, 2004 (Ex. 1039; "Wu").

Mangione-Smith. Ex. 2015 ("Mangione-Smith Decl."). Petitioner filed a Reply (Paper 18, "Pet. Reply") to the Response, along with a Supplemental Declaration of Dr. Bhattacharjee (Ex. 1057; "Bhattacharjee Supp. Decl."), and Patent Owner filed a Sur-reply (Paper 20, "PO Sur-reply") to the Reply. We held an oral hearing on May 7, 2025, and a transcript of the hearing is included in the record. Paper 30 ("Tr.").

For the reasons set forth below, Petitioner has shown by a preponderance of the evidence that claims 1–10 of the '844 Patent are unpatentable.

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.

II. ANALYSIS

A. Legal Standards

A claim is unpatentable as obvious if the differences between the claimed subject matter 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 the 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 ordinary skill in the art; and 4) any objective indicia of non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. 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. PO Resp. 19–20. We adopt Petitioner's description for purposes of this Decision.

C. 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 indicates that it does not contest those constructions. PO Resp. 20. Patent Owner proposes construing the term "domain" to mean "a network or subnetwork and its address space that are under common control," asserting that both intrinsic and extrinsic evidence support its construction. *Id*. at 20–21. Petitioner disagrees with Patent Owner's proposed construction of the term "domain." Pet. 31; Pet. Reply 3–4.

As we determined in the Institution Decision (Dec. on Inst. 6), we continue to adopt the constructions of the terms previously construed by the district court. With respect to the claim term "domain," we agree with Petitioner that the '844 Patent defines "domain" as "[a] telecommunications network administered by an operator." Pet. 31 (quoting Ex. 1001, 1:30–31). We further agree that the '844 Patent does not require the IPv4 and IPv6 domains to each be controlled by distinct entities. *See* Ex. 1003 ¶ 91.

Patent Owner argues that "a network administered by a different operator would be a different domain," and that the specification highlights the difference between a private domain and a domain operated by a service provider. PO Resp. 20–21. Patent Owner also argues that "[t]his concept is important, because a network operator controlling a domain can take precautions, such as restricting where in the network address translation occurs, and ensuring private addresses are not re-used within that domain." *Id*. at 21 (citing Ex. 2015 ¶ 48). Patent Owner also points to dictionary

definitions that detail that data processing resources in a domain are under common control. *Id*. (citing Ex. 2003, 3; Ex. 2004, 4). In addition, Patent Owner argues that "the '844 Patent claims all require that a data packet is sent or received between two separate domains, one an IPv4 domain and the other an IPv6 domain." PO Sur-reply 2.

Petitioner replies that Patent Owner's narrower construction is unsupported. Pet. Reply 3–4. Petitioner asserts that the lexicography of the Specification controls, that the provided definition "merely states that an operator must administer the domain," and that there is no support in the patent that domains must be commonly controlled by different entities. *Id*. (citing Ex. 1057 ¶¶ 3, 4). Petitioner also argues that the cited extrinsic evidence explains that "when the Internet came along, the definition got a little looser" to even encompass "a group of computers on a network that share something in common," thus undercutting Patent Owner's narrower construction. *Id*. at 4 (quoting Ex. 2003, 3–4; citing Ex. 1057 ¶ 5).

As discussed above, we are not persuaded that the recitations of different domains, such as "an IPv4 domain" and "an IPv6 domain" in independent claim 1, requires that those domains be controlled by *distinct* entities. Each domain must be administered by an operator, but we are not persuaded that each operator must be distinct, based on the intrinsic and extrinsic evidence. A single operator could maintain each domain, keeping each categorized as needed, with specific actions to be taken with respect to each domain.

It is clear that independent claim 1 requires two domains, i.e., "an IPv4 domain" and "an IPv6 domain," but we are not persuaded that the administrators of each must different, based on the evidence and arguments

presented. As such, we continue to construe "domain" as "a telecommunications network administered by an operator," per the definition supplied in the Specification of the '844 Patent.

D. Asserted 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 has shown by a preponderance of the evidence that claims 1–10 would have been obvious over Li and Wu.

1. Overview of Li (Ex. 1037)

Li discusses the transition process for migrating networks from IPv4 to IPv6 as being "difficult and complicated," and proposes a new technique for forwarding IPv4 traffics in an IPv6-only backbone. Li 1. Li proposes mapping IPv4 packets into IPv6 packets (or vice versa) "automatically at the edge of the IPv6 backbone, with the help of BGP routing tables." *Id*.

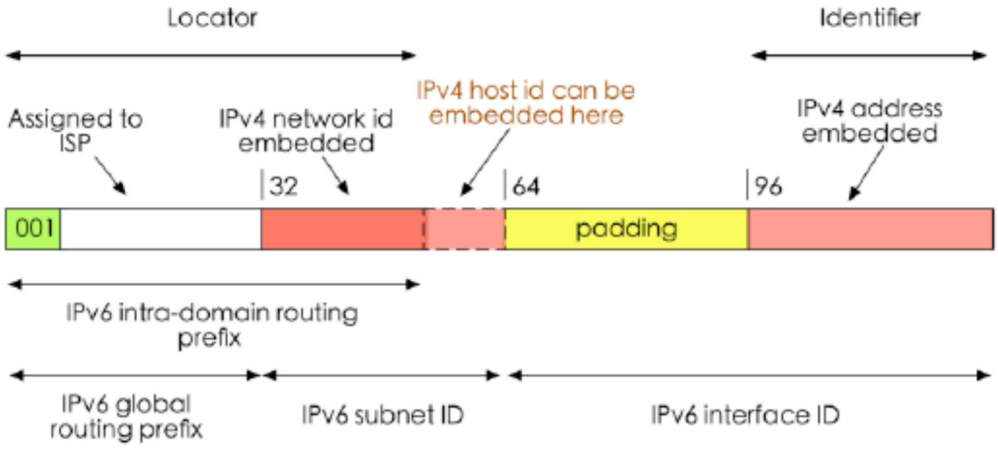


Figure 2 of Li illustrates an intra-domain IPv4-over-IPv6 transition

2. Overview of Wu (Ex. 1039)

Wu is directed to an automatic tunnel method capable of traversing network address translation. Wu 2. Wu describes a dual-stack client that

constructs an IPv6 address by concatenating different pieces of information. *Id*. at 11. This is illustrated in Figure 1 of Wu, reproduced below:

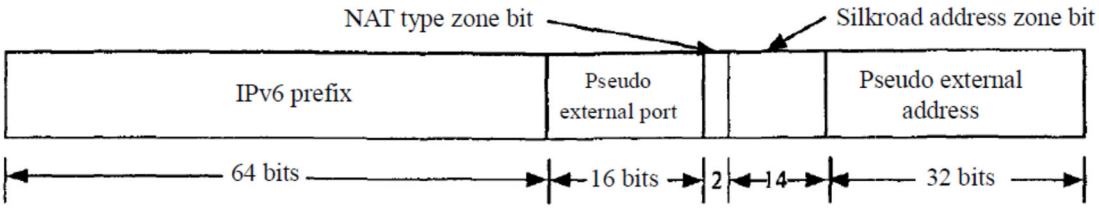


Fig. 1

Figure 1 of Wu illustrates a diagram of the address assigned by the server

Wu details that the first 64 bits of the constructed IPv6 address correspond to an IPv6 prefix, the next 16 bits correspond to the external port number, the next 2 bits indicate the type of NAT used in the network, the next 14 bits are padded with 0s, reserved for a "Silkroad address," and the final 32 bits correspond to the external IPv4 address. *Id.* at 11–12.

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."[5] Ex. 1001, 14:29–32. 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; Ex. 1037, 6–7, Fig. 7. The evidence of record indicates that the received IPv4 data packet includes a destination address and a port number. Pet. 32–33; 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. PO Resp. 22–31. Specifically, Patent Owner contends that "the networks

[5] We need not decide whether the preamble of claim 1 is limiting because the prior art teaches the recitations in the preamble.

identified by Petitioner as purported separate domains are instead all part of a single provider domain." *Id.* at 23 (citing Ex. 2015 ¶ 67). 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 25–27 (citing Ex. 2015 ¶ 70). 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 27–29 (citing Ex. 2015 ¶¶ 71–72). 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.

Petitioner responds that Li is clear that the IPv4 networks in Figure 1 are subnets of the larger network in the figure and can share addressing information using the Interior Gateway Protocol, whereas the IPv4 networks in Figure 7 are autonomous systems. Pet. Reply 4–6 (citing Ex. 1037, 3, 6–7, Figs. 1, 7; Ex. 1057 ¶ 9). Petitioner also argues that "[t]he prior art consistently explains that such autonomous systems are 'domains,'" and Li introduces Figure 7 in a section titled "Extensions to Inter-Domain Environment." *Id*. at 6 (citing Ex. 1037, 6; Ex. 1057 ¶¶ 8, 10; Ex. 1058 ¶ 13; Ex. 1059 ¶ 1). Petitioner also argues that Li "operates in the same manner in Figure 7 and Figures 8, 10, and 11," where Patent Owner has acknowledged that the constructed IPv6 address in all figures still contains (1) an IPv6 prefix, (2) the IPv4 destination address, and (3) zero padding. *Id*. at 7–8 (citing PO Resp. 13–14; Ex. 1057 ¶ 12).

Patent Owner responds that "[u]nder a proper understanding of Li's disclosure, [the] stub autonomous systems [, identified by Petitioner,] are part of a single domain controlled by a single entity." PO Sur-reply 3. Patent Owner also argues that Petitioner's construction of "domain" is "unreasonably broad definition" (*id*. at 3–4), but we need not address this argument per the analysis above. *See* Section II.C. Patent Owner also argues that Petitioner and its declarant ignore the distinction between "autonomous systems" and "stub autonomous systems," where the stub autonomous systems of Li only have accesses to IPv4 hosts within the scope controlled by the provider, and are not independent domains. PO Sur-reply 6–7. Additionally, Patent Owner argues that Petitioner improperly raises new arguments with respect to Figures 8, 10, and 11 in the Reply, and Petitioner has not shown that Figures 8, 10, and 11 of Li render the claims obvious (*id*. at 7–11), but we need not address these latter arguments, as we are not persuaded that Petitioner is alleging the obviousness of the claims of the '844 Patent over those additional figures, and the parties' discussions of those additional figures are only made to shed light on the disclosure of Figure 7 of Li, as discussed below.

Patent Owner's arguments are 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.

Additionally, we are persuaded by Petitioner's arguments that Figures 8, 10, and 11 of Li demonstrate how one of ordinary skill in the art would have viewed the disclosure of Figure 7 to be. As discussed above, Patent Owner has acknowledged that "Figures 8, 10, and 11, . . . illustrate inter-domain deployments." PO Resp. 27. We find persuasive Dr. Bhattacharjee's testimony that "[t]here is no material difference between Figure 7 and the Admitted Inter-Domain Figures that prevents mapping the '844 claims to the Admitted Inter-Domain Figures in the same manner." Ex. 1057 ¶ 11. We need not consider whether Figures 8, 10, and 11 of Li demonstrate the obviousness of the instant claims, not proffered in the Petition, to conclude that Petitioner is correct that Figure 7 of Li would have been seen as disclosing an inter-domain embodiment.

Claim 1 also 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. 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; Ex. 1037, 3, Fig. 2. Wu teaches constructing an IPv6 destination address that includes the destination port number. Pet. 70–72; Ex. 1039, 9–12, Fig. 1. As discussed in more detail below, 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. Pet. 68–69; Ex. 1003 ¶ 207; *see* Section II.D.5. We address Patent Owner's arguments with respect to the combination of Li and Wu in that latter section.

Claim 1 additionally recites "generating an IPv6 data packet from the IPv6 constructed destination address and the received IPv4 packet." Ex. 1001, 14:36–37. Li teaches generating an IPv6 data packet from the constructed IPv6 destination address and the received IPv4 packet. Pet. 36–37; 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 also 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. Li teaches routing the generated IPv6 data packet in the IPv6 backbone. Pet. 37–38; Ex. 1037, 1. Li's edge routers and relays serve a range of IPv6 addresses constructed from IPv4 destination addresses. Pet. 38–39; 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.

For the foregoing reasons, 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). The evidence of record indicates that 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." Pet. 69; Ex. 1003 ¶¶ 209–210. The evidence of record also indicates 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)." Pet. 69–70; Ex. 1003 ¶ 211 (emphasis 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. PO Resp. 51–59. In particular, Patent Owner contends that Li and Wu "address unrelated communication problems." *Id.* at 51. 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.* 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 53.

Petitioner argues that Patent Owner never disputes the discrete teaching of Wu, namely that incorporating a port number into an IPv6 address can be used to slow IPv4 address exhaustion, and "instead improperly focuses on irrelevant disclosures in Wu to confuse the issues." Pet. Reply 21. Petitioner also argues that we have previously reviewed and rejected Patent Owner's arguments regarding whether Li and Wu are analogous art. *Id*. at 23. Petitioner asserts that Patent Owner is suggesting that ordinarily skilled artisans would need to bodily implement Wu's system into Li, instead of making the alteration proposed in the Petition, and that "[t]he exact configuration of Wu's system is irrelevant because a POSITA would have just implemented this discrete teaching from Wu into Li, not the entire system." *Id*. at 24–25. Patent Owner responds that Petitioner is seeking to "focus on a narrow part of Wu, divorced from the surrounding text." PO Sur-reply 18–19.

Patent Owner's arguments are 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.

Patent Owner also argues that combining Li with Wu would eliminate the benefits of Li because Wu is a stateful system, Li is a stateless solution, such that ordinarily skilled artisans would not have looked to Wu to improve Li, and that "if Li and Wu could be combined, doing so would eliminate any advantages of Li's stateless technique." PO Resp. 53–55 (citing Ex. 1039, 3; Ex. 1037, 3; Ex. 2015 ¶¶ 102–104).

Petitioner responds that Patent Owner misunderstands how Wu works, because Wu statelessly constructs IPv6 addresses. Pet. Reply 25–26 (citing Ex. 1057 ¶¶ 63–67). Petitioner further responds that Patent Owner "takes a single quote out of context and assumes that Wu is stateful because the server in Wu 'assign[s]' an IPv6 address to a client," but that Wu's system acts dynamically and statelessly in constructing and extracting IPv6 and IPv4 information. *Id*. at 26–27 (citing Ex. 1039, 13–14). Patent Owner responds that Petitioner is citing to the initial setup process in Wu, and not packet routing, such that "the NAT mapping must be maintained," and that Petitioner's "selective quotes do not show that Wu is stateless." PO Sur-reply 20–22 (citing Ex. 1039, 6, 11–13).

Patent Owner's arguments are unavailing. We agree with Petitioner that Wu teaches that constructing the IPv6 address and extracting information from it are dynamic processes, and Wu never suggests that

devices consult state information to obtain the appropriate IPv4 and IPv6 addresses. Pet. Reply 25–26. We also find persuasive Dr. Bhattacharjee's testimony that:

> In a stateful process, intermediary servers maintain state, for example, a database table containing mappings of an internal address and port number to an external address and port number. *See* EX1062, 3 ("Finally, the third category is the *stateful* applications, that keep track of the state of packet processing, usually by setting fields of state related to the flows or connections."). The servers consult that table to route data packets by performing a lookup based on address and port information in a received data packet and then routing the packet to the internal host according to the result of the lookup. In a stateless process, the server forgoes database tables and lookups and instead dynamically constructs and deconstructs addresses based on information found in the received data packet. *See* EX1062, 2-3 ("There is another category called *stateless* applications. Stateless means that there is no record of previous packet processing and each packet processing has to be handled based entirely on its own information.").

Ex. 1057 ¶ 64. We concur further with his analysis that the address construction and deconstruction described in Wu is therefore not a stateful process, but a stateless one. *See* Ex. 1057 ¶ 65. Even taking Patent Owner's assertion that this occurs in the setup process in Wu, and not the packet routing process, we are still persuaded that one of ordinary skill in the art would have understood this as Wu disclosing the construction of an IPv6 address by concatenating a port number, and that it would have proven useful in the context of Li, given that "[o]ne known way of addressing this [IPv4 address] 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." *See* Pet. 69; Ex. 1003 ¶¶ 209–210.

Patent Owner also argues that Wu does not teach a destination address constructed with a destination port number, per the claims of the '844 Patent. PO Resp. 56–59. Patent Owner continues that Wu's NAT translates a source port number into an external port number, where the pseudo port field in Figure 1 of Wu "is at best the source port of the client, not a destination port." *Id*. at 56–57 (citing Ex. 2015 ¶ 107). Patent Owner argues that persons of ordinary skill in the art would not have understood "'pseudo external port' or 'pseudo external address' to be terms of art," and would not have necessarily understood them to be port numbers, or how they could be used when constructing an IPv6 destination address. *Id*. at 57–58 (citing Ex. 2015 ¶¶ 109–110).

Petitioner responds that the Petition does not "rely on Wu to teach 'an IPv6 address that is constructed in response to receiving an IPv4 packet,' or a server that 'perform[s] IPv6 destination address construction as specified in the '844 claims,' because Li already teaches these claim limitations." Pet. Reply 27 (citations omitted) (quoting PO Resp. 56, 58; citing Pet. 28–39 70–72). Petitioner also responds that "[a] source port in one direction is a destination port on the way back," and that Wu explains that the pseudo external port number is itself a destination port number, noting multiple times that "the destination port is the extracted external port" from the SilkRoad IPv6 address. *Id*. at 28–29 (citing Ex. 1039, 6, 15). Lastly, Petitioner responds that ordinarily skilled artisans would have recognized that there is no need to perform the additional operations on the original port number described in Wu because "Wu explains that the purpose of these operations is to prevent intermediary NATs from interfering with or changing the data packet." *Id*. at 29–30 (citing Ex. 1039, 3; Ex. 1057 ¶ 73).

Patent Owner responds that Petitioner's arguments rely on "the mistaken position that Wu is stateless," that "[c]ombining Wu's stateful system with Li's stateless system would have eliminated the benefits of Li," and that "Wu's teachings plainly change the principle of operation of Li." PO Sur-reply 19–20, 22–24 (citing Ex. 1037, 1; Ex. 1039, 3).

Patent Owner's arguments are unavailing. As discussed above, we are not persuaded that Wu teaches a stateful system, such that it would negate the benefits disclosed in Li. Further, we agree with Petitioner that Wu describes an embodiment where an "ordinary IPv6 node" communicates "to the client end"—i.e., the SilkRoad client is a destination host and the SilkRoad address is "the destination IPv6 address," such that the port number in the SilkRoad address is the destination port because the data packet is being sent to the SilkRoad client. Pet. Reply 28 (citing Ex. 1039, 15–16, 21, Fig. 11). Based on the teachings of Wu, we are persuaded that one of ordinary skill in the art would have modified Li such that its edge router can construct an IPv6 address that includes a destination port number in place of 16 bits of the unused padding, as provided in the Petition. *See* Pet. 69–70; Ex. 1003 ¶ 211.

For the foregoing reasons, 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 has shown by a preponderance of the evidence that claims 1–10 would have been obvious over Li and Wu.

E. Other Asserted Grounds

Petitioner also argues that 1) claims 1–10 would have been obvious over Li and Li-2; and 2) claims 1–10 would have been obvious over Li.

Pet. 14–67. Because Petitioner has shown that claims 1–10 are unpatentable based on the asserted grounds discussed above, we do not reach these additional asserted grounds. *See Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) ("The Commission . . . is at perfect liberty to reach a 'no violation' determination on a single dispositive issue."); *Boston Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App'x 984, 990 (Fed. Cir. 2020) (recognizing that "[t]he Board has the discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims").

III. CONCLUSION[6]

Petitioner has shown by a preponderance of the evidence that claims 1–10 of the '844 Patent are unpatentable.

In summary:

Claim(s)	35 U.S.C. §	Reference(s)/Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1–10	103	Li, Li-2[7]		
1–10	103	Li[8]		
1–10	103	Li, Wu	1–10	
Overall Outcome			1–10	

IV. ORDER

It is hereby

ORDERED that claims 1–10 of the '844 Patent are shown 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.

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[6] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

[7] We do not reach this asserted ground. *See* Section II.E.

[8] We do not reach this asserted ground. *See* Section II.E.

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