

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

JUNIPER NETWORKS, INC.,
Petitioner,

v.

MONARCH NETWORKING SOLUTIONS LLC,
Patent Owner.

U.S. Patent No. 8,451,844

“Method of Receiving a Data Packet Coming from an IPv4 Domain in an IPv6
Domain, an Associated Device, and Associated Access Equipment”

IPR2024-00485

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EX1021	H. Yeom et al., "IP Multiplexing by Transparent Port-Address Translator," 10th USENIX System Administration Conference (LISA X) (Sept. 29, 1996), available at https://www.usenix.org/conference/lisa-96/ip-multiplexing-transparent-port-address-translator
EX1022	A. Reitz, "The Dynamic Port Reservation Protocol," Univ. Ill. at Urbana-Champaign (2001), available at http://redefine.dyndns.org/~andyr/documents_and_writings/thesis/docs/areitz_msthesis.pdf
EX1023	Y. Zhu et al., "Stateless Mapping and Multiplexing of IPv4 Addresses in Migration to IPv6 Internet," Institute of Electrical and Electronics Engineers ("IEEE") (Nov. 2008), available at https://ieeexplore.ieee.org/document/4698208
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EX1037	X. Li et al., “Forwarding IPv4 Traffics in Pure IPv6 Backbone with Stateless Address Mapping,” IEEE (Apr. 2006), available at https://ieeexplore.ieee.org/document/1687557 (“Li”)
EX1038	X. Li, “Bi-directional Address Borrowing (IVI),” IETF (June 21, 2008), available at https://www.ietf.org/staging/draft-xli-ivi-00-7430-cancelled.txt (“Li-2”)
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EX1051	Correspondence from lowekamp@sipeerior.com (Nov. 14, 2007), available at

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EX1059	S. Kent et al., “Secure Border Gateway Protocol (S-BGP)—Real World Performance and Deployment Issues,” BBN Techs. (Feb. 2000), available at

	http://dpmn.postech.ac.kr/research/08/KT_BGP/BGP_Security/sbgp.pdf
EX1060	I. Kalaydjieva, "The Border Gateway Protocol and Its Convergence Properties," Tech. Univ. Munich (June 2003), available at https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=4eb2026d1c6e9babb414ddbc1359c06c92a340a0
EX1061	RFC 1771, "A Border Gateway Protocol 4 (BGP-4)," IETF (Mar. 1995), available at https://datatracker.ietf.org/doc/html/rfc1771
EX1062	J. Verdu et al., "The Impact of Traffic Aggregation on the Memory Performance of Networking Applications," J. Embedded Comput. (2006), available at https://futur.upc.edu/654889
EX1063	U.S. Patent No. 8,451,845 to Mohamed Boucadair et al. ("845 patent")
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EX1065	Reexamination Certificate, EPR Control No. 90/019,246 (Oct. 24, 2024)

I. INTRODUCTION

Patent Owner misrepresents the factual record and law to try to save the '844 claims, but these arguments are easily disproven.

Regarding all grounds, PO construes “domain” incorrectly. As a result, PO misunderstands Figure 7 of Li, which depicts an inter-domain, not an intra-domain, system. Not only is Figure 7 found a section titled “Extensions to *Inter-Domain Environment*,” but the system depicted in Figure 7 also uses a protocol for communicating addressing information in inter-domain systems.

As to ground 1, Li-2 is prior art. It existed in the IETF staging folder for over 15 years, and the staging folder itself was well-known among POSITAs who learned about it either when they submitted Internet-Drafts to the IETF or when they received one of the multiple e-mails from other POSITAs referencing the staging folder. PO's substantive attacks on the combination of Li and Li-2 are also incorrect. Li-2 expressly states it applies to the system described in Li, and it is otherwise clearly an extension of Li. Moreover, Juniper does not need to explain why a POSITA would deviate from other purported solutions in favor of Li and Li-2 because the law only requires Juniper to identify a “suitable” combination.

Li alone also renders the '844 claims obvious under ground 2. Li teaches all of the '844 claim elements other than including a port number in the constructed IPv6 address. A POSITA would have found it obvious, based on knowledge in the

art, to replace Li's unused padding with a destination port number to prevent IPv4 address exhaustion. In fact, it was common at that time to use port numbers for this very purpose. PO does not meaningfully contest these assertions. Instead, PO focuses on Juniper's evidence of simultaneous invention. This evidence demonstrates that making this change required minimal skill in the art, but it is not necessary to establish obviousness. *In re Merck & Co.*, 800 F.2d 1091, 1098 (Fed. Cir. 1986). The Board can thus cancel the '844 claims because they would have been obvious in view of Li alone—which PO fails to rebut—without needing to rely on evidence of simultaneous invention.

Finally, the combination of Li and Wu in ground 3 also renders obvious the '844 claims. PO's arguments largely rehash points that the Board already fully considered and rejected in its institution decision. PO also overstates the proposed combination of Li and Wu and therefore fails to address the discrete teaching from Wu that a POSITA would have actually relied on, *i.e.*, that port numbers can be used to mitigate IPv4 address exhaustion.

All of the '844 claims are therefore invalid as obvious, and Juniper respectfully asks the Board to cancel these claims.

II. ARGUMENT

A. All Grounds: Figure 7 of Li Depicts an Inter-Domain System

PO's argument about whether Li teaches "domains" is based on an incorrect construction and contradicts Li's teachings, and the Board has already rejected this argument. Paper 8 ("ID"), at 10-13.

PO's Narrow Construction Is Unsupported. The parties agree that the patent expressly defines "domain" to mean "[a] telecommunications network administered by an operator." EX1001, 1:30-31; Paper 16 ("POR"), at 20. This lexicography controls. EX1057 ¶3; *Martek Biosciences Corp. v. Nutrinova, Inc.*, 579 F.3d 1363, 1380 (Fed. Cir. 2009). PO tries to further limit this definition to mean "a network or subnetwork and its address space that are under common control" and require each domain to be controlled by a "different entit[y]." POR 20-21. But it is "improper to override the patentee's express definition of '[domain]' to limit the scope of the claims." *Martek*, 579 F.3d at 1381.

In support of its improperly narrow construction, PO argues that the patent allegedly "supports defining domain to include the concept of control." POR 20. But the express definition says no such thing about control, much less common control by different entities. EX1057 ¶3. It merely states that an operator must administer the domain. *Id.* PO cites various portions of the specification to argue that domains must be controlled by different entities so that the controlling entity

can take “precautions” to “ensur[e] private addresses are not re-used within that domain.” POR 21. But PO’s cites do not relate to this argument, which PO seems to have made up. EX1057 ¶4. There is also no support in the patent that domains must be commonly controlled *by different entities*. *Id.* Juniper preempted many of these points in its petition, (Paper 1 (“Petition”), at 31), and PO did not respond to Juniper’s arguments, (*see* EX1057 ¶6).

PO’s extrinsic evidence is even worse. It derides PO’s definition as “the formal technical definition” but not what the term means in everyday language. EX2003, 3. As the extrinsic evidence explains, “when the Internet came along, the definition got a little looser” to even encompass “a group of computers on a network that” merely “share something in common.” *Id.* 3-4. Rather than support its construction, PO’s extrinsic evidence confirms that “domain” has a broad meaning in the art. EX1057 ¶5. There is no support for PO’s narrow definition in either the intrinsic or extrinsic evidence.

Li Teaches Domains: Li’s Figure 7 teaches the correct construction of “domain,” as used in the patent and as it was commonly understood in the art. EX1057 ¶7. The inter-domain nature of Figure 7 is especially evident when comparing it to the intra-domain network depicted in Figure 1. *Id.* ¶¶7-10. 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, (EX1037, 3; EX1057

¶9), which is a protocol used to exchange information within a domain, (EX1060, 1; EX1057 ¶9).

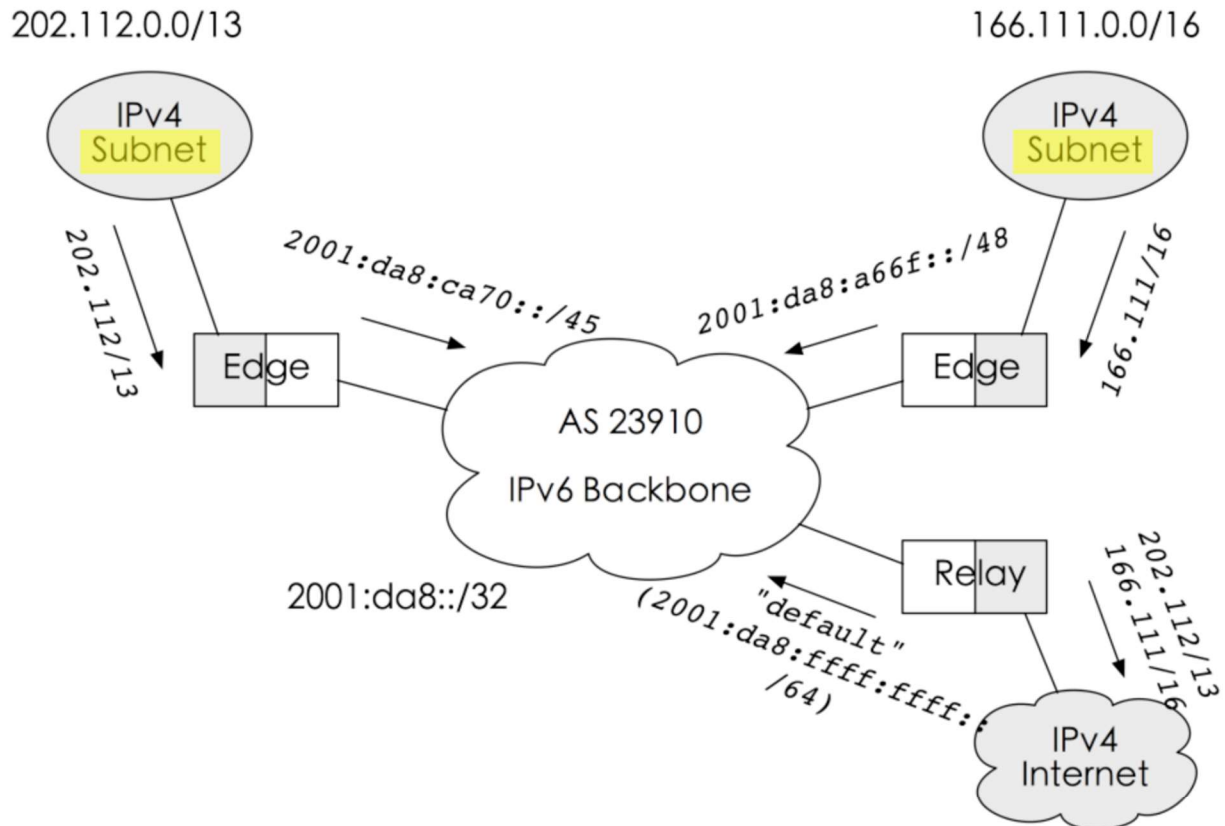


Figure 1. Intra-domain IPv4-over-IPv6 transition

EX1037, 3 (highlighted). The IPv4 networks in Figure 7, on the other hand, are autonomous systems. EX1037, 6-7; EX1057 ¶9.

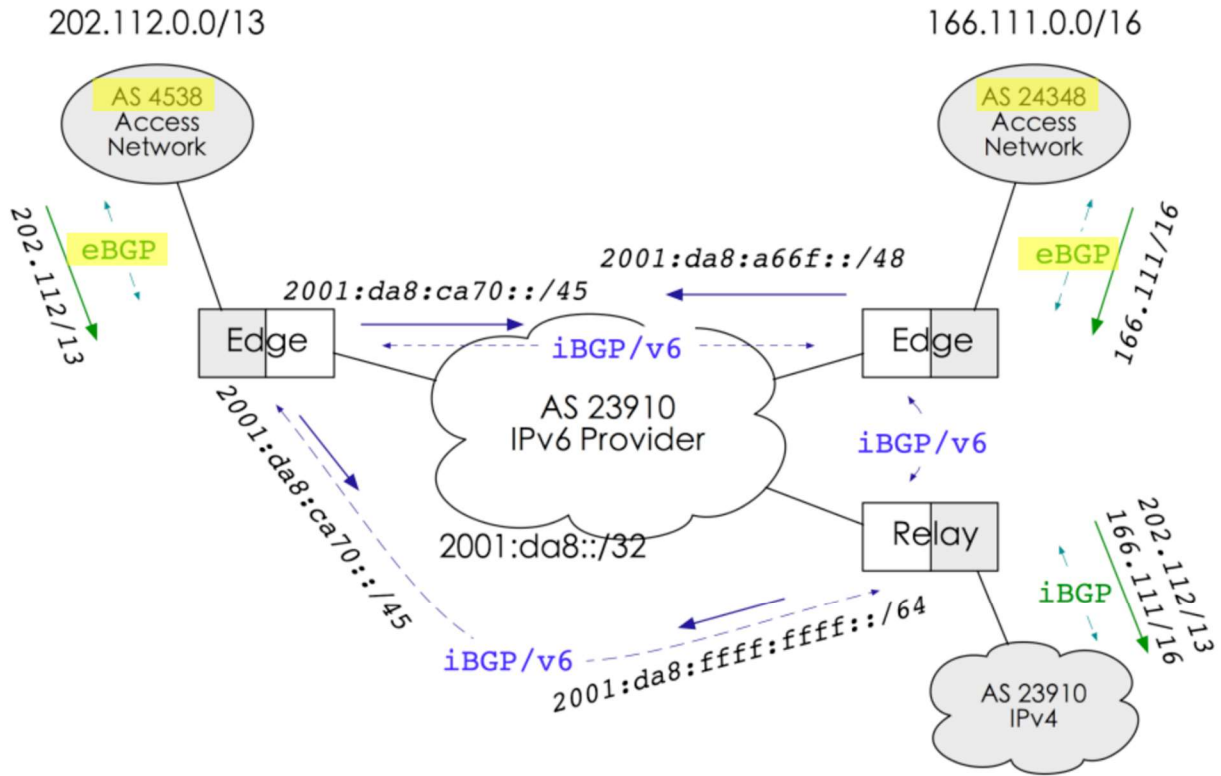
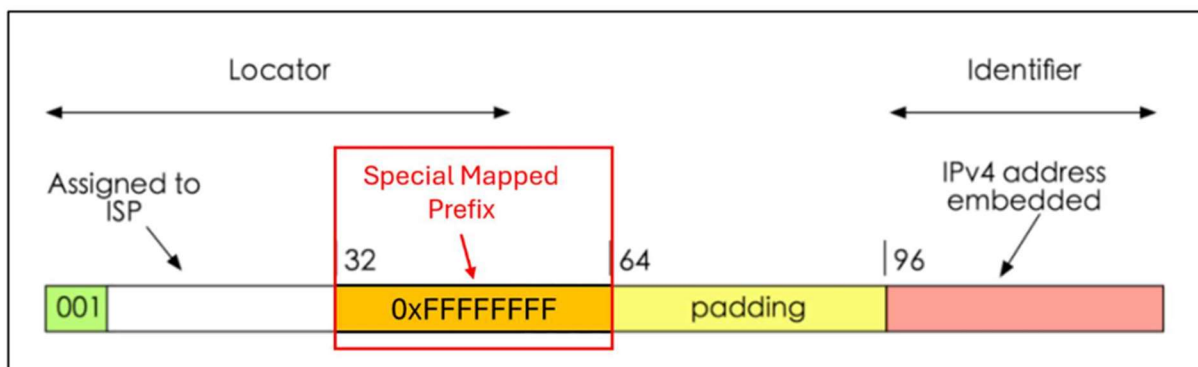


Figure 7. IPv4-over-IPv6 transition for access networks

EX1037, 7 (highlighted). The prior art consistently explains that such autonomous systems are “domains.” EX1058, 13; EX1059, 1; EX1057 ¶10. Because the autonomous systems in Figure 7 are separate domains, they use the Border Gateway Protocol, which is labelled as eBGP or iBGP in Figure 7 above. EX1037, 6; EX1057 ¶9. BGP is a protocol used to exchange routing information between independent domains. EX1058, 13; EX1059, 1; EX1060, 1; EX1061, 2; EX1057 ¶10. This is why Li introduces Figure 7 in a section titled “Extensions to Inter-Domain Environment.” EX1037, 6; EX1057 ¶8. PO ignores these differences between Figure 1 and Figure 7 and misconstrues Li as a result.

Even if the Board adopts PO's constructions, Figure 7 still invalidates the challenged claims. The autonomous systems in Figure 7 are "subnetworks" that include an "address space" that are "under common control." Petition 32. For example, PO asserts that IPv4 domains in the claims are "network[s] controlled or administered by a homeowner or business entity." POR 20; *see also* Petition 49 (quoting EX1036, 13). That is exactly what Li teaches; its IPv4 autonomous systems are "customer networks," which a POSITA would have understood are typically home or business networks. Petition 50 (citing EX1037, 6; EX1003 ¶135). Thus, Li even reads on PO's understanding of the '844 patent.

Finally, PO admits that Li's other figures—Figures 8, 10, and 11—depict inter-domain systems. POR 27-29. However, Li operates in the same manner in Figure 7 *and* Figures 8, 10, and 11. EX1057 ¶¶11, 13. In fact, PO admitted that the constructed IPv6 address in all figures still contains (1) an IPv6 prefix, (2) the IPv4 destination address, and (3) zero padding.



POR 13-14; EX1057 ¶12. In view of PO's admission, the Board can further rely on Figures 8, 10, and 11 to confirm that Li teaches "domains" under PO's interpretation.

B. Ground 1: All Claims Are Invalid as Obvious in View of Li and Li-2

1. Li-2 Is Prior Art

The record evidence shows that Li-2 was accessible to the public interested in the art before the '844 patent's priority date. *See generally* Petition 20-23.

The IETF custodian, Ms. Alexa Morris, confirmed that Li-2 was accessible by "anyone in the world" through the staging directory when Li-2 was submitted, (EX2016, 31:21-34:4), and continued to exist for over 15 years, (EX2016, 34:19-35:6).¹ Mr. Ron Bonica, a long-time IETF participant, similarly testified that he was "familiar with the staging folder" during "the relevant time period in 2008" and that POSITAs would have been aware of it too. EX1008 ¶¶7-9. Relatedly, Exhibit 1044 only contains "many thousands of files" because it is a screenshot of the staging folder in **2024**, not in the relevant time period—**mid-2008**. POR 36. Before the priority date, the staging folder would not have been a "massive collection of information" but would have instead contained approximately 900 documents (many

¹ The fact that the staging folder became inaccessible in May 2024 has no bearing on whether the folder and its contents were accessible before the '844 patent's priority date. POR 35.

of which are duplicates), which a POSITA would find manageable to review and access, especially given the descriptive filenames provided for each document. *See* EX1008 ¶10; EX1044, 1-14 (listing drafts submitted before June 2008).

It is unavailing for PO to argue that the URL of the staging folder changed over time. POR 35. Both URLs still pointed to the same publication. Exhibits 1044 and 1055 prove the point, showing that “draft-jiang-p2psip-sep-01.txt” in the “http://www3.ietf.org/proceedings/staging/” URL in 2008, (EX1055, 1), was *still accessible* via the “https://www/ietf.org/staging/” URL in 2024, even though the draft had since been cancelled, just like Li-2, (EX1044, 5). *See also* EX1054 (draft-dolganow-pwe3-ospf-ms-pw-ext-02); EX1044, 1 (same). Mr. Bonica further confirmed that both URLs resolved to the same directory. EX2017, 29:4-16. This is corroborated by Ms. Morris's and Mr. Bonica's testimony that Li-2 and the staging folder were accessible to anyone in the world before the '844 patent's priority date. EX1008 ¶¶4, 6, 8; EX1009 ¶10; EX2016, 31:21-35:6.

There is no basis to discredit Mr. Bonica's testimony. POR 35. He has been an IETF participant since the 1990s, (EX1008, ¶3; EX2017, 11:2-18); has submitted over 100 Internet-Drafts, (EX1008 ¶3); has chaired multiple IETF working groups, (EX1008 ¶1; EX2017, 11:2-18, 35:1-8, 41:1-10); was shown the Datatracker when it was first developed in mid-2000, (EX2017, 13:25-15:8); was not compensated for his testimony, (EX2017, 9:5-12); and has testified consistently with Ms. Morris.

Indeed, other than Mr. Bonica's affiliation with Juniper, PO has not discredited his personal knowledge of the IETF, has not pointed to any inconsistencies in his testimony, and has not identified any untruthful statements. There is no basis to discredit Mr. Bonica's testimony.

PO also conflates the legal definition of "published" and the IETF-specific use of that word. When Ms. Morris testified that Li-2 is an "unpublished Internet-Draft" or was not "public," she used that term to convey that Li-2 was not e-mailed to the IETF community. EX1009 ¶11; EX2016, 16:19-25. Ms. Morris admitted as much when she testified that *factually* Li-2 "was accessible" by anyone in the world through the staging folder but that *legally* she "d[id]n't know" whether documents in the staging folder were reasonably accessible to POSITAs. EX2016, 33:15-34:17. The record confirms that Li-2 was reasonably accessible, showing that POSITAs regularly e-mailed the staging folder URL to each other. *E.g.*, EXS1046-1055. PO does not even attempt to rebut these exhibits.² This is therefore not a case where

² There is no need for Mr. Bonica or Ms. Morris to "state[]" that such emails were regularly distributed" when exhibits 1046-1055 show exactly that. POR 37. The IETF e-mail archive is public, and the exhibits are a small subset of the total archived e-mails showing the same thing. *See* <https://mailarchive.ietf.org/arch/>. Patent

“the only people who kn[e]w how to find” Li-2 were “the ones who created it,” (POR 34); Li-2 was accessible to anyone in the world, and POSITAs were well aware of the folder containing it.

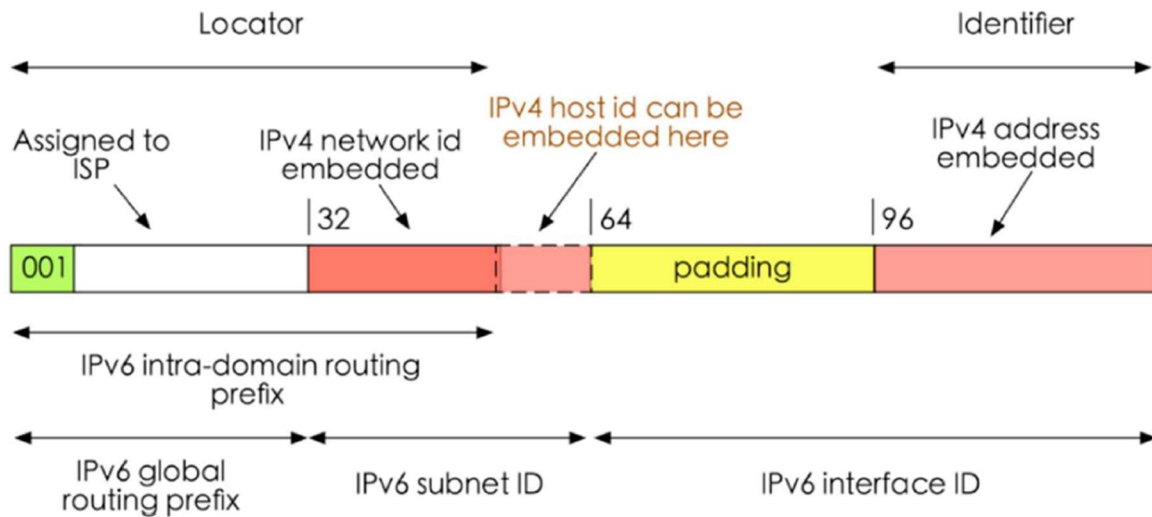
2. A POSITA Would Have Been Motivated to Combine Li and Li-2

PO's arguments that a POSITA would not have been motivated to combine Li and Li-2 are ungrounded in fact and law.

First, Li and Li-2 address the same communication problem: IPv4-to-IPv6 transition mechanisms. Petition 25-28; EX1003 ¶¶77-85. In fact, Li-2 says that “[t]he IVI scheme can support the IPv4 over IPv6 service, i.e. a stub IPv4 network can connect[] to an IVI gateway to reach IPv6 network and via another IVI gateway to reach the global IPv4 network.” EX1038, 12. This is identical to the “stub autonomous systems [] connected to an IPv6 backbone” network depicted in Li's Figure 7. EX1037, 6. And contrary to PO's unsupported statement that the solutions of Li and Li-2 are not interchangeable, (POR 40-41), Juniper already showed that they are, (Petition 24-28; EX1003 ¶¶77-85).

Owner could have—but tellingly did not—analyze the archive to confirm whether such emails were “regularly distributed.”

Second, Li-2 is an extension of Li. POR 41-42. Both references have the same author and disclose an addressing scheme comprising an IPv6 prefix, IPv4 address, and padding:



EX1037, 3.

IVI Address Mapping

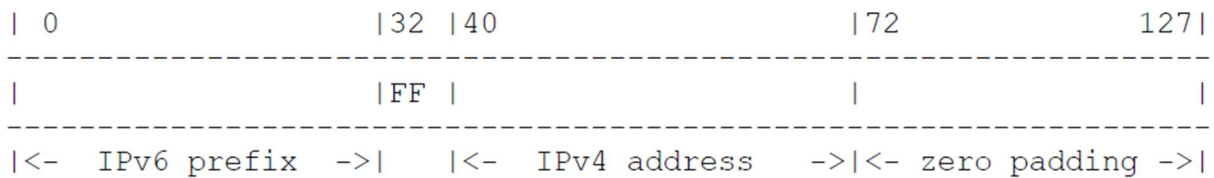


Figure 1

EX1038, 6. Li-2 expands upon this common teaching to replace the unused zero padding with a port number, thereby preventing IPv4 address exhaustion. EX1038, 14-15, 20.

Third, Juniper did not “rely on references that are not prior art.” POR 42-44. Patent Owner identifies only two references (other than the simultaneous-invention references) that are debatably not prior art and ignores the multiple other references that indisputably are prior art and teach the same thing. *Id.* Even assuming Rooney is not prior art, PO ignores that Samprathi, Li, and Wu also disclosed converting IPv4 addresses into IPv6 addresses. Petition 7, 17-18, 68; EX1003 ¶¶37-38 (discussing EX1019). Similarly, even assuming EX1023 is not prior art, PO ignores the paper published in 1996 and the paper published in 2001 that also taught that computers utilized only a small portion of their port numbers. Petition 8; EX1003 ¶41 (discussing EX1021, 4; EX1022, 9). And PO ignores that multiple references that are indisputably prior art—including Huitema, Thubert, and Wu—combined these ideas to construct IPv6 addresses by concatenating IPv4 addresses and port numbers. Petition 8; EX1003 ¶¶44-48, 205-206 (discussing EX1030, EX1032, EX1039). The Bush Paper also discusses four references showing “a long history of treating port number[s] as part of the network address,” some of which precede the priority date by decades. EX1029, 4. There is no legitimate dispute that the prior art taught POSITAs to construct IPv6 addresses comprising unused port numbers.

Fourth, PO's argument that “Petitioner has not identified a motivation to deviate from [the] known solution” of using “NAT tables to address IPv4 address exhaustion” misapplies the law. POR 44-45. Case law “does not require that the

motivation be the *best* option, only that it be a *suitable* option from which the prior art did not teach away.” *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1197-98 (Fed. Cir. 2014). Juniper identified multiple motivations to combine Li and Li-2 to prevent IPv4 address exhaustion while also allowing IPv4-to-IPv6 communications. Petition 25-28; EX1003 ¶¶78-85. PO does not address any of them or dispute that the proposed combination is suitable. This combination is not rooted in “hindsight bias” either, (POR 45); the prior art consistently points to constructing IPv6 addresses comprising port numbers, (Petition 6-8, 67-70; EX1003 ¶¶29-48, 205-214). “[J]ust because better alternatives exist in the prior art does not mean that an inferior combination is inapt for obviousness purposes.” *In re Mouttet*, 686 F.3d 1322, 1334 (Fed. Cir. 2012). A POSITA would have thus been motivated to combine Li and Li-2.

C. Ground 2: Li Alone Renders the '844 Claims Obvious, Especially in View of Simultaneous Invention

Li alone renders the '844 claims obvious. Li discloses every claim element except including a port number in the constructed IPv6 address. Petition 14-67; EX1003 ¶¶57-204. A POSITA would have been motivated to replace Li's unused padding with the destination port number based on knowledge in the art that taught utilizing port numbers to slow IPv4 address exhaustion. Petition 7-8, 25-26, 64; EX1003 ¶¶35-48, 171-177. PO does not dispute any of these facts, and the Board

can thus conclude that Li alone would have rendered the '844 claims obvious on that basis alone.

In addition, simultaneous-invention evidence demonstrates that modifying Li in this manner would have required only ordinary skill, confirming that the '844 claims were obvious in view of Li alone. This “additional, although unnecessary, evidence of contemporaneous invention is probative of ‘the level of knowledge in the art at the time the invention was made.’” *In re Merck & Co.*, 800 F.2d 1091, 1098 (Fed. Cir. 1986).

1. Juniper Does Not Need to Show Simultaneous Invention of All Limitations

The law does not require Juniper to show “simultaneous invention of *all the limitations* of the claims of the '844 patent,” as PO incorrectly suggests. POR 47. A majority of the '844 limitations were common in the art. *E.g.*, Petition 6-8; EX1003 ¶¶29-48. The only aspect that is arguably inventive, and the only aspect missing from Li, is including a port number in the IPv6 address. Accordingly, Juniper's petition focused on simultaneous invention of this missing element instead of non-inventive implementation details.

Tellingly, PO does not cite any cases holding simultaneous-invention evidence must disclose *every* claim limitation. PO instead discusses the facts of three cases—*Immunex*, *Endo Pharmaceutical*, and *Intex*—that are irrelevant to the issue here. The court in *Immunex* and *Endo Pharmaceuticals* disregarded

simultaneous-invention evidence that “were directed to different fusion proteins” and chemical compounds than the patents at issue.³ *Immunex Corp. v. Sandoz, Inc.*, 964 F.3d 1049, 1067-68 (Fed. Cir. 2020); *Endo Pharms. Inc. v. Actavis LLC*, 922 F.3d 1365, 1378 n.14 (Fed. Cir. 2019). And the Board in *Intex* merely said that expert analysis did “not persuasively support Petitioner’s conclusory statement” because the expert did “not adequately explain why” the claim was the product of ordinary mechanical skill in view of all the circumstances. *Intex Recreation Corp. v. Team Worldwide Corp.*, IPR2018-00859, Paper 128, at 52-53 (PTAB Oct. 21, 2019).

None of these decisions hold that simultaneous-invention evidence must disclose every limitation in a claim. They are also distinguishable: Unlike the parties in *Immunex* and *Endo Pharmaceuticals*, Juniper presents simultaneous-invention evidence that *is* directed to the subject matter of the claims. And unlike the party in *Intex*, Juniper *has* shown that the missing limitation was not inventive in light of all the circumstances, but was rather “the product only of ordinary [networking] skill or engineering skill.” *Geo. M. Martin Co. v. All. Mach. Sys. Int’l LLC*, 618 F.3d 1294, 1305 (Fed. Cir. 2010). All it required was replacing unused

³ The Federal Circuit’s discussion of simultaneous invention in these cases is minimal, constituting a single paragraph and a footnote.

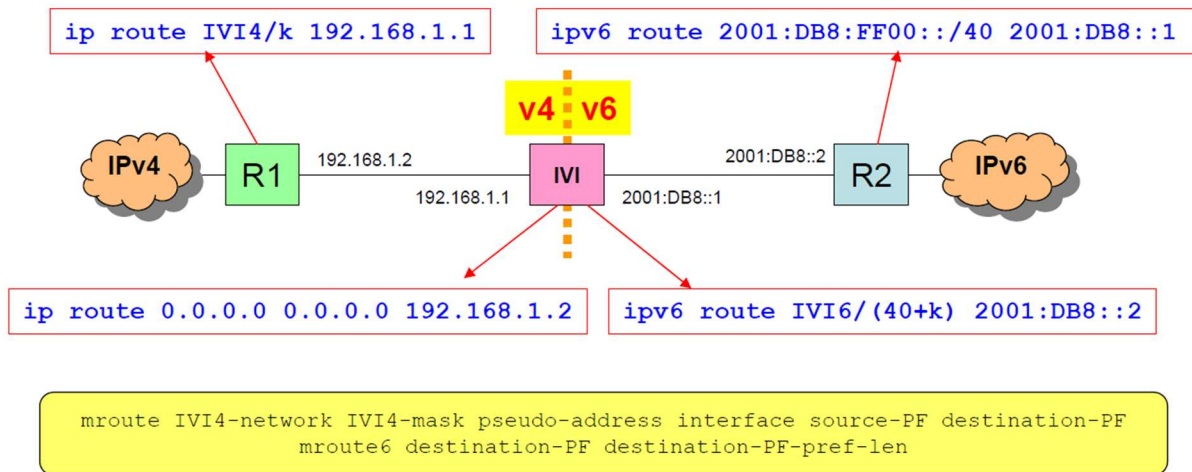
padding with a port number to prevent IPv4 address exhaustion, an idea that was already known in the art. *See* Petition 7-8, 25-26, 64.

2. Regardless, the References Show Simultaneous Invention of All Limitations

The simultaneous-invention references teach all limitations. PO identified purportedly missing limitations from only claims 1 and 3, (POR 48), so Juniper's response will focus on those claims.

Li-2 (EX1038), the IVI Memo (EX1027), and the IVI Presentation (EX1028) (collectively, the "IVI References") all describe IVI, an IPv4-to-IPv6 transition scheme disclosed by Dr. Li, at worst, just a few days after the '844 patent's priority date. These references, considered either individually or altogether, disclose all limitations. The IVI References teach receiving and sending the data packets required by the claims (limitations 1[pre]/3[pre]). EX1027, 9-10, 14-15, 23; EX1028, 9, 32; EX1038, 7-8, 10-11, 18; EX1057 ¶¶16-21, 31-36.

Routing and mapping configuration example



EX1028, 9. They teach constructing an IPv6 destination address by concatenating an operator prefix, IPv4 address, and destination port number and extracting that information as well (limitations 1[a]/3[a]). Petition 23-24, 33-36; EX1027, 8, 15, 18-19; EX1028, 6-7, 20-22; EX1038, 6, 11, 14-15; EX1057 ¶¶22-26, 37.

202.38.108.2#81 --> IVI61=2001:250:ffca:266c:0200::81#81
 202.38.108.2#82 --> IVI61=2001:250:ffca:266c:0200::82#82
 202.38.108.2#83 --> IVI61=2001:250:ffca:266c:0200::83#83
 202.38.108.2#84 --> IVI61=2001:250:ffca:266c:0200::84#84

EX1028, 22 (highlighting added). They teach generating an IPv6 data packet from the constructed address and generating an IPv4 data packet from the extracted address (limitations 1[b]/3[b]). EX1027, 7, 14-15; EX1038, 10-11; EX1057 ¶¶27-28, 38-39.

IPv4 to IPv6 Header translation based on IVI scheme

IPv4 Field	Translated to IPv6
Version (0x4)	Version (0x6)
IHL	discarded
Type of Service	discarded
Total Length	Payload Length = Total Length - IHL * 4
Identification	discarded
Flags	discarded
Offset	discarded
Time to Live	Hop Limit
Protocol	Next Header
Header Checksum	discarded
Source Address	IVI address mapping
Destination Address	IVI address mapping
Options	discarded

Figure 8

EX1027, 14.

IPv6 to IPv4 Header translation based on IVI scheme

IPv6 Field	Translated to IPv4 Header
Version (0x6)	Version (0x4)
Traffic Class	discarded
Flow Label	discarded
Payload Length	Total Length = Payload Length + 20
Next Header	Protocol
Hop Limit	TTL
Source Address	IVI address mapping
Destination Address	IVI address mapping
-	IHL = 5
-	Header Checksum recalculated

Figure 9

EX1027, 15. And they teach routing the constructed data packet in the relevant domain (limitations 1[c]/3[c]). EX1027, 7, 9-12; EX1038, 7-9; EX1057 ¶¶29-30, 40.

The Bush Paper (EX1029) and the Bush Presentation (EX1041) (collectively, “Bush”) describe an IPv4-to-IPv6 transition mechanism disclosed by Randy Bush a few weeks after the '844 patent's priority date. These references also, considered either individually and altogether, disclose all limitations, exemplified in the slide below:

IPv6 Encap Toward CPE

- BR receives IPv4 packet w/ src/dest **PREAMBLE**
- Encapsulates in IPv6 packet **LIMITATION [1B]**
 - src = WKP+src
 - dest = WKP+dest
- But note that dest is A+P **LIMITATION [1A]**
- It routes normally within ISP core **LIMITATION [1C]**

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EX1041, 21 (annotations added).

Specifically, Bush teaches receiving and sending the data packets required by the claims (limitations 1[pre]/3[pre]). EX1029, 1-3; EX1041, 15, 19, 21; EX1057

¶¶43-48, 57-59. It teaches constructing an IPv6 destination address by concatenating an operator prefix, IPv4 address, and destination port number and extracting that information as well (limitations 1[a]/3[a]). EX1029, 2-4; EX1041, 15-17, 19, 21; EX1057 ¶¶49-51, 60. It teaches generating an IPv6 data packet from the constructed address and generating an IPv4 data packet from the extracted address (limitations 1[b]/3[b]). EX1029, 3; EX1041, 19, 21-22; EX1057 ¶¶52-53, 61. And it teaches routing the constructed data packet in the relevant domain (limitations 1[c]/3[c]). EX1029, 2-3; EX1041, 19, 21; EX1057 ¶¶54-56, 62. In fact, Bush identified the same problem as the '844 patent and proposed the same solution. *Compare* EX1001, 1:61-2:10, *with* EX1029, 1-2; EX1041, 6; *see also* EX1057 ¶42.

Thus, the IVI References and Bush demonstrate simultaneous independent invention of all limitations that PO claims are missing.

D. Ground 3: All Claims Are Invalid as Obvious in View of Li and Wu

PO, unable to identify a genuine issue with the combination of Li and Wu, unleashes a barrage of attacks at the very end of its brief. At a high level, all of PO's arguments suffer the same problem: they mischaracterize Juniper's proposed combination of Li and Wu. Juniper relied on Wu for its discrete teaching that incorporating a port number into an IPv6 address can be used to slow IPv4 address exhaustion. *E.g.*, Petition 68-73. PO never disputes this discrete teaching and instead improperly focuses on irrelevant disclosures in Wu to confuse the issues. To

the extent PO's arguments based on Wu's irrelevant disclosures are considered, those arguments are wrong on the merits as discussed below. Accordingly, all of PO's arguments fail because they misstate, and therefore fail to address, the proposed combination.

Moreover, the USPTO has recently canceled PO's other claims, which cover the same technology, over comparable prior art. U.S. Patent No. 8,451,845 is in the same patent family as the '844 patent. *Compare* EX1001, 1:9-13, *with* EX1063, 1:9-13. The '845 claims are similarly directed to converting data packets in view of "an IPv6 destination address constructed by concatenating an IPv6 prefix, an IPv4 destination address and a destination port number," except the '845 claims are even *more specific* than the '844 claims because they further require "regularizing" the IPv6 addresses. *E.g.*, EX1063, claim 1. In EPR Control No. 90/019,246, the Examiner canceled several of the '845 claims in view of U.S. Patent No. 7,245,622 ("Huitema"). EX1064, 21-40 (anticipation); EX1064, 40-66 (obviousness). The Examiner issued a reexamination certificate canceling these claims on October 24, 2024. EX1065.

In the petition and supporting documents, Juniper discussed and attached the application leading to Huitema (EX1030) because it taught the '844 claims. EX1003 ¶47; Petition 8. Juniper did not rely on Huitema in its invalidity grounds because a prior examiner had allowed the '844 claims over Huitema, asserting that Huitema

“is silent on whether the port number and destination address were part of the IPv6 address routed across the IPv6 domain” in allowing the '844 claims. Petition 77-78. However, Juniper explained in detail why the prior examiner's analysis of Huitema was incorrect. Petition 78-80. As shown in the petition and supporting expert declaration, Huitema and Wu are essentially identical in how they operate. Petition 8, 77-80; EX1003 ¶47. Thus, Wu invalidates the '844 claims for the same reasons that Huitema invalidated the indistinguishable '845 claims.

1. Li and Wu Are Analogous Art

The Board already rejected PO's assertion that Li and Wu are directed to unrelated communications problems. In fact, PO's argument here is copied word-for-word from its preliminary response. *Compare* Paper 6 (“POPR”), at 49-51, *with* POR 51-53. The Board fully considered this argument and concluded that “Patent Owner's argument is unavailing” because “the evidence of record indicates that Li and Wu are analogous art...all directed to the same field of endeavor, namely, computer networking and routing data packets.” ID 14. “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.” *Id.* at 14-15 Nothing in the record has changed, so PO's argument still fails.

The Board's conclusion is well-supported by the record because Juniper's petition proposed replacing the unused padding in Li's IPv6 address with the port number disclosed in Wu, and it articulated multiple motivations to combine. *See* Petition 68-72; EX1003 ¶¶208-218. Indeed, the Board correctly recognized that Juniper "relies on Wu's teaching that an IPv6 destination address includes a destination port number." ID 14.

PO does not address this combination or dispute these motivations in its response. Instead, PO overstates the proposed combination of Li and Wu—implying that a POSITA would need to bodily implement Wu's system into Li instead of the discrete teaching that Juniper relies on—to invent problems that do not exist. *See* POR 51-53; EX1057 ¶63. That is a distortion of the combination Juniper actually proposed. "The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference." *Mouttet*, 686 F.3d at 1332. Rather, "[a] reference must be considered for everything it teaches by way of technology and is not limited to the particular invention it is describing and attempting to protect." *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1076 (Fed. Cir. 2015). Juniper relies on Wu merely to show that POSITAs knew they could use port numbers in an IPv6 address to share the mapped IPv4 address between multiple hosts. Further, both references are directed to facilitating communications between IPv4 domains and IPv6 domains, just like the '844 patent,

so they are analogous art that a POSITA would have combined. Petition 68-70; EX1003 ¶¶207-214.

The presence of a NAT does not affect the combination of Li and Wu for the same reason. POR 51-53. The 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.

PO's final, cursory attacks misrepresent the facts and law. POR 53. Juniper relies on prior art for support, (*see supra* § II.B.2), and Juniper does not need to "identif[y] a motivation to deviate from [a] known solution," (POR 53), because the law does not require the best combination, only a suitable one, (*PAR Pharm.*, 773 F.3d at 1197-98; *see supra* § II.B.2).

2. PO Misunderstands How Wu Works

PO next asserts that combining Li with Wu would eliminate the benefits of Li because Li is a stateless system while Wu allegedly teaches a stateful process. POR 53-55. This argument is, again, irrelevant because Juniper is not bodily incorporating Wu into Li. *See supra* §II.D.1.

Additionally, PO fundamentally misunderstands Wu because Wu statelessly—*not* statefully—constructs IPv6 addresses. EX1057 ¶¶63-67. Wu consistently 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. *Id.* ¶65. “After receiving [data] packet[s],” the external servers “extract[s] the external address and external port from the destination IPv6 address.” EX1039, 6; *see also* EX1039, 7, 14-16 (same). And the client dynamically “constructs a SilkRoad address” based on information it receives from the server. EX1039, 5; *see also* EX1039, 13 (same). That is exactly what the ’844 patent does too. EX1057 ¶67. The system first assigns information to the host. EX1001, 8:58-61, 13:57-59, 13:61-63. Then, the system dynamically constructs and deconstructs IPv6 addresses to transmit data packets. *E.g., id.* 6:13-15. Wu’s process for constructing an IPv6 address is therefore *not* stateful, like PO contends, but stateless.

PO’s citations to Wu in support of this point are minimal, likely because PO recognizes that Wu does not say what PO purports it says. *See* POR 55. Instead of explaining its argument within the context of how Wu works, PO 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. EX1057 ¶66. But, as explained above, what Wu actually teaches in its description of how the system works is dynamically and statelessly constructing and extracting IPv6 and IPv4 information. *Id.*; EX1039, 13-14. Thus, not only does PO distort the actual combination of Li and Wu, but PO also submits an incorrect argument that misunderstands Wu’s teachings.

Even if Wu were stateful, that still does not discredit the combination. The '844 patent itself recognizes as much, saying that a solution “that is not stateless is not *to be recommended*,” not that such a solution is impossible or must be avoided. EX1001, 13:43-44. This is confirmed by Li-2, which extends the teachings of Li by adding a stateful option that does not destroy Li's benefits. *See* EX1038, 14-15. Thus, implementing Wu's port number into the unused padding in Li's IPv6 address would not have eliminated Li's benefits.

3. Wu Teaches Constructing an IPv6 Address from a Destination Port Number

PO's last-ditch arguments suggest that Wu does not teach constructing an IPv6 address with a destination port number. POR 56-59. Again, these arguments overstate the discrete teaching from Wu that is actually relevant and therefore do not address the proposed combination. *See supra* §II.D.1. PO's arguments are also wrong.

First, PO misunderstands the combination of Li and Wu. Juniper does not rely on *Wu* to teach “an IPv6 address that is constructed in response to receiving an IPv4 packet,” (POR 56), or a server that “perform[s] IPv6 destination address construction as specified in the '844 claims,” (POR 58), because *Li* already teaches these claim limitations, (*see* Petition 28-39 70-72). PO essentially complains that all claim limitations are not present in Wu. But this invalidity ground is “based on obviousness,” in view of Wu *and Li*, “not anticipation,” and PO does not dispute

that these limitations are present in *Li. Adapt Pharma Operations Ltd. v. Teva Pharms. USA, Inc.*, 25 F.4th 1354, 1369 (Fed. Cir. 2022).

Second, PO plays semantic games to argue that the port in Wu is “at best the source port of the client, not a destination port.” POR 57. This is misdirection. A source port in one direction is a destination port on the way back. For example, 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.” EX1039, 15.

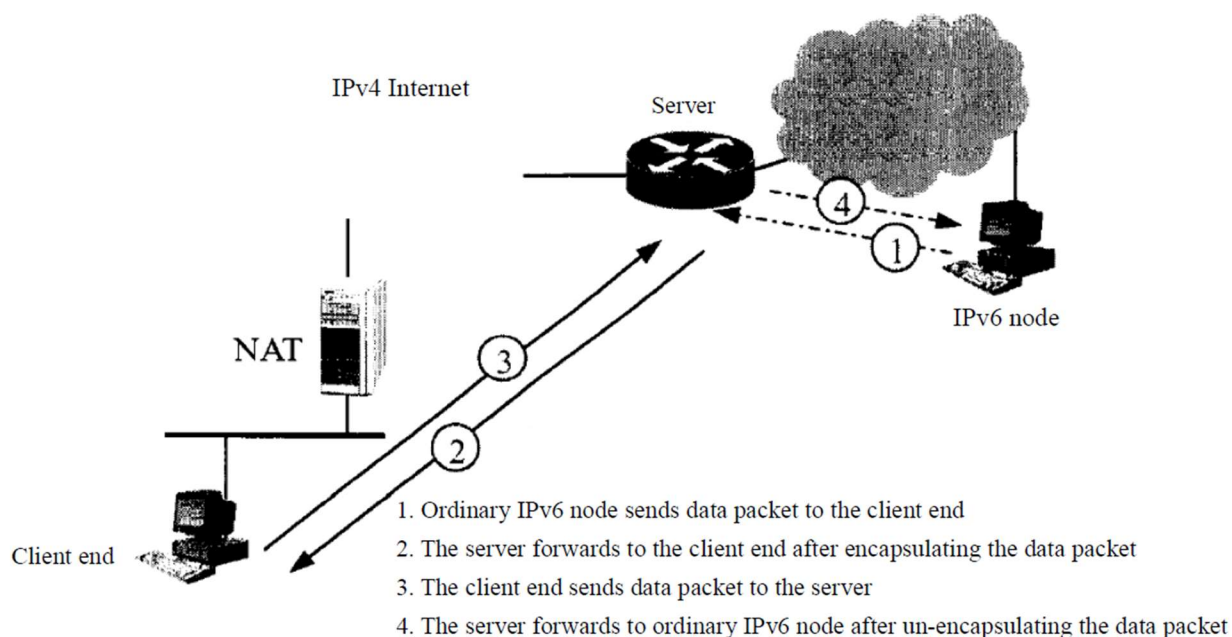


Fig. 11

Id. 21. Accordingly, the port number in the SilkRoad address is the destination port because the data packet is being sent to the SilkRoad client. *Id.* 15-16. Wu therefore discloses an IPv6 address comprising a destination port number.

Third, the pseudo external port number is a destination port number. Wu repeatedly 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. EX1039, 6; *see also* EX1039, 7, 14-16 (same); EX1057 ¶72.

Further, a POSITA would have recognized that there is no need to perform the additional operations on the original port number described in Wu—like ANDing the port number with 0xFFFF—when combining Wu’s teachings with Li. EX1057 ¶¶69-71, 73 “[I]t [i]s not requisite” that the “features be deemed equivalent for purposes of substitution.” *Mouttet*, 686 F.3d at 1332-33. “Rather, the test for obviousness is what the combined teachings of the references would have suggested to those having ordinary skill in the art.” *Id.* at 1333. Especially when the “record shows that one of skill in this advanced art would find the[] claimed ‘results’ profoundly ‘predictable.’” *In re Kubin*, 561 F.3d 1351, 1360 (Fed. Cir. 2009). In view of such records, “the claimed invention is ‘the product not of innovation but of ordinary skill and common sense.” *Id.* “Or stated in the familiar terms of [the Federal Circuit’s] longstanding case law, the record shows that a skilled artisan would have had a resoundingly ‘reasonable expectation of success’ in deriving the claimed invention in light of the teachings of the prior art.” *Id.*

Here, Wu explains that the purpose of these operations is to prevent intermediary NATs from interfering with or changing the data packet. EX1039, 3, 11; EX1057 ¶73. As PO explains, Li teaches a stateless system that does not use NATs. *E.g.*, POR 55; EX2015 ¶103. Thus, a POSITA would have recognized that it would be inefficient to perform these unneeded operations on the original port number when implementing Wu's teachings into Li, and would have simply concatenated the host's original port number when constructing the IPv6 address. EX1057 ¶73. This is a "predictable use of prior art elements according to their established functions" that renders a patent invalid as obvious. *KSR*, 550 U.S. at 417. Juniper respectfully asks the Board to cancel all of the '844 patent's claims because they are invalid as obvious in view of Li and Wu.

III. CONCLUSION

For the reasons above and in Petitioner's petition, the Board should find all claims of the '844 patent unpatentable.

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By: /s/ James M. Glass

James M. Glass (Reg. No. 46,729)
jimglass@quinnemanuel.com
Quinn Emanuel Urquhart & Sullivan, LLP
51 Madison Ave., 22nd Floor
New York, New York 10010
Tel: (212) 849-7000
Fax: (212) 849-7100

Todd M. Briggs (Reg. No. 44,040)

toddbriggs@quinnemanuel.com
Kevin Johnson (Reg. No. 38,927)
kevinjohnson@quinnemanuel.com
Quinn Emanuel Urquhart & Sullivan, LLP
555 Twin Dolphin Drive, 5th Floor
Redwood Shores, CA 94065
Tel: (650) 801-5000
Fax: (650) 801-5100

Nima Hefazi (Reg. No. 63,658)
nimahefazi@quinnemanuel.com
Quinn Emanuel Urquhart & Sullivan, LLP
865 S. Figueroa Street, 10th Floor
Los Angeles, CA 90017
Tel: (213) 443-3000
Fax: (213) 443-3100

Christopher Sabbagh (*pro hac vice*)
chrissabbagh@quinnemanuel.com
Quinn Emanuel Urquhart & Sullivan, LLP
700 Louisiana Street, Suite 3900
Houston, TX 77002
Tel: (713) 221-7000
Fax: (713) 221-7100

Attorneys for Petitioner Juniper Networks, Inc.

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), Petitioner hereby certifies, in accordance with and reliance on the word count provided by the word-processing system used to prepare this Reply, that the number of words in this paper is 5,592. Pursuant to 37 C.F.R. §42.24(d), this word count excludes the table of contents, table of authorities, mandatory notices under §42.8, certificate of service, certificate of word count, appendix of exhibits, and any claim listing.

Date: January 22, 2025

Respectfully submitted,

By: /s/ James M. Glass
James M. Glass

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing Petitioner's Reply to Patent Owner Response was served via e-mail pursuant to 37 C.F.R. §42.6(e) in its entirety to all counsel of record, as follows:

R. Allan Bullwinkel (Reg. No. 77,630)
abullwinkel@hpcllp.com
Michael F. Heim (Reg. No. 32,702)
mheim@hpcllp.com
Christopher L. Limbacher (Reg. No. 76,551)
climbacher@hpcllp.com
William B. Collier, Jr. (*pro hac vice*)
wcollier@hpcllp.com
Heim Payne & Chorush, LLP
609 Main Street, Suite 3200
Houston, TX 77002
Telephone: 713-221-2000
Facsimile: 713-221-2021

DATED: January 22, 2025

Respectfully submitted,

By: /s/ James M. Glass
James M. Glass