

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

JUNIPER NETWORKS, INC.,
Petitioner,

v.

MONARCH NETWORKING SOLUTIONS LLC,
Patent Owner.

Case IPR2024-00561
Patent 8,130,775

**PATENT OWNER'S RESPONSE
TO PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 8,130,775**

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EXHIBIT LIST

Patent Owner's Exhibits

Exhibit	Description
EX2001	Declaration In Support of Motion For Pro Hac Vice Admission of Alden G. Harris under 37 C.F.R. § 42.10(c)
EX2002	RFC3031 - Multiprotocol Label Switching Architecture
EX2003	An Architecture for Multi-Segment Pseudo-Wire Emulation Edge-to-Edge' (draft-ietf-pwe3-ms-pw-arch-02.txt) [as filed in <i>ex parte</i> reexamination no. 90/014,701]
EX2004	Redline comparing draft-ietf-pwe3-ms-pw-arch-00 with draft-ietf-pwe3-ms-pw-arch-02
EX2005	U.S. Patent No. 7,602,702 to Aggarwal
EX2006	Declaration of Dr. Michael Mitzenmacher in Support of Patent Owner's Response
EX2007	<i>Curriculum Vitae</i> of Dr. Michael Mitzenmacher
EX2008	List of Prior Testimony of Dr. Michael Mitzenmacher

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I. Introduction

Petitioner Juniper Networks Inc. (“Juniper” or “Petitioner”) filed a Petition (“Pet.”) challenging Claims 1 and 6 of U.S. Patent No. 8,130,775 (“the ’775 Patent”) on two grounds. Pet. at 7. Because Petitioner has failed to carry its burden to establish obviousness, Patent Owner Monarch Networking Solutions LLC (“Monarch” or “Patent Owner”) respectfully requests that the Board affirm the validity of the ’775 Patent.

Juniper asserts two invalidity grounds, each based on obviousness. Juniper cannot prevail because none of the references alone or in combination disclose the “said first link being shared by the first and second pseudo-wires” limitation present in each independent claim.

The parties agree that a “link” is a “connection between an interface of a first router and an interface of a second router,” and each claim states that the “first link” is between the input router and the intermediate router. To satisfy the “said first link being shared by the first and second pseudo-wires” limitation, Juniper would need to identify in the prior art two pseudowires that connect to the same interface of the input router and the same interface of the intermediate router. Juniper has not and cannot do this.

Juniper does not attempt to allege that Bocci discloses this limitation. *See, e.g.,* Pet. at 50-53 (citing nothing in Bocci related to Petitioner’s analysis of “said

first link being shared by the first and second pseudo-wires”). For the Wainner and Kamite references, rather than pointing to two pseudowires that connect to the same interface on the input router and the same interface on the intermediate router, as the ’775 claims require, Petitioner alleges these references disclose *one* pseudo-wire that connects to these interfaces. *See, e.g.*, Pet. at 50 (arguing “the shared pseudo-wire 22” meets this limitation); *id.* at 65 (alleging “Kamite’s Figure 10 depicts multiple [pseudowire] segments, the first of which—between PE11₁ and P12₁—is shared between the others”).

Introducing multi-segment pseudowires from Bocci does not cure these shortcomings of Wainner and Kamite. As discussed in detail below, Bocci teaches that multi-segment pseudowires can only connect to interfaces on T-PE routers at the network edge. Bocci forbids multi-segment pseudowires from connecting to interfaces on S-PE routers such as the claimed “intermediate router.” Because Bocci’s multi-segment pseudowires are not permitted to connect to any interface on the intermediate router, they cannot share the same link, *i.e.*, they cannot share the same connection between an interface of an input router and an interface of an intermediate router. The ’775 Patent explicitly recognized this shortcoming, describing Bocci’s multi-segment pseudowire as “a pseudo-wire set up as in the prior art.” EX1001 at 5:40–42.

II. Background

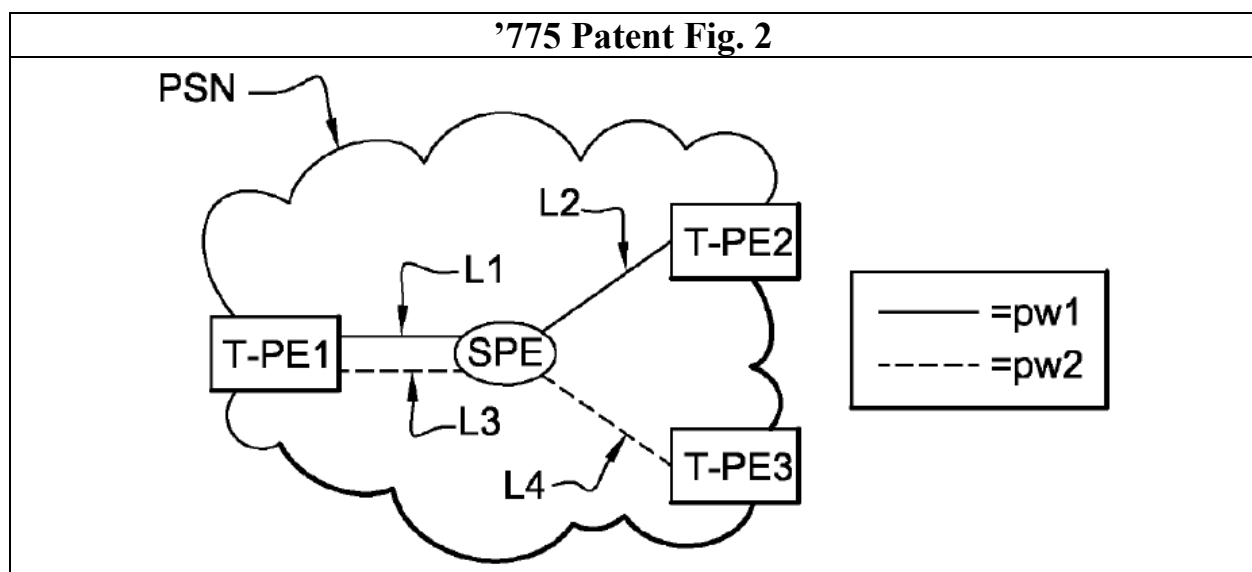
A. State of the Art

In a packet-switched network (PSN), data is transmitted and routed in the form of packets, which are processed and forwarded by routers until the packets reach their destination. EX1001 at 1:30-32. Various prior art techniques existed for routing these packets through the network, including multi-protocol label switching (MPLS). *Id.* at 1:34-36. MPLS works by adding labels to the headers of data packets; these labels contain information the routers can use to determine the next “hop” (*i.e.* the path to the next router) along which the packet can travel to reach its intended destination. *See id.* at 1:36-39. MPLS is discussed in RFC3031. *See generally* EX2002; *see also* EX1001 at 1:34-42. Mitzenmacher Dec. ¶25.

One limitation of MPLS is that it can only route a particular type of data packet: a packet that conforms to the Internet Protocol (“IP”). EX1001 at 1:43-44. To address this limitation, the Internet Engineering Task Force (IETF) promulgated RFC3985, which describes a concept known as a “pseudo-wire” or “PW.” *Id.* at 1:45-50; EX1010. Pseudo-wires have the advantage of allowing non-IP packets (*e.g.*, ATM protocol packets) to be transmitted and routed across a packet-switched network. EX1001 at 1:49-52; *see also* EX1010 at 17. Once a pseudo-wire has been set up, it can transmit a data stream across the packet-switched network, from an input router to an output router. EX1001 at 1:53-2:2; EX1010 at 3 (“The required

functions of PWs include encapsulating service-specific bit streams, cells, or PDUs arriving at an ingress port and carrying them across an IP path or MPLS tunnel.”). Mitzenmacher Dec. ¶26.

It was known in the art that a network operator might want to set up two or more pseudo-wires within the same network. *See* EX1001 at 2:3-27. For example, the operator may wish to set up a second pseudo-wire that acts as a “backup” in case the first pseudo-wire fails. *Id.* Mitzenmacher Dec. ¶27. An example of this configuration is shown in Figure 2 of the '775 Patent:



In Figure 2, a first pseudo-wire pw1 is set up across the PSN from input router T-PE1 to output router T-PE2. EX1001 at 2:12-15. This pw1 consists of two links: L1 from input router T-PE1 to intermediate router SPE, and L2 from intermediate router SPE to output router T-PE2. *Id.* at 2:15-20. Mitzenmacher Dec. ¶28.

In case of a fault affecting pw1 (e.g., a fault at link L2 or output router T-PE2), pw1 will cease to function properly, so a “backup” pseudo-wire pw2 is also set up

across the PSN to ensure continuity of service. *See id.* at 2:20-23, 2:33-39. This pw2 goes from input router T-PE1 to output router T-PE3, and also consists of two links: L3 from input router T-PE1 to intermediate router SPE, and L4 from intermediate router SPE to output router T-PE3. *Id.* at 2:20-27. In the event of a fault affecting pw1, the PSN can relay a message indicating the fault to T-PE1, which can switch the data stream from pw1 to pw2 to bypass the fault. *Id.* at 2:33-39. Mitzenmacher Dec. ¶29.

It was uniformly understood in the prior art that two pseudo-wires would always use different links and would not share any links between them. For example, RFC3985 states that a “PW is characterized as an **unshared link** or circuit of the chosen service.” EX1010 at 3. Links were not shared even when the two pseudo-wires shared the same connection path between the same two routers; for example even though pw1 and pw2 share the same connection path between T-PE1 and SPE, they use two separate links L1 and L3 to traverse their common connection path. EX1001 at Fig. 2. The ’775 Patent explains that “In the prior art, when a main pseudo-wire and a back-up pseudo-wire are set up between an input router and a first, respectively a second, output router, **a link is set up between the input router and the intermediate router for each pseudo-wire, i.e. two links**. The person skilled in the art has always considered a pseudo-wire as a point-to-point link set up between an input router and an output router, with the result that each input

router/output router pair is associated with a pseudo-wire. Moreover, this kind of approach is recommended in the standards.” *Id.* at 3:5-14 (emphasis added). Mitzenmacher Dec. ¶30.

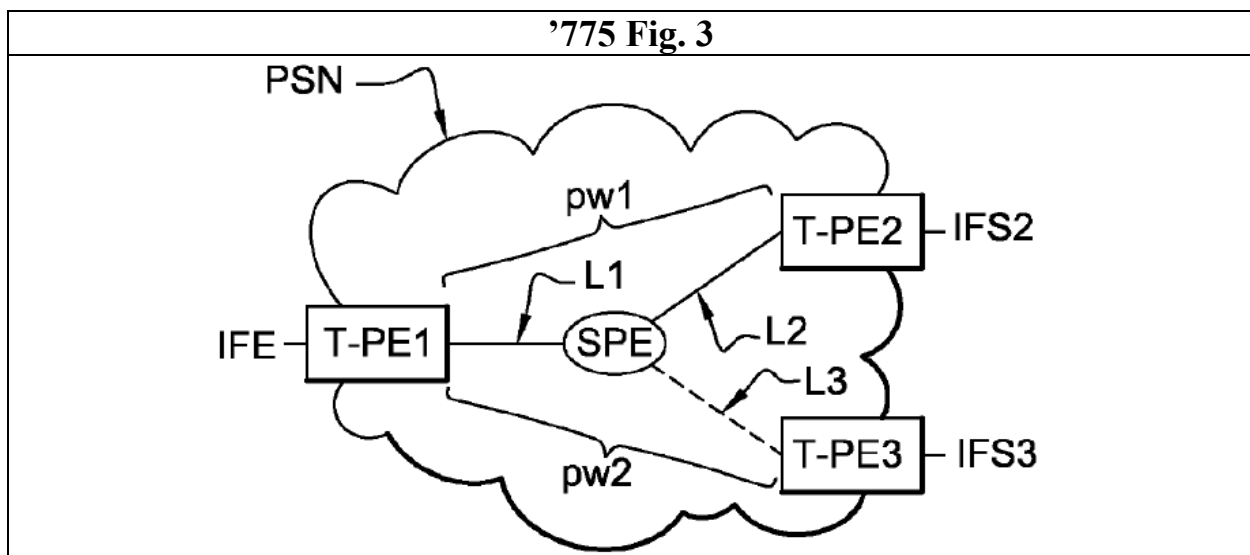
As a result of this view in the prior art that pseudo-wires should use “unshared” links to traverse the PSN, network operators would set up multiple pseudo-wires in a configuration like the one shown in Figure 2, in which the pseudo-wires are shaped like the letter “Y” (laying on its side) with a double-lined stem (representing the two unshared links from T-PE1 to SPE). Thus, the use of a shared pseudo-wire link was not known in the art prior to the ’775 Patent. Mitzenmacher Dec. ¶31.

B. The ’775 Patent Invention

The ’775 Patent inventors recognized a drawback of the prior art “double-stem Y” approach shown, for example, in Fig. 2: “this kind of solution has the drawback of consuming network resources, for example processing resources in the network equipments (storage capacity, computation capacity, etc.), signaling streams for setting-up two pseudowires, and bandwidth, especially between the input router and the intermediate router.” EX1001 at 2:40-45. Mitzenmacher Dec. ¶32.

The ’775 Patent inventors realized this drawback of the prior art could be avoided with a “single-stem Y” configuration, in which the two pseudo-wires share the same link along their shared connection path. “Going against this received

wisdom of the person skilled in the art, the inventors of the present application propose, in contrast, to share the link set up between the input router and the intermediate router, which improves the use of network resources ... Because the main pseudo-wire and the back-up pseudo-wire share the link set up between the input router and the intermediate router, the network resources that in the past were reserved for the back-up pseudo-wire are released and can be used in a manner closer to the optimum.” *Id.* at 3:15-29 (emphasis added). Mitzenmacher Dec. ¶33. This novel approach is shown, for example, in ’775 Patent Figure 3:



See also EX1001 at 6:44-48 (“the first link L1 is shared by the two pseudowires pw1 and pw2. This optimizes the use of network resources, such as bandwidth, between the input router T-PE1 and the intermediate router S-PE, as only one link is set up between these two routers.”).

A “link” is different from a “pseudowire” or a “segment of a pseudo-wire.” As discussed below, the parties agree that a “link” should be construed as a

“connection between an interface of a first router and an interface of a second router.” Pet. at 19. In other words, a link is a physical connection between router interfaces. A “segment of a pseudowire,” on the other hand, is not a term that appears in the claims and this term does not refer to a physical link. Rather, a “segment of a pseudowire” is itself a pseudowire that forms part of a single-segment or multi-segment pseudowire. *See, e.g.*, EX1031 at 6 (“PW Segment. A part of a single-segment or multi-segment PW, which is set up between two PE devices, T-PEs and/or S-PEs.”). Petitioners do not appear to dispute this. *See, e.g.*, Pet at 9 (“it was known at the time that consecutive pseudo-wires could be combined to form a multi-segment pseudo-wire”).

Nevertheless, Petitioner routinely confuses the concepts of a shared “link” with a shared “pseudowire” or “segment of a pseudowire.” *See, e.g.*, Pet. at 31 (“Wainner’s Figure 2 depicts four pseudo-wire segments, the first of which—pseudo-wire 22—is shared between the other three—pseudo-wires 24, 26, and 28”); *id.* at 50 (“Wainner explains that the first link (*e.g.*, pseudo-wire 22) is shared by the first and second pseudo-wires.” (emphasis omitted)). Sharing a *pseudo-wire* (such as Wainner’s PW22) is not the same thing as *two* pseudo-wires sharing a *link* as required by the ’775 Patent’s claims. Rather, sharing a *single pseudo-wire* is contrary to the ’775 Patent’s claim language, which requires “said first link being shared *by the first and second pseudo-wires*” and is also contrary to the ’775 Patent

specification’s teaching that “the first link L1 is shared by the *two pseudo-wires* pw1 and pw2.” EX1001 at 6:44-48, Claim 1, Claim 6 (emphasis added). If only *one* pseudowire (such as Wainner’s PW22) traverses a given link, that link is not shared by *two* pseudowires as the claims require. Petitioner’s repeated need to conflate a shared link and a shared pseudowire highlights the inability of Petitioner’s prior art to disclose the claim limitations.

C. Petitioner’s References

1. Wainner [EX1030]

“Wainner” is a US Patent Application (Pub. No. 2007/0239891) to Wainner et al. titled “Method and Apparatus for Point-to-Multipoint Distribution Using Pseudowires.” EX1030 at 1. The document shows a filing date of April 6, 2006.¹ Mitzenmacher Dec. ¶81.

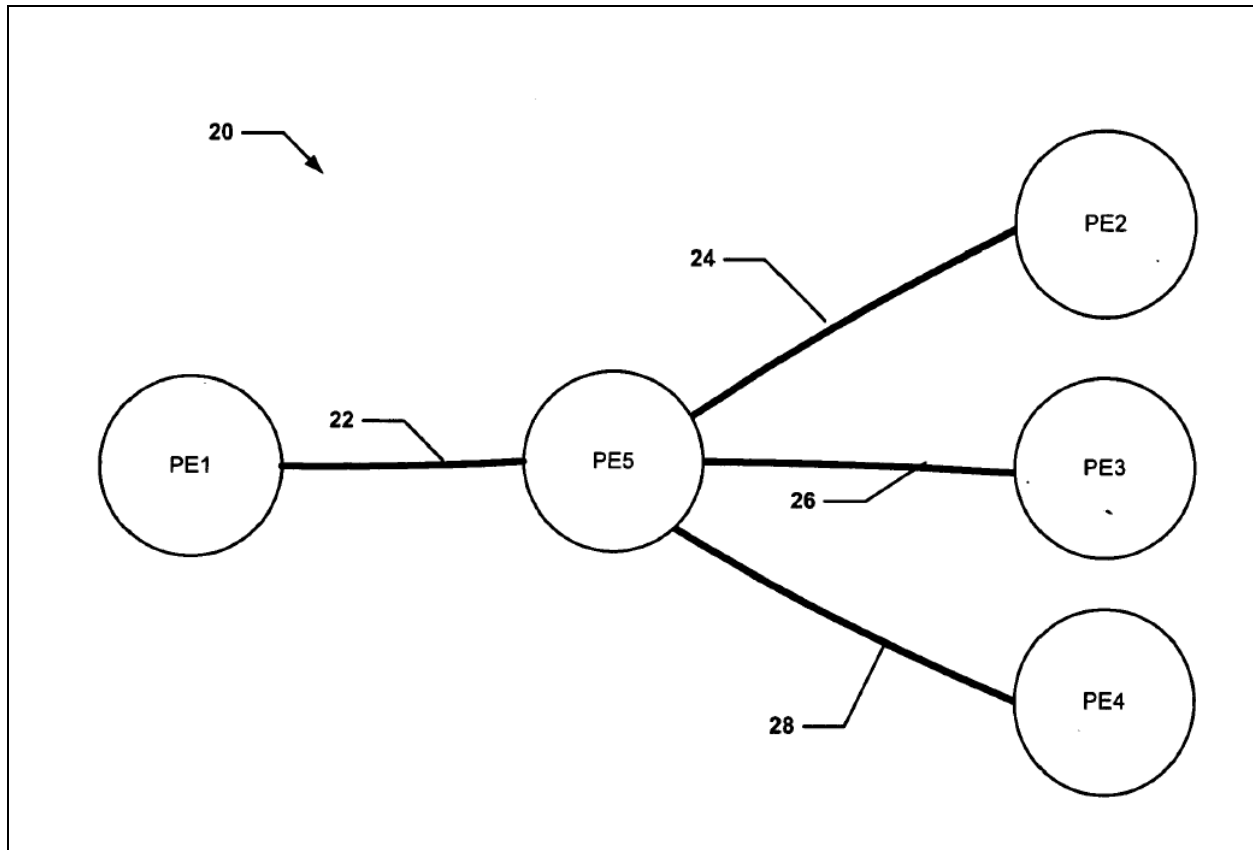
¹ For purposes of preserving error, Patent Owner notes that Wainner is not a patent under 35 U.S.C. § 311(b), and as a printed publication it is only entitled to its publication date of Oct. 11, 2007, and not its § 102(e) date as asserted by Petitioners (thus, it is not prior art to the ’775 Patent which claims a foreign application priority date of Feb. 26, 2007). A similar legal issue is currently pending before the Federal Circuit in *Link Labs Inc. v. Samsung Electronics Co.*, App. No. 2023-2346.

Wainner purports to solve a problem of prior multicast distribution methods that required “the transport provider to interact with the services plane.” *Id.* at [0004]. It solves this by setting up one pseudo wire between the ingress router and the intermediate router, and setting up one pseudowire between the intermediate router and each egress router:

[0006] In a particular embodiment of a method for providing point-to-multipoint multihop distribution using Pseudowires (PWs), the method includes receiving data at a switching provider edge (S-PE) router from an upstream originating provider edge (O-PE) router by way of a first PW, the first PW having a head-end coupled to the O-PE and a tail end coupled to the S-PE. The method also includes replicating the data received by the S-PE to at least one receiver provider edge (R-PE) router by way of a respective PW for each of the at least one R-PE, each of the respective PW between the S-PE and the R-PE having a head end coupled to the SPE and a tail end coupled to the R-PE.

Id. at [0006] (Wainner refers to a pseudowire using the abbreviation “PWs.” *Id.* at Abstract, [0006]). Mitzenmacher Dec. ¶83.

This configuration is shown, for example, in Figure 2 of Wainner:



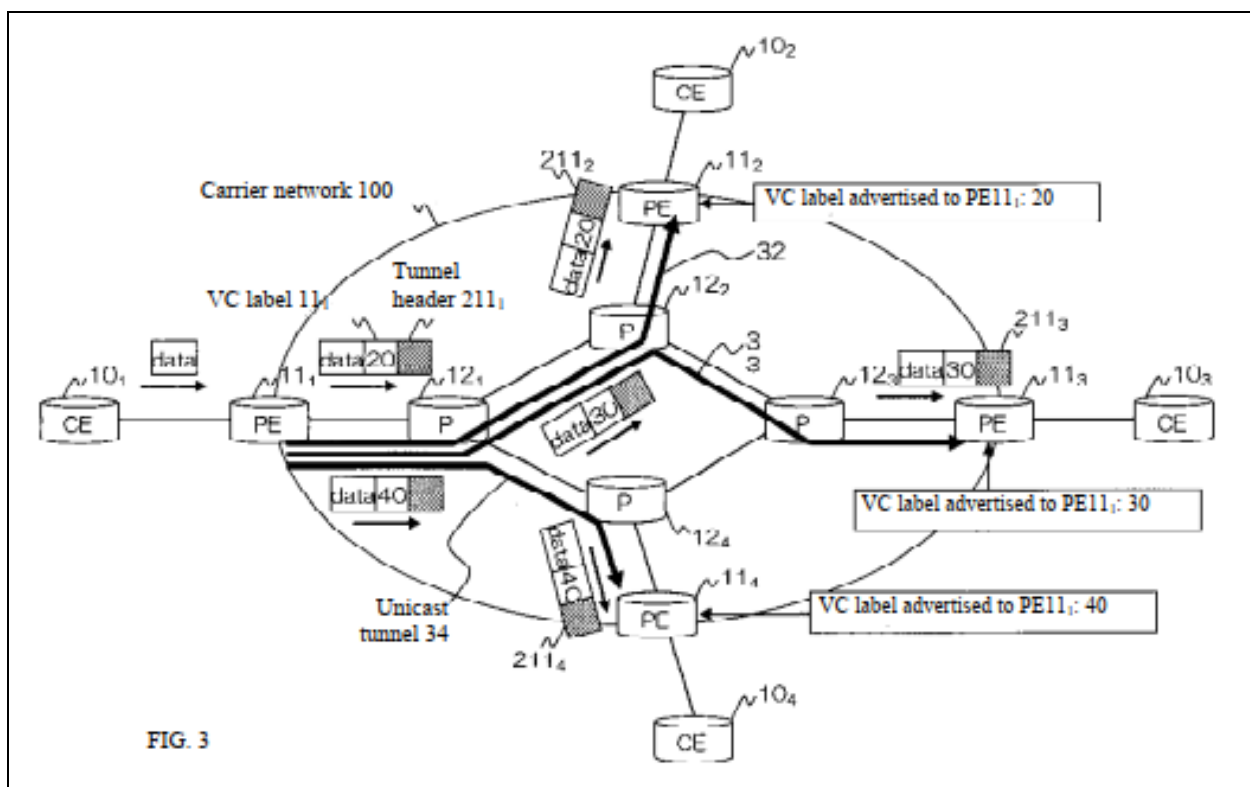
Id. at Fig. 2. Each black line depicted in Figure 2 (numbered 22, 24, 26, and 28) represents one single pseudowire. *Id.* at [0023]. The same is true of Figures 3, 4, and 5. *Id.* at [0025]-[0027]. Mitzenmacher Dec. ¶84.

Wainner does not disclose the concept of shared links. Each connection between routers in Wainner consists of at most one pseudo-wire, and there are no links shared by more than one pseudo-wire as required by the claims of the '775 Patent. Mitzenmacher Dec. ¶85.

2. Kamite [EX1041]

Kamite is purportedly a translation of Japanese Patent Application 2006-12359. EX1041 at 2. It shows a publication date of May 18, 2006. *Id.* Kamite

addresses a problem stemming from the fact that “conventional pseudo wire technology and multicast tunneling technology could not be combined.” EX1041 at 6. It purports to teach a solution which “allows pseudo wire traffic to be forwarded using a multicast tunnel.” *Id.* at 7. It shows a conventional solution in Fig. 3, in which three PWs are carried over three “separate unicast tunnels.” *Id.* at 6. Mitzenmacher Dec. ¶88.



EX1041 Fig. 3.

Kamite solves this problem by using identical VC labels for all downstream PEs. *Id.* at 7. This results in the use of a single multicast tunnel instead of multiple separate unicast tunnels. *Id.* Petitioner’s grounds repeatedly conflate Kamite’s tunnel with other concepts such as pseudo-wires and links, despite the fact that

Petitioner’s own references stress that tunnels, PWs, and links are distinct concepts. *See, e.g.*, EX1031 at 7 (noting PWs are “a separate layer to the PSN tunnel” and “independent of the PSN tunnel routing, operations, signaling and maintenance”). Mitzenmacher Dec. ¶89.

Kamite did not purport to improve on PWs, but rather on MPLS tunnels. And Kamite never mentions the concept of sharing a link. Kamite’s Abstract Problem and Solution statements do not mention pseudo-wires or links, nor do its claims, focusing instead on MPLS tunnels. *See* EX1041 at 2-5. Mitzenmacher Dec. ¶90.

3. Bocci [EX1031]

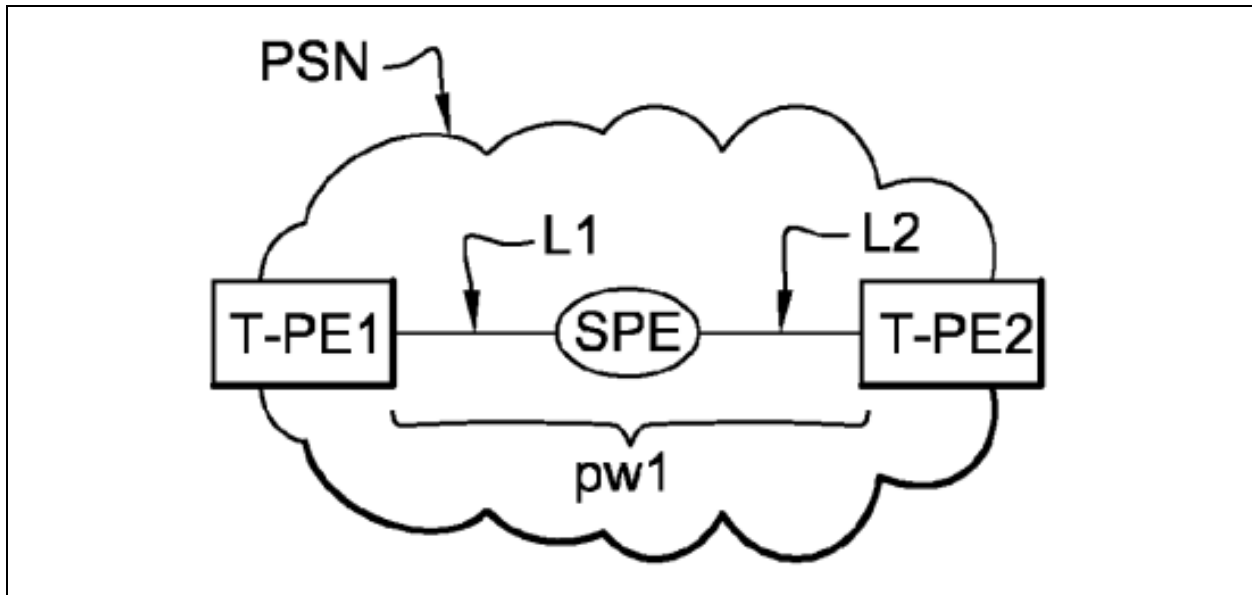
Bocci is an IETF Draft titled “An Architecture for Multi-Segment Pseudo Wire Emulation Edge-to-Edge.” EX1031 at 1. It shows a date of January 11, 2006.² Bocci appears to be a version³ of the IETF document that the ’775 Patent disparaged

² Patent Owner does not concede that EX1031 (which identifies itself as a “Draft” document) was publicly available or otherwise qualified as a printed publication as of the date shown on the document.

³ Petitioner relies on a version of Bocci bearing an apparent file name of “draft-ietf-pwe3-ms-pw-arch-00.txt” dated January 11, 2006, whereas the ’775 Patent addresses a version of Bocci bearing the file name “draft-ietf-pwe3-ms-pw-arch-02.txt”, dated October 20, 2006. *Compare* EX1031 at 1 with EX1001 at 1:66-

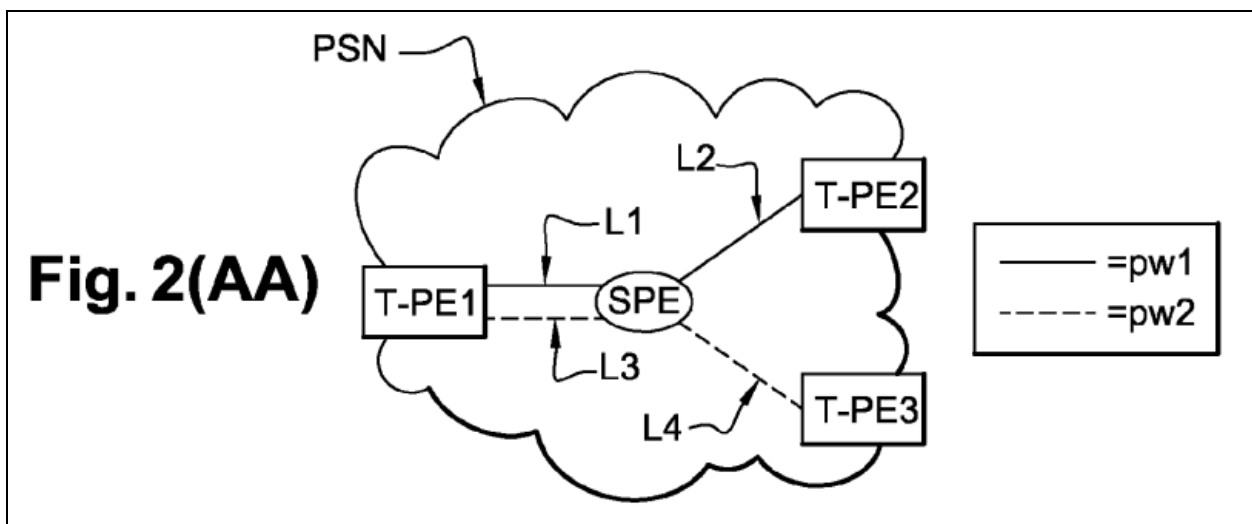
and improved on. As the '775 Patent explains, Bocci explained how to set up “[a] first link L1 that is part of the pseudo-wire pw 1 [] between the first router T-PE1 and an intermediate router S-PE” and “[a] second link L2 that is also part of the pseudo-wire pw1 [] between the intermediate router S-PE and the second router T-PE2.” EX1001 at 1:53-2:2 (discussing PW setup and noting it was defined in more detail in Bocci). Mitzenmacher Dec. ¶86. This Bocci approach is shown in '775 Patent Figure 1:

2:2; EX2003 at 2; EX2004 (redline between versions) at 1. Petitioner does not identify any differences in their teachings or otherwise distinguish between (a) the version of Bocci cited previously and discussed in the specification, and (b) the version relied upon as prior art in this proceeding. *See, e.g.*, Pet. at 83, 85. For purposes of simplicity, this Response will refer to both as “Bocci.”



EX1001 Fig. 1.

The '775 Patent further explains that the approach taught by Bocci was not fault tolerant and that the same technique used to setup two distinct PWs with two separate links was inefficient and negatively impacted quality of service. EX1001 at 2:3-47. This deficient approach based on Bocci (upon which the '775 Patent improved) is shown in '775 Patent Fig. 2:



EX1001 Fig. 2.

Petitioner relies on Bocci for both of its invalidity grounds. The fact that all Petitioner theories rely on the very reference the '775 Patent disparaged as deficient demonstrates that Petitioner's grounds are driven solely by hindsight, using the '775 Patent as a guide. It is undisputed that Bocci fails to teach two PWs that share a link (a "connection between an interface of a first router and an interface of a second router"). Thus, it cannot overcome the deficiencies of Wainner or Kamite (which also fail to teach a shared link) regardless of how it is combined with those references.

D. Prior '775 Patent Proceedings

The '775 Patent PCT Application was filed on Feb. 26, 2008, claiming priority to a Feb. 26, 2007 foreign application. EX1001. The international search report identified Bocci as a "document of particular relevance," and the examiner identified Wainner and made findings as to why it was pertinent but not sufficient to issue a rejection over. EX1002 at 105-106, 304-305.

Cisco Systems, Inc. was sued for infringing the '775 Patent on January 21, 2020. *See Monarch Networking Solutions LLC v. Cisco Systems, Inc. et al*, No. 20-cv-00015 (E.D. Tex.). Cisco filed an IPR Petition challenging the '775 Patent on July 6, 2020, based on U.S. Patent No. 7,602,702 to Aggarwal and FAULT-TOLERANT IP AND MPLS NETWORKS by Iftekhhar Hussain. *See Cisco Systems, Inc. v. Monarch Networking Solutions LLC*, IPR2020-01226, Paper 2 at 16 (PTAB).

The PTAB rejected Cisco’s IPR Petition on March 4, 2021, IPR2020-01226 Paper 11, and Cisco filed a subsequent request for *ex parte* reexamination request based on the same grounds in reexamination no. 90/014,701. Patentability of the ’775 Patent was confirmed over the proposed reexamination grounds, and Cisco agreed to settle the parallel district court litigation after service of expert reports on validity.

Petitioner Juniper Networks, Inc. was sued for infringing the ’775 Patent on May 23, 2023. It filed its initial Petition in this proceeding on Feb. 8, 2024, and then filed an amended Petition on Feb. 15, 2024. References to the “Petition” or “Pet.” in this Response refer to the amended Petition (Paper 3) unless otherwise noted.

III. Legal Standards

“In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (petitions must identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”); 35 U.S.C. § 312 (a)(3). This burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of

obviousness.” *In re Magnum Oil Tools Int’l*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

The obviousness inquiry requires considering whether one of skill in the art “would have been motivated to combine the prior art to achieve the claimed invention.” *In re NuVasive, Inc.*, 842 F.3d 1376, 1381 (Fed. Cir. 2016) (quoting *In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016)). “[T]he factual inquiry whether to combine references must be thorough and searching...” *Id.*

IV. Level of Ordinary Skill in the Art

For purposes of this Response, Patent Owner does not contest Petitioner’s recitation of the level of skill in the art, because even under Petitioner’s proposed level of skill, Petitioner has failed to meet its burden. *See* Pet. at 19; Mitzenmacher Dec. ¶34.

V. Claim Construction and Interpretation

Claims are construed according to *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100 (b). “Any prior claim construction determination concerning a term of the claim in a civil action...will be considered.” *Id.*

A. “Link”

Petitioner suggests that it has applied the construction for the claim term “link” previously identified by the Eastern District of Texas Court as a “connection between an interface of a first router and an interface of a second router.” Pet. at 19-

20. The petitioner does not propose any additional constructions. *Id.* Patent Owner agrees with and accepts Petitioner’s proposed construction of link. Dr. Mitzenmacher has used this construction of “link” in his analysis. Mitzenmacher Dec. ¶¶36-38.

B. “First link”

Claims 1 and 6 of the ’775 Patent recite a “first link set up between an input router of a packet-switched network and an intermediate router of the packet-switched network.”

Applying the agreed construction of “link,” the term “first link” means “a connection between an interface of the input router and an interface of the intermediate router.” Mitzenmacher Dec. at ¶¶39-40.

C. “Pseudowire”

A pseudowire, unlike a link, is not a physical connection. Rather, a pseudowire is a type of emulated or virtual connection achieved via encapsulation of data packets. ’775 Patent at 1:45-48 (“the IETF Pseudo-Wire Emulation Edge-To-Edge (PWE3) standardization group has defined a pseudo-wire concept for emulating a point-to-point link between two equipments of a packet-switched network based on the IP/MPLS technology”). For example, the PWE3 standard RFC3985 (referenced in the ’775 Patent at 1:45-52) describes a pseudowire as a

“mechanism that carries the essential elements of an emulated service from one PE to one or more other PEs over a PSN.” EX1010 at 5. Mitzenmacher Dec. at ¶41.

The language of the ’775 claims themselves also make clear that “link” and “pseudowire” have different meanings, because the claims and the specification use different terms to refer to these different concepts. *Apple Inc. v. Omni MedSci, Inc.*, No. 2023-1034, 2024 U.S. App. LEXIS 15066, at *9 (Fed. Cir. June 21, 2024) (“Well-settled claim construction principles govern this dispute. ‘***Different claim terms are presumed to have different meanings.***’”); *Bancorp Servs., L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1373 (Fed. Cir. 2004) (“the use of both terms in close proximity in the same claim gives rise to an inference that a different meaning should be assigned to each”); Mitzenmacher Dec. ¶42.

It is important to recognize that a “pseudowire” (a type of emulated connection) is not the same thing as a “link” (a type of physical connection between router interfaces). Conflating these concepts leads to a misunderstanding of the ’775 Patent’s claims 1 and 6. Mitzenmacher Dec. at ¶43.

D. “Said first link being shared by the first and second pseudo-wires”

This claim element, “said first link being shared by the first and second pseudo-wires,” represents an important distinction between the ’775 Patent and the prior art described in the ’775 Patent. It is critical to understand this claim element

in order to correctly understand the scope of the '775 Patent's claims. Mitzenmacher Dec. ¶44.

Prior to the '775 Patent, POSITAs uniformly understood that pseudowires could not share links. Rather, in the prior art, each link (*i.e.* each “connection between an interface of a first router and an interface of a second router”) could only include at most one pseudowire. This prior art understanding was reflected in RFC3985, which said “the PW is characterized as an ***unshared link*** or circuit of the chosen service.” EX1010 at 3; Mitzenmacher Dec. ¶45.

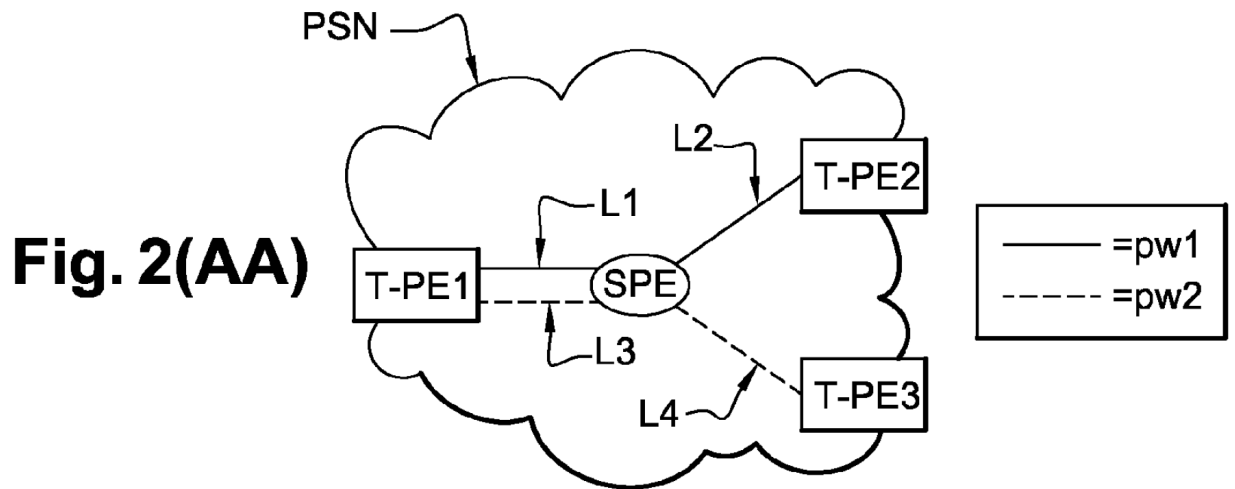
The '775 Patent's inventors recognized for the first time that one can “optimize[] the use of network resources, for example bandwidth, between the input router and the intermediate router by setting up between them ***a single link*** common to the ***two pseudo-wires***. This solution has never been envisaged in the prior art. In the prior art, when a main pseudo-wire and a back-up pseudo-wire are set up between an input router and a first, respectively a second, output router, a link is set up between the input router and the intermediate router for each pseudo-wire, *i.e.* two links.” EX1001 at 3:1-9 (emphasis added). Thus the '775 Patent distinguished the prior art, in which one link included at most one pseudowire, from the invention, in which one link is shared by two or more pseudowires. Mitzenmacher Dec. ¶46.

There are at least three approaches to setting up “pseudo-wires able to broadcast a data stream” across a network via an intermediate router. Dr.

Mitzenmacher refers to these three approaches as (1) two links, two pseudowires; (2) one link, one pseudowire; and (3) one link, two pseudowires. Mitzenmacher Dec. ¶47. The '775 Patent disparages (1) and (2) as inferior prior art approaches that are outside the scope of the claims. Only the third approach, “one link, two pseudowires,” satisfies the '775 Patent’s claims, which require “said first link being shared by the first and second pseudo-wires.”

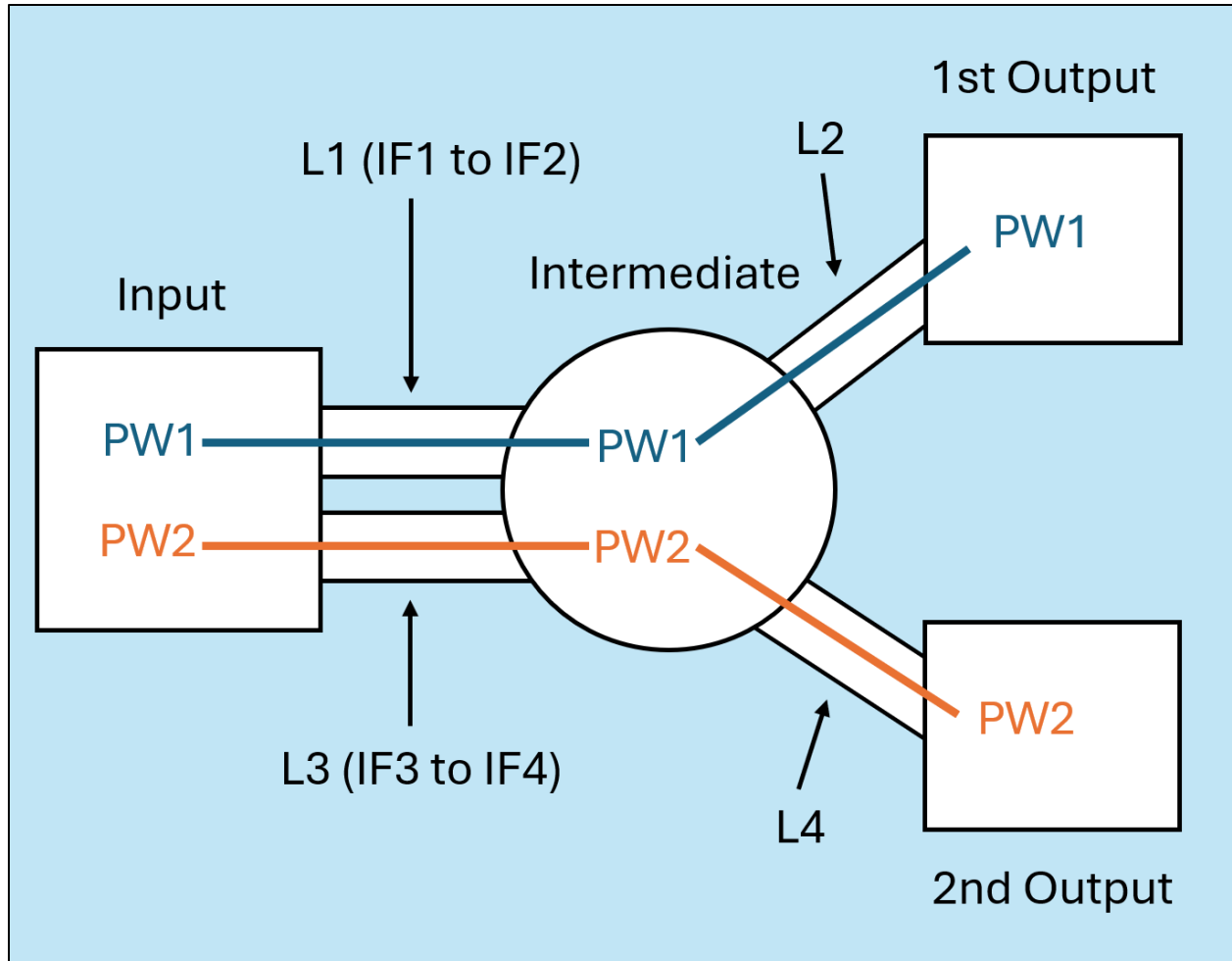
1. Two Links, Two Pseudowires (Prior Art)

The '775 Patent describes a prior art approach, shown in Figure 2 and its accompanying description, in which two separate pseudowires are set up along two separate links between the input router and the intermediate router. EX1001 at 2:12-25 (“Accordingly, referring to FIG. 2 ... [a] first link L1 that is part of the pseudo-wire pw1 is set up between the input router T-PE1 and an intermediate router S-PE ... [a] first link L3 that is part of the second pseudo-wire is set up between the input router T-PE1 and the intermediate router S-PE”). These two links (L1 and L3) use different interfaces because they are different links, and a link is defined as “a connection between an interface of a first router and an interface of a second router.”



EX1001 at Fig. 2; Mitzenmacher Dec. ¶48.

Dr. Mitzenmacher created a diagram to illustrate this prior art “two links, two pseudowires” configuration, with each of the relevant features (*e.g.*, links, pseudowires, and interfaces) shown more clearly:



Mitzenmacher Dec. ¶49.

This prior art “two links, two pseudowires” configuration does not meet the claim limitation “said first link being shared by the first and second pseudo-wires” because the claimed “first link” is “between an input router ... and an intermediate router” and there is no single link between the input router and the intermediate router that is shared by both PW1 and PW2. Mitzenmacher Dec. ¶50.

Instead, PW1 traverses link L1, which is a connection between interface IF1 of the input router and interface IF2 of the intermediate router. PW2 traverses link

L3, which is a connection between interface IF3 of the input router and interface IF4 of the intermediate router. Even though both PW1 and PW2 connect to interfaces of the input router and the intermediate router, PW1 and PW2 do not connect to the *same* interface of the input router and the *same* interface of the intermediate router. Because PW1 and PW2 connect different sets of interfaces, they use different links, and therefore do not “share” a first link. Mitzenmacher Dec. ¶51.

The ’775 Patent disparages the prior art “two links, two pseudowires” approach of Figure 2, referring to this configuration as “a solution implemented in the prior art” and noting that this configuration consumes more network resources. EX1001 at 3:15-29, 5:43; Mitzenmacher Dec. ¶52.

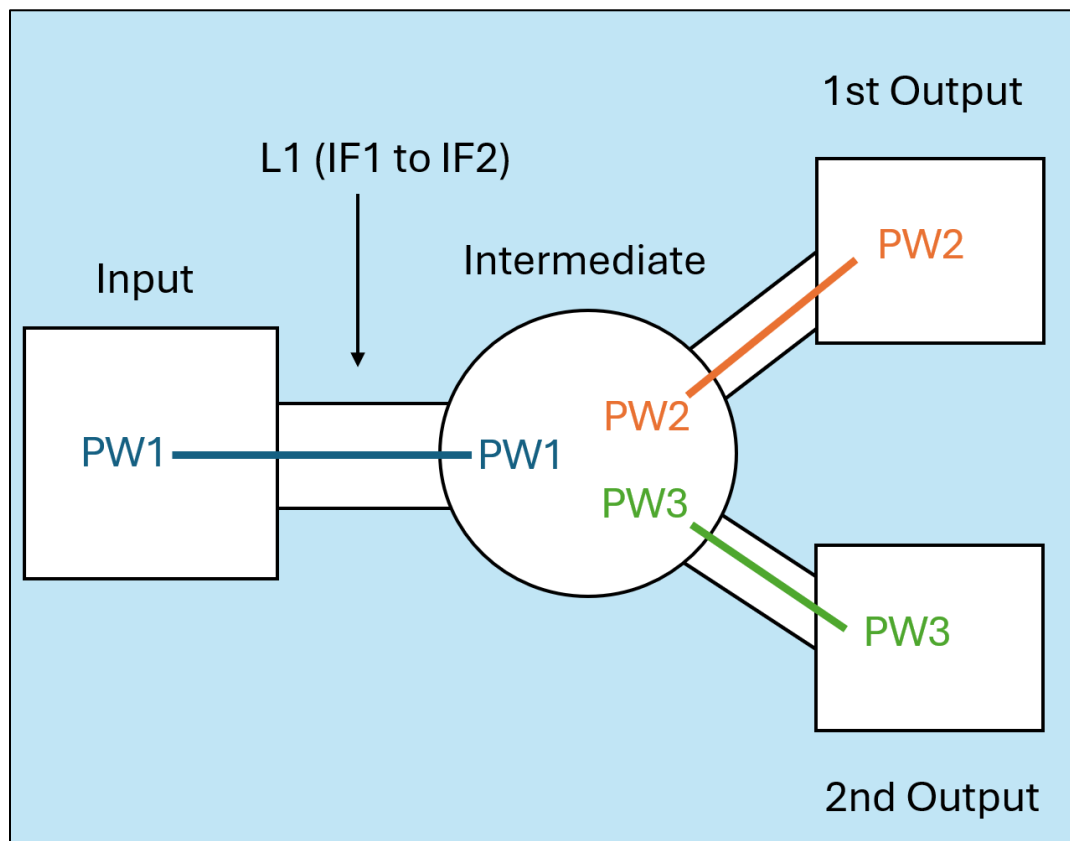
Petitioner’s putative combination of Kamite’s Fig. 3 and Bocci uses this prior art “two links, two pseudowires” configuration and therefore does not satisfy the “said first link being shared by the first and second pseudo-wires” claim element. Mitzenmacher Dec. ¶53.

2. One Link, One Pseudowire (Prior Art)

Another way that a prior art POSITA might try to set up “pseudo-wires able to broadcast a data stream” across a network would be to connect each router together using exactly one pseudowire. As noted above, before the invention of the the ’775 Patent, a POSITA would have understood a pseudowire to be an “unshared

link” and therefore would have only set up one pseudowire per link. Mitzenmacher Dec. ¶54.

Dr. Mitzenmacher created a diagram to illustrate this prior art “one link, one pseudowire” configuration, with each of the relevant features (*e.g.*, links, pseudowires, and interfaces) shown clearly:



Mitzenmacher Dec. ¶55.

This “one link, one pseudowire” configuration does not meet the claim limitation “said first link being shared by the first and second pseudo-wires.” Here, the first link (L1) includes only one pseudo-wire (PW1). In other words, only pseudowire PW1 connects to interface IF1 of the input router and interface IF2 of

the intermediate router. Because link L1 only includes one pseudowire, it cannot be “shared by the first and second pseudowires.” Mitzenmacher Dec. ¶56.

Petitioner has cited Bocci (EX1031) as disclosing multi-segment pseudowires and has contended that a POSITA would implement multi-segment pseudowires. Let us assume for the sake of discussion that we can set up multi-segment pseudo-wires in the “one link, one pseudowire” configuration shown above. Specifically, let us assume that we set up one multi-segment pseudowire consisting of segments PW1 and PW2, called MSPW1-2 and that we set up another multi-segment pseudowire consisting of segments PW1 and PW3, called MSPW1-3. This configuration cannot meet the “said first link being shared” limitation of the ’775 Patent’s claims. Mitzenmacher Dec. ¶57.

Although MSPW1-2 and MPSW1-3 both include pseudowire segment PW1, the link L1 is *not* shared by MSPW1-2 and MPSW1-3 as required by ’775 Patent claims 1 and 6. This is a critical distinction. A pseudowire (an emulated connection) is different from a link (a physical connection between interfaces) as discussed above. In order to share a “link,” two pseudowires must connect to the same interface on the input router and the same interface on the intermediate router, *i.e.* they must share the same “connection between an interface of the input router and an interface of the intermediate router.” As described in detail below, multi-segment pseudowires MSPW1-2 and MSPW1-3 can only connect to routers at the edge of the network and

cannot connect to any interface of the intermediate router, so they cannot share the claimed “first link.” The ’775 Patent recognizes this shortcoming of “prior art” multi-segment pseudowires. EX1001 at 1:53-2:2 (“Referring to **FIG. 1, a pseudo-wire pw1** is set up between a first router T-PE1 at the **edge** of a packet-switched network PSN and a second router T-PE2, also at the **edge** of the network PSN. ... This kind of **pseudo-wire pw1** is defined in more detail in the document ‘**An Architecture for Multi-Segment Pseudo-Wire Emulation Edge-to-Edge**’ (draft-ietf-pwe3-ms-pw-arch-02.txt) [Bocci]”) (emphasis added); *Id.* at 5:40–42 (“**FIG. 1** represents **a pseudo-wire set up as in the prior art**”) (emphasis added). Mitzenmacher Dec. ¶58.

Specifically, MSPW1-2 and MSPW1-3 cannot share the link L1 because MSPW1-2 and MSPW1-3 do not share the connection between interface IF1 on the input router and interface IF2 on the intermediate router. This is because neither MSPW1-2 nor MSPW1-3 connects to interface IF2 (as discussed below, they are not allowed to do so). Rather, only pseudowire PW1 connects to interface IF2. Mitzenmacher Dec. ¶59.

Bocci defines “Multi-Segment Pseudo Wire (MS-PW)” as a “static or dynamically configured set of two or more contiguous PW segments that behave and function as a single **point-to-point PW**. Each end of a MS-PW by definition **MUST terminate on a T-PE**.” EX1031 at 6 (emphasis added). Mitzenmacher Dec. ¶60.

In other words, a multi-segment pseudowire is subject to two important constraints: (1) a multi-segment pseudowire must “behave and function as a single point-to-point” pseudowire and (2) its endpoints “MUST terminate on a T-PE.” A “T-PE” refers to a “Terminating Provider Edge” router that sits at the edge of a network. *Id.* In the example above, the Input router and the two Output routers are T-PEs, but the Intermediate router is not a T-PE because it is not at the edge of the network. Rather, the intermediate router is an S-PE as described below. Mitzenmacher Dec. ¶61.

Bocci confirms that multi-segment pseudowires, such as MSPW1-2 and MSPW1-3 can only terminate on T-PEs. Therefore, MSPW1-2 and MSPW1-3 can only connect to interfaces of the Input and Output routers and cannot connect to interfaces of the Intermediate router (such as IF2), because the Intermediate router is not a T-PE. Mitzenmacher Dec. ¶62.

Conversely, Bocci teaches that pseudowire segments *can* terminate on S-PEs such as the Intermediate router: “PW Segment. A part of a single-segment or multi-segment PW, which is *set up between two PE devices*, T-PEs and/or *S-PEs*.” EX1031 at 6 (emphasis added); Mitzenmacher Dec. ¶63.

This is further confirmed by Bocci’s definition of S-PE: “PW Switching Provider Edge (S-PE). A PE capable of switching the control and data planes of the preceding and succeeding PW segments in a MS-PW. *The S-PE terminates the PSN*

tunnels of the preceding and succeeding segments of the MS-PW. It is therefore a PW switching point for a MS-PW. A PW Switching Point is *never the S-PE and the T-PE for the same MS-PW.*” EX1031 at 7 (emphasis added). Mitzenmacher Dec. ¶64.

As shown in Bocci, a multi-segment pseudowire can never terminate on an S-PE, such as the Intermediate router in the example above. Moreover, a single device can “never” be both a T-PE and an S-PE for the same MS-PW. Instead, only pseudowire segments that form the MS-PW can terminate on an S-PE, such as PW1 that terminates on interface IF2 of the Intermediate router in the example above. Mitzenmacher Dec. ¶65.

Accordingly, even if we set up multi-segment pseudowires MSPW1-2 and MSPW1-3 in the “one link, one pseudowire” example, it is impossible for the first link L1 to be shared by MSPW1-2 and MSPW1-3 because multi-segment pseudowires cannot connect to interfaces on S-PEs, such as interface IF2 on the Intermediate router. MSPW1-2 and MSPW1-3 cannot share the same connection between interface IF1 of the input router and interface IF2 of the Intermediate router, because these multi-segment pseudowires cannot connect to interface IF2. Mitzenmacher Dec. ¶66.

Instead, in the example above, only the pseudowire segment PW1 connects to interface IF2 of the intermediate router. Thus, the link L1 (*i.e.* the connection

between IF1 and IF2) includes only one pseudowire PW1. This means link L1 is *not* shared by multiple pseudowires. Introducing multi-segment pseudowires to this “one link, one pseudowire” configuration does not result in L1 being a shared link, because multi-segment pseudowires cannot connect to any interface of the Intermediate router. As described in Bocci, multi-segment pseudowires are “point-to-point” pseudowires that “MUST” terminate on interfaces of the Input and Output routers only. Mitzenmacher Dec. ¶67.

As the Board noted in the Decision, “the ’775 patent itself admits that multi-segment pseudo-wires were known in the art.” Decision at 22 (citing EX1001 at 1:53–2:2, 5:40–42). In the cited passages, the ’775 patent says that Figure 1 depicts a “pseudo-wire pw1” that “is defined in more detail in the document ‘An Architecture for Multi-Segment Pseudo-Wire Emulation Edge-to-Edge’ (draft-ietf-pwe3-ms-pw-arch-02.txt)” (*i.e.* Bocci). EX1001 at 1:53–2:2. The ’775 Patent also says that “FIG. 1 represents a pseudo-wire *set up as in the prior art.*” *Id.* 5:40–42 (emphasis added). The ’775 Patent makes clear that this “prior art” “Multi-Segment Pseudo-Wire” depicted in Figure 1 “is set up between a first router T-PE1 at the *edge* of a packet-switched network PSN and a second router T-PE2, also at the *edge* of the network PSN.” *Id.* at 1:54-56 (emphasis added); Mitzenmacher Dec. ¶68. Thus, the ’775 Patent teaches that prior art multi-segment pseudowires set up in the manner described by Bocci must connect to T-PE routers at the “edge” of the network. *See*

also id. at 3:9-18 (“The person skilled in the art has always considered a pseudo-wire as a ***point-to-point*** link set up ***between an input router and an output router***. ... Going against this received wisdom of the person skilled in the art, the inventors of the present application propose, in contrast, to ***share the link*** set up ***between the input router and the intermediate router***”). The ’775 Patent inventors went against the “received wisdom” of prior art like Bocci, in which multi-segment pseudo wires connect only to interfaces of input and ***output*** routers. The ’775 inventors patented two pseudowires connecting to the same interfaces of the input and ***intermediate*** routers.

The ’775 Patent distinguishes Bocci’s “prior art” multi-segment approach from the Figure 3 approach of the claimed invention. EX1001 at 5:45-46 (“FIG. 3 represents two pseudo-wires setup by the method of an embodiment of ***the invention***”) (emphasis added). This further confirms that the use of multi-segment pseudowires is not sufficient to satisfy the claims. As shown in the example above, the “one link, one pseudowire” configuration does not satisfy the claims even if multi-segment pseudowires MSPW1-2 and MSPW1-3 are introduced. Mitzenmacher Dec. ¶69.

Petitioner’s putative combinations of Wainner and Bocci, and of Kamite Fig. 10 and Bocci, both use this prior art “one link, one pseudowire” configuration and therefore do not satisfy the “said first link being shared by the first and second

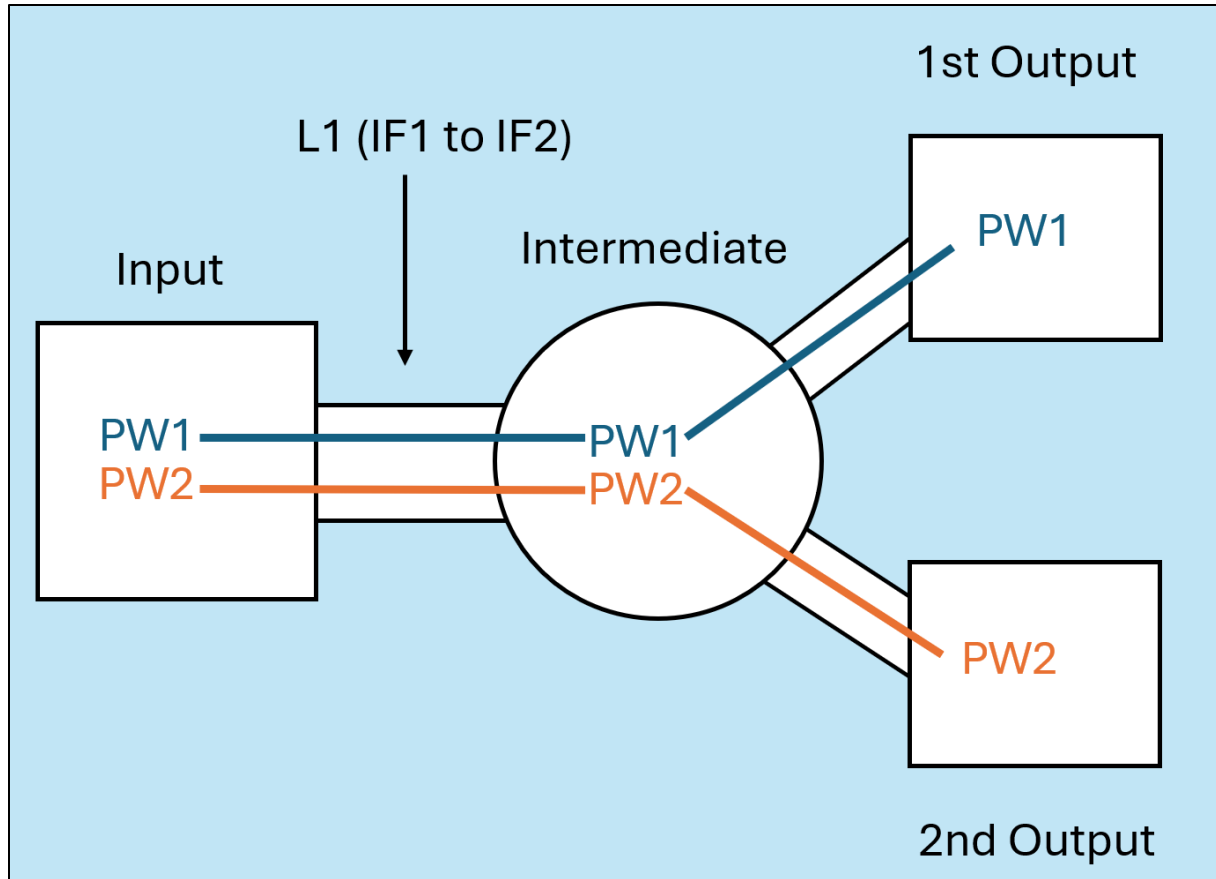
pseudo-wires” claim element, even if one introduces multi-segment pseudowires.

Mitzenmacher Dec. ¶70.

E. One Link, Two Pseudowires (Claimed Invention)

Claims 1 and 6 of the ’775 Patent require “said first link being shared by the first and second pseudo-wires.” Plugging in the agreed construction of link, this means “said connection between an interface of the input router and an interface of the intermediate router being shared by the first and second pseudo-wires.” In other words, the claims of the ’775 patent require two pseudowires to connect to the same interface on the input router and the same interface on the intermediate router. This is the embodiment shown in Figure 3. Mitzenmacher Dec. ¶71.

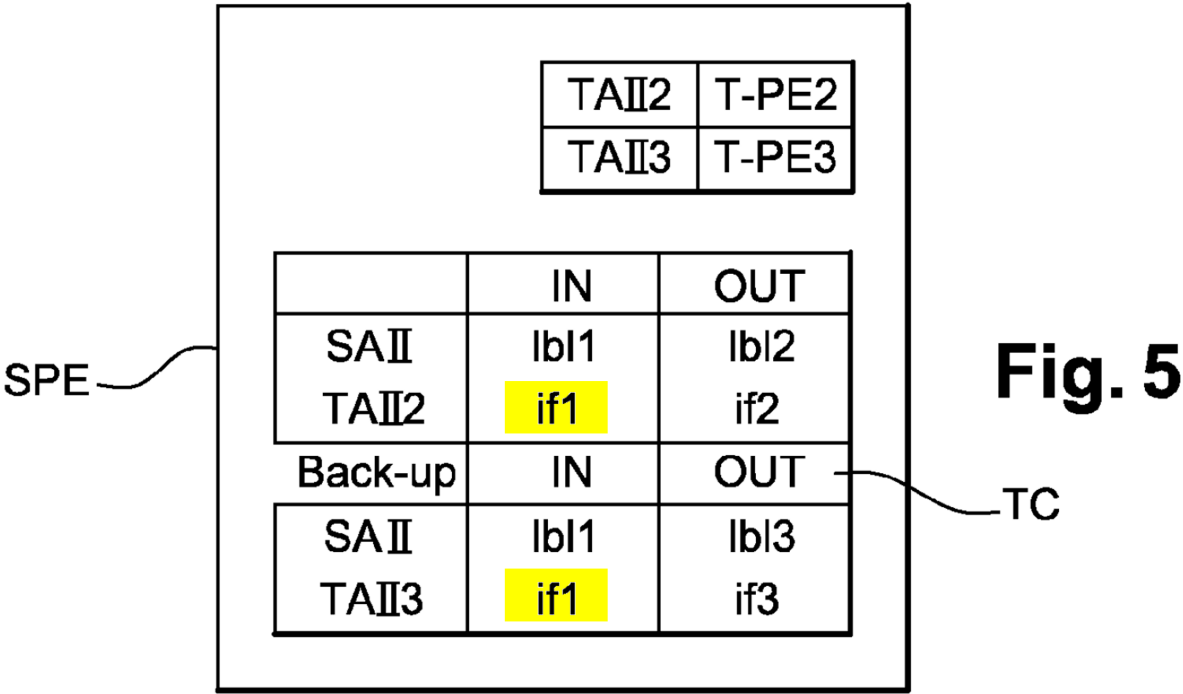
Dr. Mitzenmacher has created a diagram to illustrate the claimed “one link, two pseudowires” configuration, with each of the relevant features (*e.g.*, links, pseudowires, and interfaces) shown clearly:



Mitzenmacher Dec. ¶72.

The '775 Patent makes clear that, in the invention, PW1 and PW2 share the same first link L1: “a first link L1 is set up between the input router T-PE1 and an intermediate router S-PE. A second link L2 is set up between the intermediate router S-PE and the first output router T-PE2. The first and second links constitute a first pseudo-wire pw1 setting up a connection between the input router T-PE1 and the first output router T-PE2. ... The pseudo-wire pw2 consists of the first link L1 and a second link L3 set up between the intermediate router S-PE and the second output router T-PE3.” EX1001 at 6:29-43. Mitzenmacher Dec. ¶73.

In order for PW1 and PW2 to share the same link they must necessarily both connect to the same interface of the intermediate router. This is confirmed by the '775 Patent's Figure 5, which shows "routing and switching tables of an intermediate router." EX1001 5:53-55; Mitzenmacher Dec. ¶74.



The accompanying description of Figure 5 confirms that the intermediate router's routing table includes two pseudowires that connect to the same interface of the input router and the same interface of the intermediate router:

Referring to FIG. 5, on reception of the first set-up message SIG1, the intermediate router S-PE extracts the identifier of the input router T-PE1, the identifier of the first output router T-PE2, and the information contained in the additional field of the message SIG1, namely the identifier of the second output router T-PE3 and the "backup" parameter. The intermediate router S-PE uses this information to fill in a switching table TC. This switching table TC includes for a given FEC information indicating the label that must be inserted into the header of

the message in order to perform the next hop and the output interface if2, if3 to which to direct the data streams. The “backup” parameter indicating the nature of the second pseudo-wire pw2 is also entered into the switching table TC.

EX1001 at 7:30-43; Mitzenmacher Dec. ¶75.

As highlighted above, the ’775 Patent’s Figure 5 shows that the primary pseudowire and the backup pseudowire (*i.e.* PW1 and PW2) each connect to the same interface if1 on the intermediate router S-PE.⁴ In contrast to the two prior art examples discussed above, here there are *two* pseudowires connected to the same interface of the intermediate router. Mitzenmacher Dec. ¶76.

This is also made clear in column 8: “On reception of a data packet sent by the input router T-PE1, the intermediate router S-PE uses the label added to the packet by the input router to determine to which output interface if2, if3 to direct the data packet, as a function of the information contained in the switching table TC.” EX1001 at 8:1-5. This further confirms that intermediate router S-PE “sees” two pseudowires connected to its interface if1 and can distinguish between these two pseudowires based on the “label added to the packet” that identifies which pseudowire the packet belongs to. Mitzenmacher Dec. ¶77.

⁴ Note that the ’775 Patent labels the input interface of the intermediate router as “if1,” whereas Dr. Mitzenmacher labeled this interface as “IF2” in his example diagram above.

Accordingly, the “one link, two pseudowires” configuration shown above satisfies the claims because it comprises “said connection between an interface of the input router and an interface of the intermediate router being shared by the first and second pseudo-wires,” *i.e.*, the first and second pseudowires connect to the same interface of the input router and the same interface of the intermediate router. Mitzenmacher Dec. ¶78.

This is unlike the two prior art examples discussed above. In those examples, no more than one pseudowire is connected to an interface of the intermediate router. In the “two links, two pseudowires” example, each pseudowire PW1 and PW2 connects to a different interface on the input router and the intermediate router, and therefore PW1 and PW2 do not share the same link between the input and intermediate routers. In the “one link, one pseudowire” example, only one pseudowire PW1 connects an interface of the input router and an interface of the intermediate router. The multi-segment pseudowires MSPW1-2 and MSPW1-3 cannot connect to any interface of the Intermediate router because it is an S-PE. MSPW1-2 and MSPW1-3 are required to be “point-to-point” connections between T-PEs, and thus can only connect to interfaces on the input and output routers and cannot share the first link. Mitzenmacher Dec. ¶79.

VI. Argument

Petitioner has asserted two grounds of invalidity based on (a) Wainner (EX1030), U.S. Publication No. 2007/0239891, (b) Bocci (EX1031), IETF Internet Draft, and (c) Kamite (EX1041), JP Patent Application No. 2006-129359. Pet. at 7. Both grounds assert invalidity of '775 Patent Claims 1 and 6 based on (1) a combination of Wainner and Bocci, and (2) and combination of Kamite and Bocci. *Id.* Petitioner has not met its burden on either ground, and the Board should affirm the validity of the claims if the '775 Patent.⁵

As shown below, neither ground renders obvious the “said first link being shared by the first and second pseudo-wires” limitation present in each independent claim 1 and 6. Mitzenmacher Dec. ¶91.

A. Ground 1: Wainner and Bocci

Wainner states that “PW 22 is signaled between an origination PE (O-PE) (PE1) and an S-PE (PE5),” and that “PW 24 is established between PE5 and PE2,

⁵ To simplify the issues, Monarch and its expert Dr. Mitzenmacher have not addressed every shortcoming of the Petition. For example, although Monarch and Dr. Mitzenmacher agree that a POSITA would not combine Wainner and Bocci or Kamite and Bocci, Monarch has assumed for purposes of this Response that they could be combined. Mitzenmacher Dec. ¶92; Prelim. Resp. (Paper 9) at 27-28, 36. The fact that Monarch has not addressed every argument made by Petitioner should not be taken as an indication that Monarch agrees with Petitioner’s arguments.

PW26 is established between PE5 and PE3 and PW28 is established between PE5 and PE4.” EX1030 at [0023].

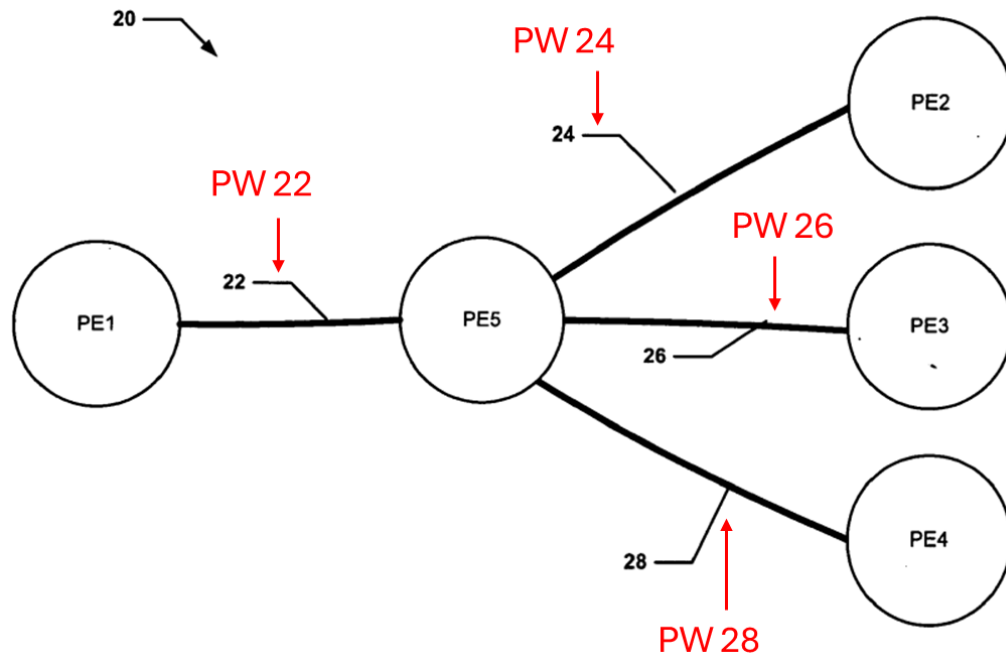


FIGURE 2

EX1030 Fig. 2 (annotated); Mitzenmacher Dec. ¶93.

Petitioner argues that “pseudo-wires 22 and 24 are combined to form a ‘multi-hop/multi-point pseudowire.’” Decision at 21 (citing Pet. at 41). Petitioner also argues that “pseudo-wires 22 [] and 28 [] combine to form a ‘multi-hop/multi-point pseudowire.’” Decision at 25 (citing Pet. at 48). Petitioner also argues that “a person of ordinary skill in the art (POSITA) ‘would have known that a ‘multi-hop’ pseudo-wire is equivalent to a ‘multi-segment’ pseudo-wire’” and that “Wainner would operate in its disclosed manner and further implement Bocci’s teaching of

combining consecutive pseudo-wires to form a multi-segment pseudo-wire.”

Decision at 22-23 (citing Pet. at 43-45); Mitzenmacher Dec. ¶94.

For the sake of discussion, Monarch assumes (without agreeing) that one can combine PW22 and PW24 into a multi-segment pseudowire called MSPW22-24, and assumes that one can combine PW22 and PW28 into a multi-segment pseudowire called MSPW22-28. According to petitioner, these two multi-segment pseudowires constitute the “first pseudowire” and the “second pseudowire.” Mitzenmacher Dec. ¶95.

“Petitioner then contends that Wainner’s ‘first link (*e.g.*, pseudo-wire 22) is shared by the first and second pseudo-wires.” Decision at 26 (citing Pet. at 50). This is not correct. Even though MSPW22-24 and MSPW22-28 both include PW22, they do not share the first link because they do not share a “connection between an interface of the input router and an interface of the intermediate router.” This corresponds to the prior art “one link, one pseudowire” example discussed above. In order to share a “link,” two pseudowires must connect to the same interface on the input router and the same interface on the intermediate router, *i.e.* they must share the same “connection between an interface of the input router and an interface of the intermediate router.” As described in detail above, multi-segment pseudowires cannot connect to any interface of the intermediate router, so they cannot share the

claimed “first link” between an interface of the input router and an interface of the intermediate router. Mitzenmacher Dec. ¶96.

Wainner makes clear that router PE5 is an S-PE. EX1030 at [0023] (“PW 22 is signaled between an origination PE (O-PE) (PE1) and an ***S-PE (PE5)***”) (emphasis added). As discussed in more detail above regarding the “one link one pseudowire” example, Bocci makes clear that multi-segment pseudowires can ***only*** connect to interfaces on T-PE routers and cannot connect to interfaces on S-PE routers such as PE5. EX1031 at 6 (a multi-segment pseudowire must “behave and function as a single ***point-to-point*** PW” and “[e]ach end of a MS-PW by definition ***MUST terminate on a T-PE***”) (emphasis added). Mitzenmacher Dec. ¶97.

Because PE5 is an S-PE, multi-segment pseudowires MSPW22-24 and MSPW22-28 cannot connect to any interface on PE5. Instead, MSPW22-24 is a point-to-point pseudowire that connects an interface on T-PE router PE1 and an interface on T-PE router PE2. Likewise, MSPW22-28 is a point-to-point pseudowire that connects an interface on T-PE router PE1 and an interface on T-PE router PE4. Neither MSPW22-24 nor MSPW22-28 can connect to any interface on PE5. Mitzenmacher Dec. ¶98.

This is precisely the prior art configuration the ’775 Patent distinguishes itself from: “The person skilled in the art has always considered a pseudo-wire as a ***point-to-point*** link set up ***between an input router and an output router***. ... Going against

this received wisdom of the person skilled in the art, the inventors of the present application propose, in contrast, to *share the link* set up *between the input router and the intermediate router.*” EX1001 at 3:9-18. Petitioner’s proposed MSPW22-24 and MSPW22-28 are “point-to-point” pseudowires that connect to *input and output* routers only. The ’775 Patent went “against this received wisdom” and claimed two pseudowires that connect to the same interfaces of *input and intermediate* routers instead. Mitzenmacher Dec. ¶¶68-69.

In Wainner, the only pseudowire that connects an interface of the input router (PE1) and an interface of the intermediate router (PE5) is pseudowire segment PW22. EX1030 at [0023] (“PW 22 is signaled between an origination PE (O-PE) (PE1) and an S-PE (PE5)”). Therefore, the first link includes only PW22. Because there is only one pseudowire that connects an interface of the input router (PE1) and an interface of the intermediate router (PE5), the link between PE1 and PE5 includes only one pseudowire. That first link between PE1 and PE5 is not shared by two pseudowires as required by the claims of the ’775 Patent. Mitzenmacher Dec. ¶99.

This is further confirmed by Wainner’s teaching that “Environment 30 includes a PW 22 between a first origination PE (O-PE) (PE1) and an S-PE (PE5) where the content is sourced at the O-PE. The S-PE understands through the PW control plane that it [is] receiving the tail-end of the PW[22].” EX1030 at [0025]. In other words, intermediate router PE5 can only “see” one pseudowire connecting to

its input interface, namely, the tail-end of PW22. Intermediate router PE5 cannot “see” MSPW22-24 or MSPW22-28, because they are point-to-point multi-segment pseudowires that only connect to input and output routers and do not connect to any interface on intermediate router PE5. This is in sharp contrast to ’775 Patent Figure 5 in which the intermediate router can “see” two pseudowires connecting to its interface if1. Mitzenmacher Dec. ¶¶ 77, 100.

Petitioner’s proposed combination of Wainner and Bocci is precisely the prior art “one link, one pseudowire” configuration discussed above. In this configuration, the first link cannot be shared by multi-segment pseudowires because multi-segment pseudowires cannot connect to interfaces on intermediate S-PE routers such as PE5, and may only connect to interfaces on T-PE routers at the network edge. Because the claimed “first link” is “between an input router ... and an intermediate router,” and because multi-segment pseudowires cannot connect to any interface of an intermediate router, multi-segment pseudowires cannot share the claimed first link in this “one link, one pseudowire” configuration of the Wainner-Bocci combination. Mitzenmacher Dec. ¶ 101.

B. Ground 2: Kamite and Bocci

Petitioner points to two separate embodiments of Kamite, shown in Figures 3 and 10. Petitioner annotates Figure 10 as follows:

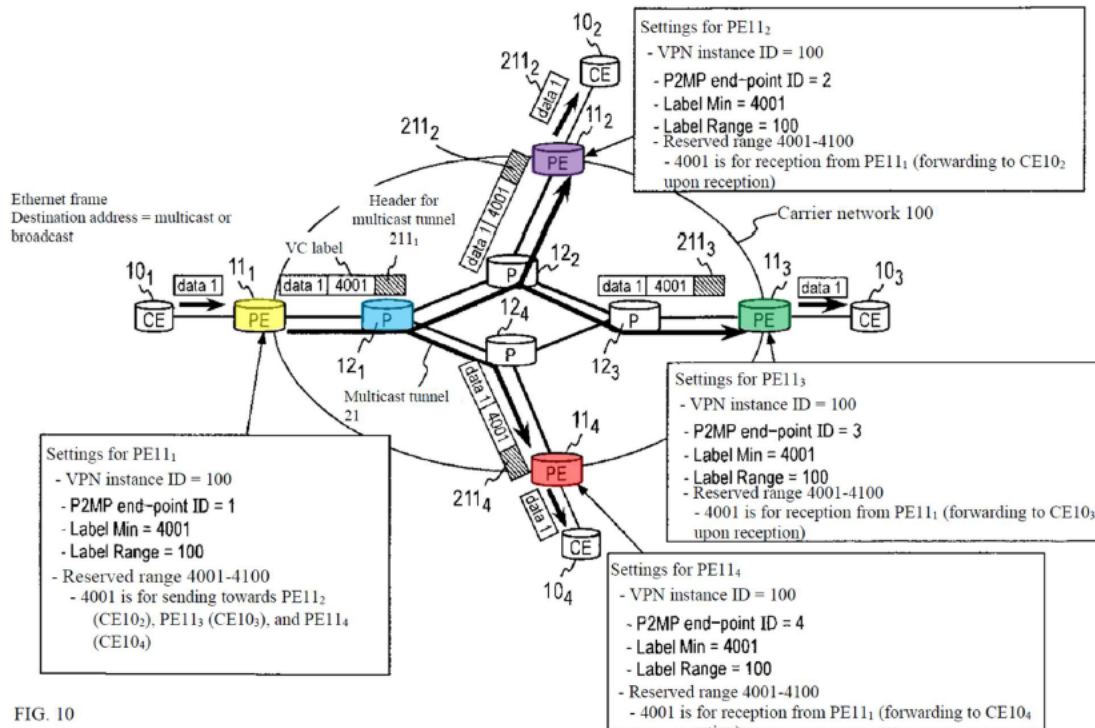


FIG. 10

The Board's Decision explained that Petitioner relies "on Kamite's connections between PE11₁ and P12₁ and between P12₁ and PE11₂, as separate PW segments put together, forming a 'first pseudo-wire,' ... wherein Bocci explains how to 'concatenate PW segments' to form a 'multi-segment PW.'" Decision at 39 (citing Pet. at 71-72). Petitioner also argues that "Kamite's second pseudo-wire comprises the first link from input router PE11₁ (yellow) to intermediate router P12₁ (blue) and a third link from the intermediate router P12₁ (blue) to the second output router PE11₄ (red) ... wherein Kamite in combination with Bocci teach 'combining Kamite's segments into a multi-segment pseudo-wire that spans from the input router PE11₁ to the output router PE11₄.'" Decision at 41 (citing Pet. at 76); Mitzenmacher Dec. ¶ 103.

To simplify this discussion, Monarch and its expert have assumed (without agreeing) that Kamite and Bocci teach setting up pseudowire segments and multi-segment pseudowires in the manner described in the preceding paragraph. Mitzenmacher Dec. ¶ 104.

The Board further noted that “Kamite discloses setting up its pseudo-wires according to a TLV that contains an Interface Parameter ‘used in conventional point-to-point pseudo wire specification,’ and a POSITA would understand the Interface Parameter ‘specifies how the pseudo-wire connects to a particular interface.’” Decision at 39 (citing Pet. at 69).

In Petitioner’s view, the link between PE11₁ (the input router) and P12₁ (the intermediate router) includes one pseudowire segment. Decision at 41 (citing Pet. at 76). This is confirmed by the fact that Figure 10 shows a single line going between PE11₁ and P12₁. This pseudowire segment would include an “Interface Parameter” as taught by Kamite, that would specify which interface of the intermediate router P12₁ that pseudowire segment connects to. This pseudowire segment is the only pseudowire that connects an interface on PE11₁ and an interface on P12₁. Therefore, the link between PE11₁ and P12₁ is not shared because it includes only one pseudowire. Mitzenmacher Dec. ¶ 106.

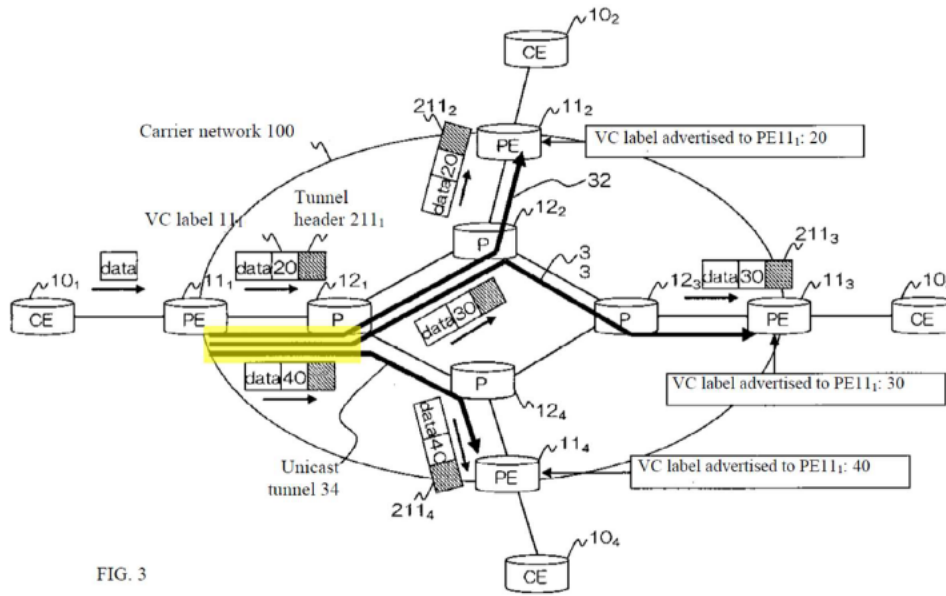
This is the familiar “one link, one pseudowire” configuration discussed above. Introducing multi-segment pseudowires into this configuration does not result in the

claimed “first link” being shared, because Bocci makes clear that multi-segment pseudowires can *only* connect to interfaces on T-PE routers and cannot connect to interfaces on S-PE routers such as P12₁. EX1031 at 6 (a multi-segment pseudowire must “behave and function as a single *point-to-point* PW” and “[e]ach end of a MS-PW by definition *MUST terminate on a T-PE*”) (emphasis added); Mitzenmacher Dec. ¶ 107.

Specifically, a multi-segment pseudowire that spans from input router PE11₁ to output router PE11₂ cannot share the “first link” with a multi-segment pseudowire that spans from input router PE11₁ to output router PE11₄. The claimed “first link” is a connection between an interface of the input router (PE11₁) and an interface of the intermediate router (P12₁). Neither multi-segment pseudowire is permitted to connect to an interface on the intermediate router P12₁ because it is an S-PE, not a T-PE at the edge of the network. Mitzenmacher Dec. ¶ 108.

As discussed above, only pseudowire segments are permitted to connect to S-PE routers such as P12₁. In this case, only one pseudowire segment connects an interface of PE11₁ and an interface of P12₁, and therefore the “first link” between PE11₁ and P12₁ is not shared by two pseudowires. Mitzenmacher Dec. ¶ 109.

Petitioner attempts to cure this by pointing to a different embodiment of Kamite, Figure 3:



Petitioner argues that in Figure 3, “three-pseudo wires (highlighted in yellow) traverse a single link between PE11₁ and P12₁.” Decision at 41 (citing Pet. at 77).

Petitioner’s characterization of Figure 3 is incorrect. Kamite states that Figure 3 uses “conventional pseudo wire technology” in which “there are three instances of traffic between PE11₁ and P12₁.” EX1041 at 6. The three pseudowire segments in Figure 3 do not share a “first link”—they are conventional pseudowires like those in ’775 Patent Figure 2 that use three separate links for three separate instances of traffic. Mitzenmacher Dec. ¶ 112.

This is underscored by Kamite’s teaching that it assigns each pseudowire an “Interface Parameter.” EX1041 at 8. Kamite does not teach that pseudowires can share the same interfaces or the same Interface Parameters. Rather, a POSITA at the time would have understood a pseudowire as an “unshared link” (EX1010 at 3) and would have assigned each of the three highlighted pseudowire segments to a separate

interface, *i.e.* each pseudowire would be assigned different links between PE11₁ and P12₁. This is the conventional prior art approach illustrated in '775 Patent Figure 2 and discussed in the prior art “two links, two pseudowires” configuration above. Mitzenmacher Dec. ¶ 113.

Because there is no teaching in Kamite that the three highlighted pseudowire segments in Figure 3 can share the same interfaces, there is no teaching that they can share the same link. Figure 3 therefore does not disclose “said first link being shared by the first and second pseudowires.” Each of the three highlighted pseudowires originates and terminates on a different interface, resulting in a “three links, three pseudowires” configuration. Mitzenmacher Dec. ¶ 114.

The Board’s Decision appears to agree that the three highlighted pseudowire segments do not share links, but the Board instead found a different argument persuasive: “although Patent Owner contends that Kamite ‘does not teach that pseudo[-]wires can share the same interfaces’ (Prelim. Resp. 35), we instead find availing Petitioner’s contention that Kamite’s *multi-segment pseudo-wires* share the link between input router PE11₁ and intermediate router P12₁.” Decision at 45 (emphasis added); Mitzenmacher Dec. ¶ 115.

This is incorrect. As discussed above, multi-segment pseudowires cannot connect to interfaces on S-PE routers such as P12₁. Therefore, two multi-segment pseudowires cannot share a “connection between an interface of an input router

PE11₁ and an interface of an intermediate router P12₁.” The ’775 Patent recognizes this shortcoming of multi-segment pseudowires and says the invention goes “against the received wisdom” of this approach. EX1001 at 3:9-18; Mitzenmacher Dec. ¶ 116.

Only pseudowire segments are permitted to connect to interfaces of P12₁, but since all three highlighted pseudowire segments shown in Figure 3 use separate links, those three pseudowire segments use different interfaces and do not share the claimed “first link” either. Mitzenmacher Dec. ¶ 117.

Kamite (alone or in combination with Bocci) never discloses two or more pseudowires that share the same “connection between an interface of an input router PE11₁ and an interface of an intermediate router P12₁.” Mitzenmacher Dec. ¶ 118.

VII. Conclusion

Monarch respectfully requests that the Board affirm the validity of the claims if the ’775 Patent for the reasons stated herein.

Dated: November 5, 2024

Respectfully submitted,

By: / R. Allan Bullwinkel /
R. Allan Bullwinkel (Reg. No. 77,630)
Attorney for Patent Owner
Monarch Networking Solutions LLC

CERTIFICATE OF SERVICE

The undersigned certifies that pursuant to 37 C.F.R. § 42.6(e), a copy of the foregoing was served via email to lead and backup counsel of record for Petitioners as follows:

Lead Counsel for Petitioner
Todd M. Briggs (Reg. No. 44,040) Quinn Emanuel Urquhart & Sullivan, LLP 555 Twin Dolphin Drive, 5th Floor Redwood Shores, CA 94065 toddbriggs@quinnemanuel.com (650) 801-5000
Back-Up Counsel for Petitioner
James M. Glass (Reg. No. 46,729) Quinn Emanuel Urquhart & Sullivan, LLP 51 Madison Ave., 22nd Floor New York, New York 10010 jimglass@quinnemanuel.com (212) 847-7000
Nima Hefazi (Reg. No. 63,658) Quinn Emanuel Urquhart & Sullivan, LLP 865 S. Figueroa St., 10th Floor Los Angeles, California 90017 nimahefazi@quinnemanuel.com (213) 624-7707
Kevin Johnson (Reg. No. 38,927) Quinn Emanuel Urquhart & Sullivan, LLP 555 Twin Dolphin Drive, 5th Floor Redwood Shores, CA 94065 kevinjohnson@quinnemanuel.com (650) 801-5000

Dated: November 5, 2024

Respectfully submitted,

By: / R. Allan Bullwinkel /
R. Allan Bullwinkel (Reg. No. 77,630)
Attorney for Patent Owner
Monarch Networking Solutions LLC

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that this brief complies with the type-volume limitation of 37 C.F.R. § 42.24 because this brief contains 9,416 words.

Dated: November 5, 2024

Respectfully submitted,

By: /R. Allan Bullwinkel/
R. Allan Bullwinkel (Reg. No. 77,630)
Attorney for Patent Owner
Monarch Networking Solutions LLC