

***Juniper Networks, Inc. v.
Monarch Networking Solutions LLC***

**IPR2024-00561
U.S. Patent No. 8,130,775**

Hearing: May 12, 2025

Summary: Grounds

Grounds	Claims Challenged
1. Wainner + Bocci	1, 6
2. Kamite + Bocci	1, 6

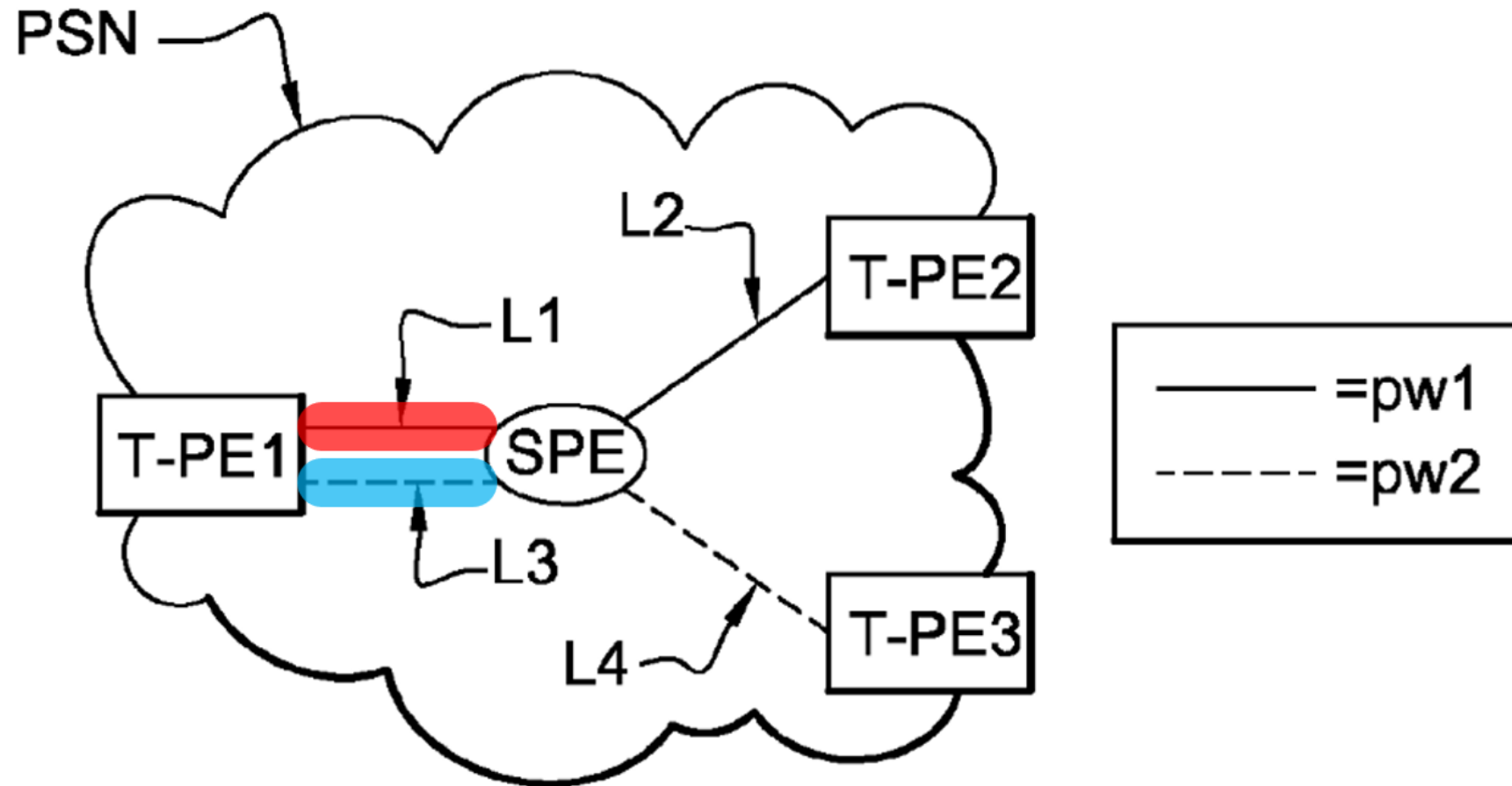
Summary: Disputed Points

Ground	Disputed Points	Claims
All	Patent Owner provides an incorrect explanation of “said first link being shared by the first and second pseudo-wires” that wrongly implies that the two pseudo-wires in the first link are independent and unrelated.	1, 6
1	Patent Owner advances a non-sensical argument that multi-segment pseudo-wires cannot connect to an interface of an intermediate router. Patent Owner’s argument contradicts the ’775 patent itself, which shows a multi-segment pseudo-wire connecting to the interface of an intermediate router.	1, 6
2	Patent Owner makes the same argument regarding intermediate routers here. In addition to the ’775 patent contradicting Patent Owner’s argument, Kamite’s Figure 3 further teaches Patent Owner’s incorrect interpretation of the patent.	1, 6

'775 Patent Overview

'775 Patent: Overview

- '775 Patent: prior art pseudo-wires were independent and unrelated



Ex. 1001 ('775 Patent) at Figure 2(AA) (highlighting added); see *also* Petition 12.

'775 Patent: Overview

- '775 Patent: prior art pseudo-wires inefficiently occupied bandwidth

“In the prior art, the back-up pseudo-wire, although used only to broadcast data in the event of a fault affecting the main pseudo-wire, reserves resources used to set it up **over the whole of the network** between the input router and the output router.”

Ex. 1001 ('775 Patent) at 3:20-24; see also Reply 10.

'775 Patent: Overview

- '775 Patent: prior art pseudo-wires were slow to detect faults

“A fault affecting the first output router T-PE2 is detected in the input router T-PE1, for example from a message indicating the occurrence of a fault sent via the public switched network PSN to the input router T-PE1. **Once informed of the fault, *the input router T-PE1* triggers switching of the data stream** from the first pseudo-wire pw1 to the second pseudo-wire pw2, thus routing the data to the output router T-PE3.

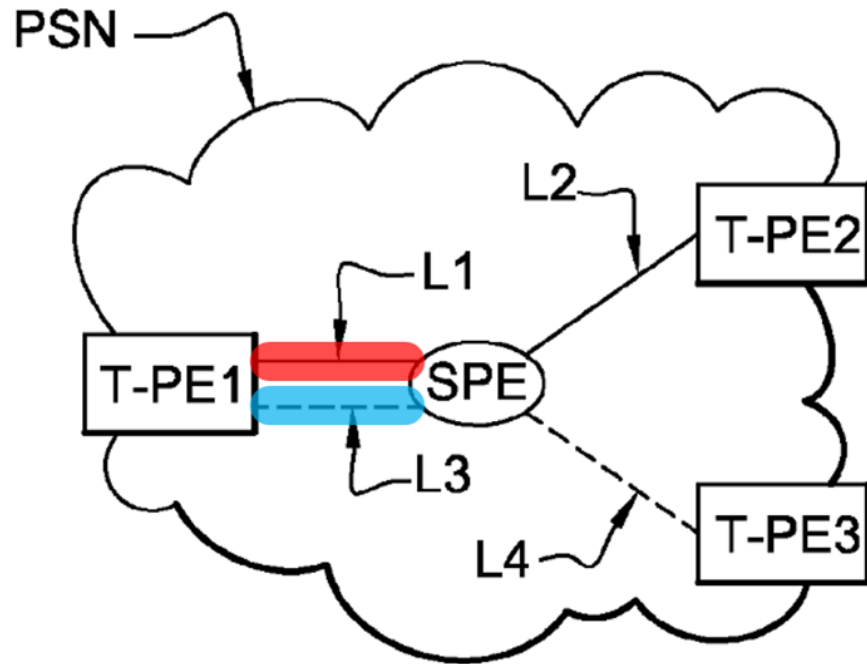
However, this kind of solution has the drawback of *consuming network resources*, for example processing resources in the network equipments (storage capacity, computation capacity, etc.), signaling streams for setting-up two pseudo-wires, and bandwidth, especially between the input router and the intermediate router. This increases the restore time in the event of a fault affecting an output router, with a negative impact on quality of service.”

Ex. 1001 ('775 Patent) at 2:28-47; see also Reply 12.

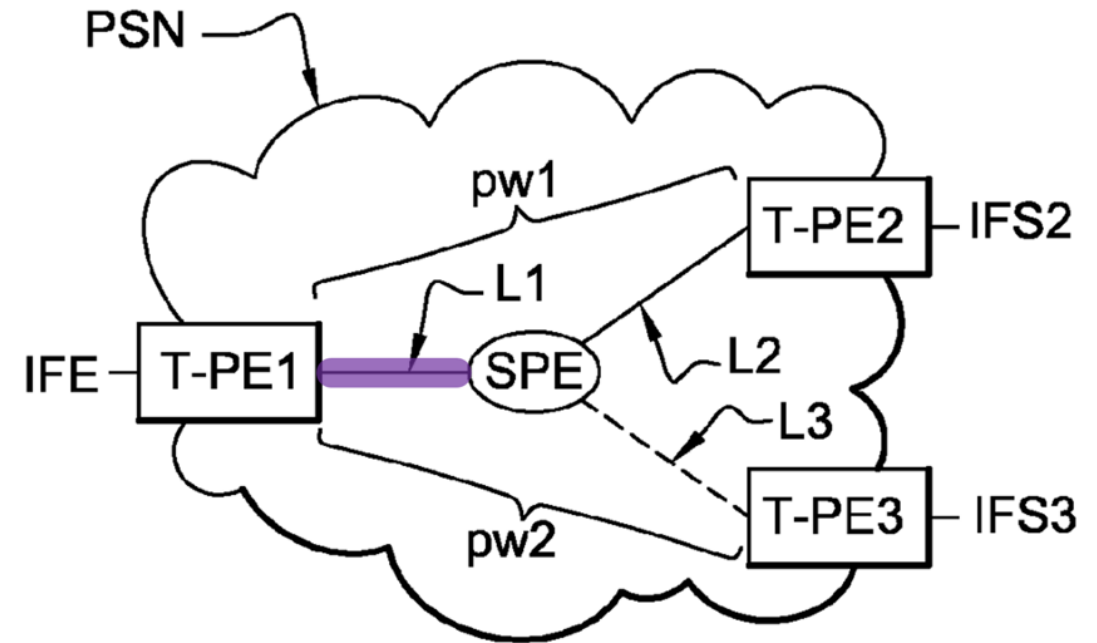
'775 Patent: Overview

- The '775 patent merely discloses sharing the first link:

Admitted Prior Art (Fig. 2(AA))



'775 "Invention" (Fig. 3)



Ex. 1001 ('775 Patent) at Figures 2(AA) and 3 (highlighting added); see also Petition 16.

'775 Patent: Overview

- '775 Patent: sharing a link uses bandwidth more efficiently

“In the prior art, the back-up pseudo-wire, although used only to broadcast data in the event of a fault affecting the main pseudo-wire, reserves resources used to set it up over the whole of the network between the input router and the output router. 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*.”

Ex. 1001 ('775 Patent) at 3:20-29; see also Reply 10-11.

'775 Patent: Overview

- '775 Patent: sharing the first link allows the system to detect faults more quickly

“Providing in the intermediate router a function for detecting a fault affecting the first output router and a function for switching the data stream improves the restore time on detection of a fault affecting the first output router.

This improves the responsiveness of the network because ***detection occurs as close as possible to the fault***. Accordingly, a fault affecting the first output router is detected more quickly, as the information does not have to cross the network as far as the input router before being processed. The function for switching the data stream also being a function of the intermediate router, switching the data stream to the third link, set up between the intermediate router and the second output router and with the first link constituting the back-up pseudo-wire, occurs faster because it is triggered on detection of the fault by the intermediate router.”

Ex. 1001 ('775 Patent) at 4:55-60; see also Reply 12.

'775 Patent: Overview

- Patent Owner: the “innovation” of the '775 patent is that it moves away from point-to-point pseudo-wires toward a point-to-multipoint configuration

“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.”

Patent Owner Response 41-42;
see also Patent Owner Response 31-32, 49 (repeating this point again).

'775 Patent: Overview

- The purported invention of the '775 patent is described in just 12 words in the claims:

The invention claimed is:

1. A method of setting up at least two pseudo-wires able to broadcast a data stream, comprising:

setting up a first pseudo-wire comprising a first link set up between an input router of a packet-switched network and an intermediate router of the packet-switched network and a second link set up between said intermediate router and a first output router of the packet-switched network; and

setting up a second pseudo-wire between said input router and a second output router of the packet-switched network, wherein the second pseudo-wire comprises said first link and a third link set up between said intermediate router and said second output router, said first link being shared by the first and second pseudo-wires.

Ex. 1001 ('775 Patent) at Claim 1.

Summary of Prior Art

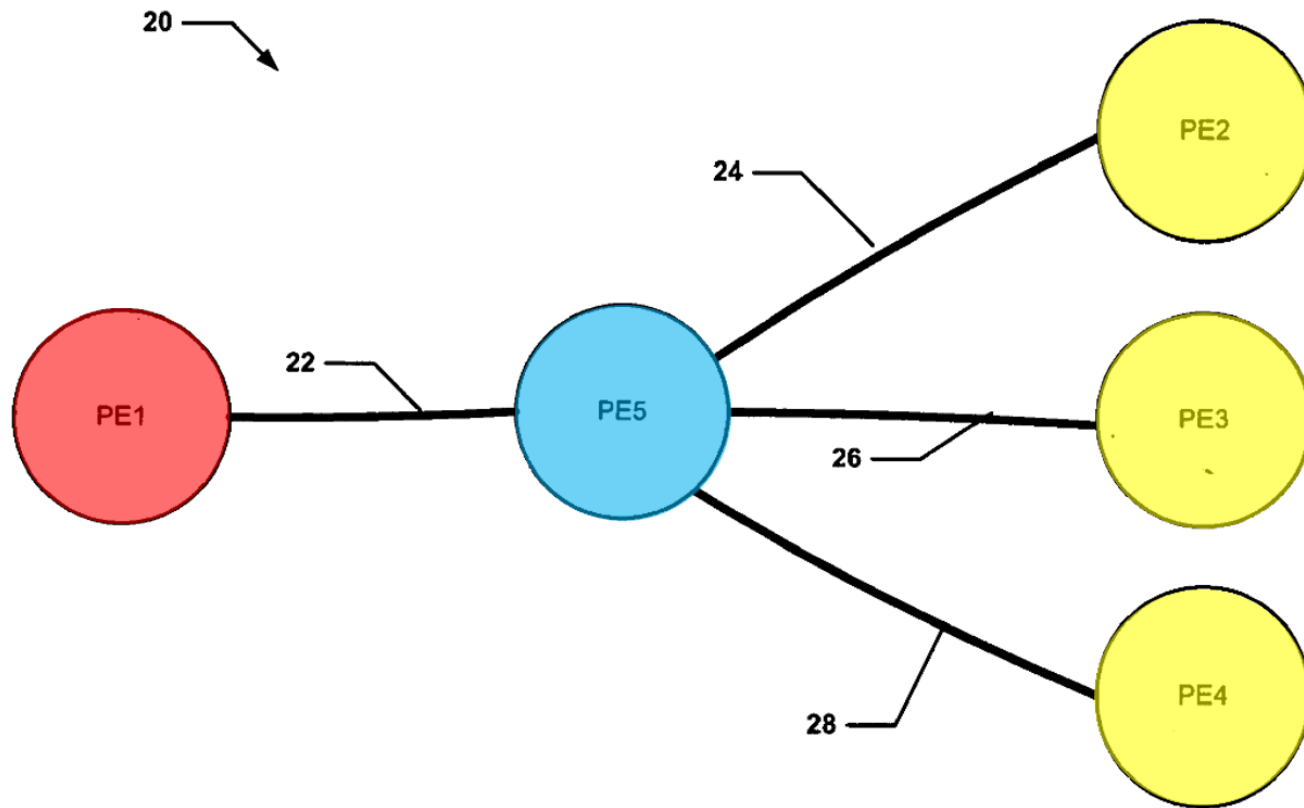
- Wainner similarly recognizes that prior-art pseudo-wires transport data inefficiently:

“Historically, the SP has either provided basic transport for multicast data where the subscriber is responsible for the replication or the SP provides multicast services where replication is done on behalf of the subscriber. **The former model is very inefficient**, as the subscriber must replicate the data onto each transport instance built in the SP; nevertheless, the architecture is simple for the provider to support.”

Ex. 1030 (Wainner) ¶1; see also Petition 20.

Wainner: Overview

- Wainner teaches overcoming these inefficiencies by sharing initial links:



Ex. 1030 (Wainner) at Figure 2; see *also* Petition 21.

“Embodiments of the invention significantly overcome such deficiencies and provide mechanisms and techniques that provide a method and apparatus for point-to-multipoint distribution using pseudowires. The presently defined architecture decouples the transport plane from the service plane enabling a more scalable operational model. It also provides an optimized distribution tree for P2MP flows that are typical of broadcast video. The transport provider has explicit control over the merge and replication points in the network.

Ex. 1030 (Wainner) ¶15; see *also* Petition 20.

- Wainner teaches that the pseudo-wires connect to a single interface of each router:

“Wainner explains that its routers are network devices that contain a ‘**communications interface**’ that ‘allows the network device 240 to communicate with external devices or systems.’ EX1030, ¶34. Further, Wainner explains that pseudo-wire 22 has ‘a head-end coupled to’ the originating provider edge router ‘and a tail end coupled to’ the switching provider edge router. *Id.*, ¶6. A POSITA would have known that this ‘coupling’ occurs at each router’s communications interface, thereby ‘allow[ing] the network device[s] to communicate with external devices or systems.’ *Id.*, ¶34; EX1040, ¶83.”

Petition 39.

Wainner: Overview

- Wainner:

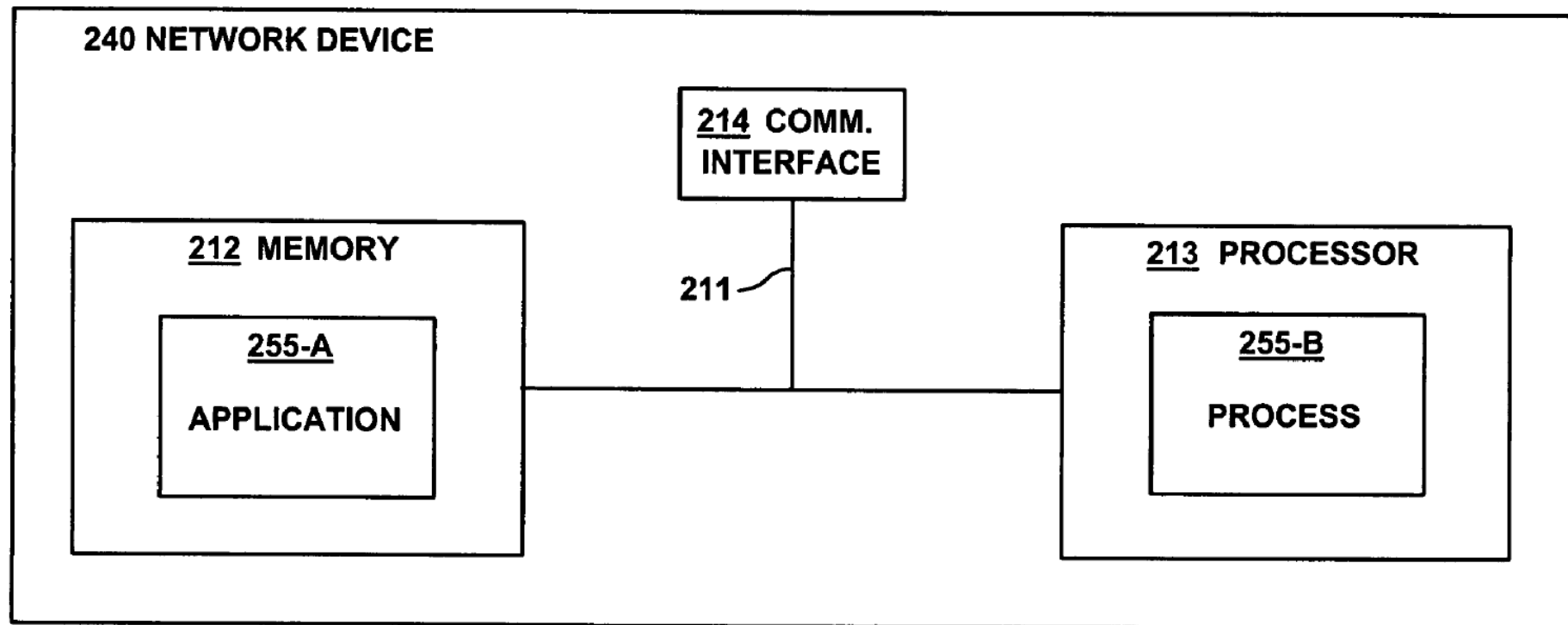


Figure 7

- Just like the '775 patent, Wainner teaches that sharing this link conserves bandwidth:

“By way of the present environment 20, the transport provider is able to specify the location of SPE(s) branchpoints in order to **conserve bandwidth and provide optimal utilization of the system**, especially in multicast type applications such as broadcast video.”

Ex. 1030 (Wainner) ¶24; see also Petition 22.

Wainner: Overview

- Just like the '775 patent, Wainner teaches deviating from a point-to-point configuration toward a point-to-multipoint configuration:

“Referring now to FIG. 2, with the introduction of Layer 2 Virtual Private Networks (L2VPNs) a provider may use a PW as a means of transporting multicast data. To avoid the scalability problem at the head-end, an architecture that uses multi-hop/multi-point pseudowires is utilized. **This deviates from previous L2VPN concepts that define a *point-to-point PW*.** This model statically binds an upstream PW to one or more downstream PW.”

Ex. 1030 (Wainner) ¶20; see also Petition 22; Reply 19, 22-23.

“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.

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”

Ex. 1001 ('775 Patent) at 3:9-18.

- Kamite also recognizes that prior-art pseudo-wires were inefficient:

“Thus, as shown in FIG. 3, PE11₁ establishes separate unicast tunnels with PE11₂, PE11₃, and PE11₄, copies the data that was sent from CE10₁, and transmits that data after assigning the advertised VC label for each downstream PE. In this way, even though the actual data to be transmitted (the data that was sent from CE10₁) is the same, ***there are three instances of traffic*** between PE11₁ and P12₁.”

Ex. 1041 (Kamite) at 6; see also Petition 55.

Kamite Figure 3: Overview

- Kamite's Figure 3 show three pseudo-wires passing through a first link:

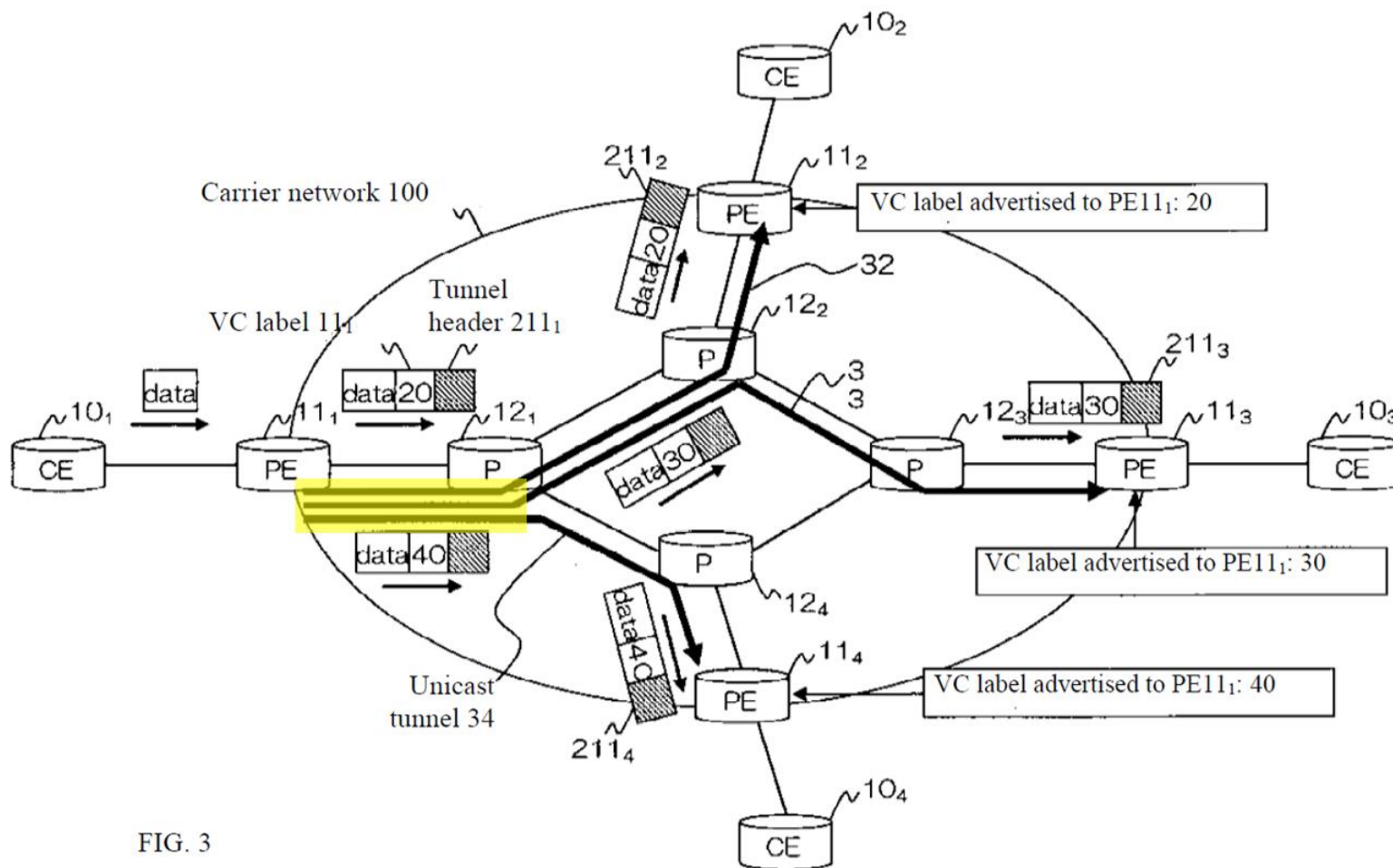


FIG. 3

Ex. 1041 (Kamite) at Figure 3 (highlighting added); see also Petition 77.

Kamite Figure 10: Overview

- Kamite teaches combining the initial link of these three pseudo-wires into one link:

“Thus, as shown in FIG. 3, PE11₁ establishes separate unicast tunnels with PE11₂, PE11₃, and PE11₄, copies the data that was sent from CE10₁, and transmits that data after assigning the advertised VC label for each downstream PE. In this way, even though the actual data to be transmitted (the data that was sent from CE10₁) is the same, there are three instances of traffic between PE11₁ and P12₁. In other words, **if a multicast tunnel could be utilized using a common VC label for the downstream PEs, the traffic between PE11₁ and PE12₁ could be reduced to 1/3 of the conventional volume.**”

Ex. 1041 (Kamite) at 6; see also Petition 55.

Kamite Figure 10: Overview

- Kamite's Figure 10 shows sharing the first link among three pseudo-wires:

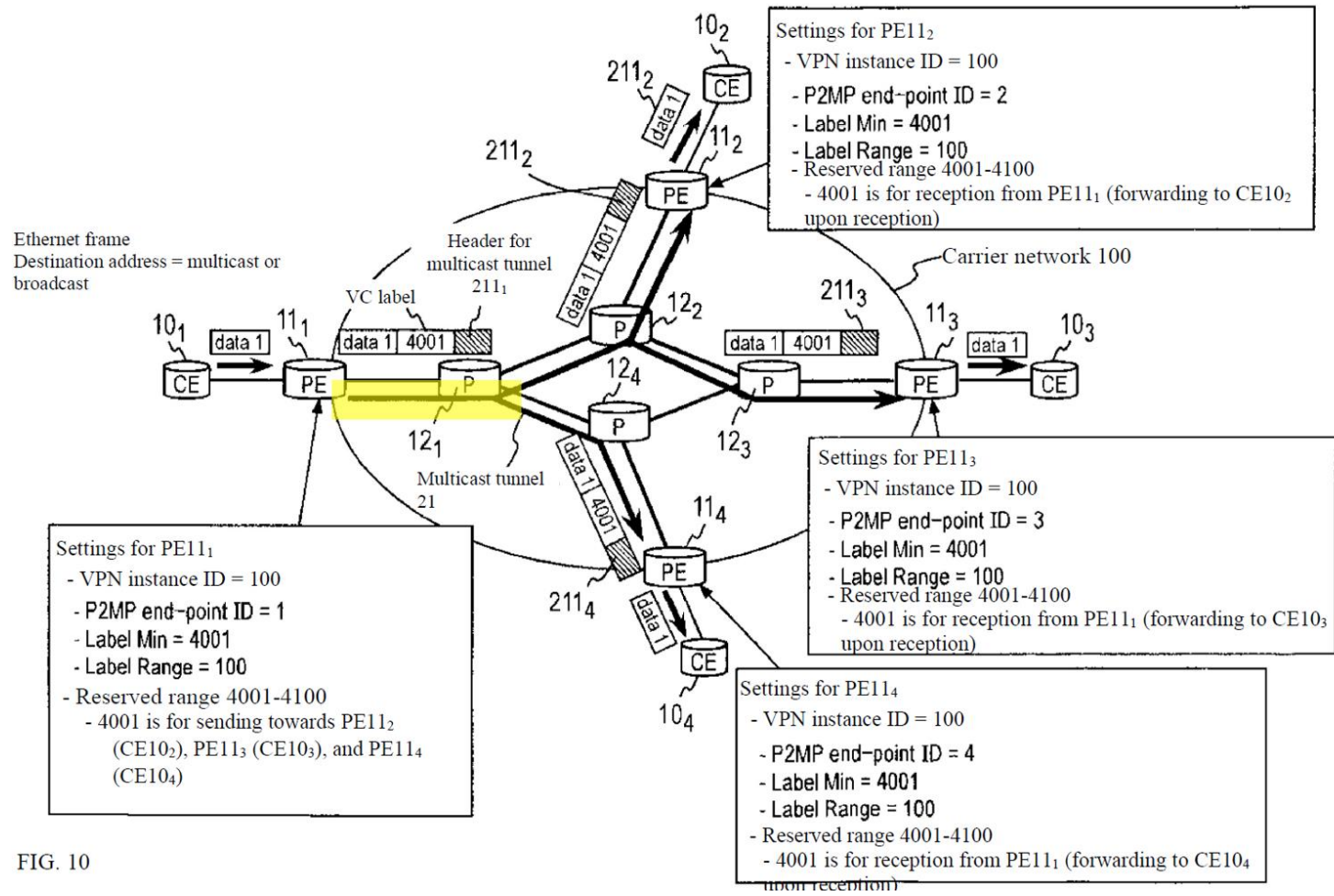


FIG. 10

Ex. 1041 (Kamite) at Figure 10 (highlighting added); see also Petition 77.

Kamite: Overview

- Just like the '775 patent, Kamite teaches deviating from a point-to-point configuration toward a point-to-multipoint configuration:

“In other words, if a **multicast** tunnel could be utilized using a common VC label for the downstream PEs, the traffic between PE111 and PE121 could be reduced to 1/3 of the **conventional** volume.”

Ex. 1041 (Kamite) at 6.

“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.

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”

Ex. 1001 ('775 Patent) at 3:9-18.

- If needed, Bocci also teaches combining pseudo-wire segments:

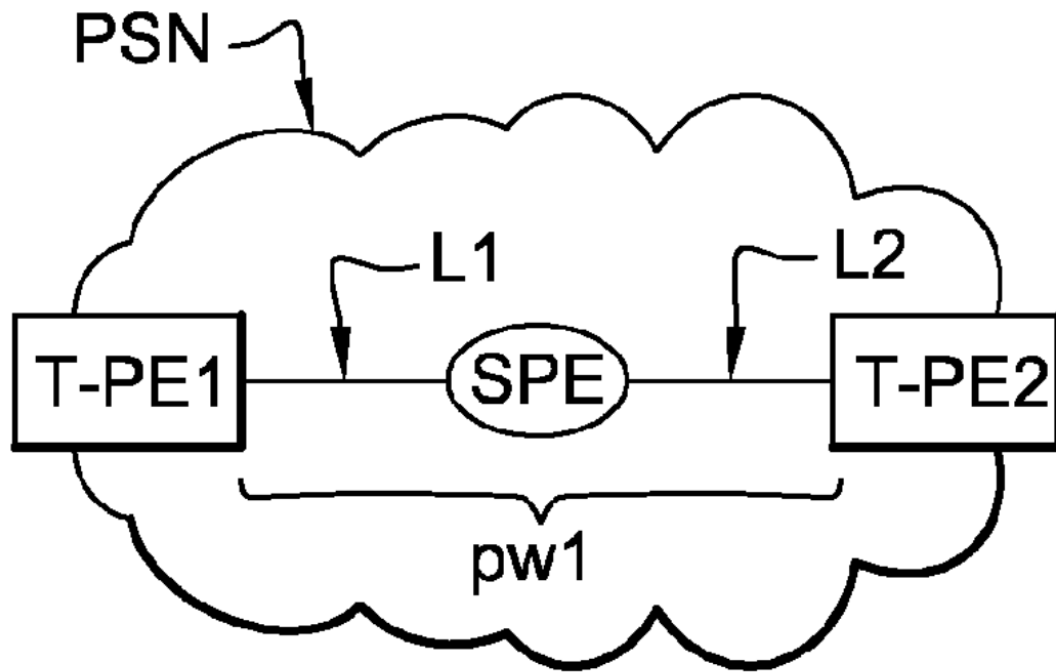
“Multi-Segment Pseudo Wire (MS-PW). A static or dynamically configured set of ***two or more contiguous PW segments that behave and function as a single point-to-point PW***. Each end of a MS-PW by definition MUST terminate on a T-PE. . . .

A MS-PW is a single PW that for technical or administrative reasons is segmented into a number of concatenated hops. From the perspective of a T-PE, a MS-PW is indistinguishable from a SS-PW.”

Ex. 1031 (Bocci) at 6-7; see also Petition 23.

Bocci: Overview

- The '775 patent acknowledges that Bocci is prior art:



“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. A first link L1 that is part of the pseudo-wire pw1 is set up between the first router T-PE1 and an intermediate router S-PE of the network PSN. A second link L2 that is also part of the pseudo-wire pw1 is set up between the intermediate router S-PE and the second router T-PE2. . . . 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).

Ex. 1001 ('775 Patent) at 1:53-2:2; see also Petition 23; Reply 21-22.

Bocci: Overview

- Bocci:

“1.3. Terminology

The terminology specified in RFC 3985 applies. In addition, we define the following terms:

- PW Terminating Provider Edge (T-PE). A PE where the customerfacing attachment circuits (ACs) are bound to a PW forwarder. A Terminating PE is present in the first and last segments of a MSPW. This incorporates the functionality of a PE as defined in RFC 3985.
- Single-Segment Pseudo Wire (SS-PW). A PW setup directly between two T-PE devices. Each PW in one direction of a SS-PW traverses one PSN tunnel that connects the two T-PEs.
- Multi-Segment Pseudo Wire (MS-PW). 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.
- 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.
- 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. A PW switching point runs necessary protocols to setup and manage PW segments with other PW switching points and terminating PEs.”

Bocci: Overview

- Bocci:

“2. Applicability A MS-PW is a single PW that for technical or administrative reasons is segmented into a number of concatenated hops. From the perspective of a T-PE, a MS-PW is indistinguishable from a SS-PW. Thus, the following are equivalent from the perspective of the T-PE

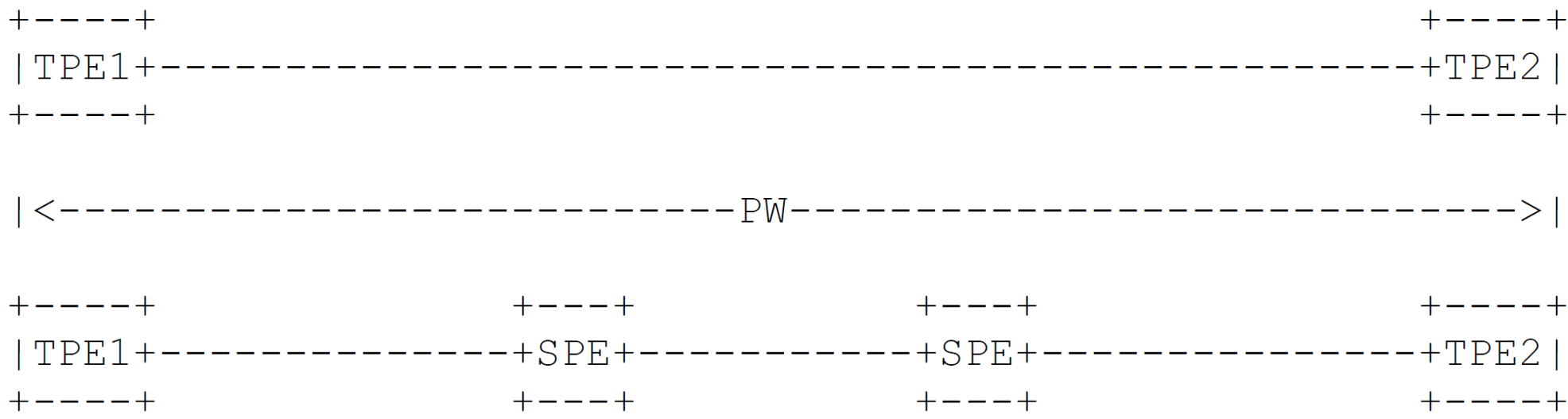


Figure 3 MS-PW Equivalence

Claim Construction and Level of Skill in the Art

Level of Skill in the Art: Undisputed

“A person of ordinary skill in the art (“POSITA”) in February 2007 would have had a Bachelor of Science degree in electrical engineering, computer engineering, computer science, or a related subject, and three years of work experience in computer networking or a related field. EX1040, ¶¶48-50. Lack of professional experience can be remedied by additional education, and vice versa. *Id.*”

Petition 19.

“For purposes of this proceeding, Patent Owner does not contest Petitioner’s recitation of the level of skill in the art”

Patent Owner Response 17.

Claim Construction: Link

- Stipulated meaning: “connection between an interface of a first router and an interface of a second router”

Reply 5; see also Petition 19-20; Patent Owner Response 18-19.

- Patent Owner Response and Sur-Reply added additional requirements:
 - Must be physical Patent Owner Response 19.
 - Cannot be a “path” Sur-Reply 9-10.

- Stipulated meaning: “a connection between the interface of an input router and the interface of an intermediate router”

Reply 6; see *also* Patent Owner Response 19.

Claim Construction: Pseudo-Wire

- Stipulated meaning: “an emulated connection that transmits data packets”

Reply 6; see also Patent Owner Response 19.

- Patent Owner Response added additional requirements:
 - Always point-to-point in the prior art Patent Owner Response 5-6, 31-32, 41-42.
 - Distinct from “links” Patent Owner Response 20.

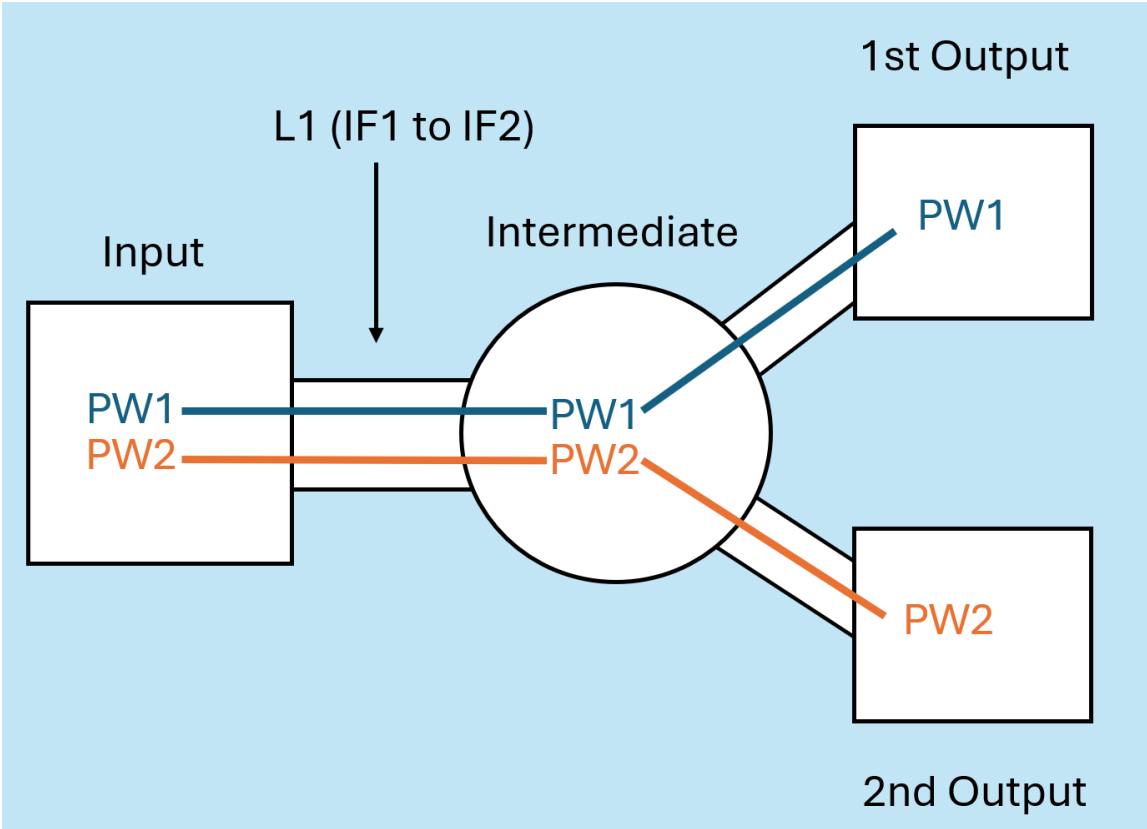
Claim Construction: “Said First Link Being Shared”

- Patent Owner Response ignores the ordinary meaning
 - Patent Owner requires intermediate router to “see” two incoming links
 - Patent Owner’s demonstrative depicts two pseudo-wires that do not share a first link

All Grounds: Claim Construction

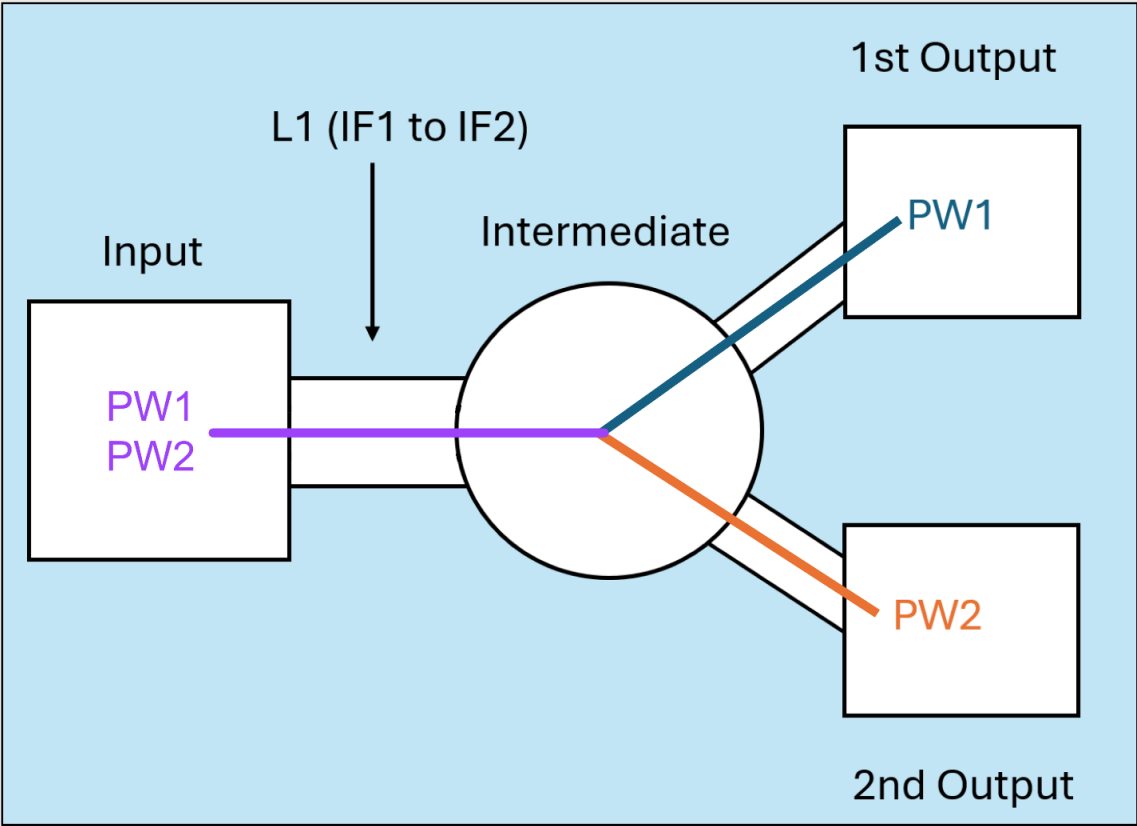
Claim Construction: Summary

- PO's demonstrative implies that the two pseudo-wires must be independent and unrelated by depicting two separate pseudo-wires in blue and orange:



Patent Owner Response 34.

- Incorrect:** More accurately, the claims disclose combining the first link of the two pseudo-wires into one:



Reply 16.

Patent Owner's Demonstrative Depicting the "Invention" Is Misleading

1

PW1 and PW2 appear to connect to different interfaces of the intermediate router

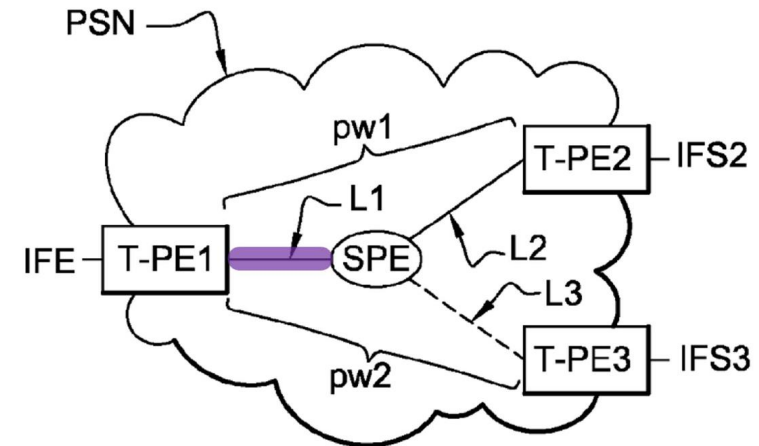
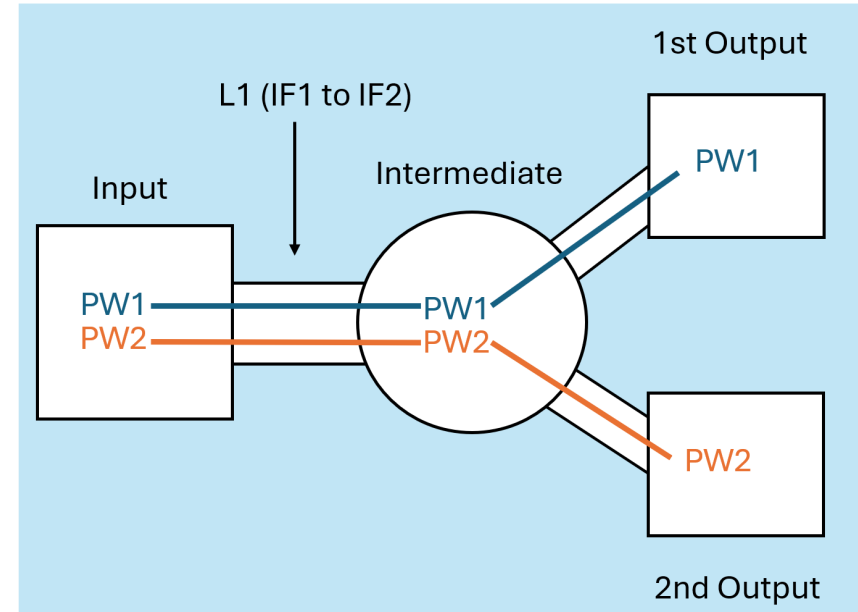
2

PW1 and PW2 both independently occupy bandwidth in L1

3

PW1 and PW2 never converge and therefore cannot share data

- Patent Owner's demonstrative differs significantly from the patent's depiction of the invention:



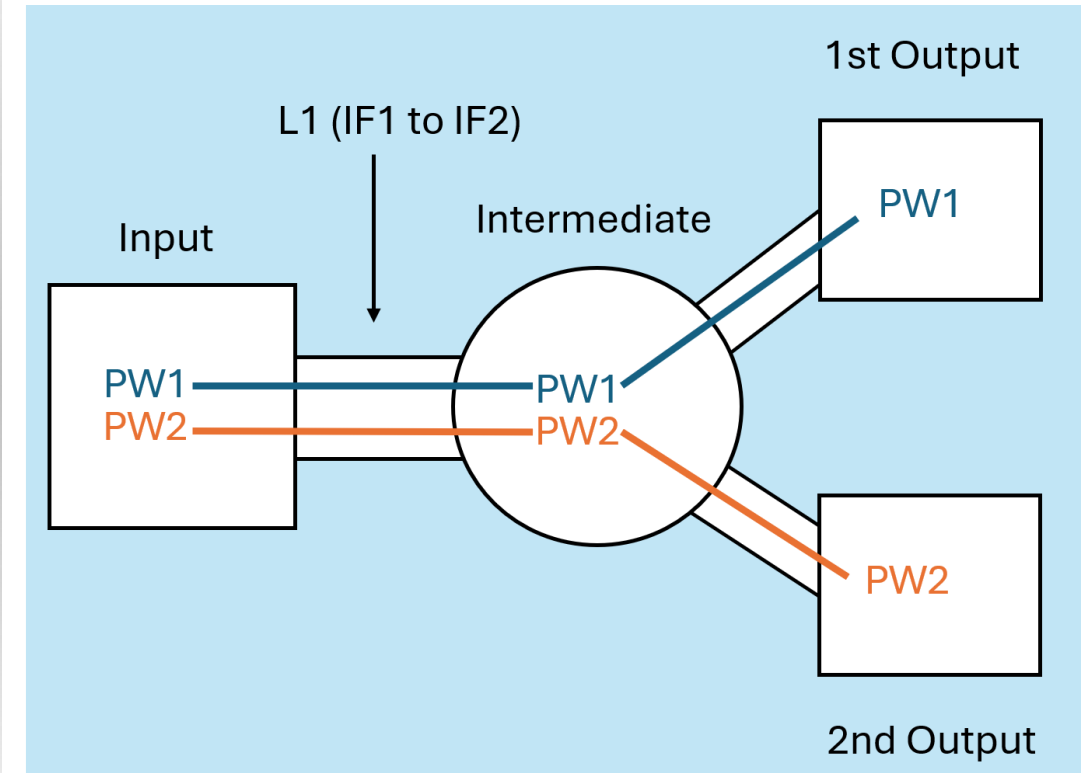
Patent Owner Depicts PW1 and PW2 as Independent and Unrelated

1

PW1 and PW2 appear to connect to different interfaces of the intermediate router

- PW1 and PW2 pass through the same physical connection (L1)
- But PW1 and PW2 appear to use two separate virtual connections (the blue and orange lines)

Reply 9-10.



Patent Owner Response 34.

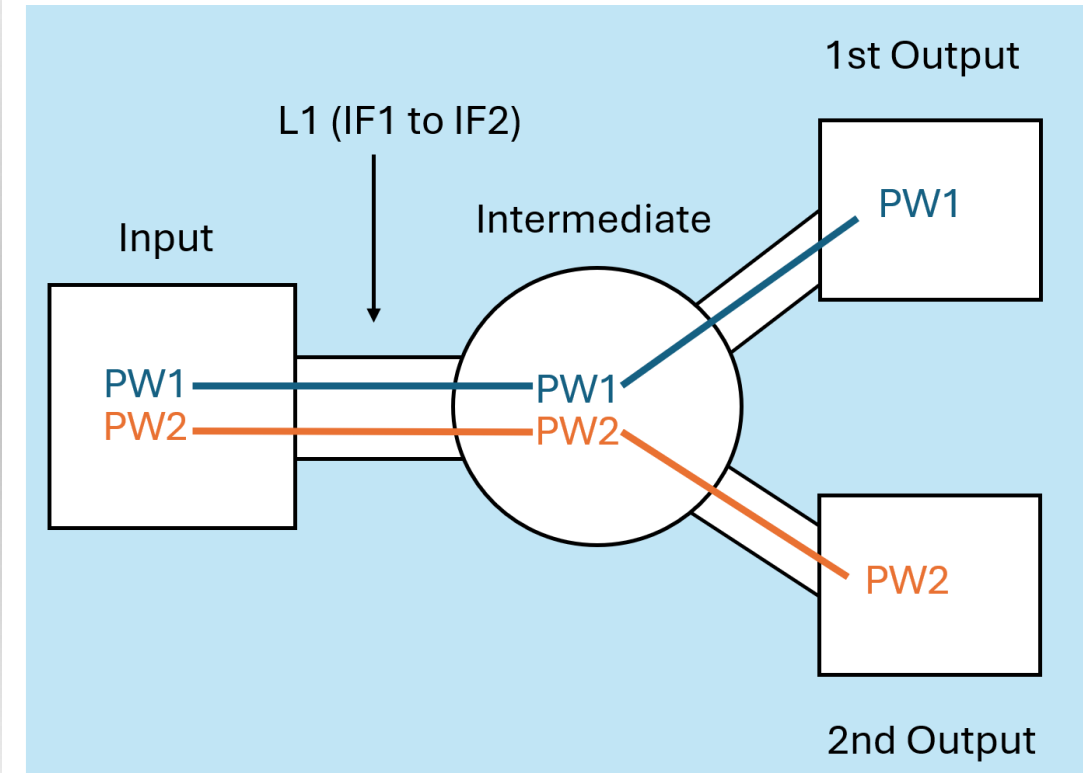
Patent Owner Discredited This Very Configuration in a Prior IPR

1

PW1 and PW2 appear to connect to different interfaces of the intermediate router

“Aggarwal does not disclose a ‘link’ as ‘a connection between an interface on a first router and an interface on a second router.’ Instead, Aggarwal defines ‘link’ differently: ‘The term ‘link’ is often used to refer to the connection between two devices on a network.’ Ex.1005 at 1:22-27. This definition does not include the concept of interfaces. Instead, under the Aggarwal definition, two links that use different interfaces but that share the same physical path (i.e. the same ‘connection between two devices on a network’) would be considered one link.”

Ex. 1027 (Monarch POPR in Cisco IPR) at 29; see also Reply 14.



Patent Owner Response 34.

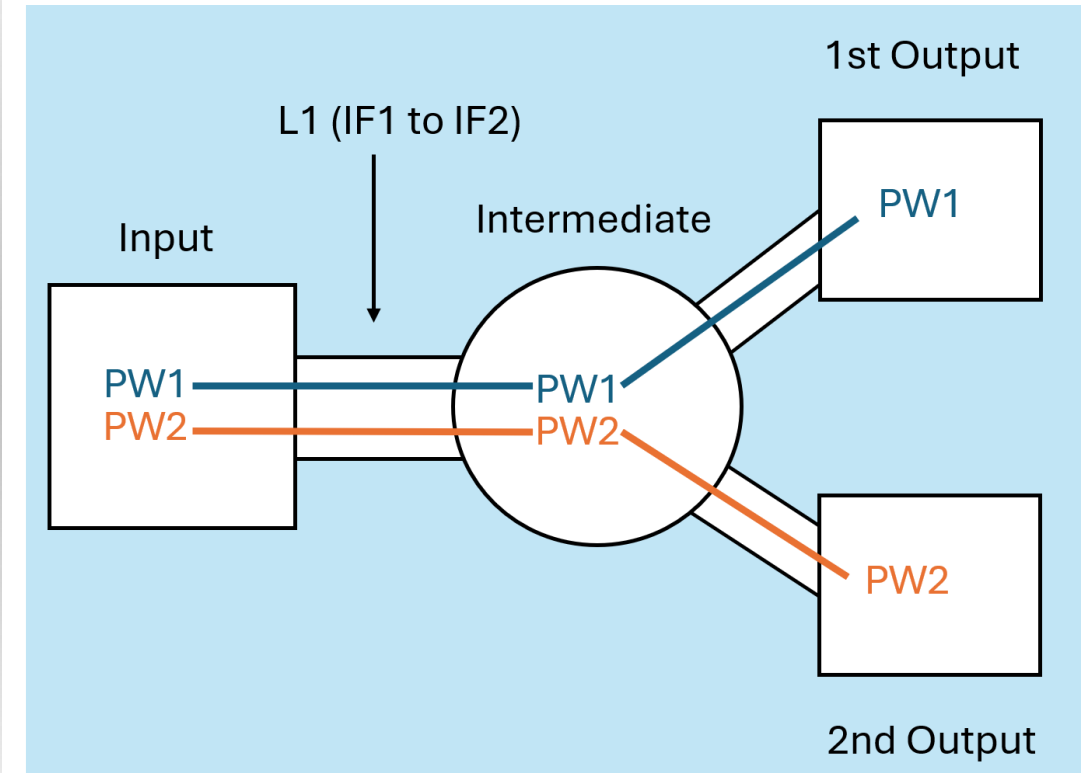
Patent Owner Depicts Both PW1 and PW2 as Occupying Bandwidth

2

PW1 and PW2 both independently occupy bandwidth in L1

- PW1 and PW2 occupy independent space in L1, suggesting that they both independently take up bandwidth within L1

Reply 11.



Patent Owner Response 34.

The '775 Patent Discredits This Configuration

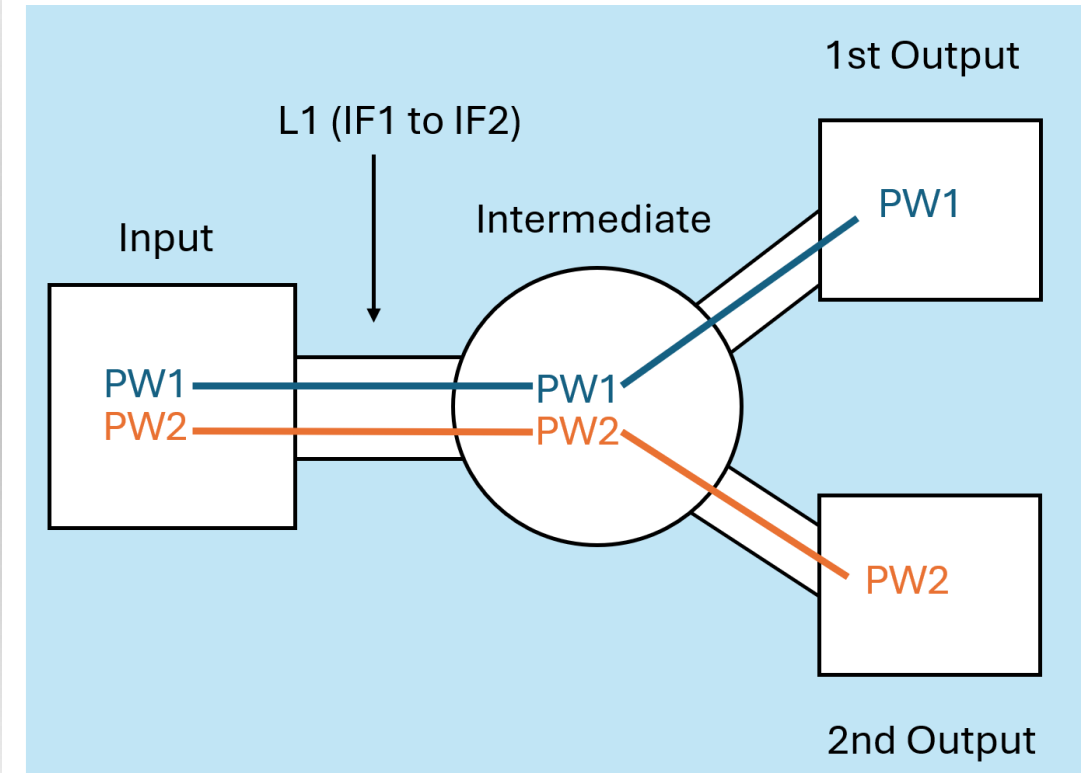
2

PW1 and PW2 both independently occupy bandwidth in L1

“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.”

“Accordingly, the link L10 and the link L11 are shared by the two pseudo-wires pw3 and pw4. **This optimizes use of network resources, *such as bandwidth***, between the input router T-PE1 and the second intermediate router S-PE4.”

Ex. 1001 ('775 Patent) at 3:20-29, 6:44-57; see also Reply 11-12.



Patent Owner Response 34.

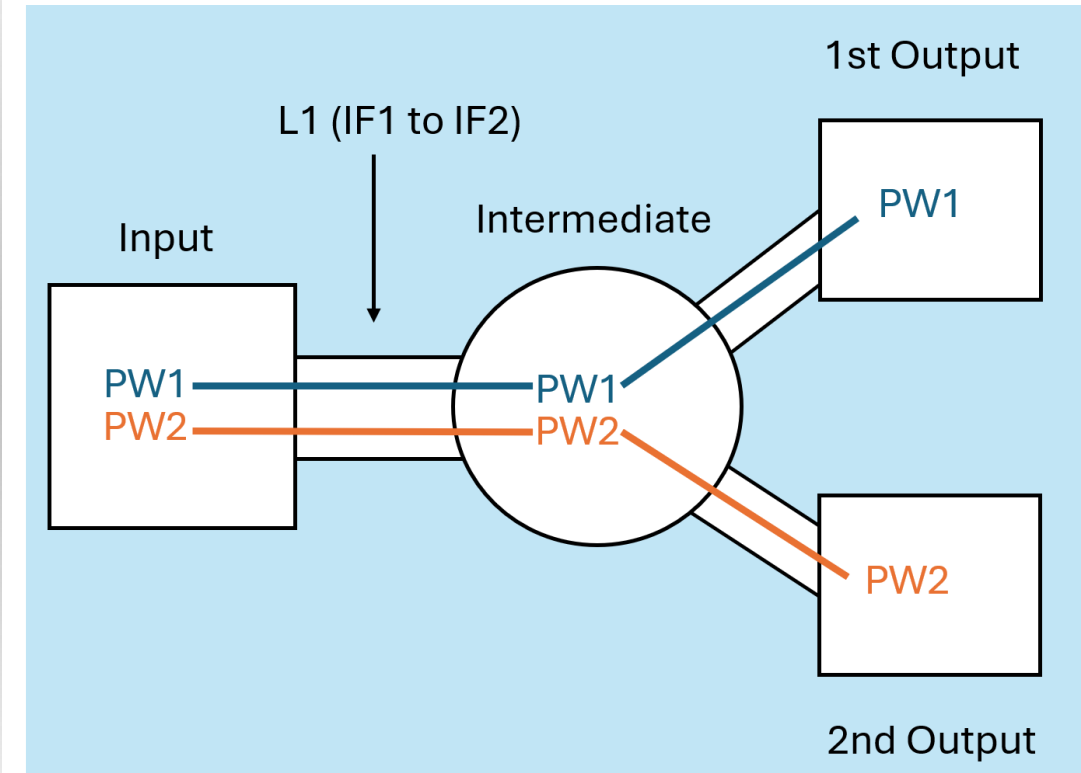
PW1 and PW2 Never Converge in Patent Owner's Demonstrative

3

PW1 and PW2 never converge and therefore cannot share data

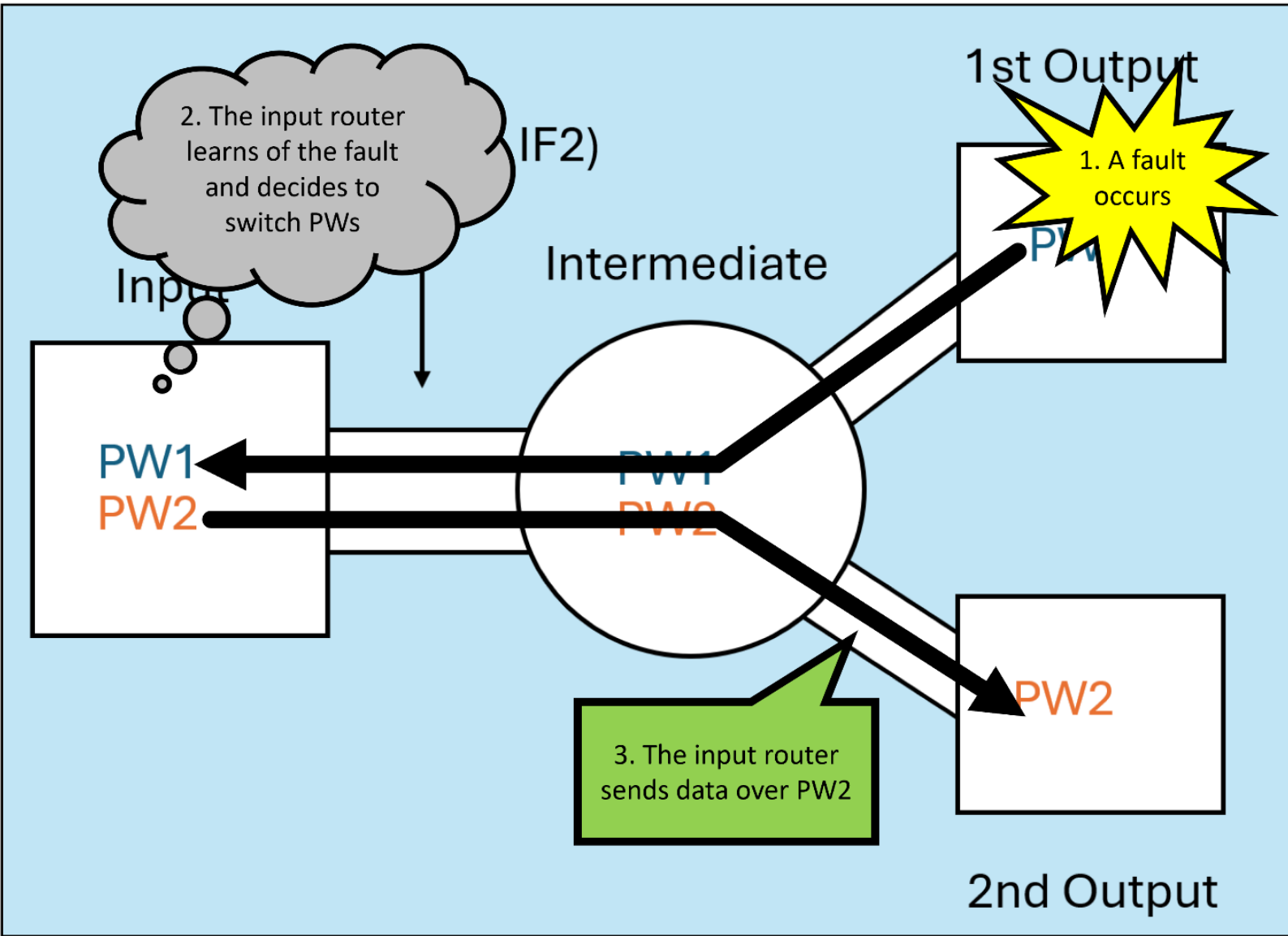
- In Patent Owner's demonstrative, PW1 and PW2 are depicted as independent and unrelated pseudo-wires
- As a result, the pseudo-wires never converge and cannot appear to share data

Reply 11-14.



Patent Owner Response 34.

Because PW1 and PW2 Are Unrelated, They Cannot Share Data



Reply 13.

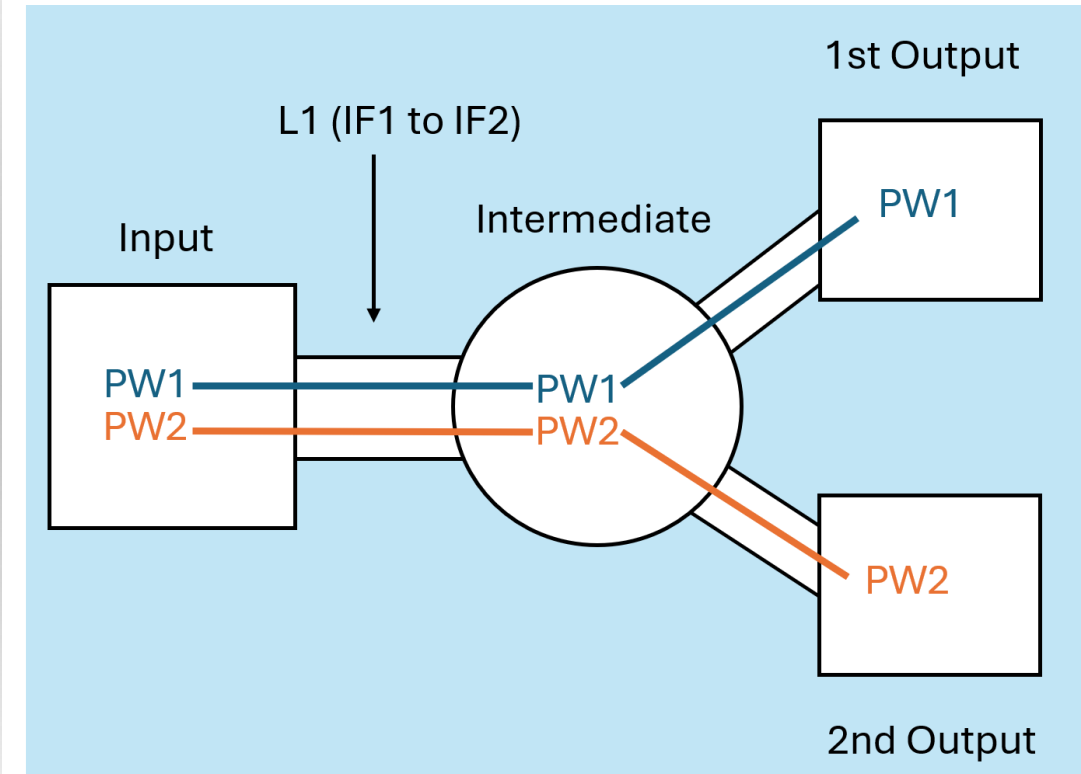
The '775 Patent Discredits This Configuration

3

PW1 and PW2 never converge and therefore cannot share data

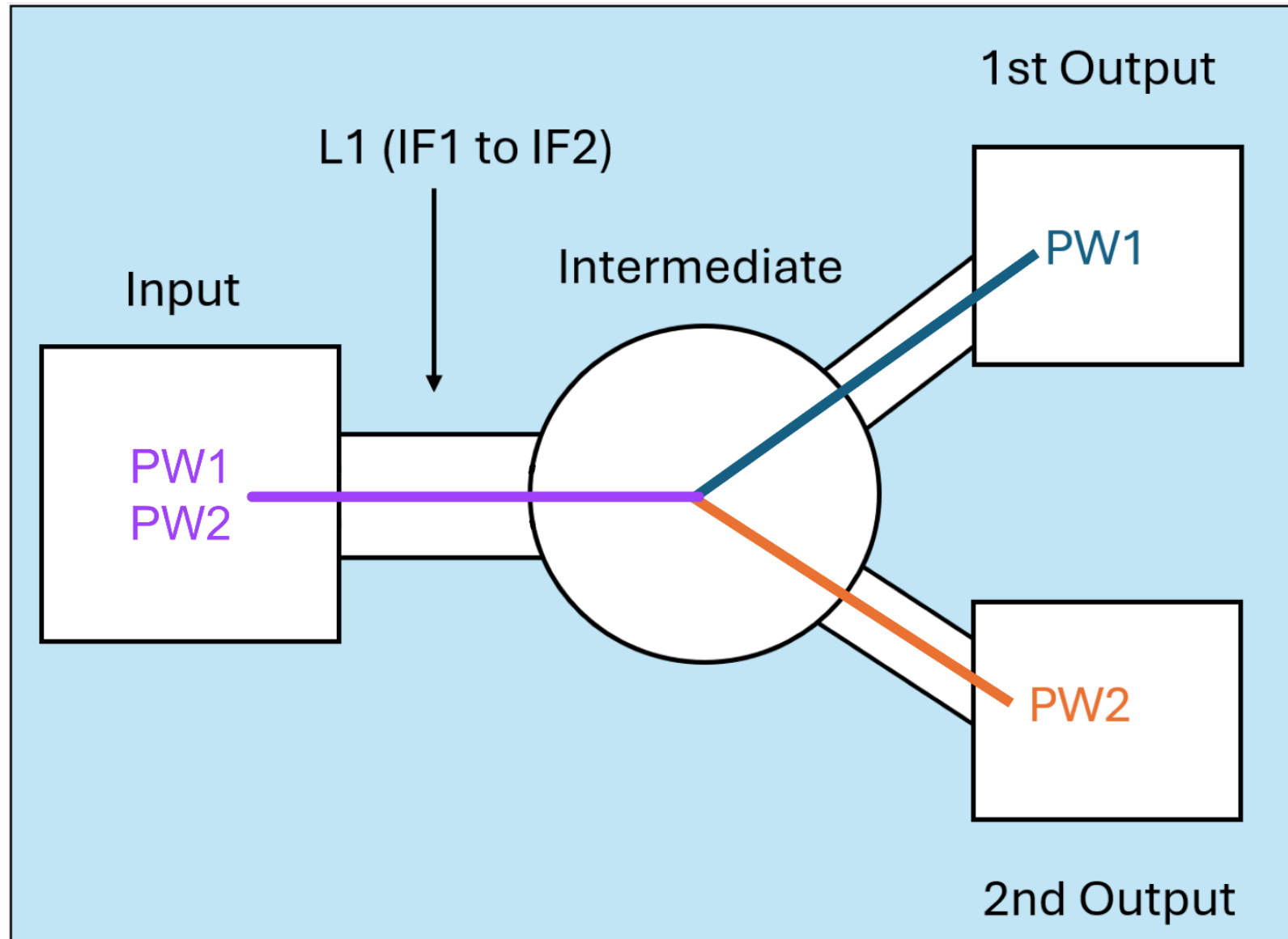
“This improves the responsiveness of the network because **detection occurs as close as possible to the fault**. Accordingly, a fault affecting the first output router is detected more quickly, as the information **does not have to cross the network** as far as the input router before being processed.”

Ex. 1001 ('775 Patent) at 4:59-63; see also Reply 11-12.



Patent Owner Response 34.

The Claims Are More Adequately Depicted in a Modified Demonstrative



Reply 16.

The Modification Solves All Issues with PO's Demonstrative

1

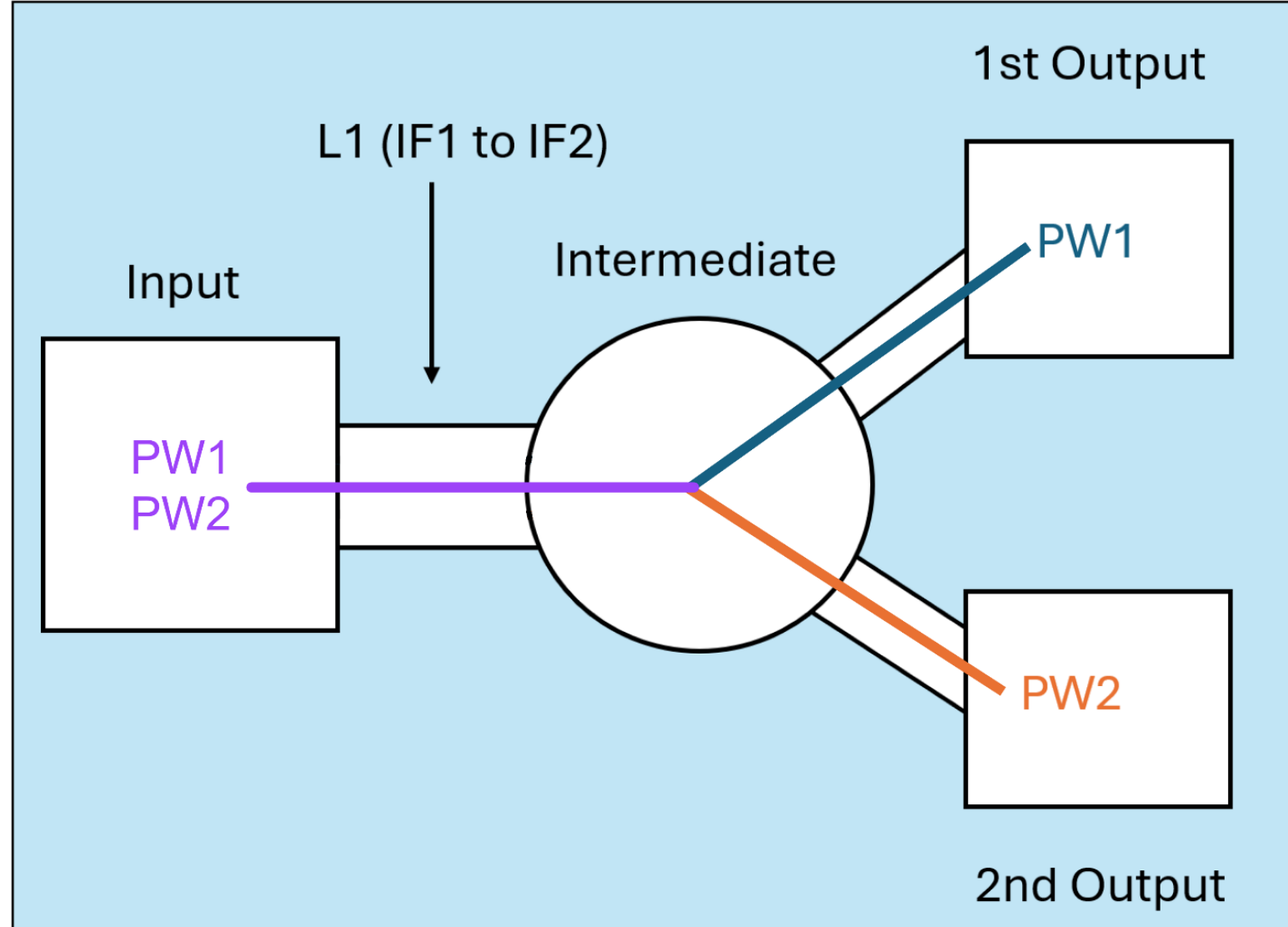
PW1 and PW2 now connect to the same interface of the intermediate router

2

PW1 and PW2 now share bandwidth in L1

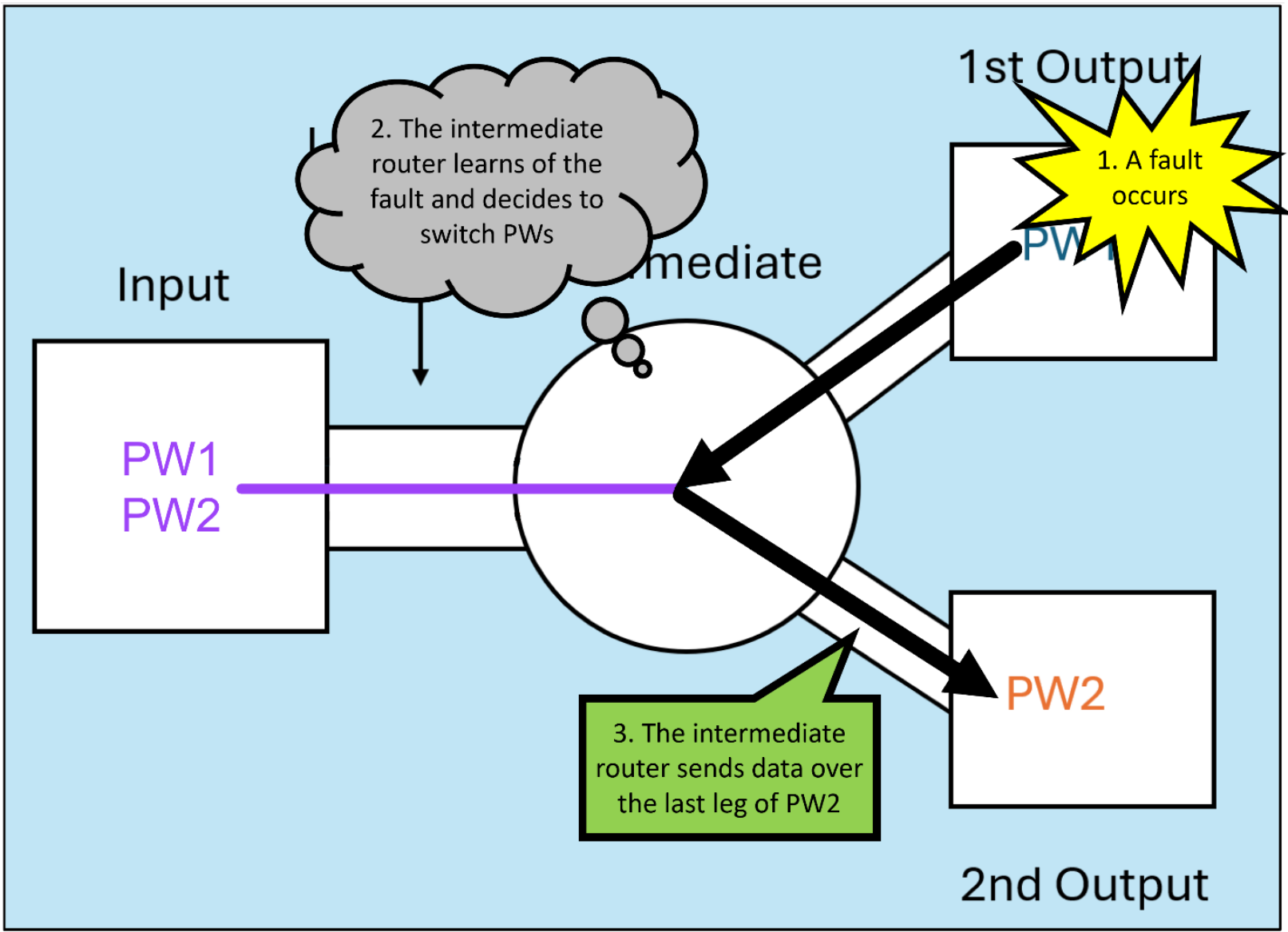
3

PW1 and PW2 now converge and can therefore share data



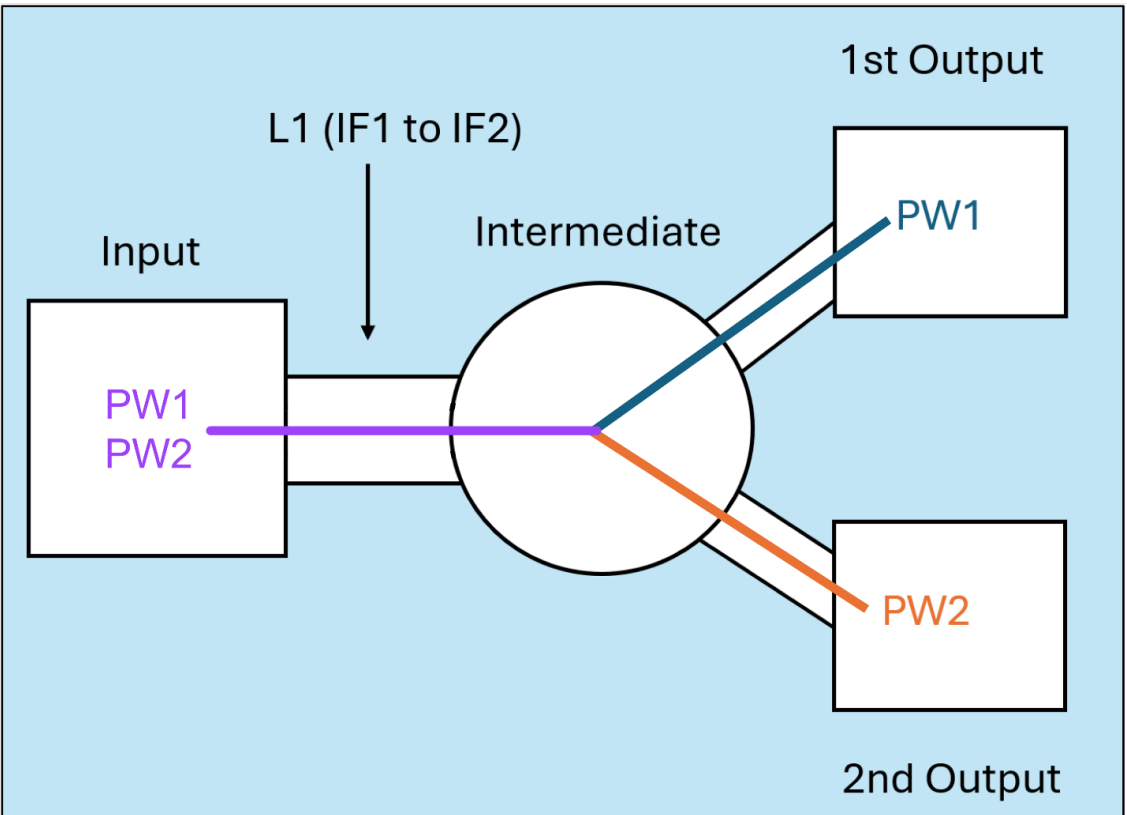
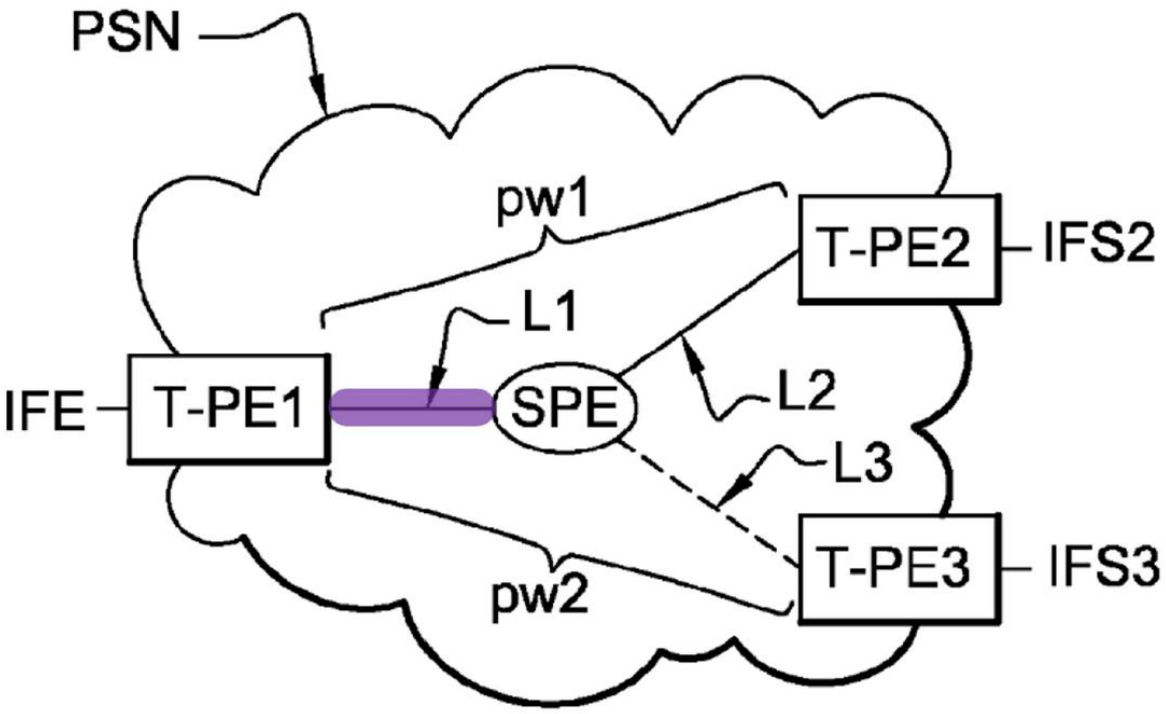
Patent Owner Response 34.

The Modified Demonstrative Does Not Need to Send Data Across the Network



Reply 17.

The Modified Demonstrative Is Truer to the Patent's Depiction of the Invention



Reply 15-16.

Ground 1: Wainner Alone

Ground 1, Wainner Alone: Summary

- **PO:** Wainner's links are separate pseudo-wires Patent Owner Response 42.
 - **Incorrect:** Wainner teaches combining the “upstream PW to **one or more** downstream PW” Ex. 1030 (Wainner) ¶20; see also Petition 30-31; Reply 19.
-
- **PO:** Claims require intermediate router to “see” two pseudo-wires from the input router Patent Owner Response 42-43.
 - **Incorrect:**
 - Claim have no such requirement Reply 23.
 - Wainner's intermediate router recognizes that the incoming PW segment ends on different output routers Ex. 1030 (Wainner) ¶23; see also Reply 23.
-
- **PO:** Wainner's PWs do not connect to the same interface Sur-Reply 13.
 - **Incorrect**

Wainner's Configuration Is Identical to the '775 Patent's Configuration

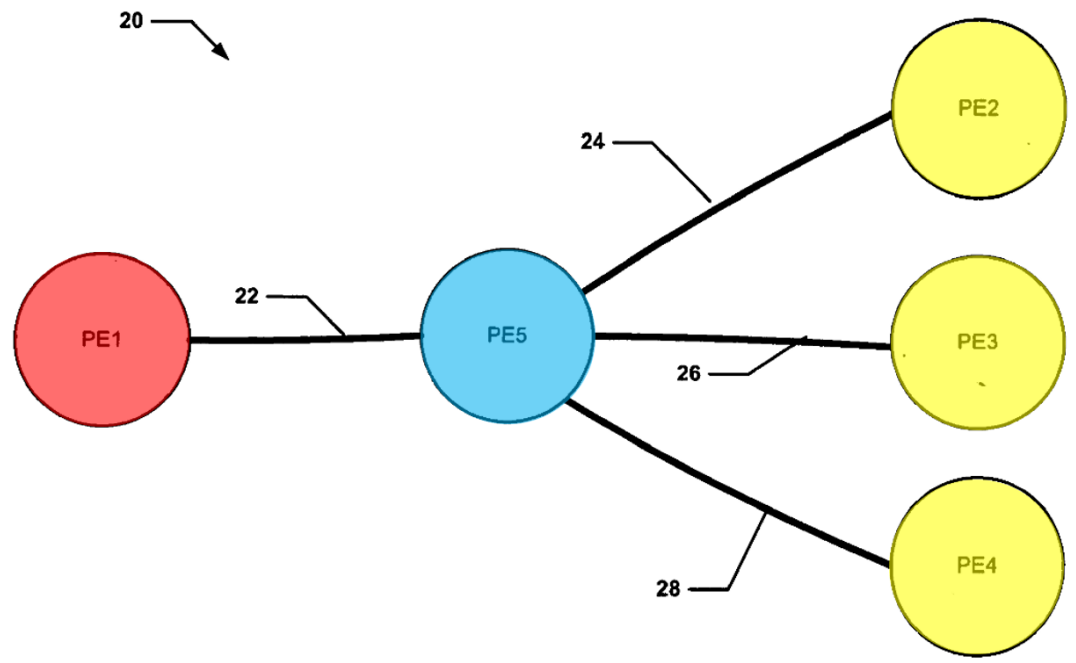
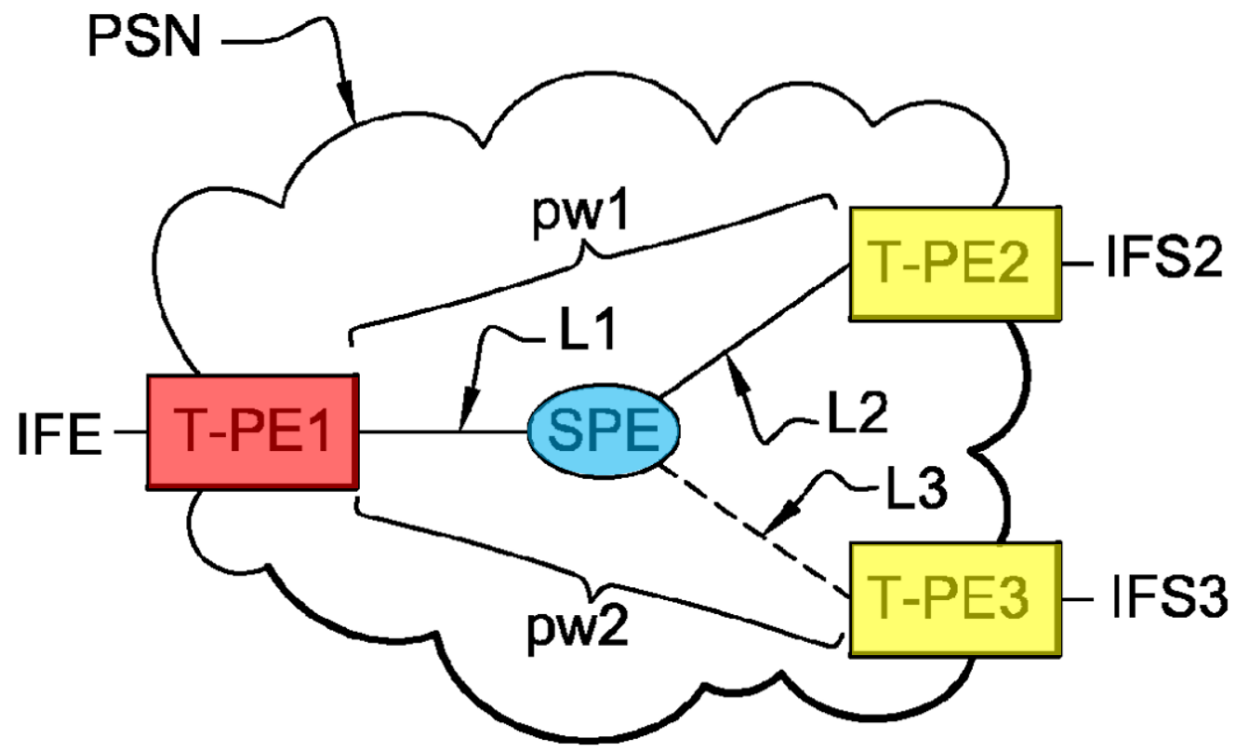


FIGURE 2

Ex. 1030 (Wainner) at Figure 2; see also Petition 29.



Ex. 1001 ('775 Patent) at Figure 3; see also Petition 30.

Wainner Teaches PWs That Span Its Entire Network

- Patent Owner asserted that the link in Wainner is an individual pseudo-wire:

“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.”

Patent Owner Response 42.

- But Wainner teaches combining these individual pseudo-wires together:

“Referring now to FIG. 2, with the introduction of Layer 2 Virtual Private Networks (L2VPNs) a provider may use a PW as a means of transporting multicast data. To avoid the scalability problem at the head-end, an architecture that uses multi-hop/multi-point pseudowires is utilized. This deviates from previous L2VPN concepts that define a point-to-point PW. **This model statically binds an upstream PW to one or more downstream PW.**”

Ex. 1030 (Wainner) ¶¶20; see also Petition 30-31; Reply 19.

Wainner Teaches PWs That Span Its Entire Network

- Dr. Bhattacharjee (Petitioner's expert):

“Wainner explains that it employs a ‘model [that] statically binds an upstream PW to one or more downstream PW.’ EX1030, ¶20 (emphasis added). In other words, Wainner teaches creating multiple multi-hop (i.e., multisegment) pseudo-wires that share a first upstream pseudo-wire (i.e., first link). For example—as discussed further below with respect to the appropriate limitations—upstream pseudo-wire 22 is bound to downstream pseudo-wire 24 to form the ’775 patent’s ‘first pseudo-wire’ in limitation 1[a] and upstream pseudo-wire 22 is further bound to downstream pseudo-wire 28 to form the ’775 patent’s ‘second pseudowire’ in limitation 1[b].”

“Further, Wainner explicitly teaches combining pseudo-wires 22 and 24 to form a single ‘multi-hop/multi-point pseudowire[]’ that spans from input router PE1 to output router PE2. EX1030, ¶20 (‘This model statically binds an upstream PW—for example, pseudo-wire 22—to one or more downstream PW—for example, pseudo-wire 24—to form ‘multihop/ multi-point pseudowires.’). A POSITA would have known that a ‘multi-hop’ pseudo-wire is equivalent to a ‘multi-segment’ pseudo-wire. In fact, Bocci explains that ‘[a] MS-PW is a single PW that for technical or administrative reasons is segmented into a number of concatenated hops.’ EX1031, 7. Further, Wainner explains that binding pseudo-wire segments results in “a layer 2 connection” between the input and output router. EX1030, ¶24. A POSITA would have known that a pseudo-wire is a layer 2 connection.”

Ex. 1040 (Bhattacharjee Declaration) ¶¶ 73, 87.

Patent Owner's Only Response Is Not Supported by the Claims

- Patent Owner: claims require that intermediate router must “see” incoming pseudo-wires

“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.”

Patent Owner Response 42-43.

Patent Owner's Only Response Is Not Supported by the Claims

- Claim 1:

1. A method of setting up at least two pseudo-wires able to broadcast a data stream, comprising:

setting up a first pseudo-wire comprising a first link set up between an input router of a packet-switched network and an intermediate router of the packet-switched network and a second link set up between said intermediate router and a first output router of the packet-switched network; and

setting up a second pseudo-wire between said input router and a second output router of the packet-switched network, wherein the second pseudo-wire comprises said first link and a third link set up between said intermediate router and said second output router, said first link being shared by the first and second pseudo-wires.

- Claim 6:

6. A computer program product stored on a non-transitory computer-readable medium and comprising program code instructions for implementing a method of setting up at least two pseudo-wires able to broadcast a data stream when said program is executed by a computer, the program code instructions comprising instructions for:

setting up a first pseudo-wire comprising a first link set up between an input router of a packet-switched network and an intermediate router of the packet-switched network and a second link set up between said intermediate router and a first output router of the packet-switched network; and

setting up a second pseudo-wire between said input router and a second output router of the packet-switched network, wherein the second pseudo-wire comprises said first link and a third link set up between said intermediate router and said second output router, said first link being shared by the first and second pseudo-wires.

Wainner's Intermediate Router "Sees" the Same Set Up

- Wainner:

“A PW 22 is signaled between an 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. Subsequently, the S-PE signals the establishment of PWs to *one or more downstream receiving PE* (R-PE).”

Ex. 1030 (Wainner) ¶23; see also Reply 23.

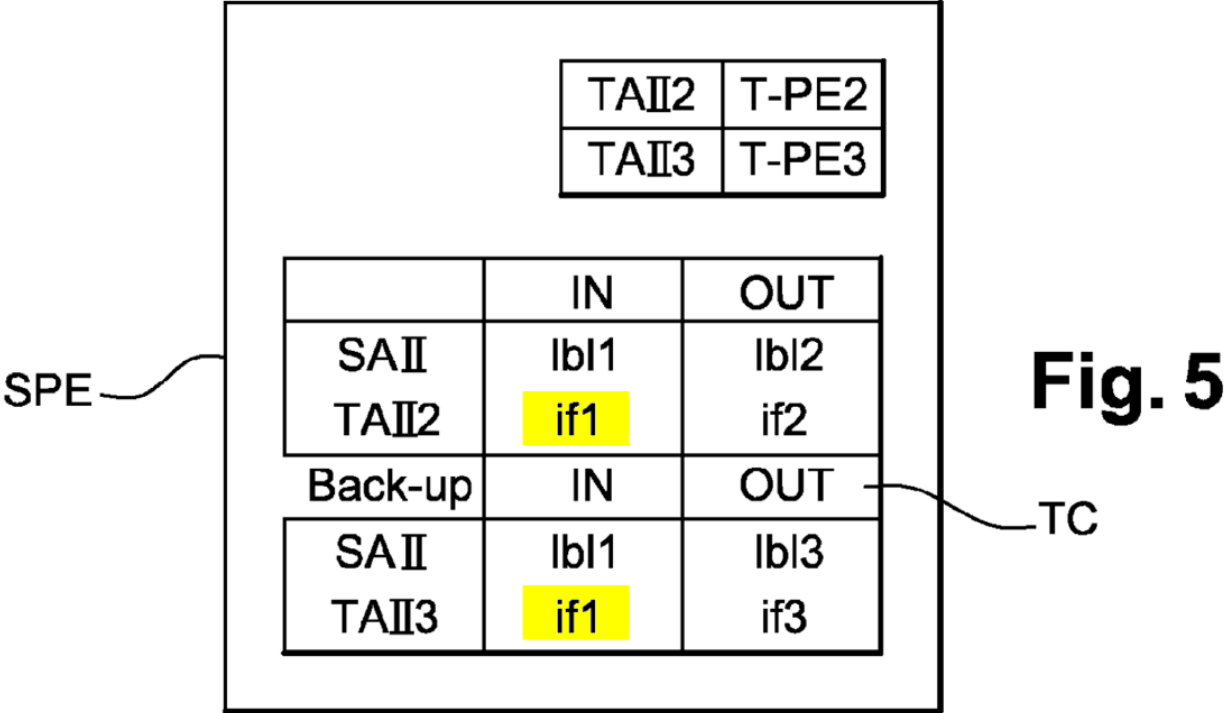
Wainner's Intermediate Router "Sees" the Same Set Up

- Wainner:

“A PW 22 is signaled between an 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. Subsequently, the S-PE signals the establishment of PWs to **one or more downstream receiving PE (R-PE).**”

Ex. 1030 (Wainner) ¶23; see also Reply 23.

- '775 Patent:



Patent Owner Response 35.

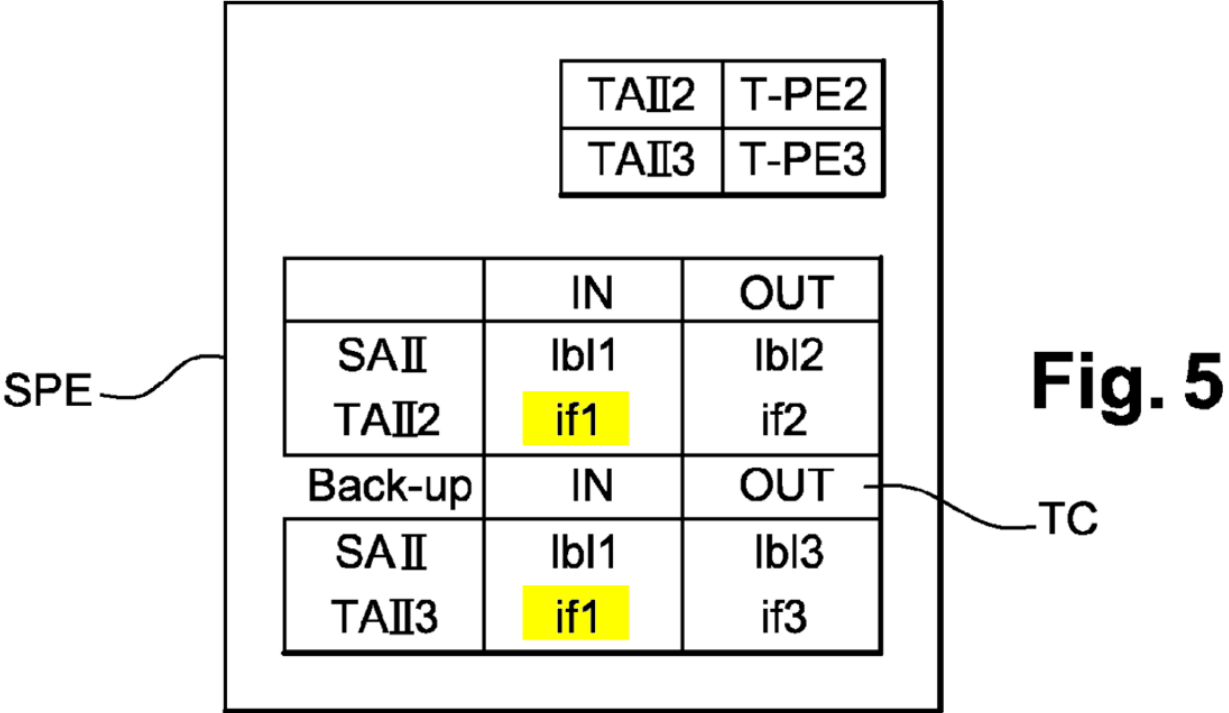
Wainner Would Not Work If It Could Not “See” the Pseudo-Wires

- Reply:

“Even if it were required, a POSITA would know that Wainner’s intermediate router keeps state in order to distinguish the separate pseudo-wires, just like the switching table in Figure 5 of the ’775 patent. *Id.* If the intermediate router were unable to ‘see’ that the incoming connection is associated with multiple outgoing connections, then it would route data packets from the input router to only one output router rather than all of them. *Id.* That would contradict Wainner’s express teaching that ‘Packets received by PE1 from another network device (not shown) may be forwarded to one or more of PE2, PE3 and PE4.’ EX1030 ¶19 (emphasis added); EX1042 ¶31.”

Reply 23-24.

- ‘775 Patent:



Patent Owner Response 35.

Patent Owner Does Not Address Juniper's Arguments in Sur-Reply

“First, each link in Wainner includes at most **one** pseudowire segment that connects to the interfaces of that link. It is therefore impossible for any of the links in Wainner to be shared by two pseudowires, because each link includes at most one pseudowire. EX2006 at ¶¶84-85 (‘Each connection between routers in Wainner consists of at most one pseudowire, and there are no links shared by more than one pseudowire.’).”

Patent Owner Sur-Reply 13-14.

“A PW 22 is signaled between an 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. Subsequently, the S-PE signals the establishment of PWs to **one or more downstream receiving PE (R-PE)**.”

Ex. 1030 (Wainner) ¶23; see also Reply 23.

Patent Owner's Sur-Reply Argument

- Patent Owner's sur-reply:

“A single pseudowire (PW22) in Wainner’s Figure 2 connects the input router PE1 and the intermediate router PE5. ***All packets*** traversing the link between PE1 and PE5 ***are carried by one pseudowire PW22 along that link.***”

Patent Owner Sur-Reply 15.

Cisco: If Point-to-Multipoint PWs Infringe, then They Also Invalidate

- *Cisco* complaint:

“Cisco makes, uses, sells, and/or offers to sell in the United States, and/or imports into the United States products that directly infringe the ’775 Patent, including the above identified Cisco Accused Products that use VPLS LSM such as **ASR 9000 Series routers** and any other products with similarly functionality.”

“The computer code comprises instructions for implementing a method of automatically configuring at least two pseudo-wires able to broadcast a data stream when said program is executed by a computer. Starting at least with IOS XR Release 5.1, the ASR 9000 Router implements Label Switched **Multicast** with **point-to-multipoint** traffic engineering (P2MPTE) for delivering broadcast, multicast and certain unicast streams to a VPLS domain using pseudo-wires.”

Ex. 1033 (*Monarch v. Cisco* Complaint) ¶¶ 120, 123.

- Wainner:

“Embodiments of the invention significantly overcome such deficiencies and provide mechanisms and techniques that provide a method and apparatus for **point-to-multipoint distribution using pseudowires**. The presently defined architecture decouples the transport plane from the service plane enabling a more scalable operational model. It also provides an optimized distribution tree for P2MP flows that are typical of broadcast video. The transport provider has explicit control over the merge and replication points in the network.”

Ex. 1030 (Wainner) ¶15; see also Petition 32-33; Reply 19-20.

Patent Owner Forfeited Responding to the *Cisco* Argument

- Patent Owner did not address Petitioner's *Cisco* argument in the POR, and it is waived:

“Tellingly, PO does not address these points and therefore forfeits a response to them; **PO should not be allowed to belatedly cobble together a response in surreply**, depriving Juniper an opportunity to respond. Google, IPR2022-00473, Paper 25, at 44.”

Reply 20; see also Reply 19, 28.



“Patent Owner also argues that ‘if Ehlers provides outside temperature information as alleged by Petitioner, there would be no need to provide outside temperature measurements localized by ZIP code.’ PO Sur-reply 25. First, **Patent Owner forfeited this argument by not raising it in the Patent Owner Response**. See Paper 8, 8 (Scheduling Order) (‘Patent Owner is cautioned that any arguments not raised in the response may be deemed waived.’).”

Google LLC v. Ecofactor, Inc., IPR2022-00473 (PTAB Aug. 1, 2023), Paper 25, at 44.

Patent Owner's *Cisco* Response Is Also Wrong

“Instead, Patent Owner’s complaint against Cisco showed that in Cisco’s accused system, two pseudowires share the same link because they connect to the same interface on the input router and the same interface on the intermediate router. **The complaint even identifies the specific shared interfaces *by their IP addresses***: the shared interface on the PE1 router (the input router) is 209.165.200.225 and the shared interface on the P router (the intermediate router) is 209.165.200.226. EX1033 at ¶¶133-135.”

Patent Owner Sur-Reply 12.

“FIG. 7 illustrates example architectures of a computer system that is configured as a network device 240. In this example, the network device 240 includes an interconnection mechanism 211 that couples a memory system 212, a processor 213, and a communications interface 214. **The communications interface 214 allows the network device 240 to communicate with external devices or systems.**”

Ex. 1030 (Wainner) ¶34; see also Petition 39.

Patent Owner's Cisco Response Is Also Wrong

- Cisco Complaint:

130. According to the Cisco Configuration guidance, P2MP pseudo-wires are automatically created by the Cisco 9000 Series Router between PE-1, PE-2, and PE-3 with a P router (P-4) configured as an intermediate (or bud) node. Because P2MP pseudo-wires are unidirectional, a separate P2MP pseudo-wire may be created in each direction if traffic is two-way.

The P2MP tunnels are auto-discovered tunnels. Static P2MP tunnels are not supported. Static tunnel configurations are not used. The auto P2MP tunnel configuration must be enabled on all of the PE routers and also on a P router if it acts as a bud node. A bud node is a midpoint and tailend router at the same time.

A sample topology with configuration is shown here. In this topology, P2MP PWs are created between the three PEs and a P router which acts as a bud node. All three PE routers act as Head (for ingress traffic) and Tail (for egress traffic).

ASR 9000 Overview at 5-6. During auto-configuration, the PE1 router is connected to the P router.

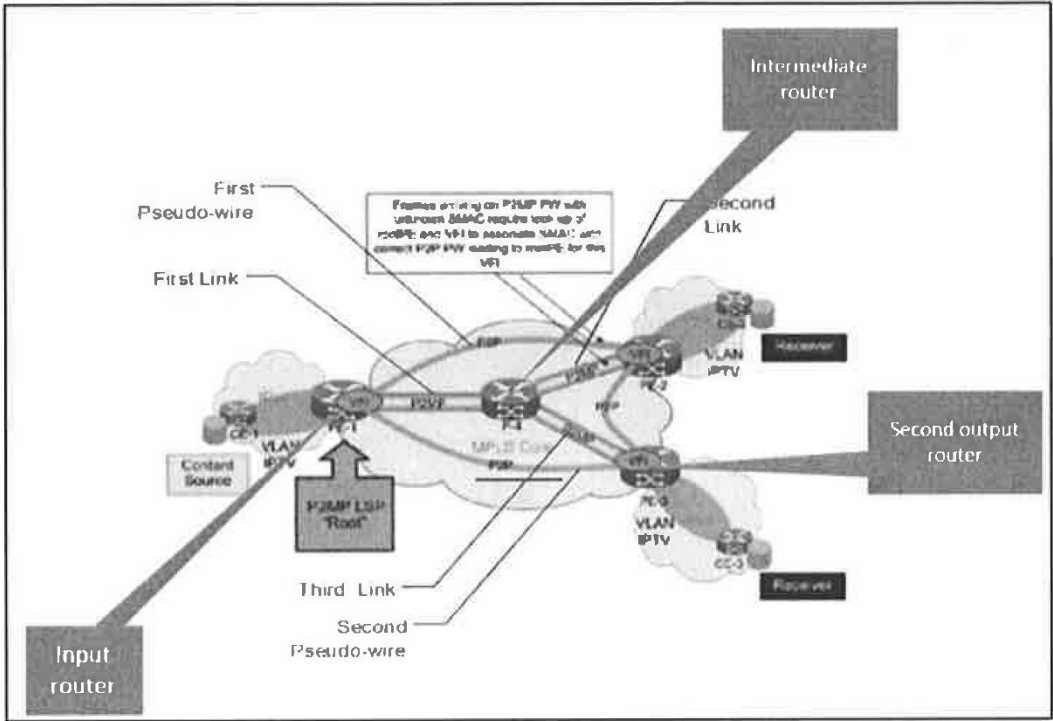
PE1 Configuration	P Configuration
RP/0/RSP0/CPU0:PE1#show run hostname PE1	RP/0/RSP0/CPU0:P#show run hostname P
interface GigabitEthernet0/1/1/0 description connected P router ipv4 address 209.165.201.1 255.255.255.224	interface GigabitEthernet0/1/1/0 description connected to PE1 router ipv4 address 209.165.201.2 255.255.255.224 transceiver permit pid all

ASR 9000 Overview at 6–8. During auto-configuration, the PE bud node router is connected to the PE2 router as a second link.

PE2 Configuration	P Configuration
RP/0/RSP0/CPU0:PE2#show run hostname PE2	RP/0/RSP0/CPU0:P#show run hostname P
interface GigabitEthernet0/1/1/3 description connected to P router ipv4 address 209.165.201.67 255.255.255.224 transceiver permit pid all	interface GigabitEthernet0/1/1/3 description connected to PE2 router ipv4 address 209.165.201.61 255.255.255.224

ASR 9000 Overview 8–10.

131. As described above, the first output router is PE-2, the second output router is PE-3, the bud PE is the intermediate router (P-4), and the input router is PE-1.



ASR 9000 Overview at 4 (annotations added).

Patent Owner's *Cisco* Response Is Also Wrong

- *Cisco* Complaint:

133. The Cisco Configuration Guide shows the configuration of the underlying P2MP sub-LSP and pseudo-wires (Bridge Domain – L2VPN) confirming the link between the input router and Intermediate router is used for both the pseudo-wires terminating at the PE2 and PE3 and traversing the intermediate, a.k.a. bud, router. The Loopback addresses are (identifying only the last octate):

PE1: -.225
P: -.226
PE2: -.227
PE3: -.228

```
RP/0/RSP0/CPU0:PE1#show l2vpn bridge-domain

List of VFI's:
VFI bgl_bdl_vfi (up)
  P2MP: RSVP-TE, BGP, 1, Tunnel Up
  Neighbor 209.165.200.226 pw-id 1, state: up, Static MAC address
  Neighbor 209.165.200.227 pw-id 1, state: up, Static MAC address
  Neighbor 209.165.200.228 gw-id 1, state: up, Static MAC address
RP/0/RSP0/CPU0:PE1#
```

ASR 9000 Overview at 14.

134. The PE1 pseudo-wire paths are to the P router destination (209.165.200.226), the PE2 router destination (209.165.200.227) and to the PE3 router destination (209.165.200.228).

```
RP/0/RSP0/CPU0:PE1#show mpls traffic-eng tunnels p2mp

Name: tunnel-mt100 (auto-tunnel for VPLS (l2vpn))
  Signalled-Name: auto_PE1_mt100
Destination summary: (3 up, 0 down, 0 disabled) Affinity: 0x0/0xffff
Auto-bw: disabled
Destination: 209.165.200.226
  State: Up for 00:32:35
  Path options:
    path-option 10 dynamic [active]
Destination: 209.165.200.227
  State: Up for 00:25:41
  Path options:
    path-option 10 dynamic [active]
Destination: 209.165.200.228
  State: Up for 00:22:55
  Path options:
    path-option 10 dynamic [active]
```

ASR 9000 Overview at 17-18.

Ground 1: Wainner + Bocci

- ***PO***: Bocci requires that multi-segment pseudo-wires cannot connect to ***any*** interface of an intermediate router

Patent Owner Response 40-41.

- ***Incorrect***: The '775 patent itself explains that in Bocci the multi-segment pseudo-wire connects to the interface of an intermediate router

Ex. 1001 ('775 Patent) at 1:53-2:2; see also Reply 22.

Patent Owner Concedes That Wainner + Bocci Teach Most Limitations

“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.”

Patent Owner Response 40.

Patent Owner Concedes That Wainner + Bocci Teach Limitation [1pre]

“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.”

Patent Owner Response 40.

[1pre]: “A method of setting up at least two pseudo-wires able to broadcast a data stream, comprising:”

Patent Owner Concedes That Wainner + Bocci Teach Most of Limitation [1a]

“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.”

Patent Owner Response 40.

[1a]: “setting up a first pseudo-wire comprising a first link set up between an input router of a packet-switched network and an intermediate router of the packet-switched network and a second link set up between said intermediate router and a first output router of the packet-switched network; and”

- Patent Owner disputes whether this first connection (PW22) constitutes a “link” (more on this later)

Patent Owner Concedes That Wainner + Bocci Teach Most of Limitation [1b]

“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.”

Patent Owner Response 40.

[1b]: “setting up a second pseudo-wire between said input router and a second output router of the packet-switched network, wherein the second pseudo-wire comprises said first link and a third link set up between said intermediate router and said second output router, said first link being shared by the first and second pseudo-wires.”

- Patent Owner disputes whether this first connection (PW22) constitutes a “link” (more on this later)

Patent Owner Only Contends That PW22 Is Not a “Link”

- Patent Owner’s only argument: Bocci’s pseudo-wires do not connect to intermediate routers:

“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.”

Patent Owner Response 40.

“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.”

Patent Owner Response 40-41.

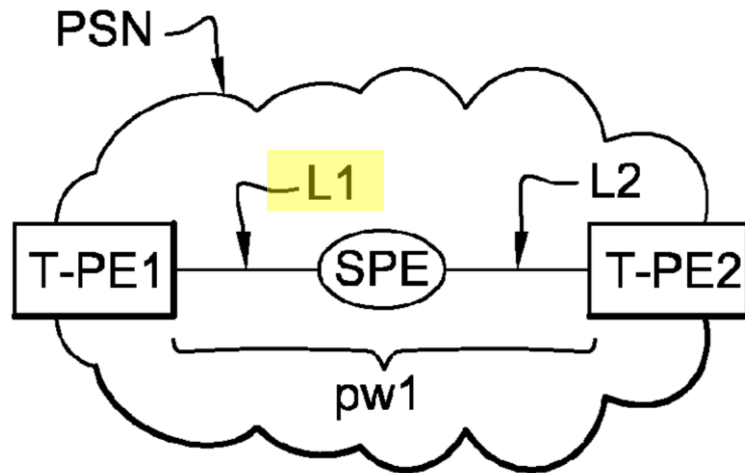
The '775 Patent Itself Contradicts PO's Argument About Interfaces

- Patent Owner argues that—according to Bocci—multi-segment PWs cannot connect to any interface of an 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.”

Patent Owner Response 40-41.

- The '775 patent itself contradicts PO's argument and explains that multi-segment PWs in Bocci do connect to an interface of an intermediate router:



“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. **A first link L1** that is part of the pseudo-wire pw1 is set up between the first router T-PE1 **and an intermediate router S-PE** of the network PSN.”

Ex. 1001 ('775 Patent) at Figure 1; see also Reply 22.

Ex. 1001 ('775 Patent) at 1:53-2:2; see also Reply 22.

PO's Citations to Bocci Do Not Support Its Argument

“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.”

Patent Owner Reply 41 (emphasis in original).

“PO’s only support for this sweeping and extreme statement is that Bocci says multi-segment pseudo-wires ‘behave and function as a single point-to-point PW’ and that ‘[e]ach end of a MS-PW by definition MUST terminate on’ an output router. POR 27-20, 41 (quoting EX1031, 6). That says nothing about whether a multi-segment pseudo-wire connects to the interface of an intermediate router. EX1042 ¶26.”

Reply 20-21.

Patent Owner Misrepresents Juniper's Point About Bocci

- Patent Owner: Petitioner argued Bocci in its entirety “says nothing about whether multi-segment pseudo-wire[s] connect[] to the interface of an intermediate router”

“Petitioner also argues that **Bocci** ‘says nothing about whether a multi-segment pseudo-wire connects to the interface of an intermediate router.’ This is a striking admission that Bocci does not disclose any multi-segment pseudo-wire connecting to any interface of an intermediate router.”

Patent Owner Sur-Reply 15.

- But Petitioner was referring to only the evidence in Bocci that was cited by Patent Owner, not the entirety of Bocci:

“PO’s only support for this sweeping and extreme statement is that Bocci says multi-segment pseudo-wires ‘behave and function as a single point-to-point PW’ and that ‘[e]ach end of a MS-PW by definition MUST terminate on’ an output router. POR 27-20, 41 (quoting EX1031, 6). **That** says nothing about whether a multi-segment pseudo-wire connects to the interface of an intermediate router. EX1042 ¶26.”

Reply 20-21.

Ground 2: Kamite's Figure 3

Ground 2, Kamite Figure 3: Summary

- ***PO***: The pseudo-wires in Kamite's Figure 3 connect to different interfaces

Patent Owner Response 47.

- ***Incorrect***: Kamite does not suggest the pseudo-wires in Figure 3 connect to different interfaces
 - Kamite's Figure 3 shows all three pseudo-wires traversing the same physical connection
 - Patent Owner's citations to Kamite refer to Figure 10, not Figure 3

Reply 27-28.

Patent Owner Is in a Double Bind

- If **multiple** connections must pass through the first link, then Figure 3 invalidates

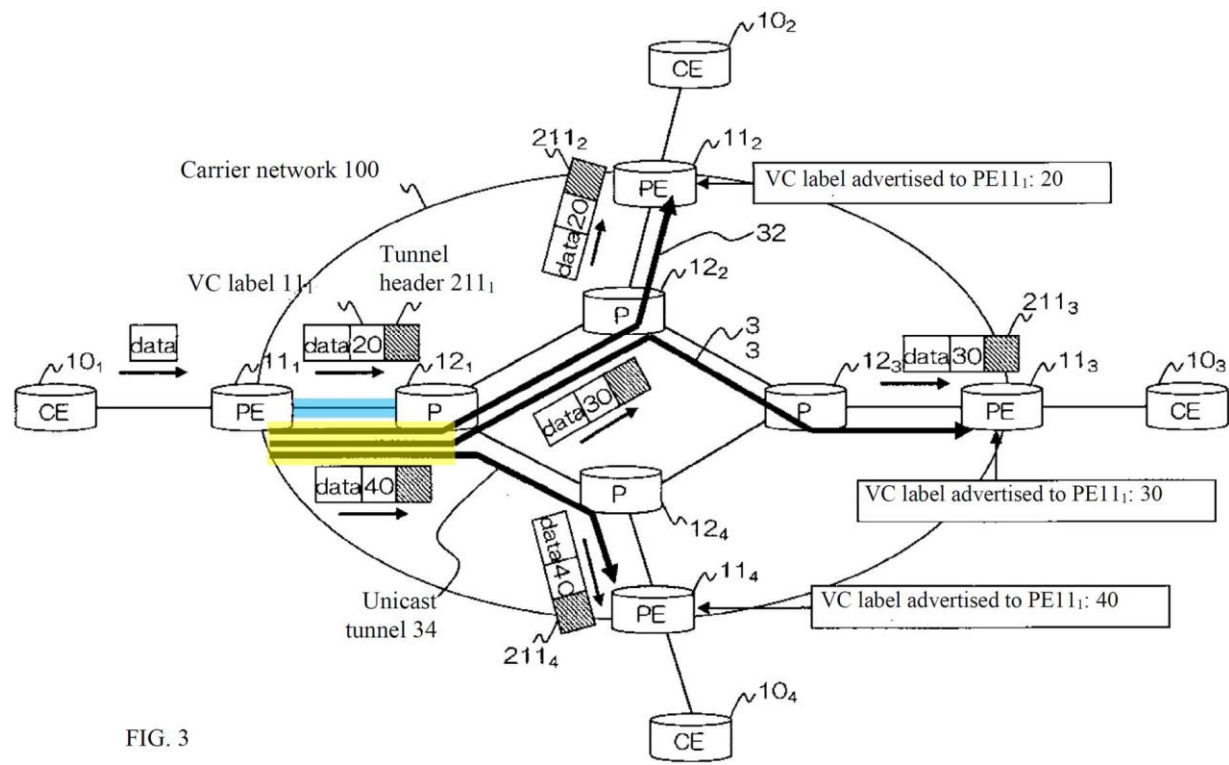


FIG. 3

- If **one** connection must pass through the first link, then Figure 10 invalidates

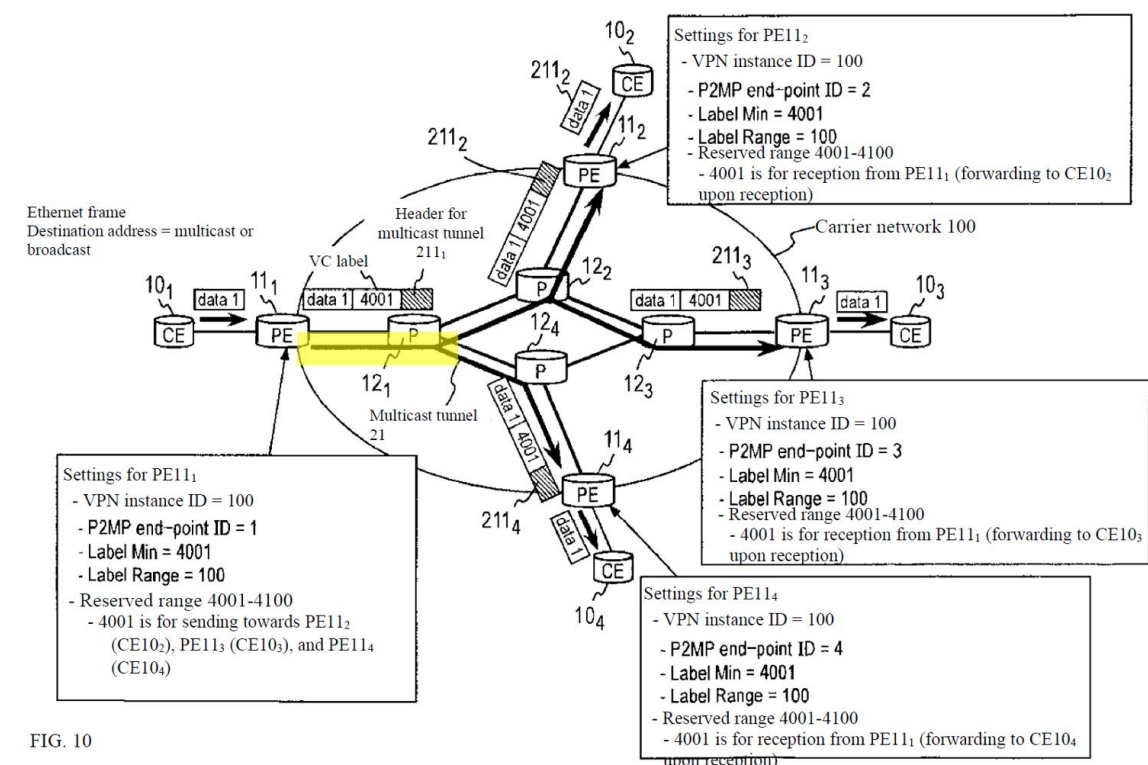


FIG. 10

Reply 24, 29.

PO's Demonstrative Is Identical to Kamite's Figure 3

“As shown below—identically to PO’s demonstrative of the alleged invention—there is one physical connection between the input router PE111 and intermediate router P121, highlighted in blue, and three pseudo-wires passing through it, highlighted in yellow:”

Reply 26-27.

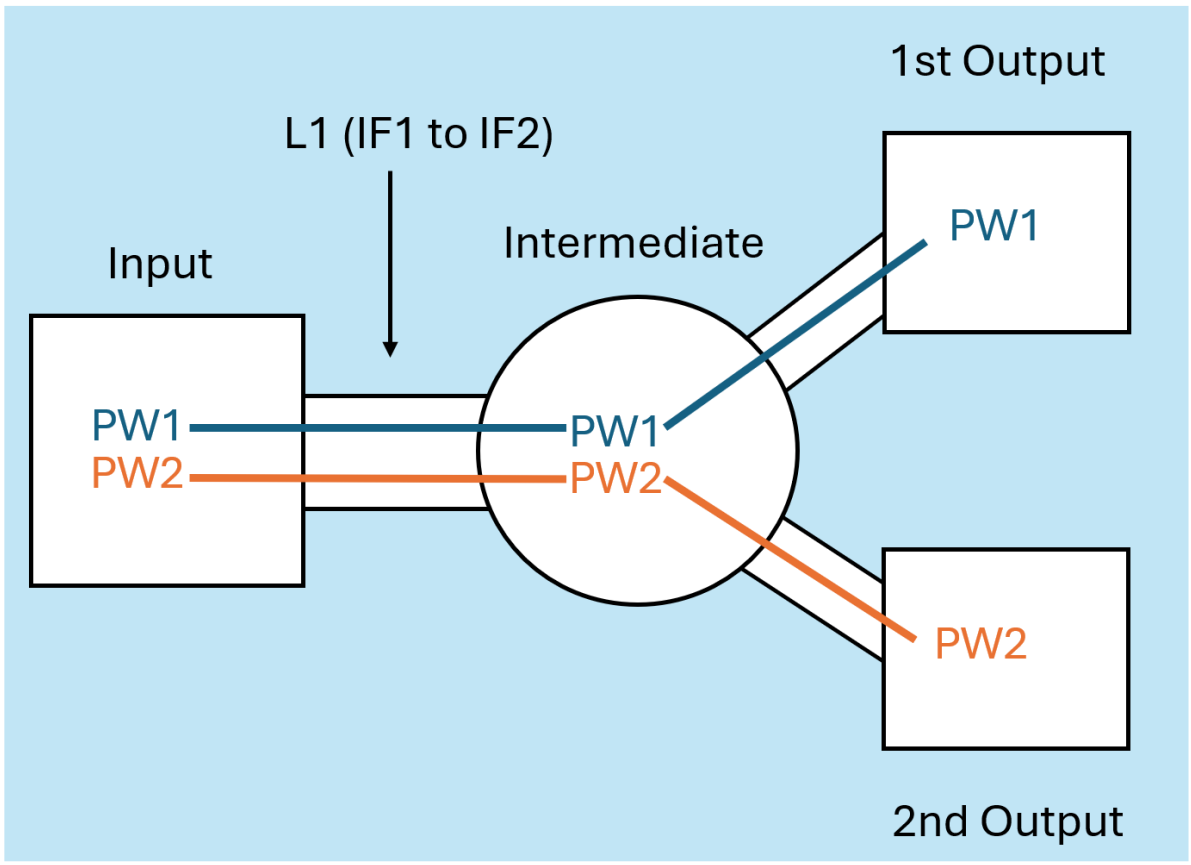
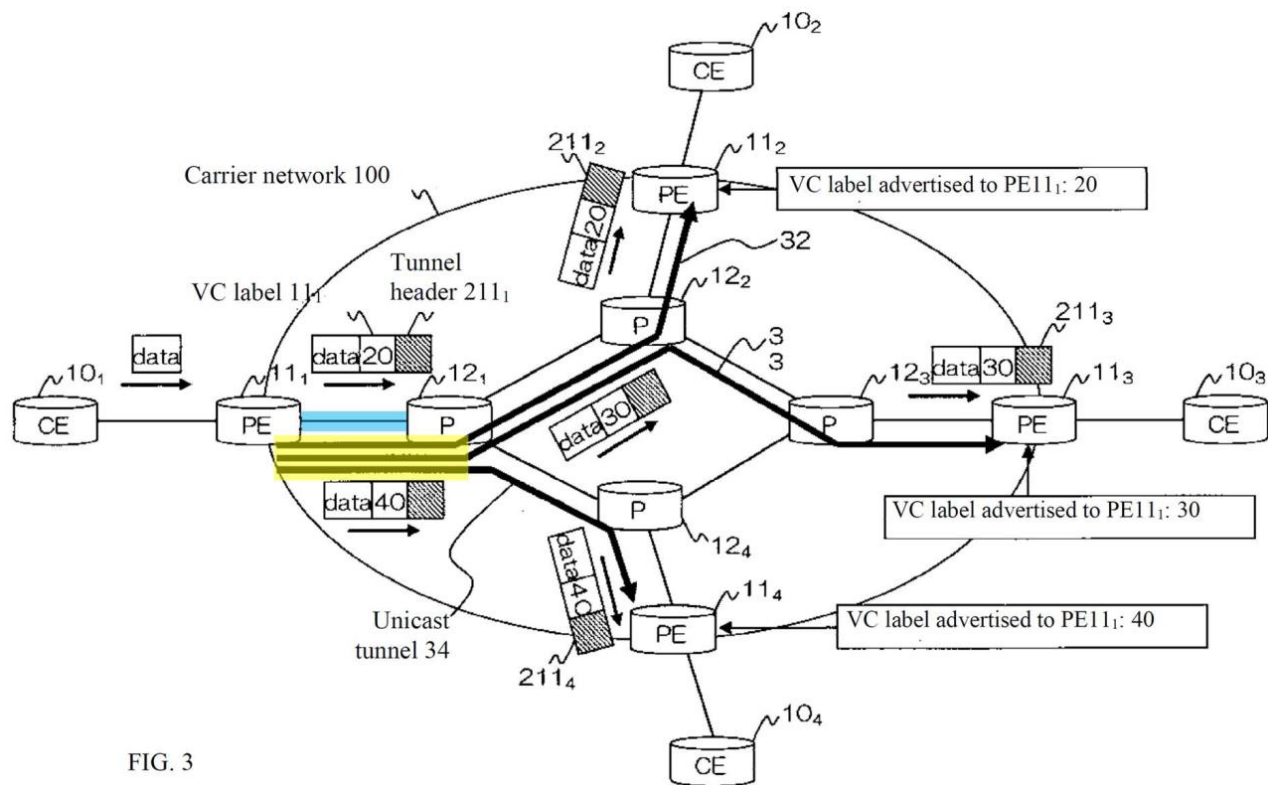


FIG. 3

Kamite Does Not Suggest That the PWs Are on Different Interfaces

- PO asserts that the three pseudo-wires in Figure 3 use different interfaces:

“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.”

Patent Owner Response 47.

- Petitioner identifies three problems with PO’s argument:

1

Kamite never suggests that it assigns **different** interface parameters to each pseudo-wire

2

PO’s citation in support of its argument (Ex1041 at 8) is describing “the present invention,” not Figure 3.

3

To the extent Kamite assigns different interface parameters to each pseudo-wire, they are different **virtual** interfaces, not **physical** ones.

Reply 27-28.

Ground 2: Kamite's Figure 10

Ground 2, Kamite Figure 10: Summary

- **PO:** Kamite's Figure 10 and Bocci does not teach a "first link" because Bocci discloses that multi-segment pseudo-wires cannot connect to ***any*** interface of an intermediate router

Patent Owner Response 46.

- ***Incorrect:*** The '775 patent itself explains that in Bocci the multi-segment pseudo-wire connects to the interface of an intermediate router

Ex. 1001 ('775 Patent) at 1:53-2:2; see *also* Reply 22.

Kamite Teaches Connecting to a Single Interface of an Intermediate Router

- Institution Decision: Kamite teaches a link between the input and intermediate routers

“Further, as discussed above, the parties agree to the construction of ‘link’ as a ‘connection between an interface of a first router and an interface of a second router.’ See Pet. 19; Prelim. Resp. 18. As Petitioner contends, 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.’ Pet. 69 (citing Ex. 1041, 8; Ex. 1040 ¶ 126). Accordingly, on this current record, we find availing Petitioner’s reliance on Kamite’s connection between PE11₁ and P12₁ **for teaching a link**, i.e., a connection between an interface of PE11₁ and an interface of P12₁. *Id.* at 69–71 (citing Ex. 1041, 7–8, Figs. 3, 10; Ex. 1040 ¶¶ 126–127). We also find availing Petitioner’s reliance on Kamite’s connection between P12₁ and PE11₂ **as a link between P12₁ and PE11₂**. *Id.* at 71 (citing Ex. 1040 ¶ 129).”

Institution Decision 39.

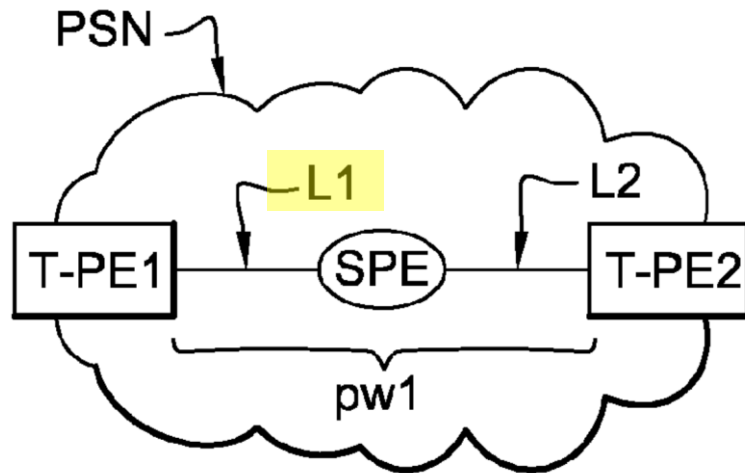
The '775 Patent Itself Contradicts PO's Argument About Interfaces

- Patent Owner: Bocci's multi-segment PWs cannot connect to any interface of an 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.”

Patent Owner Response 40-41.

- The '775 patent itself contradicts PO's argument and explains that multi-segment PWs in Bocci do connect to an interface of an intermediate router:



“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. A first **link L1** that is part of the pseudo-wire pw1 is set up between the first router T-PE1 **and an intermediate router S-PE** of the network PSN.”

Ex. 1001 ('775 Patent) at Figure 1; see also Reply 22.

Ex. 1001 ('775 Patent) at 1:53-2:2; see also Reply 22.

Kamite's First Link Is Not a Single Pseudo-Wire

- Patent Owner misrepresents Petitioner's position:

“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 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.”

Patent Owner Response 45.

- Reply:

“[T]hat connection is not a component pseudo-wire—*i.e.*, an individual pseudo-wire that starts at PE11₁ and ends at P12₁—it is a segment of larger pseudo-wires that span the entire network in Figure 10. EX1042 ¶35. **Juniper *never asserted* that it was a component pseudo-wire and that is not supported by Kamite either.** The link between PE111 and P121 therefore does not ‘include[] only one pseudowire’ as PO contends. POR 45.”

Reply 29.

Cisco: If Point-to-Multipoint PWs Infringe, then They Also Invalidate

“Cisco makes, uses, sells, and/or offers to sell in the United States, and/or imports into the United States products that directly infringe the '775 Patent, including the above identified Cisco Accused Products that use VPLS LSM such as **ASR 9000 Series routers** and any other products with similarly functionality.”

“The computer code comprises instructions for implementing a method of automatically configuring at least two pseudo-wires able to broadcast a data stream when said program is executed by a computer. Starting at least with IOS XR Release 5.1, the ASR 9000 Router implements Label Switched **Multicast** with **point-to-multipoint** traffic engineering (P2MPTE) for delivering broadcast, multicast and certain unicast streams to a VPLS domain using pseudo-wires.”

Ex. 1033 (*Monarch v. Cisco Complaint*) ¶¶ 120, 123.

“[Problem] In the prior art, the value of a VC label used by an upstream PE is different for each downstream PE, making it impossible to forward pseudo wire traffic using a **multicast** tunnel.

[Solution] The present invention proposes a method in which a PE is provided with a reservation management function for VC labels, a set label value range is reserved for each **multipoint connection group** that constitutes a VPN, VC label values are derived in downstream PEs according to predetermined rules that are set so that the derivation results are the same as those for other downstream PEs, and those results are advertised to the upstream PE.”

Ex. 1041 (*Kamite*) at 1; see also *Petition 66*; *Reply 28*.

Patent Owner Forfeited Responding to the *Cisco* Argument

- Patent Owner did not address Petitioner’s *Cisco* argument in the POR, and it is waived:

“Again, PO does not dispute any of this and therefore forfeits a response. *Google*, IPR2022-00473, Paper 25, at 44.”

Reply 28.



“Patent Owner also argues that ‘if Ehlers provides outside temperature information as alleged by Petitioner, there would be no need to provide outside temperature measurements localized by ZIP code.’ PO Sur-reply 25. First, Patent Owner forfeited this argument by not raising it in the Patent Owner Response. See Paper 8, 8 (Scheduling Order) (‘Patent Owner is cautioned that any arguments not raised in the response may be deemed waived.’).”

Google LLC v. Ecofactor, Inc., IPR2022-00473 (PTAB Aug. 1, 2023), Paper 25, at 44.

Patent Owner's *Cisco* Response Is Also Wrong

“Instead, Patent Owner’s complaint against Cisco showed that in Cisco’s accused system, two pseudowires share the same link because they connect to the same interface on the input router and the same interface on the intermediate router. The complaint even identifies the specific shared interfaces *by their IP addresses*: the shared interface on the PE1 router (the input router) is 209.165.200.225 and the shared interface on the P router (the intermediate router) is 209.165.200.226. EX1033 at ¶¶133-135.”

Patent Owner Sur-Reply 12.

Patent Owner's *Cisco* Response Is Also Wrong

- *Cisco* Complaint:

130. According to the Cisco Configuration guidance, P2MP pseudo-wires are automatically created by the Cisco 9000 Series Router between PE-1, PE-2, and PE-3 with a P router (P-4) configured as an intermediate (or bud) node. Because P2MP pseudo-wires are unidirectional, a separate P2MP pseudo-wire may be created in each direction if traffic is two-way.

The P2MP tunnels are auto-discovered tunnels. Static P2MP tunnels are not supported. Static tunnel configurations are not used. The auto P2MP tunnel configuration must be enabled on all of the PE routers and also on a P router if it acts as a bud node. A bud node is a midpoint and tailend router at the same time.

A sample topology with configuration is shown here. In this topology, P2MP PWs are created between the three PEs and a P router which acts as a bud node. All three PE routers act as Head (for ingress traffic) and Tail (for egress traffic).

ASR 9000 Overview at 5-6. During auto-configuration, the PE1 router is connected to the P router.

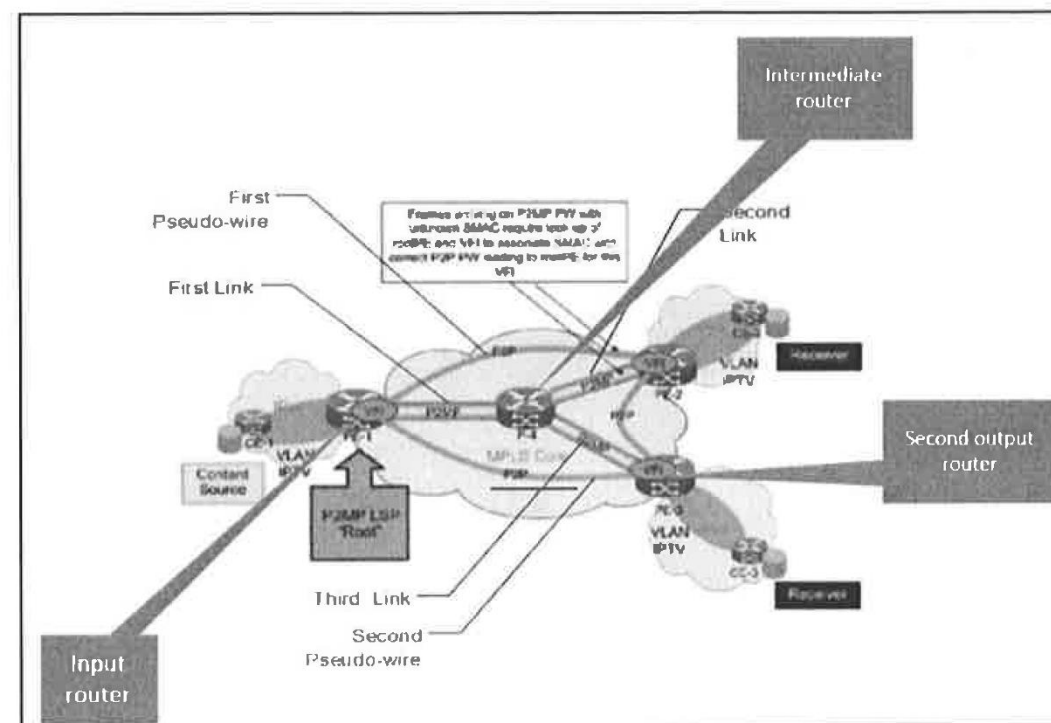
PE1 Configuration	P Configuration
<pre>RP/0/RSP0/CPU0:PE1#show run hostname PE1 interface GigabitEthernet0/1/1/0 description connected P router ip address 209.165.201.1 255.255.255.224 transceiver permit all</pre>	<pre>RP/0/RSP0/CPU0:P#show run hostname P interface GigabitEthernet0/1/1/0 description connected to PE1 router ip address 209.165.201.2 255.255.255.224 transceiver permit all</pre>

ASR 9000 Overview at 6–8. During auto-configuration, the PE bud node router is connected to the PE2 router as a second link.

PE2 Configuration	P Configuration
<pre>RP/0/RSP0/CPU0:PE2#show run hostname PE2</pre>	<pre>RP/0/RSP0/CPU0:P#show run hostname P</pre>
<pre>interface GigabitEthernet0/3/0/3 description connected to P router ip4 address 209.165.201.62 255.255.255.254 frame-relay permit pld all</pre>	<pre>interface GigabitEthernet0/1/1/3 description connected to PE2 router ip4 address 209.165.201.61 255.255.255.254</pre>

ASR 9000 Overview 8–10.

131. As described above, the first output router is PE-2, the second output router is PE-3, the bud PE is the intermediate router (P-4), and the input router is PE-1.



ASR 9000 Overview at 4 (annotations added).

Ex. 1033 (Cisco Complaint) ¶¶ 130-131.

Patent Owner's *Cisco* Response Is Also Wrong

- Cisco* Complaint:

133. The Cisco Configuration Guide shows the configuration of the underlying P2MP sub-LSP and pseudo-wires (Bridge Domain – L2VPN) confirming the link between the input router and Intermediate router is used for both the pseudo-wires terminating at the PE2 and PE3 and traversing the intermediate, a.k.a. bud, router. The Loopback addresses are (identifying only the last octate):

PE1: -.225
P: -.226
PE2: -.227
PE3: -.228

```
RP/0/RSP0/CPU0:PE1#show l2vpn bridge-domain

List of VFI's:
VFI bgl_bdl_vfi (up)
P2MP: RSVP-TE, BGP, 1, Tunnel Up
Neighbor 209.165.200.226 pw-id 1, state: up, Static MAC address
Neighbor 209.165.200.227 pw-id 1, state: up, Static MAC address
Neighbor 209.165.200.228 gw-id 1, state: up, Static MAC address
RP/0/RSP0/CPU0:PE1#
```

ASR 9000 Overview at 14.

134. The PE1 pseudo-wire paths are to the P router destination (209.165.200.226), the PE2 router destination (209.165.200.227) and to the PE3 router destination (209.165.200.228).

```
RP/0/RSP0/CPU0:PE1#show mpls traffic-eng tunnels p2mp

Name: tunnel-mt100 (auto-tunnel for VPLS (l2vpn))
  Signalled-Name: auto_PE1_mt100
Destination summary: (3 up, 0 down, 0 disabled) Affinity: 0x0/0xffff
Auto-bw: disabled
Destination: 209.165.200.226
  State: Up for 00:32:35
  Path options:
    path-option 10 dynamic [active]
Destination: 209.165.200.227
  State: Up for 00:25:41
  Path options:
    path-option 10 dynamic [active]
Destination: 209.165.200.228
  State: Up for 00:22:55
  Path options:
    path-option 10 dynamic [active]
```

ASR 9000 Overview at 17-18.

As Bocci Confirms, Pseudo-Wires Can Be Implemented Over Tunnels

“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”

Patent Owner Response 12-13.

“This document extends the architecture in RFC 3985 to enable pseudo wires to be extended through multiple PSN tunnels. Use cases for multi-segment pseudo wires, and the consequent requirements, are defined in [3].”

Ex. 1031 (Bocci) at 3; see also Reply 30.