

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.,
Petitioner

v.

ORCKIT CORPORATION,
Patent Owner

IPR2023-00402
U.S. Patent No. 8,830,821

**PETITIONER'S REPLY
TO PATENT OWNER'S RESPONSE**

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PETITIONER'S EXHIBIT LIST

Ex.1001	U.S. Patent No. 8,830,821 to Cohn et al.
Ex.1002	Prosecution History of U.S. 8,830,821
Ex.1003	Declaration of Dr. Henry Houh under 37 C.F.R. § 1.68
Ex.1004	<i>Curriculum Vitae</i> of Dr. Houh
Ex.1005	U.S. Patent Publication No. 2004/0205239 to Doshi et al. ("Doshi")
Ex.1006	"Definitive MPLS Network Designs," by Guichard et al., Cisco Press, 2005 ("Guichard")
Ex.1007	U.S. Patent Publication No. 2003/0117950 to Huang ("Huang")
Ex.1008	"MATE: MPLS Adaptive Traffic Engineering" by Elwalid et al., IEEE, 2001
Ex.1009	"Traffic Engineering with MPLS," by Osborne et al., Cisco Press, 2003
Ex.1010	"Fast Network Re-optimization Schemes for MPLS and Optical Networks" by Bhatia et al., 2006
Ex.1011	RFC3209
Ex.1012	Complaint, <i>Orckit Corporation v. Cisco Systems, Inc.</i> , Civil Action No. 2:22-cv-276-JRG-RSP (E.D. Tex, Jul. 22, 2022)
Ex.1013	Federal Court Statistics
Ex.1014	Proposed Docket Control Order, <i>Orckit Corporation v. Cisco Systems, Inc.</i> , Civil Action No. 2:22-cv-276-JRG-RSP (E.D. Tex, Dec. 2, 2022)
Ex.1015	Infringement Contentions, <i>Orckit Corporation v. Cisco Systems, Inc.</i> , Civil Action No. 2:22-cv-276-JRG-RSP (E.D. Tex, Nov. 3, 2022)
Ex.1016	U.S. Patent Publication No. 2028/0155257

Ex.1017	U.S. Patent No. 7,624,142
Ex.1018	U.S. Patent Publication No. 2006/0015781
Ex.1019	Definitive MPLS Network Designs Guichard, Copyright Public Record(s)
Ex.1020	Definitive MPLS Network Designs Guichard, Library of Congress Record(s)
Ex.1021	Internet Archive Capture of Amazon.com, Definitive MPLS Network Designs (Guichard)
Ex.1022	RFC3272
Ex.1023	"Multiprotocol Label Switching (MPLS) Traffic Engineering," Cisco IOS Release 12.0(5)
Ex.1024	IETF "Multiple Metrics for Traffic Engineering with IS-IS and OSPF," Fedyk et al.
Ex.1025	U.S. Patent Publication No. 2011/0141877 to Xu et al., ("Xu")
Ex.1026	U.S. Patent No. 5,699,403 to Ronnen ("Ronnen")
Ex.1027	RFC2026
Ex.1028	U.S. Patent No. 8,102,774
Ex.1029	U.S. Patent Publication No. 2007/0201513
Ex.1030	RFC3469
Ex.1031	U.S. Patent No. 6,980,906
Ex.1032	U.S. Patent No. 7,502,884
Ex.1033	U.S. Patent No. 7,197,418
Ex.1034	U.S. Patent Publication No. 2006/0250948

Ex.1035	U.S. Patent Publication No. 2007/0047469
Ex.1036	U.S. Patent Publication No. 2006/0291391
Ex.1037 (NEW)	Deposition Transcript of Mr. Gomez
Ex.1038 (NEW)	Second Declaration of Dr. Henry Houh under 37 C.F.R. § 1.68
Ex.1039	<i>Reserved</i>
Ex.1040 (NEW)	U.S. Patent Publication No. 2001/0012295
Ex.1041 (NEW)	U.S. Patent Publication No. 2001/0017723
Ex.1042 (NEW)	RFC 2105
Ex.1043 (NEW)	<i>Linear Protection Switching in MPLS-TP</i>; MPLS Working Group; July 12, 2010
Ex.1044 (NEW)	<i>What is the difference between 1+1 and 1:1 protection</i>; Optical Tech Articles; September 4, 2006
Ex.1045 (NEW)	U.S. Patent Publication No. 2002/0016937

I. Introduction

Patent Owner's Response ("Resp.," Paper 22) argues that the prior art does not teach various limitations and that there is no motivation to combine the teachings of the prior art references with a reasonable expectation of success. For the detailed reasons discussed below, the Board should find all challenged claims unpatentable.

II. Claim construction

A. "*selecting...*"

Patent Owner does not expressly construe this term, but nonetheless contends that "*selecting an entity pair...*" recited in "**claim[] 1 [and 17]...requires selecting from the total number of potential paths associated with 'said plurality' of entities.**" Resp. 28, 30. Patent Owner contends that this excludes selecting from a "subset of transport entities." Resp. 25-26, 28. Patent Owner's implicit claim construction should be rejected because (1) it is contrary to claim language and (2) excludes embodiments in the specification.

First, dependent claim 9 confirms that "*selecting...*" is not so limited by reciting "***selecting a subset of entity pairs...*[and]...*selecting an entity pair from said subset....***" Ex.1001, 8:22-30. Thus, the scope of independent claim 1 "includes selecting an entity pair from a subset of entity pairs." Ex.1038, ¶5.

Second, Patent Owner's implicit construction would exclude an embodiment in the specification. In Figure 4C (below), the '821 patent discloses an embodiment where an **“entity pair is selected from a subset.”** See Ex.1001, 5:56-66.

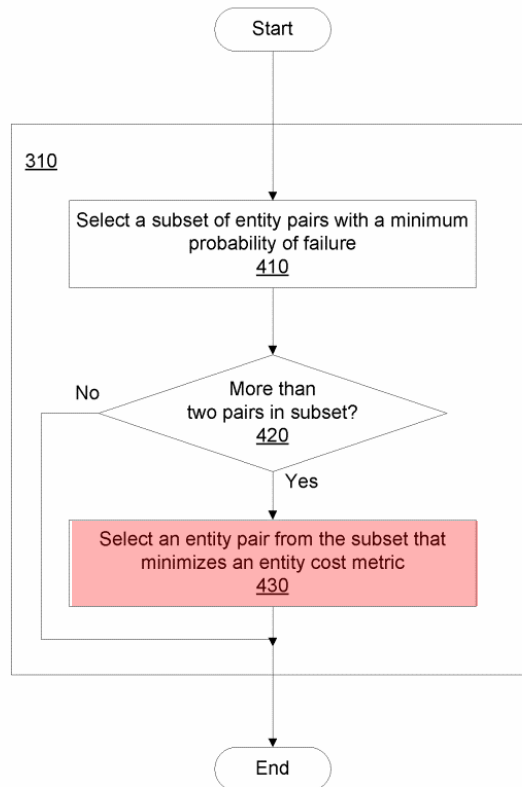


FIG. 4C
Ex.1001, Fig. 4C (annotated).

Patent Owner's declarant, Mr. Gomez, agreed that the Fig. 4C embodiment is within the scope of claim 1. Ex.1037, 152:18-25 ("Claim 1 includes... selecting an entity pair from the plurality of transport entities.... So that is part of what also 4C does."). Dr. Houh agrees that "the scope of claim 1 includes the '821 patent's

embodiment of Figure 4C.” Ex.1038, ¶¶6-8. Interpreting claim 1 to exclude the subset-selection embodiment of Fig. 4C would be error. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583-84 (Fed. Cir. 1996); *Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1305 (Fed. Cir. 2007).

In view of the claim language and the '821 patent's specification, the Board should construe “*selecting an entity pair from said plurality of transport entities based at least in part upon said overall cost*” according to its plain meaning, which includes selecting an entity pair from a subset. Ex.1038, ¶9.

B. “*working entity*” and “*protection entity*”

Patent Owner does not provide an express claim construction for “*working entity*” and “*protection entity*” as recited in claim 14. *See Resp. generally.* Patent Owner, however, implicitly construes the term “*protection entity*” as an entity that is not “actively transmitting and receiving.” Resp. 51-52. The Board should not adopt Patent Owner's implicit construction because it is contrary to the '821 patent's disclosure. Ex.1038, ¶10.

The '821 patent describes using “elements used for MPLS-TP linear protection scheme,” described in “IETF draft-zulr-mpls-tp-linear-protection-switching.” Ex.1001, 1:58-61, 3:20-22. The MPLS-TP linear protection scheme draft contemplates supporting “**1:n architecture**” for the protection entity. Ex.1043, 5. As Dr. Houh explains, “a POSITA would have understood that in 1:n

architecture there is one protection entity that is shared among n working entities.”

Ex.1038, ¶11; Ex.1044, 2 (“An architecture in which any of the n working channels can be bridged to a single protection line.”). Dr. Houh further explains that “the protection entity may be actively transmitting and receiving traffic if one working entity fails, while still acting as the protection entity for the remaining n-1 working entities.” Ex.1038, ¶11. Thus, the ’821 patent contemplates that the protection entity may be capable of actively transmitting and receiving network data for multiple working entities. Accordingly, the Board should not adopt Patent Owner’s implicit construction because it would exclude one of its own embodiments. *See Vitronics* 90 F.3d 1583-84; *Verizon Servs.*, 503 F.3d 1305.

Petitioner does not believe that the terms “*working entity*” and “*protection entity*” need construction for the purposes of the proceeding. However, if the Board determines that a construction is needed, Petitioner submits that the term “*working entity*” should be construed as “an entity that actively carries network traffic” and the term “*protection entity*” should be construed as “an entity intended to carry network traffic of a working entity if that working entity fails.” *See* Ex.1001, 1:51-53, 5:22-25; Ex.1038, ¶12.

III. Doshi teaches “*selecting an entity pair from said plurality of transport entities based at least in part upon said overall cost.*” ([1.3], [17.1])

Patent Owner incorrectly asserts that Doshi does not disclose “selecting...” in claims 1 and 17. *See* Resp. 25-33; §II, *supra*.

A. Doshi teaches “*selecting...*” under the plain ordinary meaning.

The Petition explained how Doshi teaches the “*selecting*” step under its plain and ordinary meaning. Pet. 35. Patent Owner does not dispute Doshi’s teachings under the plain and ordinary meaning. If the Board rejects Patent Owner’s claim construction arguments, the Petition’s analysis of “*selecting*” is unrebutted.

B. Doshi teaches “*selecting...*” under Patent Owner’s construction.

Patent Owner argues, under its implicit construction, that Doshi does not teach this limitation because Doshi selects from a “**subset of the candidate pairs associated with said plurality of entities.**” Resp. 28. In support, Patent Owner creates a “numerical example...[of] a plurality of 10 MPLS entities between two network nodes.” *See* Resp. 29-31. Based on this example, Patent Owner contends that “Doshi requires that the total number of available pairs does not exceed the total number of available candidate paths” where as in “claim 1 of the ’821 Patent...the number of pairs associated with a set of entities (i.e., a plurality) always exceeds the number of entities.” Resp. 29-30; *see also* Resp. 25-33. These arguments do not distinguish Doshi’s selection for the reasons discussed below.

Ex.1038, ¶14.

The claim recites a “*plurality*” of MPLS entities, which both parties agree includes three MPLS entities. Ex.1038, ¶14; Ex.1037, 139:7-22. Both declarants also agree that in the context of the claim, a “POSITA [may] treat pairs as interchangeable, irrespective of their designation as primary/protection paths.” Ex.1038, ¶14; Ex.2025, ¶70. According to Patent Owner's Mr. Gomez, Doshi's number of entity pairs may be equal to the number of MPLS entities. *See* Ex.2025, ¶68 (“Doshi requires that the...pairs does not exceed...candidate [MPLS] paths”). Consequently, when there are 3 MPLS entities, both Doshi and the '821 patent contemplate selecting from 3 entity pairs (e.g., Pair1=LSP1, LSP2; Pair2=LSP1, LSP3; Pair3=LSP2, LSP3). Ex.1038, ¶14. Accordingly, Doshi is not distinguished when considering an example with three MPLS entities. *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1002 (Fed. Cir. 2016) (“[C]ombinations... that sometimes meet the claim elements are sufficient to show obviousness.”)

Second, Patent Owner argues that Doshi's selection is not from “*said plurality*,” because allegedly, the “selection process curbs the size of the candidate selection set and is effectively a shortcut compared to the selection required by claim 1.” Resp. 31. According to Patent Owner, Doshi's selection is made from a “a subset of the total provided paths” and “does not disclose selecting a restoration path from the same plurality of transport entities as the primary paths.” Resp. 31-

32. This argument fails. Ex.1038, ¶15.

Doshi meets the limitation since the primary and restoration path pairs are selected from the candidate pairs of the provided MPLS LSPs. Pet. 25-31. In the context of Figure 11, Doshi teaches selecting from every possible path pair via the combination of steps 1104 and 1106. In step 1104, a “minimum-cost restoration path” is selected for every one of the K primary paths. Ex.1005, [0143], Figs. 10, 11. As such, in step 1104 for one primary path, Doshi's process considers (K-1) potential restoration paths. By repeating step 1104 for each of the K primary paths, Doshi's process identifies K primary/restoration path pairs. Then, in step 1106, for each pair identified at step 1104, Doshi's process computes the total primary-plus-restoration path cost. At step 1108, Doshi's process selects the pair having the lowest total path cost. As such, contrary to Patent Owner's assertion, Doshi is not taking any shortcuts—it is breaking the selection process into smaller steps. Every possible pair is still evaluated and potentially selectable based on cost. Thus, Doshi's candidate pairs are from the same plurality of MPLS entities. Ex.1038, ¶16.

Third, with respect to Doshi's disjoint path pair selection, Patent Owner similarly argues that “Doshi fails to disclose a selection from said plurality of entities.” Pet. 35-36; Resp. 32. Patent Owner contends that Doshi's teachings fail “[b]ecause the disjoint path pairs are **necessarily** a subset of the total number of

path pairs (since **not all pairs are disjoint**), this selection likewise is made from a number of candidate paths that is less or equal than the plurality.” Resp. 33.

Notably, Patent Owner's Mr. Gomez contradicted the alleged necessity, testifying that it is “possible for a network to be structured such that **all entity pairs are disjoint**.” Ex.1037, 212:1-12. Dr. Houh agrees. Ex.1038, ¶17. Since Patent Owner's argument is limited to the circumstance where “not all pairs are disjoint,” it is undisputed that where all pairs are disjoint, Doshi's selection would meet the claimed limitation. Further, Patent Owner ignores Doshi's express disclosure of that “**primary and protection paths...are selected from the plurality of candidate path pairs**” “**as the overall minimum-cost pair**.” Ex.1005, [0014], [0142]-[0145], Fig. 11; Pet. 25-31, 35-39.

IV. Doshi teaches “*digital logic configured to select...*” ([14.4])

Patent Owner argues that “Petitioner's challenge as to claim 14 fails for the same reasons as for claims 1 and 17.” Resp. 33-34. Therefore, for the same reasons discussed above, the prior art teaches this limitation recited in claim 14. *See also* Pet. 78-80.

V. The prior art renders “*if an entity pair reselection event occurs, reselecting said entity pair from the group consisting of said entity pair and a replacement entity pair comprising at least one entity distinct from the entities of said entity pair.*” ([1.4], [17.4])

The Petition explained that the combination of Doshi and Guichard renders obvious reselecting the entity pair if a reselection event occurs. Pet. 40-45. Patent Owner argues that (1) there is no reason to combine Guichard with Doshi (Resp. 34-44), and (2) there is no reasonable expectation of success (Resp. 44-47). Both arguments are meritless.

A. There are numerous reasons to combine.

The Petition provided ample reasons to combine Guichard's teachings with Doshi. *See e.g.*, Pet. 20-23. The Petition explained that Guichard teaches that it is “highly desirable” to detect better paths and that “[a] POSITA would have been motivated to perform reoptimization evaluations, as taught by Guichard, when implementing Doshi's pair calculation and selection techniques to identify a potentially better LSP (e.g., for primary or protection LSP paths) with an even lower overall minimum-cost.” Pet. 21; *see also* Pet. 22 (“...reoptimization would allow for selecting a shorter path if one becomes available.”). Patent Owner does not dispute (and therefore concedes) these specific reasons to combine. The evidence weighs solely in favor of obviousness.

Notwithstanding the specific reasons to combine (which Patent Owner

ignores), Patent Owner asserts that the motivation to combine “fail as a matter of law” because “[t]he needs for efficiency and reliability” are “generic needs that the Federal Circuit has held insufficient to provide reason to combine.” Resp. 36-37 (citing *Forest Lab 'ys, LLC v. Sigmapharm Lab 'ys, LLC*, 918 F.3d 928, 935 (Fed. Cir. 2019)).

First, the Petition's analysis did not rely on generic efficiency and reliability. Regardless, Patent Owner's declarant conceded that efficiency and reliability were recognized as “very important” product features. Ex.1037, 193:20-195:9; *see also* Ex.1037, 71:25-72:3. Dr. Houh similarly confirms that “efficiency and reliability would have been recognized as important operational characteristics.” Ex.1038, ¶18.

Patent Owner's cited case is readily distinguished on its facts. Resp. 36-37. *Forest Laboratories* is a pharmaceutical case (a notoriously unpredictable art) where petitioner argued for “a generic need for more antipsychotic treatment options.” *Forest*, 918 F.3d at 935. Here, Petitioner does not argue for a “generic need for more... options,” but instead identified specific aspects for improvement. Moreover, “a rationale is not inherently suspect merely because it's generic in the sense of having broad applicability or appeal.” *See Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 797 (Fed. Cir. 2021); *see also Dystar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick*, 464 F.3d 1356, 1368 (Fed. Cir. 2006) (a

combination is obvious where the resulting product or process “is stronger, cheaper, cleaner, faster, lighter, smaller, more durable, or more efficient.”).

Second, Patent Owner improperly argues the references individually. Resp. 38 (“...Doshi omits the reoptimization technique taught in Guichard.”). “The question in an obviousness inquiry is whether it would have been obvious to a person of ordinary skill in the art to combine the relevant disclosures of the two references, not whether each individual reference discloses all of the necessary elements.” *Game & Tech Co. v. Wargaming Grp. Ltd.*, 942 F.3d 1343, 1352 (Fed. Cir. 2019).

Here, the Petition provided articulated reasoning based on rational underpinning to support combining Guichard and Doshi. *See* Pet. 20-23. For example, the Petition explained that the combination would detect better LSP paths that may be used reduce overall cost in Doshi's system. Pet. 21. Ex.1006, 79. Dr. Houh testified that “Guichard complements Doshi by teaching how to reoptimize an LSP selection” when the “[n]etwork state keeps changing.” Ex.1003, ¶¶ 60-66 (citing additional references). Patent Owner does not dispute that networks' states change, such that it is “highly desirable to detect the existence of” network state changes, or that Guichard teaches how to optimize (and reoptimize) LSP selection in such conditions. Ex.1006, 79. Accordingly, there is motivation to combine when a known technique “has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same

way.” *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 797 (Fed. Cir. 2021) (*citing KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007)).

Patent Owner contends that Doshi teaches protection mechanisms while Guichard teaches reoptimization mechanisms. Patent Owner further contends that “combining such recovery mechanisms requires ‘extra care to avoid ... a lack of optimality in terms of backup resources.’” Resp. 38-39. To the contrary, Guichard teaches that it may be “**be desirable to elect to use a combination of recovery mechanisms**” and that any lack of optimality can be “**avoid[ed]**.” Ex.2028, 96. Indeed, Patent Owner’s Mr. Gomez agreed that in a “narrow set of cases, it might be desirable” to combine multiple recovery mechanisms. Ex.1037, 167:3-12. To the extent that Doshi and Guichard are characterized as describing distinct recovery mechanisms (which Petitioner does not agree with), Guichard and Mr. Gomez confirm that combining protection and reoptimization mechanisms would have been recognized as desirable. Ex.1038, ¶¶19-20.

Patent Owner’s unsubstantiated assertions regarding alleged “significant costs and tradeoffs” fail because any lack of optimality can be “avoid[ed],” as Guichard teaches. Resp. 39; Ex.2028, 96. And even if there were tradeoffs, “[i]t’s not necessary to show that a combination is the best option, only that it be a suitable option.” *Intel Corp. v. Pact XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023); *see also* Ex.1038, ¶21.

Third, Patent Owner contends that there is no “reason for adapting that combination to practice reselection with respect to entity pairs.” Resp. 40-44. According to Patent Owner, the combination fails because “to the extent that a POSITA were to adapt Doshi to practice reoptimization (or reselection) that reoptimization would occur with respect to individual entities in a pair.” Resp. 41. That is, “reoptimization would be used only with respect to the primary path.” Resp. 41. This argument lacks merit. Ex.1038, ¶22.

As an initial matter, claim 1 recites that the “*replacement entity pair*” requires just “*one entity distinct from the entities of said entity pair.*” As Dr. Houh explains, “[i]n the instance where the primary path is reoptimized (e.g., because there is a new better LSP path), the reselection per the proposed combination would still meet the claim since reselecting the entity pair would be from the original entity pair and a replacement entity pair comprising a new primary LSP path.” Ex.1038, ¶23.

Additionally, Patent Owner ignores the Petition, which explained, with citation to Dr. Houh's declaration, that in “implementing the combination with Doshi, a POSITA **would have evaluated any restored and new LSPs along with all existing LSPs (including the currently utilized LSP pair) by repeating Doshi's candidate pair cost determination and selection techniques**” to select the overall-minimum cost LSP pair. Pet. 40-45; Ex.1003, ¶119. As Dr. Houh

explains, “[b]ecause Doshi’s candidate pair cost determination and selection techniques are repeated, all possible LSP pair combinations of would be evaluated and an LSP pair that provides the overall minimum-cost would be selected.”

Ex.1038, ¶24; *see also* Pet. 30-42.

Furthermore, Patent Owner’s arguments about “significant tradeoffs” (Resp. 42-43) and “heuristics” ignores that a combination need not result in the best option to render the claims obvious. *Intel*, 61 F.4th at 1380. Patent Owner also ignores that Xu’s “heuristics” discussion is limited to NP-hard problems, which do not apply to the proposed combination of Doshi and Guichard. Resp. 43; Ex.1025, [0057], [0097], [0113]; Ex.2027, 157:16-158:2; Ex.1038, ¶25.

Therefore, the Petition and cited evidence demonstrates that there is motivation to combine Guichard and Doshi.

B. There is a reasonable expectation of success.

The Petition explained that the results would have been predictable and there would have been a reasonable expectation of success in the combination of Guichard and Doshi. Rep. 22-23. Patent Owner also concedes that Guichard gives “guidance on the types of tools that can be used for reoptimization of a primary path,” further evidencing expectation of success. Resp. 45.

Notwithstanding the ample evidence, Patent Owner contends that there is no evidence that “combining disparate elements from these two families would work

successfully” and that “Guichard teaches against a system combining reoptimization with precomputed protection paths.” Resp. 44-45. These assertions are baseless. As noted, Guichard recognizes the “**desirab[ility]...[of] use[ing] a combination of recovery mechanisms.**” Ex.1006, 79; Ex.2028, 96; *see also* Ex.1037, 167:3-12. Guichard also supports a reasonable expectation of success by teaching a POSITA “to avoid race conditions between recovery mechanisms and double protection.” Ex.2028, 96. Dr. Houh testifies that “a POSITA would have had a reasonable expectation of success, including avoiding any race conditions, when implementing the combination of Guichard and Doshi.” Ex.1038, ¶¶20, 26.

The Petition also provided evidence of other prior art systems that reoptimized paths. Pet. 22-23. Patent Owner does not dispute (and therefore concedes) that these references show that reoptimization was successfully performed. Patent Owner also concedes that Ex.1034 describes reoptimization in the context of a protection system. Resp. 46. As Dr. Houh testifies, “POSITAs had the technical capabilities to perform path reoptimization generally, including in the context of protection systems.” Ex.1038, ¶26.

The Petition further explained that “the combination would be within a POSITA’s skillset since Doshi already sets forth the calculation and selection techniques that would be utilized during the reoptimization evaluation” and that “Doshi is already ‘monitoring and updating...network topology’” and

contemplates “[v]arious modifications of the described embodiments.” Pet. 23.

Patent Owner does not dispute (and therefore concedes) these facts.

Rather than addressing the Petition's evidence, Patent Owner argues that “Doshi contains some techniques that might work without reoptimization” and therefore “cannot possibly provide a POSITA with a reasonable expectation that the same techniques would work in the context of the Doshi/Guichard combination.” Resp. 47. Patent Owner's argument again fails because it argues the references individually instead of addressing the combination of references relied upon in the Petition. Patent Owner also concedes that in certain circumstances (e.g., where Doshi would not work without reoptimization), Guichard's reoptimization teachings would be beneficial. *See Game & Tech* 942 F.3d at 1352. Further, Patent Owner's assertion of no reasonable expectation of success in “[p]erforming the same computations repeatedly in response to state changes” is illogical. Resp. 47. As Dr. Houh testifies, “there is nothing unpredictable about performing the same computations repeatedly.” Ex.1038, ¶27.

Therefore, the evidence demonstrates that there would have been a reasonable expectation of success in combining Guichard and Doshi.

VI. Obviousness of “*logic configured to determine a probability of concurrent failure of said working entity and said protection entity.*” ([14.4])

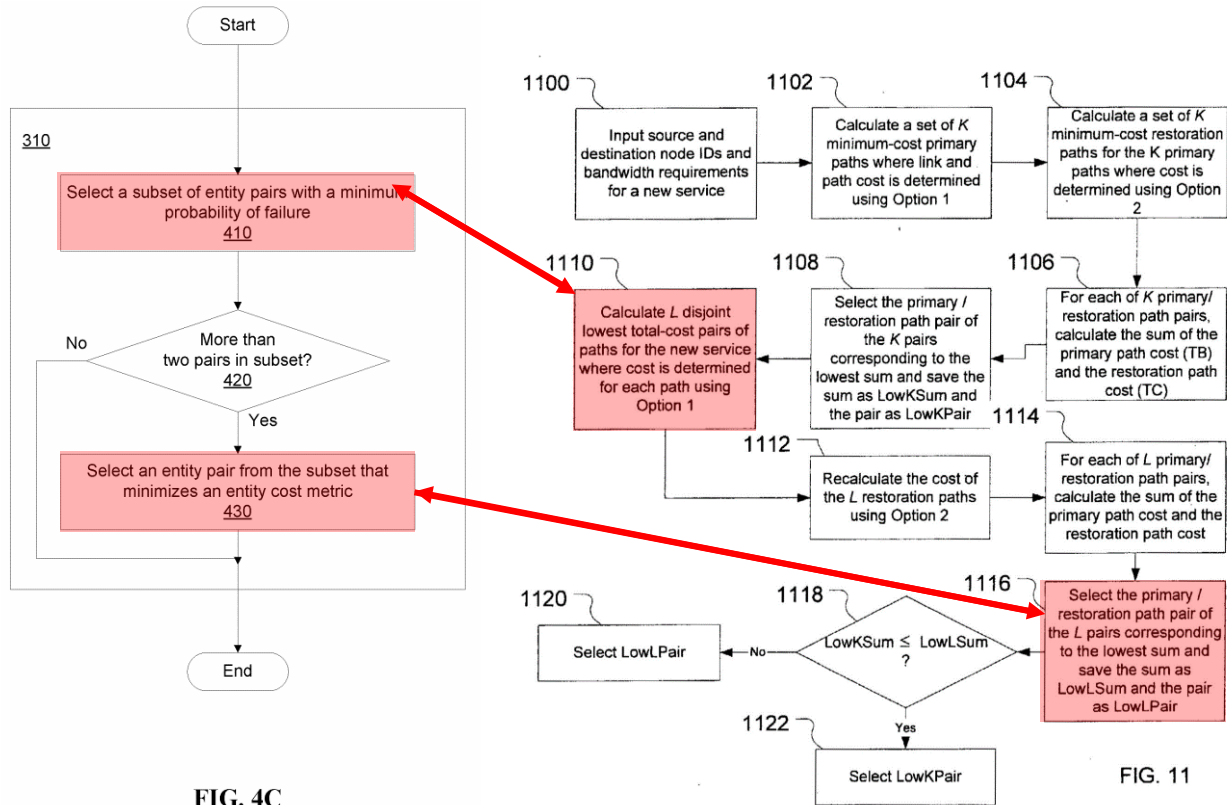
A. Doshi teaches “*logic configured to determine a probability of concurrent failure...*”

The Petition explained that Doshi's digital logic for performing the flowchart of Figure 11 discloses “determine[es] path disjointedness” discloses “*logic configured to determine a probability of concurrent failure*” since paths that are strictly disjoint have “very insignificant” probability of simultaneous failures. Pet. 80-81.

Patent Owner argues that “Doshi teaches a POSITA to ignore the probability of failure” while “the '821 Patent discloses that the probability of failure is a factor in the claimed cost determination for the entity pairs.” Resp. 49-51. This is wrong. Doshi plainly considers the probability of simultaneous failure as part of its pair calculations and selection process of Figure 11. Doshi's utilizes one calculation (LowKSum) that is based on shared paths (which have a higher probability of joint failure) and another calculation (LowLSum) for disjoint paths (with “very insignificant” probability of joint failure). Ex.1038, ¶28.

The similarities of Doshi's process of Figure 11 and the '821 patent's method of Figure 4C is demonstrated in the below side-by-side comparison, where both determine a subset of entity pairs with a minimum probability of failure (e.g.,

disjoint pairs) (Ex.1001, 5:55-66, 8:22-30, Ex.1005, [0056], [0144]) and ultimately select the lowest cost pair. Ex.1038, ¶29.



Ex.1001, Fig. 4C (annotated).

Ex.1005, Fig. 11 (annotated).

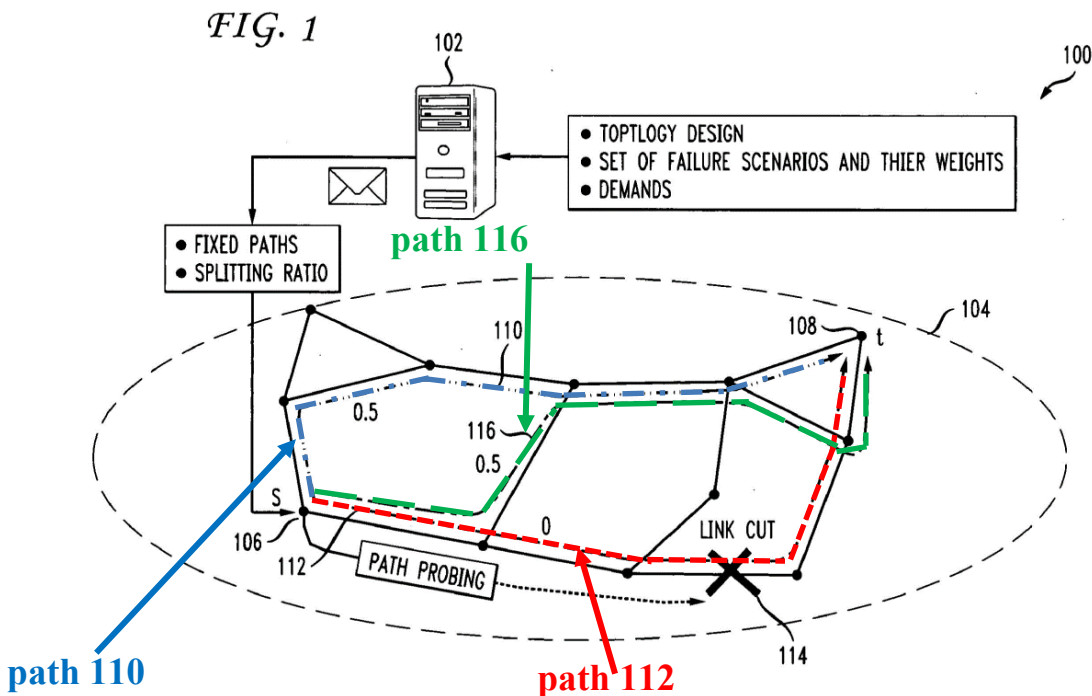
Therefore, Doshi's disclosure of selection logic configured to perform the method of Figure 11, including logic to determine disjoint pairs that have "very insignificant" probability of simultaneous failures, teaches this limitation. Ex.1038, ¶30.

B. Doshi and Xu render obvious “*logic configured to determine a probability of concurrent failure...*”

Xu discloses digital logic that models failure states in which the failure may affect two paths simultaneously. Each modeled failure state has a predetermined probability of occurrence, which in combination with Doshi, renders obvious this limitation. Pet. 81-82.

First, Patent Owner argues—incorrectly—that Xu does not disclose a “*working entity*” and a “*protection entity*.” Resp. 51-52. Patent Owner’s contention that in Xu “each path [is]... a ‘working entity,’” concedes that Xu discloses a “*working entity*.” Patent Owner’s argument that Xu does not disclose a “*protection entity*” because each path “is constantly transmitting and receiving traffic,” is based on an improper implicit construction and therefore fails. *See* §II.B, *supra*. As Dr. Houh testifies, “the mere fact that a path in Xu may (or may not) be shared and actively transmitting and receiving traffic does not preclude that path from also acting as a ‘*protection entity*.’” Ex.1038, ¶31.

Additionally, Patent Owner essentially ignores that Xu “combin[es] **path protection** and traffic engineering.” Ex.1025, [0001]. And Xu’s protection path need not actively carry traffic, per the embodiment of Figure 1, reproduced below. Ex.1038, ¶32.



Ex.1025, Fig. 1 (annotated).

Regarding Fig. 1, Xu discloses that “[u]nder normal operating conditions, **traffic is sent via paths 110 and 112,**” without stating that path 116 carries traffic. Ex.1025, [0033]. Once a link has been cut, “as represented by 114, **traffic is immediately redistributed** to the remaining paths, in this example via paths 110 and 116, based on their static configuration.” Ex.1025, [0033]. As Dr. Houh explains, “[a] POSITA would have understood that path 116 corresponds to a ‘*protection entity*’ because at least some traffic from path 112, a ‘*working entity*,’ is redistributed to this path when the link on path 112 is cut.” Ex.1038, ¶33. Accordingly, to the extent “that a ‘*protection entity*’ cannot carry traffic, per Patent

Owner's implicit construction, Xu's path 116 meets that requirement under normal circumstances." Ex.1038, ¶33.

Moreover, Patent Owner ignores that the proposed combination relied on Doshi to teach a "*working entity*" and "*protection entity*." The Petition relied on Xu's teachings to disclose "*determine a probability of concurrent failure*." Pet. 82; Ex.1025, [0030]-[0038]. As such, the Petition relied on the combined teachings to render obvious this limitation. Patent Owner's attempt to argue Xu's teachings individually fails. *See Game & Tech*, 942 F.3d at 1352.

Second, contrary to Patent Owner's contention, Xu does not require "a heuristic (or shortcut) that is used to avoid determining a probability of failure." Resp. 53-54. Xu's heuristics discussion is limited to the context of an "NP-hard" embodiment. Ex.1025, [0057], [0097]; *see also* Ex.1025, [0113] ("[T]his does not imply that the problem...discussed in the present disclosure is NP-hard."). Xu's relied-upon three path embodiment of Figure 1 is not NP-hard. Pet. 81-82; Ex.2027, 157:16-158:2; Ex.1038, ¶34.

Third, Patent Owner argues that Xu "does not disclose a mechanism or logic for determining the probability of concurrent failure of an entity pair" because "Xu's prebaked probabilities are...different from calculating probabilities in a dynamically changing system like an MPLS network." Resp. 54. Contrary to Patent Owner's contention, Mr. Gomez, testified that the claim does not require

“computing” probabilities or “dictate an order” of when the logic is executed.

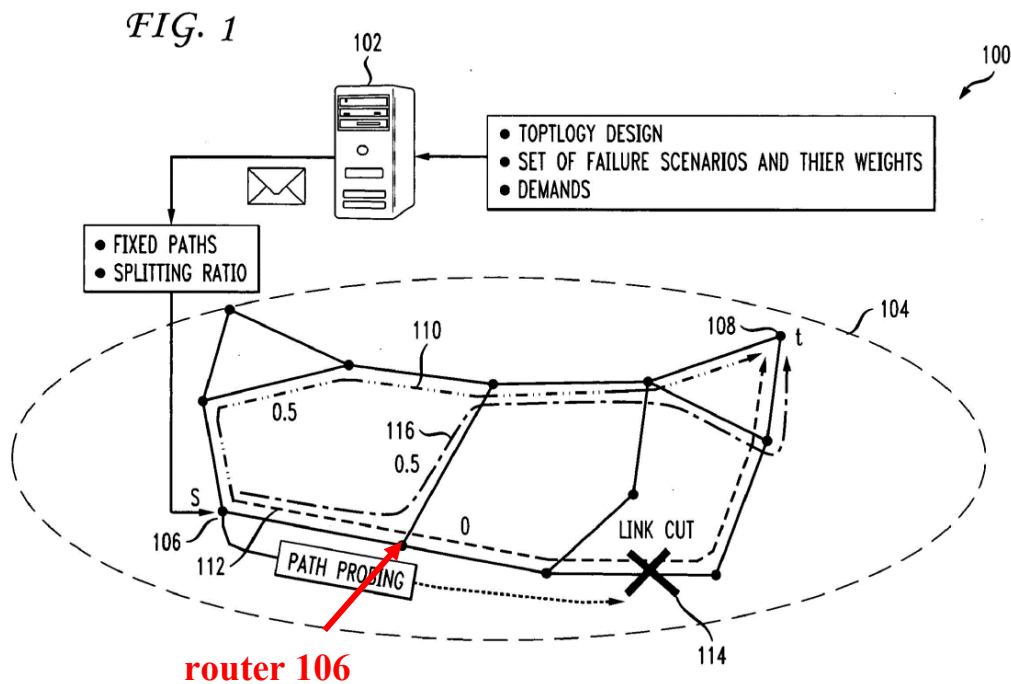
Ex.1037, 173:20-174:22. This argument is also wrong for the reasons discussed below. Ex.1038, ¶35.

According to the '821 patent, “a pair having multiple spans and/or nodes in common may be more likely to simultaneously fail than a pair having no spans or nodes in common.” Ex.1001, 3:47-50. The '821 patent discloses that the “**spans and/or nodes**” “**failure probabilities may be assigned...manually by a network operator based on network knowledge,**” “**vendor-provided,**” and “**infrastructure failure probabiliti[es].**” Ex.1001, 6:20-33. As Dr. Houh explains, “a POSITA would have understood ‘network knowledge,’ ‘vendor-provided probabilities,’ and ‘infrastructure failure probabilities’ to be predetermined probabilities of failure of spans and/or nodes in the concurrent failure probability matrix.” Ex.1038, ¶36. Accordingly, “a POSITA would have understood that in the '821 patent, the network operator assigning failure probabilities of spans and/or nodes (which have been predetermined) configures the probability matrix to determine a probability of simultaneous failure for a pair that has the spans or nodes in common.” Ex.1038, ¶36.

Xu's failure model is similarly configured. Like the '821 patent, Xu discloses that a “**network operator**” inputs potential or planned failure states or scenarios, with each having a “**predetermined probability of occurrence.**”

Ex.1025, [0006], [0033], [0041]. Also like the '821 patent, Xu's failure scenarios apply to **"links or nodes"** that are **"most probable"** to **"cause[] simultaneous failure of multiple upper layer links."** Ex.1025, [0049]. Xu's utilizes the failure scenarios with a "shared vulnerability" to "calculate multiple diverse paths so that at least one of them works for each failure scenario." *See* Ex.1025, [0040]; Ex.1038, ¶37.

As Dr. Houh explains, "in the instance where multiple paths (e.g., working and protection paths) traverse the same node (e.g., router), a POSITA would have understood that a probability of simultaneous failure of the paths that traverse the node corresponds to a probability of failure of the node." Ex.1038, ¶37. For example, illustrated below is Xu's Figure 1, where a failure of router 106 causes paths 112 and 116 (which as discussed above correspond to a "*working entity*" and a "*protection entity*") to also fail. As such, the probability of router 106 failing corresponds to a probability of simultaneous failure of paths 112 and 116.



Ex.1025, Fig. 1 (annotated).

Lastly, Petitioner notes that Mr. Gomez did not dispute that the '821 patent's probability matrix corresponds to a failure model (which is what Xu discloses).

Ex.1037, 189:2-7.

Accordingly, Xu’s failure model corresponds to “*logic*.” The network operator inputting failure scenarios (with a predetermined probability of occurrence) for links and nodes that are shared among different paths, “*configures*” the failure model “*to determine a probability of concurrent failure concurrent failure*” because the probability of failure for shared links and nodes corresponds to a probability of simultaneous failure for a pair that has the links or nodes in common. Ex.1038, ¶40.

Therefore, consistent with the analysis in the Petition, Doshi in combination with Xu renders obvious this limitation.

VII. Doshi teaches “*said step of selecting an entity pair further comprises: selecting a working entity...and...a protection entity from said entity pair.*” ([2.1], [18.1])

The Petition cited Doshi's claim 1, which recites, “**selecting the primary and restoration paths** for the new service **from the plurality of candidate path pairs,**” and as analyzed at limitation [1.3], the selected candidate path pair corresponds to the “*said entity pair.*” Pet. 46-47; Ex.1005, Claim 1; *see also* Ex.1005, [0014]; Ex.1003, ¶¶135-137. The Petition additionally explained that like the '821 patent, Doshi describes “Switching **Between** Working and Protection LSPs” of the entity pair. Ex.1005, [0266]-[0267]. Patent Owner ignores (and therefore concedes) that the cited teachings in Doshi disclose the claimed limitations. Patent Owner's non-responsive arguments fail. Ex.1038, ¶41.

VIII. The prior art renders obvious “*sequentially replacing said working entity and said protection entity...*” ([13.1]).

The Petition, expanding on the analysis at limitations [1.3]-[1.4], explained why it would have been obvious for “the originally selected pair (e.g., a primary LSP and a protection LSP) to be sequentially replaced.” *See* Pet. 59-63; *see also* Pet. 20-22; Ex.1038, ¶¶42-43.

Patent Owner argues that there is no evidence in support of Petitioner's positions. To the contrary, the cited portions of Dr. Houh's declaration show what a POSITA would have understood and known at the time. Resp. 57-60; Ex.1003, ¶¶107-108, 175-179. As Dr. Houh further explains, "the prior art of record demonstrates that it was known to sequentially replace LSPs (referred to as 'make-before-break') during reoptimization, because it was recognized as desirable to maintain the LSP throughout the replacement process to avoid interruption of service." Ex.1038, ¶44 (citing Ex.1011, 12); *see also* Ex.1006, 81; Ex.1010, 251.

Patent Owner also ignores Dr. Houh's confirming testimony during deposition and its own submitted evidence, which further demonstrates that it was common knowledge to sequentially replace LSPs. Ex.2027, 115:1-116:7 (Dr. Houh testifying that "make-before-break" was known in the art); Ex.2028, 81 ("A key property of MPLS TE is its ability to reoptimize a TE LSP along a more optimal path without any traffic disruption."), 388 ("[W]hen a reoptimization evaluation is triggered... each TE LSP to be reoptimized is signaled along the new path in a nondisruptive fashion using the make-before-break procedure."); Ex.2033, 19; Ex.2035, 22; Ex.1038, ¶45. Thus, Patent Owner's arguments to the contrary fail.

IX. The testimony of Mr. Gomez should be given little to no weight.

Mr. Gomez's opinions should be given little or no weight because he does not have the requisite level of skill to testify from the perspective of a POSITA.

The agreed-upon level of ordinary skill requires approximately two years of experience working in the field of network communications and knowledge of MPLS techniques. Pet. 12; Resp. 25; Ex.2025, ¶¶60; Ex.1038, ¶46.

Mr. Gomez does not have the requisite experience or knowledge with MPLS, and therefore his “opinions are neither relevant nor reliable.” *Kyocera Senco Indus. Tools Inc. v. Int’l Trade Comm’n*, 22 F.4th 1369, 1376-77 (Fed. Cir. 2022). Mr. Gomez’s declaration, under the heading “QUALIFICATIONS,” does not mention MPLS and only includes the conclusory statement that he “was at the time of invention, and [is] currently, one of more than ordinary skill in the art through my education and research experience.” Ex.2025, ¶¶6-25. Like the problematic witness in *Kyocera*, Mr. Gomez has some relevant academic training but does not have the required practical working experience. Mr. Gomez’s curriculum vitae lists two pages of technical topics about which he claims “Expertise” or performs “Consulting”—but MPLS is not one of them. *See* Ex.2026, *generally*.

Mr. Gomez testified that he had no working experience on projects involving MPLS:

5 Q. Have you worked on projects
6 involving MPLS?
7 A. Not specifically . . .

Ex.1037, 216:5-7. Mr. Gomez asserted that he became “familiar” with “concepts of MPLS” “early on in the mid ‘90s” when he worked on a “videoconferencing system” where “resources [were] reserved.” Ex.1037, 216:10-217:2; *see also* Ex.1037, 106:15-107:20.

Contrary to Mr. Gomez’s assertion, MPLS did not exist in the “mid ‘90s.” According to Dr. Houh, “IETF first formed a group to work on what became the MPLS standard in 1997. <https://datatracker.ietf.org/wg/mpls/history/>.” Ex.1038, ¶46. Moreover, Mr. Gomez’s alleged work on a “videoconferencing system” where “resources [were] reserved” does not qualify him as a POSITA. As Dr. Houh explains, “MPLS is an industry-standardized version of a Cisco proprietary technique called ‘tag switching,’ which Cisco publicly described in early 1997.” *See* Ex.1038, ¶46; Ex.1040, [0020]; Ex.1041, [0015]; Ex.1042. Dr. Houh further testifies that “MPLS is a specialized area of network communications”—a sentiment that Patent Owner agrees with. Ex.1038, ¶46; Paper 7 at 21 (“MPLS techniques are a specialized area of network communications...”). “Although MPLS can involve resource reservations, it does not have to, and it certainly implicates topics and features (e.g., label switching) that go beyond mere resource reservations.” Ex.1038, ¶46.

Additionally, Mr. Gomez’s opinions should be given little or no weight because they are unhelpful and generally present arguments without supporting

underlying facts or data. 37 C.F.R. §42.65. Most of Mr. Gomez's statements lack evidentiary support. Mr. Gomez also admitted during deposition that his opinions offered as a "matter of law" are baseless parroting of attorney argument. Ex.2025, ¶85; Ex.1037, 190:20-192:1.

In contrast Dr. Houh's Ph.D. thesis was on label-switch-paths (prior to MPLS becoming a standard) and he has "help[ed] configure networks with MPLS." Ex.1038, ¶47; Ex.2027, 8:5-9:21. Dr. Houh also worked with MPLS protocols and filed a patent application involving MPLS technology. *See e.g.*, Ex.1045, Claims 3-4; Ex.1038, ¶47.

X. Conclusion

For the foregoing reasons, Patent Owner's arguments in its Response should be rejected, and the Challenged Claims should be found unpatentable.

Respectfully submitted,

Dated: March 29, 2024
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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), Petitioner hereby certifies, in accordance with and reliance on the word count provided by the word-processing system used to prepare this Reply, that the number of words in this paper is 5,548.

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CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. § 42.6(e),
service was made on Patent Owner as detailed below.

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