

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ARISTA NETWORKS, INC.,
Petitioner,

v.

ORCKIT CORPORATION,
Patent Owner.

IPR2024-01238
Patent 8,830,821 B2

Before KRISTEN L. DROESCH, MATTHEW J. McNEILL, and
BRENT M. DOUGAL, *Administrative Patent Judges*.

DROESCH, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background

Arista Networks, Inc. (“Petitioner”) filed a petition requesting *inter partes* review (“IPR”) of claims 1–20 of U.S. Patent No. 8,830,821 B2 (Ex. 1001, “the ’821 Patent”). Paper 2 (“Petition” or “Pet.”). Petitioner filed a Declaration of Paul Min, Ph.D., with its Petition. Ex. 1003. Orckit Corporation (“Patent Owner”) timely filed a preliminary response. Paper 6 (“Preliminary Response,” or “Prelim. Resp.”). Subsequent to the filing of the Petition and Preliminary Response, an Inter Partes Review Certificate (Ex. 3001) was issued on February 13, 2025, which cancelled claims 1–13 and 17–20 of the ’821 Patent. Therefore, only claims 14–16 remain at issue (“the remaining challenged claims”).

We have authority to determine whether to institute review under 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a). An *inter partes* review may not be instituted unless it is determined that “the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

For the reasons provided below, we determine, based on the record before us, there is a reasonable likelihood Petitioner would prevail in showing at least one of the challenged claims is unpatentable.

B. Related Matters

The parties identify the following related matters involving the ’821 Patent:

Orckit Corporation v. Arista Networks, Inc., 1-23-cv-00821 (D.Del.)

Orckit Corporation v. Juniper Networks, Inc., 1-23-cv-00822 (D.Del.)

Orckit Corporation v. Cisco Systems, Inc., 2:22-cv-276 (E.D. Tex.)

Cisco Systems, Inc. v. Orckit Corporation, IPR2023-00402 (“Cisco IPR”)

Juniper Networks, Inc. v. Orckit Corporation, IPR2024-00034¹

Reissue Application No. 18/097,635 (January 1, 2023)

Reissue Application No. 15/230,434 (August 7, 2016).

Pet. 1–2; Paper 3, 1.

C. The ’821 Patent (Ex. 1001)

The ’821 Patent “relates to telecommunications and more particularly, is related to high availability of telecommunication entities.” Ex. 1001, 1:16–19. “[W]hen a failure is detected in a network device or connection, network traffic is switched to a standby network device or connection.” *Id.* at 1:27–29. A multiprotocol label switching-transport profile (MPLS-TP) accomplishes a node or span failure recovery by defining a protection transport entity between the same endpoints as the working transport entity. *See id.* at 1:38–49. “[These] working and protection entities do not share the span or nodes against whose failure protection is required” (*id.* at 1:50–51), but “may not protect against one or several failures affecting both [entities]” (*id.* at 1:64–66). Thus, “there is a need for a protection mechanism to provide . . . recovery in the event of a failure in any of the transport entities.” *Id.* at 2:1–3.

¹ Juniper Networks, Inc. was joined as a petitioner to the Cisco IPR. Cisco IPR, Paper 29.

The '821 Patent discloses

an entity selection method by an MPLS network device . . . [that] provid[es] a plurality of MPLS transport entities between a first endpoint and a second endpoint, determin[es] an overall cost for each pair of entities of the plurality of entities, select[s] a pair of entities from the plurality of transport entities based at least in part upon the entity pair cost, and[,] if an entity pair reselection event occurs, reselect[s] the entity pair.

Id. at 2:9–18. “The method . . . may further include . . . selecting a working entity from the plurality of transport entities, selecting a protection entity from the plurality of transport entities, and selecting an active entity from the set consisting of the working entity and the protection entity.” *Id.* at 2:22–26.

Figure 1 of the '821 Patent is reproduced below.

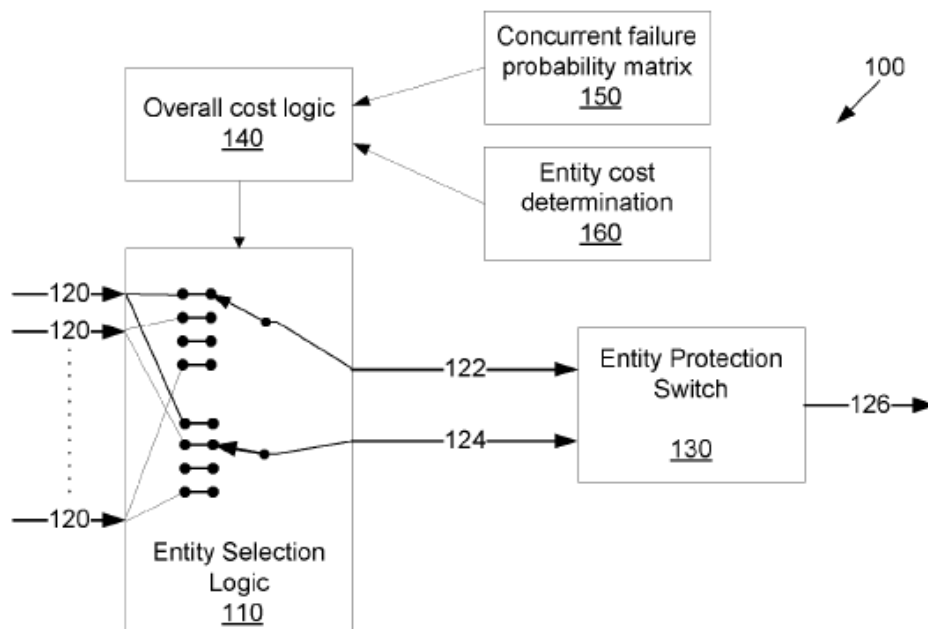


Figure 1 depicts “a block diagram of a first exemplary embodiment of an entity protection system.” Ex. 1001, 2:59–60. “An entity protection switch 130 switches between a working entity 122 and a protection entity 124[, which are] from a set of entities 120 . . . represented within an

entity selection logic block 110.” *Id.* at 3:33–36. “Each entity 120 represents a network route between a first endpoint and a second endpoint.” *Id.* at 3:36–37. “An overall cost logic block 140 uses results from a concurrent failure probability matrix 150 and an entity cost determination block 160 to select the working entity 122 and the protection entity 124 from the set of entities 120.” *Id.* at 3:40–44. “[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.” *Id.* at 3:47–50.

“Each possible entity pairing is examined for cost.” *Id.* at 4:13. “The overall cost may be determined based on the probability of simultaneous failure of the working and protection entities (SFP), . . . the entity cost, or a combination of SFP and entity cost.” *Id.* at 4:16–19. “[E]ach entity of the selected entity pair may be selected as a working entity, a protection entity, or an active entity.” *Id.* at 4:30–32. “[E]ntity pair reselection may be triggered when the operational status changes for an entity . . . , when an entity is added . . . , when an entity is removed . . . , or due to combined cost changes in one or more entities.” *Id.* at 4:35–41.

“[An] entity pair may be selected based upon each entity of the pair having the lowest possible probability of individual failure.” Ex. 1001, 5:42–43. “Alternatively, the entity pair may be selected to minimize the probability of a span or node failure simultaneously affecting the working and protection entities.” *Id.* at 5:44–46. “An example [approach] would be to minimize SFP . . . by selecting working and protection entity pairs with the lowest SFP, and, if there are multiple pairs with the same SFP within an error margin, . . . choosing the pair that minimizes entity IGP [(interior gateway protocol)] cost.” *Id.* at 5:59–66.

D. Illustrative Claim

Of the remaining challenged claims, claim 14 is independent and claims 15 and 16 depend directly therefrom. *See* Ex. 1001, 8:42–67.

Claim 14 is reproduced below:

A system for selecting entities within an MPLS network, comprising:
a data structure comprising a plurality of transport entity descriptors;
an entity protection switch configured to switch between a working entity and a protection entity; and
digital logic configured to select said working entity and said protection entity from said plurality of transport entity descriptors, comprising: logic configured to determine a probability of concurrent failure of said working entity and said protection entity;
logic configured to determine an entity cost of said plurality of transport entity descriptors: and
logic configured to reselect said working entity and said protection entity from said plurality of transport entity descriptors upon a reselection event,
wherein said reselection event is selected from a group consisting of adding an entity to said plurality of transport entities, removing an entity from said plurality of transport entities, an operational status change for one of said plurality of transport entities, and a change in overall cost for one of said plurality of transport entities.

Ex. 1001, 8:42–63.

E. Asserted Patentability Challenges and Asserted Prior Art

Petitioner asserts that claims 14–16 are unpatentable on the following grounds (Pet. 8):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
14–16	103(a) ²	Doshi, ³ Guichard, ⁴ Ashwood Smith ⁵

II. ANALYSIS

A. Claim Construction

In an *inter partes* review proceeding, the Board applies the same claim construction standard as that applied in federal courts in a civil action under 35 U.S.C. § 282(b), which is generally referred to as the *Phillips* standard. *See* 37 C.F.R. § 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). Under the *Phillips* standard, “words of a claim ‘are generally given their ordinary and customary meaning.’” *Phillips*, 415 F.3d at 1312.

Petitioner asserts that the term “entity” recited in independent claim 14 includes an MPLS label switch path (LSP) or pseudo wires (PW). *See id.* (citing Ex. 1001, 3:22–29; Ex. 1003 ¶ 57; *Cisco* IPR Paper 1 at 13). Patent Owner does not address claim construction. *See* Prelim. Resp.

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103 effective March 16, 2013. Because the ’821 Patent claims an effective filing date prior to March 16, 2013, we refer to the pre-AIA version of § 103.

³ US 2004/0205239 A1, published Oct. 14, 2004 (Ex. 1005, “Doshi”).

⁴ Guichard et al., *Definitive MPLS Network Designs*, Cisco Press, Indianapolis, IN, 2005 (ISBN: 1-58705-186-9) (Ex. 1006, “Guichard”).

⁵ WO 2004/068799 A1, published August 12, 2004 (Ex. 1037, “Ashwood Smith”).

As demonstrated in the analysis below, we need not construe any claim terms and phrases to resolve the controversy before us. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

B. Level of Ordinary Skill in the Art

Petitioner asserts that “[a] person of ordinary skill in the art (‘POSITA’) would have had a working knowledge of network communications and multiprotocol label switching (‘MPLS’) techniques available at the time.” Pet. 11 (citing Ex. 1003 ¶¶ 50–51). Petitioner contends that “[a] POSITA would have had a bachelor’s degree in computer science, computer engineering, electrical engineering, or equivalent training, and approximately two years of experience working in the field of network communications and been knowledgeable regarding MPLS techniques.” *Id.* (citing Ex. 1003 ¶ 51). Patent Owner does not address the skill level of a person of ordinary of skill in the art. *See* Prelim. Resp.

For the purpose of determining whether to institute trial, we adopt Petitioner’s definition of a person of ordinary skill in the art because it is consistent with the level of skill reflected by the ’821 Patent Specification and the asserted prior art.

C. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter

pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) if in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).⁶

D. Patentability Challenge Based on Doshi, Guichard, and Ashwood Smith
1. Overview of Doshi (Ex. 1005)

Doshi “relates to network communications and, more specifically, to restoration path sharing.” Ex. 1005 ¶ 4. Doshi discloses “a shared mesh network (SMN) that includes components for [use of] . . . network sharing information . . . and improved service primary and restoration path calculation as a function of the sharing information.” *Id.* ¶ 9. “The SMN includes components that determine primary/restoration path pairs . . . [for] grouping of certain links within the network into shared-risk link groups (SRLGs).” *Id.* ¶ 11. “Links that belong to SRLGs having a primary path link[] are set to a link cost of infinity.” *Id.* “[R]emaining links that do not belong to such SRLGS are evaluated as to their ability to support sharing of restoration bandwidth.” *Id.* “If a link supports sharing, its link cost is reduced by . . . a function of the sharing degree for the link.” *Id.* “Ultimately, the adjusted link costs are used in a minimum-cost primary/restoration path calculation.” *Id.*

The invention also provides a method and network manager “for determining primary and restoration paths for a new service in a mesh

⁶ At this stage, the parties do not present evidence or arguments regarding secondary considerations.

network having a plurality of nodes interconnected by a plurality of links.”

Ex. 1005 ¶ 14.

For each of a plurality of candidate path pairs for the new service, each candidate path pair comprising a candidate primary path and a candidate restoration path for the new service, a path cost associated with said each candidate path pair is generated, [and] the path cost for a candidate path pair is a function of shareability of links within the corresponding candidate restoration path.

Id. “The primary and restoration paths for the new service are selected from the plurality of candidate path pairs based on the path cost of each candidate path pair.” *Id.*

Figure 1 is reproduced below and is described as “an exemplary shared mesh data network (SMDN).” *Id.* ¶ 16.

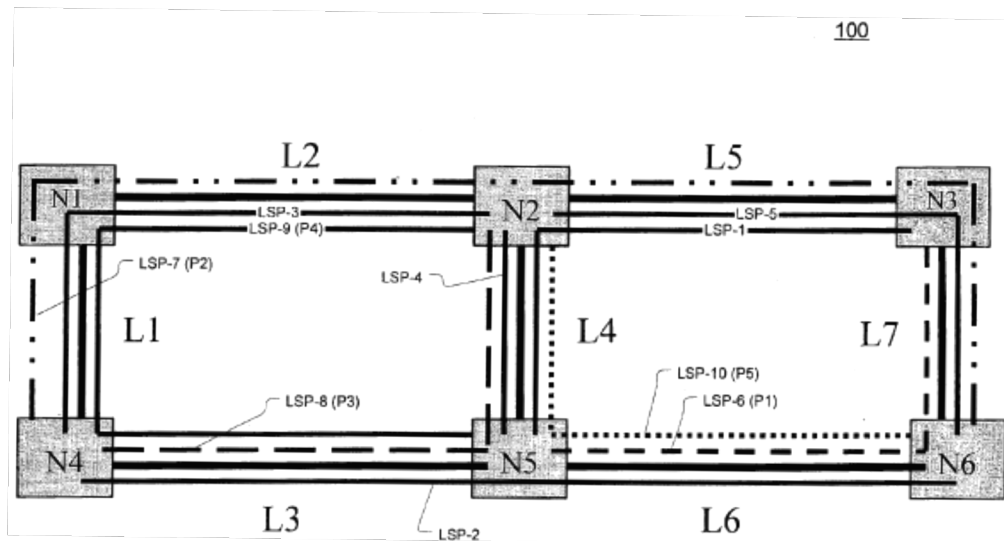


Figure 1 shows that “SMDN 100 includes six ingress/egress nodes N1 to N6 interconnected by seven bidirectional links L1 to L7.” Ex. 1005 ¶ 48.

“These nodes and links provide different paths between different pairs of nodes.” *Id.* “SMDN 100 has been provisioned with five primary label-switched paths (LSPs) LSP-1 to LSP-5.” *Id.* ¶ 50. “A label-switched path is

effectively a tunnel between two nodes that carries Service traffic according to a predetermined route[; e.g.,] LSP-1 is a tunnel from node N3 to node N5 that follows the path N3-N2-N5.” *Id.* There are “five primary LSPs as follows: LSP-1 carries traffic along path N3–N2–N5, LSP-2 carries traffic along path N4–N5–N6, LSP-3 carries traffic along path N2–N1–N4, LSP-4 carries traffic along path N2–N5, and LSP-5 carries traffic along path N2–N3–N6.” *Id.* ¶ 52. “[E]ach LSP may have an associated demand of any reasonable value (e.g., 2Mbps, 10 Mbps, and 100 Mbps).” *Id.* ¶ 51. “[F]or this example, each of the LSPs in FIG. 1 is assumed to be of unit demand.” *Id.*

Figure “1 also illustrates five exemplary protection paths LSP-6 to LSP-10 (also of unit bandwidth in this example) that have been reserved to use for protection of services given a failure of one of the primary paths.” Ex. 1005 ¶ 54. “[T]he tag for each protection LSP carries a parenthetical suffix indicating the primary LSP it protects[; e.g., the figure’s label of] LSP-6 (P1) indicates the protection role that LSP-6 plays for primary LSP-1.” *Id.* In all, the protection paths are: “LSP-6 (along path N3-N6-N5) protects LSP-1, LSP-7 (along path N4-N1-N2–N3–N6) protects LSP-2, LSP-8 (along path N2–N5-N4) protects LSP-3, LSP-9 (along path N2-N1-N4 N5) protects LSP-4, and LSP-10 (along path N2–N5-N6) protects LSP-5.” *Id.*

Figure 11 is reproduced below and “depicts an exemplary method for calculating a minimum-cost primary/restoration path pair for a new service in consideration of link utilization, utilization threshold, administrative weight, and sharing degree.” Ex. 1005 ¶ 26.

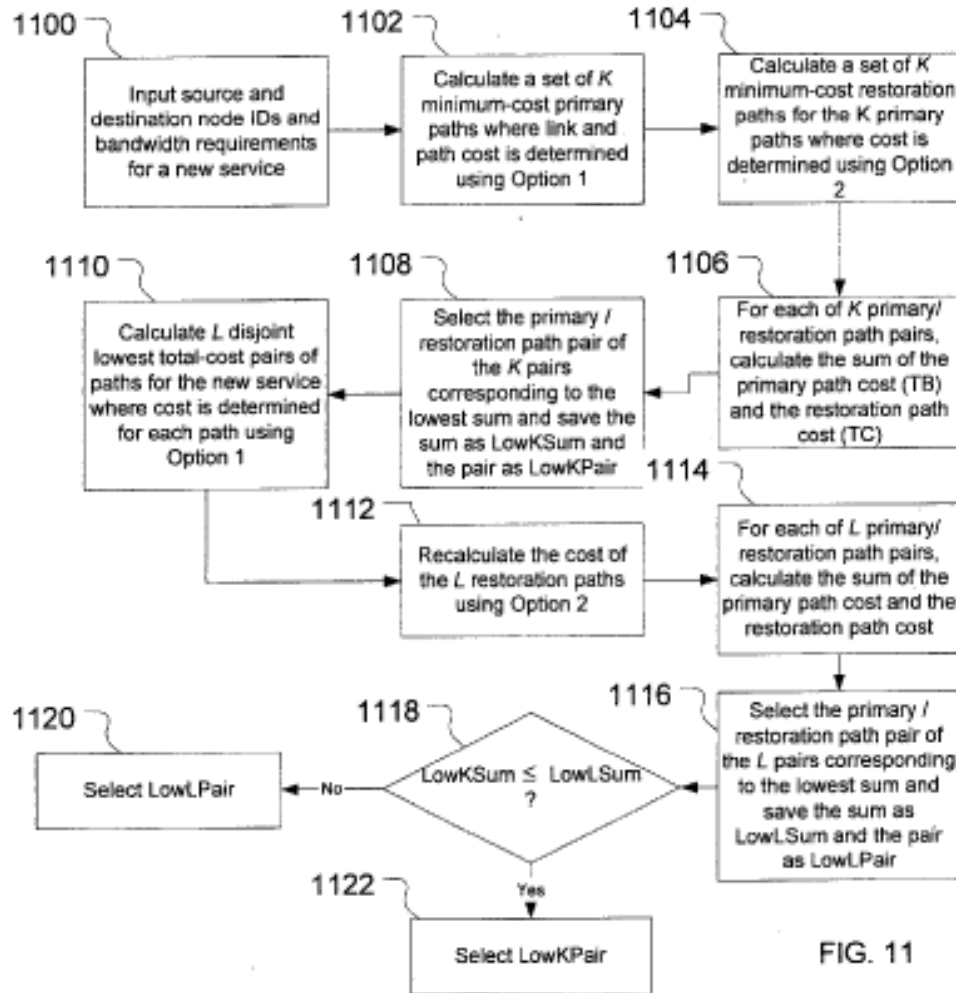


FIG. 11

“[I]n step 1100 [of Figure 11], the bandwidth and source and destination IDs for a new service are input.” *Id.* ¶ 142. “[I]n step 1102, the first flow starts with selection of K minimum cost primary paths.” *Id.* ¶ 143. “[I]n step 1104, a set of K minimum-cost restoration paths are calculated and priced.” *Id.* “[I]n step 1106, the Path Costs that were calculated in steps 1102 and step 110[4] are used in the calculation of a sum of the pair cost for each of the K primary/restoration path pairs.” *Id.* “In step 1108, the minimum sum is saved in the variable LowKSum and the minimum-cost pair is saved in the data structure LowKPair.” *Id.* “In step 1110, the second flow starts with the calculation of L disjoint lowest total-cost pairs of paths

for the new Service where cost is determined for each path.” *Id.* ¶ 144. “[I]n step 1114, the sum is calculated of the cost of the primary and the restoration path for each of the L pairs.” *Id.* “[I]n step 1116, the lowest sum is stored in the variable LowLSum and the lowest-cost pair is Stored in the data structure LowLPair.” *Id.* “[I]n the test of step 1118, LowKSum is compared to LowLSum.” *Id.* ¶ 145. “If LowKSum is lower than or equal to LowLSum, then in step 1122, LowKPair is selected as the minimum-cost path pair.” *Id.* “If it is not lower, then in step 1118, LowLPair is selected.” *Id.*

2. Overview of Guichard (Ex. 1006)

Guichard is a textbook directed to “MPLS Network Designs” and includes a section titled “Reoptimizing a Traffic Engineering LSP.” Ex. 1006, 1, 3. Guichard discloses that “[n]etwork state keeps changing.” *Id.* at 3. “Links and nodes fail and recover; new TE LSPs are set up while others may be torn down.” *Id.* at 3. “Consequently, for any TE LSP, a more optimal path may appear in the network.” *Id.* “It is then highly desirable to detect the existence of such a path and reoptimize a TE LSP along a better path when it becomes available.” *Id.*

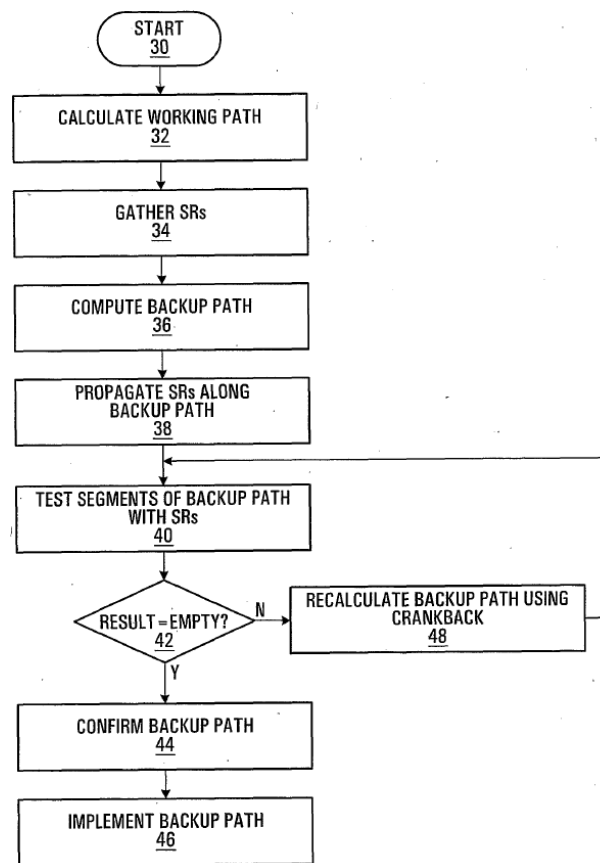
Guichard further discloses that “[a]n important aspect of any MPLS TE network design relates to the reoptimization triggers.” *Id.* at 5. Examples of “reoptimization triggers” include manual reoptimization, timer-based reoptimization, and event-driven reoptimization. *See id.*

3. Overview of Ashwood Smith (Ex. 1037)

Ashwood Smith relates to “[a] method for computing a backup path for protecting a first working path in a data transport network that includes a plurality of working paths. . . . includ[ing] determining a backup path route

by selecting individual backup path segments from a set of possible segments in the network.” Ex. 1037, code (57). In cases where a segment is shared between a first working path and one or more other working paths, “the selection process takes into account the existence of a potential point of failure common to the working paths sharing the segment.” *Id.*

Figure 5 is reproduced below and depicts a flow chart of the method for computing the backup path. *See* Ex. 1037, 4:27–28.



The method depicted in Figure 5 starts and step 30, and during the first step 32 the routing of the working path is calculated. *See id.* at 7:26–30. At step 34, the Shared-Risk (SR) values for the working path are gathered. *See id.* at 7:31–32. SR is an identifier that is unique in the data transport network. *See id.* at 8:1–2. SRs are assigned to network resources such that

if two resources share a single point of failure they are marked with the same SR. *See id.* at 8:2–3. Once the SRs of the working path have been gathered, a tentative backup path is computed at step 36. *See id.* at 8:13–15. At step 38 the SRs of the working path are added to the set of SRs of each segment of the tentative backup path. *See id.* at 8:24–25. At step 40, the method tests the tentative backup path to determine if it contains any segments shared by working paths that also share one or more potential point of failure. *See id.* at 8:28–30. This is accomplished by intersecting the SRs of the working path with the SRs of each segment of the tentative backup path. *See id.* at 8:30–33. If the result of this intersection is empty, the answer is yes to conditional step 42. *See id.* at 9:3–4. Based on an empty result, one can conclude that working paths that also share a potential point of failure do not share this particular segment of the tentative backup path. *See id.* at 9:4–7. If the result is empty at step 42, then the tentative backup path is confirmed at step 44 and implemented at step 46. *See id.* at 9:7–13. If the result is not empty, the conditional step 42 will be answered in the negative and the method branches to step 48 in which a process implemented to correct the segments of the tentative backup path to exclude the segments that conflict. *See id.* at 9:15–30.

Ashwood Smith further discloses that a possible refinement to this process is to take into account the actual probability of failure at a common point shared by two or more working paths in deciding if it is acceptable to deploy a backup path with a segment shared between these two working paths. *See Ex. 1037, 10:21–26.* If the common point is highly unlikely to fail, it may be acceptable to allow working paths sharing that common point

to also share a common segment on a backup path. *See id.* at 10:31–11:1.

Ashwood Smith further discloses:

A possible approach to implement this variant is to consider each time a positive interaction between sets of SRs is observed (step 42 is answered in the affirmative) a probability of failure at the common point (allocated by the data transport network operator or otherwise) and accept the segment if the probability is below a certain level or reject the segment if the probability is above the level.

4. Analysis of Independent Claim 14 and Dependent Claims 15 and 16

Petitioner relies on the combined teachings of Doshi and Guichard to teach most of the limitations of independent claim 14. *See* Pet. 70–74, 78–79. To address the limitation “digital logic . . . configured to determine a probability of concurrent failure of said working entity and said protection entity,”⁷ Petitioner relies on the combined teachings of Doshi (as modified by Guichard) and Ashwood Smith. *See* Pet. 66–69, 74–78.

Petitioner asserts that “Doshi teaches protecting services against link failures by considering disjointedness when selecting primary and protection paths.” Pet. 67 (citing Ex. 1005 ¶¶ 155–156). According to Petitioner, Doshi teaches that “[s]trictly disjoint paths share no common links or nodes other than their common ingress and egress nodes, so the failure of a single network element would not affect both paths.” *Id.* (citing Ex. 1005 ¶¶ 55, 158); *see* Pet. 74 (similar argument, citing Ex. 1003 ¶¶ 254–255; Ex. 1005 ¶ 40). Petitioner asserts that for strictly disjoint paths, “[i]t would take two distinct failures (one affecting each path) for both paths to fail concurrently.” Pet. 74. Petitioner contends that “[a] POSITA would have understood that probability of concurrent failure is inversely related to

⁷ Petitioner refers to this limitation as 14[d]. *See* Pet. 6, 74–78

disjointedness—as paths become more disjoint, the likelihood they will fail concurrently goes down.” Pet. 74.

According to Petitioner, “[s]ince Doshi explains that the ‘probability of occurrence’ of two such failures is ‘**very insignificant**,’ a POSITA would have understood that determining that two paths are disjoint with no nodes or links in common is also a determination that the paths have a ‘very insignificant’ probability of failing concurrently.” Pet. 74–75 (citing Ex. 1003 ¶¶ 254–255; Ex. 1005 ¶ 40). Petitioner concludes that “determining path disjointedness (as part of Doshi’s flowchart) corresponds to ‘*determin[ing] a probability of concurrent failure*’ since knowledge of, e.g., strict disjointedness represents a determination that there is a ‘very insignificant’ probability that the paths will fail at the same time.” Pet. 75 (citing Ex. 1003 ¶¶ 254–255).

Petitioner further contends that “Doshi plainly considers the probability of simultaneous failure as part of its pair calculations and selection process of Figure 11.” See Pet. 75 (citing Ex. 1003 ¶ 256). According to Petitioner, Doshi “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).” *Id.* (citing Ex. 1003 ¶ 256; Ex. 1005 ¶¶ 144–145). Petitioner reproduces Figure 4C of the ’821 Patent and Figure 11 of Doshi and asserts that both processes are similar and both determine a subset of entity pairs with minimum probability of failure, and ultimately select the lowest cost pair. See Pet. 75–76 (reproducing Ex. 1001, Fig. 4C (with Petitioner’s added annotations); Ex. 1005, Fig. 11 (with Petitioner’s added annotations); citing Ex. 1001, 5:55–66, 8:22–30; Ex. 1005

¶¶ 56, 144; Ex. 1003 ¶ 257). Petitioner contends that “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.” Pet. 76 (citing Ex. 1003 ¶ 258).

Consistent with our findings in the Final Written Decision of IPR2023–00402, we find that Doshi does not disclose, teach, or suggest “digital logic . . . configured to determine a probability of concurrent failure of said working entity and said protection entity,” as required by claim 14. Although Doshi discloses selecting a subset of path pairs based on cost (*see* Ex. 1005 ¶ 144, Fig. 11), and that disjoint path pairs may have very insignificant probability of failure, Petitioner does not direct us to where Doshi discloses, teaches, or suggests “digital logic . . . configured determine the probability of concurrent failure of the primary path and the restoration path.” *See* Pet. 67, 74–76. We also give little weight to Petitioner’s witness Dr. Min’s testimony (Ex. 1003 ¶ 255) that determining path disjointedness corresponds to determining a probability of concurrent failure is entitled to little weight because, for the same reasons, it is not supported by an underlying factual basis. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”). For example, Petitioner does not provide a factual basis for equating a determination of path disjointedness (e.g., strictly disjoint, partially disjoint) with a determination of the probability of concurrent failure of the primary and restoration path. We also give little weight to Dr. Min’s testimony (Ex. 1003 ¶ 258) that Doshi’s disclosure of selection logic configured to perform the method of Figure 11 teaches logic

configured to determine probability of concurrent failure of said working entity and said protection entity because it also is not supported by an underlying factual basis. *See* Ex. 1003 ¶¶ 256–258; Ex. 1005 ¶¶ 142–145; Fig. 11.

Petitioner further contends that Doshi recognizes that there will be some cases where no strictly disjoint path exists, or where other factors may lead to the selection of a protection path that is not strictly disjoint from the primary path. *See* Pet. 67 (citing Ex. 1005 ¶ 55). According to Petitioner, “[i]t would have been obvious, in such instances, to at least minimize the likelihood of a concurrent failure.” *Id.* Petitioner asserts that “where factors preclude selection of disjoint paths, it would have been obvious to build upon Doshi’s calculation and selection techniques by applying Ashwood Smith’s teaching of determining the probability of concurrent failure of two paths.” Pet. 76 (citing Ex. 1005 ¶ 55; Ex. 1003 ¶ 259).

According to Petitioner, “Ashwood Smith teaches a network architecture that transports data using a working and backup path and selects a path out of multiple possible paths.” *See* Pet. 77 (citing Ex. 1037, code (57)). Petitioner asserts that “Ashwood Smith complements Doshi by teaching ‘to take into account the actual probability of failure at a common point shared by’ two paths when selecting a path.” Pet. 67 (citing Ex. 1003 ¶¶ 233–234; Ex. 1037, 2:21–25, 3:19–21, 10:21–26, 11:4–9); *see* Pet. 76 (similar argument, citing Ex. 1003 ¶ 260; Ex. 1037, 2:15–25, 7:2–13, 10:21–11:1). According to Petitioner,

Ashwood Smith’s method determines the probability of failure at a common point shared between two paths and, based on the probability of concurrent failure of the two paths, determines if

it is ‘acceptable to allow working paths sharing that common point to also share a common segment on a backup path.’

Pet. 67 (citing Ex. 1003 ¶ 234; Ex. 1037, 10:26–11:9). Petitioner contends that

Ashwood Smith accounts for ‘actual probability of failure at a common point’ shared by two paths (i.e., probability of concurrent failure of both paths) and, ‘[i]f the common point is highly unlikely to fail,’ it may ‘allow working paths sharing that common point to also share a common segment on a backup path.’

Pet. 77 (citing Ex. 1003 ¶ 260; Ex. 1037, 2:15–25, 7:2–13, 10:21–11:1).

According to Petitioner,

Ashwood Smith demonstrates that a POSITA would have known to account for the probability of concurrent failure of two paths as part of the path selection process, and would have understood that calculating such probability for two paths that share a common segment (e.g., are not strictly disjoint), would provide an additional layer of protection for a network by reducing the chance of simultaneous failure.

Pet. 77 (citing Ex. 1003 ¶ 261; Ex. 1037, 10:31–11:1); *see* Pet. 67 (similar argument, citing Ex. 1003 ¶ 234). Petitioner further contends that

it would have been obvious to a POSITA to look to Ashwood Smith’s method of determining concurrent failure of two working paths (while selecting a backup path) to calculate the probability of concurrent failure of the paths being considered by Doshi – a working path and a protection path” in order “to minimize disruptions caused by failure of a working path during the protection path’s selection process.

Pet. 77 (citing Ex. 1003 ¶ 262). Petitioner further contends that a person of ordinary skill in the art would have been motivated to combine the teachings of Doshi and Ashwood Smith “in order to further inform selection decisions and better protect services against link failures in circumstances where no

strictly disjoint pair of paths exists or where other factors lead to selection of a partially disjoint pair,” and “achieve a more refined selection between pairs of paths that have the same level of disjointedness.” Pet. 68 (citing Ex. 1003 ¶¶ 234–235), Pet. 77–78 (citing Ex. 1003 ¶ 263; Pet. 66–69).

Petitioner asserts that for pairs that have the same disjointedness “there may be differences in risk of failure for different links, e.g., due to variations in ‘the type of hardware or software used at that location.’” Pet. 68 (citing Ex. 1037, 10:26–31). According to Petitioner,

A pair in which the link in common between primary and protection paths of the pair has a higher risk of failure would, everything else being equal, be more likely to concurrently fail than a pair in which the link in common has a lower risk of failure. A POSITA would have been motivated to apply Ashwood Smith’s probability determination to differentiate between such pairs to improve reliability by reducing the probability of concurrent failure of Doshi’s selected pair.

Pet. 68 (citing Ex. 1003 ¶ 235).

In the Preliminary Response, Patent Owner argues that “[t]hough Ashwood Smith discusses the concept of a ‘probability of failure’ in the context of working and backup entities, it has nothing to do with determining a probability of concurrent failure of a working entity and a protection entity.” Prelim. Resp. 2; *see id.* at 18 (similar argument, citing Ex. 1037, 3:16–27, 10:19–11:9). According to Patent Owner, “Ashwood Smith discusses failure at a single point in the network and teaches against using working and backup entities that share that single point unless its probability of failure is sufficiently low.” *Id.* at 2; *see id.* at 18 (similar argument). Patent Owner contends that

Ashwood Smith is discussing the probability of failure for a single point. It is not determining the probability of failure for a

network path (e.g., a network route composed of multiple different segments and nodes), let alone the probability of failure for two different paths that may not even share a common point.

Id. at 18.

We agree with Patent Owner’s arguments. We find that Petitioner does not show sufficiently that Ashwood Smith discloses, teaches, or suggests “digital logic . . . configured to determine a probability of concurrent failure of a working entity and a protection entity,” as required by claim 14. Petitioner implicitly construes “digital logic . . . configured to determine a probability of concurrent failure of said working entity and said protection entity” to require “calculat[ing] the probability of concurrent failure of the paths.” Pet. 77; *see also id.* (“calculating such probability for two paths”), 78 (also implicitly construing “digital logic . . . configured to determine an entity cost of said plurality of transport entity descriptors” to require “cost calculation”). We agree with Petitioner’s implicit construction because it is consistent with the claim language and the ’821 Patent Specification which discloses a simultaneous failure probability (SFP) function (Eq. 1) and SFP values calculated by a concurrent failure probability matrix. *See* Ex. 1001, 3:44–47, 6:5–11, 6:39–40.

Similar to Doshi’s description of the probability of failure in terms of “very insignificant” (*see* Ex. 1005 ¶ 40), Petitioner’s cited disclosures of Ashwood Smith describe the probability of failure at a common point in terms of “fairly low” (*see* Ex. 1037, 3:21–23) “highly unlikely” (*see* Ex. 1037, 10:32), and “below a certain level” (*see* Ex. 1037, 11:7–8). Although Petitioner asserts that Ashwood Smith’s method determines the probability of failure at a common point between two paths (*see* Pet. 67), the

teachings of Ashwood Smith cited by Petitioner do not support a finding that Ashwood Smith discloses, teaches, or suggests “digital logic . . . configured to determine the probability of concurrent failure,” as implicitly construed by Petitioner to require calculating a probability of concurrent failure of a working entity and a protection entity. Petitioner also cites Ashwood Smith’s disclosure suggesting a possible refinement to the disclosed method that would take into account the actual probability of failure at a common point shared by two or more working paths. *See* Ex. 1037, 10:21–24. Petitioner, however, does not direct us to any disclosure in Ashwood of digital logic configured to determine or calculate the probability of failure at a common point. *See* Pet. 66–69, 74–78. Instead, Petitioner overlooks Ashwood Smith’s disclosure that the probability of failure at a common point is allocated (i.e., distributed, assigned, given out) by the data transport network operator. *See* Ex. 1037, 11:4–6. This allocation of failure probability by the data transport operator is similar to the ’821 Patent Specification’s disclosure that “[s]pan failure probabilities may be assigned, for example, manually by a network operator based on network knowledge” and “[n]ode failure probabilities may be configured by the operator, typically based on vendor-provided mean time between failure (MTBF) parameters, and on infrastructure failure probability, for example, power failure probability.” Ex. 1001, 6:20–23, 6:29–33. We also give little weight to Petitioner’s witness Dr. Min’s testimony (Ex. 1003 ¶¶ 234–237) that Ashwood Smith teaches determining a probability of concurrent failure of two paths because, for the same reasons, it is not supported by an underlying factual basis. *See* 37 C.F.R. § 42.65(a).

Based on the record before us, Petitioner does not set forth sufficient argument and evidence to demonstrate that the combined teachings of Doshi, Guichard, and Ashwood Smith teach or suggest “digital logic . . . configured to determine a probability of concurrent failure of said working entity and said protection entity,” as recited in claim 14. Accordingly, there is not a reasonable likelihood that Petitioner would prevail in showing that the subject matter of independent claim 14 would have been obvious over Doshi, Guichard, and Ashwood Smith.

Due to the dependency of claims 15 and 16 from claim 14, and for the same reasons as those explained above addressing claim 1, based on the record before us Petitioner does not set forth sufficient argument and evidence to demonstrate that the combination of Doshi, Guichard, and Ashwood Smith teaches or suggests the limitations of claims 15 and 16. Accordingly, there is not a reasonable likelihood that Petitioner would prevail in showing that the subject matter of dependent claims 15 and 16 would have been obvious over Doshi, Guichard, and Ashwood Smith.

III. CONCLUSION

For the foregoing reasons, we determine there is not a reasonable likelihood that Petitioner would prevail in showing at least one of the remaining challenged claims of the '821 Patent is unpatentable.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), the Petition is denied, and no *inter partes* review is instituted.

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