



CISCO SYSTEMS, INC. Petitioner,
V.
ORCKIT CORPORATION., Patent Owner

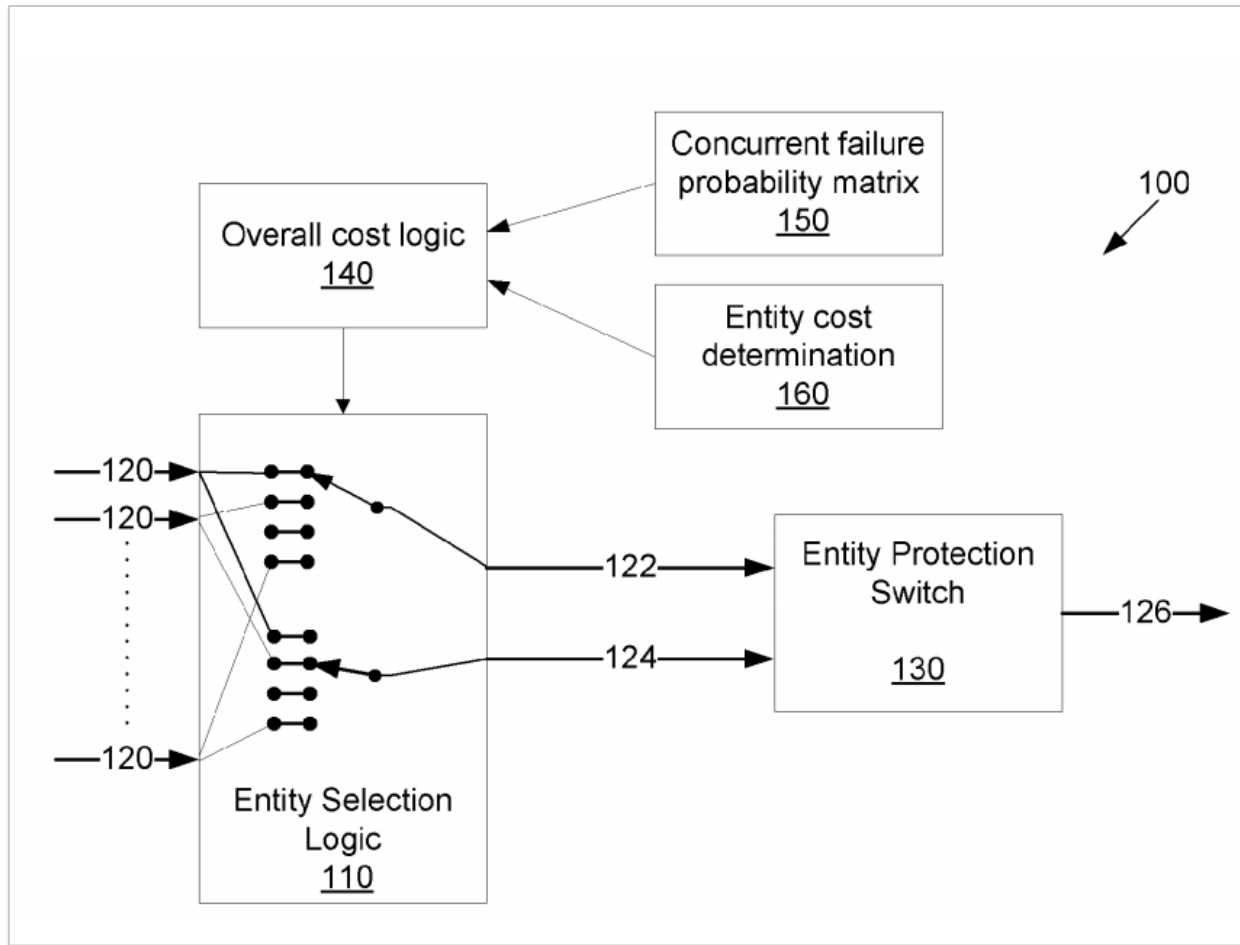
Case No. IPR2023-00402
U.S. Patent No. 8,830,821

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The '821 Patent



Ex.1001, Fig. 1.

1. An entity selection method performed by a network device, comprising the steps of:

- providing a plurality of multi protocol label switching (MPLS) transport entities between a first endpoint and a second endpoint;
- determining an overall cost for each entity pair of said plurality of entities;
- selecting an entity pair from said plurality of transport entities based at least in part upon said overall cost; and
- 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,

wherein said entity pair 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, Claim 1.

The '821 Patent

14. 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, Claim 14.

Key Points

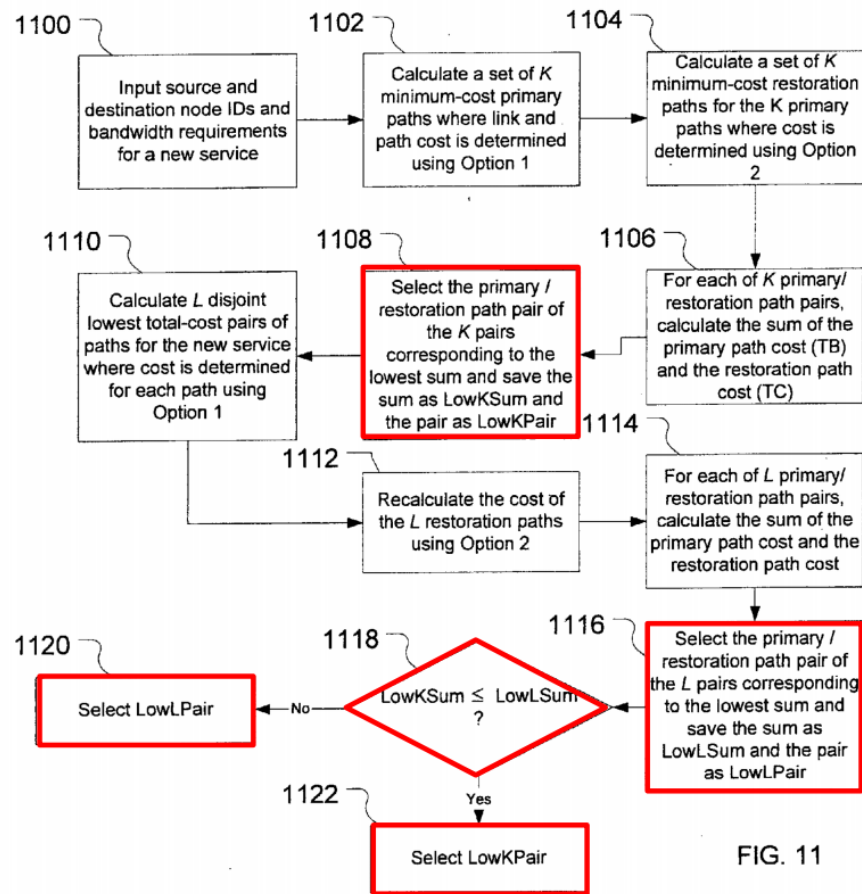
1. Doshi teaches “*selecting an entity pair from said plurality of transport entities based at least in part upon said overall cost.*”
2. Doshi and Guichard teach “*if an entity pair reselection event occurs, reselecting said entity pair from the group consisting of said entity pair and a replacement entity pair comprising at least one entity distinct from the entities of said entity pair.*”
 - a. Reasons to combine
 - b. Reasonable expectation of success
3. Doshi and Xu teach “*logic configured to determine a probability of concurrent failure of said working entity and said protection entity.*”
4. Unpatentability of dependent claims 2, 13, 18.

The '821 Patent

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wherein said entity pair 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, Claim 1.

Doshi selects an LSP pair from the MPLS LSPs based on the overall cost.



Ex.1005 (Doshi), Fig. 11; Petition, 36.

[0014] In one embodiment, the invention is a method for determining primary and restoration paths for a new service in a mesh network having a plurality of nodes interconnected by a plurality of links. 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, wherein the path cost for a candidate path pair is a function of sharability of links within the corresponding candidate restoration path. 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. The method may be implemented by a network manager for the mesh network.

[0142] FIG. 11 depicts and exemplary method for calculating a minimum-cost primary/restoration path pair for a ... pairs by a second method. Then in step 1118, and steps 1120 or 1122, the lowest-cost pair of these two lowest-cost results is selected as the overall minimum-cost pair.

Ex.1005 (Doshi), [0014], [0142]; Petition, 18, 20, 25, 35.

Patent Owner's implicit construction is improper.

Claim 1 recites:

selecting an entity pair from said plurality of transport entities based at least in part upon said overall cost; and

Ex.1001, Claim 1.

Patent Owner Response argues that claim a requires selecting from the total number of potential paths

In contrast to Doshi, a POSITA would understand claim 1 of the '821 Patent to require a much more computationally intensive process because it requires selecting from the total number of potential paths associated with “said plurality” of entities; and the number of pairs associated with a set of entities (i.e., a plurality) always exceeds the number of entities.

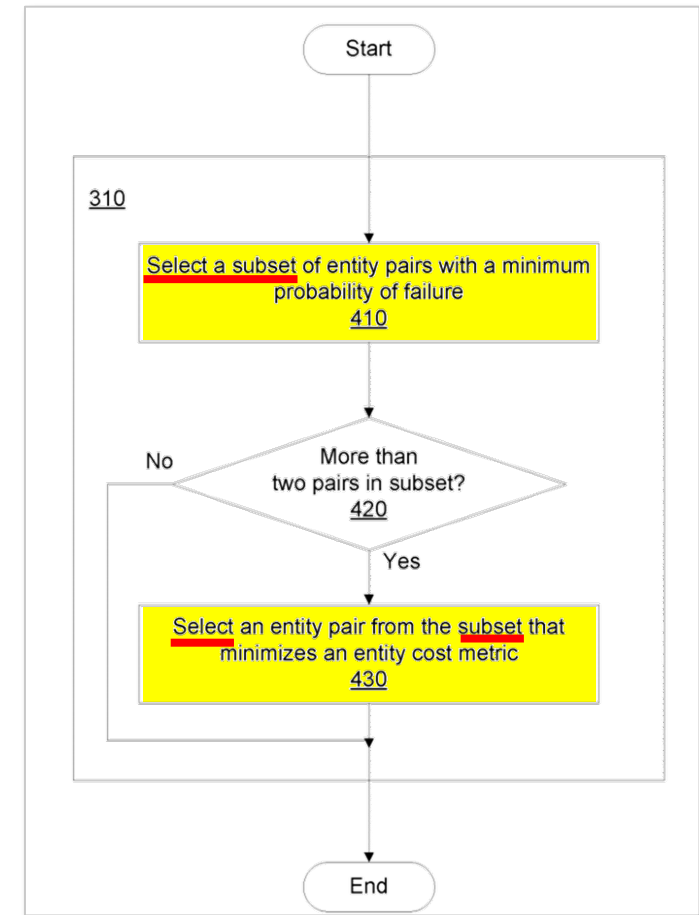
Patent Owner's implicit construction excludes the '821 patent's “subset” embodiment.

Unlike the claim language, which requires selecting an entity pair from the pairs associated with *said* plurality of entities, Doshi teaches a simplified selection process in which an entity pair is selected from a narrow subset of the candidate pairs associated with *said* plurality of entities. In particular, Doshi discloses calculating

Patent Owner Response, 28.

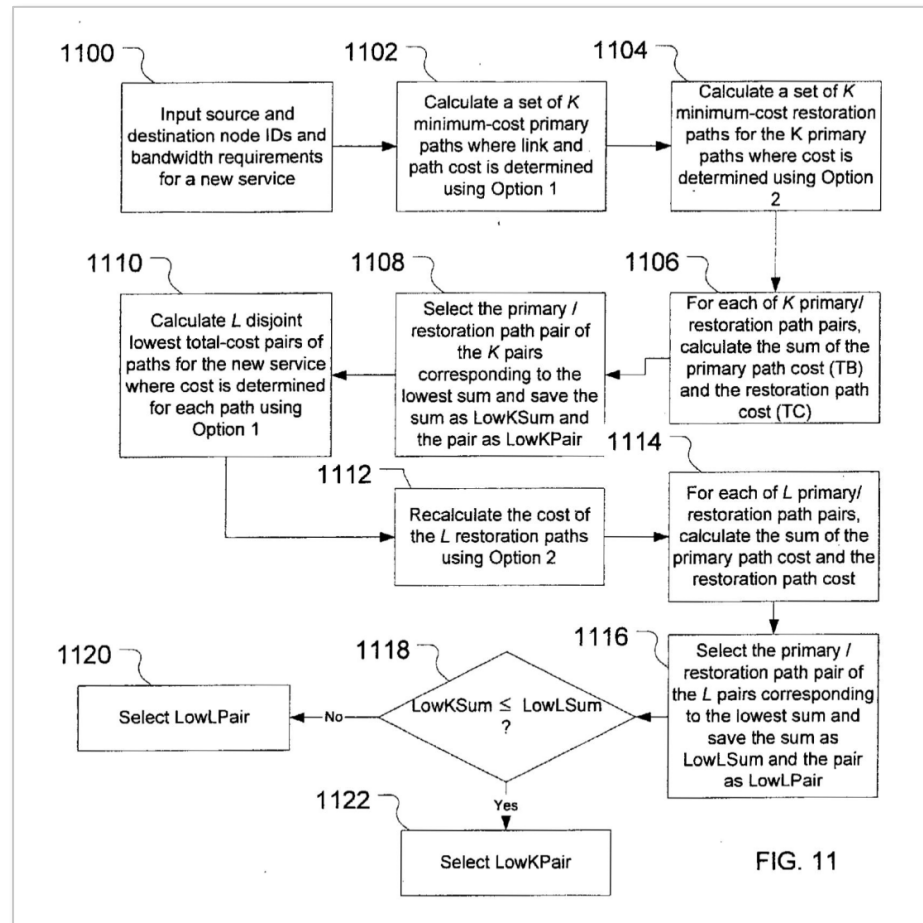
18 Q. And is the method of Figure 4C
19 within the scope of Claim 1?
20 A. Claim 1 includes the language in
21 Element C, selecting an entity pair from
22 the plurality of transport entities based
23 on at least, in part, upon said overall
24 cost. So that is part of what also 4C
25 does.

Ex.1037 (Mr. Gomez Deposition), 152:18-25; Reply, 8.



Ex.1001, Fig. 4C; Reply, 8.

Doshi's selection is made from every possible pair.



Ex.1005 (Doshi), Fig. 11; Reply, 13.

16. Regardless, 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, Doshi's process considers (K-1) alternatives, and from all considered alternatives identifies each K primary/restoration path pair combinations. Then, in step 1106, for each K primary/restoration path pairs that were identified at step 1104, Doshi computes the total primary-plus-restoration path cost and ultimately selects the lowest sum as LowKPair at step 1108. 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 (Dr. Houh Declaration), ¶16; Reply, 13.

Key Points

1. Doshi teaches “*selecting an entity pair from said plurality of transport entities based at least in part upon said overall cost.*”
2. Doshi and Guichard teach “*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.*”
 - a. Reasons to combine
 - b. Reasonable expectation of success
3. Doshi and Xu teach “*logic configured to determine a probability of concurrent failure of said working entity and said protection entity.*”
4. Unpatentability of dependent claims 2, 13, 18.

The '821 Patent

1. An entity selection method performed by a network device, comprising the steps of:
providing a plurality of multi protocol label switching (MPLS) transport entities between a first endpoint and a second endpoint;
determining an overall cost for each entity pair of said plurality of entities;
selecting an entity pair from said plurality of transport entities based at least in part upon said overall cost; and
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,
wherein said entity pair 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, Claim 1.

Doshi monitors and updates the network topology and Guichard teaches reoptimizing LSPs when the network changes.

[0275] Network Topology (NT): This module primarily consists of the link-state-based routing protocol. It is responsible for monitoring and updating of network topology.

Ex.1005 (Doshi), [0275]; Petition, 23.

Network state keeps changing. Links and nodes fail and recover; new TE LSPs are set up while others may be torn down. Consequently, for any TE LSP, a more optimal path may appear in the network. 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.

Ex.1006 (Guichard), 79; Petition, 21, 40.

Event-driven reoptimization-In some cases, it may be desirable to trigger a reoptimization upon the occurrence of a particular event such as the restoration of a link in the network. Indeed, if a link is restored in the network, some TE LSPs may benefit from that new link to follow a more optimal path.

Ex.1006 (Guichard), 81; Petition, 40.

Patent Owner recognizes that in the resulting combination at least one LSP would be distinct.

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,

Ex.1001, Claim 1.

protection system like the one in Doshi. Thus, to the extent that a POSITA would have had a reason to combine Doshi and Guichard (it would not), such a POSITA would create a combination in which reoptimization would be used only with respect to the primary path, which is what Guichard teaches. Because Guichard does not

Patent Owner Response, 41; Reply, 19.

Patent Owner Sur-Reply improper new argument is inconsistent with the Response.

“A sur-reply may only respond to arguments raised in the corresponding reply.”

37 C.F.R. § 42.23(b); *Google LLC v. Uniloc 2017 LLC*, IPR2020-00447, Paper 24 at 13–14 (PTAB May 11, 2021).

a second set (also with K or L members). *Supra*, §III.A. Thus, 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, rather than all pairs associated with a given plurality of entities. Ex2025 [Gomez Decl.], ¶¶95.

Patent Owner Response, 41.

replacement entity pair. *AFG Indus., Inc. v. Cardinal IG Co.*, 239 F.3d 1239, 1245 (Fed. Cir. 2001) (“consisting of” [is] understood to exclude any elements, steps, or ingredients not specified in the claim.”). Further, Dr. Houh admits that Doshi’s LSP pair would be reselected from “all possible LSP pair combinations.” Reply, 20 (citing EX1038, ¶24).

Patent Owner Sur-Reply, 16.

Patent Owner Response argues that the claim requires reselecting from all pairs

Patent Owner Sur-Reply untimely argues for the first time that the claim’s recitation of “consisting of” does not permit reselecting from all pairs

Reasons to combine Doshi and Guichard were presented in the Petition and confirmed by Dr. Houh

61. A POSITA would have been motivated to perform reoptimization evaluations over time, as taught by Guichard, when implementing Doshi's pair calculation and selection techniques in order to ^[1] identify a potentially better LSP (e.g., for primary or protection LSP paths) with an even lower overall minimum-cost. Doshi's initial LSP path selection identifies and selects the lowest cost pair of better pair available for reoptimization. Performing repeated reoptimization evaluations as taught by Guichard ^[2] furthers Doshi's stated objectives of optimization and optimal path choice. Doshi, [0172] ("In general, path selection is a powerful tool that can be used to achieve several objectives such as ... **optimization.**"), [0200] ("...making an **optimal** restoration path choice..."). For instance, reoptimization would allow for ^[3] selecting a shorter path if one becomes available. Doshi expressly describes attempting to identify the shortest primary and protection paths as part of optimization. Doshi, [0151], [0165], [0172].

1. **Identify better LSP with lower overall minimum-cost**
2. **Further Doshi's stated objectives of making an optimal path choice**
3. **Select a shorter path if available**

Ex.1003 (Dr. Houh Declaration), ¶61; Petition, 21-22.

Patent Owner's arguments about "efficiency and reliability" are meritless.

That both Guichard and Doshi are purportedly directed to an efficient and reliable MPLS network does not (and cannot) as a matter of law provide a reason to combine these two specific references. The needs for efficiency and reliability are common to virtually every innovation in the field of MPLS networks (Ex2025 [Gomez Decl.], ¶¶86-88.); thus, they are precisely the types of *generic* needs that the Federal Circuit has held insufficient to provide reason to combine specific prior art references to practice a specific claimed invention. *See Forest Lab's, LLC v. Sigmapharm Lab's, LLC*, 918 F.3d 928, 935 (Fed. Cir. 2019) ("a generic need for more antipsychotic treatment options did not provide a motivation to combine these particular prior art elements").

Patent Owner Response, 36-37.

Patent Owner does not address the Petition's specific reasons to combine.

Patent Owner presents arguments about generic "efficiency and reliability."

Efficiency and reliability are reasons to combine.

Federal Circuit

“[A] rationale is not inherently suspect merely because it’s generic in the sense of having broad applicability or appeal.”

Intel Corp. v. Qualcomm Inc., 21 F.4th 784, 797 (Fed. Cir. 2021); Reply, 16.

“[M]otivation to combine exists...[when] the combination of references results in a product or process that is **more desirable, for example because it is stronger, cheaper, cleaner, faster, lighter, smaller, **more durable**, or **more efficient**”**

Dystar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick, 464 F.3d 1356, 1368 (Fed. Cir. 2006); Reply, 16.

Both experts agree that efficiency and reliability are important.

Mr. Gomez confirms that reliability and efficiency are important.

20 A. In my industry, the industries
21 I've been in, as I've said before, if a
22 product goes out and it's not reliable,
23 that company is likely to go under.
24 Q. And -- I'm sorry.
25 A. I'm sorry. It's just one of
1 those elements that's so important that
2 companies will go to great lengths, extreme
3 lengths to ensure reliability. And I named

Ex.1037 (Mr. Gomez Deposition), 195:20-196:3; Reply, 16.

2 Was it also very desirable to
3 provide sufficient that's efficient?
4 MR. STAMATOPOULOS: Object to
5 form.
6 A. In a competitive environment like
7 most of the products I've ever worked on
8 are. You need efficiency to stay
9 competitive.

Ex.1037 (Mr. Gomez Deposition, 196:2-9; Reply, 16.

Dr. Houh agrees that efficiency and reliability are important.

lower overall minimum-cost. But regardless, I agree with Mr. Gomez, who
testified during deposition that efficiency and reliability are very important when
designing a product for a company's competitiveness:

Ex.1038 (Dr. Houh Declaration), ¶18; Reply, 16.

There would have been a reasonable expectation of success in reoptimizing Doshi's LSPs.

1. Guichard teaches how to avoid network instability
2. Doshi monitors network and updates topology
3. Reoptimization would utilize Doshi's own calculation and selection

63. I also note that the results would have been predictable and there would have been a reasonable expectation of success in the combination given that Doshi and Guichard are analogous art and in the same field of endeavor. Also, a POSITA would have had a reasonable expectation of success in reoptimizing Doshi's initial LSP pair selection by performing a reoptimization evaluation because Guichard [1] provides significant implementation details, including when to trigger reoptimization evaluations and how to "avoid network instability." Guichard, 81.

Ex.1003 (Dr. Houh Declaration), ¶63; Petition, 22-23.

64. Making the combination would be within a POSITA's skillset since Doshi already sets forth the calculation and selection techniques to be utilized during the reoptimization evaluation. Additionally, the combination would be a simple matter as it pertains to event-driven reoptimization evaluations since Doshi already [2] monitors the network. Doshi, [0270]-[0281] (describing, for example, "monitoring and updating of network topology."). Doshi is already equipped to detect the event-based reoptimization evaluation triggers described in Guichard, and the [3] reoptimization evaluation itself would utilize Doshi's own calculation and selection techniques. I also note that Doshi acknowledges that a POSITA would have had the necessary skill set to make "[v]arious modifications of the described embodiments." Doshi, [300]. It would have been obvious for such modifications to include a reoptimization evaluation as taught by Guichard.

Ex.1003 (Dr. Houh Declaration), ¶64; Petition, 22-23.

Guichard teaches avoiding unstable race conditions.

It is worth noting that this should be handed with some care to avoid network instability. Let's consider the case of an unstable link. This would have the effect of constantly attracting new TE LSPs, which would then fail and be reoptimized again, creating some very undesirable network instability and consequently traffic disruption. This explains why such a trigger should always be used in conjunction with a dampening mechanism at the interface or IGP level to avoid network instabilities in case of unstable links or routers.

Ex.1006 (Guichard), 81; Petition, 22-23.

In some cases, it might be desirable to elect to use a combination of recovery mechanisms, although such an option requires some extra care to avoid race conditions between recovery mechanisms and double protection.

Ex.2028 (Guichard), 96; Reply, 21.

A reasonable expectation of success is confirmed by expert testimony.

would have been recognized as desirable. Also, this technology was well-known in the art, indeed textbook knowledge, and as such 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 (Dr. Houh Declaration), ¶20; Reply, 21.

8 A. In a very narrow set of cases, it
9 might be desirable if the objectives of the
10 recovery mechanism are in alignment and
11 they do not create and have been validated
12 not to create issues -- unintended issues

Ex.1037 (Mr. Gomez Deposition), 167:8-12; Reply, 21.

Key Points

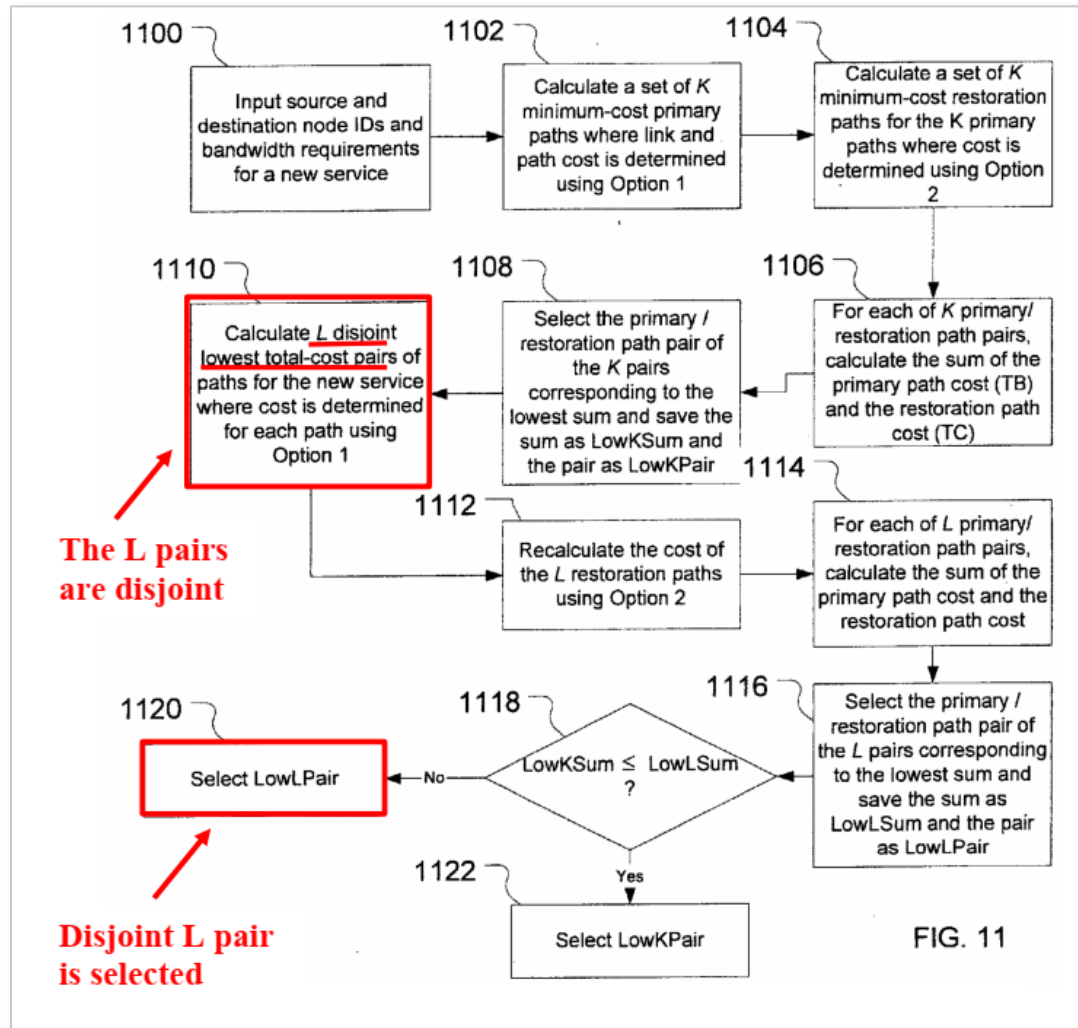
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The '821 Patent

14. 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, Claim 14.

Doshi's logic is configured to determine a probability of concurrent failure by determining path disjointness.



Ex.1005 (Doshi), Fig. 11; Petition, 51.

Accordingly, determining path disjointness (as part of Doshi's flowchart) corresponds to "*determine[ing] a probability of concurrent failure*" since knowledge of, e.g., strict disjointness represents a determination that there is a "very insignificant" probability that the paths will fail at the same time. Ex.1003, ¶¶250-251.

Petition, 81.

network. This is due to the fact that the probability of occurrence of more than one failure during the time interval required to repair a failure is very insignificant, and therefore most of the time it is sufficient to cover just a single network failure. This also provides opportunity to share restoration capacity between disjoint network failures. To understand sharing, realize that if two primary paths carrying traffic are routed disjointly, then a failure affecting one of them will not affect the other. Now, if the corresponding protection paths

Ex.1005 (Doshi), [0040]; Petition, 51, 80-81.

The '821 patent's probability matrix is “*configured*” by a network operator with predetermined probabilities.

Entity elements may include spans and/or nodes. Span failure probabilities may be assigned, for example, manually by a network operator based on network knowledge. Alternatively, span failure probabilities may be automatically calculated by the network, for example, by a management entity or by the endpoints themselves, based on span parameters such as span length, which in some scenarios can be automatically detected by the endpoints, for example, based on measured received optical power. Node 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, 6:20-33; Reply, 28.

Dr. Houh testifies that in the '821 patent a network operator configures the probability matrix

failure probability matrix. As such, 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 (Dr. Houh Declaration), ¶36; Reply, 29.

The '821 patent's alternative automatic calculation embodiment is not required by the claim.

Entity elements may include spans and/or nodes. Span failure probabilities may be assigned, for example, manually by a network operator based on network knowledge. Alternatively, span failure probabilities may be automatically calculated by the network, for example, by a management entity or by the endpoints themselves, based on span parameters such as span length, which in some scenarios can be automatically detected by the endpoints, for example, based on measured received optical power. Node 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, 6:20-33; Reply, 28.

Mr. Gomez concedes that computing the probability matrix is not required

10 A. Well, I could say determining --
11 in paragraph 116 -- determining a
12 probability of concurrent failures includes
13 the steps of collecting data from the
14 network, storing the data using
15 computational hardware for computing the
16 matrix of probabilities.

17 Q. And all of that is required by
18 the claim, sir?

19 A. No. This is -- you know, the
20 claim is a little bit more limited in
21 what -- but I expanded on it. I say to
22 explain further. That's my language.

Ex.1037 (Mr. Gomez Deposition), 174:10-22; Reply, 28.

Xu's failure model is “*configured*” by the network operator with predetermined probabilities.

path p of the predefined set of paths P_d to fail. The set of modeled failure states includes a no-failure state in which the network has no failures. Each modeled failure state has at least a predetermined probability of occurrence.

[0007] The predetermined probability of occurrence may be sufficient to meet a predetermined network availability objective when the network is restored against the set of modeled failure states.

Ex.1025 (Xu), [0006]-[0007]; Reply, 28-29.

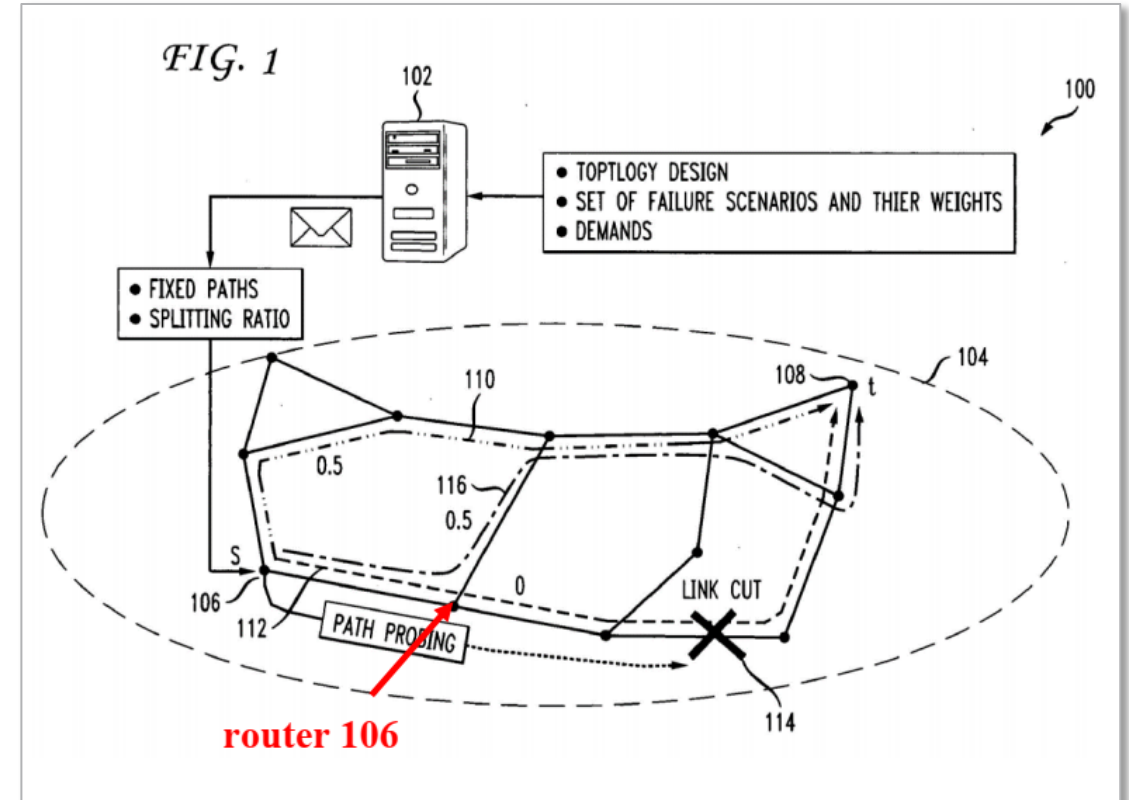
[0041] The NMS has access to the network topology and anticipated traffic demands. With this information, the network operator can provide the NMS with a list of potential or planned failures; correlated link failures can be determined by considering sets of links that share a common vulnerability as

Ex.1025 (Xu), [0041]; Reply, 29.

Xu's failure model is configured *"to determine a probability of concurrent failure."*

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.

Reply, 29.



Ex.1025 (Xu), FIG. 1; Reply, 30.

Both experts agree that a failure model is within the scope of the '821 patent's probability matrix.

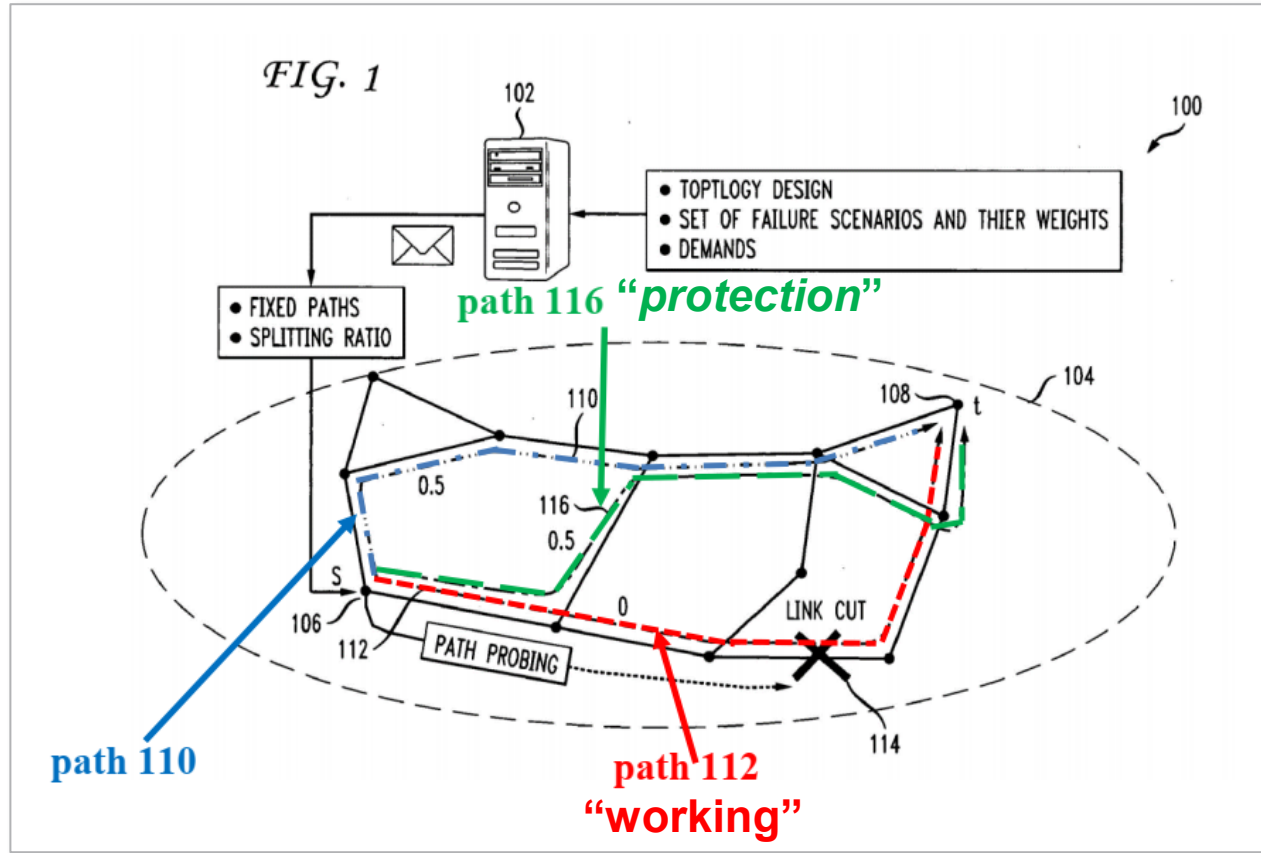
37. I note that Xu's failure model is similarly configured. Like the '821 patent, Xu discloses that a **"network operator"** inputs potential or planned failure states or scenarios, with each having a **"predetermined probability of occurrence."** Ex.1025, [0006], [0033], [0041]. Also like the '821 patent, 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]. As such, 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 shared node.

Ex.1038 (Dr. Houh Declaration), ¶37; Reply, 28-29.

2 Q. Is the probability matrix the
3 model of failure modes?
6 A. I don't think it's only a model.

Ex.1037 (Mr. Gomez Deposition), 189:2-3, 6; Reply, 30.

Xu discloses a “*working*” and a “*protection*” path.



Ex.1025 (Xu), FIG. 1; Reply, 26; Petition, 81-82.

Patent Owner's implicit construction is improper.

Patent Owner argues that a protection entity cannot be transmitting other data.

¶[0008]. Because each path p is constantly transmitting if it is available, each path is by default a “working entity,” *i.e.*, it is constantly transmitting and receiving traffic, and there is therefore no designated “protection entity” as required by the claims here. *See id.*, ¶¶[0030], [0035]. Indeed, because all entities are actively transmitting and receiving, Xu does not describe the concept of a “working entity” at all, let alone of a “protection entity.”

Patent Owner Response, 52.

Patent Owner's implicit construction excludes the '821 patent's IETF embodiment, which supports 1:n protection.

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.

Reply, 9.

Ex.1043, 5. At the time, a POSITA would have understood that in 1:n architecture there is one protection entity that is shared among n working entities. *See e.g.*, Ex.1044, 1 (“An architecture in which any of the n working channels can be bridged to a single protection line.”). This means 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. Because the

Ex.1038 (Dr. Houh Declaration), ¶11; Reply, 9-10.

Patent Owner's Sur-Reply argument is inconsistent with the '821 patent.

The '821 Patent could not have intended to refer to EX1043 for examples of 1:n MPLS mechanisms because *EX1043 provides no 1:n examples*. The '821 Patent refers to "IETF draft-zulr-mpls-tp-linear-protection-switching" as providing examples of MPLS mechanisms that "support both 1:1 and 1+1 architectures"

Patent Owner Sur-Reply, 9.

The working entity 122 and the protection entity 124 are inputs to an entity protection switch 130. The entity protection switch 130 may employ, for example, an MPLS linear protection scheme such as those defined in IETF draft-ietf-mpls-tp-linear-protection, IETF draft-zulr-mpls-tp-linear-protection-switching, and ITU-T G.8131 T-MPLS Linear Protection. However, a person having ordinary skill in the art will appreciate that other protection switching mechanisms may be employed within the scope of this disclosure. The

Ex.1001, 3:54-62.

Patent Owner Sur-Reply argues that the '821 patent is limited to the examples of "1:1 and 1+1 architectures"

The '821 patent's disclosure is not limited to example protection mechanisms

Patent Owner's Sur-Reply new untimely construction contradicts the '821 patent.

“A sur-reply may only respond to arguments raised in the corresponding reply.”

37 C.F.R. § 42.23(b); *Google LLC v. Uniloc 2017 LLC*, IPR2020-00447, Paper 24 at 13–14 (PTAB May 11, 2021).

nodes, some of which are shared and some of which are disjoint. The probability of concurrent failure is the total probability that any shared segment(s) fail in addition to the probability that any disjoint segments fail. The annotation below

Patent Owner Sur-Reply, 24.

The probability of multiple failures affecting two entities, such that the second failure occurs before the entity pair reselection process triggered by the first failure was completed, may be considered low enough to be disregarded.

Ex.1001, 6:16-19.

Key Points

1. Doshi teaches “*selecting an entity pair from said plurality of transport entities based at least in part upon said overall cost.*”
2. Doshi and Guichard teach “*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.*”
 - a. Reasons to combine
 - b. Reasonable expectation of success
3. Doshi and Xu teach “*logic configured to determine a probability of concurrent failure of said working entity and said protection entity.*”
4. Unpatentability of dependent claims 2, 13, 18.

Doshi teaches dependent claim 2.

[2.1] *The method of claim 1, wherein said step of selecting an entity pair further comprises: selecting a working entity from said entity pair; and selecting a protection entity from said entity pair.*

The '821 patent describes “switch[ing] between a working entity and a protection entity” after failure. Ex.1001, 1:51-43; 2:35-36. Doshi similarly describes “Switching Between Working and Protection LSPs” “after detecting a failure.” Ex.1005, [0266]-[0267]. Doshi’s working LSP corresponds to a “working

Petition, 46.

EX1001, claim 1. The functionality Petitioner relies on in Doshi (Reply, 31) describes “switch[ing] traffic from a primary (i.e., working) LSP to its corresponding protection LSP” “after detecting a failure.” EX1005, [0267]. See

Patent Owner Sur-Reply, 55-56.

1. **Petition explained how Doshi’s “switching” teaching meets claim 2. Petition, 46-47.**
2. **Patent Owner Response never addressed Doshi’s “switching” teaching presented in the Petition.**
3. **Patent Owner Sur-Reply untimely argues for the first time that Doshi’s “switching” does not meet the claim.**

“A sur-reply may only respond to arguments raised in the corresponding reply.”

37 C.F.R. § 42.23(b); *Google LLC v. Uniloc 2017 LLC*, IPR2020-00447, Paper 24 at 13–14 (PTAB May 11, 2021).

Doshi and Guichard teaches dependent claim 13.

As discussed at [1.3]-[1.4], Doshi teaches that a primary and a protection pair (e.g., LSP pair) are selected from the plurality of paths of the MPLS network and that, in view of Guichard's teaching of ongoing reoptimization efforts, it would have been an obvious to perform Doshi's cost calculations repeatedly to attempt to determine whether the originally selected LSP pair still has the overall minimum-cost or if another LSP pair should be selected. Ex.1003, ¶176.

It would have been obvious for the LSPs of the originally selected pair (e.g., a primary LSP and a protection LSP) to be sequentially replaced as the ongoing reoptimization efforts identify lower cost LSPs. To build upon an earlier example,

Petition, 60.

It would have been similarly obvious for a single event-triggered reoptimization evaluation to find that both the Fifth and Second LSPs are suboptimal. When both LSPs are determined to be suboptimal, a POSITA would have found it obvious to replace the LSPs sequentially to minimize interruption in service. In that regard, a POSITA would have appreciated the desirability of maintaining a working and protection path throughout the replacement process. In

Petition, 62.

Dr. Houh's testimony and record evidence confirms that sequentially replacing LSPs was known in the art to minimize interruption.

44. The explanations I provided in my first declaration referred back to limitations [1.3]-[1.4], and reflected general knowledge in the art. Indeed, 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.1011, 12 ("It is highly desirable not to disrupt traffic...[this] requirement necessitates establishing a new LSP tunnel and transferring traffic from the old LSP tunnel onto it before tearing down the old LSP tunnel. This concept is called 'make-before-break.'"); *see also* Ex.1006, 81 ("As soon as that new TE LSP is successfully set up, the old is torn down. This is known as the make-before-break mechanism."); Ex.1010, 251 ("The networks routing optimality may be restored by occasional re-optimization that re-routes some of the LSPs. Note that features such as the make-before-break...are usable for LSP re-routing.").

Ex.1038 (Dr. Houh Declaration), ¶36; Reply, 32.

Doshi teaches dependent claim 18.

[18.1] The non-transitory computer readable media of claim 17, wherein said step of selecting an entity pair further comprises: selecting a working entity from said plurality of transport entities; selecting a protection entity from said plurality of transport entities; and

As discussed above at [1.3], Doshi discloses selecting an LSP pair comprising a primary LSP and a protection LSP from the plurality of MPLS LSPs. Doshi's "primary path" corresponds to a "working path." Ex.1005, [0046]. Thus, Doshi's step of selecting an LSP pair comprises selecting a "working path" and a protection path from the MPLS LSPs, which renders obvious this limitation. Ex.1003, ¶¶192-194.

Petition, 46.

In claim 2, the entity pair is selected before the working and protection entity are selected; In Doshi, the entity pair is selected after the potential working entities and protection entities are selected. Thus, claims 2 and 18 are patentable over Doshi.

Patent Owner Response, 55-56.

Petition explained how Doshi teaching of selecting a working path and a protection path from the MPLS LSPs meets claim 18.

Patent Owner Response does not address the Petition's analysis of claim 18.



The bridge to possible

