UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.,

Petitioner,

- vs. -

CORRIGENT CORPORATION,

Patent Owner.

Case IPR2023-00447

U.S. Patent No. 9,118,602

PETITIONER'S REPLY TO PATENT OWNER RESPONSE

TABLE OF CONTENTS

I. Introduction....1

II. Claim Construction....1

III. Ground 1: Raz Renders Claims 1-13, 15-24 AND 26 Obvious....1

A. Raz and the '602 Patent Are Not Fundamentally Different....1

B. A POSA Would Have Been Motivated to Modify Raz. 6

C. There is a Reasonable Expectation of Success in Modifying Raz....12

D. Claim 1 12

1. Raz Teaches or Renders Obvious a "LAG" Connecting a "First MPLS/LAG Switch" to a "Second MPLS/LAG Switch." 12

2. Raz Teaches or Renders Obvious Limitation [1.5]. 14

E. Independent Claim 15 17

F. Independent Claim 26 19

IV. Ground 2: The Combination of Raz and Ferguson Renders Obvious Claims 1-26… 19

A. A POSA Would Have Modified Raz Based on Ferguson. 19

B. There is a Motivation to Modify Raz with Ferguson....22

C. Petitioner Establishes a Reasonable Expectation of Success....23

D. When Raz is Modified Based on Ferguson, the Claims Are Rendered Obvious. 24

V. Dependent Claims....24

I. INTRODUCTION

The Petition demonstrated the claims of the '602 Patent were unpatentable as obvious in view of Raz (Ground 1) or the combination of Raz and Ferguson (Ground 2). Paper 1. After the Board preliminarily agreed on unpatentability in the Institution Decision, Patent Owner ("PO") served a Patent Owner Response ("POR," Paper 14) that repeats the arguments raised by PO before institution. For Ground 1, PO rehashes its arguments that Raz relates to transmitting packets via a subport within an LSR, that Petitioner did not explain how or why a POSA would have modified Raz, and Raz fails to teach Limitation [1.5]. *Compare* Paper 6 at 2, 4-11 *with* POR at 6-61. For Ground 2, PO replays its argument that there is no motivation to combine Raz and Ferguson. *Compare* Paper 6 at 3, 11-16 *with* POR at 51-66. These arguments failed the first time, and, despite PO's more drawn-out discussion, the arguments still fail. Petitioner respectfully requests that the Board maintain its determination that Claims 1-26 of the '602 Patent are unpatentable.

II. CLAIM CONSTRUCTION

The POR "adopts Petitioner's claim construction position" that no terms require construction. POR at 4; *see* Paper 8 at 5; EX1021, ¶¶7-8.

III. GROUND 1: RAZ RENDERS CLAIMS 1-13, 15-24 AND 26 OBVIOUS

A. Raz and the '602 Patent Are Not Fundamentally Different.

PO begins its discussion of Ground 1 with the misplaced assertion that Raz and the claimed inventions of the '602 Patent are "fundamentally different." POR at

6-12. This is the first of many times that PO argues that "Raz is directed to using multiple slow-speed processors (i.e., 'subports') ***within*** a network device such as an LSR (label switching router) for processing a ***single*** high-speed stream between LSRs," whereas the '602 Patent is directed to using a data packet label to transmit packets between MPLS/LAG switches. POR at 7-9 (emphasis in original). This argument did not succeed in the Patent Owner Preliminary Response (Paper 6 at 4-7, "POPR"), and it fails here. EX1021, ¶¶9-14. Petitioner has always acknowledged that Raz addresses the use of subports within an LSR (*see* Paper 1 at 15, 19 and 22-25), but a POSA would have found it obvious from Raz to use Ethernet physical data ports of a router or switch in an Ethernet LAG to communicate high-speed packet streams in a MPLS network. EX1021, ¶13; EX1006, Cols. 1:16-19, 2:23-31, 7:7-29, 11:3-12, 13:16-19, 14:42-44, 15:56-58, 17:7-9. The switching fabric within the LSR in Raz has subports, and Raz's technique identifies one of the subports with sufficient bandwidth to meet the requirements of a LSP (which correlates to a network tunnel) and then assigns that subport to communicate packets. EX1021, ¶13. The same principles apply to forwarding packets between MPLS/LAG switches in an MPLS network. *Id.* A POSA would have known from Raz to assign a physical tunnel port of a LAG to a network tunnel in order to provide a pathway meeting the bandwidth requirements "in the event a wide connection is to be allocated" for

forwarding a high-speed packet stream. EX1021, ¶13; EX1006, Col. 11:3-12; *see* EX1006, Cols. 2:23-25, 7:7-26, 11:13-12:9, Figure 5.

LAGs were well-known in the art and widely used to communicate packet streams between switches or routers before the priority date for the '602 Patent, as demonstrated by both Raz and Ferguson. EX1006, Col. 9:9-28; EX1007, Cols. 1:57-2:3, 1:28-42, 3:36-4:19, Figures 2A-2B; EX1022 at 21:19-22:6, 27:20-28:16 (PO's expert Dr. Rouskas acknowledging the LAGs were well-known); EX1021, ¶14. A POSA reading Raz would have understood that using aggregation to communicate packets of a high-speed packet stream through subports within a LSR also applies to communicating individual packets through Ethernet physical data ports of routers or switches in a MPLS network. EX1021, ¶14; EX1006, Col. 1:40-46 (Raz discussing use of "aggregate link speeds" to communicate packet streams). In either case, there is a desire to identify and assign a path that will have sufficient bandwidth to accommodate packets within a high-speed stream. EX1021, ¶14.

While PO argues that Raz teaches the use of a single high-speed link to communicate streams between LSRs (POR at 8-9), that is merely a design choice. EX1021, ¶¶15-17. It would have been obvious to a POSA that high-speed packet streams could be communicated between switches or routers through a physical tunnel port of a LAG. *Id.* A single high-speed link has bandwidth limitations. If a given high-speed transmission requires more bandwidth than the physical limit of

the high-speed link, then a POSA would have known that a LAG was an alternative that offers increased usable bandwidth for transmitting packets. EX1021, ¶15; EX1006, Col. 9:9-28; EX1007, Cols.1:28-2:3, 3:36-4:19, Figures 2A-2B; EX1022 at 21:19-22:6, 27:20-28:16. As Dr. Rouskas acknowledges, a LAG is treated as a "single logical entity," which evidences that a POSA would find it an obvious alternative to a single link. EX1022 at 13:10-21.

PO also incorrectly asserts that "Raz is fundamentally different than the '602 patent claims when considering packet labeling and how packets are processed by Raz's subports." POR at 9-12. As discussed in the Petition, Raz teaches that a first LSR generates a data packet label in which a port serial number is encoded and sends the label to a preceding LSR. Paper 1 at 7-10, 24-25; EX1006, Cols. 7:17-45, 9:29-58, 14:23-26, Figures 3-4; EX1021, ¶¶18-22. Subsequently, the preceding LSR sends a data packet to the first LSR, and the first LSR examines the label and forwards the packet to the proper subport for processing. *Id.* The process is then repeated in sending the data packet from the first LSR to a second LSR. *Id.* This technique just as easily could have been implemented to identify a single physical tunnel port through which a data packet in a first router or switch would be communicated to a second router or switch via a LAG. EX1006, Col. 11:3-12; *see id.*, Cols. 2:23-25, 7:7-16, 7:22-26, 11:3-12:9, Figure 5; EX1021, ¶18; Paper 1 at 19-25; Paper 8 at 10-11.

PO's argument about Raz's packet labeling fails because it (1) improperly imports a limitation into the claims of the '602 Patent and (2) oversimplifies the example embodiment in Figure 3 of Raz. EX1021, ¶¶19-22. First, the claims of the '602 Patent require only that the data packets are sent to the second MPLS/LAG switch through the single physical tunnel port having the port serial number encoded in the data packet label. EX1001, Cols. 9:44-47, 10:62-64, 12:33-36. For instance, limitation [1.5] recites "sending said data packet from said first MPLS/LAG switch to a second MPLS/LAG switch via said single physical tunnel port having the port serial number encoded in the data packet label." EX1001, Col. 9:44-47. The claims do not require that the first switch ***assign*** the single physical tunnel port to be used to send a data packet to the second switch.[1] *Id.*; EX1021, ¶19.

Second, it would have been obvious to a POSA that the same subport could have been used in Raz for the transmission of a data packet from the preceding LSR to the first LSR to the second LSR. EX1021, ¶20; EX1006, Cols. 7:17-29, 7:39-45,

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[1] Even if the claims of the '602 Patent do require that the first MPLS/LAG switch assign the single physical tunnel port to be used to send a data packet to the second MPLS/LAG switch, this would have been a straightforward design choice in view of Raz (and a simpler configuration to implement). EX1021, ¶21.

9:29-58, 14:23-26, Figures 3-4. PO argues that Figure 3 of Raz shows otherwise, but that is wrong. POR at 11. As Dr. Rouskas acknowledges, the same subport number could have been used to transmit a data packet from LSR A to LSR B to LSR C in Figure 3. EX1022 at 65:18-68:13; EX1021, ¶22. It is merely a matter of bandwidth availability as to which subport is chosen. EX1021, ¶22. Notably, Raz's discussion of Figure 3 explains that subport 1 "may be" chosen for transmission from LSR B to LSR C if subport 0 (which was used for transmission form LSR A to LSR B) does not have sufficient bandwidth in LSR B. EX1006, Col. 7:17-29. However, subport 0 just as easily could have been identified in a data packet label to transmit a data packet from LSR B to LSR C if there were sufficient bandwidth. EX1022 at 65:18-68:13. Thus, the data packet label in a data packet could have been used to send the packet from a proceeding node to a first MPLS/LAG switch to a second MPLS/LAG switch via the same physical tunnel port. EX1021, ¶¶18-22.

B. A POSA Would Have Been Motivated to Modify Raz.

PO lists a plethora of arguments why "[a] POSA would not have been motivated to modify Raz's teachings." POR at 12-24. But they all fail, just as they did in the POPR. EX1021, ¶¶23-52; Paper 6 at 9-11. PO begins its motivation argument by repeating its position that Raz's teachings are limited to what takes place within an LSR (which is incorrect for the reasons discussed above) and asserting that "Raz describes that the capacity of [the] external links or streams

between LSRs already exceeds the capacity of internal processors." POR at 12-13, 20. But this ignores what would have been obvious to a POSA – namely, that single external links have a limit to their capacity and, where additional capacity is needed, Raz's techniques provide a solution. EX1021, ¶¶24-25, 46. A POSA would have known that the concept of using aggregation to communicate individual packets of a high-speed packet stream through subports within a LSR also applies to communicating the packets through physical tunnels ports of a LAG between routers or switches in a MPLS network. *Id.* In either case, available bandwidth is increased to accommodate packets within a high-speed stream. *Id.*; *see* EX1022 at 21:19-22:6, 27:20-28:16 (Rouskas testimony on bandwidth).

PO next argues that "Raz addresses a different problem than the '602 [P]atent." POR at 13-14. But this contradicts the words of both the '602 Patent and Raz, which each discuss the need to provide additional bandwidth. EX1001, Cols. 2:22-41, 2:59-3:16, 6:11-51, Figures 3-4; EX1006, Abstract, Cols. 1:40-2:20, 6:24-45, 11:3-12, Figure 5. Both Raz and the '602 Patent aggregate slower speed communication pathways (the "slow speed" processors within the LSR in Raz and the slower speed links between MPLS/LAG switches in the '602 Patent) to maximize available bandwidth. EX1021, ¶¶26-27, 34, 39.

PO also asserts that a POSA would not have modified Raz because Raz is "outside the purview" of MPLS networks. POR at 14-15. This defies common sense.

EX1021, ¶¶28-29. Raz discloses the implementation of its invention in an MPLS network, as shown below in Figure 1 of Raz:

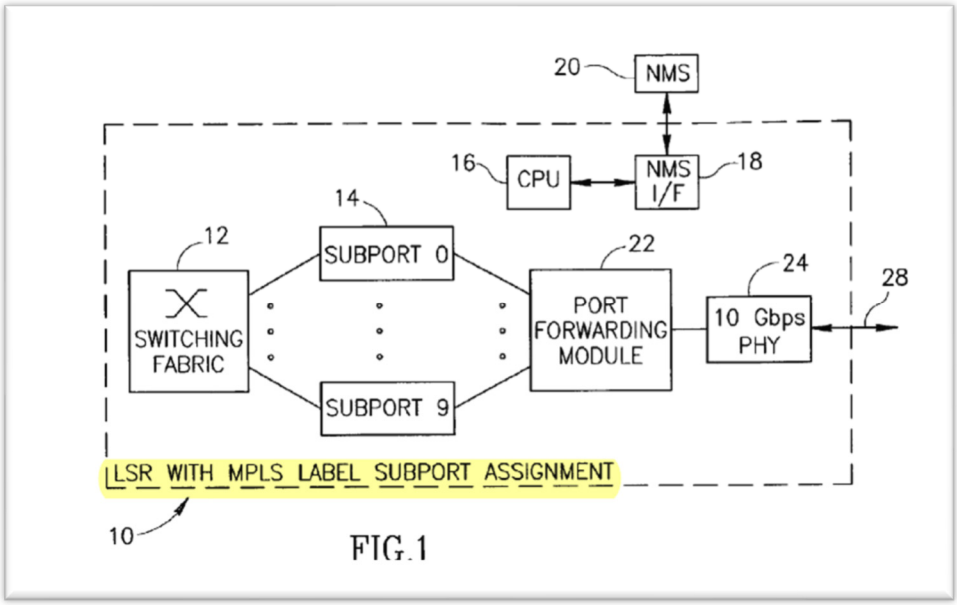


Figure 1 of Raz (Annotated)

See EX1006, Cols. 7:7-29, 9:9-48, 11:3-12; EX1021, ¶28. The fact that Raz's techniques are implemented within a LSR does not change the fact that Raz operates in an MPLS network. EX1021, ¶¶28-29. Further, Raz discloses ways to improve available bandwidth in a MPLS network. EX1006, Abstract, Cols. 1:40-2:20, 11:3-12; EX1021, ¶¶28-29.

PO next argues that any modification of Raz would render it "inoperable for its intended purpose" of "multiplexing" the outputs of LSRs into "a single high-speed stream." POR at 15-16. But Raz discloses multiplexing as a design choice only because the processors within the LSRs are slower in speed than the external link

between LSRs. EX1021, ¶¶30-32. As discussed above, it would have been an obvious alternative for a POSA to use a LAG between LSRs if there is a need to increase the bandwidth of the link between the LSRs. EX1021, ¶¶31-32. A POSA would have understood that, if a LAG were available between LSRs, there would be no need to multiplex the packet streams transmitted between LSRs, as shown by Ferguson. EX1007, Cols. 1:28-2:3, Figures 2A-2B; EX1021, ¶¶31-32, 45.

Further, PO's assertion that Raz requires using the same subport on both sides of a link (POR at 16) is misplaced. EX1021, ¶33. Subports are physical structures within an LSR and thus are different from the link between LSRs. EX1006, Cols. 2:15-16, 6:38-41, 7:20, 8:46-47, Figure 3. The use of a LAG as a link between LSRs would not affect the subports within the LSRs. EX1021, ¶¶33, 45.

In addition, PO argues that the motivation analysis in the Petition is deficient because it "does not mention 'modify' at all and only mentions 'motivat[ion] three times for [the] independent claims under Ground 1." POR at 17. But the Petition and supporting declaration had extensive discussion of the motivation that a POSA would have had to modify Raz. Paper 1 at 15, 19-20 and 22-25; EX1004, ¶¶82, 90-91, 95, 100, 104 and 108; EX1021, ¶¶35-36. This analysis is not undercut just because the specific words "modify" and "motivation" was not used enough for PO.

PO next discusses Limitation [1.0], arguing there is no motivation to modify Raz because "Raz does not use subports to 'communicate high speed packet streams'

as Petitioner alleges but rather for ***internal processing*** of a high-speed packet stream within an LSR." POR at 18 (emphasis in original). That is incorrect. Raz discloses "a subport forwarding and provisioning mechanism" that forwards packets to and through the subports within a LSR. *See, e.g.*, EX1006, Cols. 1:65-2:3, 6:24-25, 7:18-58, Figure 3. Thus, the "packet processing" performed by the subports in Raz includes communicating the packet streams. EX1021, ¶37; EX1006, Col. 2:41-51.

PO also asserts that the Petition does not explain "*why* or *how* a POSA would have been motivated to modify Raz's specific teachings to include a LAG between LSRs." POR at 18 (emphasis in original). Wrong. The Petition explains that Raz's system would have been modified to include a LAG between the LSRs, the modified system would select a physical tunnel port of the LAG to communicate a high-speed packet stream, and the modified system would use a data packet label to identify the selected physical tunnel port and communicate that label to a preceding node to allow the packet to be forwarded through the proper physical tunnel port. Paper 1 at 15, 19-20 and 22-25; EX1021, ¶38. As discussed above, these modifications would have been made is to increase available bandwidth. EX1021, ¶38.

PO also argues that "how packets are processed and move within a switch is different from how packet streams are communicated between switches." POR at 19. Dr. Rouskas identifies purported technical differences relating to decapsulation of packets within an LSR, serial bit-by-bit transmission of packets, and whether a

subport in a LSR is reading a packet from a memory location during processing. EX2007, ¶72. But none of these technical differences is recited in the claims of the '602 Patent. EX1001, Cols. 9:44-47, 10:62-64, 12:33-36; EX1021, ¶¶40-44. Nor do the '602 Patent specification, Raz or Ferguson address them when discussing transmission of packets within or between routers or switches. EX1021, ¶¶40-44. Moreover, while these technical differences may be correct in some network architectures, that is not always the case. EX1021, ¶40. A POSA thus would have understood that the technical differences discussed by PO are not relevant to Raz's teachings about the use of aggregation to communicate individual packets of a high-speed packet stream through a network. EX1021, ¶¶40-44; EX1006, Col. 7:17-38, 7:65-8:13, 9:49-58. This conclusion is supported by Ferguson's disclosure that its aggregation techniques between routers can apply within a router, and vice versa. EX1007, Cols. 5:61-6:9; EX1021, ¶43.

In discussing Limitation [1.1], PO asserts that the Petition discusses how Raz could have been modified, not how Raz would have been modified.[2] POR at 21. This is contradicted by the Petition, which repeatedly explains that a POSA would have

[2] PO's discussion of Limitations [1.2]-[1.5] either repeats earlier arguments or refers to later arguments that will be addressed below. POR at 22-23; EX1021, ¶¶47-52.

known to use Ethernet physical data ports of a router or switch in an Ethernet LAG to communicate high-speed packet streams in a MPLS network. Paper 1 at 15, 19-20 and 22-25; EX1006, Cols. 1:16-19, 2:23-31, 7:7-29, 11:3-12; EX1021, ¶¶47-52.

C. There is a Reasonable Expectation of Success in Modifying Raz.

PO argues that Petitioner does not address "a reasonable expectation of success in modifying Raz to meet the claims." POR at 24-25. Not so. There is no requirement that the Petition use the exact words "reasonable expectation of success." Here, the Petition and Dr. Bhattacharjee (who noted the need for a reasonable expectation of success, EX1004, ¶¶14, 17) explain why a POSA reasonably would have expected success in modifying the teachings of Raz to (1) use a physical tunnel port in an Ethernet LAG to communicate packet streams and (2) generate a data packet label identifying the physical tunnel port to be used. Paper 1 at 15, 19-20 and 22-25; EX1004, ¶¶82, 90-91 and 107-108; EX1021, ¶¶53-54. PO provides no evidence to the contrary.

D. Claim 1

1. Raz Teaches or Renders Obvious a "LAG" Connecting a "First MPLS/LAG Switch" to a "Second MPLS/LAG Switch."

PO's analysis of Claim 1 repeats the arguments made in its motivation analysis that "Raz's subports do not teach or render obvious the claimed 'LAG' connecting a 'first MPLS/LAG switch' to a 'second MPLS/LAG switch.'" POR at 25-29. PO states that (1) Raz's subports are internal network processors in an LSR,

(2) "Raz's multiple subports are not 'aggregated' in the sense of a LAG," and (3) "Raz distinguishes between a LAG and its own subports." *Id.* These arguments fail for the reasons discussed above in Sections III.A-III.C. A POSA reviewing Raz would have understood that Raz's subports act functionally like a LAG because the subports provide multiple 1G pathways for handling packet streams that can be thought of as logically associated and treated as a single aggregated 10G pathway. EX1021, ¶¶55-62; EX1006, Cols. 7:7-16, 8:26-40. Notably, Dr. Rouskas acknowledged during his deposition that "Raz was well aware of a LAG" and that the embodiment disclosed in Column 9 of Raz was "taking a ***LAG switch*** and he's ***repurposing it to use it for his embodiment inside the switch***." EX1022 at 31:21-34:5 (emphasis added). Thus, Dr. Rouskas himself admits that the subports within Raz function as if they were a LAG. *Id.*; EX1021, ¶¶58, 60; EX1007, Col. 1:34-36 (Ferguson explaining that a LAG act as a single logical entity that increases available bandwidth).

Raz's discussion of multiplexing the output of its subports into a single high-speed link is not to the contrary. POR at 29. As discussed above, Raz discloses multiplexing as a design choice, and it would have been an obvious alternative for a POSA to use a LAG as the link between LSRs. EX1021, ¶62.

2. Raz Teaches or Renders Obvious Limitation [1.5].

The bulk of PO's analysis of Claim 1 is spent on its argument that Raz does not teach or render obvious Limitation [1.5]. POR at 29-42. PO previously raised this argument in the POPR (Paper 6 at 6-9), and the Board preliminarily rejected it (Paper 8 at 9-11).

The Petition explains that Raz discloses or renders obvious sending a data packet from a first MPLS/LAG switch to a second MPLS/LAG switch via a single physical tunnel port having the port serial number encoded in the data packet label. Paper 1 at 25; EX1021, ¶¶63-66. For example, LSR B in the embodiment described in Column 7 generates a data packet label in which the port serial number for the physical tunnel subport (e.g., subport 3) is encoded, and it corresponds to the claimed first MPLS/LAG switch. EX1006, Col. 7:17-29; EX1004, ¶107. A POSA would have understood that the data packet in LSR B could be sent to another LSR (corresponding to the claimed second MPLS/LAG switch) via a physical tunnel subport (subport 3) having the same port serial number encoded in the data packet label. EX1021, ¶¶66-67; EX1006, Col. 7:39-45; *see id.*, Cols. 7:17-29, 9:29-58, 14:23-26, Figures 3-4.

PO objects to this disclosure by repeating its argument that Raz addresses what is occurring within the LSRs. POR at 29-32. This argument fails for the reasons stated above, namely that Raz is using aggregation to communicate individual

packets of a high-speed packet stream through subports within a LSR, and a POSA would have known to apply the same concept to the selection and aggregation of physical tunnel ports of a LAG between LSRs. EX1021, ¶¶68-69.

PO faults Petitioner for relying on the disclosure in Column 7 of Raz because that disclosure allegedly involves LSR B receiving, not sending, the data packet via subport 3. POR at 32-35. But this is too narrow a reading of Raz. As discussed above, it would have been obvious to a POSA that the same subport number could have been used in Raz for the transmission of a data packet from LSR B to another LSR. EX1021, ¶66-69; EX1006, Cols. 7:17-45, 9:29-58, 14:23-26, Figures 3-4. PO similarly criticizes Figure 3 of Raz (POR at 32-33), but Dr. Rouskas acknowledged that, in Figure 3, the same subport could have been used to transmit a data packet from LSR A to LSR B to LSR C. EX1022 at 65:18-68:13; EX1021, ¶¶22, 67. It is merely a matter of bandwidth availability as to which subport is chosen. EX1021, ¶¶22, 68; EX1006, Col. 7:17-29; EX1022 at 65:18-68:13. Thus, a POSA would have known that the data packet label could have been used to send the packet from a proceeding node to a first MPLS/LAG switch to a second MPLS/LAG switch via the same physical tunnel port. EX1021, ¶¶18-22, 68-75.

PO also argues that Raz teaches that a receiving LSR selects the subport used for receiving data packets at that LSR, and whatever subport is used for transmitting data packets to the next LSR is independently chosen by that next LSR. POR at 33-

42. But, as previously explained, the claims do not require that the first MPLS/LAG switch assign the single physical tunnel port to be used to send a data packet to the second MPLS/LAG switch. EX1001, Cols. 9:44-47, 10:62-64, 12:33-36; EX1021, ¶76. As such, a POSA would have understood from Raz that the same subport could have been used for transmission of a packet from LSR A to LSR B to LSR C in Figure 3. EX1021, ¶77; EX1006, Cols. 7:17-45, 9:29-58, 14:23-26, Figures 3-4. A POSA also would have understood that the data packet label in a data packet could have been used to send the packet from the proceeding node to the first MPLS/LAG switch to the second MPLS/LAG switch via the same physical tunnel port. *Id.* This satisfies Limitation [1.5].

Even if the claims of the '602 Patent require that the first MPLS/LAG switch assign the single physical tunnel port to be used to send a data packet to the second MPLS/LAG switch, this would have been a straightforward design choice in view of Raz. EX1021, ¶78-80.

Finally, PO argues that the Petition "relies on what 'could' happen, not on what Raz actually discloses." POR at 34-35. This is not correct. The Petition repeatedly states that a POSA would have known to use Ethernet physical data ports of a router or switch in an Ethernet LAG to communicate high-speed packet streams in a MPLS network. Paper 1 at 15, 19-20 and 22-25.

E. Independent Claim 15

PO's arguments on independent Claim 15 mirror its arguments with respect to Claim 1 (*see* EX1021, ¶¶81-83), with the addition that PO incorrectly asserts that Raz does not teach the "mapper" recited in Claim 15. POR at 42-50. PO argues that the Petition does not explain how Raz's subport forwarding module (which corresponds to the claimed mapper) performs the functions recited in limitations [15.6]-[15.8] or, alternatively, that module cannot perform those functions. POR at 43-48. PO is wrong.

Raz discloses that the "port forwarding module" can be implemented on a network processor, FPGA or ASIC, and the port forwarding module performs the functions of the claimed mapper. EX1006, Cols. 6:65-7:5, 7:30-58, 12:61-13:5, Figures 1, 6; EX1021, ¶¶82-84. For example, Limitation [15.6] recites that the claimed mapper must "receive a data packet from an upstream node," and Raz discloses that "[t]he port forwarding module functions to receive the 10G packet stream…" EX1006, Col. 7:42-51. Further, Limitation [15.7] requires that the mapper must "detect said data packet label in said data packet," and Raz states that the port forwarding module "examine[s] the label in each packet." *Id.* Further, Limitation [15.8] claims that, based on the data packet label, the mapper "send[s] said data packet to the second MPLS/LAG switch via said single physical tunnel port." Raz discloses that its port forwarding module forwards the packet "to one of the subports

in accordance with the label." EX1006, Col. 7:51-52; *see id.*, Col 7:42-45. Thus, the port forwarding module is inspecting the data packet label, determining the subport to which the data packet should be sent, and forwarding the data packet to that subport. EX1021, ¶¶85-87. It would have been obvious to a POSA that the port forwarding module could also be applied to select a physical tunnel port over which to send a data packet from LSR B (corresponding to the first MPLS/LAG switch) to the next LSR (corresponding to the second MPLS/LAG switch). *Id.* As such, Raz's port forwarding module corresponds to the claimed mapper performing the functions recited in Limitations [15.6]-[15.8]. *Id.*

PO also argues that the subport forwarding module "just directs such a received data packet to a subport within the LSR for processing." POR at 45-48. This argument ignores that a POSA would have understood that the techniques used to forward packets within an LSR also could be applied to a LAG communicating a high-speed packet stream between LSRs. EX1021, ¶88. For example, the subport forwarding module of Raz could have been applied as a mapper to select a physical tunnel port of a LAG between LSRs (or MPLS/LAG switches). *Id.*

Further, PO argues that "Petitioner's claim 15 obviousness arguments do not even mention Raz's subport forwarding module." POR at 48. But Page 46 of the Petition states, "Raz teaches a ***forwarding module*** that performs these functions and

thus corresponds to the mapper recited in Element [15.5]." Paper 1 at 46 (emphasis added). PO is wrong. EX1021, ¶89.

Finally, PO argues that "Petitioner fails to establish that Raz teaches or renders obvious limitation 15.8 for the same reasons as limitation 1.5." POR at 50. This argument fails for the reasons discussed in Sections III.A-III.C. EX1021, ¶¶89-90.

F. Independent Claim 26

PO asserts that "[C]laim 26 is non-obvious for the same reasons as [C]laim 1." POR at 50-51. This incorrect for the reasons stated for Claim 1. *See supra* Sections III.A-III.C; EX1021, ¶91.

IV. GROUND 2: THE COMBINATION OF RAZ AND FERGUSON RENDERS OBVIOUS CLAIMS 1-26.

A. A POSA Would Have Modified Raz Based on Ferguson.

PO asserts that "a POSA would not have been motivated to modify Raz based on Ferguson." POR at 51-56. PO initially raises a similar argument about "Raz's teachings regarding subports ***within*** an LSR to apply to communications ***between*** LSRs in view of Ferguson." POR at 51-53 (emphasis in original), 63-64. However, as discussed above in Ground 1, it would have been obvious to a POSA that Raz's techniques could be applied to communications on links between LSRs. EX1021, ¶¶92-97. Thus, Ferguson's teachings to "load balance label switched packets of an LSP across an aggregated link having two or more logically associated physical interconnects" and, thereby maximize bandwidth, would have provided a motivation

to modify Raz. EX1007, Col. 1:60-63; *see id.*, Cols. 1:22-27, 1:57-2:6, 2:40-47, Figures 2A-2C; Paper 1 at 52-60.

Further, PO argues that "while Ferguson teaches that its own techniques for communications between routers may be applied within a router (EX1007, Cols. 5:61-6:9), a POSA would not have understood, based on Ferguson, that the opposite is true for any teachings outside of Ferguson, such as the teachings of Raz." POR at 53; *see id.* at 60-64. PO has no support for this supposition, and it is wrong. As explained in the Petition, a POSA would have understood from Ferguson that techniques used to communicate high-speed data streams between routers or switches in an MPLS network can also be used to communicate high-speed data streams within a router or switch, and vice versa. Paper 1 at 56-59; EX1021, ¶¶97-98. It would have been obvious to a POSA that Ferguson teaches that the aggregation principles used outside of a router or switch can also be applied inside of a router or switch. EX1021, ¶97. Indeed, PO admits that "Ferguson's techniques can apply to both between and within routers." POR at 63. The opposite also would have been obvious in light of Ferguson – that Raz's aggregation techniques used with subports in an LSR could be applied to links between LSRs. EX1021, ¶97.

PO asserts that Ferguson and Raz "address different problems" and "use fundamentally different methods." POR at 53-56. Not so. EX1021, ¶¶99-105. As explained in the Petition, both Ferguson and Raz are directed to solving the problem

of ensuring enough bandwidth is available to communicate high-speed packet streams through an MPLS network. Paper 1 at 56-59; EX1006, Cols. 10:60-11:12, 14:33-41; EX1007, Cols. 1:28-42, 2:54-57, 4:55-60. Ferguson, like Raz, focuses on improving the use of bandwidth when using a LAG in an MPLS network. EX1006, Cols. 1:65-2:8, 2:41-67, 6:24-45, Figures 1 and 3-4; EX1007, Cols. 1:21-2:3, 2:22-26, 2:54-57, 3:36-67, Figures 2A-8. Further, like Raz, Ferguson explains that it can "use one or more fields directly from one or more of [the] MPLS labels" to select the path for communicating data packets. EX1007, Col. 8:10-12.

PO argues that "[u]nlike Raz, Ferguson assumes the routers have sufficient processing capacity to handle the data communications that Ferguson describes distributing." POR at 53-54. But this argument cannot stand because Ferguson discloses that its techniques can be used both between and within routers or switches. EX1007, Cols. 5:61-6:9; EX1021, ¶102. Further, PO's argument that Ferguson differs from Raz because Ferguson distributes packets of a common LSP across multiple paths of an aggregated link is misplaced because the relevant teaching from Ferguson is that aggregation methods can be used to increase bandwidth usage when transmitting high-speed packets between two routers or switches in a network. POR at 54-55; EX1021, ¶103.

PO's argument that "Ferguson and Raz teach different methods regarding packet labels" (POR at 55-56) is a red herring because (1) Ferguson does not

foreclose the possibility of using the same packet labeling technique as Raz and (2) even if the labeling techniques are different, Ferguson still teaches aggregation techniques relevant to Raz. EX1021, ¶104.

B. There is a Motivation to Modify Raz with Ferguson.

PO's motivation analysis begins by asserting Petitioner "does not perform a limitation-by-limitation analysis of the alleged Raz and Ferguson combination." POR at 57. But this ignores that Ground 2 incorporates by reference the analysis of Raz in Ground 1 and then explains specific ways that Ferguson supplements what was disclosed by Raz. Paper 1 at 52-60; EX1021, ¶¶106-107. Contrary to PO's argument, the Petition's analysis explains why and how a POSA would have modified Raz based on Ferguson. *See, e.g.*, Paper 1 at 52 ("Ferguson builds on the previous analysis of Raz…").

PO's motivation argument for Ground 2 also repeats assertions already made by PO, including that Petitioner fails to explain (1) why a POSA ***would*** have modified Raz in view of Ferguson, (2) how the two references are "compatible,"[3]

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[3] PO notes that Page 53 of the Petition accidentally lists the word "CITE" where a citation should be located. The appropriate citation of "EX1004, ¶¶246-250" is listed after the following sentence.

and (3) that Ferguson teaches the opposite of Raz. POR at 58-62. These arguments are incorrect for reasons discussed above and in the Petition. EX1021, ¶¶108-119. For example, the Petition cites Ferguson in explaining that "a POSA reviewing Ferguson ***would have understood that it would be desirable to implement*** the techniques in Raz for assigning a physical tunnel subport within an LSR to assign a physical tunnel port to communicate packets along 'physical interconnects' between 'two switches' in an MPLS network." Paper 1 at 53 (emphasis added) (citing EX1007, Col. 1:22-27, 1:57-66; EX1004, ¶245).

PO also argues that Raz "is not concerned with 'bandwidth … to communicate high-speed packet streams through an MPLS network.'" POR at 62-63. That is incorrect, as Raz explains that its "invention also comprises a mechanism to improve the ability to handle wide connections ... that require a relatively large amount of CIR bandwidth." EX1006, Col. 10:60-11:12. It would have been obvious to a POSA that these bandwidth concerns apply both within and between Raz's LSRs. EX1021, ¶117.

C. Petitioner Establishes a Reasonable Expectation of Success.

PO argues that "Petitioner presents no argument that a POSA would have had a reasonable expectation of success in modifying Raz with Ferguson to meet the claims." POR at 64-65. While there is no requirement that the Petition use the exact words "reasonable expectation of success," the Petition explains why a POSA

reasonably would have expected success in modifying the teachings of Raz in view of the teachings of Ferguson. Paper 1 at 55-59; EX1021, ¶¶120-121. PO provides no argument to the contrary.

D. When Raz is Modified Based on Ferguson, the Claims Are Rendered Obvious.

PO also asserts that Raz and Ferguson, if combined, would nonetheless fail to render obvious Claims 1, 15 and 26. POR at 65. Here, PO repeats several of its previous arguments for Grounds 1 and 2. *Id.* These arguments fail for the above-discussed reasons. EX1021, ¶122.

V. DEPENDENT CLAIMS

PO provides no separate argument with respect to Dependent Claims 2-14 and 16-25. These dependent claims should be found unpatentable. Paper 1 at 26-40, 48-49, 59-60.

Respectfully submitted,

Date: February 20, 2024

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24, the undersigned attorney for the Petitioner, Cisco Systems, Inc., declares that the argument section of this reply brief has 5,592 words, according to the word count tool in Microsoft Word™.

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CERTIFICATE OF SERVICE

The undersigned certifies, in accordance with 37 C.F.R. §§ 42.105 and 42.6, that service was made on the Patent Owner as detailed below.

Date of service	February 20, 2024
Manner of service	Email
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