

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ARISTA NETWORKS, INC.,
Petitioner,

v.

CORRIGENT CORPORATION,
Patent Owner.

IPR2023-00839

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

EXHIBIT 1037

Petitioner's Demonstratives for Oral Argument on September 4, 2024

Petitioner Arista Networks, Inc.'s Oral Argument for PTAB Hearing

Arista Networks, Inc. v. Corrigent Corporation, Case IPR2023-00839

September 4, 2024

'602 Patent - Overview

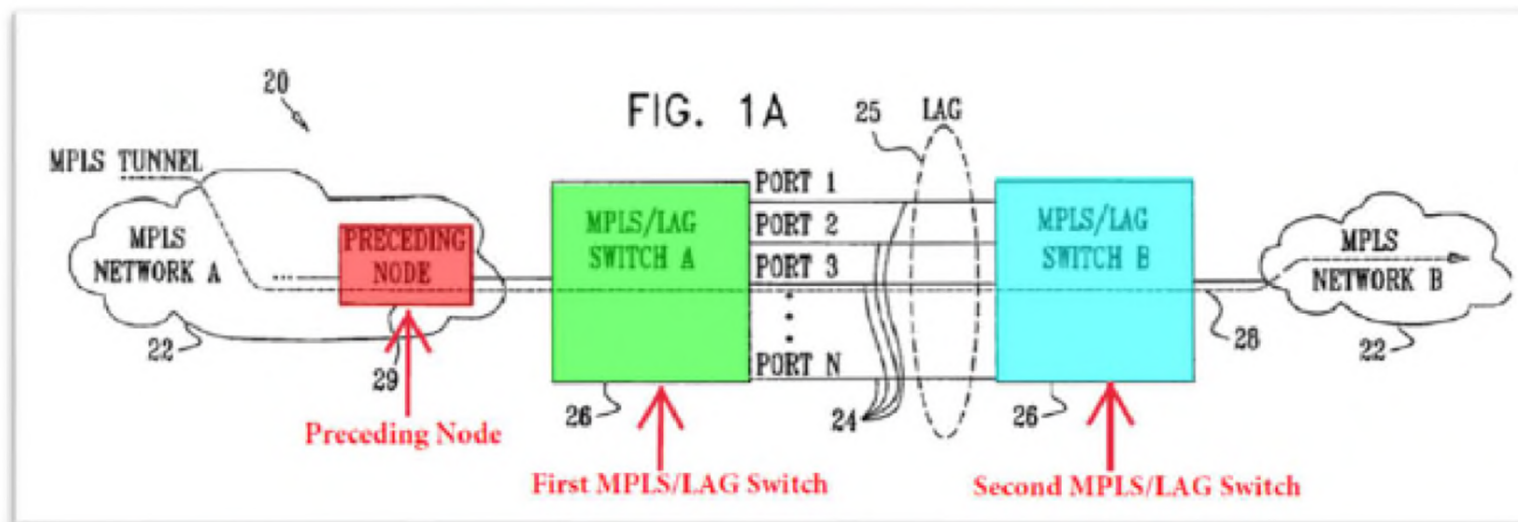


Figure 1A of the '602 Patent (Annotated)

'602 Patent at Fig. 1A

The '602 Patent describes a "method for assigning and utilizing an Ethernet physical data port in an Ethernet Link Aggregation Group (LAG) in a Multi-Protocol Label Switching ("MPLS") network."

Ex. 1001 at 2:30-34

"The flow of packets along a label-switched path (LSP) under MPLS is completely specified by the label applied at the ingress node of the path." As such, "an LSP can be viewed as a tunnel through the network."

Ex. 1001 at 1:40-43

Paper 2 (Pet.) at 2-3
Ex. 1001 ('602 Patent)

'602 Patent - Overview

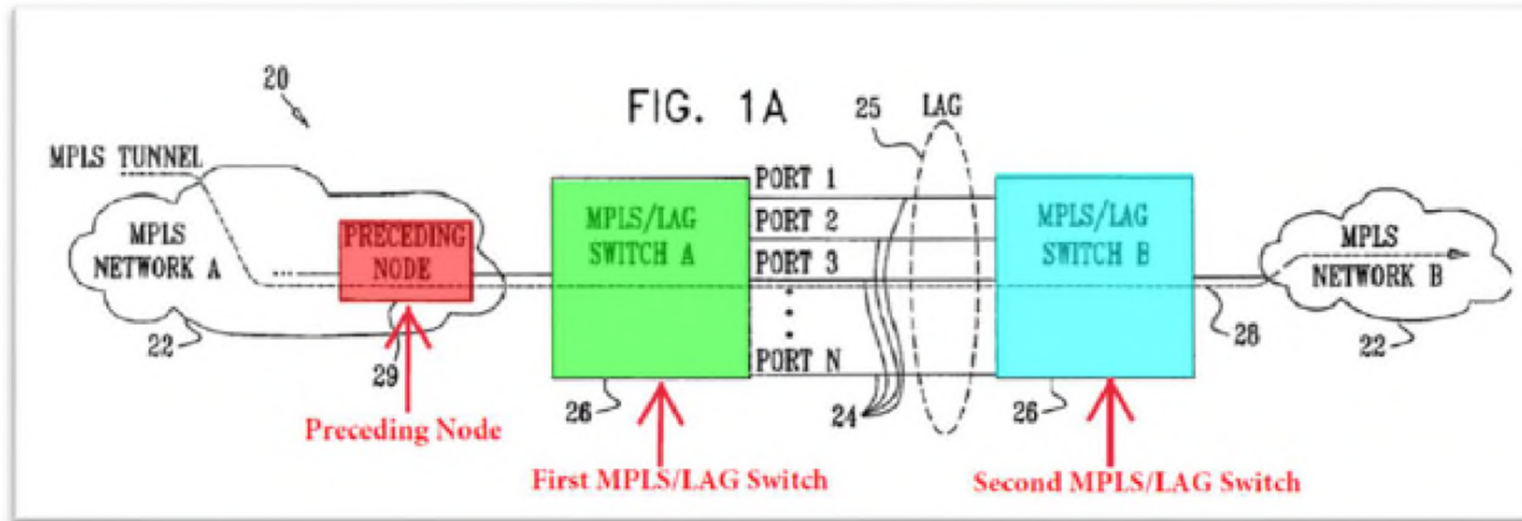


Figure 1A of the '602 Patent (Annotated)

'602 Patent at Fig. 1A

The '602 Patent Background explains that the claimed LAG, MPLS, and RSVP are well-known techniques:

- LAG is a "technique by which a group of parallel physical links between two endpoints in a data network can be joined together into a single logical link." Ex. 1001 at 2:2-4 (Background of the Invention)
- "MPLS defines a label distribution protocol (LDP) by which one LSR informs another of the meaning of labels used to forward traffic between and through them. Another example is RSVP-TE, which is described by Awduche et al., in IETF RFC 3209 entitled "RSVP-TE: Extensions to RSVP for LSP Tunnels" (December 2001), which is incorporated herein by reference." Ex. 1001 at 1:44-50 (Background of the Invention)

Paper 2 (Pet.) at 2-3
Ex. 1001 ('602 Patent)

Introduction: Patent at Issue - '602 Patent

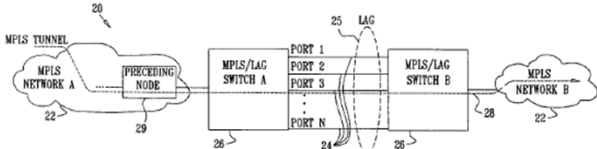
U.S. Patent No. 9,118,602 [Ex. 1001]

Example claim - Claim 1



US009118602B2

(12) United States Patent Solomon (54) TUNNEL PROVISIONING WITH LINK AGGREGATION (71) Applicant: Orekit-Corrigent Ltd., Tel Aviv (IL) (72) Inventor: Ronen Solomon, Ramat Gan (IL) (73) Assignee: Orekit-Corrigent Ltd., Tel Aviv (IL) (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 102 days. This patent is subject to a terminal disclaimer. (21) Appl. No.: 13/969,520 (22) Filed: Aug. 17, 2013 (65) Prior Publication Data US 2013/0336324 A1 Dec. 19, 2013 Related U.S. Application Data (63) Continuation of application No. 13/116,696, filed on May 26, 2011, now Pat. No. 8,537,682, which is a continuation of application No. 11/123,801, filed on May 6, 2005, now Pat. No. 7,974,202. (51) Int. Cl. G08C 15/00 (2006.01) H04L 12/28 (2006.01) G06F 15/173 (2006.01) H04L 12/723 (2013.01) H04L 12/54 (2013.01) H04L 12/715 (2013.01) H04L 12/709 (2013.01) H04L 12/913 (2013.01) H04L 12/911 (2013.01) (52) U.S. Cl. CPC H04L 45/50 (2013.01); H04L 12/5695 (2013.01); H04L 45/04 (2013.01); H04L	(10) Patent No.: US 9,118,602 B2 (45) Date of Patent: *Aug. 25, 2015 45/245 (2013.01); H04L 45/502 (2013.01); H04L 47/724 (2013.01); H04L 47/728 (2013.01); H04L 47/825 (2013.01); H04L 47/829 (2013.01); 702B 60/33 (2013.01) (58) Field of Classification Search CPC ... H04L 12/5695; H04L 45/04; H04L 45/245; H04L 45/50; H04L 45/502; H04L 47/724; H04L 47/728; H04L 47/825; H04L 47/829 USPC 370/235, 389, 392, 400; 709/239, 242 See application file for complete search history. (56) References Cited U.S. PATENT DOCUMENTS 7,983,286 B2 * 7/2011 Rehker 370/409 2003/0020976 A1 * 1/2003 Krishnaswamy et al. 359/110 2004/0107285 A1 * 6/2004 Larson et al. 709/229 (Continued) OTHER PUBLICATIONS Kireeti Kompella, "Internet Draft: Link Bundling in MPLS Traffic Engineering," Dec. 2004, Internet Engineering Task Force, <tools.ietf.org/id/draft-ietf-mpls-lb-mllc-06.txt>.* Primary Examiner—Mounir Moutaouakil (74) <i>Attorney, Agent, or Firm</i>—Peter A. Nieves; Sheehan Phinney Bass & Green PA (57) ABSTRACT A method for processing data packets in a communication network includes establishing a path for a flow of the data packets through the communication network. At a node along the path having a plurality of aggregated ports, a port is selected from among the plurality to serve as part of the path. A label is chosen responsively to the selected port. The label is attached to the data packets in the flow at a point on the path upstream from the node. Upon receiving the data packets at the node, the data packets are switched through the selected port responsively to the label. 26 Claims, 3 Drawing Sheets
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Ex. 1001 (Cover)

1. A method for assigning and utilizing an Ethernet physical data port in an Ethernet Link Aggregation Group (LAG) in a Multi-Protocol Label Switching (MPLS) network, the method comprising the steps of:

assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel, wherein the single physical tunnel port of the LAG meets a bandwidth requirement of the network tunnel, and wherein said single physical tunnel port of the LAG has a port serial number;

dedicating a sub-set of bits in a data packet label prepared by the first MPLS/LAG switch to encode said port serial number of said single physical tunnel port of the LAG into the data packet label;

sending, by said first MPLS/LAG switch, the data packet label, in which said port serial number of said single physical tunnel port is encoded, to a preceding node;

receiving from the preceding node, by said first MPLS/LAG switch, a data packet comprising said data packet label, in which said port serial number of said single physical tunnel port is encoded; and

sending said data packet from said first MPLS/LAG switch to a second MSPLS/LAG switch via said single physical tunnel port having the port serial number encoded in the data packet label.

Ex. 1001 at 9:23-47 (Claim 1)

Ex. 1001 ('602 Patent)

Petitioner's Instituted Grounds

Grounds	Claims	Statute	Basis for Challenge
1	Claims 1–26	§ 103(a)	<i>RFC 3209 in view of Raz</i>
2	Claims 1–26	§ 103(a)	<i>RFC 3209 in view of Raz and Ferguson</i>

Introduction: Overview of Asserted References

Ex. 1010 - RFC 3209 (RSVP-TE: Extensions to RSVP for LSP Tunnels)

Describes “the use of RSVP (Resource Reservation Protocol), including all the necessary extensions, to establish label-switched paths (LSPs) in MPLS (Multi- Protocol Label Switching).”

Ex. 1010 at Abstract

RFC 3209 discloses “several additional objects that extend RSVP, allowing the establishment of explicitly routed label switched paths using RSVP as a signaling protocol. The results is the instantiation of label-switched tunnels which can be automatically routed away from network failures, congestion, and bottlenecks.”

Ex. 1010 at Abstract; *see also* Ex. 1003 (Min Decl.), ¶62

“The set of packets that are assigned the same label value by a specific node...effectively define the ‘RSVP flow.’ When traffic is mapped onto a label-switched path in this way, we call the LSP an ‘LSP Tunnel.’ . . . When labels are associated with traffic flows, it becomes possible for a router to identify the appropriate reservation state for a packet based on the packet’s label value.”

Ex. 1010 at §1.1; *see also* Paper 2 (Pet.) at 5; Ex. 1003 (Min Decl.), ¶62

Paper 2 (Pet.) at 5-6

Ex. 1010 (RFC 3209)

RFC 3209 describes LSP tunnel setup framework

"For tunnel setup, "[a] request to bind labels to a specific LSP tunnel is initiated by an ingress node through the RSVP Path message [which is] augmented with a LABEL_REQUEST object. Labels are allocated downstream and distributed (propagated upstream) by means of the RSVP Resv message."

Ex. 1010 at §1.1; *see also* Paper 2 (Pet.) at 5; Ex. 1003 (Min Decl.), ¶62

"[The Path message is propagated downstream from the ingress node to the tunnel's endpoint, and "[r]outers along the path may use the setup to hold priorities....For instance, in the traffic engineering application, it is very useful to use the Path message as a means of verifying that bandwidth exists...along an entire path."

Ex. 1010 at § 2.2

Paper 2 (Pet.)
Ex. 1003 (Min Decl.)
Ex. 1010 (RFC 3209)

Introduction: Overview of Asserted References

Ex. 1006 - Raz (U.S. Patent No. 7,466,697)

Raz discloses “a scheme for allocating LSP bandwidth to subports that . . . provides a tradeoff between leaving subports empty for wide LSPs and spreading traffic between subports for best utilizing the bandwidth....”

Ex. 1006 at 11:8-10

“The output of all the subports is aggregated and combined into a single high speed packet stream and transmitted over the link.”

Ex. 1006 at 2:11-13; 6:36-38

“[T]he example LSR shown [in Figure 1] comprises a 10G interface that is composed of ten individual 1G packet streams. The ten subports are provided wherein each is adapted to handle a 1G packet stream.”

Ex. 1006 at 7:7-9

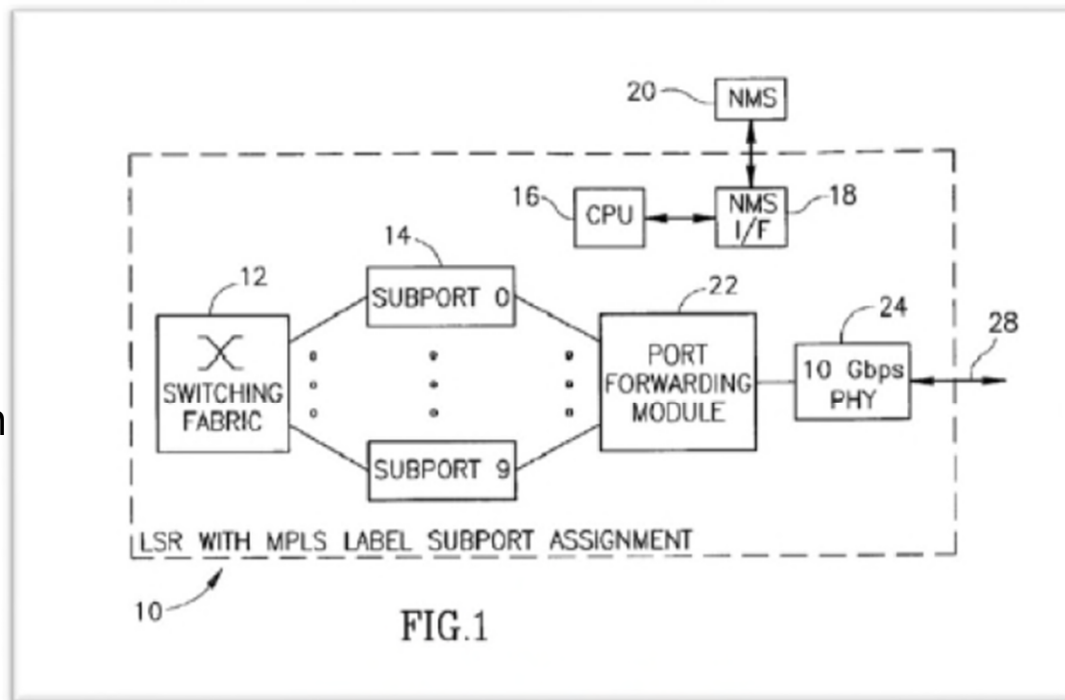


Figure 1 of Raz

Raz at Fig. 1

Paper 2 (Pet.) at 6-7

Ex. 1006 (Raz)

Introduction: Overview of Asserted References

Ex. 1007 - *Ferguson* (U.S. Patent No. 7,277,386)

A system for "distribution of traffic within computer networks."

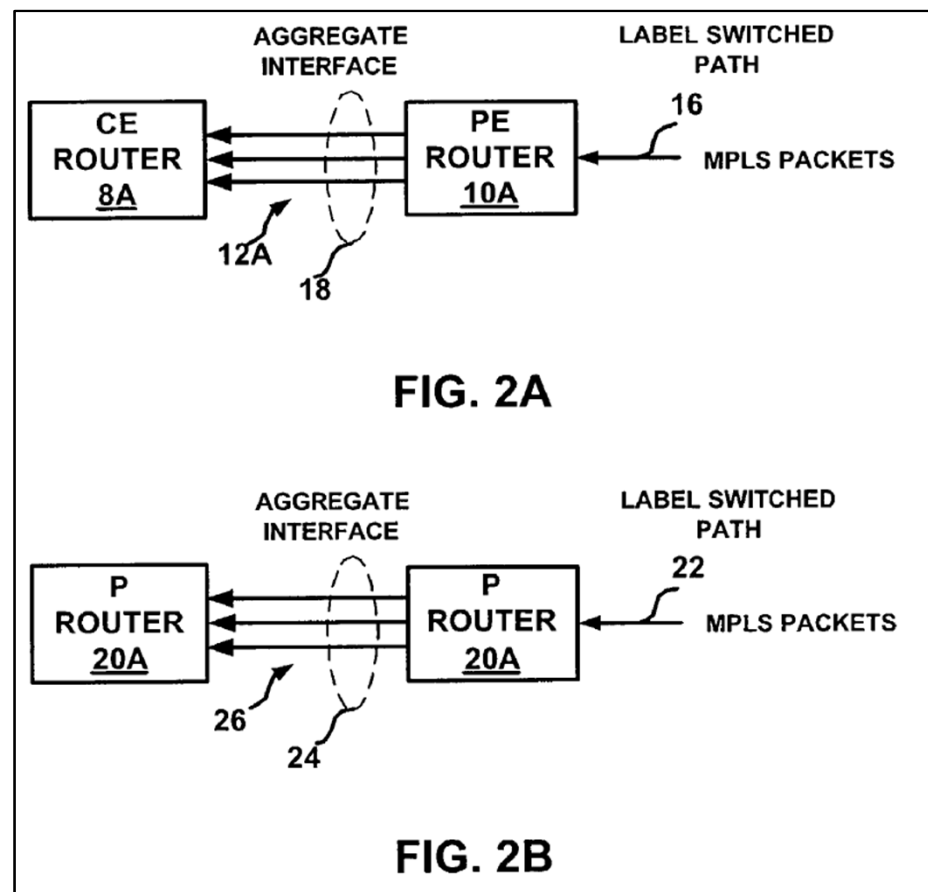
Ex. 1007 at Abstract

"The techniques may. . .be used to load balance label switched packets of an LSP across an aggregated link having two or more logically associated physical interconnects."

Ex. 1007 at 1:60-63

"In addition, the techniques may be used to distribute label switched packets of a common LSP across multiple data paths within a network device, such as a router."

Ex. 1007 at 1:63-66



Ferguson at Figs. 2A-2B

GROUND 1

RFC 3209 IN VIEW OF RAZ

Ground 1 – Claim 1, Element [1.0]

[1.0] A method for assigning and utilizing an Ethernet physical data port in an Ethernet Link Aggregation Group (LAG) in a Multi-Protocol Label Switching (MPLS) network, the method comprising the steps of:

RFC 3209's Label Switched Path Setup System

RFC 3209 discloses that an LSP is “the path created by the concatenation of one or more label switched hops, allowing a packet to be forwarded by swapping labels from an MPLS node to another MPLS node.”

Ex. 1010 at § 1.2; *see also* Paper 2 (Pet.) at 16; Ex. 1003 at ¶¶ 93-94

“[T]he flow along an LSP is completely identified by the label applied [to the traffic] at the ingress node of the path.”

Ex. 1010 at Abstract; § 1.1; *see also* Paper 2 (Pet.) at 16; Ex. 1003 at ¶¶ 93-94

“A POSITA would have known further that ports—i.e., the path that a data packet takes from one node to another—may be assigned to LSPs and utilized when traffic actually traverses the ‘pre-determined’ label-switched path. In order to know where to forward traffic, a transmitting node must know which interface to use, such as which interface connects it to the specified next node along the LSP.”

Ex. 1003 at ¶ 94; *see also* Paper 2 (Pet.) at 16-17

Also applicable to [15.0], [26.0]

Paper 2 (Pet.) at 15-19

Ex. 1003 (Min Decl.), ¶¶ 92-99

Ground 1 – Claim 1, Element [1.0]

[1.0] A method for assigning and utilizing an Ethernet physical data port in an Ethernet Link Aggregation Group (LAG) in a Multi-Protocol Label Switching (MPLS) network, the method comprising the steps of:

Raz's Ethernet Link Aggregation

"In addition to the disclosures and suggestions of RFC 3209, Raz discloses that the particular interface assigned to the network tunnel may be a port (Raz uses the term 'subport') of a LAG."

Paper 2 (Pet.) at 23; *see also* Ex. 1003 at ¶¶ 96-97

"[S]ome commercially available layer 2 switches can determine the destination port for a packet destined to a LAG (Link Aggregation Group) [and] defining its ports leading to the different subports as a single LAG."

Ex. 1006 at 9:9-12; *see also* Paper 2 (Pet.) at 18-19; Ex. 1003 at ¶ 96-97

"Raz discloses that the LAG subports are Ethernet subports: 'Each of the one GE links make up the subports of the aggregate 10GE link,' where Raz defines GE as 'Gigabit Ethernet.'"

Paper 2 (Pet.) at 24 (*citing* Ex. 1006 at 8:22-29, 4:52); *see also* Ex. 1003 at ¶ 97-98

Also applicable to [15.0], [26.0]

Paper 2 (Pet.) at 15-19

Ex. 1003 (Min Decl.), ¶¶ 92-99

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

RFC 3209's Outgoing Interface Assignment to LSP Tunnels

"Hosts and routers that support both RSVP [1] and Multi-Protocol Label Switching [2] can associate labels with RSVP flows. . . . Once a label switched path (LSP) is established, the traffic through the path is defined by the label applied at the ingress node of the LSP. ... When traffic is mapped onto a label-switched path in this way, we call the LSP an 'LSP Tunnel'."

Ex. 1010 at § 1.1

"A node receiving a Path message containing an EXPLICIT_ROUTE object must determine the next hop for this path. ... [S]election of this next hop may involve a decision from a set of feasible alternatives."

Ex. 1010 at §4.3.4.1; *see also* Paper 2 (Pet.) at 21-23; Ex. 1003 at ¶ 102

"RFC 1583 confirms that a 'Next hop' is 'The outgoing router interface to use when forwarding traffic to the destination.'"

Paper 2 (Pet.) at 22 (*citing* Ex. 1020 at § 11); *see also* Ex. 1003 at ¶¶ 104-05

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1010 (RFC 3209)

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Petition Relies on a Combination of RFC 3209 with Raz

A. Motivation to Combine RFC 3209 and Raz

A POSITA would have been motivated to apply various techniques and implementation details disclosed in Raz to the Multi-Protocol Label Switching (MPLS) network disclosed and suggested by RFC 3209 at least because (1) both references deal with the same purposes of preserving resources for setting up a label-switched path (LSP), and ensuring appropriate allocation of bandwidth to the path, as well as assisting the reroute of the path in the event of a failure, and (2) both references teach the same solution—using well known label signaling protocols to perform downstream-on-demand label allocation after the downstream, intermediate node along the requested path assigns an interface (port) to the LSP. EX1003, ¶¶84-91.

Paper 2 (Pet.) at 9; *see also* Ex. 1003 (Min Decl.), ¶¶ 83-91; Paper 23 (Reply) at 7-11

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 9-15, 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Petition Relies on a Combination of RFC 3209 with Raz

“RFC 3209 discloses or renders obvious the assignment of a physical interface to a network tunnel (i.e., an LSP operating as a network tunnel) in an MPLS network by an MPLS switch (i.e., an LSR) operating as the claimed ‘first’ switch, where the physical interface is an outgoing interface connecting the LSR with another node on the next hop of the LSP.”

Paper 2 (Pet.) at 26-27; *see also* Ex. 1003 at ¶ 102

“Raz discloses or renders obvious the assignment of a physical Ethernet LAG subport to a network tunnel (i.e., a LSP operating as a network tunnel) in an MPLS network by an MPLS/LAG switch (i.e., an LSR) operating as the claimed “first” switch, where the subport meets a bandwidth requirement of the network tunnel and has a port serial number.”

Paper 2 (Pet.) at 27; *see also* Ex. 1003 at ¶¶ 104-05

“While Raz discloses a method of assigning a LAG subport within an LSR to the network tunnel, a POSITA would have understood that the same principles would also have been applied to the physical/outgoing interface of the LSR operating as the claimed “first” MPLS switch, as taught by RFC 3209.”

Paper 2 (Pet.) at 27; *see also* Ex. 1003 at ¶¶ 104-05

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 9-15, 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

A POSITA Would Have Been Motivated To Employ Raz's LAG Supports as RFC 3209's Assigned Outgoing Interface

A POSITA would have understood that RFC 3209's system could have been improved by incorporating these aspects of Raz to ensure that LSPs, when they are set up, (1) can pass through aggregated links (such as LAG) and still employ traffic engineering functions of reserving bandwidth of the aggregated link to the LSP, and (2) support traffic engineering so that LSPs can handle high speed packet streams and wide connections. EX1003, ¶90. RFC 3209 emphasizes that “[a]n advantage of

Paper 2 (Pet.) at 13; *see also* Ex. 1034 (Supp. Min Decl.), ¶ 18; Paper 23 (Reply) at 2-3

Raz's invention is “described in the context of an **MPLS based network employing any suitable routing** such as OSPF-TE and signaling **such as RSVP-TE signaling.**”

Ex. 1006 at 6:46-50; *see also* Paper 2 (Pet.) at 23-24; Ex. 1003, ¶ 91

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 9-15, 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

A POSITA Would Have Been Motivated To Employ Raz's LAG Subports as RFC 3209's Assigned Outgoing Interface

"It would have been obvious to a POSITA for ***the outgoing interface of the LSR—which connects the LSR to another LSR—as rendered obvious by RFC 3209*** to be a subport of a LAG (i.e., claimed "single physical tunnel port of a LAG") as taught by Raz."

Paper 2 (Pet.) at 12-13 (emphasis added); *see also* Ex. 1003, ¶ 89

"A POSITA would have been motivated to combine RFC 3209 with Raz because in addition to being directed at the same problem and using the same solution, they ***analogously describe devices assigning network components to label-switched paths*** (LSPs) as network tunnels ***and allocating MPLS labels to advertise the assigned components.***"

Paper 2 (Pet.) at 10 (emphasis added); *see also* Ex. 1003, ¶ 89

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 9-15, 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Ex. 1021 (U.S. Patent No. 8,312,145 to “Rabie”) Further Motivates a POSITA

“Traffic engineering and bandwidth management of bundled links may, at times, require the selection of one of a plurality of component links in a bundled link.”

Ex. 1021 at Abstract (emphasis added); *see also* Paper 2 (Pet.) at 28; Ex. 1003, ¶ 112

“As is typical, each router includes a processor, some memory and a number of ports for connecting the links that allow communication between the routers 102. Five parallel links connect a router D 102D and a router E 102E and may be configured as a bundled link 106.”

Ex. 1021 at 6:58-63 (emphasis added); *see also* Paper 2 (Pet.) at 28; *see also* Ex. 1003, ¶ 112

“A POSITA would have been motivated to employ this same concept between nodes in an MPLS network as taught by RFC 3209 in order to improve the ability to communicate high speed packet streams that require increased bandwidth. At the time of the ‘602 Patent’s priority date, a POSITA would have understood that bundled links may connect LSRs together.”

Ex. 1003, ¶ 112 (emphasis added) (citing Ex. 1021 at Abstract; 6:58-63); *see also* Paper 2 (Pet.) at 28

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 26-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Ex. 1021 (U.S. Patent No. 8,312,145 to “Rabie”) Further Motivates a POSITA

“Rabie is used to support the motivation to combine, further supporting the motivation to use Raz’s ability to select a particular port of the bundled subports and apply it towards the selection of an externally facing sending port of a LAG. EX1021, Abstract, 6:58-63; EX1003, ¶¶112, 130. PO’s expert also confirms this. EX1036, 17:2-13, 17:18-20 (admitting that LAG was a well-known standard with multiple implementations).”

Paper 23 (Reply) at 10 (citing Ex. 1021 at Abstract; 6:58-63); *see also* Ex. 1003, ¶¶ 112, 130

“A POSITA at the time would have been aware, as supported by Rabie, that the aggregation or bundling of ports . . . refers to a LAG and that this aggregation can be performed, according to one implementation, between two LSRs. Based upon this additional foundation, the application of Raz’s subport selection and assignment teachings to ports and/or the links connected to those ports would have been obvious, and a POSITA consequently would have applied Raz’s teachings to RFC3209 to improve upon the disclosed traffic engineering applications.”

Paper 23 (Reply) at 10 (internal citations omitted); *see also* Ex. 1003, ¶¶ 112, 130; Ex. 1034, ¶¶ 19-22; Paper 2 (Pet.) at 28

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 26-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Raz's Subports Disclose or Render Obvious a LAG (Subport Aggregation)

"The CPU 16 in the LSR performs the conventional LSR functionality including the provisioning of LSPs. In particular, the CPU functions to perform the assignment of subports to LSPs in response to LSP setup requests."

Ex. 1006 at 7:65-8:13; *see also* Paper 2 (Pet.) at 23-24

"Each of the one GE links make up the subports of the aggregate 10GE link."

Ex. 1006 at 8:22-29; *see also* Paper 2 (Pet.) at 21-23; Ex. 1003 at ¶ 102

"[T]he high speed interface (e.g., 10G) may be trunked into any number of individual subports."

Ex. 1006 at 7:7-16; *see also* Paper 2 (Pet.) at 18; Ex. 1003, ¶¶ 64, 66, 96

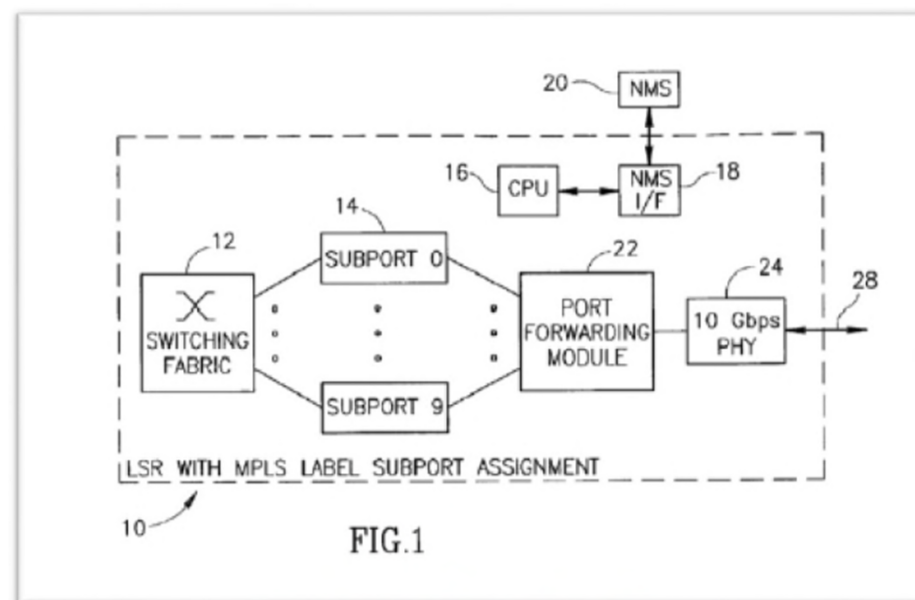


Figure 1 of Raz Raz at Fig. 1

*Also applicable to [15.2], [26.1], [26.2]
Paper 2 (Pet.) at 19-28; Paper 23 (Reply) at 2-5*

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Raz's Subports Disclose or Render Obvious a LAG (LAG Defined by Binding of Ports)

802.3ad defines "Aggregation System" as a "uniquely identifiable entity comprising (among other things) an arbitrary grouping of **one or more ports** for the purpose of aggregation. An instance of an aggregated link always occurs between exactly two Aggregation Systems."

Ex. 1033 at § 1.4 (emphasis added); *see also* Paper 23 (Reply) at 2-3; Ex. 1034 (Supp. Min Decl.), ¶ 18

"The Aggregator binds to **one or more ports** within a System."

Ex. 1033 at § 43.2.1; *see also* Paper 23 (Reply) at 2-3 (*citing* Ex. 1033 at §§ 43.3.5, 43.3.7); Ex. 1034, ¶¶ 18-19

"**Each port** is selected for membership in the Link Aggregation Group."

Ex. 1033 at § 43.3.7; *see also* Paper 23 (Reply) at 2-3; Ex. 1034, ¶¶ 18-19

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Raz's Subports Disclose or Render Obvious a LAG (Subports Paired Across 10G Link)

"As an example, consider two LSRS, LSR A and LSR B, each with 10 subports wherein each subport is mapped to an 8K range of labels. An LSP is to be provisioned from LSRA to LSR B. When the LSP is signaled or provisioned through management, the CAC in **LSRB decides to accept the LSP on Subport 3** and thus assigns a label comprising an indication that subport 3 was selected. The label is communicated to **LSRA** which **now knows that the output subport should be subport 3 (i.e. the same subport is provisioned).**"

Ex. 1006 at 7:30-38 (emphasis added); *see also* Paper 2 (Pet.) at 23 (*citing* Ex. 1006 at 7:30-38); Ex. 1003, ¶¶ 67-69

""[t]he selected subport is the same for both sides of a 10G link.""

Ex. 1003, ¶ 67 (*citing* Ex. 1006 at 7:20); *see also* Paper 2 (Pet.) at 23-24

802.3ad defines "Aggregation Link" as "[a]n instance of a MAC-Physical Layer-Medium[-]Physical Layer-MAC entity between a pair of Aggregation Systems."

Ex. 1033 at § 1.4; *see also* Ex. 1034 (Supp. Min Decl.), ¶ 18; Paper 23 (Reply) at 2-3

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

A POSITA Would Have Understood that Raz's Pairing of Subports Across a 10G Link Is an Implementation of LAG

"[T]he 'link' of link aggregation is an instance of an entity that spans the entire path from one Aggregation System to another, starting with an aggregated group of ports at the MAC layer and ending at the paired aggregated group of ports, also at the MAC layer. As I have explained, the aggregation of these ports creates a LAG. The path of a data packet bound for each port of the group follows the 'MAC-Physical Layer-Medium[-]Physical Layer-MAC' instance of the 'Aggregation Link' definition."

Ex. 1034 (Supp. Min Decl.), ¶ 18; *see also* Paper 23 (Reply) at 2-3;

"Raz teaches provision of subports at both ends of a high-speed 10G PHY link. The "PHY" refers to the physical layer, which interfaces with the MAC layer at the LSR and with the subports at this MAC layer. Raz describes that the high-speed traffic comes into one of the paired LSRs on an interface which carries "the ten individual 1G packet streams" bound for the ten subports, and that Raz "trunks" that port into the subports which are logically associated together. It is my opinion that this describes the aggregation of ports and is an implementation of link aggregation.

Ex. 1034 (Supp. Min Decl.), ¶ 19 (citing Ex. 1006 at 7:7-16); *see also* Paper 23 (Reply) at 2-4;

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

A POSITA Would Have Understood that Raz's Pairing of Subports Across a 10G Link Is an Implementation of LAG

"A POSITA reading Raz's disclosure would have concluded that the pairing of subports on LSRs A and B, on both sides of the high-speed PHY link, such that the receiving subport "ha[s] the same subport index as the one through which the packet was sent out over at the transmitting node," refers to an implementation of link aggregation. This is because Raz's subports provide multiple 1G pathways for handling packet streams that are logically associated and treated as a single aggregated 10G pathway."

Ex. 1034 (Supp. Min Decl.), ¶ 20 (citing Ex. 1006 at 7:7-16); *see also* Paper 23 (Reply) at 2-4;

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Raz's Subports Disclose or Render Obvious a LAG (Type of Physical Connection Not Part of LAG Definition)

27. But LAG does not require multiple physical links, and PO appears to fail to take into consideration the necessary *ports* of a LAG. EX1034, ¶¶12-18. 802.3ad defines an “Aggregation Link” as “[a]n instance of a MAC-Physical Layer-Medium[-]Physical Layer-MAC entity between a pair of Aggregation Systems.” EX1033, §1.4. For LAG, a “link” is an instance of an entity that spans the entire path from one Aggregation System to another, starting with an aggregated group of *ports* at the MAC layer and ending at the paired aggregated group of *ports*, also at the MAC layer. EX1034, ¶18. “[A]s for how they’re [(the packet streams)] actually being

Paper 23 (Reply) at 5-6; see also Ex. 1034 (Supp. Min Decl.), ¶¶ 16-22

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Raz's Subports Disclose or Render Obvious a LAG (Type of Physical Connection Not Part of LAG Definition)

layer. EX1034, ¶18. “[A]s for how they’re [(the packet streams)] actually being submitted across and between the two switches, two LSR switches, that is not part of the definition of link aggregation group.” EX2013, 43:22-44:12. Because LAG is defined according to bound *ports*, LAG may be implemented in many types of LSR-to-LSR connections, including ports interfacing with multiple low-speed links, or ports whose output is aggregated to a single high-speed link as taught by Raz. EX1034, ¶¶16-21.

Paper 23 (Reply) at 6; *see also* Ex. 1034 (Supp. Min Decl.), ¶¶ 16-22

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

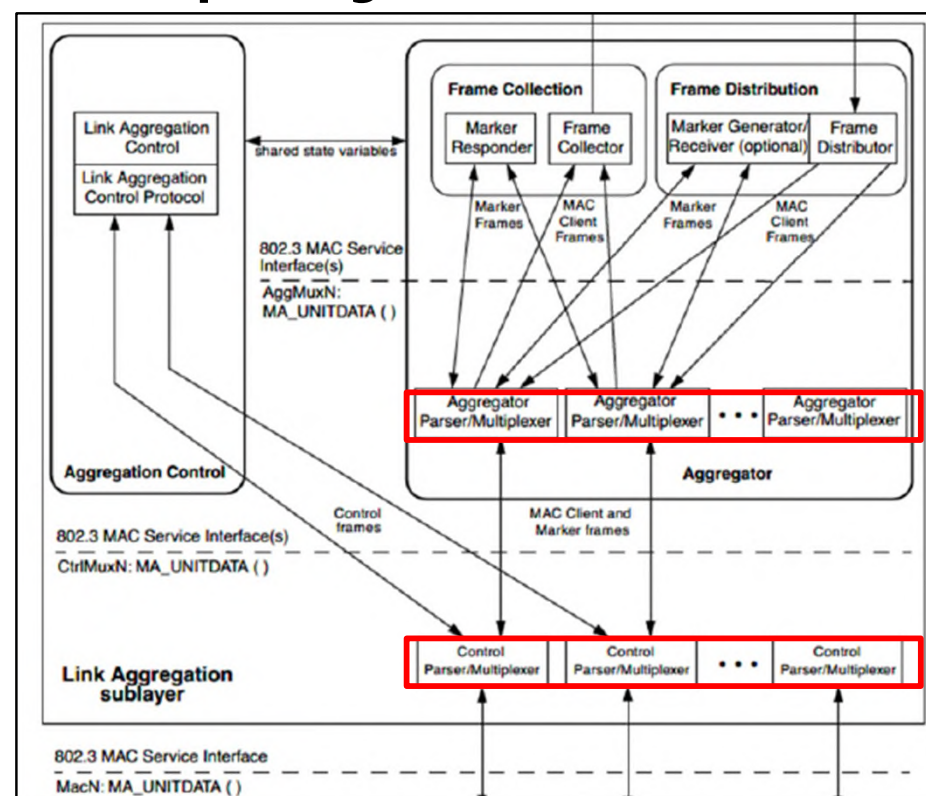
Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Raz's Subports Disclose or Render Obvious a LAG (LAG is Compatible with Multiplexing)

"Raz teaches multiplexing in conjunction with link aggregation. 'Aggregation' to create a LAG is the logical association of the transport entities—it is the fact that the ports are assigned to a particular trunk. Multiplexing is done on the traffic itself; it is concerned with collecting the packets that are output by the transport entities, and with packing those packets into the stream that is to be transported to the PHY link. These concepts are not incompatible. 802.3ad itself describes that 'multiplexing' is performed within the Link Aggregation sublayer."

Ex. 1034 at ¶ 29 (citing Ex. 1033 at §43.1.4); see also Ex. 1034 at ¶¶ 29-31; Paper 23 (Reply) at 3



Excerpt of RFC 3209 at Fig. 43-2 (annotated)

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Raz's Subports Disclose or Render Obvious a LAG **(LAG is Compatible with Multiplexing)**

"LAG (known as inverse multiplexing)" "divides a data stream into multiple concurrent streams that are transmitted at the same time across separate channels. . ."

Ex. 2007, ¶ 49; *see also* Ex. 1034 (Supp. Min Decl.), ¶ 18

"This is not inconsistent with Raz. Raz teaches that the receiving LSR "divides a data stream" (the high speed 10G PHY comprised of multiple 1G data streams) "into multiple concurrent streams" (the multiple component 1G data streams) "that are transmitted at the same time across separate channels" (separate subports at the receiving LSR)."

Ex. 1034, ¶ 30 (citing Ex. 1006 at 7:7-11; 7:49-52)

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Raz's Subports Are Interfaces, Not Processors

"[E]ach subport [may be] **handled by** a different network processor;"

Ex. 1006 at 11:24-29 (emphasis added); *see also* Paper 23 (Reply) at 4-5; Ex. 1034 (Supp. Min Decl.), ¶ 31

Alternatively, "network processors [may] **handle** two subports each."

Ex. 1006 at 11:24-29 (emphasis added); *see also* Paper 23 (Reply) at 4-5; Ex. 1034 (Supp. Min Decl.), ¶ 31

"[T]he high speed **interface** (e.g., 10G) may be **trunked into** any number of individual subports."

Ex. 1006 at 7:7-16 (emphasis added); *see also* Paper 23 (Reply) at 4-5; Ex. 1034 (Supp. Min Decl.), ¶ 31

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28; Paper 23 (Reply) at 2-5

Ex. 1003 (Min Decl.), ¶¶ 100-113; Ex. 1034 (Supp. Min Decl.), ¶¶ 11-31

Ground 1 – Claim 1, Element [1.1]

[1.1] . . . wherein the single physical tunnel port of the LAG meets a bandwidth requirement of the network tunnel, . . .

RFC 3209 Discloses or Renders Obvious an Interface Bandwidth Requirement

“An advantage of using RSVP to establish LSP tunnels is that it enables the **allocation of resources** along the path. **For example, bandwidth can be allocated to an LSP tunnel** using standard RSVP reservations and Integrated Services service classes [4].”

Ex. 1010 at § 1.1 (emphasis added); see also Paper 2 (Pet.) at 25-26; Ex. 1003 (Min Decl.), ¶¶ 109-110

“[I]n the traffic engineering application, it is very useful to use the Path message as a means of verifying that bandwidth exists at a particular priority along an entire path.”

Ex. 1010 at § 2.2; see also Paper 2 (Pet.) at 25-26; Ex. 1003 (Min Decl.), ¶¶ 109-110

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28

Ex. 1003 (Min Decl.), ¶¶ 100-113

Ground 1 – Claim 1, Element [1.1]

[1.1] . . . wherein the single physical tunnel port of the LAG meets a bandwidth requirement of the network tunnel, . . .

Alternatively, Raz Discloses Bandwidth Allocation

“[I]t may be the case that a different subport is the only subport (or the subport best suited) that can accept the LSP with the required bandwidth.”

Ex. 1006 at 7:22-26; *see also* Paper 2 (Pet.) at 25-26; Ex. 1003 (Min Decl.), ¶¶ 109-110

“In addition, the invention comprises an algorithm for allocating subport bandwidth to LSPs.”

Ex. 1006 at 2:23-25; *see also* Paper 2 (Pet.) at 25-26; Ex. 1003 (Min Decl.), ¶¶ 109-110

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28

Ex. 1003 (Min Decl.), ¶¶ 100-113

Ground 1 – Claim 1, Element [1.1]

[1.1] . . . and wherein said single physical tunnel port of the LAG has a port serial number;

Raz Discloses a Port Serial Number

“Consider an LSP to be setup through LSR A to LSR C. When the LSP is signaled, the CAC in LSR C decides to provision the LSP on subport 1 and therefore assigns the label 0x22003. With reference to [Figure] 4, each label 140 comprises 20 bits or 5 nibbles where the first three bits indicate 1 of 8 line interface cards, **bits 16 to 13 indicate the subport** and bits 12 to 0 indicate the actual label. In this example, the label 0x22003 indicates line interface card 1, subport 1 and label 3.”

Ex. 1006 at 9:41-48 (emphasis added); *see also* Paper 2 (Pet.) at 26; Ex. 1003 (Min Decl.), ¶¶ 111

“[T]he LSR network device 48 comprises ... a plurality of subports 34, labeled subport 0 through subport 9.”

Ex. 1006 at 8:35-39; *see also* Paper 2 (Pet.) at 26; Ex. 1003 (Min Decl.), ¶¶ 111

Also applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 19-28

Ex. 1003 (Min Decl.), ¶¶ 100-113

Ground 1 – Claim 1, Element [1.2]

[1.2] dedicating a sub-set of bits in a data packet label prepared by the first MPLS/LAG switch to encode said port serial number of said single physical tunnel port of the LAG into the data packet label;

RFC 3209's Data Packet Label Preparation

"The signaling protocol model uses downstream-on-demand label distribution. ... Labels are allocated downstream and distributed (propagated upstream) by means of the RSVP Resv message. For this purpose, the RSVP Resv message is extended with a special LABEL object."

Ex. 1010 at § 1.1; *see also* Paper 2 (Pet.) at 30-31; Ex. 1003 (Min Decl.), ¶¶ 114-115

"Each node that receives a Resv message containing a LABEL object uses that label for outgoing traffic associated with this LSP tunnel. If the node is not the sender, it allocates a new label and places that label in the corresponding LABEL object of the Resv message which it sends upstream to the PHOP [previous hop]."

Ex. 1010 at § 2.2; *see also* Paper 2 (Pet.) at 30-31; Ex. 1003 (Min Decl.), ¶¶ 114-115

"The contents of a LABEL is a single label, encoded in 4 octets. Each generic MPLS label is an unsigned integer in the range 0 through 1048575."

Ex. 1010 at § 4.1; *see also* Paper 2 (Pet.) at 30-31; Ex. 1003 (Min Decl.), ¶¶ 114-115

Also applicable to [15.3], [26.3]

Paper 2 (Pet.) at 29-32

Ex. 1003 (Min Decl.), ¶¶ 114-118; Ex. 1010 (RFC 3209)

Ground 1 – Claim 1, Element [1.2]

[1.2] dedicating a sub-set of bits in a data packet label prepared by the first MPLS/LAG switch to encode said port serial number of said single physical tunnel port of the LAG into the data packet label;

A POSITA Would Have Understood that RFC 3209's Label Must Contain Information Sufficient to Identify the Pre-Assigned Outgoing Interface

"The label sent upstream in the LABEL object is the label which this node will use to identify incoming traffic associated with this LSP tunnel. This label also serves as shorthand for the Filter Spec. The node can now update its "Incoming Label Map" (ILM), which is used to map incoming labeled packets to a "Next Hop Label Forwarding Entry" (NHLFE), see [2]."

Ex. 1010 at § 2.2; see also Paper 2 (Pet.) at 30-31; Ex. 1003 (Min Decl.), ¶¶ 114-115

"[T]raffic belonging to the LSP tunnel is identified ***solely on the basis of packets arriving*** from the PHOP or 'previous hop' (see [1]) ***with the particular label value(s) assigned by this node to upstream senders*** to the session," where ***"the label effectively defines the 'flow' through the LSP."***

Ex. 1010 at § 2.1; see also Paper 2 (Pet.) at 30-31; Ex. 1003 (Min Decl.), ¶¶ 114-115

Also applicable to [15.3], [26.3]

Paper 2 (Pet.) at 29-32

Ex. 1003 (Min Decl.), ¶¶ 114-118; Ex. 1010 (RFC 3209)

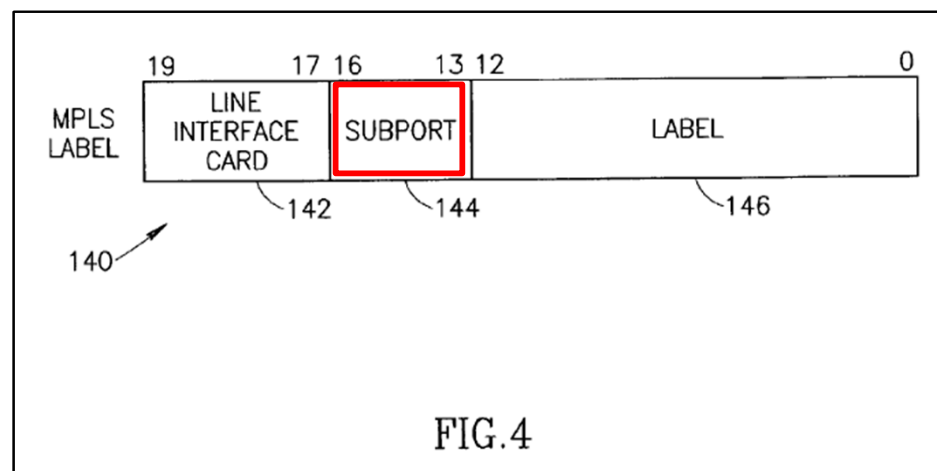
Ground 1 – Claim 1, Element [1.2]

[1.2] dedicating a sub-set of bits in a data packet label prepared by the first MPLS/LAG switch to encode said port serial number of said single physical tunnel port of the LAG into the data packet label;

Raz's Discloses Encoding the Subport Serial Number into Label, to the Extent Not Disclosed or Rendered Obvious by RFC 3209

"Consider an LSP to be setup through LSR A to LSR C. When the LSP is signaled, the CAC in LSR C decides to provision the LSP on subport 1 and therefore assigns the label 0x22003. With reference to [Figure 4], each label 140 comprises 20 bits or 5 nibbles where the first three bits indicate 1 of 8 line interface cards, **bits 16 to 13 indicate the subport** and bits 12 to 0 indicate the actual label. In this example, the label 0x22003 indicates line interface card 1, subport 1 and label 3."

Ex. 1006 at 9:41-58; see also Paper 2 (Pet.) at 31-32; Ex. 1003 (Min Decl.), ¶¶ 116-117



Ex. 1006 at Fig. 4 (annotated)

Also applicable to [15.3], [26.3]
Paper 2 (Pet.) at 29-32

Ex. 1003 (Min Decl.), ¶¶ 114-118; Ex. 1010 (RFC 3209)

Ground 1 – Claim 1, Element [1.3]

[1.3] sending, by said first MPLS/LAG switch, the data packet label, in which said port serial number of said single physical tunnel port is encoded, to a preceding node;

RFC 3209's RSVP Label Distribution Protocol

"Once a label is allocated, the node formats a new LABEL object. The node then sends the new LABEL object as part of the Resv message to the previous hop."

Ex. 1010 at § 4.1.1.1; *see also* Paper 2 (Pet.) at 32; Ex. 1003 (Min Decl.), ¶¶ 119-120

In "downstream-on-demand label distribution. . .[l]abels are allocated downstream and distributed (propagated upstream) by means of the RSVP Resv message."

Ex. 1010 at § 1.1; *see also* Paper 2 (Pet.) at 32; Ex. 1003 (Min Decl.), ¶¶ 119-120

Also applicable to [15.4], [26.4]

Paper 2 (Pet.) at 32

Ex. 1003 (Min Decl.), ¶¶ 119-123; Ex. 1010 (RFC 3209)

Ground 1 – Claim 1, Element [1.4]

[1.4] receiving from the preceding node, by said first MPLS/LAG Switch, a data packet comprising said data packet label, in which said port serial number of said single physical tunnel port is encoded;

RFC 3209's Label Switched Path Operation

"RFC 3209 discloses data packets arriving from the previous hop of the LSP tunnel with the label value which was assigned by this LSR: 'The semantics of these objects, from the perspective of a node along the label switched path, is that traffic belonging to the LSP tunnel is identified solely on the basis of **packets arriving from the PHOP or 'previous hop' (see [1]) with the particular label value(s) assigned by this node** to upstream senders to the session.'"

Paper 2 (Pet.) at 31-32 (quoting Ex. 1010 at § 2.1); see also Ex. 1003, ¶¶ 114-118

"The label sent upstream in the LABEL object is the label which this node will use to identify incoming traffic associated with this LSP tunnel. This label also serves as shorthand for the Filter Spec. The node can now update its "Incoming Label Map" (ILM), which is used to map incoming labeled packets to a "Next Hop Label Forwarding Entry" (NHLFE), see [2]."

Ex. 1010 at § 2.1; see also Paper 2 (Pet.) at 31-32; Ex. 1003, ¶¶ 114-118

Also applicable to [15.6], [15.7], [26.5]

Paper 2 (Pet.) at 27 - 29

Ex. 1003 (Min Decl.), ¶¶ 114-118; Ex. 1010 (RFC 3209)

Ground 1 – Claim 1, Element [1.5]

[1.5] sending said data packet from said first MPLS/LAG switch to a second MSPLS/LAG switch via said single physical tunnel port having the port serial number encoded in the data packet label.

RFC 3209's Label Switched Path Operation

RFC 3209 discloses that a "Label Switched Path" is "The path created by the concatenation of one or more label switched hops, **allowing a packet to be forwarded** by swapping labels **from an MPLS node to another MPLS node.**"

Ex. 1010 at § 1.2; *see also* Paper 2 (Pet.) at 34-35; Ex. 1003, ¶¶ 131-132

"The node [which assigns the next hop and prepares the label] SHOULD be prepared to **forward packets carrying the assigned label** prior to sending the Resv message."

Ex. 1010 at § 4.1.1.1 (emphasis added); *see also* Paper 2 (Pet.) at 34-35; Ex. 1003, ¶¶ 131-132

Also applicable to [15.8], [26.6]

Paper 2 (Pet.) at 33-36

Ex. 1003 (Min Decl.), ¶¶ 129-134; Ex. 1010 (RFC 3209)

Ground 1 – Claim 1, Element [1.5]

[1.5] sending said data packet from said first MPLS/LAG switch to a second MSPLS/LAG switch via said single physical tunnel port having the port serial number encoded in the data packet label.

A POSITA Would Have Understood that the Outgoing Interface Used is the Interface Which Was Previously Assigned and Encoded into the Label

“[A]s previously explained, RFC 3209 discloses that each intermediate node (LSR or MPLS switch) assigns the “next hop” of an LSP tunnel during LSP setup, and a POSITA would have found it obvious that this assignment necessarily includes the assignment of the LSR’s outgoing interface (i.e., the physical tunnel port) which connects the LSR to the next LSR.”

Ex. 1003 at ¶ 130; *see also* Paper 2 (Pet.) at 34-35

“RFC 3209 discloses forwarding a data packet received from the preceding node to another node (i.e., the LSR connected to it and the claimed “second” MPLS switch) via said previously assigned outgoing interface (i.e., said previously assigned LAG subport which is the claimed “physical tunnel port”). The LSR which does the forwarding function is also the LSR which performed the “assigning” of its outgoing interface and the allocation of the label.”

Ex. 1003 at ¶ 131 (citing Ex. 1010 at § 4.1.1.1); *see also* Paper 2 (Pet.) at 34-35

Also applicable to [15.8], [26.6]

Paper 2 (Pet.) at 33-36

Ex. 1003 (Min Decl.), ¶¶ 129-134; Ex. 1010 (RFC 3209)

Ground 1 – Claim 2

2. The method of claim 1, further comprising the step of receiving from a preceding node located upstream from said first MPLS/LAG switch, by said first MPLS/LAG switch, a request message requesting configuration of said network tunnel, the message further requesting said data packet label associated with said network tunnel.

RFC 3209's RSVP Protocol

"To create an LSP tunnel, the first MPLS node on the path -- that is, the sender node with respect to the path -- creates an RSVP Path message and inserts a LABEL_REQUEST object into the Path message. The LABEL_REQUEST object indicates that a label binding for this path is requested and also provides an indication of the network layer protocol that is to be carried over this path."

Ex. 1010 at § 2.2; *see also* Paper 2 (Pet.) at 36-37

"The LABEL_REQUEST object requests intermediate routers and receiver nodes to provide a label binding for the session."

Ex. 1010 at § 2.2; *see also* Ex. 1010 at § 4.2.4; Paper 2 (Pet.) at 36-37

Paper 2 (Pet.) at 36-37
Ex. 1003 (Min Decl.), ¶¶ 135-138; Ex. 1010 (RFC 3209)

Ground 1 – Claim 3

3. The method of claim 2, wherein said request message comprises an RSVP-TE PATH message augmented with a LABEL REQUEST object.

RFC 3209's RSVP Protocol

"To create an LSP tunnel, the first MPLS node on the path -- that is, the sender node with respect to the path -- creates an RSVP Path message and inserts a LABEL_REQUEST object into the Path message. The LABEL_REQUEST object indicates that a label binding for this path is requested and also provides an indication of the network layer protocol that is to be carried over this path."

Ex. 1010 at § 2.2; *see also* Paper 2 (Pet.) at 37

"The LABEL_REQUEST object requests intermediate routers and receiver nodes to provide a label binding for the session."

Ex. 1010 at § 2.2; *see also* Ex. 1010 at § 4.2.4; Paper 2 (Pet.) at 37

Paper 2 (Pet.) at 37
Ex. 1003 (Min Decl.), ¶¶ 139-142; Ex. 1010 (RFC 3209)

Ground 1 – Claim 4

4. The method according to claim 3, wherein said request comprises an indication of a service property, and wherein said selecting comprises identifying a physical port in compliance with said service property.

RFC 3209's RSVP Protocol

"An advantage of using RSVP to establish LSP tunnels is that it enables the **allocation of resources** along the path. For example, **bandwidth can be allocated to an LSP tunnel using standard RSVP reservations** and Integrated Services service classes [4]."

Ex. 1010 at § 1.1 (emphasis added); Paper 2 (Pet.) at 38

"Service Classes – This document does not restrict the type of Integrated Service requests for reservations."

Ex. 1010 at § 2.3; *see also* Ex. 1010 at § 2.6; Paper 2 (Pet.) at 38

Ex. 1010 at Fig. 17 (annotated)

Also applicable to 16
Paper 2 (Pet.) at 38-39

Ex. 1003 (Min Decl.), ¶¶ 143-146, 209-210; Ex. 1010 (RFC 3209)

Ground 1 – Claim 5

5. The method according to claim 4, wherein said service property comprises at least one of a guaranteed bandwidth; a peak bandwidth; and a class of service.

RFC 3209's RSVP Protocol

"An advantage of using RSVP to establish LSP tunnels is that it enables the **allocation of resources** along the path. For example, **bandwidth can be allocated to an LSP tunnel using standard RSVP reservations** and Integrated Services service classes [4]."

Ex. 1010 at § 1.1 (emphasis added); Paper 2 (Pet.) at 40

"Service Classes – This document does not restrict the type of Integrated Service requests for reservations."

Ex. 1010 at § 2.3; *see also* Ex. 1010 at § 2.6; Paper 2 (Pet.) at 40

Also applicable to 17
Paper 2 (Pet.) at 40-41

Ex. 1003 (Min Decl.), ¶¶ 147-149, 211-212; Ex. 1010 (RFC 3209)

Ground 1 – Claim 6

6. The method according to claim 1, wherein said selecting comprises selecting a single physical tunnel port having a maximum available bandwidth of said plurality of physical data ports.

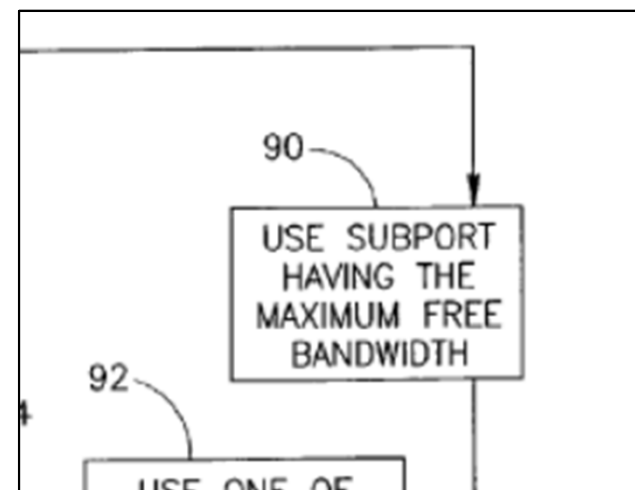
Raz's Bandwidth Allocation

"[T]he subport having the most free bandwidth is used."

Ex. 1006 at 11:13-59, FIG. 5

Raz describing leaving a subport "empty (i.e. no bandwidth used) in the event a wide connection is to be allocated."

Ex. 1010 at 11:3-10



Excerpt of Ex. 1006 at Fig. 5

*Also applicable to 18
Paper 2 (Pet.) at 41*

Ex. 1003 (Min Decl.), ¶¶ 150-151, 213-214; Ex. 1010 (RFC 3209)

Ground 1 – Claim 7

7. The method according to claim 1, wherein said selecting comprises selecting a port having a minimum available bandwidth of said plurality of physical data ports which is not less than said bandwidth requirement of the network tunnel.

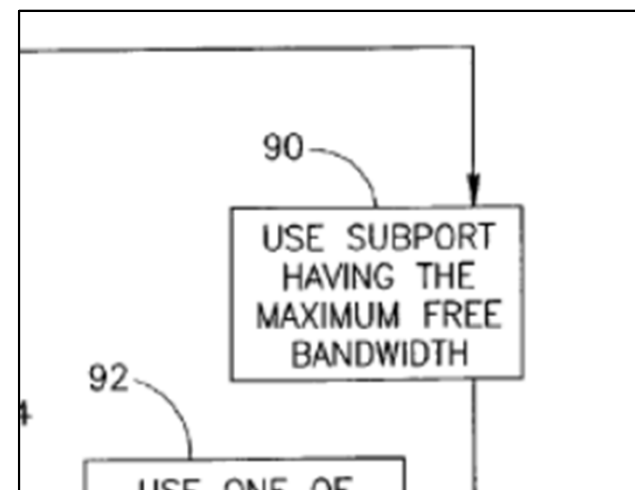
Raz's Bandwidth Allocation

"[T]he subport having the most free bandwidth is used."

Ex. 1006 at 11:13-59, FIG. 5; *see also* Ex. 1006 at 10:60-11:12

Raz describing leaving a subport "empty (i.e. no bandwidth used) in the event a wide connection is to be allocated."

Ex. 1010 at 11:3-10; 11:13-59



Excerpt of Ex. 1006 at Fig. 5

Also applicable to 19
Paper 2 (Pet.) at 41-42
Ex. 1003 (Min Decl.), ¶¶ 152-153, 215-216; Ex. 1006 (Raz)

Ground 1 – Claim 8

8. The method according to claim 1, wherein said switching said data packet is according to a mapping function.

RFC 3209's LSP Tunnel Operation

RFC 3209 discloses that "traffic is ***mapped*** onto a label-switched path," and that "when labels are associated with traffic flows, it becomes possible for a router to identify the appropriate reservation state for a packet based on the packet's label value."

Ex. 1010 at § 1.1 (emphasis added); Paper 2 (Pet.) at 42-43

A "Label Switched Path" is "the path created by the concatenation of one or more label switched hops, ***allowing a packet to be forwarded by swapping labels*** from an MPLS node to another MPLS node."

Ex. 1010 at § 1.2 (emphasis added); Paper 2 (Pet.) at 42-43

"RFC 3209's disclosure of a node (i.e., claimed "MPLS/LAG switch") using the label "to map incoming labeled packets to a 'Next Hop Label Forwarding Entry'" is a mapping function which is used to switch the data packet to its next hop."

Paper 2 (Pet.) at 43 (citing Ex. 1010 at § 1.1, 2.2); Ex. 1003 at ¶¶ 155-156

Paper 2 (Pet.) at 42-43
Ex. 1003 (Min Decl.), ¶¶ 154-157; Ex. 1010 (RFC 3209)

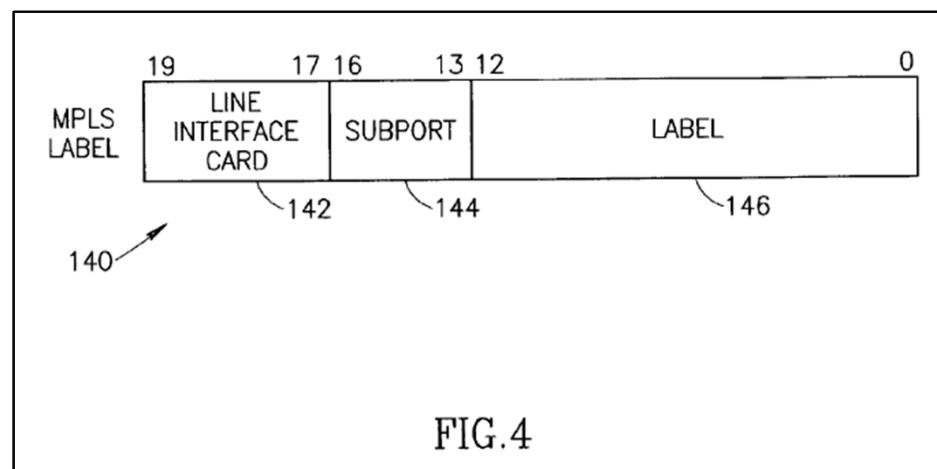
Ground 1 – Claim 9

9. The method according to claim 1, wherein said preparing comprises inserting into said data packet label a set of bits that identify said single physical tunnel port; and wherein said switching said data packet comprises extracting said set of bits to determine an identity of said single physical tunnel port.

Raz's Label Encoding

"Consider an LSP to be setup through LSR A to LSR C. When the LSP is signaled, the CAC in LSR C decides to provision the LSP on subport 1 and therefore assigns the label 0x22003. With reference to [Figure 4], each label 140 comprises 20 bits or 5 nibbles where the first three bits indicate 1 of 8 line interface cards, **bits 16 to 13 indicate the subport** and bits 12 to 0 indicate the actual label. In this example, the label 0x22003 indicates line interface card 1, subport 1 and label 3."

Ex. 1006 at 9:41-58; *see also* Paper 2 (Pet.) at 41-42; Ex. 1003 (Min Decl.), ¶¶ 160-161



Ex. 1006 at Fig. 4 (annotated)

Also applicable to 20
Paper 2 (Pet.) at 41-42

Ex. 1003 (Min Decl.), ¶¶ 158-163, 217-218; Ex. 1010 (RFC 3209)

Ground 1 – Claim 10

10. The method according to claim 1, wherein said preparing comprises storing said data packet label along with an identifier of said single physical tunnel port in a memory, and wherein said switching said data packet comprises retrieving said identifier from said memory responsively to said data packet label.

RFC 3209's LSP Setup

"when labels are associated with traffic flows, it becomes possible for a router to **identify** the appropriate reservation state for a packet based on the packet's label value."

Ex. 1010 at § 1.1 (emphasis added); Paper 2 (Pet.) at 44-45; Ex. 1003, ¶ 164-165

"The label sent upstream in the LABEL object is the label which this node will use to identify incoming traffic associated with this LSP tunnel. This label also serves as shorthand for the Filter Spec. The node can now update **its 'Incoming Label Map' (ILM), which is used to map incoming labeled packets to a "Next Hop Label Forwarding Entry'** (NHLFE), see [2]."

Ex. 1010 at § 2.2 (emphasis added); Paper 2 (Pet.) at 44-45

Also applicable to 21
Paper 2 (Pet.) at 44-46

Ex. 1003 (Min Decl.), ¶¶ 164-167, 219-220; Ex. 1010 (RFC 3209)

Ground 1 – Claim 11

11. The method according to claim 1, further comprising the steps of selecting a backup port from among the plurality of physical data ports, different from said single physical tunnel port; and responsively to a service interruption of said single physical tunnel port, switching said data packet to said backup port and sending said data packet to said second MPLS/LAG switch via said backup port.

RFC 3209's LSP Rerouting

"One of the requirements for Traffic Engineering is the **capability to reroute** an established TE tunnel under a number of conditions, [one condition being] when TE tunnel reroute is usually required is **upon failure of a resource along the TE tunnel's established path.**"

Ex. 1010 at § 2.5 (emphasis added); Paper 2 (Pet.) at 46; Ex. 1003, ¶ 168

"A POSITA would understand that in this context, a "failure" of a "resource" may include failure of any working component of the path (i.e., an interface assigned to the LSP), and that the "reroute" of the tunnel involves switching the data packets flowing through the tunnel to a different route (i.e., a different interface)."

Paper 2 (Pet.) at 46; *see also* Ex. 1003, ¶ 168

Also applicable to 22
Paper 2 (Pet.) at 46-47

Ex. 1003 (Min Decl.), ¶¶ 168-171, 221-222; Ex. 1010 (RFC 3209)

Ground 1 – Claim 12

12. The method according to claim 11, further comprising the step of responsive to a restoral of said service interruption of said single physical tunnel port, reverting switching of said data packet from said backup port and sending said data packet to said second MPLS/LAG switch via said single physical tunnel port.

RFC 3209's LSP Rerouting

"TE tunnel reroute is usually required is upon failure of a resource along the TE tunnel's established path. Under some policies, ***it may also be necessary to return the TE tunnel to its original path when the failed resource becomes re-activated.***"

Ex. 1010 at § 2.5 (emphasis added); Paper 2 (Pet.) at 47-48; Ex. 1003, ¶ 172

Paper 2 (Pet.) at 47-48
Ex. 1003 (Min Decl.), ¶¶ 172-174; Ex. 1010 (RFC 3209)

Ground 1 – Claim 13

13. The method according to claim 1, wherein said first MPLS/LAG switch comprises a Label Switched Router (LSR).

RFC 3209's Label Switched Router

RFC 3209 discloses "a label distribution protocol as a set of procedures by which one ***Label Switched Router (LSR)*** informs another of labels used to forward traffic between and through them."

Ex. 1010 at § 1.1 (emphasis added); Paper 2 (Pet.) at 48; Ex. 1003, ¶ 175-176

Also applicable to 23

Paper 2 (Pet.) at 48

Ex. 1003 (Min Decl.), ¶¶ 175-176, 223-224; Ex. 1010 (RFC 3209)

Ground 1 – Claim 14

14. The method of claim 1, further comprising the step of designating by said first MPLS/LAG switch, the plurality of physical data ports in said first MPLS/LAG switch as a single logical port.

Raz's Link Aggregation

Raz discloses that "some commercially available layer 2 switches can determine the destination port for a packet destined to a LAG (Link Aggregation Group)...This can be used for spreading the packets to the subports[...] and defining its ports leading to the different subports as a single LAG."

Ex. 1006 at 9:9-15

Also applicable to 25
Paper 2 (Pet.) at 48-49
Ex. 1003 (Min Decl.), ¶¶ 177-179; Ex. 1006 (Raz)

Ground 1 – Claim 15, Element [15.1]

[15.1] a processor, which is configured to:

A POSITA Would Have Found a Processor Obvious

"[A] network **processor** [is] adapted to implement the mechanism of the present invention"

Ex. 1006 at 2:33-36 (emphasis added); *see also* Ex. 1003 at ¶¶ 184-186; Paper 2 (Pet.) at 50-51

"The use of a processor to perform various functionality as described in RFC 3209 and Raz would have been obvious to a POSITA."

Ex. 1003 at ¶¶ 275-279 (citing Ex. 1006 at 2:36-40; 3:39; 7:54-8:13; 12:25-30); *see also* Paper 2 (Pet.) at 50-51

Paper 2 (Pet.) at 50-51; Paper 23 (Reply) at 17-19
Ex. 1003 (Min Decl.), ¶¶ 184-186; Ex. 1010 (RFC 3209)

Ground 1 – Claim 15, Element [15.5]

[15.5] a mapper, which is configured to:

A POSITA Would Have Found a Mapper Obvious

“RFC 3209 discloses that its intermediate node (LSR) which corresponds to the claimed ‘first’ switch performs the functions of the claimed ‘mapper,’ i.e., receiving a data packet from an upstream node, detecting a data packet label, and determining how to forward the packet in accordance with the label. RFC 3209 therefore renders obvious that this node (an LSR) comprises the claimed ‘mapper’ which performs these functions.”

Paper 2 (Pet.) at 51 (citing Ex. 1010 at §§ 2.2, 4.1.1.1) (internal citations omitted); *see also* Ex. 1003 at ¶¶ 196-198

“A POSITA would have understood that intermediate nodes comprise a component which performs these functions and therefore corresponds to the claimed “mapper.” To the extent not disclosed by RFC 3209, Raz discloses that its apparatus can be implemented using a network processor, a FPGA, an ASIC or a combination of these.”

Ex. 1003 at ¶¶ 197; *see also* Paper 2 (Pet.) at 51

Paper 2 (Pet.) at 51; Paper 23 (Reply) at 17-19
Ex. 1003 (Min Decl.), ¶¶ 196-198

Ground 1 – Claim 15, Element [15.5]

[15.5] a mapper, which is configured to:

Petition has Met its Burden for the Claimed Mapper

“The Petition states that the combination of RFC3209 with Raz render obvious a mapper, because it would have been obvious for RFC3209's intermediate nodes to contain ‘a component’ corresponding to the claimed ‘mapper.’ The Petition then cites to the Min Declaration, which states to the extent not disclosed by RFC3209,” a mapper would have been obvious in view of Raz’s disclosures of a ‘forwarding module.’”

Paper 23 (Reply) at 18 (citing Paper 2 (Pet.) at 51); *see also* Ex. 1003 at ¶¶ 196-198

“Whether the disclosure of the claimed ‘mapper’ and its functions comes from Raz or RFC3209, the Petition argues that it would have been obvious to a POSITA for *RFC3209*’s LSRs to contain a ‘mapper.’”

Paper 23 (Reply) at 18; *see also* Ex. 1003 at ¶¶ 196-208; Paper 2 (Pet.) at 51

Paper 2 (Pet.) at 51; Paper 23 (Reply) at 17-19
Ex. 1003 (Min Decl.), ¶¶ 196-198

GROUND 2

RFC 3209 IN VIEW OF RAZ AND FERGUSON

Ground 2 – RFC 3209, Raz, Ferguson Disputes

Disputed Issues:

- Claim 1's LAG
- Combination of RFC 3209 with Raz and Ferguson

Ground 2 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Ferguson discloses the claimed LAG, to the extent not disclosed or rendered obvious by Raz

“In FIG. 2A, PE router 10A receives inbound MPLS packets 16 from provider network 6, and distributes the inbound MPLS packets across physical interconnects 18 of aggregated link 12A.”

Ex. 1007 at 6:15-18; see also Paper 2 (Pet.) at 57

“In general, link aggregation operates by inserting a layer within the networking stack between the second and third layers. For Ethernet, for example, a new Link Aggregation Layer functions between the Ethernet Media Access Control (MAC) layer, and the higher layer protocols. Each of the underlying Ethernet ports in an aggregated link transmits and receives frames with its own unique MAC address.”

Ex. 1007 at 6:15-18; see also Paper 2 (Pet.) at 57

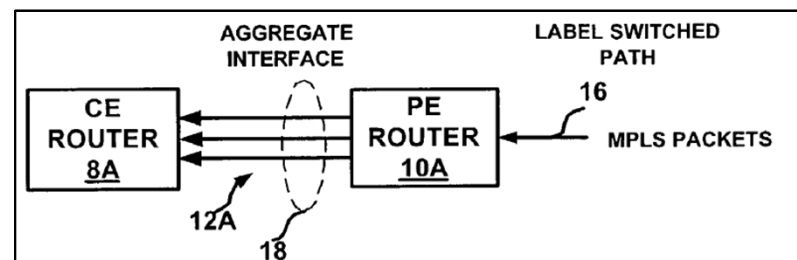


FIG. 2A

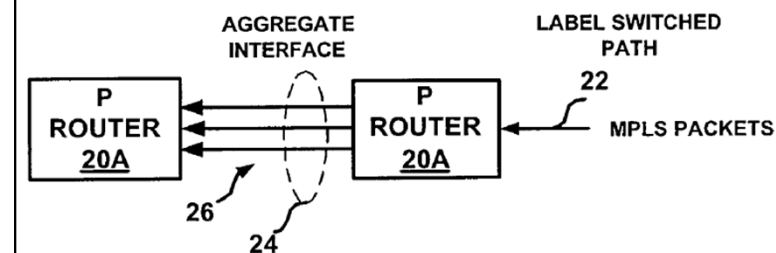


FIG. 2B

Ferguson at Figs. 2A-2B

*Also Applicable to [15.2], [26.1], [26.2]
Paper 2 (Pet.) at 53-60; Paper 23 (Reply) at 19-24*

Ex. 1003 (Min Decl.), ¶¶ 247-264, 243-246; Ex. 1034 (Supp. Min Decl.), ¶¶ 41-55

Ground 2 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Petition demonstrates that Raz’s subport assignment could have been implemented in a LAG between network devices as taught by Ferguson to arrived at the claimed limitations

“Ferguson discloses that physical interconnects between network devices (such as switches or routers) can be used as part of a LAG.”

Paper 2 (Pet.) at 59 (citing Ex. 1007 at 1:28-53; 2:44-47); *see also* Ex. 1003, ¶¶ 250-51

“[N]o matter where interfaces or links are situated with respect to a given LSR, there is a need to ensure that the entire proposed path has sufficient bandwidth to support the proposed traffic.”

Paper 23 (Reply) at 22; *see also* Paper 2 (Pet.) at 58; Ex. 1003, ¶¶ 250-51; Ex. 1034, ¶¶ 48-55

“It would have been obvious, and in fact elementary, to apply the provisioning method employed within an LSR of an MPLS/LAG switch to selecting and reserving physical data ports of LAGs between an MPLS/LAG switch.”

Ex. 1034, ¶ 52; *see also* Paper 23 (Reply) at 21-22; Paper 2 (Pet.) at 58; Ex. 1003, ¶¶ 250-51; Ex. 1034, ¶¶ 48-55

Also Applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 53-60; Paper 23 (Reply) at 19-24

Ex. 1003 (Min Decl.), ¶¶ 247-264, 243-246; Ex. 1034 (Supp. Min Decl.), ¶¶ 41-55

Ground 2 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Techniques for communicating packets within an LSR are readily applicable to communication between network devices

Ferguson states that “[a]lthough [its] techniques have been described in reference to distribution of MPLS packets across parallel physical interconnects of an aggregated link, the techniques may be applied in a variety of environments.” Ex. 1007 at 5:63-67. “For example, the techniques may be readily applied to internal parallel data paths within a device.” *Id.*, 5:67-6:2. “For example, the techniques may be used by a router [or switch] to distribute packets across internal data paths that begin at the same input interface of the router [or switch] and end at the same output interface of the router [or switch], but traverse through different internal, high-speed switch fabrics.” *Id.*, 6:2-6.

See Paper 2 (Pet.) at 59; see also Ex. 1003, ¶¶ 242-246; Ex. 1034, ¶¶ 48-55

“It would have been obvious, and in fact elementary, to apply the provisioning method employed within an LSR of an MPLS/LAG switch to selecting and reserving physical data ports of LAGs between an MPLS/LAG switch.”

Ex. 1034, ¶ 52; see also Paper 23 (Reply) at 21-22; Paper 2 (Pet.) at 58; Ex. 1003, ¶¶ 250-51; Ex. 1034, ¶¶ 48-55

Also Applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 53-60; Paper 23 (Reply) at 19-24

Ex. 1003 (Min Decl.), ¶¶ 247-264, 243-246; Ex. 1034 (Supp. Min Decl.), ¶¶ 41-55

Ground 2 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Raz's subports are for communicating, and Raz's techniques are readily applicable to communication *between* network devices

"Dr. Rouskas argues that a POSITA would have understood that Raz's subports are not for communicating but internal processing. This is inaccurate. The subports in Raz, as the specification in Raz made it clear, are for communicating, and a POSITA would have reached this conclusion after reading Raz. . . . Raz further discloses 'outbound subport' and 'subport for receiving' [which] specifically identifies that the purpose of the subports are as a communication channel, tunnel or path for traffic comprised of MPLS packets to be transported."

Ex. 1034, ¶ 54 (citing Ex. 1006 at 9:50-53; 2:9-13); *see also* Paper 2 (Pet.) at 59; Ex. 1003, ¶¶ 250-51

"[T]he efficient use of bandwidth realized inside the LSR would also have been realized using the same techniques for communications between LSRs."

Paper 2 (Pet.) at 56; *see also* Paper 23 (Reply) at 22-24; Ex. 1003, ¶¶ 250-51; Ex. 1034, ¶¶ 48-55

Also Applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 53-60; Paper 23 (Reply) at 19-24

Ex. 1003 (Min Decl.), ¶¶ 247-264, 243-246; Ex. 1034 (Supp. Min Decl.), ¶¶ 41-55

Ground 2 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Petition demonstrates that the combination of RFC 3209 with Raz and Ferguson renders the claimed limitations obvious

To the extent not obvious over Ground 1, “Ferguson would have taught a POSITA that ***Raz’s method of assigning a subport with appropriate bandwidth*** within the LSR ***could also be implemented, in the framework of RFC 3209, between network devices.***”

Paper 2 (Pet.) at 58 (emphasis added); see also Ex. 1003, ¶¶ 250-51

“***[A] POSITA would have understood from Ferguson—to the extent not already known—that LSPs as described by RFC3209 are capable of passing through LAGs and that there is a need for ensuring that a LAG can handle the LSP traffic. Thus, a POSITA would have been motivated to apply Raz’s teachings expressly to ensure that when an LSP is destined for a LAG, there is sufficient bandwidth reserved on one of the LAG’s subports.***”

Paper 23 (Reply) at 23 (citing Ex. 1007 at 1:28-53; 2:44-47) (emphasis added); see also Paper 2 (Pet.) at 58-60; Ex. 1003, ¶¶ 250-51; Ex. 1034, ¶¶ 48-54

Also Applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 53-60; Paper 23 (Reply) at 19-24

Ex. 1003 (Min Decl.), ¶¶ 247-264, 243-246; Ex. 1034 (Supp. Min Decl.), ¶¶ 41-55

Ground 2 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

No dispute that Petition relies on RFC 3209's LSP setup and outgoing interface assignment and incorporates Ground 1 analysis for Ground 2:

The combination of RFC 3209, Raz, and Ferguson, along with the knowledge of a POSITA, renders Claims 1-26 obvious. The analysis of the obviousness of Claims 1-26 set forth in Ground 1 are incorporated by reference. *See* §IX; EX1003, ¶¶83-241.

Paper 2 (Pet.) at 53

"Ferguson builds on the previous analysis of RFC 3209 and Raz by disclosing a system for communicating packets between switches and routers in an MPLS network that addresses the same concerns about allocating the bandwidth of physical data ports in a LAG to deal with the demands of communicating high-speed packet streams as are addressed by RFC 3209 and Raz."

Paper 2 (Pet.) at 56

Also Applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 53-60; Paper 23 (Reply) at 19-24

Ex. 1003 (Min Decl.), ¶¶ 247-264, 243-246; Ex. 1034 (Supp. Min Decl.), ¶¶ 41-55

Ground 2 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

Petition demonstrates that the teachings of Raz *and* Ferguson would have been incorporated into the framework taught by RFC 3209

“[T]o the extent that it was not already obvious from the combination of RFC 3209 and Raz, a POSITA reviewing Ferguson would have understood that it would be desirable to implement the techniques in Raz for assigning a physical tunnel subport to assign a physical tunnel port to communicate packets along ‘physical interconnects’ between ‘two switches’ in an MPLS network ***according to the framework provided by RFC 3209.***”

Paper 2 (Pet.) at 56-57

“[T]he Petition demonstrates that ***a POSITA would have understood from Ferguson—to the extent not already known—that LSPs as described by RFC3209 are capable of passing through LAGs*** and that there is a need for ensuring that a LAG can handle the LSP traffic. Thus, a POSITA would have been motivated to apply Raz’s teachings expressly to ensure that when an LSP is destined for a LAG, there is sufficient bandwidth reserved on one of the LAG’s subports.”

Paper 32 (Reply) at 23 (internal citations omitted); *see also* Paper 2 (Pet.) at 58-60;

Also Applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 53-60; Paper 23 (Reply) at 19-24

Ex. 1003 (Min Decl.), ¶¶ 247-264, 243-246; Ex. 1034 (Supp. Min Decl.), ¶¶ 41-55

Ground 2 – Claim 1, Element [1.1]

[1.1] assigning, by a first MPLS/LAG switch, a single physical tunnel port of a LAG to a network tunnel. . .

RFC 3209, Raz, and Ferguson teach a common labeling technique

“[E]ach of RFC 3209, Raz, and Ferguson relate to the use of an MPLS network to communicate data packets.”

Ex. 1003, ¶ 243 (citing Ex. 1010, §§ 1, 1.1, 1.2, 2.2; Ex. 1006 at 1:65-2:8, 2:26-31, 6:24-33, Figs. 1, 3-4; Ex. 1007 at 1:57-2:3, 2:22-26, 3:36-67, 8:10-12, Figs. 2A-8); *see also* Paper 2 (Pet.) at 56-57

“Not only does Raz teach that its downstream LSR allocates a label and sends it upstream, but that the LSR receives packets upon which that label has been appended and—like Ferguson, like RFC3209’s teachings, and like every other application of MPLS—the LSR forwards the packet in accordance with that label.”

Paper 32 (Reply) at 21 (citing Ex. 1003, ¶¶ 86, 115, 131); *see also* Paper 2 (Pet.) at 16, 58-60

Also Applicable to [15.2], [26.1], [26.2]

Paper 2 (Pet.) at 53-60; Paper 23 (Reply) at 19-24

Ex. 1003 (Min Decl.), ¶¶ 247-264, 243-246; Ex. 1034 (Supp. Min Decl.), ¶¶ 41-55

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