

Petition for *Inter Partes* Review of U.S. Patent No. 8,489,134

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MOTOROLA SOLUTIONS, INC.,

Petitioner,

v.

STA GROUP LLC,

Patent Owner.

IPR2023-01293

U.S. Patent No.: 8,489,134 B2

**PETITION FOR *INTER PARTES* REVIEW OF CLAIMS 1-14 OF U.S.
PATENT NO. 8,489,134 B2**

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PETITIONER’S EXHIBIT LIST

Ex[No.]¹	Description of Documents
1001	U.S. Patent No. 8,489,134 (“’134 patent”)
1002	Declaration of Dr. Sayfe Kiaei in Support of Petition for <i>Inter Partes</i> Review of the ’134 Patent, with CV attached as Appendix A (“Kiaei Decl.”)
1003	Prosecution File History of the ’134 Patent (“’134 patent file history”)
1004	<i>Satellite Earth Stations and Systems (SES); Broadband Satellite Multimedia; IP Interworking over Satellite; Multicasting</i> , ETSI TR 102 156 v1.1.1 (published April 2003) (“ETSI-156”)
1005	ETSI, Publicly Available Specifications (PAS), https://www.etsi.org/images/files/Brochures/ETSI-Brochure-PAS.pdf (last accessed August 3, 2023)
1006	<i>Resource ReSerVation Protocol (RSVP) – Version 1 Functional Specification</i> by Braden et. al. (published September 1997) (“RFC-2205”)
1007	U.S. Patent Publication 2006/0268824 (published November 30, 2006) (“Dhesikan”)
1008	U.S. Patent Publication 2005/0248652 (published November 10, 2005) (“Firestone”)

¹ Citations to issued patents (Exhibits 1001, 1030, and 1034) are made by column and line number. Citations to patent application publications (Exhibits 1007-1009, 1026-1027, and 1031) are made by paragraph number. Citations to Exhibits 1002 and 1016 are made by paragraph number. Citations to Exhibits 1004-1006, 1011-1013, 1019-1020, 1022-1025, 1033, 1035, and 1037 are to the original page numbering in the exhibits. Citations to Exhibits 1003, 1010, 1014-1015, 1017-1018, 1021, 1028-1029, 1032, and 1036 are to the page number added by the exhibit label.

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Ex[No.] ¹	Description of Documents
1009	U.S. Patent Publication 2007/0036118 (published February 15, 2007) (“Shaffer”)
1010	RFC-Editor, Publication Process, https://www.rfc-editor.org/pubprocess/ (last accessed August 3, 2023)
1011	<i>Satellite Earth Stations and Systems (SES); Broadband Satellite Multimedia; IP Interworking over satellite; Performance, Availability and Quality of Service</i> , ETSI TR 102 157 v1.1.1 (published July 2003) (“ETSI-157”)
1012	<i>Satellite Earth Stations and Systems (SES); Broadband Satellite Multimedia; IP over Satellite</i> , ETSI TR 101 985 v1.1.2 (published November 2002) (“ETSI-985”)
1013	<i>RTP: A Transport Protocol for Real-Time Applications</i> by Schulzrinne et al. (published July 2003) (“RFC 3550”)
1014	<i>The BGAN Extension Programme</i> , The European Space Agency (ESA) Bulletin 124 (Nov. 2005) (“BGAN”)
1015	Web archive for <i>The BGAN Extension Programme</i> , https://web.archive.org/web/20061009113656/https://www.esa.int/esapub/bulletin/bulletin124/bul124j_rivera.pdf (Oct. 9, 2006)
1016	Declaration of Dr. Sylvia Hall-Ellis
1017	ETSI, <i>Technical Committee (TC) Satellite Earth Stations and Systems (SES)</i> , https://www.etsi.org/committee/1412-ses (last accessed Aug. 3, 2023)
1018	Docket Control Order, <i>STA Group LLC v. Motorola Solutions, Inc.</i> , No. 2:22-CV-0381-JRG-RSP, Dkt. 35 (E.D. Tex. Feb. 3, 2023)
1019	Sastri L. Kota, <i>Broadband Satellite Networks: Trends and Challenges</i> , IEEE Wireless Communications and Networking Conference, Vol. 3, pp. 1472-78 (2005) (“Kota”)
1020	Eylem Ekici et al., <i>A Multicast Routing Algorithm for LEO Satellite IP Networks</i> , IEEE/ACM Transactions on Networking, Vol. 10, No. 2, pp. 183-92 (2002) (“Ekici”)

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Ex[No.]¹	Description of Documents
1021	Jiangchuan Liu et al., <i>Adaptive Video Multicast over the Internet</i> , IEEE MultiMedia, Vol. 10, No. 1, pp. 22-33, (2003) (“Liu”)
1022	Plaintiff’s First Amended Disclosure of Asserted Claims and Infringement Contentions and Document Production Accompanying Disclosure Pursuant to P.R. 3-1 & 3-2, <i>STA Group LLC v. Motorola Solutions, Inc.</i> , No. 2:22-CV-0381-JRG-RSP (E.D. Tex. June 15, 2023).
1023	<i>Host Extensions for IP Multicasting</i> by Deering (published August 1989) (“RFC-1112”)
1024	<i>Internet Group Management Protocol, Version 3</i> by Cain et al. (published October 2002) (“RFC-3376”)
1025	<i>Protocol Independent Multicast – Sparse Mode (PIM-SM): Protocol Specification (Revised)</i> by Fenner et al. (published August 2006) (“RFC-4601”)
1026	U.S. Patent Publication 2005/0047582 (published March 3, 2005) (“Shaffer”)
1027	U.S. Patent Publication 2005/0086302 (published April 21, 2005) (“Aggarwal”)
1028	Celestri Multimedia LEO System, Federal Communications Commission Filing (June 1997) (“Celestri”)
1029	Iridium System Application, Federal Communications Commission Filing (December 3, 1990) (“Iridium”)
1030	U.S. Patent 6,104,925 (issued August, 15, 2000) (“Grube”)
1031	U.S. Patent Publication 2005/0021726 (published January 27, 2005) (“Denoual”)
1032	<i>Comparisons of Conventional and Trunked Systems</i> , Public Safety Wireless Network, May 1999
1033	<i>Satellite Earth Stations and Systems (SES); Broadband Satellite Multimedia; Part 1: Survey on Standardization Objectives</i> , ETSI TR 101 374-1 v1.2.1 (published October 1998) (“ETSI-374”)
1034	U.S. Patent No. 6,477,150 (issued Nov. 5, 2002) (“Maggenti”)
1035	Wayback Machine capture of <i>Resource ReSerVation Protocol (RSVP) – Version 1 Functional Specification</i> by Braden et. al. (published September 1997) (“RFC-2205”) from October 10, 2004
1036	Parties’ Local P.R. 4-2 Disclosure of Preliminary Proposed Constructions of Claim Terms and Preliminary Identification of Extrinsic Evidence

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Ex[No.] ¹	Description of Documents
1037	Katherine K. Vidal, <i>Memorandum: Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation</i> (June 21, 2022)

MANDATORY NOTICES UNDER 37 C.F.R. 42.8(a)(1)

A. Real Party-in-Interest under 37 C.F.R. 42.8(b)(1)

The real party-in-interest is Motorola Solutions, Inc. No other parties exercised or could have exercised control over this Petition; no other parties funded or directed this Petition.

B. Related Matters under 37 C.F.R. 42.8(b)(2)

As of the filing date of this Petition, and to the best knowledge of Petitioner, the '134 patent is involved in *STA Grp. LLC v. Motorola Solutions, Inc.*, Case No. 2:22-cv-00381 (E.D. Tex. filed Sept. 30, 2022) (“EDTX Litigation”). Petitioner moved to dismiss the complaint on December 12, 2022. That motion was denied in a report and recommendation by the Magistrate Judge on July 7, 2023, which was adopted on August 11, 2023.

The '134 patent was also asserted against Petitioner in an identical Complaint in *STA Grp. LLC v. Motorola Solutions, Inc.*, Case No. 4-22-cv-00840 (E.D. Tex. filed Sept. 30, 2022), which was filed in error on September 30, 2022 and administratively closed October 6, 2022 without any proceedings.

C. Lead and Back-Up Counsel under 37 C.F.R. 42.8(b)(3)

Petitioner provides the following designation of counsel:

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D. Service Information under 37 C.F.R. 42.8(b)(4)

A copy of this entire Petition, including all Exhibits and a power of attorney, is being served by FEDERAL EXPRESS, costs prepaid, to the correspondence address of record for the '134 patent at the USPTO: Cisco Systems, Inc. – Patent Team (PatCapGroup Customer Number), SJC 10/5, 170 W. Tasman Drive, San Jose, CA 95134-1706; and by email to the attorney or agent of record for Patent Owner in the EDTX Litigation: James A. Shimota, K&L Gates, Jim.Shimota@klgates.com.

Please address all correspondence to lead and back-up counsel. Petitioner consents to service at lead counsel's address provided above. Petitioner consents to electronic service, provided it is made to the following e-mail address:

- dlbbstamsiiprs@BakerBotts.com.

A Power of Attorney is filed concurrently herewith under 37 C.F.R. § 42.10(b).

CLAIM LISTING

Claim 1

1[Pre]	An apparatus, comprising:
1[a]	a first communication resource manager located in a first domain and operable to interact with a second communication resource manager located in a second domain, wherein the first communication resource manager is configured to:
1[b]	determine to establish a link for multicasting between users in the first domain and users in the second domain based on presence data of at least one user in the first domain and at least one user in the second domain;
1[c]	determine an application to be used in a communication session over the link;
1[d]	allocate a bandwidth level to be used for the link to accommodate the application;
1[e]	increase the bandwidth level for the link based on a change in the application and based on an identification of additional presence data for additional users that have joined the communication session,
1[f]	wherein the communication resource managers each includes respective trunking element that is automatically configured to select a transcoding based on available bandwidth;
1[g]	adjust the bandwidth level based on a determination which of the additional users and the users in the first and second domains can transmit data simultaneously during the communication session;
1[h]	detect an absence of active users in the first domain and the second domain; and
1[i]	tear down the link based on the absence;
1[j]	wherein the link is a satellite communication link.

Claim 2

2	The apparatus of claim 1, wherein the users of the first domain comprise a virtual talking group (VTG).
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Claim 3

3	The apparatus of claim 1, wherein the additional presence data relates to whether a given end user has logged into their respective system.
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Claim 4

4	The apparatus of claim 1, wherein the communication resource managers each includes respective virtual talk group (VTG) presence managers (VPMs), each of which is operable to monitor their users who are present in their respective domains.
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Claim 5

5	The apparatus of claim 4, wherein information received from the VPMs is used to maintain a designated link bandwidth allocation.
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Claim 6

6	The apparatus of claim 4, wherein if either one of the VPMs determine that there are no active users logged into their respective systems, then the VPMs tear down the link.
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Claim 7

7	The apparatus of claim 1, further comprising: a router that establishes the link based on direction from the communication resource manager.
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Claim 8

8[Pre]	A method to be executed in conjunction with a processor to perform the steps of, comprising:
8[a]	interacting, via a first communication resource manager located in a first domain, with a second communication resource manager located in a second domain;
8[b]	determining to establish a link for multicasting between users in the first domain and users in the second domain based on presence data of at least one user in the first domain and at least one user in the second domain;
8[c]	determining an application to be used in a communication session over

	the link;
8[d]	allocating a bandwidth level to be used for the link to accommodate the application;
8[e]	increasing the bandwidth level for the link based on a change in the application and based on an identification of additional presence data for additional users that have joined the communication session,
8[f]	wherein the communication resource managers each includes respective trunking element that is automatically configured to select a transcoding based on available bandwidth;
8[g]	adjusting the bandwidth level based on a determination which of the additional users and the users in the first and second domains can transmit data simultaneously during the communication session;
8[h]	detecting an absence of active users in the first domain and the second domain; and
8[i]	tearing down the link based on the absence;
8[j]	wherein the link is a satellite communication link.

Claim 9

9	The method of claim 8, wherein the link is a satellite communication link, and wherein the users of the first domain comprise a virtual talking group (VTG).
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Claim 10

10	The method of claim 8, further comprising: detecting whether a given end user has logged into their respective system in order to identify the additional presence data.
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Claim 11

11	The method of claim 8, further comprising: maintaining a designated link bandwidth allocation based on a number of users who are logged into their respective systems.
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Claim 12

12[Pre]	Non-transitory media that include instructions for execution and when executed by a processor operable to:
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12[a]	interact, via a first communication resource manager located in a first domain, with a second communication resource manager located in a second domain;
12[b]	determine to establish a link for multicasting between users in the first domain and users in the second domain based on presence data of at least one user in the first domain and at least one user in the second domain;
12[c]	determine an application to be used in a communication session over the link;
12[d]	allocate a bandwidth level to be used for the link to accommodate the application;
12[e]	increase the bandwidth level for the link based on a change in the application and based on an identification of additional presence data for additional users that have joined the communication session,
12[f]	wherein the communication resource managers each includes respective trunking element that is automatically configured to select a transcoding based on available bandwidth;
12[g]	adjust the bandwidth level based on a determination which of the additional users and the users in the first and second domains can transmit data simultaneously during the communication session;
12[h]	detect an absence of active users in the first domain and the second domain; and
12[i]	tear down the link based on the absence;
12[j]	wherein the link is a satellite communication link.

Claim 13

13	The non-transitory media of claim 12, wherein the instructions for execution and when executed by the processor is further operable to: detect whether a given end user has logged into their respective system in order to identify the additional presence data.
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Claim 14

14	The non-transitory media of claim 12, wherein the instructions for execution and when executed by the processor is further operable to: maintain a designated link bandwidth allocation based on a number of users who are logged into their respective systems.
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I. INTRODUCTION

Motorola Solutions, Inc. (“Petitioner”) respectfully submits this Petition for *inter partes* review of Claims 1-14 (the “Challenged Claims”) of U.S. Patent No. 8,489,134 (the “’134 patent”). Petitioner respectfully requests institution of *inter partes* review and a finding that the Challenged Claims are unpatentable.

As the Examiner recognized during prosecution, the Challenged Claims recite standard IP teleconferencing processes well-known by the patent’s priority date—*e.g.*, establishing, allocating and adjusting bandwidth for, and tearing down an IP link. The claims were allowed based on the combination of those standard IP teleconferencing processes with the equally well-known concept of transmitting an IP link via satellite. *E.g.*, Ex[1001], cls.1, 8, 12. But that addition recites nothing more than the use of a known technique (IP over satellite) with known benefits (permitting use of ubiquitous satellite communication infrastructure) according to its established function. It is therefore obvious. *See Intel Corp. v. Pact XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023).

II. REQUIREMENTS UNDER 37 C.F.R. 42.104

A. Grounds for Standing

Petitioner certifies that the ’134 patent is available for IPR and that Petitioner is not barred or otherwise estopped.

B. Identification of Challenge and Statement of Precise Relief Requested

This IPR, supported by the declaration of Dr. Sayfe Kiaei (Exhibit 1002),

asserts the following grounds of unpatentability:

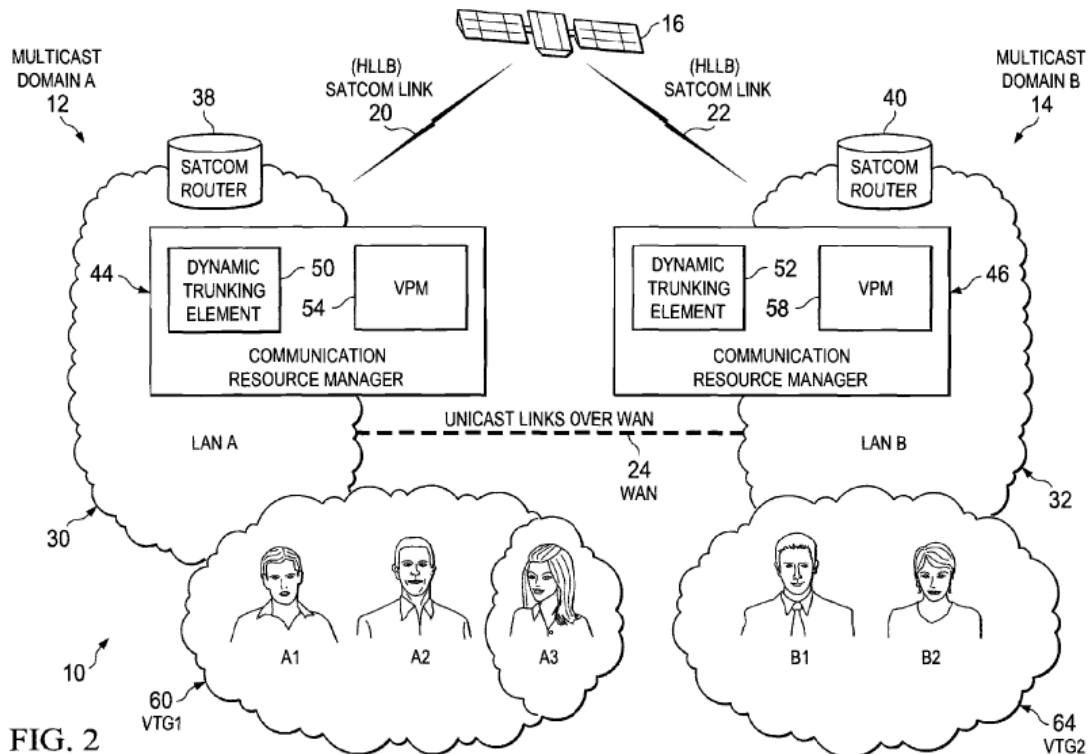
Ground	'134 Patent Claims	Basis for Challenge
1	1-14	Obvious under §103 based on ETSI-156 in view of ETSI-157, ETSI-985, and RFC-2205
2	1-14	Obvious under §103 based on Dhesikan in view of BGAN and Firestone

III. THE '134 PATENT AND PROSECUTION HISTORY

The '134 patent discloses a system in which endpoints (*e.g.*, users) in multiple domains are connected over satellite or wide area network links, so that users in each domain can communicate with each other. Ex[1001], 1:66-2:20. The purported improvement involves cost reduction by tearing down links between domains when they are not needed. *Id.*, 3:27-29; Ex[1002], ¶42.

For example, in FIG. 2 (below), the “communication system” includes “multicast domain A” and “multicast domain B” connected by a satellite. Each multicast domain includes a “communication resource manager” (“CRM”), which monitors its respective domains for the presence of users and includes dynamic trunking elements to bring up the satellite link. *Id.*, 2:21-30, 3:57-59. When a CRM detects at least one user in both domains, a “SatCom link” is brought up with the “bandwidth required for the applications used by the user.” *Id.*, 3:57-4:8, 4:13-16. The “dynamic trunking elements 50 and 52” also select a transcoding for the application “based on the available bandwidth.” *Id.*, 4:25-28. The link is maintained “as long as the VTG [virtual talk group] is active” and the CRMs “detect that users

are present in both locations.” *Id.*, 3:57-48. When the CRMS “on either side detect that they have no users present in a given multi-location VTG,” they “tear down the SatCom link.” *Id.*, 4:8-12.



Notably, the original independent claims filed by the applicant did not include any limitation directed to satellite communications, Ex[1003], pp.36-41, and were repeatedly rejected as obvious. *Id.*, pp.67-68, 106-107, 146-147, 182-183. Applicants repeatedly (and unsuccessfully) sought allowance by adding limitations relating to tearing down the generic link, allocating bandwidth to the link, increasing and adjusting the link bandwidth, and transcoding. *Id.*, pp.91, 128, 165, 206. None of these additions were sufficient to overcome the prior art. The Examiner only

issued an allowance when the independent claims were amended to include all these limitations *as well as* an Examiner amendment specifying that the claimed link must be “*a satellite communication link.*” *Id.*, pp.230-33.

Even as issued, the Challenged Claims merely combine well-known aspects of network links between domains (*e.g.*, establishing a link for multicasting; allocating and adjusting the bandwidth level for the link; and tearing down the link) with the equally well-known concept that the link can be a “satellite communications link.” *E.g.*, Ex[1001], cls.1, 8, 11. Nothing in the claims recites any specific type of satellite communication link, much less a novel one. Ex[1002], ¶45; Ex[1001], 2:21-30 (describing generic SatCom routers); Ex[1001], 5:45-53; *see generally* Ex[1001], 2:41-3:26.

IV. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art (“POSITA”) as of September 2, 2008 would have had at least a bachelor’s degree in computer science, electrical engineering, or a similar field, and would have had approximately three years industry experience in networking or communication systems, in particular addressing interoperability between different types of networks and satellite communications. Ex[1002], ¶52. Additional education in the fields of electrical engineering or computer science may serve as a substitute for experience in the field. *Id.* A person with less or different education but more relevant practical experience, or vice versa, may also meet this standard. *Id.*

V. CLAIM CONSTRUCTION

In district court, Patent Owner and Petitioner have proposed constructions for several terms in the Challenged Claims. *See* Ex[1036]; Ex[1002], ¶57. The specification of the '134 patent also describes or further defines certain terms related to the Challenged Claims, stating that (a) “[m]ulticast” is “the delivery of information to a group of destinations simultaneously using the most efficient strategy,” Ex[1001], 1:14-16; and (b) “presence information” refers to “a status indicator that conveys an ability and/or willingness of a potential communication partner to communicate.” *Id.*, 6:41-44.

The Petition accounts for these descriptions and definitions, as well as both parties’ district court proposals (Ex[1002], ¶57), and, as described, the claims are invalid under any proposal or any reasonable construction. §VII.A-B. Accordingly, the Board need not construe any term to find the Challenged Claims invalid. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

VI. SUMMARY OF PRIOR ART

The application that issued as the '134 patent was filed on September 2, 2008. Accordingly, Petitioner assumes without conceding that the Challenged Claims are entitled to a September 9, 2008 priority date, and thus are subject to the pre-AIA provisions of 35 U.S.C. §§102 and 103.

A. ETSI-156 (Ex[1004]), ETSI-157 (Ex[1011]), ETSI-985 (Ex[1012])

ETSI-156, ETSI-157, and ETSI-985 (collectively, the “ETSI Specifications”) are related technical specifications published by the European Telecommunications Standards Institute (“ETSI”) relating to a “broadband satellite multimedia” (BSM) network. Ex[1002], ¶92. ETSI-156 was published in April 2003, ETSI-157 was published in July 2003, and ETSI-985 was published in November 2002, and each is prior art under at least 35 U.S.C. §102(a), 102(b). Ex[1016], ¶68. The ETSI Specifications would have been accessible to POSITAs interested in BSM networks. Ex[1005], p.5 (“Once published as an ETSI TS or ETSI TR it becomes an ETSI specification with a number of advantages” including “broaden[ing] visibility.”), p.7 (ETSI standards are “[a]vailable to all” and “freely accessible on [ETSI’s] website.”); Ex[1002], ¶¶92-93. While this document refers to each of the ETSI technical specifications separately, a POSITA would also have understood that these specifications are part of the same standard. Ex[1002], ¶93.

The ETSI Specifications generally relate to the use of BSM networks “to transport IP-structured traffic.” Ex[1012], p.7. FIG. 2 of ETSI-157 (below) discloses the basic components of a BSM network, including “one or more satellites” connecting various networks. Ex[1011], pp.19-20. For example, a local area network (LAN) of end users can connect to a satellite terminal (ST) that can manage communications with another network of end users (*e.g.*, the Internet) connected to a satellite gateway. *Id.*, p.20.

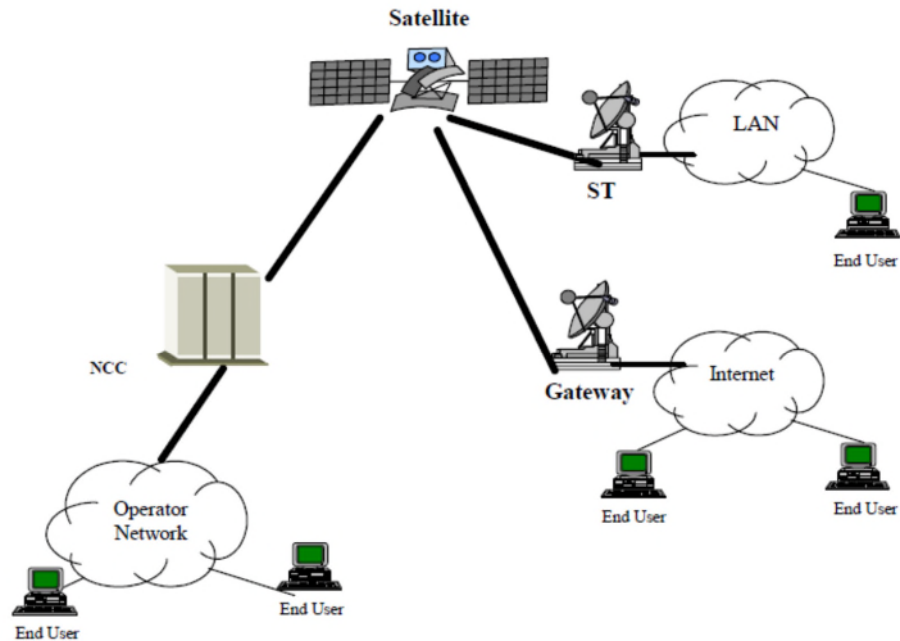


Figure 2: Generic BSM system

The ETSI Specifications cross-reference each other and describe different aspects of the BSM system. ETSI-156 focuses on standards for “delivering IP Multicast over BSM networks,” describes how multicast groups are formed, and describes protocols to establish and tear down links and track group membership. Ex[1004], p.6; Ex[1002], ¶95. ETSI-985 describes additional details regarding lower-layer satellite dependent functionality, including media access control (“MAC”) and physical (“PHY”) layer components that transform the IP multicast packets into frames compatible with satellite transmissions. Ex[1012], pp.15, 17.

Finally, ETSI-157 focuses on standardizing IP quality of service (QoS) procedures for BSM networks. Ex[1011], p.8. For example, ETSI-157 describes “QoS parameters and management mechanisms” and how they apply to BSMs “to ensure that their required performance is met” and, in particular, discloses how

bandwidth is allocated and adjusted based on various factors. *Id.*, p.8; Ex[1002], ¶96. ETSI-157 defines bandwidth-on-demand (BoD) as “a bandwidth sharing mechanism that allocates bandwidth to [a] requesting session based on a number of parameters including priorities and other QoS-related mechanisms.” Ex[1011], p.31. ETSI-157 further discloses that a satellite gateway or satellite terminal can use a Resource ReSerVation Protocol (RSVP) (specifically, as defined in RFC-2205 (Ex[1006])) to allocate bandwidth on demand to accommodate applications. Ex[1011], pp.34-35.

B. RFC-2205 (Ex[1006])

RFC-2205 is cross-referenced in ETSI-157. Ex[1002], ¶99. It was published September 1997, and is prior art under at least 35 U.S.C. §102(a) and 102(b). Ex[1016], ¶68. RFC-2205 discloses details regarding the RSVP protocol described in the ETSI Specifications and how RSVP is used to allocate and adjust bandwidth of a link. Ex[1006], pp.1-2, 6. RFCs, including RFC-2205, would have been accessible to POSITAs interested in the RFC’s subject matter. Ex[1010], pp.2, 5 (“All RFCs are first published as Internet-Drafts (I-Ds)” and “[w]hen an RFC is published, an announcement is sent to” relevant “mailing lists.”); Ex[1002], ¶97-99.

C. Dhesikan (Ex[1007])

U.S. Patent Publication 2006/0268824 (“Dhesikan”) was filed August 31, 2005 and published on November 30, 2006, and is prior art to the ’134 patent at least under 35 U.S.C §102(a) and 102(b).

Dhesikan discloses “a communication system 10” (FIG. 1, below) for

teleconferencing and video-conferencing applications. Ex[1007], ¶¶[0020], [0023]-[0024]. Dhesikan discloses multiple locations (102a and 102b) comprising multiple endpoints (106a, 106c, 106d, and 106f) communicating with each other in a conference over network elements. *Id.*, ¶[0020]. Dhesikan additionally discloses quality of service (QoS) “agents 104” that establish and tear down links between endpoints, allocate and adjust bandwidth of the links to “accommodate audio and video media streams” and additional conference participants, and select transcoding for the transmitted multimedia. *E.g.*, *Id.*, ¶[0024], FIG. 2B. Locations (102a and 102b) can be connected via known network elements, including service providers. *Id.*, ¶[0022].

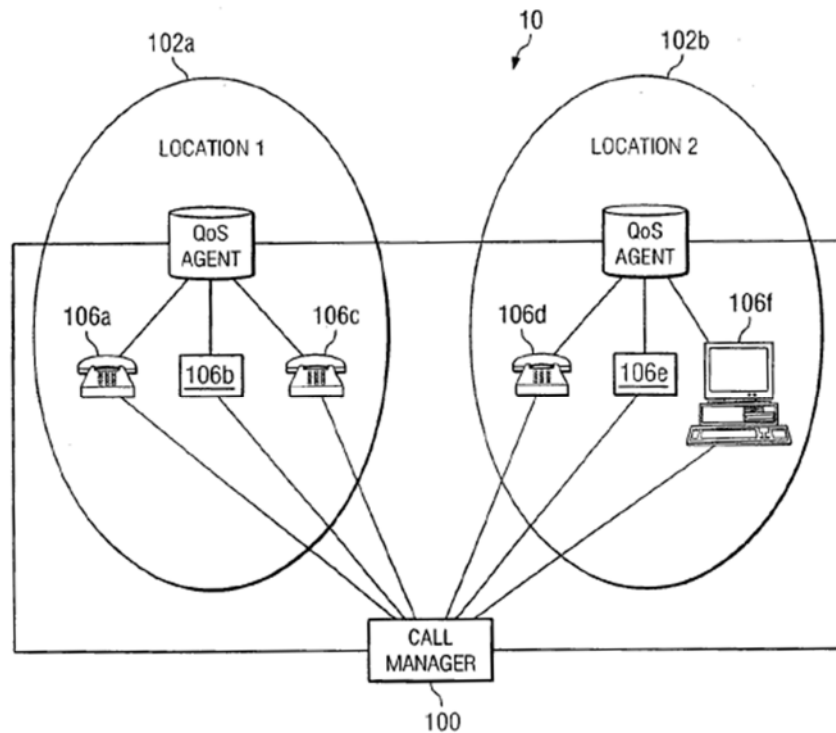


FIG. 1

D. BGAN (Ex[1014] and Ex[1015])

BGAN is a technical bulletin published by the European Space Agency (ESA) in November 2005, and available on the Internet Archives by October 9, 2006. Ex[1016], ¶68; Ex[1015] (indicating BGAN was available online by at least October 9, 2006). BGAN is prior art to the '134 patent at least under 35 U.S.C §102(a) and 102(b). BGAN would have been accessible to POSITAs interested in, for example, implementing an IP network between distant locations. Ex[1002], ¶104.

BGAN, or Broadband Global Area Network, discloses an on-demand commercial broadband satellite service for the “modern office” provided by Inmarsat. Ex[1014], p.2. BGAN is “[b]ased on IP technology” (*id.*, p.4) and provides “IP-based mobile data communications” for “mobile multimedia” including conference calling (*id.*, pp.3-5). BGAN can provide “guaranteed bandwidth on demand, enabling live video applications like video conferencing or video streaming,” as well as “multicast service capabilities.” *Id.*, pp.3, 5. The “BGAN Multicast Service” provides “reliable and secure multicast transport protocols ensuring quality of service for individual multicast flows.” *Id.*, p.6.

E. Firestone (Ex[1008])

U.S. Patent Publication 2005/0248652 (“Firestone”) was filed July 12, 2005 and published on November 10, 2005, and is prior art to the '134 patent at least under 35 U.S.C §102(a) and 102(b).

Firestone, like Dhesikan, was originally assigned to Cisco and discloses a

video-conferencing system with “appropriate data-routing procedures to achieve optimal data management in a video conferencing environment.” Ex[1008], ¶[0003]. Firestone explains that “[m]edia switches 26” can be used in the communication system to perform, *e.g.*, audio and video “transcoding.” Ex[1008], ¶[0034].

VII. THE ASSERTED GROUNDS OF INVALIDITY

A. Ground 1: Claims 1-14 are obvious over ETSI-156 in view of ETSI-157, ETSI-985, and RFC-2205.

1. Motivation to Combine ETSI-156 with ETSI-157, ETSI-985, and RFC-2205.

ETSI-156, ETSI-157, ETSI-985, and RFC-2205 are analogous art to the ’134 patent because they relate to the field of broadband communication, network management, and/or satellite communication. Ex[1002], ¶112. A POSITA would have been motivated to combine ETSI-156, ETSI-157, ETSI-985, and RFC-2205 for several reasons.

As a general matter, these references relate to BSM systems, cross-reference each other, and are intended to work together. Ex[1002], ¶113. Specifically, ETSI-156, ETSI-157, and ETSI-985 are all integrated into the same standard and promulgated by the same technical committee at ETSI, namely the Technical Committee Satellite Earth Stations and Systems (SES) which is “responsible for standardization relating to all types of satellite communication systems.” Ex[1004], pp.1, 6, 13-14, 72; Ex[1011], pp.1, 8-9; Ex[1012], p.1, 6-7; Ex[1017], p.1; Ex[1002], ¶113.

Each specification describes different aspects of the same BSM network system. Ex[1002], ¶114. ETSI-156 discloses BSM networks for “delivering IP Multicast,” including “service architectures for satellite multicasting” and the gateways and terminals used in the networks. Ex[1004], p.6-7. ETSI-157 describes details regarding certain components of the gateways and terminals described in ETSI-156, including a BSM Protocol Manager that maintains Quality of Service (“QoS”), and uses an RSVP to allocate bandwidth-on-demand. Ex[1011], pp.34-35, 64. ETSI-985 describes details regarding other components of the gateways and terminals, including the MAC layer and PHY layer that transform IP multicast packets into frames compatible with the satellite transmissions, using appropriate modulation and coding. Ex[1012], p.15. Finally, RFC-2205 is described in detail and referenced by ETSI-157 to explain the use of RSVP in a BSM network. Ex[1004], pp.71-72; Ex[1011], pp.34-35; Ex[1012], pp.24-25; *see* Ex[1006], p.4. Thus, a POSITA looking to implement a BSM network that complies with international standards would have sought out, and been motivated to combine, the teachings of ETSI-156, ETSI-157, ETSI-985, and RFC-2205; Ex[1002], ¶114.

More specifically, a POSITA would have been motivated to combine ETSI-156 with ETSI-157’s description of QoS and use of RSVP to allocate bandwidth, as further supplemented by RFC-2205, because ETSI-157 and RFC-2205 detail how RSVP may be used to reserve bandwidth and manage QoS in a communication session. Ex[1002], ¶115. No modification would be needed because the references

are specifically designed to be used together and all are intended to provide a multicast communication system with dynamic QoS management. Ex[1004], p.7, 71-72; Ex[1011], pp.10, 25; Ex[1006], pp.1, 6; Ex[1002], ¶115. Moreover, ETSI-156 explicitly encourages the use of RSVP, disclosed in both ETSI-157 and RFC-2205, to address the QoS requirements of ETSI-156's BSM network. Ex[1002], ¶115. ETSI-157 and RFC-2205 simply provide a detailed explanation of RSVP and QoS management as referenced in ETSI-156. *Id.* Accordingly, a POSITA would have understood that implementing ETSI-156 with ETSI-157's description of QoS and use of RSVP as further supplemented by RFC-2205 would have been a predictable combination of known, standardized elements reasonably expected to succeed. *Id.*

Likewise, a POSITA would have been motivated to combine ETSI-156 with ETSI-985's description of MAC layer and PHY layer components because ETSI-985 provides implementation details regarding how these layers may be used to establish the satellite link discussed in ETSI-156. Ex[1012], p.29; Ex[1002], ¶116. Again, no modification would be needed to the references because they are specifically designed to be used together and both provide a multicast communication system (*e.g.*, a BSM network) with dynamic QoS management and describe systems aimed at providing IP-based services via BSM networks. Ex[1004], pp.7, 13; Ex[1012], p.7; Ex[1002], ¶116. Moreover, ETSI-156 references the MAC and PHY layers for which ETSI-985 provides additional detail. *E.g.*, Ex[1004],

p.100; Ex[1012], p.17; Ex[1002], ¶116. Accordingly, a POSITA would have understood that implementing ETSI-156 with ETSI-985’s description of MAC and PHY layer components would have been a predictable combination of known, standardized elements according to their established functions, reasonably expected to succeed. Ex[1002], ¶116.

2. Claim 1

a. 1[Pre]: “An apparatus”

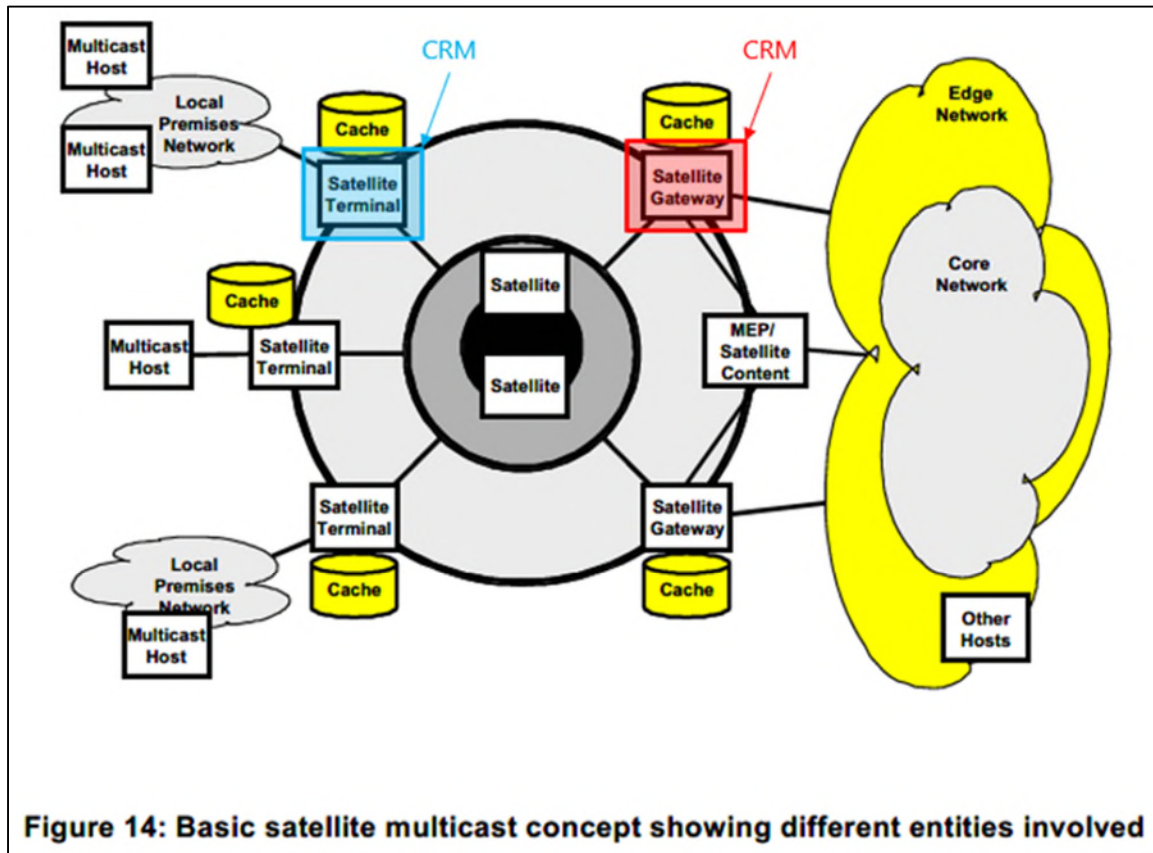
If the preamble is limiting, ETSI-156 discloses “[a]n apparatus,” namely a “Broadband Satellite Multimedia [(BSM)]” network for multicasting content. Ex[1004], pp.13-14.

b. 1[a]: “a first communication resource manager located in a first domain and operable to interact with a second communication resource manager located in a second domain”

ETSI-156 discloses limitation 1[a], under either party’s proposed construction. Ex[1002], ¶118. Each network in a BSM is a domain that interacts with other domains via respective gateway or satellite terminals (*communication resource managers*) that manage resources, including satellite links. Ex[1002], ¶118.

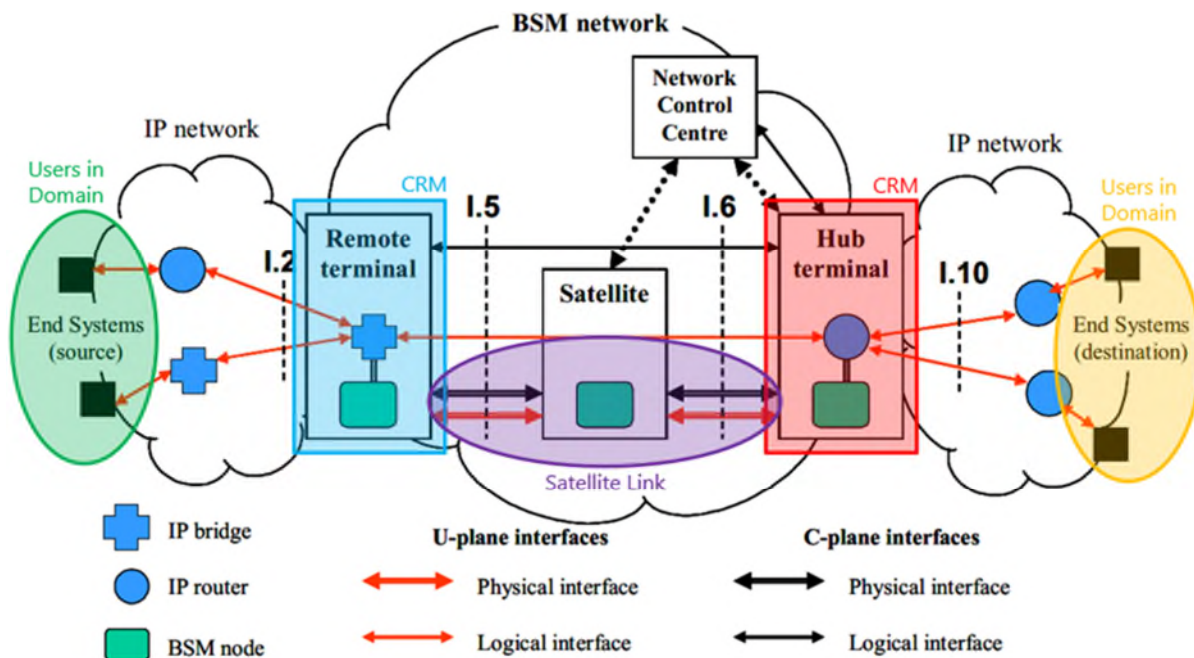
As shown below, ETSI-156 teaches that a BSM includes a satellite that connects at least two domains, *e.g.*, (1) a core network (*e.g.*, Internet); and (2) a local premises network. Ex[1004], p.42. Both domains have a *communication resource manager* (“CRM”)—in one domain, the first CRM is a gateway or satellite terminal connected to the core network (red), and, in the other domain, the second CRM is

the gateway or satellite terminal connected to the local network (blue). *Id.* Gateways and satellite terminals have similar components and either one constitutes a CRM; the former is used to connect to a core network, whereas the latter is used to connect to a local area network. *Id.*, pp.42-43; Ex[1002], ¶119.



Ex[1004], p.42, FIG. 14 (annotated). ETSI-156 discloses using this BSM architecture for multicast applications, including one-to-many services such as “Internet TV” or “streaming media” such as a “web concert,” as well as “many-to-many” services, such as “[t]eleconferencing.” *Id.*, pp.13, 32, 35. In FIG. 14 (above), the BSM includes “satellite multicast.” *Id.*, p.42.

The two CRMs are *operable to interact* with each other. Ex[1002], ¶121. For example, FIG.18 of ETSI-156 (annotated below) shows the interaction of the two CRMs connecting two domains (IP networks), each with a CRM. Ex[1004], p.49. Here, the first CRM (gateway, referred to as “[h]ub terminal”) creates a satellite link to the second CRM (satellite terminal, referred to as “[r]emote terminal”), so that users connected to the gateway (*e.g.*, teleconference participants) can stream media to users connected to the satellite terminal (*e.g.*, other teleconference participants) via the satellite link. *Id.*, pp.49, 32, 35.



Each CRM also controls and manages resources, including a satellite link for multicasting. Ex[1002], ¶122. ETSI-156, for example, describes that the satellite terminals and gateways (CRMs) include “[s]atellite [i]ndependent” (SI) components, which implement non-satellite protocols, and “satellite dependent”

components, which create physical satellite links. Ex[1004], pp.90, 91-93. The CRMs, for example, “maintain a set of[] tables” tracking presence data and identifying which receiver terminals need to receive which multicast messages, which routes the messages should take, and “which coding/modulation/power should be used in each beam.” *Id.*, p.51, 44 (describing use of satellite links in IP multicast routing trees). The CRMs include a BSM Multicast Proxy (BSM-MP), which “will act as a multicast manager” and is designed to “optimize the use of” satellite resources by controlling, for example, “session management.” *Id.*, pp.16 (acronym list), 90-91, 93.

ETSI-157 provides further details regarding the CRM’s management and control functions. Ex[1002], ¶123. For example, ETSI-157 explains that each CRM also includes a BSM Protocol Manager that adjusts bandwidth or other parameters to maintain Quality of Service (“QoS”). Ex[1011], p.64 (explaining the BSM Protocol Manager is implemented in an “ST” (satellite terminal)). As illustrated in FIG. 19 (below), the BSM Protocol Manager, for example, “defines how IP protocols and packet markings are interpreted and transmitted through the BSM, which satellite independent (SI) protocols are used and how they in turn trigger Satellite Dependent (SD) functions.” *Id.* The BSM Protocol Manager is an “intelligent” traffic manager; it “receives information from various interfaces and decides on the BSM protocol to trigger.” *Id.*, pp.64, 66, FIG. 20.

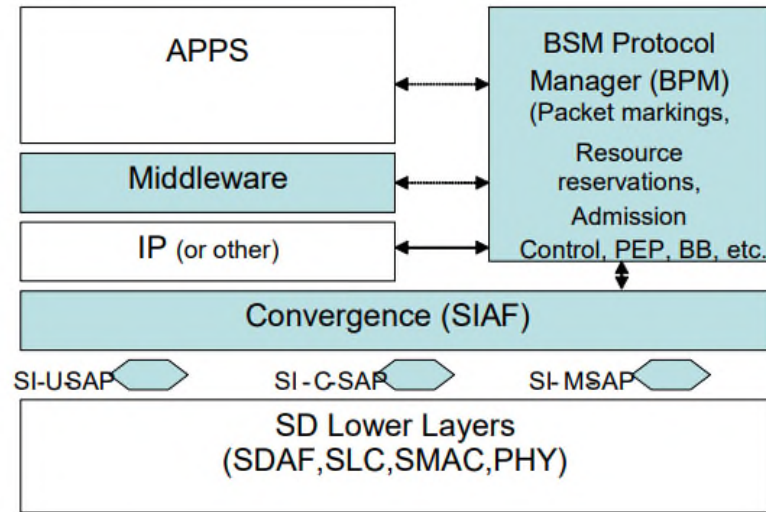


Figure 19: Protocol manager - System architecture

Id., p.65.

- c. 1[b]: “determine to establish a link for multicasting between users in the first domain and users in the second domain based on presence data of at least one user in the first domain and at least one user in the second domain”

ETSI-156 in view of ETSI-985 discloses limitation 1[b], under either party’s proposed construction. Ex[1002], ¶124. The gateway or satellite terminal (CRM) in the first network (domain) establishes a satellite link for multicasting between users in the first domain and a second domain if it detects that at least one user is active in each domain (presence data). Ex[1002], ¶124.

First, ETSI-156 discloses that the first CRM (gateway or satellite terminal) establishes a satellite link for multicasting, for example by “mapping” multicast IP addresses into “satellite layer 2 addresses,” which creates a satellite link to a receiver. Ex[1004], p.67; Ex[1002], ¶125. In particular, the first CRM specifies: the address

for the recipients; the modulation and coding scheme needed for the type of transmission; and whether the transmission requires reliable multicast (*e.g.*, file transfers) or semi-reliable multicast (*e.g.*, audio- and video-conferencing). *Id.*, pp.62, 64. The link simultaneously delivers information between a group of users in the first domain and a group of users in a second domain using the most efficient strategy,² for example, during audio and video conferencing. Ex[1004], pp.35, 14; *id.*, pp.66 (Multicasting “should be dynamic to allow efficient use of bandwidth.”), 43 (“Efficiency is here considered to be with the minimum use of spectrum resources while fulfilling the multicast requirements that are given for that group....”).³

ETSI-985 additionally details how the first CRM establishes a satellite link. For example, as shown in Figure 5.3.3.4 (below), each CRM in each domain (satellite terminal (ST) #1 and #2, blue and red below) includes, as part of its satellite dependent functionality, MAC layer and PHY layer components that transform the IP multicast packets into frames compatible with the satellite transmissions, using appropriate modulation and coding. Ex[1012], p.15.

² In general, IP multicasting uses a unique address to “transport data to multiple destination stations using a single IP packet.” Ex[1004], 67.

³ ETSI-156 enables multi-party video conferencing using the disclosed architecture and processes. Ex[1002], ¶125.

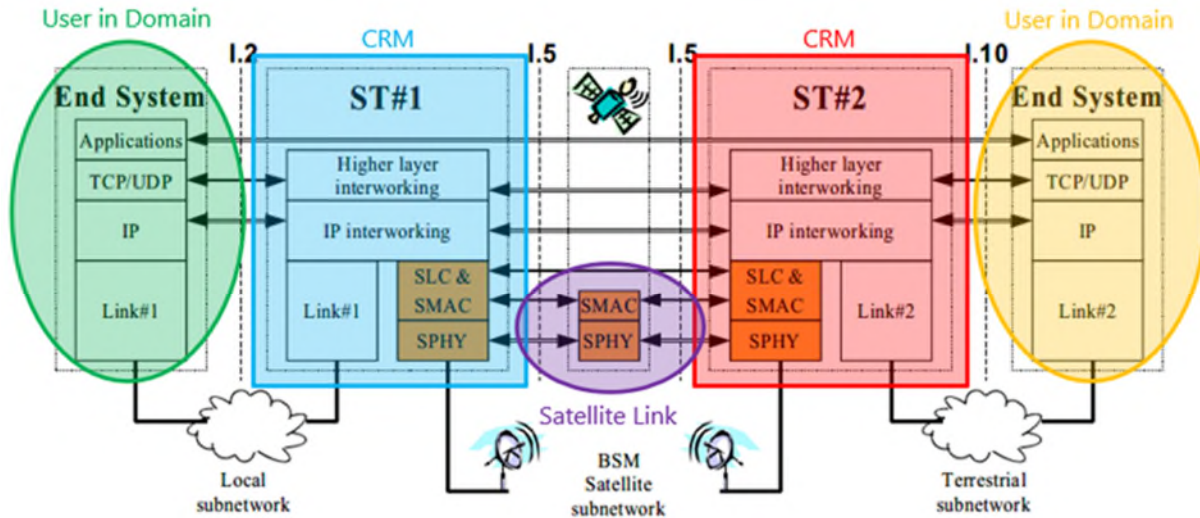


Figure 5.3.3.4: Higher layer interworking functions

Ex[1012], p.17 (annotated).

Second, the link for multicasting can be between *users* in the first domain and *users* in the second domain. Ex[1002], ¶127. In a BSM network, the satellite link for multicasting can be used for “multi-party video conference[s],”⁴ that connect participants in a call located in the two domains. Ex[1004], p.46. ETSI-156 also describes “[s]atellite systems” that “can support mobile and/or nomadic users” and support multicasting on a “*user* basis.” *Id.*, p.67. For example, Figure 5.3.3.4 from ETSI-985 (above) shows a satellite link connecting “[e]nd [s]ystem[s]” in each domain (green and yellow), each of which communicate via TCP/UDP and IP

⁴ ETSI-156 states that providing multi-party multicast data, *e.g.*, video-conferencing, is complex but specifically recognizes that it is possible using the ETSI Specifications, and a POSITA could have achieved multi-party video-conferencing over satellite from these disclosures. Ex[1002], ¶125.

protocols. Ex[1012], p.17. Each end system is operated by an “end user,” and the BSM network is designed to ensure a reliable QoS “experienced by the end user.” *Id.*, p.20 (describing “user” satisfaction as measured by multiple parameters).

Third, to establish the link, the first CRM determines presence data of at least one user in the first domain and one user in the second domain. Ex[1002], ¶128. In general, in a BSM network, “the spectrum resources need to be used wisely.” Ex[1004], p.58. “[R]esources are limited” so it is important to monitor presence information using a “satellite group management system.” *Id.*, pp.68-69, 55 (“[e]fficient satellite multicast” should not send data where “no target receivers are known”), 95 (“multicast data should only require capacity in those beams that have subscribers to the content”).

Accordingly, each CRM includes tables of available “hosts and multicast groups” (*presence data*) that “[i]dentify where these receivers are (at the moment).” *Id.*, pp.58, 62. A CRM thus knows the “availability of a multicast source” (in the first domain) and “which down-links need to receive this multicast transmission” to address multicast receivers (in the second domain). *Id.*, p.95. To build the tables of presence data, ETSI-156 discloses that CRMs implement multicast protocols, such as Internet Group Management Protocol (IGMP) and Protocol Independent Multicast - Sparse Mode (PIM-SM). *Id.*, p.86.

For example, IGMP “is an Internet protocol” enabling a host “to report its multicast group membership to adjacent routers” and “verify whether known group

members are still active.” Ex[1004], p.22. In a BSM network, IGMP is implemented at a “satellite terminal” to determine if hosts are present and available and to convey a status indicator of ability and/or willingness if the host can communicate. *Id.*, pp.66, 69, 87 (describing use of IGMP version 2 at terminals); Ex[1002], ¶130. Specifically, using IGMP, each host in a satellite multicast group periodically sends a report notifying the group of its presence. Ex[1004], p.68. In several applications, such as teleconferencing, each host can represent a “user,” such as a participant in the teleconference, that can join and leave the multicast teleconference group. *Id.*, p.69; *see also id.*, p.102 (“The initiative to subscribe to a multicast group would come from the end user...”). The user’s report is received at the terminal (CRM), which collects presence information about all hosts in the group. *Id.*, pp.66, 69 (describing “simple IGMP router functionality in the terminal”); Ex[1002], ¶130.⁵

Finally, ETSI-156 explains that a first CRM can use the presence data of users in two domains in determining to establish the satellite link. Ex[1002], ¶131. For example, the below annotated flow diagram (Ex[1004], p.94) illustrates the process of establishing a link when a new user at a host in one domain sends an IGMP message to its connected terminal requesting to join a multicast group in another domain (“IGMP message” below). *Id.* Here, the first CRM is a gateway already

⁵ ETSI-985 describes that PIM-SM instead of IMGP can be used at gateways (other CRMs) to determine if a host is still active, or if the host should be pruned from the CRM’s routing table. Ex[1012], p.36; Ex[1004], p.66; Ex[1002], ¶130.

participating in the multicast group, and the second CRM is the satellite terminal seeking to join the group. Ex[1002], ¶131. If the user's terminal had not previously subscribed to the group (the group is not "here" at the terminal, below), the terminal relays the request to the gateway in the source domain (first CRM in a first domain) ("Request new group message" below). If the group is available on the gateway ("Yes," below), then the gateway (first CRM) determines presence information about both the (a) host ("source") of the user in the first domain, and (b) new recipient host in the second domain. Ex[1004], p.94, 102. "At this point [the gateway, CRM] can consider the requirements for the source and terminals" such as "QoS setting" and "subscription." *Id.*, p.102. If appropriate, the gateway then establishes a satellite link to the terminal by passing the "Group ID" and "related params," after which the terminal starts receiving from the group over the link. *Id.*, p.94. The first CRM also modifies its tables to ensure that "[d]ata is forwarded only to those satellite terminals (ST) that have multicast members connected to them." *Id.*, p.104.

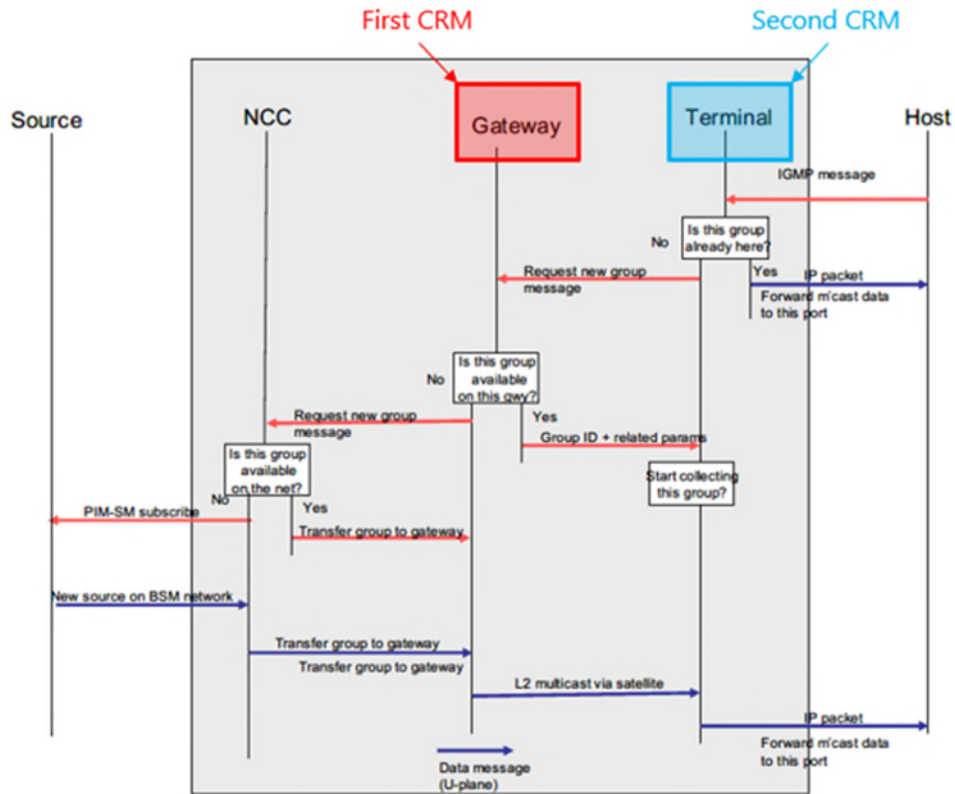


Figure 38: Interworking example

- d. 1[c]: “determine an application to be used in a communication session over the link”

ETSI-156 in view of ETSI-157 discloses limitation 1[c]. ETSI-156 discloses the first CRM can determine a variety of applications to be used over the multicast link in a communication session. *Id.*, pp.34-35; Ex[1002], ¶133. Applications may include “[c]onversational services” (*e.g.*, “video telephony” and “video-conferences,”) “[m]essage services” (*e.g.*, “video mail and document mail,”) and “[r]etrieval services” (*e.g.*, “video” and “high-resolution imag[ing]”). Ex[1004], p.34. Each multicast application is used in a multicast session, “a specific instance of multicast communication by a multicast group defined by its parameters (*e.g.*, rate), participants, and time of existence.” *Id.*, p.103. An “on-demand session” “may

allow potential participants to join dynamically after the session has been set up.”
Id., p.104.

Accordingly, after determining to establish a link, the first CRM determines the application for the session as part of its resource reservation process, which in turn determines “guaranteed bandwidth and delay” for the session. *Id.*, p.72; *see also id.*, p.35; Ex[1002], ¶134. Such QoS management occurs at the CRM’s BSM Protocol Manager and BSM-MP. Ex[1004], p.100 (figure); §VII.A.2.c.

ETSI-157 provides additional details of a CRM’s determination of an application. Ex[1002], ¶135. ETSI-157 specifically discloses that QoS management and performance monitoring are “located in the gateway and the terminals” (CRMs). Ex[1011], p.23. As explained in ETSI-157, QoS requires the “ability to segment traffic between service types or streams” (QoS classes) so that certain services can be prioritized. *Id.*, pp.26-27. ETSI-157 maps QoS classes to applications such that choosing a QoS class determines the application. *Id.*, p.28 (describing different QoS classes based on application), 42; Ex[1002], ¶135. Additionally, a bandwidth reservation request “generally includes a service class” specifying “the desired QoS.” Ex[1011], p.35. For example, a “QoS class” of “High” indicates VoIP, interactive application, and a “QoS class” of “Medium” with a “Low delay” indicates “Streaming Audio/Video.” *Id.*, pp.46, 57 (describing different performance targets for audio and video); Ex[1002], ¶135.

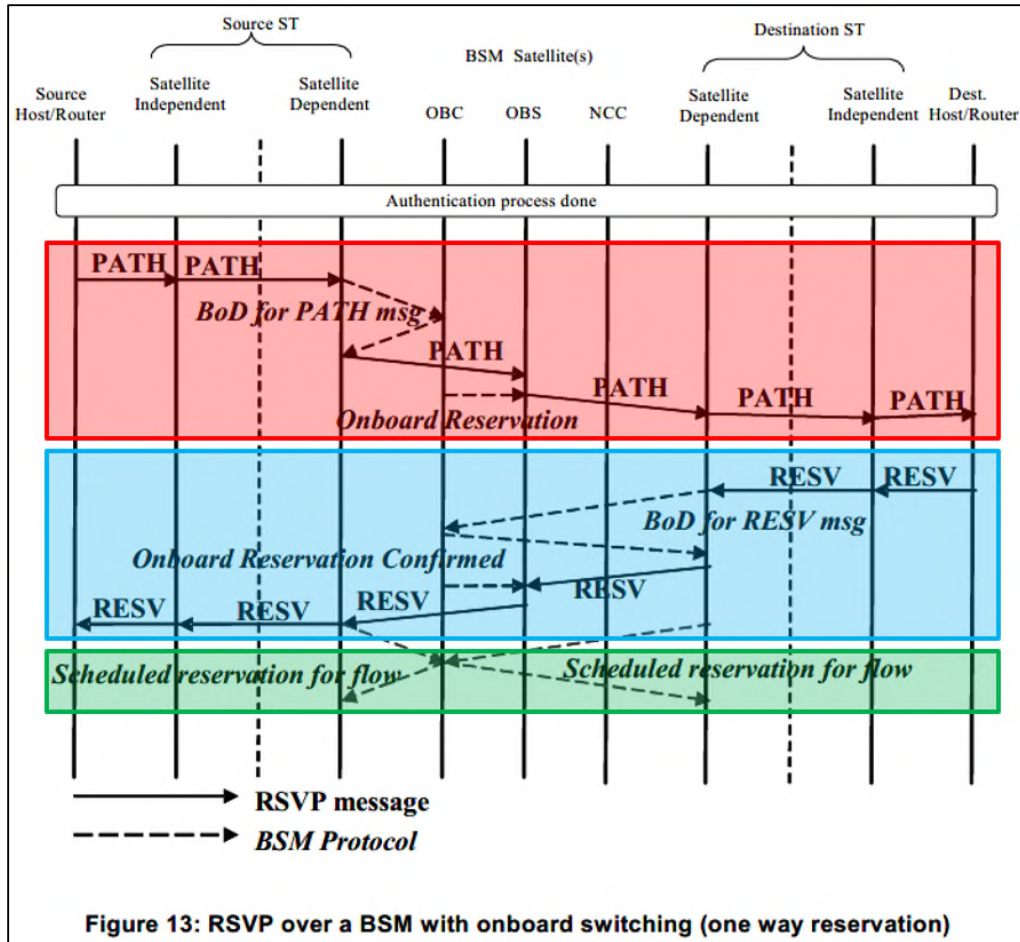
- e. 1[d]: “allocate a bandwidth level to be used for the link to accommodate the application”

ETSI-156 in view of ETSI-157 discloses limitation 1[d]. ETSI-157 discloses that a first CRM (gateway or satellite) can use an RSVP protocol for allocating bandwidth on demand to accommodate an application. Ex[1002], ¶136.

In particular, because satellite spectrum resources are “very limited” and “bandwidth management” must be “tight,” ETSI-157 provides for “bandwidth on demand” to allocate bandwidth to a particular satellite link for a specific application. Ex[1011], p.25; Ex[1002], ¶137. Bandwidth-on-demand “defines a bandwidth sharing mechanism that allocates bandwidth to requesting session based on a number of parameters” including the application to be used for the link. *Id.*, p.31. Indeed, ETSI-157 explains that “[a]ny QoS mechanism must ensure that bandwidth is available for high priority (or high revenue generating) services even if it means dropping lower level sessions in times of high load or high noise.” *Id.*, pp.31, 25. Accordingly, a first CRM (gateway or satellite terminal) uses RSVP to request a specific QoS from the network for a data stream, and allocate bandwidth-on-demand to accommodate applications. *Id.*, pp.34-35. In particular, using RSVP, “bandwidth is reserved” for a flow from source to destination, where the flow is associated with a “desired QoS” for the specific “service class” and performance target associated with an application. *Id.*, pp.34-35; Ex[1002], ¶138.

ETSI-157 describes how to implement RSVP in a BSM network. Ex[1002],

¶139. For example, FIG. 13 (annotated below) illustrates an example of how a first CRM (“Source ST”) allocates bandwidth using RSVP and how “RSVP leads to scheduled requests for bandwidth to ensure that the reservation is met when the traffic flow traverses the BSM.” Ex[1011], p.39. As shown, a user first issues a PATH message (red) to the first CRM (“[s]ource ST”) to “initiate[] the communication session” and to “bid[]” the “data path of a flow.” *Id.*, p.34. The first CRM sends the PATH message (red) to the satellite to request initial bandwidth to communicate with a second CRM (“[d]estination ST”). The satellite responds with bandwidth-on-demand, which the first CRM uses to establish a link to the second CRM. *Id.*, p.39. On this link, second CRM then responds with a “RESV” message (blue), which includes “specific QoS resource requirements of the destination.” *Id.*, p.34. Based on this response, the first CRM allocates a bandwidth for the application flow and “establishes a scheduled or permanent uplink bandwidth reservation to support the RSVP flow with the accepted bandwidth and delay” (green). *Id.*, p.39; *see also id.*, p.27 (The control plane functions in the CRM include “signalling reservation and bandwidth allocation.”); Ex[1002], ¶139.

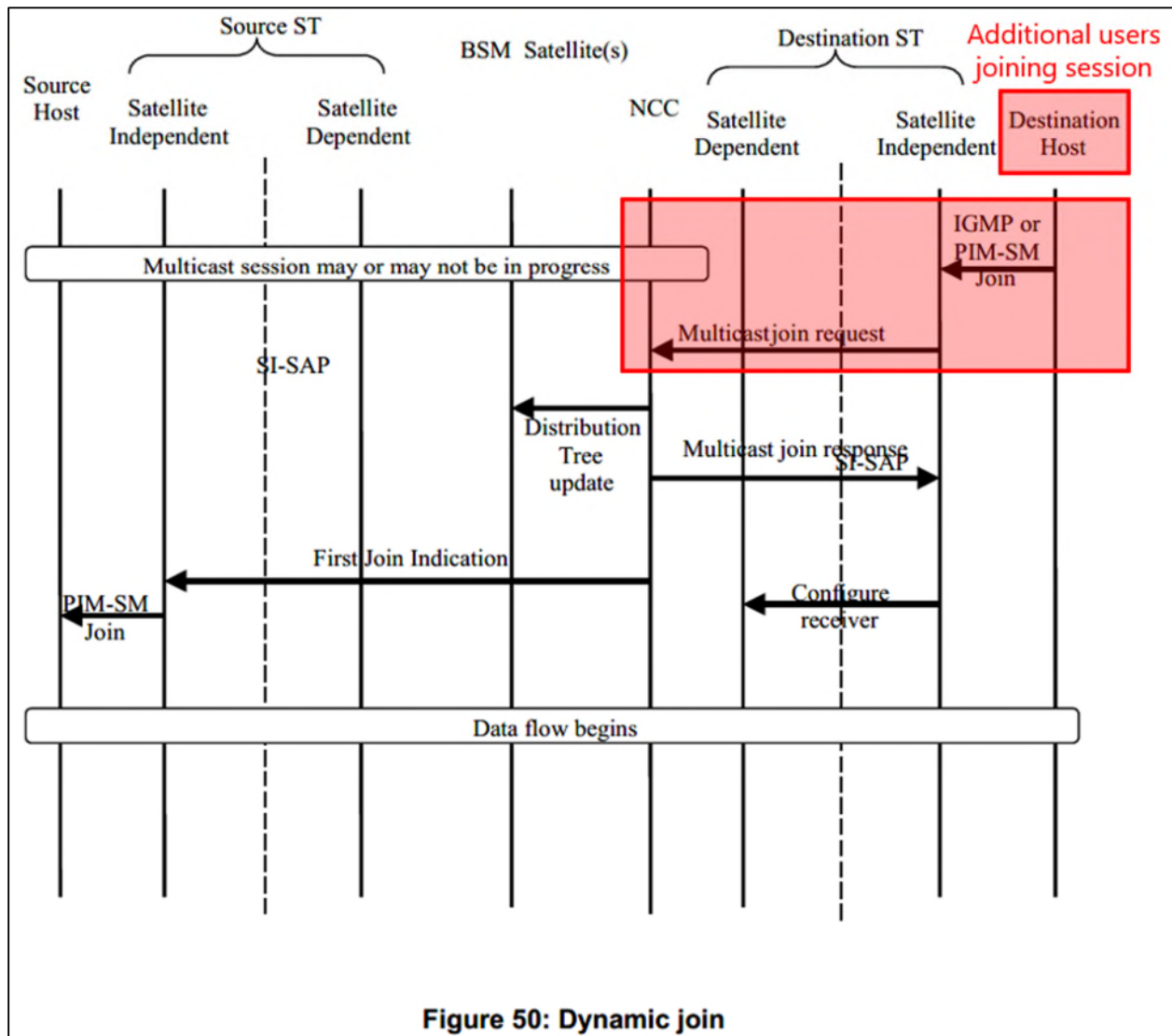


- f. 1[e]: “increase the bandwidth level for the link based on a change in the application and based on an identification of additional presence data for additional users that have joined the communication session”

ETSI-156 in view of ETSI-157 and RFC-2205 discloses limitation 1[e]. The first CRM uses the RSVP protocol to increase bandwidth when either the application is changed or based on presence data for additional users in the session. Ex[1002], ¶140.

Specifically, ETSI-156 discloses that a multicast session may dynamically change. Ex[1002], ¶141. For example, FIG. 50 (below) shows how users can be added to the session, and, as described for limitation 1[b], the first CRM will monitor

the presence of these users using a table of available “hosts and multicast groups” that is built and updated using IGMP or PIM-SM. Ex[1004], pp.58, 62; Ex[1012], pp.34-35; §VII.A.2.c; Ex[1004], p.104.(“An on-demand session may have participants that are preconfigured or may allow potential participants to join dynamically after the session has been set up.”).



Ex[1004], p.107 (annotated).

In addition, an application can change during a session. Ex[1002], ¶142. For

example, ETSI-156 explains a user can request “supplemental text content” during a television broadcast. Ex[1004], p.38. In this case, a user initially receiving audio and video streaming (one set of applications) changes an application by adding text (another type of application). Ex[1002], ¶142; Ex[1001], 4:16-24 (describing voice, video, and text as different applications). Similarly, ETSI-157 describes different applications (*e.g.*, conversational voice, streaming audio, and videophone) with different performance targets. Ex[1011], p.57. It would have been obvious to a POSITA that conferencing programs could allow a user in a conference to change an application from audio-video to audio-only during a session. Ex[1002], ¶142. As described for limitation 1[c], the CRM’s QoS manager will determine the application change to determine “guaranteed bandwidth and delay,” as a POSITA would have recognized. Ex[1004], p.72; §VII.A.2.d; Ex[1002], ¶142.

ETSI-157, in combination with RFC-2205, teaches that the CRM can allocate additional bandwidth for additional users or different applications. Ex[1002], ¶143. As described for limitation 1[d], ETSI-157 reserves bandwidth for a particular flow involving a particular application and a particular set of users. Ex[1011], p.34 (describing that each user destination has “specific QoS resource requirements”); §VII.A.2.e. A particular user added to the session may subscribe to a guaranteed quality tier of service that imposes additional QoS requirements on the transmission. Ex[1011], p.45 (users can subscribe to a “reliable delivery” service to receive a higher QoS). A change in application also may require a different QoS parameter.

Id., pp.57-58. And, as described above (§VII.A.2.e), using RSVP, based on the specific QoS requirement, “bandwidth is reserved” for a flow from source to destination. Ex[1011], pp.34-35; *id.*, p.27; Ex[1002], ¶143.

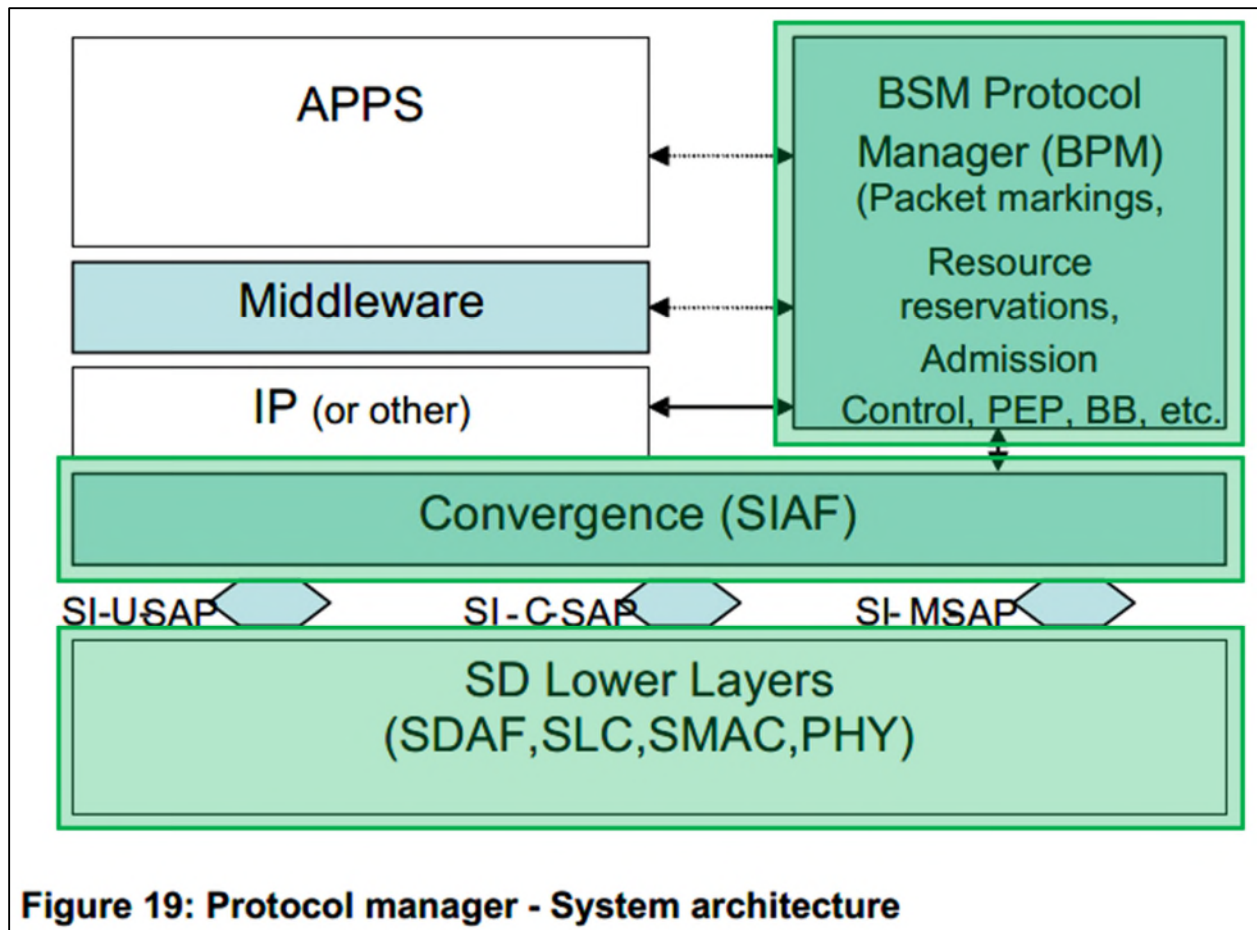
RFC-2205 further discloses how additional bandwidth can be reserved during a session. Ex[1011], pp.34-35 (referencing RFC-2205). RFC-2205 explains that “RSVP makes receivers responsible for requesting a specific QoS” so as “to efficiently accommodate large groups, dynamic group membership, and heterogenous receiver requirements.” Ex[1006], p.4. For example, RSVP can accommodate QoS changes based on a new user with a higher QoS joining a call, or a changing application during a session to one with a higher QOS requirement. Ex[1002], ¶144. In these scenarios, “[t]he state maintained by RSVP is dynamic” and “to change any QoS request, a host simply starts sending revised Path and/or Resv messages.” Ex[1006], p.23. RFC-2205 refers to this as “a ‘soft state’ approach to managing the reservation state in routers and hosts” that provides “support for dynamic membership changes and automatic adaptation to routing changes.” *Id.*, pp.6, 22. If a new PATH message is sent, then, as described for limitation 1[d], the first CRM will establish a link with an additional allocation of bandwidth in the same way as with the initial PATH message. Ex[1002], ¶144; §VII.A.2.e.

- g. 1[f]: “the communication resource managers each includes respective trunking element that is automatically

configured to select a transcoding based on available bandwidth”

ETSI-156 in view of ETSI-157 discloses limitation 1[f], under either party’s proposed construction. Ex[1002], ¶145. The trunking element in each CRM includes functionality in the BSM Protocol Manager, BSM Multicast Proxy, “[s]atellite [i]ndependent,’ and “satellite dependent” functionality in each gateway or satellite terminal. Ex[1002], ¶145; §VII.A.2.c. That trunking element is automatically configured to select a transcoding based on bandwidth. Ex[1002], ¶145.

In particular, ETSI-156 in view of ETSI-157 discloses the same type of trunking elements as described in the ’134 patent. Ex[1001], 2:54-62, 3:11-19, 4:33-49 (describing “dynamic trunking elements 50 and 52” that “bring up the SatCom link” “increase the bandwidth of the link,” and “bring[] down the SatCom link”). As described for limitation 1[a], in the ETSI Specifications, each CRM’s trunking element (green below, except BSM Multicast Proxy, not shown) creates and tears down physical satellite links. §VII.A.2.c (describing establishing link); Ex[1004], pp.51, 44 (describing use of satellite links in IP multicast routing trees), 58, 62. As described for limitation 1[d], these components also allocate bandwidth for the link. §VII.A.2.e.



Ex[1011], p.65 (annotated).

In addition, ETSI-157 explains each CRM's trunking element is configured to automatically select a transcoding based on available bandwidth. Ex[1002], ¶147. Generally, BSM networks are susceptible to changes in available bandwidth due to external conditions. *Id.* For example, “wind that can move [satellite terminal] antennas, rain that induces large fades and scintillation that causes interference” can cause “error bursts (or reduced bandwidth) that will lead to packet loss.” Ex[1011], p.25. In these scenarios, “[t]he BSM cannot allocate bandwidth that does not

exist...” *Id.*

To address these problems, ETSI-157 discloses that “bandwidth and delay should be used as metrics for QoS routing.” *Id.*, p.43. For example, to address changes in bandwidth, ETSI-157 discloses a “Codec Type” field included in the “QoS metadata.” *Id.*, p.68. A POSITA would have understood that this field would only change if necessary and that the codec with the highest compatible fidelity would generally be selected. *Id.*, p.68; Ex[1002], ¶148. In addition, the CRM can “reduce the rate” of transmissions to accommodate lower bandwidth circumstances so that “service can continue with degraded performance for all services (if the service agreements allow it) or at nominal performance for high QoS classes by shutting down some low priority services.” *Id.*, p.32; *id.* (describing that “[l]ink layer methods” can “maintain the link budget”); Ex[1002], ¶149.

Modifying bit rate using compression or changing codec type are methods of *transcoding* because, *e.g.*, they are coding techniques applied to previously encoded data. Ex[1002], ¶150. For example, ETSI-157 describes applications, including VoIP, RTSP (for streaming audio/video), and SMTP (for email), in which the data content received by the CRM for transmission is previously encoded based on various protocols/standards. Ex[1011], p.46 (describing BSM services and protocols), 12 (describing data transfer units as including ATM cells and MPEG digital packets). For example, a CRM could receive an MPEG video encoded at a certain bit rate and, using the QoS functionality in ETSI-157, reduce the bit rate to

accommodate available bandwidth using another codec type. Ex[1002], ¶150.

- h. 1[g]: “adjust the bandwidth level based on a determination which of the additional users and the users in the first and second domains can transmit data simultaneously during the communication session”

ETSI-156 in view of RFC-2205 discloses limitation 1[g]. As described for limitation 1[e], ETSI-156 in view of ETSI-157 and RFC-2205 discloses that the first CRM reserves and increases bandwidth based on the presence of users that have joined the communication session. §VII.A.2.f. The first CRM can further adjust bandwidth based on whether the additional users and the users in the first and second domains can transmit data simultaneously during the session. Ex[1002], ¶151.

ETSI-156 describes that the BSM supports various service classes, including applications in which multiple users transmit simultaneously, *e.g.*, “[c]onversational services,” “video-conferences.” Ex[1004], p.34. Indeed, performance targets vary based on whether the transmission is “one-way” (one transmitter) or “[t]wo-way” (simultaneous transmitters). Ex[1011], p.57 (web-browsing is “[p]rimarily one-way” and “[c]onversational voice” is “[t]wo-way”).

As described for limitation 1[e], ETSI-157 further discloses that the first CRM considers service class and performance targets for a new user (*e.g.*, whether the new user will participate as a potential transmitter in a two-way communication session) in determining whether to adjust the QoS and, correspondingly, the bandwidth for a session. *E.g.*, Ex[1011], p.35 (“The flowspec in a reservation request generally

includes a service class...”); §VII.A.2.e (QoS determines bandwidth allocation); Ex[1002], ¶153. It would at least have been obvious to consider whether each of the users can transmit data simultaneously in adjusting bandwidth after a user joins a session, as a user could change their role from receiver to transmitter, *e.g.*, during a conference call, and with more simultaneous transmitters in a session, a link with a higher bandwidth may be required. Ex[1002], ¶153.

i. 1[h]: “detect an absence of active users in the first domain and the second domain”

ETSI-156 discloses limitation 1[h]. As described for limitation 1[b], ETSI-156 discloses that a gateway or satellite terminal (first CRM) monitors presence of users in a multicast session, such as a video-conferencing session. §VII.A.2.c. ETSI-156, *e.g.*, describes that “[f]or sessions that allow dynamic membership, any participant may leave the session while it is active” by sending an IGMP leave request to its connected first CRM, which will also receive indication of users of hosts in the same multicast group that leave a remote domain. Ex[1004], pp.108-09. For example, a message may be sent to the first CRM that there are no other remaining active hosts in the BSM so that the first CRM will “teardown the multicast tree.” *Id.* Thus, the first CRM detects an absence of users in both domains. Ex[1002], ¶155.

j. 1[i]: “tear down the link based on the absence”

ETSI-156 in view of RFC-2205 discloses or at least renders obvious limitation

1[i]. Ex[1002], ¶156. As described for limitation 1[h], a first CRM detects the absence of users in its own domain and in other domains, §VII.A.2.i; the first CRM will also receive a teardown message when the last satellite terminal leaves the multicast group so that the first CRM will tear down the link. Ex[1004], pp.108-09; Ex[1002], ¶156.

It would have been obvious in view of ETSI-156 that the teardown message would only be sent if there is an absence of active users in both domains. *Id.* If either domain had active users in a multicast videoconference, *e.g.*, the link should remain active (not torn down) in case a user in another domain chooses to join that conference. Ex[1004], pp.107 (describing a timer for waiting for receivers to join), 108-109 (“[i]f other [satellite terminals] in the multicast session are still active...multicast packets are still down-linked to that beam”); Ex[1002], ¶157.

k. 1[j]: “wherein the link is a satellite communication link”

ETSI-156 discloses limitation 1[j]. Ex[1002], ¶158. The link is a satellite link in the BSM network. §§VII.A.2.b-i.

3. Claim 2

ETSI-156 discloses claim 2 under any party’s proposed construction—“*the users of the first domain comprise a virtual talking group (VTG).*” Ex[1002], ¶159.

ETSI-156 discloses a “virtual talking group” as described in the ’134 patent. *E.g.*, Ex[1001], FIGs. 3-4. ETSI-156, *e.g.*, describes a BSM network for multicasting in which users (hosts) form a “host group,” “a set of zero or more hosts identified by

a single IP destination address.” Ex[1004], pp.14-15. Multiple users (hosts) can exist in each domain, as shown below. Ex[1002], ¶160.

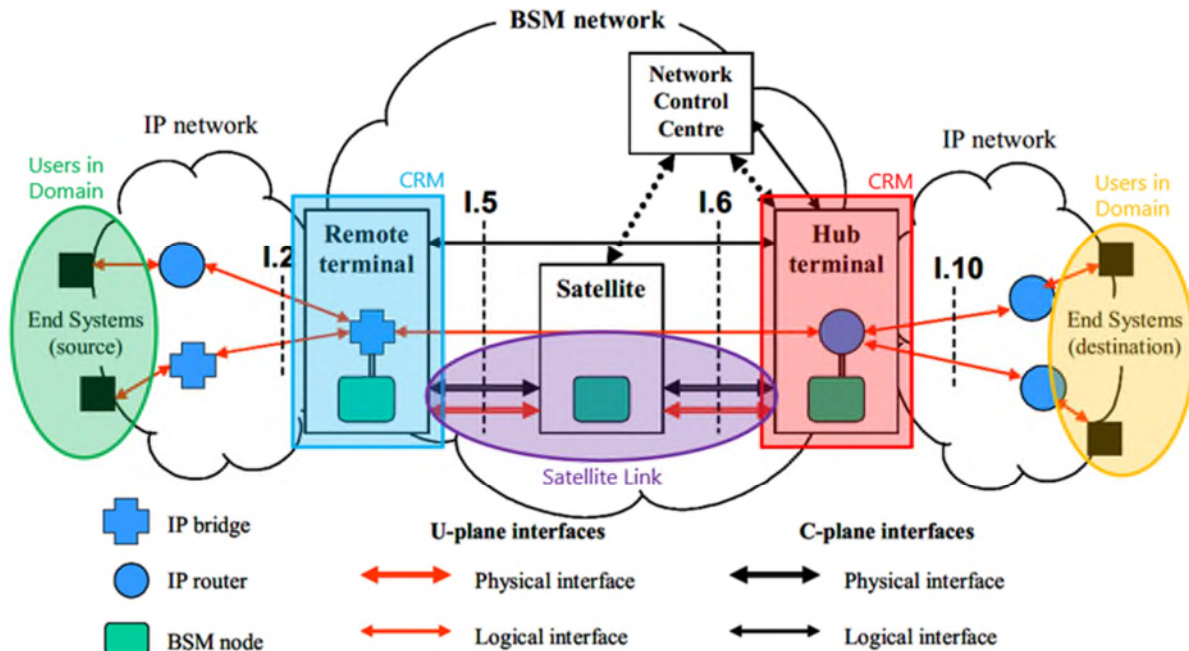


Figure 18: Star network architecture from TR 101 984

Ex[1004], pp.8, 53, FIG. 18 (annotated), p.35 (describing the IP multicast group for voice or “[t]eleconferencing”); Ex[1002], ¶160.

4. Claim 3

ETSI-156 in view of ETSI-157 discloses claim 3—“*the additional presence data relates to whether a given end user has logged into their respective system.*” Ex[1002], ¶162.

In ETSI-156, the BSM network may support “conditional access, including authentication” (logging in). Ex[1004], p.43, 72 (explaining multicast applications require “user authentication”); Ex[1002], ¶163. Authentication “may be located at a service provider gateway” (e.g., the first CRM). *Id.*, p.43. It would have been

obvious to a POSITA to require a user's authentication required *before* monitoring a user's presence with IGMP/PIM-SM, otherwise satellite links could be established for fraudulent users. Ex[1004], pp.58, 62; §VII.A.2.f. In this circumstance, the subsequent transmission of IGMP/PIM-SM presence data *relates to* the user's authentication (logging in). Ex[1002], ¶164.

5. Claim 4

ETSI-156 in view of ETSI-157 discloses claim 4—“*the communication resource managers each includes respective virtual talk group (VTG) presence managers (VPMs), each of which is operable to monitor their users who are present in their respective domains.*” Ex[1002], ¶165. The VPM is included in the BSM Multicast Proxy and BSM Protocol Manager. *Id.*

A CRM's BSM Multicast Proxy (BSM-MP) acts as a multicast manager to track presence of users in its domain. Ex[1004], pp.91-92, 94, FIGs. 35 (below), 38. A CRM's BSM Protocol Manager is “an ‘intelligent’ traffic manager” and “defines how IP protocols” such as IGMP/PIM-SM (which track presence data in a domain, §VII.A.2.c) “are interpreted and transmitted through the BSM.” Ex[1011], pp.64-65. Accordingly, the BSM-MP and BSM Protocol Manager both include functionality to monitor users who are present in their domain. Ex[1002], ¶166.

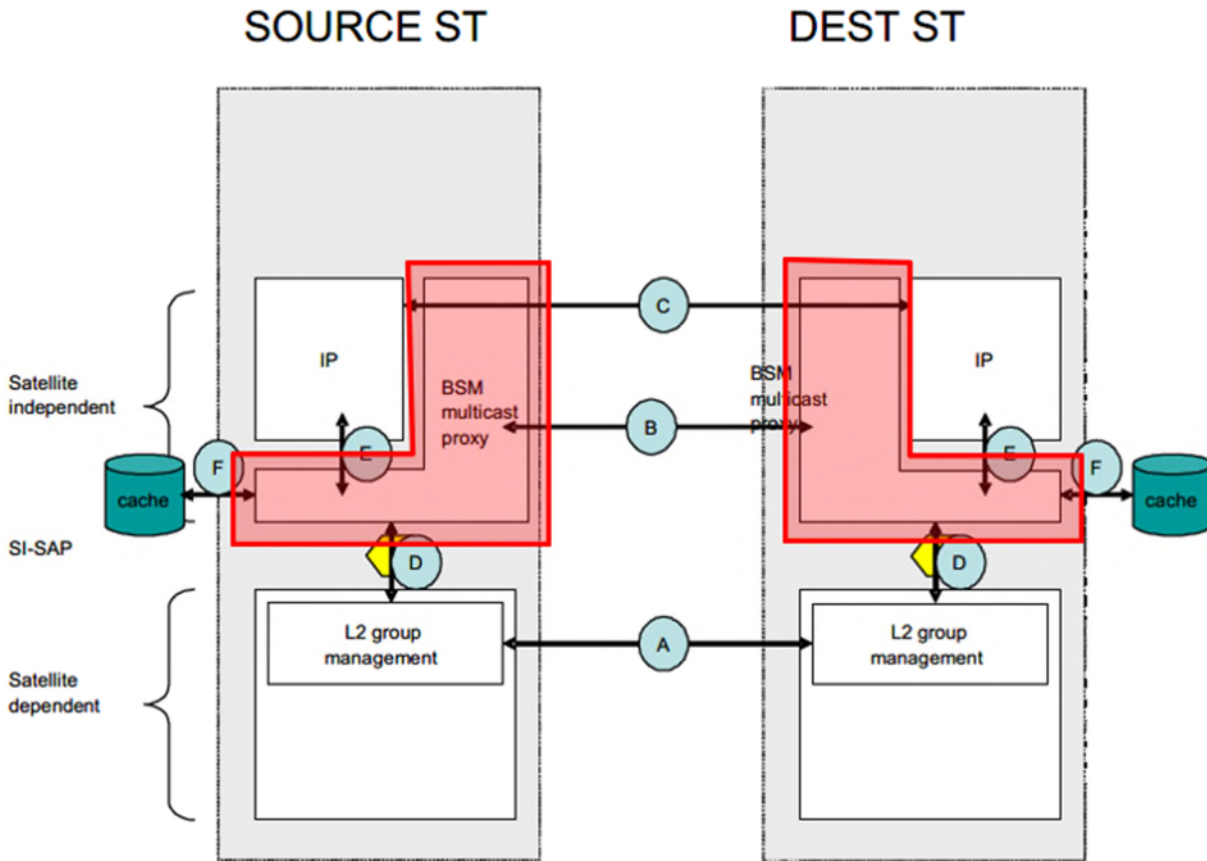


Figure 35: BSM proxy concept

Ex[1004], p.92 (annotated).

6. Claim 5

ETSI-156 in view of ETSI-157 and RFC-2205 discloses claim 5—
“information received from the VPMs is used to maintain a designated link
bandwidth allocation.” Ex[1002], ¶167.

As described for limitation 1[d] (§VII.A.2.e), the portion of the CRM that
allocates bandwidth based on presence information is in the BSM Protocol Manager,
which, together with the BSM Multicast Proxy (BSM-MP), disclose the VPM.
§VII.A.5; Ex[1004], p.100 (figure). Lower level components of the CRM

subsequently receive information from the VPM to create and maintain a satellite link at a particular bandwidth. Ex[1011], p.65, FIG. 19; §VII.A.2.c, e. Even if there is no change to the number of users or application, the VPMs use RSVP to maintain the link at the specified bandwidth. Ex[1002], ¶168; §VII.A.2.e; Ex[1011], p.34; Ex[1006], p.6 (periodic refresh messages maintain the state).

7. Claim 6

ETSI-156 in view of ETSI-157 and RFC-2205 discloses claim 6—“*if either one of the VPMs determine that there are no active users logged into their respective systems, then the VPMs tear down the link.*” Ex[1002], ¶169.

As described for claims 3-4, ETSI-156 discloses or renders obvious determining if a user is logged into their system through “authentication.” §§VII.A.4-5. Additionally, as described for limitation 1[i], each CRM (including the VPM) looks for active users in at least one domain and receives a teardown message when the last satellite terminal leaves the multicast group. §§VII.A.2.j; Ex[1002], ¶170; Ex[1004], pp.91-92, 108-109. The VPM then communicates with other portions of the CRM to tear down the link. Ex[1002], ¶170; Ex[1004], pp. 91-92; §VII.A.2.j.

8. Claim 7

ETSI-156 in view of ETSI-157 discloses claim 7—“*a router that establishes the link based on direction from the communication resource manager.*” Ex[1002], ¶171. The router includes functionality in the BSM Multicast Proxy, “[s]atellite

[i]ndependent,” and “satellite dependent” components, which route a transmission to the host and multicast group from the CRM. Ex[1004], pp.90-93 (describing a “multicast enabled router”); Ex[1002], ¶172. These elements also receive direction from the BSM Protocol Manager, *e.g.*, for route discovery and authentication. Ex[1011], p.65; Ex[1002], ¶172.

9. Claim 8

a. 8[Pre]

If the preamble is limiting, ETSI-156 discloses it. Ex[1004], p.6; Ex[1002], ¶173.

b. 8[a]

See limitation 1[a]. Ex[1002], ¶174; §VII.A.2.b.

c. 8[b]

See limitation 1[b]. Ex[1002], ¶175; §VII.A.2.c.

d. 8[c]

See limitation 1[c]. Ex[1002], ¶176; §VII.A.2.d.

e. 8[d]

See limitation 1[d]. Ex[1002], ¶177; §VII.A.2.e.

f. 8[e]

See limitation 1[e]. Ex[1002], ¶178; §VII.A.2.f.

g. 8[f]

See limitation 1[f]. Ex[1002], ¶179; §VII.A.2.g.

h. 8[g]

See limitation 1[g]. Ex[1002], ¶180; §VII.A.2.h.

i. 8[h]

See limitation 1[h]. Ex[1002], ¶181; §VII.A.2.i.

j. 8[i]

See limitation 1[i]. Ex[1002], ¶182; §VII.A.2.j.

k. 8[j]

See limitation 1[j]. Ex[1002], ¶183; §VII.A.2.k.

10. Claim 9

See claim 2. Ex[1002], ¶184; §VII.A.3.

11. Claim 10

See claim 3. Ex[1002], ¶185; §VII.A.4.

12. Claim 11

See claim 5. Ex[1002], ¶186; §VII.A.6.

13. Claim 12

a. 12[Pre]

If the preamble is limiting, ETSI-156 discloses it. Ex[1004], p.6; Ex[1002], ¶187.

b. 12[a]

See limitation 1[a]. Ex[1002], ¶188; §VII.A.2.b.

c. 12[b]

See limitation 1[b]. Ex[1002], ¶189; §VII.A.2.c.

d. 12[c]

See limitation 1[c]. Ex[1002], ¶190; §VII.A.2.d.

e. 12[d]

See limitation 1[d]. Ex[1002], ¶191; §VII.A.2.e.

f. 12[e]

See limitation 1[e]. Ex[1002], ¶192; §VII.A.2.f.

g. 12[f]

See limitation 1[f]. Ex[1002], ¶193; §VII.A.2.g.

h. 12[g]

See limitation 1[g]. Ex[1002], ¶194; §VII.A.2.h.

i. 12[h]

See limitation 1[h]. Ex[1002], ¶195; §VII.A.2.i.

j. 12[i]

See limitation 1[i]. Ex[1002], ¶196; §VII.A.2.j.

k. 12[j]

See limitation 1[j]. Ex[1002], ¶197; §VII.A.2.k.

14. Claim 13

See claim 3. Ex[1002], ¶198; §VII.A.4.

15. Claim 14

See claim 5. Ex[1002], ¶199; §VII.A.6.

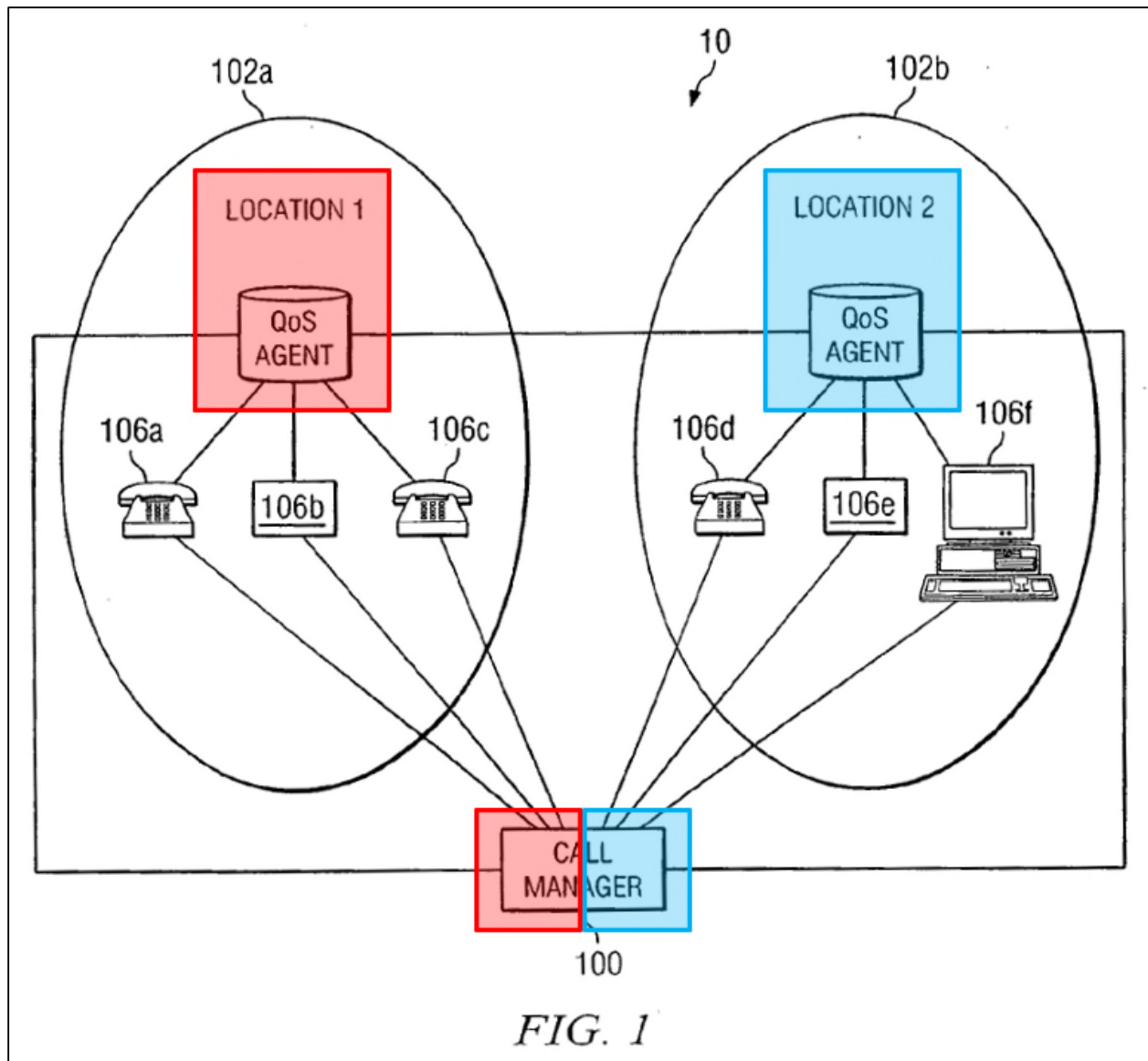
B. Ground 2: Claims 1-14 are obvious over Dhesikan in view of BGAN and Firestone.

1. Motivation to Combine Dhesikan with BGAN and Firestone.

A POSITA would have combined, and could have combined, Dhesikan with BGAN and Firestone with an expectation of success to arrive at the Challenged Claims. Ex[1002], ¶200.

a. *A POSITA Would Have Been Motivated to Modify Dhesikan to Use BGAN's Satellite Network*

Dhesikan discloses a system 10 (below) for setting up an audio and video-conference call between two or more groups of different types of endpoints, 106a, 106c, 106d, 106f, in different networks at different locations, 102a and 102b. Ex[1007], ¶¶[0005], [0020], [0022], [0023], FIG. 1. Although shown as a centralized call manager in FIG. 1, call agents may be “distributed” and located in each domain; for example, a “separate call agent 100 may be associated with each location 102,” as indicated by the red and blue highlighting below. Ex[1007], ¶[0031].

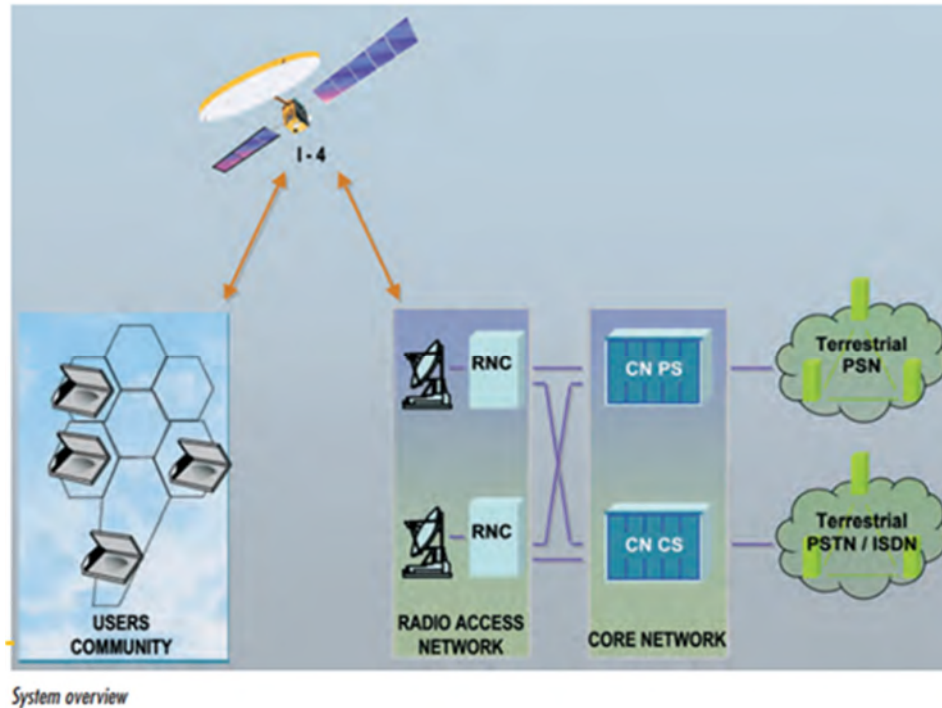


Ex[1007], FIG. 1 (annotated).

Dhesikan further discloses that the locations “communicate with each other” via “network elements” that transmit audio and video streams (data) using an IP-based signaling protocol, including a “multicast” protocol, that maintains a certain QoS level. *Id.*, ¶¶[0022], [0024], [0027]. Although Dhesikan does not describe or limit the type of network elements that can exist between domains and teaches that the domains may be connected to “a service provider network” and “any suitable

architecture” “that facilitates communications,” *id.*, ¶[0022], Dhesikan does not expressly disclose use of a satellite communication link.

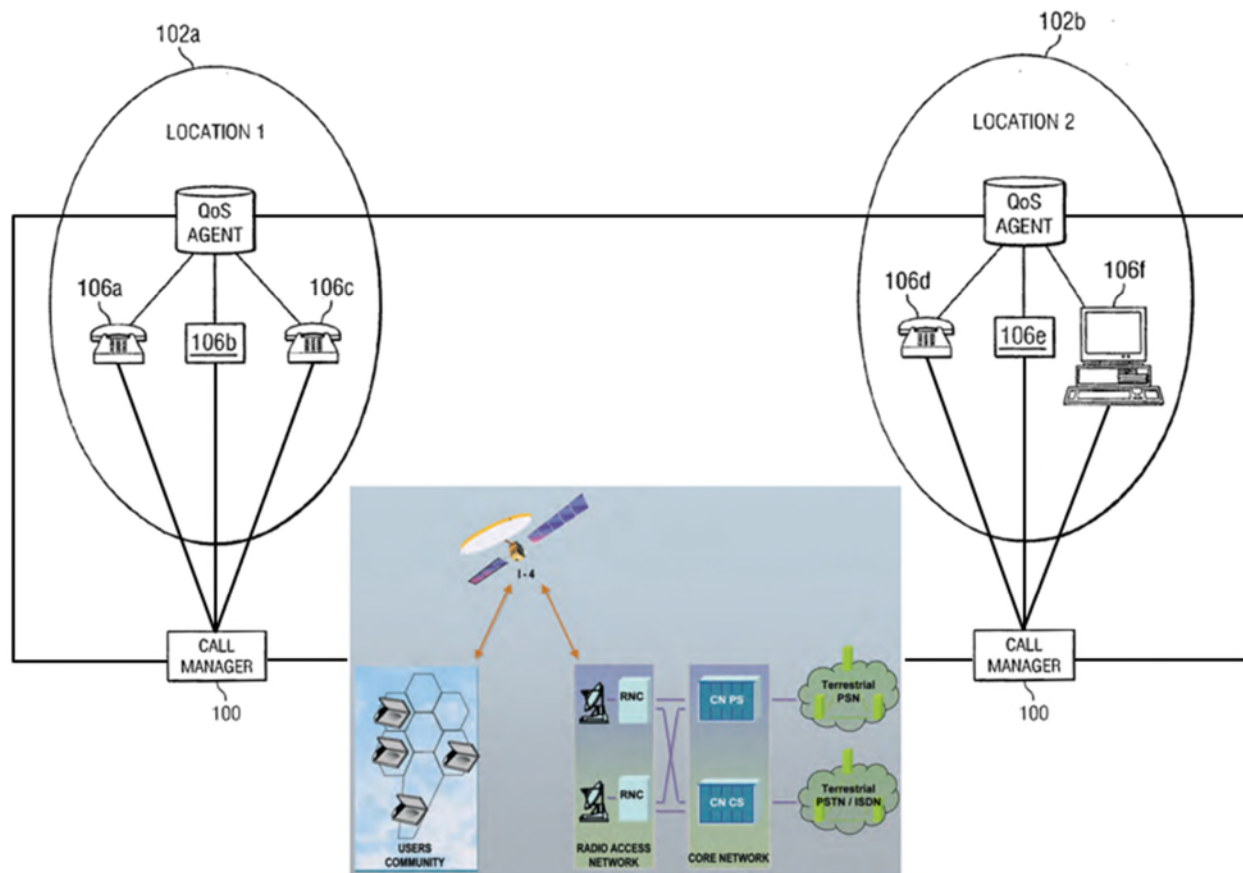
BGAN (below) discloses this aspect of the claims. Ex[1002], ¶202. BGAN is an on-demand broadband satellite service for the “modern office.” Ex[1014], p.2. BGAN is “[b]ased on IP technology,” and provides “IP-based mobile data communications” for “multimedia” including “conference calling” services.” *Id.*, pp.3-5. “The Streaming IP data service” provides “guaranteed bandwidth on demand, enabling live video applications like video conferencing or video streaming.” *Id.* BGAN also provides “multicast service capabilities,” “exploiting the natural strength of satellites for delivering multicast services at the global level.” *Id.*, p.3. The “BGAN Multicast Service” provides “reliable and secure multicast transport protocols ensuring quality of service for individual multicast flows.” *Id.*, p.6.



Id., p.4.

It would have been obvious to a POSITA to modify Dhesikan's system 10 to operate with the satellite network in BGAN, as shown below in a modified version of FIG. 1 of Dhesikan combined with BGAN ("Dhesikan+BGAN"). Ex[1002], ¶203. A POSITA would have understood that BGAN's satellite system would improve Dhesikan by "enabl[ing] broadband connection on the move, delivering all the key tools of the modern office" "to almost anywhere on the planet." Ex[1014], pp.2-3. BGAN's "large bandwidth" and "ubiquitous coverage, reliability, and portability" (*id.*, p.2) would have been desirable, especially in circumstances where endpoints are operating in remote locations in which other connections are not available. Ex[1002], ¶203. Incorporating BGAN's satellite network with Dhesikan to connect two locations via a satellite link would enhance Dhesikan's ability "to

quickly and effectively interact with an individual through any suitable communications media” and further Dhesikan’s goal of providing a system that can use any “appropriate architecture or system that facilitates communications.” Ex[1007], ¶¶[0003], [0022]; Ex[1002], ¶203.



A POSITA would have had a reasonable expectation of success in combining these known individual elements in Dhesikan and BGAN to connect locations 102a and 102b in Dhesikan using a satellite communications link in the manner recited in the Challenged Claims. Ex[1002], ¶204; Ex[1007], ¶[0022]. In addition to BGAN, the use of satellite communications links in other systems was well-known, which suggests that a POSITA would have been able to implement the combination.

Ex[1002], ¶204. As one example, Shaffer discloses a similar system to Dhesikan for setting up a call between two or more groups of different types of endpoints (*e.g.*, radios, IP phones) in different networks at different locations (*e.g.*, 24a-24d). Ex[1009], ¶[0021], FIG. 1. In Shaffer, the different networks can communicate with each other via an IP network, which can be any “global distributed network” such as *a “satellite network.”* *Id.*, ¶¶[0025], [0027], [0030]-[0031] (emphasis added).

Dhesikan already contemplates that its techniques are applicable to “any suitable architecture” “that facilitates communications.” Ex[1007], ¶[0022]. A POSITA would have understood BGAN’s satellite network to be one such “suitable architecture” that would be compatible with Dhesikan’s system. Ex[1002], ¶205. As discussed below, Dhesikan discloses an IP link, including over multicast, with a guaranteed QoS. §§VII.B.2.a-d. BGAN discloses that the same type of IP link—using multicast with a guaranteed QoS—can be implemented as a satellite communications link over a commercial satellite service. Ex[1014], p.6. It would have been within the abilities of a POSITA to incorporate BGAN’s commercial satellite service (including satellite terminals connected to a satellite), as designed, between the CRMs in each domain in Dhesikan. Ex[1002], ¶205. A POSITA would have reasonably expected that Dhesikan’s CRM could interface with the satellite provider’s terminal, which would repackage IP communications from each CRM/domain to send over satellite to the other CRM/domain. *Id.* Each element would merely perform the same function as it did separately. *Id.*

The combination would have relied on known methods, and a POSITA would have understood it to be predictable, routine, and reasonably expected to succeed before September 2008. *Id.*, ¶206. The combination would have merely required purchasing well-known services to implement IP over satellite that had been commercially available for years, and using that commercial service to connect Dhesikan's locations 102a and 102b. *Id.* Indeed, Dhesikan *already* teaches to connect the locations using such a "service provider network" such as that disclosed as BGAN. Ex[1007], ¶[0022].

b. *A POSITA Would Have Been Motivated to Modify Dhesikan's QoS Agents to Implement Firestone's Transcoding Functionality*

Each of the domains in Dhesikan's system 10 (above) includes a QoS agent (104a or 104b) comprising "[s]oftware, hardware, or a combination" that can be implemented on "switches, gateways, bridges, voice-mail servers, routers, and load balancers." Ex[1007], ¶¶[0023]-[0024], [0032], FIG. 1. Dhesikan's QoS agents are "involved in the signaling and media exchange between endpoints" and perform bandwidth reservations to "accommodate audio and video media streams" along with "appropriate transcoding operations." *Id.*, ¶[0024]. Although Dhesikan extensively describes how the QoS agents reserve bandwidth, Dhesikan does not describe the transcoding operations in detail. Ex[1002], ¶207. Thus, a POSITA would have looked to other prior art references for further details regarding how Dhesikan's QoS agents could implement transcoding. *Id.*

Firestone is one such reference. *Id.*, ¶208. Firestone discloses a similar communication system as Dhesikan with “media switches” that also are involved in signaling and media exchange. Ex[1008], ¶¶[0015], [0025]. In Firestone, “audio and video streams may be transmitted between end points 12 and their associated media switch 26.” *Id.*, ¶¶[0022], [0034]. Like the QoS agents of Dhesikan, Firestone’s media switches can be implemented as “software” using “existing network devices such as routers, switches, and wireless access points.” *Id.*, ¶[0036]. Additionally, like Dhesikan’s QoS agents, Firestone’s media switches perform “transcoding” operations. *Id.*, ¶[0034]. Firestone expressly discloses that the media switch transcoding accommodates available bandwidth, *e.g.*, when endpoints require “a video transrater” or a “video transcoder” to accommodate “[b]andwidth constraints” (*i.e.*, available bandwidth). *Id.*, ¶[0029].

It would have been obvious to implement Firestone’s transcoding functionality in Dhesikan’s QoS agents, and a POSITA would have had a reasonable expectation of success in doing so. Ex[1002], ¶209. Firestone’s media switch transcoding can be implemented in software on a switch or router (Ex[1008], ¶[0036]), and Dhesikan already discloses that its QoS agents perform transcoding, and can be implemented in software on a switch and router (Ex[1007], ¶¶[0023]-[0024], [0032]). The combination would involve a straightforward modification to Dhesikan’s existing software to require that the QoS agents select the appropriate transcoding based on available bandwidth that the QoS agents are also responsible

for calculating. Ex[1002], ¶209. No additional components would be required other than those already implemented by the QoS agents, and the combination would have been simple, predictable, and reasonably expected to succeed. *Id.*

Moreover, a POSITA would have been motivated to make the combination. *Id.*, ¶210. Dhesikan already teaches that QoS agents perform transcoding, but fails to provide details regarding how transcoding should be performed. Firestone provides those details. *See Intel Corp.*, 61 F.4th at 1380 (“[I]f there’s a known technique to address a known problem using ‘prior art elements according to their established functions,’ then there is a motivation to combine.”). Both references are in the same field of art, originally assigned to the same entity, and aimed at solving similar problems associated with resource allocation and management to make conferencing more efficient. Ex[1007], ¶¶[0020], [0024]; Ex[1008], ¶¶[0015]-[0016], [0034], [0109]; Ex[1002], ¶210.

2. Claim 1

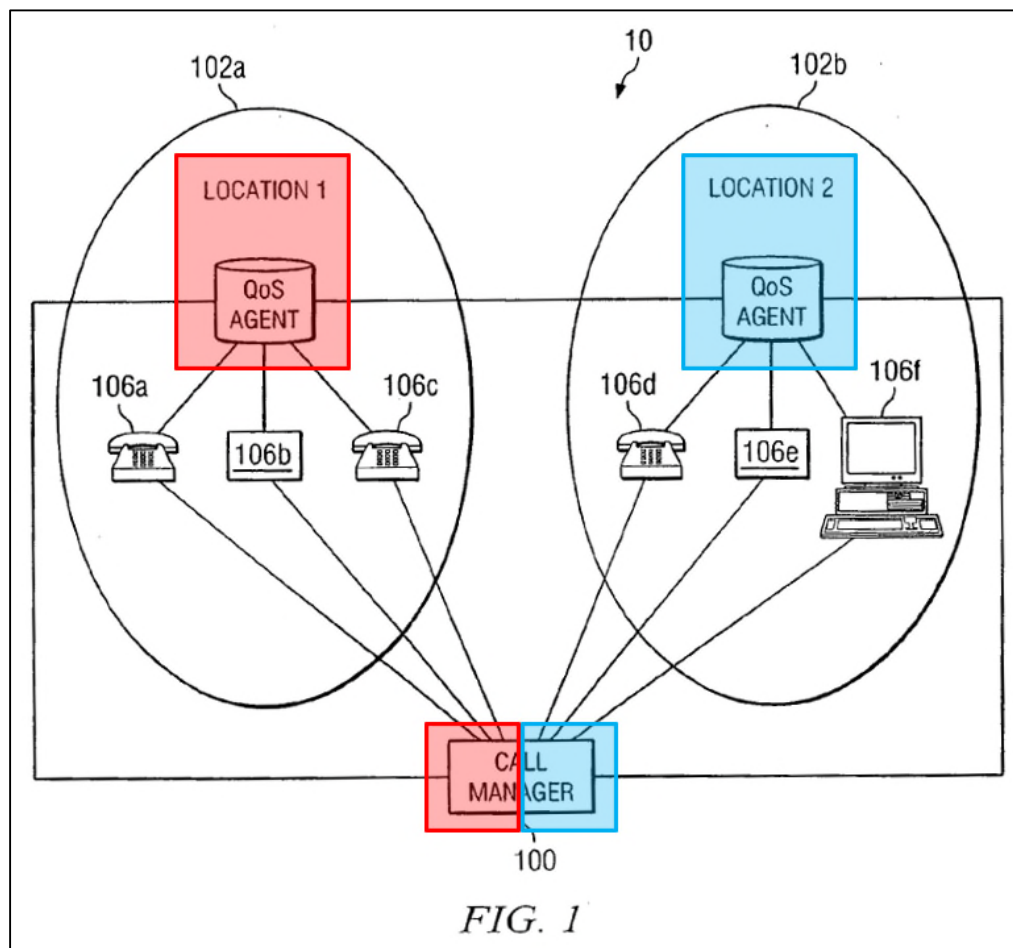
a. 1[Pre]: “An apparatus”

If the preamble is limiting, Dhesikan+BGAN discloses “[a]n apparatus.” Ex[1007], ¶¶[0002], [0005], [0020].

b. 1[a]: “a first communication resource manager located in a first domain and operable to interact with a second communication resource manager located in a second domain”

Dhesikan+BGAN discloses limitation 1[a], under any party’s proposed construction. Ex[1002], ¶212. Dhesikan+BGAN discloses a first CRM (first QoS

agent and first portion of call agent 100⁶ in location 1, shown in red below), and a second CRM (second QoS agent and second portion of call agent 100 in location 2, shown in blue below). *Id.* Although shown as a centralized call manager below, call agents may be “distributed” and located in each domain; for example, a “separate call agent 100 may be associated with each location 102,” as indicated by the red and blue highlighting below. Ex[1007], ¶[0031].



⁶ FIG. 1 refers to element 100 as “call manager,” but Dhesikan uses the term “call agent” for element 100 throughout the specification. Ex[1007], ¶¶[0020]-[0022], [0024], [0026]-[0028].

Ex[1007], FIG. 1 (annotated).

In Dhesikan+BGAN, each of the CRMs manage resources, including controlling a satellite link between domains and tracking presence data in each domain. Ex[1002], ¶213. For example, the call agents “control[] the setup of a call between two or more endpoints” operated by users (of telephones and computer 106a-106d in FIG.1). Ex[1007], ¶[0005]. Moreover, QoS agents “establish[] reservations between endpoints in order to guarantee a certain amount of bandwidth for the call.” *Id.*, ¶¶[0005], [0020]. Specifically, each QoS agent “reserve[s] bandwidth on behalf of endpoints 106, and are involved in the signaling and media exchange between endpoints 106 as determined by call agent 100.” *Id.*, ¶[0024].

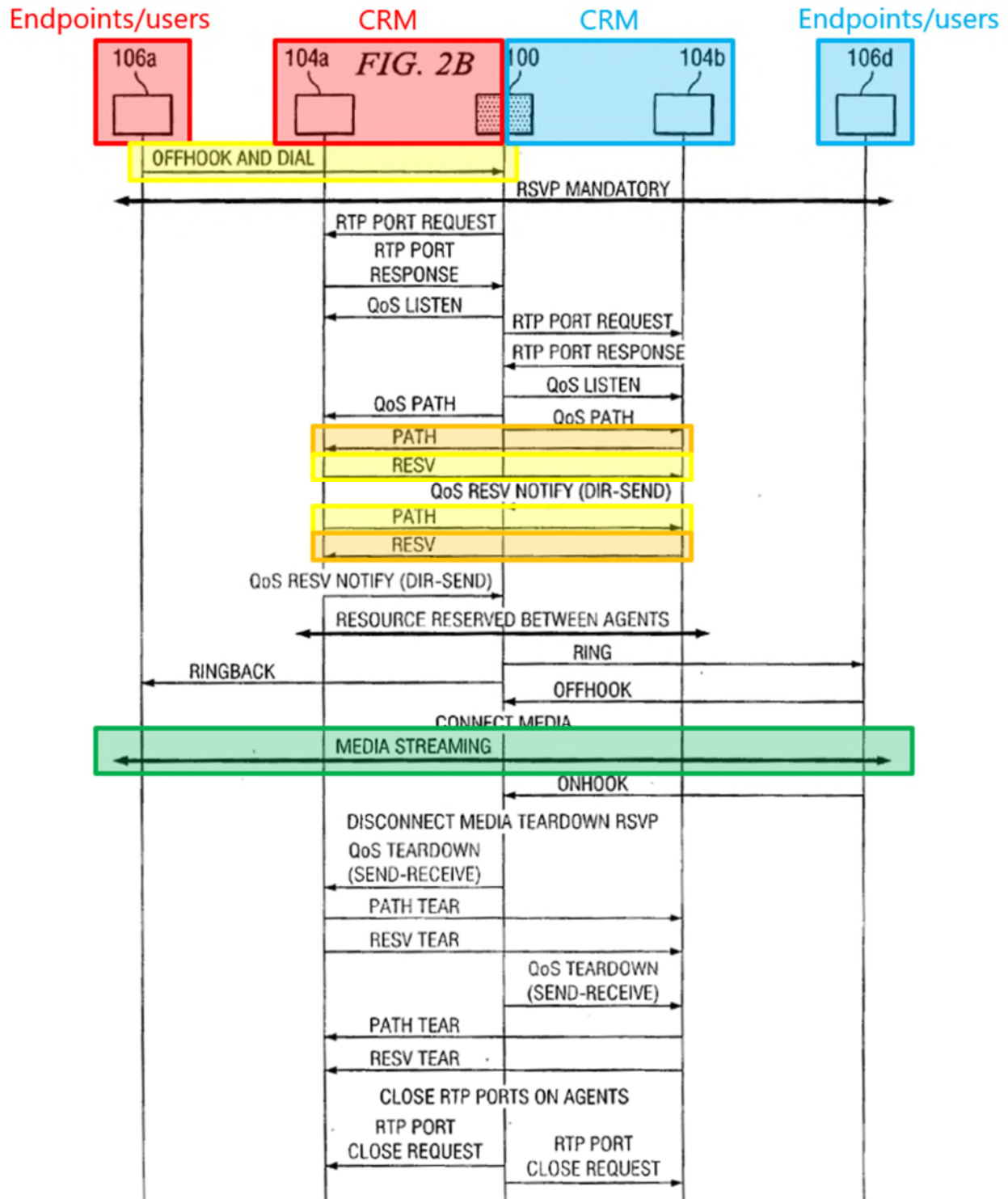
The CRMs in each domain are operable to interact with each other via satellite network equipment. Ex[1002], ¶214. Ex[1007], ¶[0031]; §VII.B.1.a (motivation to combine analysis).

- c. 1[b]: “determine to establish a link for multicasting between users in the first domain and users in the second domain based on presence data of at least one user in the first domain and at least one user in the second domain”

Dhesikan+BGAN discloses limitation 1[b], under any party’s proposed constructions. Ex[1002], ¶217. QoS and call agent in the first domain (first CRM) establishes a link for multicasting between users in two domains based on presence data of users in both domains. *Id.*

First, Dhesikan+BGAN describes that the first CRM (location 1 in FIG. 1

above) determines to establish a satellite link between users in two domains. Ex[1002], ¶218. When a first user (*e.g.*, at endpoint 106a in FIG. 2B, below) wants to communicate with a second user (*e.g.*, at endpoint 106d in FIG. 2B, below), the first CRM in the first user's domain (first QoS and call agent in location 1 of FIG. 1 above) determines to establish a link between the users by "secur[ing] a reservation for each media stream" in the communication session. Ex[1007], ¶¶[0027]-[0028], [0054]. The first CRM establishes the link using the RSVP protocol, which reserves IP resources in BGAN's satellite system for a communication session between users. *Id.*, ¶¶[0020], [0027]. As shown in FIG. 2B (below), the first CRM allocates bandwidth for user 106a to transmit to user 106d using the "PATH" messages (bottom yellow) and bandwidth for 106a to receive from user 106d using the "RESV" message (middle yellow), which results in a link ("MEDIA STREAMING," green) between the users. *Id.*, ¶¶[0038]-[0039].



Id., FIG. 2B (annotated).

Second, the satellite link can be a multicast link. Ex[1007], ¶[0027] (explaining that “RSVP supports unicast and multicast environments”); Ex[1002],

¶219. Indeed, the link simultaneously delivers information between a group of users in the first domain and a group of users in a second domain using the most efficient strategy,⁷ *e.g.*, during “audio and video conferences,” which are enabled by QoS agents 104. Ex[1007], ¶[0024]. Using RSVP is efficient and helps “move away from a hub and spoke network topology.” Ex[1007], ¶[0027]; *id.* ¶[0006]; Ex[1002], ¶219.

Finally, Dhesikan+BGAN discloses that the satellite link is established based on presence data of at least one user in the first domain and one user in the second domain. Ex[1002], ¶220. In Dhesikan, the first CRM (QoS and call agent in first domain) receives the same type of presence information for the first user (106a) and the second user (106d) as described in the ’134 patent. *Id.*; Ex[1001], 6:41-44. For example, in FIG. 2B (above), for first user 106a, the first CRM receives an “inbound call request from endpoint 106a” indicating the willingness of user 106a to communicate (“OFFHOOK AND DIAL,” top yellow). Ex[1007], ¶[0038]. In addition, for the second user 106d, the first CRM receives a PATH message (top orange) and a RESV message (bottom orange) from the user 106d’s CRM, indicating the ability of the second user to transmit and receive.⁸ *Id.* The first CRM establishes

⁷ IP multicasting uses a unique address to “transport data to multiple destination stations using a single IP packet.” Ex[1004], 67.

⁸ The first CRM also receives an indication that the endpoint 106d goes “off hook,” further indicating the *willingness* of the second user to communicate. Ex[1007], ¶[0040]; Ex[1002], ¶220.

the communication link (green) *based on* and only after the first CRM detects all of this presence data. *Id.*, FIG.2B; Ex[1002], ¶220.

To the extent Patent Owner argues Dhesikan does not disclose a link for *multicasting*, it would have been obvious to implement Dhesikan such that the link implements conferencing using multicast services and delivers information between a group of users in the first domain and a group of users in a second domain using the most efficient strategy, such as in BGAN's system. *E.g.*, Ex[1014], p.3; Ex[1002], ¶221. A POSITA implementing Dhesikan using the multicast services in BGAN would have had a reasonable expectation of success, and the result would have been predictable, because multicast protocols were well-known and frequently used and Dhesikan itself expressly discloses that the link can be for multicasting. Ex[1007], ¶[0027] ("RSVP supports unicast and multicast environments."); §VII.B.1; Ex[1002], ¶221. A POSITA would also have understood that BGAN's multicast services are particularly well-suited for the conferencing applications in Dhesikan, which involves more than one user. *Id.*, FIG.8 (illustrating "a conference call situation" with multiple users), ¶[0063]; Ex[1002], ¶221.

d. 1[c]: "determine an application to be used in a communication session over the link"

Dhesikan+BGAN discloses limitation 1[c]. The first CRM (QoS and call agent in first domain) determines an application (*e.g.*, video or audio) to be used over the link in a communication session. Ex[1002], ¶223.

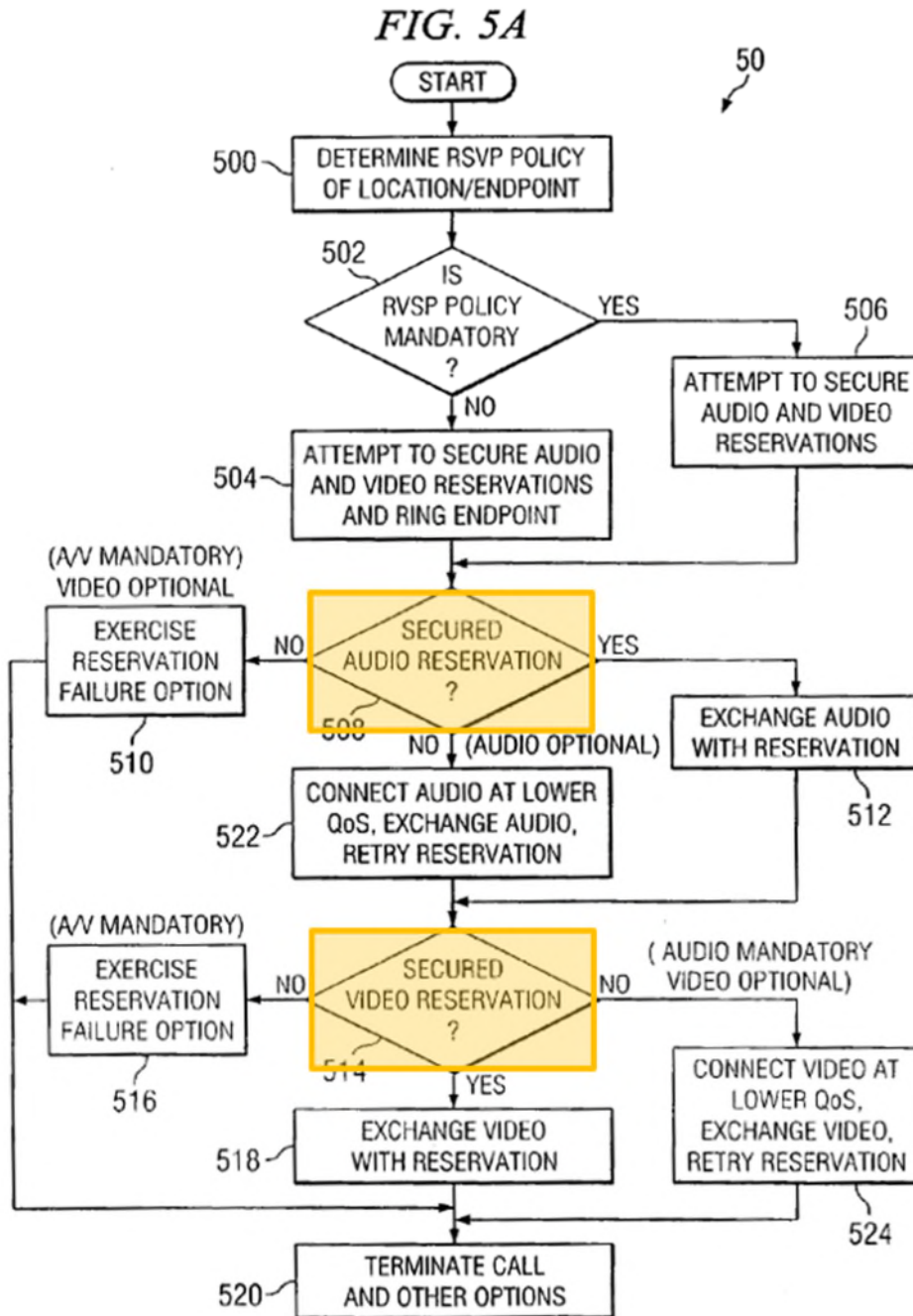
First, Dhesikan describes users communicating over the established link in a *communication session*. *Id.*, ¶224. For example, “[e]ndpoints 106 establish a communication tunnel, link, or session in communication system 10 via locations 102.” Ex[1007], ¶[0023]. Dhesikan makes “a reservation of bandwidth for a particular session” allowing users to communicate in that session. *Id.*, ¶[0027].

Second, after determining to establish the link for an audio call, the first CRM (QoS and call agent in the first domain) determines if another application (*e.g.*, video) will be used in the session over the link. Ex[1002], ¶225; Ex[1007], ¶[0039]. For example, Dhesikan discloses that “[f]or an *audio* call, call agent 100 may use any estimated bandwidth between endpoints 106a and 106d determined in any manner” while “[f]or a *video* call, call agent 100 may use a desired minimum value default video bandwidth.” Ex[1007], ¶[0044] (emphases added). Likewise, the QoS agent in each domain determines an application because the QoS agent reserves appropriate resources for a communication session based on whether the session “accommodate[s] audio and video media streams” and “audio and video conferences.” *Id.*, ¶¶[0024], [0053]; Ex[1002], ¶225.

- e. 1[d]: “allocate a bandwidth level to be used for the link to accommodate the application”

Dhesikan+BGAN discloses limitation 1[d]. The first CRM (QoS and call agent in the first domain) allocates bandwidth for the link based on the determined application. Ex[1002], ¶226.

For example, Dhesikan discloses that the QoS agent in the first CRM allocates different bandwidth levels for the link based on whether the link will also include video transmissions. Ex[1007], ¶[0024]. FIG. 5A (below, annotated), *e.g.*, “expand[s] on the concepts” of FIG. 2B for calls “exchanging both audio and video streams” for which the CRM attempts “to secure” separate reservations. *Id.*, ¶¶[0053]-[0054]. As shown, first, “[a]t block 508,” the CRM determines whether an audio reservation “has been secured” and bandwidth allocated. *Id.*, ¶¶[0054], ¶[0027] (“By having a reservation, a call can utilize reserved bandwidth and experience improved QoS.”); Ex[1002], ¶227. Then, “[a]t decision block 514,” the CRM determines whether a video reservation has been secured and bandwidth allocated. *Id.*, ¶¶[0055], [0027]; *see also id.*, ¶¶[0035], [0044], [0024]; Ex[1002], ¶227.

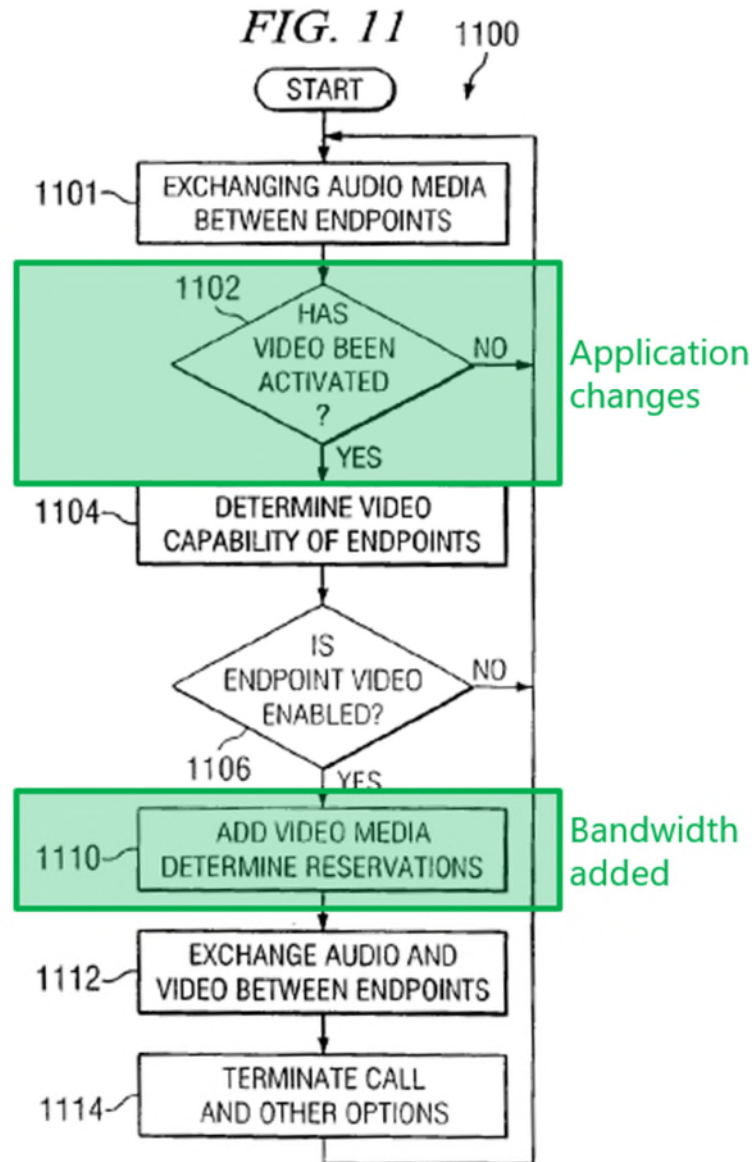


- f. 1[e]: “increase the bandwidth level for the link based on a change in the application and based on an identification of additional presence data for additional users that have joined the communication session”

Dhesikan+BGAN discloses limitation 1[e]. Ex[1002], ¶229. The first CRM (QoS and call agent in the first domain) increases bandwidth based on changes in

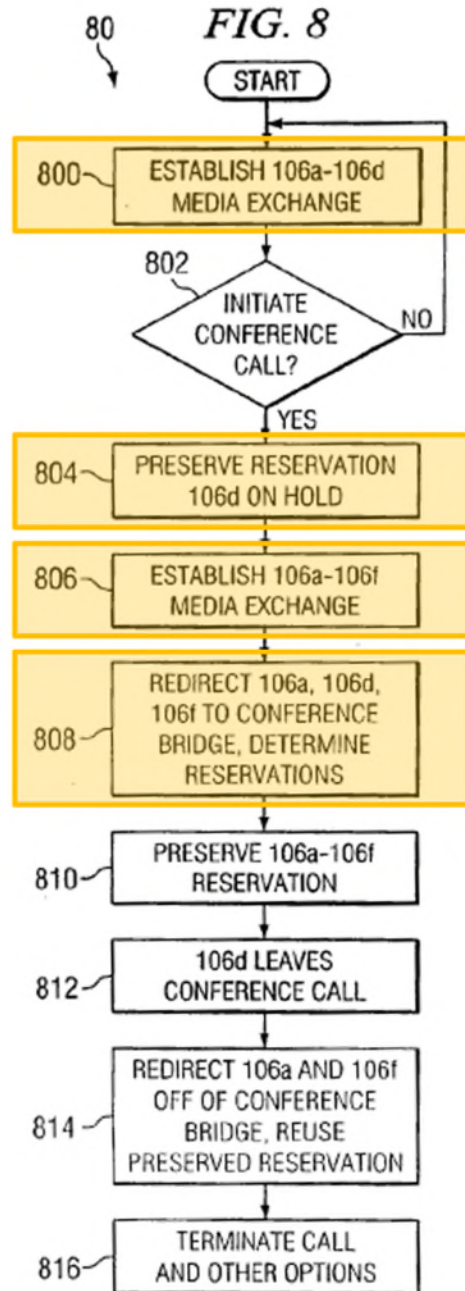
application and presence data for additional users joining the communication session. *Id.*

First, Dhesikan describes that an application can change during a conference call (*e.g.*, video can be added to an audio call) and, based on that change, the first CRM can increase the bandwidth allocated to the link. *Id.*, ¶230-31. The process is shown in FIG. 11 (below, annotated). At block 102, during a call between users 106a and 106d, the “[c]all agent 100” may “dynamically determine[] whether video has been activated.” Ex[1007], ¶[0068]. If so, and if both devices are “video enabled,” then “[v]ideo media is added to the call with a RSVP reservation at block 1110.” *Id.* The additional reservation increases the bandwidth level for the link. *Id.*, ¶¶[0005], [0027]; Ex[1002], ¶231.



Second, Dhesikan discloses the first CRM increases the bandwidth level based on an identification of additional presence data for users joining a call (communication session). Ex[1002], ¶232. FIG. 8 (below, annotated), *e.g.*, illustrates the process. At block 800, original users 106a and 106d are exchanging media in a communication session. Ex[1007], ¶[0063]. Then, at step 802, user 106a indicates it would like to initiate a conference call including both user 106d and new user 106f.

Id. Accordingly, at step 806, user 106a attempts to connect with user 106f by checking 106f's "reservation" requirements as needed (*e.g.*, whether 106f requires bandwidth for video). *Id.* As described above for FIG. 2B, reserving bandwidth for user 106f involves identifying presence data for user 106f, including its willingness to communicate, via a PATH or RESV message sent by user 106f's CRM to the first CRM. §VII.B.2.e; Ex[1002], ¶232; Ex[1007], ¶¶[0038]-[0039], [0063] (noting the process for reserving bandwidth for user 106f is the same "as discussed above").



Further, Dhesikan discloses new user 106f can join the original communication session using the established link between 106a and 106d. Ex[1002], ¶233. For example, Dhesikan explains new user 106f can be co-located with original user 106d, such that 106f uses the same link as 106d and the same bandwidth reservation for the call between 106a and 106d can be “reuse[d]” to accommodate

(at least in part) user 106f's reservation requirements. Ex[1007], ¶[0063].

Finally, Dhesikan also discloses that the first CRM can increase the bandwidth allocated to the link based on the additional presence data for user 106f. Ex[1002], ¶234. More specifically, in Dhesikan, the conference bridge for the call between the three users can be located in the same domain as user 106a. Ex[1007], ¶[0064]. In that scenario, each of the individual bandwidths for each of the individual reservations (106a-106d) and (106a-106f) "can be reused" for the call using the conference bridge. *Id.* Accordingly, the bandwidth allocated to the individual call between 106a and 106d *and* the bandwidth allocated to the individual call between 106a and 106f can be combined and used for the three-way conference call. *Id.* It would at least have been obvious to a POSITA that reusing *both* individual bandwidth reservations would result in an *increase* in overall bandwidth for the link to accommodate both reservations and both QoS requirements. *Id.*; Ex[1002], ¶234.

- g. 1[f]: "the communication resource managers each includes respective trunking element that is automatically configured to select a transcoding based on available bandwidth"

Dhesikan+BGAN in view of Firestone discloses limitation 1[f], under any party's proposed constructions. Ex[1002], ¶235. As described for limitation 1[a], Dhesikan's CRMs include a trunking element (at least QoS agent and a portion of call agent), which performs the same trunking functionality as described in the '134 patent. Ex[1001], 2:54-62, 4:33-49. For example, the QoS agent and call agent

establish the link using the RSVP protocol, Ex[1007], ¶¶[0020], [0027], allocate different bandwidth levels for the link, *id.*, ¶[0024], and tear down a link, *id.*, ¶[0040]; *see also* Ex[1002], ¶236.

It would also have been obvious for the QoS agents to incorporate Firestone's media switch functionality to automatically select a transcoding based on available bandwidth. Ex[1002], ¶237; Ex[1007], ¶[0024]; §VII.B.1.b. In the combination, when users (end points) have limitations on "how much bandwidth reservation" they can request, Dhesikan's QoS agent uses functionality from Firestone's "[m]edia switch" to select "transcoding" and "transrating" to accommodate the "[b]andwidth constraints." Ex[1008], ¶¶[0029], [0032], [0034], [0108]-[0109]; Ex[1002], ¶237. "[V]ideo transrating and transcoding" "allow end points using different rates or codecs to natively join the same conference without needing external transraters or transcoders."⁹ *Id.*, ¶[0034].

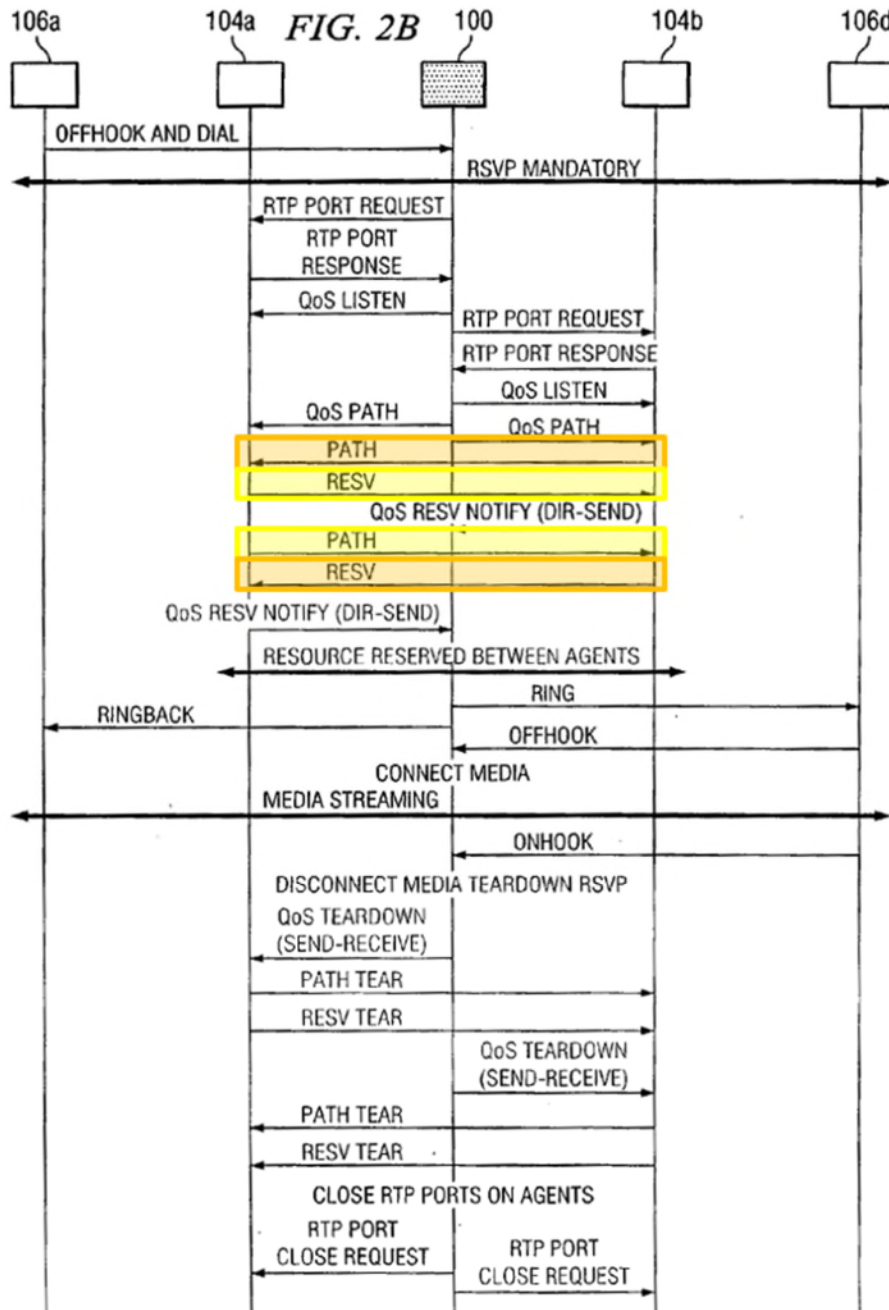
- h. 1[g]: "adjust the bandwidth level based on a determination which of the additional users and the users in the first and second domains can transmit data simultaneously during the communication session"

Dhesikan+BGAN discloses limitation 1[g]. Ex[1002], ¶239. The first CRM (QoS and call agent in the first domain) adjusts bandwidth based on determining which of the additional users and the users in the first and second domains can

⁹ As described in Firestone, video transrating is a special case of video transcoding that alters bandwidth of a video signal. Ex[1002], ¶237.

transmit data simultaneously during the communication session. *Id.*

As described for limitation 1[e], Dhesikan discloses increasing (adjusting) the bandwidth level based on determining additional users have joined a communication session. §VII.B.2.e-f. Further, in Dhesikan, a CRM (QoS and call agent) allocates bandwidth for each user that wishes to transmit *simultaneously* on the link. Ex[1007], ¶[0039]. In FIG. 2B (below, annotated), for the communication session between users 106a and 106d, the first “PATH” message from QoS agent 104b reserves bandwidth on the link so user 106d can *transmit* to user 106a. *Id.* Then, the second “PATH” message from QoS agent 104a reserves additional bandwidth on the link for user 106a to *transmit* to user 106d. *Id.* Together, the reservations increase (adjust) bandwidth to allow for transmission by both users. Ex[1002], ¶241.



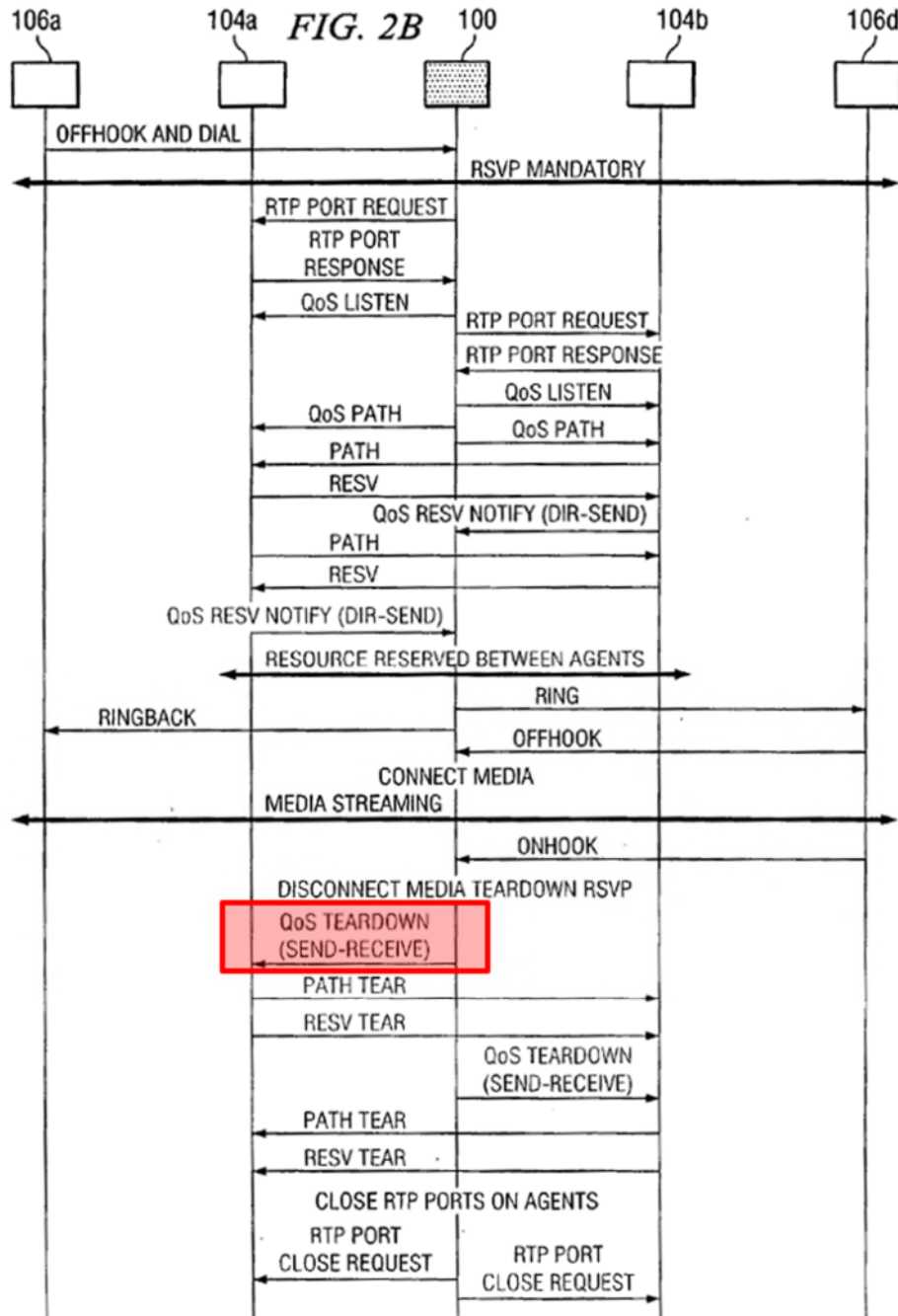
Based on this disclosure, a POSITA would have understood that these transmissions occur *simultaneously*, and that would have at least been obvious. *Id.*, ¶242. Key applications for Dhesikan and BGAN are video/teleconferencing, which typically involve full duplex communications with users transmitting simultaneously in a communication session. *Id.*; Ex[1007], ¶[0024]; Ex[1014], p.66.

Dhesikan also describes protocols used in full duplex communications. *See, e.g.*, Ex[1007], ¶[0024]; Ex[1002], ¶242.

- i. 1[h]: “detect an absence of active users in the first domain and the second domain”

Dhesikan+BGAN discloses limitation 1[h]. Ex[1002], ¶243. In Dhesikan, the first CRM (QoS and call agent in the first domain) detects an absence of active users in both domains. *Id.*

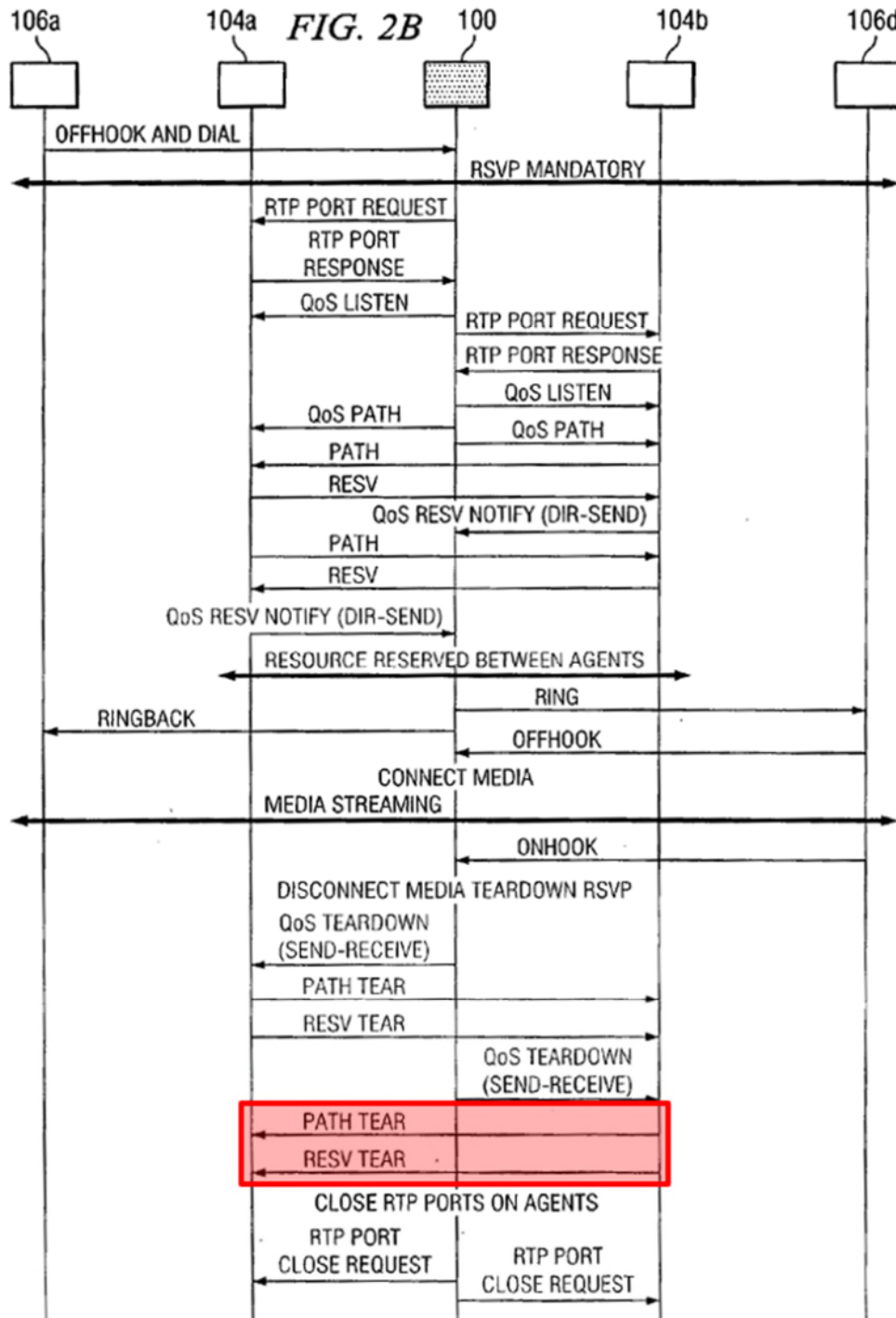
For example, when endpoint 106d goes “on hook,” the users in the session may remain active (*e.g.*, on “hold” until a call resumes), or the users can go inactive and indicate their intent to leave the session. Ex[1007], ¶[0040]. As shown in FIG. 2B (annotated below), in the latter case, the first CRM (including QoS agent 104a) detects the absence of activity of both users via a “QoS TearDown” message (red below) indicating both (a) that user 106d has left the session (is inactive); and (b) that user 106a will leave the session and become inactive (such that the reservation should be torn down, rather than preserved). *Id.*; Ex[1002], ¶244.



j. 1[i]: “tear down the link based on the absence”

Dhesikan+BGAN discloses limitation 1[i]. Ex[1002], ¶245. As described for limitation 1[h], the first CRM detects an absence of active users in the two domains. §VII.B.2.i. Based on the absence of detected activity, the first CRM (QoS agent 104a

and call agent) tears down the link. Ex[1002], ¶245. As shown in FIG. 2B (annotated below), QoS agent 104a sends a “PATHTEar message” and a “RESVTEar message” (red below, annotated) to tear down the link for user 106a. *Id.*; Ex[1007], ¶[0040].



k. 1[j]: “the link is a satellite communication link”

Dhesikan+BGAN discloses limitation 1[j]; as described in §VII.B.1.a, it would have been obvious to implement the link described in Dhesikan using the satellite-based network disclosed in BGAN. Ex[1002], ¶247.

3. Claim 2

Dhesikan+BGAN discloses claim 2, under any party’s proposed construction—“the users of the first domain comprise a virtual talking group (VTG).” *Id.*, ¶248.

FIG. 1 of Dhesikan (below, annotated), *e.g.*, illustrates “logical groupings of endpoints.” Ex[1007], ¶[0022].

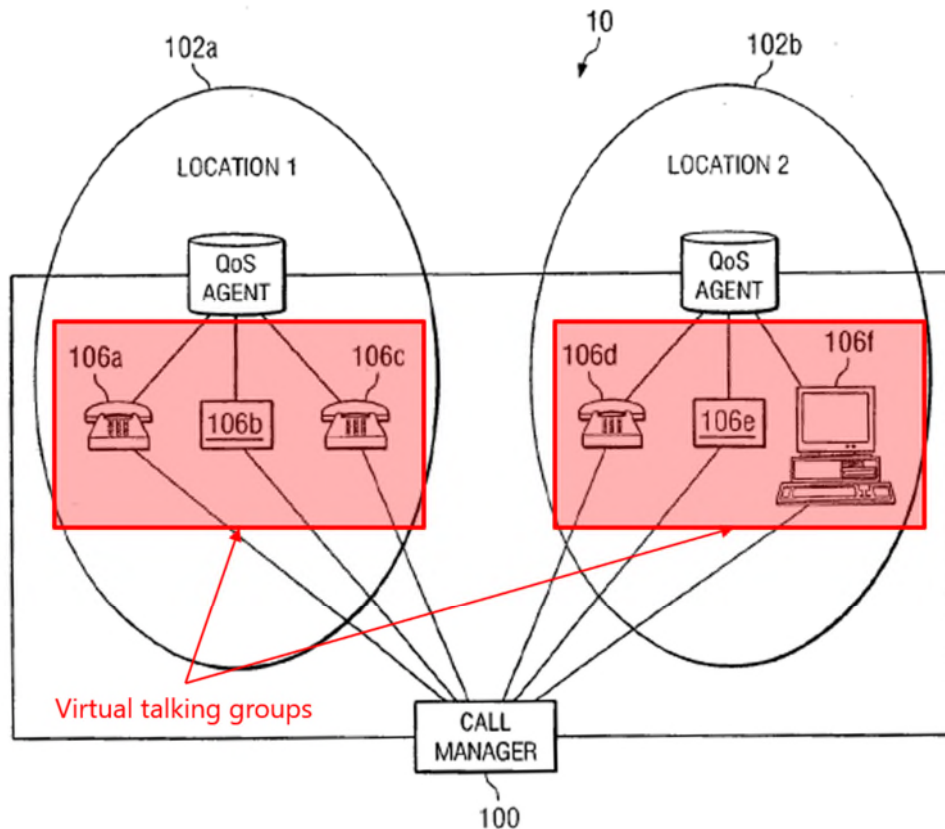


FIG. 1

Id., FIG.1. A group in each domain (connected to a QoS agent) can join a conference to talk to each other. *Id.*, FIGs. 8, 10A, ¶¶[0063] (users 106d and 106f at the same “location” can use the same “preserved reservations”), [0066]. The users can communicate using an IP protocol and an IP address. §VII.B.2.b, Ex[1002], ¶249.

4. Claim 3

Dhesikan+BGAN discloses claim 3—“*the additional presence data relates to whether a given end user has logged into their respective system.*” Ex[1002], ¶250.

As described for limitation 1[e], Dhesikan’s disclosure of a PATH or a RESV message for a new user 106f constitutes additional presence data for a user that joins a session. §VII.B.2.f. BGAN further discloses that a new user must also be authenticated “prior to authorising the reception of the multicast content.” Ex[1014], p.6. User authentication constitutes log-on information for a system and further relates to Dhesikan’s presence data (PATH or RESV message) because a PATH or RESV message would only be sent if a user is determined to have the privileges necessary to transmit or receive information in the session. Ex[1002], ¶251.

It would have been obvious to a POSITA to implement the user authentication of BGAN in the call agent of Dhesikan and doing so would have enhanced the security of Dhesikan’s communication system which is a common goal in networking. Ex[1002], ¶252. Dhesikan’s call agent, for example, already stores caller precedent information and passes that information to the QoS agent, to indicate if a caller (user) has a high or low priority designation. Ex[1007], ¶[0043].

It would have been a simple software design change for the call agent to store information about the user's successful authentication and login to the system. Ex[1002], ¶252.

5. Claim 4

Dhesikan+BGAN discloses claim 4—“*the communication resource managers each includes respective virtual talk group (VTG) presence managers (VPMs), each of which is operable to monitor their users who are present in their respective domains.*” *Id.*, ¶253.

The QoS agent in each CRM discloses the claimed virtual presence manager. *Id.*, ¶254. As explained for limitations 1[a]-1[b], Dhesikan discloses that each CRM in a domain includes a QoS agent that monitors user presence in that domain and, if a user is present, issues a PATH or RESV message for that user to reserve bandwidth. See §§VII.B.2.b-e; Ex[1002], ¶254.

6. Claim 5

Dhesikan+BGAN discloses claim 5—“*information received from the VPMs is used to maintain a designated link bandwidth allocation.*” Ex[1002], ¶255.

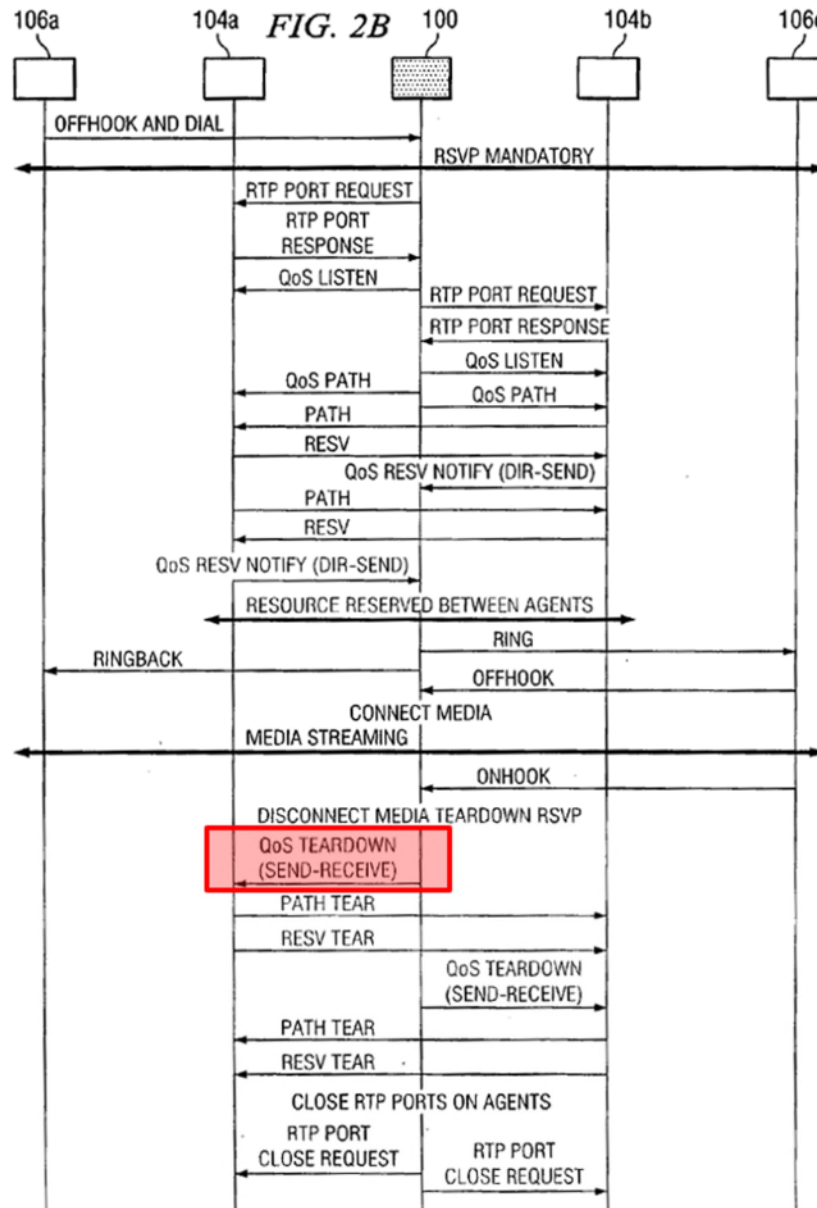
As disclosed for limitations 1[d]-1[e], a call agent in a domain receives information from the QoS agent (which corresponds to the claimed VPM) in that domain to maintain a designated link bandwidth allocation. §VII.B.2.e-f; Ex[1002], ¶256. For example, Dhesikan's FIGs. 3Ba-3Bb illustrate a scenario where a reservation has been lost. Ex[1007], ¶[0052]. In that situation, the QoS agent (VPM)

retries the reservation and sends a QoS RESV NOTIFY message to the call agent to notify the call agent that the original bandwidth allocation has been maintained so that call agent can reestablish a “higher class of service.” *Id.*, ¶[0052], FIGs. 3Ba-3Bb; Ex[1002], ¶256.

7. Claim 6

Dhesikan+BGAN discloses claim 6—“*if either one of the VPMs determine that there are no active users logged into their respective systems, then the VPMs tear down the link.*” Ex[1002], ¶257.

As described for limitations 1[h]-1[i] and claim 3, Dhesikan discloses that *each* QoS agent (VPM) in each of two connected domains can determine if no active users are logged onto their respective systems. §§VII.B.2.i-j; Ex[1002], ¶258. For example, as shown in FIG. 2B (below, annotated) each QoS agent in each domain can receive a “QoS TearDown” message from a call agent indicating that a session should be torn down because no remaining active users are in the session that requires a call to be placed on “hold.” Ex[1007], ¶[0040]; §§VII.B.2.i-j. When the QoS agent (VPM) receives that message, it then takes steps to tear down the link by sending RESVTear and PATHTear messages. Ex[1007], ¶[0040]; Ex[1002], ¶258.



8. Claim 7

Dhesikan+BGAN discloses claim 7—“a router that establishes the link based on direction from the communication resource manager.” Ex[1002], ¶259.

As described for limitation 1[b], Dhesikan discloses that QoS agents receive direction from other components of the CRM (call agents) to establish the link. See §VII.B.2.c; Ex[1007], FIG. 2B (showing transmissions from call agent to QoS

agents); Ex[1002], ¶260. Additionally, Dhesikan discloses that QoS agents 104 may be “routers.” Ex[1007], ¶[0024]; Ex[1002], ¶260.

9. Claim 8

a. 8[Pre]

If the preamble is limiting, Dhesikan+BGAN discloses it. Ex[1007], ¶[0033]; Ex[1002], ¶261.

b. 8[a]

See limitation 1[a]. Ex[1002], ¶262; §VII.B.2.b.

c. 8[b]

See limitation 1[b]. Ex[1002], ¶263; §VII.B.2.c.

d. 8[c]

See limitation 1[c]. Ex[1002], ¶264; §VII.B.2.d.

e. 8[d]

See limitation 1[d]. Ex[1002], ¶265; §VII.B.2.e.

f. 8[e]

See limitation 1[e]. Ex[1002], ¶266; §VII.B.2.f.

g. 8[f]

See limitation 1[f]. Ex[1002], ¶267; §VII.B.2.g.

h. 8[g]

See limitation 1[g]. Ex[1002], ¶268; §VII.B.2.h.

i. 8[h]

See limitation 1[h]. Ex[1002], ¶269; §VII.B.2.i.

j. 8[i]

See limitation 1[i]. Ex[1002], ¶270; §VII.B.2.j.

k. 8[j]

See limitation 1[j]. Ex[1002], ¶271; §VII.B.2.k.

10. Claim 9

See claim 2. Ex[1002], ¶272; §VII.B.3.

11. Claim 10

See claim 3. Ex[1002], ¶273; §VII.B.4.

12. Claim 11

See claim 5. Ex[1002], ¶274; §VII.B.6.

13. Claim 12

a. 12[Pre]

If the preamble is limiting, Dhesikan+BGAN discloses it. Ex[1007], ¶[0033];
Ex[1002], ¶275.

b. 12[a]

See limitation 1[a]. Ex[1002], ¶276; §VII.B.2.b.

c. 12[b]

See limitation 1[b]. Ex[1002], ¶277; §VII.B.2.c.

d. 12[c]

See limitation 1[c]. Ex[1002], ¶278; §VII.B.2.d.

e. 12[d]

See limitation 1[d]. Ex[1002], ¶279; §VII.B.2.e.

f. 12[e]

See limitation 1[e]. Ex[1002], ¶280; §VII.B.2.f.

g. 12[f]

See limitation 1[f]. Ex[1002], ¶281; §VII.B.2.g.

h. 12[g]

See limitation 1[g]. Ex[1002], ¶282; §VII.B.2.h.

i. 12[h]

See limitation 1[h]. Ex[1002], ¶283; §VII.B.2.i.

j. 12[i]

See limitation 1[i]. Ex[1002], ¶284; §VII.B.2.j.

k. 12[j]

See limitation 1[j]. Ex[1002], ¶285; §VII.B.2.k.

14. Claim 13

See claim 3. Ex[1002], ¶286; §VII.B.4.

15. Claim 14

See claim 5. Ex[1002], ¶287; §VII.B.6.

VIII. SECONDARY CONSIDERATIONS

Petitioner is aware of no evidence of secondary considerations that would meaningfully rebut a finding of obviousness. Ex[1002], ¶288. Petitioner reserves the right to rebut any purported objective evidence of non-obviousness raised by Patent Owner.

IX. INSTITUTION SHOULD BE GRANTED

A. Discretion Under 35 U.S.C. §314(a)

The Board should not exercise its discretion under §314(a) to deny this Petition. First, no other petitions have been filed against the '134 patent. Accordingly, the *General Plastics* factors weigh in favor of institution. *See Gen. Plastic Indus. Co. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 at 15-16 (P.T.A.B. Sept. 6, 2017) (precedential).

Second, if the Board applies the analysis in *NHK Spring Co. v. Intri-Plex Techs. Inc.*, IPR2018-00752, Paper 8 at 19-20 (P.T.A.B., Sept. 12, 2018) (precedential)¹⁰ or *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (P.T.A.B. Mar. 20, 2020) (precedential), those factors taken together support institution.

Factor 1: Potential Stay

The Board should “not attempt to predict how the district court in the related district court litigation will proceed.” *Sand Revolution II LLC v. Continental Intermodal Group-Trucking LLC*, IPR2019-01393, Paper 24 at 7 (P.T.A.B. Jun. 16, 2020) (informative). Institution should not be denied based on this factor.

¹⁰ Petitioner recognizes the Board must apply its precedent, but reserves its objection to the Board’s application of *NHK-Fintiv* as non-justiciable under the APA.

Factor 2: Trial Date

Trial is scheduled for June 2024 in the EDTX Litigation, approximately eight months before the projected February 2025 statutory deadline for the Board to enter a final written decision in this proceeding (if instituted). Ex[1018], p.1. Accordingly, “the decision whether to institute will likely implicate other factors...such as the resources that have been invested in the parallel proceeding.” *Apple*, IPR2020-00019, Paper 11 at 9. As discussed below, if trial were to proceed as scheduled, this factor is outweighed by other factors here.

Factor 3: Investment in the parallel proceeding

The parties have served infringement and invalidity contentions and the claim construction process has just begun. Ex[1018], p.4. The effort and resources expended to date are “typical of the early stages of litigation” and thus this factor “does not favor exercising discretion to deny institution.” *Apple Inc. v. Smart Mobile Techs. LLC*, IPR2022-00808, Paper 24 at 52 (P.T.A.B. Sept. 29, 2022).

Petitioner worked diligently to file this Petition. As noted above, Petitioner moved to dismiss on December 12, 2022, and filed this petition just over a month after the magistrate judge recommended denial of that motion. To conserve resources of the Board and the parties, it was not unreasonable for Petitioner to wait to file petitions for IPR because the motion to dismiss had the potential to resolve the case. Furthermore, since serving its original infringement contentions on January 5, 2023, Patent Owner has served proposed supplemental infringement contentions

on three separate occasions, including a proposal just two months ago to more than double the number asserted claims (including nine additional claims of the '134 patent) and to add a number of new accused products. Ex[1022], pp.2-4. Given Patent Owner's shifting infringement theories, it was entirely reasonable for Petitioner to wait to file the instant Petition until the scope of the EDTX Litigation crystallized. There will certainly be "much work remain[ing] in the district court case as it relates to invalidity" when this proceeding is ready for institution. *Sand Revolution*, Paper 24 at 11. Coupled with Petitioner's diligence in filing this Petition, this factor weighs against discretionary denial. *Cf. id.* at 10-11; *Google LLC v. Parus Holdings Inc.*, IPR2020-00846, Paper 9 at 18 (P.T.A.B. Oct. 21, 2020).

Factor 4: Issue Overlap

The Petition challenges each claim asserted in the EDTX Litigation. Ex[1022], p.2. The Petition also challenges claims not asserted in the litigation (Claims 12-14, which includes independent Claim 12).

Factor 5: Party Overlap

Petitioner and Patent Owner are parties in the EDTX Litigation.

Factor 6: Other Circumstances Favoring Institution

Additional circumstances favor institution. First, Petitioner acted with diligence, as noted above. Petitioner has gained no advantage from the parallel litigation, which favors institution. *See Oticon Med. AB v. Cochlear Ltd.*, IPR2019-00975, Paper 15 at 22-23 (P.T.A.B. Oct. 16, 2019) (precedential) (noting *NHK*

factors include considering whether petitioner's use of patent owner's pre-petition litigation positions "resulted in any tactical advantage to Petitioner").

Moreover, the merits favor institution as the strong multiple grounds in this Petition demonstrate. "In such cases, the institution of a trial may serve the interest of overall system efficiency and integrity because it allows the proceeding to continue in the event that the parallel proceeding settles or fails to resolve the patentability question presented in the PTAB proceeding." *Google*, Paper 9 at 21 (quoting *Fintiv*, Paper 11 at 14-15); Ex[1037], p.4 (USPTO Guidance indicating "compelling, meritorious challenges will be allowed to proceed at the PTAB even where the district court litigation is proceeding in parallel").

B. Discretion Under 35 U.S.C. §325(d)

The Board should not exercise its discretion under 35 U.S.C. §325(d). None of the references relied upon in Grounds 1 or 2 were presented to the Office or considered during prosecution. Ex[1001], Cover.

X. CONCLUSION

Petitioner respectfully requests institution of IPR and that the Challenged Claims be cancelled as unpatentable pursuant to 35 U.S.C. §318(b).

Petition for *Inter Partes* Review of U.S. Patent No. 8,489,134

Respectfully Submitted,

August 21, 2023

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CERTIFICATE OF SERVICE

In accordance with 37 C.F.R. §§ 42.6(e) and 42.105, the undersigned certifies that on August 21, 2023, a complete and entire copy of the **PETITION FOR *INTER PARTES* REVIEW OF CLAIMS 1-14 OF U.S. PATENT NO. 8,489,134 B2** including exhibits and testimony relied upon were served on Patent Owner via FedEx overnight at the correspondence address of record for the '134 patent and counsel for Patent Owner in the EDTX Litigation, as included below:

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CERTIFICATION UNDER 37 C.F.R. § 42.24(d)

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the word count under § 42.24(a)(1) for the foregoing Petition for *Inter Partes* Review totals 13,997 words, within the 14,000 word limit allowed under § 42.24(a)(1)(i).

Date: August 21, 2023

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