IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

_____

BEFORE THE PATENT TRIAL AND APPEAL BOARD

_____

SAMSUNG ELECTRONICS AMERICA, INC.,

SAMSUNG ELECTRONICS CO., LTD.,

Petitioners,

v.

KONINKLIJKE KPN N.V.,

Patent Owner.

_____

Case No. IPR2025-00502

U.S. Patent No. 9,667,669

_____

DECLARATION OF KEVIN C. ALMEROTH, PH.D. IN SUPPORT OF PETITION FOR INTER PARTES REVIEW OF UNITED STATES PATENT NO. 9,667,669

TABLE OF CONTENTS

I. INTRODUCTION

1. I have been retained by Samsung Electronics America, Inc. and Samsung Electronics Co., Ltd. ("Petitioner") as an independent expert consultant in this proceeding before the United States Patent and Trademark Office ("PTO") against Koninklijke KPN N.V. ("Patent Owner") regarding U.S. Patent No. 9,667,669 ("the '669 patent") (Ex. 1001).[1] I have been asked to submit this Declaration on behalf of Petitioner.

2. I have been asked to consider whether certain references disclose or render obvious the features recited in claims 2-9, 13-18, 20, and 23 (collectively, the "Challenged Claims") of the '669 patent. My opinions are set forth below. Based on my experience and expertise, it is my opinion that the prior art renders obvious all limitations of the Challenged Claims, as I discuss in detail below.

3. I am being compensated at a rate of $850 per hour for my work in this proceeding. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no other interest in this proceeding.

[1] Where appropriate, I refer to exhibits that I understand are to be attached to the petition for *Inter Partes* Review of the '669 patent.

4. All of my opinions stated in this Declaration are based on my own personal knowledge and professional judgment. I am over 18 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth in this Declaration.

II. BACKGROUND AND QUALIFICATIONS

5. I am currently a Professor Emeritus in the Department of Computer Science at the University of California, Santa Barbara (UCSB). While at UCSB, I held faculty appointments and was a founding member of the Computer Engineering (CE) Program, Media Arts and Technology (MAT) Program, and the Technology Management Program (TMP). I also served as the Associate Director of the Center for Information Technology and Society (CITS) from 1999 to 2012. I have been a faculty member at UCSB since July 1997.

6. I hold three degrees from the Georgia Institute of Technology: (1) a Bachelor of Science degree in Information and Computer Science (with minors in Economics, Technical Communication, and American Literature) earned in June 1992; (2) a Master of Science degree in Computer Science (with specialization in Networking and Systems) earned in June 1994; and (3) a Doctor of Philosophy (Ph.D.) degree in Computer Science (Dissertation Title: Networking and System Support for the Efficient, Scalable Delivery of Services in Interactive Multimedia System, minor in Telecommunications Public Policy) earned in June 1997. During

my education, I took a wide variety of courses as demonstrated by my minor. My undergraduate degree also included a number of courses more typical of a degree in electrical engineering including digital logic, signal processing, and telecommunications theory.

7. One of the major concentrations of my research over the past 30+ years has been the delivery of multimedia content and data between computing devices, including through various network architectures. In my research, I have studied large-scale content delivery systems, and the use of servers located in a variety of geographic locations to provide scalable delivery to hundreds or thousands of users simultaneously. I have also studied smaller-scale content delivery systems in which content is exchanged between individual computers and portable devices. My work has emphasized the exchange of content more efficiently across computer networks, including the scalable delivery of content to many users, mobile computing, satellite networking, delivering content to mobile devices, and network support for data delivery in wireless networks.

8. In 1992, the initial focus of my research was on the provision of interactive functions (e.g., VCR-style functions like pause, rewind, and fast-forward) for near video-on-demand systems in cable systems; in particular, how to aggregate requests for movies at a cable head-end and then how to satisfy a multitude of requests using one audio/video stream broadcast to multiple receivers

simultaneously. This research has continually evolved and resulted in the development of techniques to scalably deliver on-demand content, including audio, video, web documents, and other types of data, through the Internet and over other types of networks, including over cable systems, broadband telephone lines, and satellite links.

9. An important component of my research has been investigating the challenges of communicating multimedia content, including video, between computers and across networks including the Internet. Although the early Internet was used mostly for text-based, non-real time applications, the interest in sharing multimedia content, such as video, quickly developed. Multimedia-based applications ranged from downloading content to a device to streaming multimedia content to be instantly used. One of the challenges was that multimedia content is typically larger than text-only content, but there are also opportunities to use different delivery techniques since multimedia content is more resilient to errors. I have worked on a variety of research problems and used a number of systems that were developed to deliver multimedia content to users. One content-delivery method I have researched is the one-to-many communication facility called "multicast," first deployed as the Multicast Backbone, a virtual overlay network supporting one-to-many communication. Multicast is one technique that can be used on the Internet to provide streaming media support for complex applications like video-on-demand,

distance learning, distributed collaboration, distributed games, and large-scale wireless communication. The delivery of media through multicast often involves using Internet infrastructure, devices and protocols, including protocols for routing and TCP/IP.

10. Starting in 1997, I worked on a project to integrate the streaming media capabilities of the Internet together with the interactivity of the web. I developed a project called the Interactive Multimedia Jukebox (IMJ). Users would visit a web page and select content to view. The content would then be scheduled on one of a number of channels, including delivery to students in Georgia Tech dorms delivered via the campus cable plant. The content of each channel was delivered using multicast communication.

11. In the IMJ, the number of channels varied depending on the capabilities of the server including the available bandwidth of its connection to the Internet. If one of the channels was idle, the requesting user would be able to watch their selection immediately. If all channels were streaming previously selected content, the user's selection would be queued on the channel with the shortest wait time. In the meantime, the user would see what content was currently playing on other channels, and because of the use of multicast, would be able to join one of the existing channels and watch the content at the point it was currently being transmitted.

12. The IMJ service combined the interactivity of the web with the streaming capabilities of the Internet to create a jukebox-like service. It supported true Video-on-Demand when capacity allowed, but scaled to any number of users based on queuing requested programs. As part of the project, we obtained permission from Turner Broadcasting to transmit cartoons and other short-subject content. We also connected the IMJ into the Georgia Tech campus cable television network so that students in their dorms could use the web to request content and then view that content on one of the campus's public access channels.

13. More recently, I have also studied issues concerning how users choose content, especially when considering the price of that content. My research has examined how dynamic content pricing can be used to control system load. By raising prices when systems start to become overloaded (i.e., when all available resources are fully utilized) and reducing prices when system capacity is readily available, users' capacity to pay as well as their willingness can be used as factors in stabilizing the response time of a system. This capability is particularly useful in systems where content is downloaded or streamed on-demand to users.

14. As a parallel research theme, starting in 1997, I began researching issues related to wireless devices and sensors. In particular, I was interested in showing how to provide greater communication capability to "lightweight devices," i.e., small form-factor, resource-constrained (e.g., CPU, memory, networking, and

power) devices. Starting in 1998, I published several papers on my work to develop a flexible, lightweight, battery-aware network protocol stack. The lightweight protocols we envisioned were similar in nature to protocols like Bluetooth, Universal Plug and Play (UpnP) and Digital Living Network Alliance (DLNA).

15. From this initial work, I have made wireless networking—including ad hoc, mesh networks and wireless devices—one of the major themes of my research. My work in wireless networks spans the protocol stack from applications through to the encoding and exchange of data at the data link and physical layers.

16. At the application layer, even before the large-scale "app stores" were available, my research looked at building, installing, and using apps for a variety of purposes, from network monitoring to support for traditional computer-based applications (e.g., content retrieval) to new applications enabled by ubiquitous, mobile devices. For example, my research has looked at developing applications for virally exchanging and tracking "coupons" through "opportunistic contact" among mobile wireless devices (i.e., communication among devices moving into communication range with each other). In many of the courses I have taught there is a project component. Through these projects I have supervised numerous efforts to develop new "apps" for download and use across a variety of mobile platforms.

17. Toward the middle of the protocol stack, my research has also looked to build wireless infrastructure support to enable communication among a set of

mobile devices unaided by any other kind of network infrastructure. These kinds of networks are useful either in challenged network environments (e.g., when a natural disaster has destroyed existing infrastructure) or when suitable support for network communication never existed. The deployment of such networks (or even the use of traditional network support) are critical to support services like disaster relief, catastrophic event coordination, and emergency services deployment.

18. Yet another theme is monitoring wireless networks, in particular different variants of IEEE 802.11 compliant networks, to (1) understand the operation of the various protocols used in real-world deployments, (2) use these measurements to characterize use of the networks and identify protocol limitations and weaknesses, and (3) propose and evaluate solutions to these problems. I have successfully used monitoring techniques to study wireless data link layer protocol operation and to improve performance by enhancing the operation of such protocols. For wireless protocols, this research includes functions like network acquisition and channel bonding.

19. One theme in my wireless network research has been cross-layer solutions and innovations. As mentioned above, with greater wireless device use and network support, we envisioned new application paradigms and services, for example, when mobile devices come into contact with each other. Instead of relying on existing infrastructure to relay communication, the devices are able to discover

each other and communicate directly. Other examples include discovering and using location information to enhance users' experiences. Network support and novel applications span use a variety of network architectures supporting users on foot, in vehicles, and across varying terrains and environments. Finally, we studied how communication efficiency can be supported through intelligent handoffs as well as location and movement prediction.

20. Protecting networks, including their operation and content, has been an underlying theme of my research almost since the beginning of my research career. Starting in 2000, I have been involved in several projects that specifically address security, network protection, and firewalls. After significant background work, a team on which I was a member successfully submitted a $4.3M grant proposal to the Army Research Office (ARO) at the Department of Defense to propose and develop a high-speed intrusion detection system. Key aspects of the system included associating streams of packets and analyzing them for viruses and other malware. Once the grant was awarded, we spent several years developing and meeting the milestones of the project. A number of my students worked on related projects and published papers on topics ranging from intrusion detection to developing advanced techniques to be incorporated into firewalls. I have also used firewalls, including their associated malware detection features, in developing techniques for the classroom to ensure that students are not distracted by online content.

21. My recent work ties some of the various threads of my past research together. I have investigated content delivery in online social networks and proposed reputation management systems in large-scale social networks and marketplaces. On the content delivery side, I have looked at issues of caching and cache placement, especially when content being shared and the cache has geographical relevance. We were able to show that effective caching strategies can greatly improve performance and reduce deployment costs. Our work on reputation systems showed that reputations have economic value, and as such, creates a motivation to manipulate reputations. In response, we developed a variety of solutions to protect the integrity of reputations in online social networks. The techniques we developed for content delivery and reputation management were particularly relevant in peer-to-peer communication and recommendations for downloadable "apps."

22. As an important component of my research program, I have been involved in the development of academic research into available technology in the market place. One aspect of this work is my involvement in the Internet Engineering Task Force (IETF). The IETF is a large and open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. I have been involved in various IETF groups including many content delivery-related working

groups like the Audio Video Transport (AVT) group, the MBone Deployment (MBONED) group, Source Specific Multicast (SSM) group, the Inter-Domain Multicast Routing (IDMR) group, the Reliable Multicast Transport (RMT) group, the Protocol Independent Multicast (PIM) group, etc. I have also served as a member of the Multicast Directorate (MADDOGS), which oversaw the standardization of all things related to multicast in the IETF. Finally, I was the Chair of the Internet2 Multicast Working Group for seven years.

23. My involvement in the research community extends to leadership positions for several academic journals and conferences. I am the co-chair of the Steering Committee for the ACM Network and System Support for Digital Audio and Video (NOSSDAV) workshop and on the Steering Committees for the International Conference on Network Protocols (ICNP), ACM Sigcomm Workshop on Challenged Networks (CHANTS), and IEEE Global Internet (GI) Symposium. I have served or am serving on the Editorial Boards of IEEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Network, ACM Computers in Entertainment, AACE Journal of Interactive Learning Research (JILR), and ACM Computer Communications Review. I have co-chaired a number of conferences and workshops including the IEEE International Conference on Network Protocols (ICNP), IEEE Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON), International Conference on

Communication Systems and Networks (COMSNETS), IFIP/IEEE International Conference on Management of Multimedia Networks and Services (MMNS), the International Workshop On Wireless Network Measurement (WiNMee), ACM Sigcomm Workshop on Challenged Networks (CHANTS), the Network Group Communication (NGC) workshop, and the Global Internet Symposium, and I have served on the program committees for numerous conferences.

24. Furthermore, in the courses I taught at UCSB, a significant portion of my curriculum covered aspects of the Internet and network communication including the physical and data link layers of the Open System Interconnect (OSI) protocol stack, and standardized protocols for communicating across a variety of physical media such as cable systems, telephone lines, wireless, and high-speed Local Area Networks (LANs). The courses I have taught also cover most major topics in Internet communication, including data communication, multimedia encoding, and mobile application design. My research and courses have covered a range of physical infrastructures for delivering content over networks, including cable, Integrated Services Digital Network (ISDN), Ethernet, Asynchronous Transfer Mode (ATM), fiber, and Digital Subscriber Line (DSL). For a complete list of courses I have taught, see my curriculum vitae (CV).

25. In addition, I co-founded a technology company called Santa Barbara Labs that was working under a sub-contract from the U.S. Air Force to develop very

accurate emulation systems for the military's next generation internetwork. Santa Barbara Labs' focus was in developing an emulation platform to test the performance characteristics of the network architecture in the variety of environments in which it was expected to operate, and, in particular, for network services including Ipv6, multicast, Quality of Service (QoS), satellite-based communication, and security. Applications for this emulation program included communication of a variety of multimedia-based services, including video conferencing and video-on-demand.

26. In addition to having co-founded a technology company myself, I have worked for, consulted with, and collaborated with companies for nearly 30 years. These companies range from well-established companies to start-ups and include IBM, Hitachi Telecom, Turner Broadcasting System (TBS), Bell South, Digital Fountain, RealNetworks, Intel Research, Cisco Systems, and Lockheed Martin.

27. Through my graduate education, leadership with CITS, involvement in TMP, role in the development of the Internet2 infrastructure, and consulting with ISPs, I have gained a strong understanding in the role of the Internet in our society and the challenges of deploying large-scale production networking infrastructure. CITS, since its inception, has looked at the role of the Internet in society, including how the evolution of technology have created communication opportunities and challenges, including, for example through disruptive technologies like P2P. TMP

looks to focus on non-purely technical issues, including, for example, state-of-the-art business methods, strategies for successful technology commercialization, new venture creation, and best practices for fostering innovation. Through my industry collaborations and Internet2 work, I have developed significant experience in the challenges of deploying, monitoring, managing, and scaling communication infrastructure to support evolving Internet services like streaming media, conferencing, content exchange, social networking, and e-commerce.

28. I am a Member of the Association of Computing Machinery (ACM) and a Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

29. Additional details about my employment history, fields of expertise, courses taught, and publications are further included in my CV attached as Ex. 1004.

30. Based on my professional experience, I believe I am qualified to testify as an expert on matters related to the patent at issue.

III. LEGAL STANDARDS

31. Petitioner' attorneys have explained to me the legal standards that apply in this case. My understanding of those standards is described below. I am not an attorney, and I do not have formal training in the law regarding patents. I have used my understanding of the following legal principles set forth in this section in reaching my opinions.

32. I understand that, in this proceeding, Petitioner have the burden of proving that the challenged claims are invalid by a preponderance of the evidence.

A. Obviousness

33. I have been informed that a claim is invalid as obvious under 35 U.S.C. § 103 (pre-AIA) if the differences between the claimed subject matter and the prior art are such that the subject matter as a whole would have been obvious at the time of the invention to a person of ordinary skill in the art. I have been informed that the following matters are relevant to determining whether the claimed invention would have been obvious: (1) the scope and content of the prior art, (2) the difference or differences between the patent claim and the prior art, (3) the level of ordinary skill in the art at the time the invention of the patent, and (4) any secondary considerations or objective indicia of non-obviousness.

34. I have been informed that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. When a claim simply arranges prior art elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, then such a combination is obvious. When a patent claims a structure already known in the prior art altered by the mere substitution of one element for another known in the field, the combination is likely to be obvious unless the combination yields an unpredictable result.

35. I have been informed that when a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill in the art can implement a predictable variation, such a variation is likely unpatentable. For the same reason, if a technique has been used to improve one device, and one of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. One question to consider is whether the improvement is more than predictably using prior art elements according to their established functions.

36. I have been informed that it may often be necessary, in a validity analysis, to consider whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. This can be accomplished by looking to interrelated teachings of multiple patents or other publications or pieces of prior art; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by one of ordinary skill in the art.

37. I have been informed that a validity analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim; it is appropriate to take account of the inferences and creative steps that a person of

ordinary skill in the art would employ. I have been informed that a person of ordinary skill in the art is a person of ordinary creativity, not an automaton.

38. I have been informed that a claim composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art. I have been informed that it can be important to identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does. I am told that one way that subject matter can be proved obvious is by noting there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims. I have been informed that any need or problem known in the field of endeavor at the time of the claimed invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.

39. I have been informed that one should not assume that a person of ordinary skill in the art attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem. Instead, I have been informed that since familiar items may have obvious uses beyond their primary purposes, in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple prior art references together like pieces of a puzzle.

40. I have been informed that, when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable

solutions, persons of ordinary skill in the art have good reason to pursue the known options within their technical grasp. If this leads to the anticipated success, the product was likely not accomplished by innovation but by using ordinary skill and common sense. I have been informed that, in such an instance, the fact that the combination was obvious to try may show that the combination was obvious.

41. I have been informed that, when determining whether a claimed combination would have been obvious, the correct analysis is not whether a person of ordinary skill in the art, writing on a blank slate, would have chosen the particular combination of elements described in the claim. Instead, I have been informed that the correct analysis considers whether one of ordinary skill, facing the wide range of needs created by developments in the field of endeavor, would have seen a benefit to selecting the combination claimed.

42. I have been informed that, when determining whether a claimed invention is obvious, any "secondary considerations" of non-obviousness identified by the patentee should also be considered. These secondary considerations can include:

- commercial success of the invention, causally related to the invention itself rather than to companion factors, such as advertising or attractive packaging;

- the invention taught away from the technical direction followed by those skilled in the art;
- a long-felt but unsatisfied need for the invention while the needed implementing arts and elements had long been available;
- the invention achieves results unexpected to those skilled in the art;
- copying of the invention by competitors as distinguished from their independent development
- unsuccessful attempts by those skilled in the art to make the invention;
- acquiescence by the industry to the patent's validity by honoring the patent through taking licenses or not infringing the patent, or both; and
- skepticism, disbelief in or incredulity by those skilled in the art that the patentee's approach worked.

43. I have been informed that, for the above information to impact the obviousness of a patent claim, there must be a nexus between the alleged secondary

considerations and the claims. In addition, I have been informed that the burden of introducing evidence of secondary considerations generally is on the Patent Owner. If the Patent Owner or its expert should assert secondary considerations of non-obviousness, I reserve the right to provide a Declaration addressing assertions of non-obviousness due to secondary considerations.

B. Claim Construction

44. I have been informed that claim terms are typically given their plain and ordinary meanings, as would have been understood by a person of ordinary skill in the art at the time of the earliest alleged priority date. I have further been informed that when considering the meaning of any terms in the Challenged Claims of the '669 patent, I should apply the plain and ordinary meaning of those terms. I have further been informed that in considering the meaning of the claims, one must consider the language of the claims, the specification, and the prosecution history of record.

45. I have been informed that in general, a preamble limits the invention if it recites essential structure or steps, or if it is necessary to give life, meaning, and vitality to the claim. I have further been informed that a preamble is not limiting where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention. I have further been informed that dependence on a particular disputed preamble phrase for antecedent basis may limit claim scope because it indicates a reliance on both the

preamble and claim body to define the claimed invention. I have further been informed that clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art transforms the preamble into a claim limitation because such reliance indicates use of the preamble to define, in part, the claimed invention.

IV. PERSON OF ORDINARY SKILL IN THE ART AND THE TIME OF THE ALLEGED INVENTION

46. I have been asked to assume that the ’669 patent is entitled to its earliest alleged priority date of January 19, 2009. *See* Ex. 1001. Beyond this assumption, I have not undertaken an analysis to determine the earliest priority date to which the ’669 patent is entitled.

47. Based on the materials and information I have reviewed and based on my experience in the technical areas relevant to the ’669 patent, a person of ordinary skill in the art at the time of the alleged invention of the ’669 patent would have had at least a Bachelor’s degree in Electrical Engineering, Computer Engineering, Computer Science or equivalent, and at least two years of experience with computer networking technology. More education can supplement practical experience and vice versa. Based on my knowledge and experience, including as discussed above in Section II, I exceeded the level of skill of a person of ordinary skill in the art at the time of the alleged invention of the ’669 patent and can provide opinions regarding the knowledge of a person of ordinary skill in the art as of that time. My opinions

herein are, where appropriate, based on my understandings as to a person of ordinary skill in the art at that time. I myself had more than these capabilities at the time of the alleged invention of the ’669 patent.

V. THE ’669 PATENT

A. Description of the ’669 Patent’s Specification

48. The ’669 patent to Stokking *et al.* was filed January 19, 2010 and claims priority to a European application filed January 19, 2009.

49. The ’669 patent is titled “Managing associated sessions in a network.” It is directed to managing associated sessions in a network. Ex. 1001 at Abstract. The ’669 patent purports to improve on the “IP Multi-Media Subsystem (IMS) architecture,” and, in particular, to “blended or composite services, which combine services of various platforms … (e.g. phone, multicast, broadcast, television/video, content on demand etc.).” *Id.* at 1:23-40. The patent explains, “[f]or example an end-user may compose a personalized multimedia service by enriching a main service, for example a TV broadcast (BC) with personally selected multi-media content, such as content-on-demand (CoD), user-generated content (UCG), etc., originating from different sources in the network.” *Id.* at 1:44-49.

50. The specification states that in the prior art, “the managing of the enriched television experience” must be performed “by the end-user” because “[i]nformation regarding the relation between the different multimedia streams

originating from different sources in the network … only exists at the user equipment." *Id.*, 1:64-2:9. However, it may "be convenient and/or even necessary to manipulate the personalized television experience from within the network," for example, "to simultaneously pause associated multimedia streams … in order to deliver a targeted advertisement" or in "the situation of an incoming phone call." *Id.* at 2:10-26. In such cases it "would be convenient if the network could only pause the streams related to the personalized television experience and not those related to" other tasks, such as "background download or recording sessions." *Id.* at 2:26-33.

51. The '669 patent purports to address this by using a "composition session" with a "composition session identifier" to "associat[e] two or more sessions with the composition session by exchanging the composition session identifier" between a network element and a user equipment. *Id.* at 2:66-3:11. The composition session identifier "allows network centric administration" of multimedia sessions by associating the multimedia session with a composition session identifier. *Id.* at 3:25-32. A new multimedia session may thus "be associated with other multimedia sessions that may have already been assigned to the same composition session identifier." *Id.* at 3:32-34. The associated sessions may then be managed by the network device collectively, such as by "collective[ly] pausing (for example, in

response to an incoming call, destined for the user equipment), replaying, diverting of the data streams associated with the group of sessions." *Id.* at 3:35-43.

B. The '669 Patent's Prosecution History

52. I have reviewed the prosecution history of the '669 patent and summarize it below.

1. Application No. 13/144,385

53. During prosecution of Application No. 13/144,385, which issued as the '669 patent, the Examiner had repeatedly rejected the claims pending in the application in view of references that disclosed the concept of a composition session and associated identifier for associating multiple media stream sessions at a network device, which was well known by the date of the '669 patent. Such references included U.S. Patent Pub. Nos. 2009/0177778 ("Turk"), 2008/0288644 ("Gilfix"), and 2008/0089344 ("Jansson"). In response, the Applicant amended the claims several times to add limitations related to the session initiation process. For example, the Applicant's amendments included limitations that two or more sessions are associated with a composition session by exchanging the composition session identifier between the user equipment and the network device at least two times, which the Examiner determined to be in the prior art. The Applicant then further amended the claims to include limitations that signaling in the composition session

may be used to modify all of the associated sessions, including by terminating those sessions. The amended claims were later allowed.

2. IPR2022-00557

54. I understand that on February 10, 2022, Ericsson filed a petition for *inter partes review* of the '669 patent in IPR2022-00557, challenging claims 1-3, 6, 8, 10-12, 21-22, and 24-25. Ericsson's petition relied on six references that are not relied upon in Samsung's Petition here. I understand that the Board instituted an *inter partes review* based on Ericsson's petition, and issued a Final Written Decision on October 4, 2023, determining that claims 1, 10-12, 21, 22, 24, and 25 of the '669 patent were unpatentable. I understand that the Board determined that Claims 2, 3, 6, and 8 were not unpatentable in view of the prior art cited by Ericsson, because the Board determined that the prior art raised in the Ericsson petition did not disclose initiating two or more associated sessions by sending two or more session initiation requests, each comprising the composition session identifier.

C. Interpretation of the '669 Patent's Challenged Claims

55. For the purposes of my analysis in this IPR proceeding, I understand that the words of a claim are given their plain meaning that those words would have had to a POSITA at the time of the alleged invention. I also understand that the structure of the claims, the specification, and the prosecution history may also be used to better construe a claim insofar as the plain meaning of the claims cannot be

understood. Moreover, I understand that even treaties and dictionaries may be used, albeit under limited circumstances, to determine the meaning attributed by a POSITA to a claim term at the time of filing. Furthermore, I understand that a Patent Owner's own apparent interpretation of certain terms in related proceedings can be considered to determine the meaning of patent claims in an IPR proceeding.

56. I have followed this approach in my analysis, and, except as explicitly stated below, I have applied the plain and ordinary meaning of those terms as the would have been interpreted by a POSITA at the time the invention was made (not today). For purposes of my analysis here, I have used January 19, 2009, the date of the European application to which the '669 patent claims priority, as the date of the invention.

57. I understand that in the *Ericsson* IPR, the Board construed three terms of the '669 patent's claims, which are identified in the table below.

Term	Construction
"associated sessions"	"sessions that should not be managed independent from each other"
"composition session"	"a separate signaling session for managing the associated sessions that is initiated using a different signaling session than the associated sessions"
"exchanging the composition session identifier"	"sending the composition session identifier in either direction"

58. I have been asked to adopt and apply the Board's prior constructions for purposes of my analysis, and therefore have done so.

VI. SUMMARY OF PRIOR ART

A. Widegren (EX1005)

59. U.S. Pat. Pub. No. 2002/0120749 was filed on November 5, 2001, and published on August 29, 2002. I understand that it is therefore prior art because it was published before the earliest priority date of the '669 patent.

60. Like the '669 patent, Widegren relates to an "IP Multimedia Service ('IMS')" that "may be defined 'on top' of" a cellular communications network, using "IP application signaling" such as the "session initiation protocol (SIP) and session description protocol (SDP)." EX1005, ¶63. Also like the '669 patent, Widegren recognizes that the "relationship of the various media streams" are normally "under the control of the end user establishing the multimedia session [and] the various media streams," which prevents elements on the network from applying "[s]ession level policy controls." *Id.*, ¶64. Widegren then discloses the same solution to this well-known problem as the '669 patent: "providing an efficient and effective mechanism … to permit session level control" of multiple multimedia streams by "setting up and orchestrating a multimedia session … [u]sing session signaling." *Id.*, ¶¶66-67. In particular, Widegren's session signaling includes a "session identifier that identifies the session," which is distinct from the "media data stream identifier" corresponding to each of the associated media streams and performs the same function as the '669 patent's composition session identifier. *Id.*, ¶71.

61. Figure 18 provides a process flow of Widegren's process, where a multimedia session is initiated and each media data stream is associated with the multimedia session through media binding information. The media binding information contains the session, media stream, and policy-related information from the multimedia system.

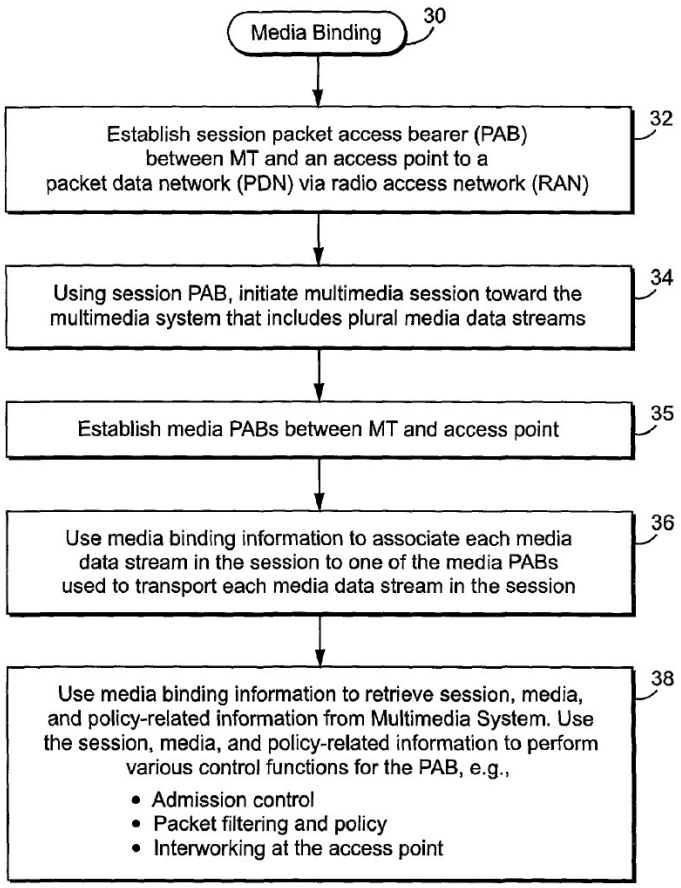


Fig. 18

B. Widegren-793 (EX1006)

62. U.S. Pat. No. 6,621,793 was filed on May 21, 2001, and issued September 16, 2003. I understand that it is therefore prior art because it issued before the earliest priority date of the '669 patent.

63. Widegren-793 discloses policy control mechanisms for packet data networks. EX1006, Abstract. Among other things, Widegren-793 discloses a "session termination" event that "terminates the session directly to the UE" and "results in the termination of the bearer." *Id.*, 14:24-35.

C. Astrom (EX1007)

64. WIPO Publication No. 2007/101473 was filed on March 7, 2006, and published on September 13, 2007. I understand that it is therefore prior art because it was published before the earliest priority date of the '669 patent.

65. Astrom relates to an IPTV system using a standard IMS communication system. EX1007, Abstract. In particular, Astrom discloses a method of handling incoming calls in an IPTV system using an "Incoming Call Notification sequence with Time-Shift functionality." *Id.*, 18:6-21:3. In this scenario, when an incoming call is received on the IPTV device, the user may accept the call and start a time-shift operation. *Id.*, 19:16-25. In response, the IPTV application server begins recording the currently viewed television channel, and display of television content on the user's device is interrupted in order to accept the incoming call. *Id.*, 19:27-

20:20. When the call completes, the user may resume viewing the time-shifted (recorded) content, and the application server delivers the recorded content to the user's device for playback. *Id.*, 20:22-21:22.

D. ETSI TS 183 063 (EX1008)

66. Exhibit 1008 is a copy of ETSI TS 183 063 V2.1.0 ("ETSI TS 183 063"). ETSI TS 183 063 is a Technical Specification published by the European Telecommunications Standards Institute ("ETSI"), titled "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); IMS-Based IPTV Stage 3 Specification." ETSI TS 183 063 describes procedures for "protocols and their possible enhancements to support IPTV services." EX1008, 10. The disclosed protocols are based on an IMS architecture as disclosed in Widegren. *Id.*, 14. ETSI TS 183 063 discloses several different types of sessions that may be supported, including a broadcast (BC) service, a content on-demand (CoD) service, and a network-side personal video recorder (nVPR) service. *Id.*, 19-20, 22-23, 29-30.

1. Public Availability of ETSI TS 183 063

67. I have been asked to opine on the public availability of ETSI TS 183 063. Exhibit 1007 is a true and correct copy of ETSI TS 183 063 as published by ETSI on its website, etsi.org. ETSI TS 183 063 has a date of publication on its face of 2008-06. In my opinion, ETSI TS 183 063 was publicly available by June 2008,

or at least before the priority date I have been asked to apply for the '669 patent, January 19, 2009.

68. ETSI is a well-known organization that has promulgated well-known telecommunications standards, such as GSM, 3G, 4G, and 5G. Accordingly, the June 2008 publication date, which is further corroborated by the ETSI website, is a highly reliable indicator of public availability to a POSITA. *Details of 'DTS/TISPAN-03127-NGN-R2' Work Item*, ETSI, https://portal.etsi.org/webapp/workprogram/Report_WorkItem.asp?WKI_ID=26367 (last accessed Jan. 17, 2025). In addition, the specification of the '669 patent refers to ETSI TS 183 063 as providing "standard procedures" to initiate multimedia sessions. This indicates that ETSI TS 183 063 was published and available as of the date of the alleged invention of the '669 patent. EX1001, 11:10-12, 11:31-33, 12:37-43.

VII. OPINIONS ON OBVIOUSNESS[2]

A. Ground 1: Widegren in view of Widegren-793 Renders Obvious Claims 2-6, 8, and 14-20

69. Widegren discloses a multimedia session comprising a plurality of associated media streams for use in an IP Multimedia Subsystem. The multimedia

[2] I am not aware of any secondary considerations of non-obviousness identified by Patent Owner. Nonetheless, in my opinion, none would overcome my opinions that each of the Challenged Claims is unpatentable, as explained throughout this

session facilitates network management and control of the plurality of media streams associated with the multimedia session.

70. Widegren-793 discloses session-level policy controls, including policies for gating data flow between a user equipment and the network. In particular, Widegren-793 discloses a "session termination" event that terminates a session and the network bearer services associated with the session.

71. In my opinion, a POSITA would be motivated to combine Widegren and Widegren-793 such that Widegren-793's "session termination" event could be applied to Widegren's multimedia session, thereby terminating all of the bearers (media streams) associated with the multimedia session.

72. As I explain below, a POSITA would have been motivated to provide a "session termination" capability as disclosed by Widegren-793 for use with Widegren's multimedia sessions, rendering the challenged claims obvious.

1. Motivation to Combine and Reasonable Expectation of Success

73. In my opinion, a POSITA would have been motivated to incorporate Widegren-793's session termination capability into Widegren's multimedia sessions.

Declaration. I reserve the right to address any purported secondary considerations of nonobviousness with respect to the '669 patent if Patent Owner later raises any.

74. First, Widegren expressly references Widegren-793 as a "desirable policy control approach" for use with multimedia streams and multimedia sessions. EX1005, ¶67 (citing "commonly-assigned U.S. patent application Ser. No. 09/861,817"). Widegren's multimedia sessions are specifically designed "to permit session level control" of packet access bearers relating to multimedia streams, such as the session-level control disclosed in Widegren-793. *Id.* For example, Widegren explains that "[s]ession level policy controls, such as the service-based local policy control described in [Widegren-793] cannot automatically be applied to PDP contexts unless the relationship of the various media streams of the PDP contexts is known." *Id.*, ¶65. Widegren then explains that the "chief problem addressed by this invention is how to communicative effectively and efficiently the relationship between a session, media flow in that session, and PDP context bearers established for those media flows," thus enabling session level policy controls such as those described in Widegren-793. *Id.*, ¶66.

75. Second, Widegren-793's session termination functionality provides an enhancement to data flow and filter functionality provided by Widegren. For example, Widegren discloses that its session-level admission control and policy enforcement rules are provided to a Gateway GPRS Support Node (GGSN) network element as part of a "Gate Set" command. EX1005, ¶¶190-191. Widegren-793 discloses more detailed techniques for filtering and gating data flows using policy

control mechanisms, including sending a "session termination" event trigger to send a "gate close" command, terminating the session and the associated media streams. EX1006, Abstract, 14:24-35.

76. Third, a POSITA considering Widegren would also have been motivated to look to Widegren-793's session-level control for use in Widegren's multimedia sessions because Widegren and Widegren-793 are both references assigned to Ericsson with overlapping inventors, and directed to related improvements to the same underlying technology. For example, both Widegren and Widegren-793 are directed to improved quality-of-service in IP multimedia subsystems. EX1005, ¶3 ("The present invention generally relates to … coordinating Quality of Service (QoS) provisioning mechanisms in IP networks with multimedia applications."); EX1006, 11:33-37 ("The present invention … employ[s] policy mechanisms ... to provide policy driven filtering and gating of data flow over a QoS connection in a packet data network."). In addition, both references build on the same underlying technology, *i.e.*, IP Multimedia Subsystems built on a GPRS bearer service and using IP application signaling, namely, Session Initiation Protocol. EX1005, ¶63; EX1006, 9:18-24.

77. In my opinion, a POSITA would have reasonably expected the combination to succeed. As the '669 patent, Widegren, and Widegren-793 all recognize, IP Multimedia Subsystems and Session Initiation Protocol were well

known, standardized technologies well before the date of the '669 patent, and would have been familiar to a POSITA. Applying and combining techniques using these well-known standardized technologies, such as by adding support for a "session termination" event to Widegren's multimedia sessions, would have been well within the capabilities of a POSITA, and would have required nothing more than the application of known techniques to improve similar devices in a predictable way. Further, in my opinion, Widegren-793's "session termination" event could have been implemented in an IMS system as disclosed by Widegren using well-known existing software functions and methods.

78. Finally, in my opinion Widegren and Widegren-793 are analogous art to the '669 patent because all three are directed to managing sessions in a network, and in particular, in an IP Multimedia Subsystems using Session Initiation Protocol. EX1001, Abstract ("A method and system for managing associated sessions inn a network…"), 1:23-29 (discussing IMS and SIP); EX1005, Abstract ("Using session signaling, a multimedia session with plural media data streams is initiated …."), ¶63 (discussing IMS and SIP); EX1006, Abstract ("A method of filtering and gating data flow in a QoS connection" including "filtering data derived from session data received by the application server during the session."), 9:18-24 (discussing IMS and SIP). Therefore, a POSITA confronted with Widegren would have also been aware of Widegren-793.

2. Claim 1[3]

(a) 1pre: A method for managing associated sessions in a network, the network having a network element configured for managing associated sessions between the network and at least one user equipment, the method comprising:

79. **A method for managing associated sessions in a network:** Widegren discloses a "multimedia session" for managing "plural media data streams" (***associated sessions***). EX1005, Abstract. Widegren expressly discloses that the plural media data streams ***should not be managed independent from each other*** because in "multimedia sessions, it is important that network managers and service providers be able to monitor, control, and enforce the use of network resources and services based on 'policies' derived from certain established criteria." *Id.*, ¶64. Indeed, Widegren notes that a "chief problem addressed by [its] invention is how to communicate effectively and efficiently the relationship between a session[and] media flows in that session" because the "interworking and cooperation between" network resource mechanisms for different media streams "is critical to ensure end-to-end quality of service." *Id.*, ¶66. Accordingly, Widegren's invention "overcomes

[3] Claims 1 and 21 were held to be unpatentable in the Ericsson FWD, and I understand they are not independently challenged in the Petition; however, I have been asked to opine on them here because the Petition challenges claims that depends from claims 1 and 21.

these and other problems by providing an efficient and effective mechanism … to permit session level control" (*i.e.*, ***managing***) of the multimedia streams. *Id.*, ¶67.

80. Widegren's "plural media data streams" are also consistent with the '669 patent's description of ***associated sessions***. For example, the '669 patent discloses that the associated sessions may be a "main content stream" and "additional content streams," where "[o]ne session would comprise the stream with the main content and additional sessions for each of the additional streams would comprise the additional content items." EX1001, 1:55-63, 2:47-53; *see also id.*, 8:59-9:8 (example where "three multimedia sessions" comprising three separate video streams are associated together).

81. Widegren further discloses that its multimedia session manages multimedia streams in "Internet Protocol (IP) ***networks***." *Id.*, ¶3. The IP network may include an "IP backbone network 104" that a particular user connects to through a "local access network 105," as illustrated in Figure 1 (reproduced below).

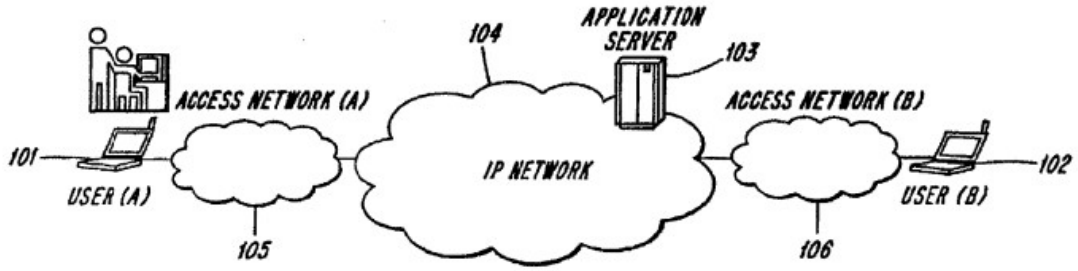


Fig. 1

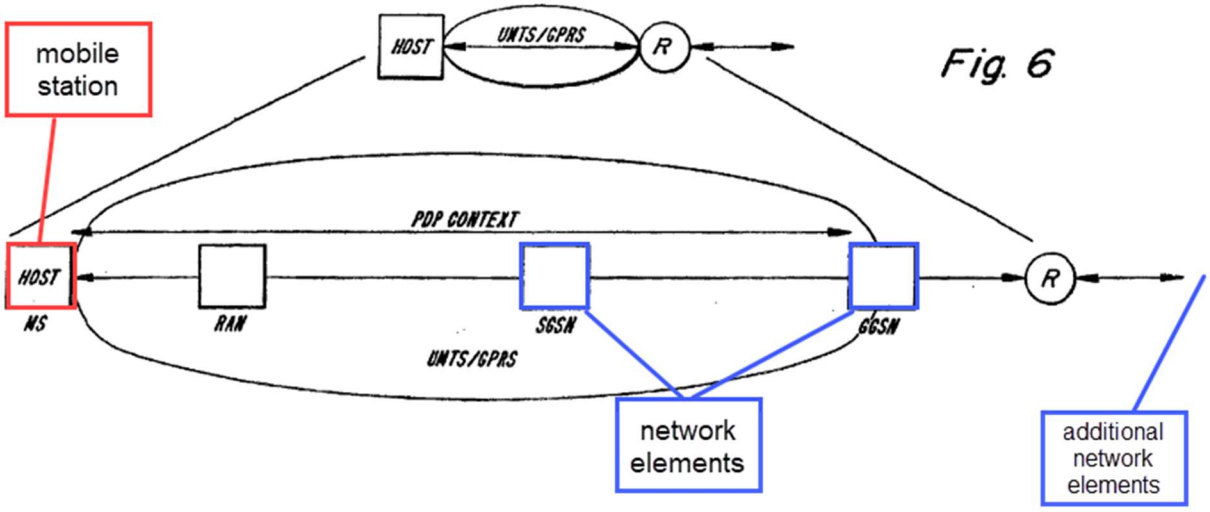
Id., ¶5; *see also id.*, ¶¶12-15 (describing exemplary network architectures for providing end-to-end services), 20-22 (describing GPRS/UMTS network for connecting a mobile station to an external packet switching network such as the Internet), 68 (disclosing the use of multimedia sessions in a "mobile terminal and a remote host coupled to a packet data network" to "transport corresponding ones of the media data streams between the mobile terminal and the access points").

82. **The network having a network element configured for managing associated sessions between the network and at least one user equipment:** Widegren discloses that the network includes network elements and at least one user equipment.

83. For example, Widegren discloses "a ***user equipment*** (UE) allowing a user access to network services," which may be a "mobile terminal" or "any type or configuration of user equipment that can communicate over a radio interface or a fixed user to network interface." EX1005, ¶102. Media services may be provided over the network to ***at least one*** user equipment (*e.g.*, between two users, User-A and User-B, or between a user and an application server). *Id.*, ¶5; *see also id.*, ¶¶110-114 (example involving multimedia session between two users' equipment, UE-A and UE-B).

84. Widegren also discloses a wide variety of "***network elements***," including "subnets and IP routers" in the IP network that "support mechanisms to

control the quality of service delivered to [] packets," EX1005, ¶9, and other "network elements" in a mobile network (*e.g.*, a "GPRS/UMTS network") that connect a "Mobile Station" to "an external packet switch network … like the Internet," *id.*, ¶20. For example, Figure 6, reproduced below, illustrates network elements in a GPRS/UMTS network between a mobile station and an external packet switching network. *Id.*, ¶20. The network may also include a "Multimedia System 16" that may be "an integral part of the Packet Data Network." *Id.*, ¶104.



85. Widegren's network elements are ***configured for managing associated sessions*** between the network and the UEs. For example, as illustrated in Figure 19 (reproduced below), the multimedia system is configured to "correlate each multimedia flow and its corresponding quality of service requirements with the ***session*** to establish necessary admission and policy enforcement rules for the session," and to provide the rules to "the Access Network Bearer Control block … which performs admission and policy enforcement operations for the session."

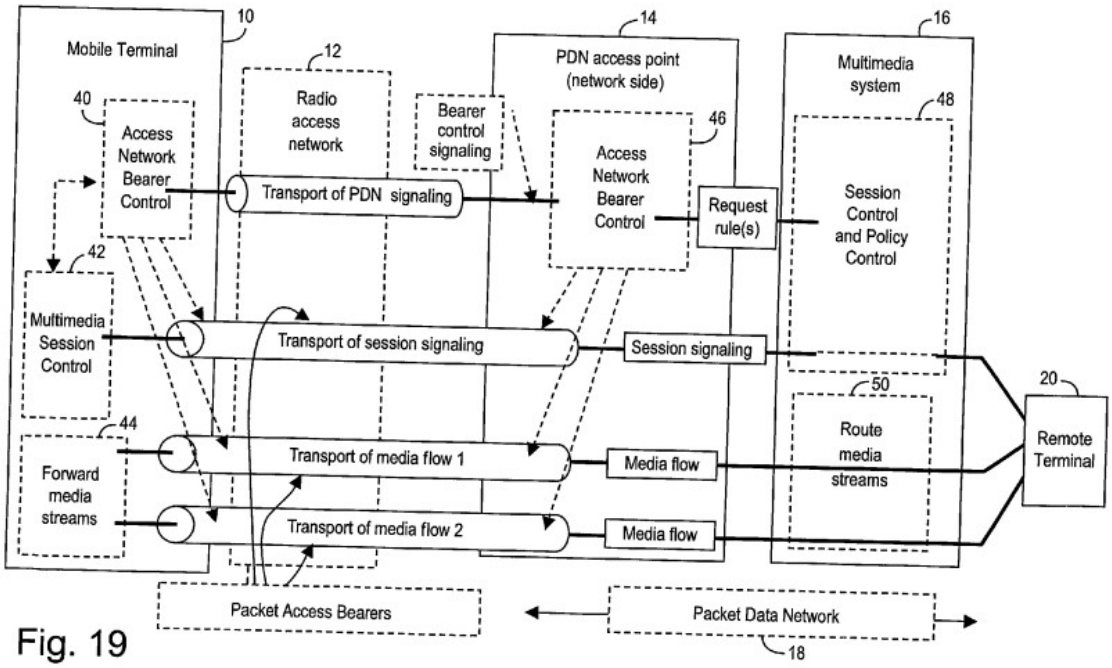


Fig. 19

Id., ¶107; *see also id.*, ¶¶109-118, Figs. 21-22 (example illustrating the IP multimedia subsystem (IMSS) in a GPRS/UMTS network managing associated media streams in a multimedia session), ¶¶185-194, Figs. 24-26 (additional examples showing more granular signaling between UE and network elements).

(b) 1a: providing a composition session identifier for associating sessions in the network;

86. Widegren discloses a "session identifier," sometimes also referred to as an "authorization token" (***composition session identifier***) that "is determined for [a] multimedia session." EX1005, ¶185; *see also id.*, ¶¶71, 111. As described in Limitation 1pre, Widegren's multimedia sessions are used to ***associate*** multiple media streams (***associated sessions***) over the ***network***. For example, the session identifier is included in "media binding information" that "associates each media

data stream in the session to one of the media packet access bearers and is used to provide session-based control of each of the media packet access bearers."[4] *Id.*, ¶¶68, 71, 120.

87. In my opinion, the "multimedia session" (***composition session***) corresponding to Widegren's "session identifier" is ***a separate signaling session for managing the associated sessions that is initiated using a different signaling session than the associated sessions***. For example, Widegren discloses that "session signaling" is used to initiate the "multimedia session," but "[a] plurality of packet access bearers" is separately "established between the mobile terminal and the access point to transport corresponding ones of the media data streams between the mobile terminal and the access points." EX1005, ¶68; *see also id.*, ¶106, Fig. 19 (multimedia session is initiated using "session packet access bearer" and "each of the plural media data streams are established" using separate "[m]edia packet access bearers"). In other words, the session signaling used to initiate the multimedia session that manages the associated media streams is separate and different from the signaling used to establish the packet access bearers for each media stream. For example, as shown in Figure 19 (reproduced and annotated below), each media flow

[4] A "bearer" is "a logical connection between two entities through one or more interfaces, networks, gateways, etc., and usually corresponds to a data stream." *Id.*, ¶18.

(***associated stream***) and its corresponding transport (in orange) is separate from the session signaling (***composition session***) and its corresponding transport (in yellow).

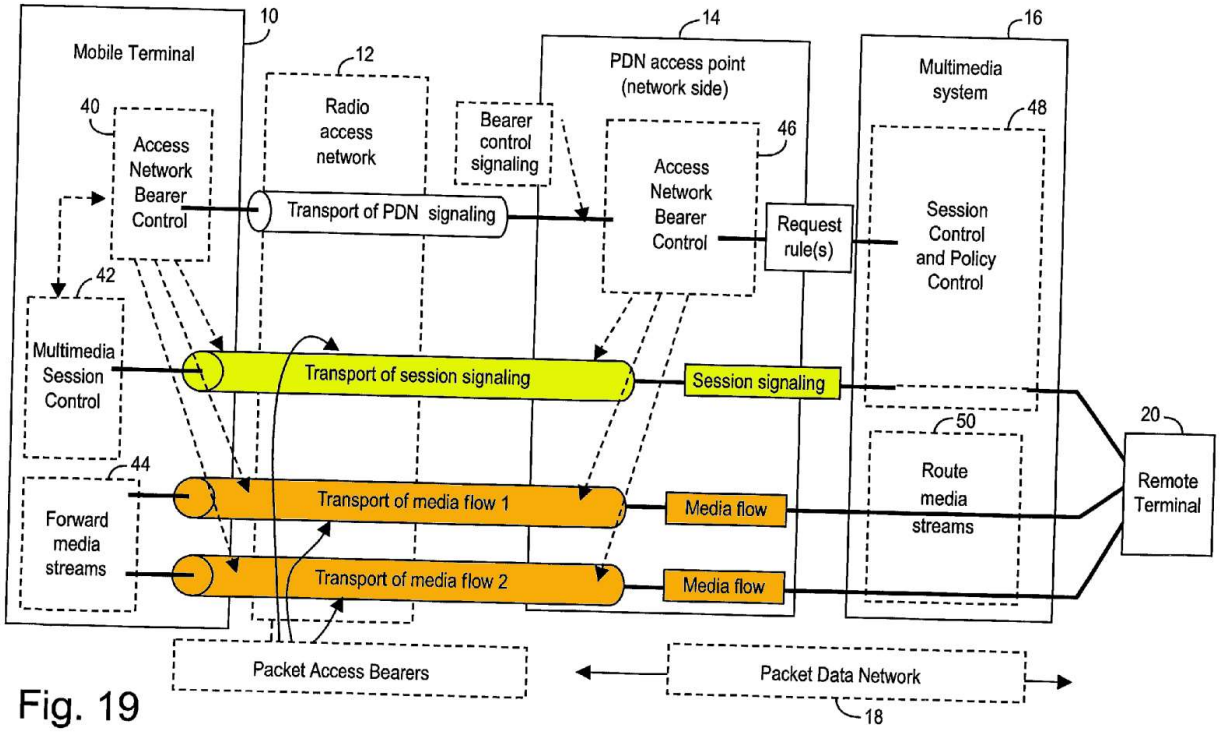


Fig. 19

88. In addition, Widegren discloses that an entirely different protocol may be used to initiate the media streams (***associated sessions***) as compared to the multimedia session (***composition session***). For example, "RSVP" ("Resource reSerVation Protocol") "is used by a host (e.g., User A's computer) to request specific service from the network for particular application data streams or flows" (*i.e.*, to initiate a media stream). EX1005, ¶11. The "session signaling" for the multimedia session, by contrast, "may employ … session initiation protocol (SIP) with a message portion that uses session description protocol (SDP)." *Id.*, ¶70. The SDP message describes each media stream to be included in the session. *Id.*, ¶63.

The ’669 patent describes the identical protocols, SIP and SDP, for establishing composition sessions comprising a plurality of associated sessions. *See, e.g.*, EX1001, 7:39-44 (“The IPTV system uses the ***Session Initiation Protocol (SIP)*** to set up and control sessions between user terminals or user terminals and the application servers …. The ***Session Description Protocol (SDP) carried by SIP signaling*** is used to describe and negotiate the media components in the session.”), 9:40-10:13 (example of initiating a composition session “using the SIP protocol” with a “Broadcast (BC) Service” stream identified in the SDP message).

(c) 1b: after providing the composition session identifier, exchanging the composition session identifier between a user equipment and the network element a first time;

89. Widegren discloses that the session identifier/authorization token (***composition session identifier***) is sent (*i.e.*, ***exchanged***) both ***from the network element to the UEs***, and ***from the UEs to the network element***. The ’669 patent explains that “[t]he sending of such composition session identifier ***in either direction*** may be referred to as an ‘exchange’.” Ex. 1001, 3:18-20.

90. For example, as part of establishing a multimedia session, a Policy Control Function (PCF) block, which is part of the multimedia system (a ***network element***), may “generate[] an authorization ‘token’ for the session (session identifier),” and ***after the composition session identifier is provided***, “send[] [*i.e.*, ***exchange***] it to” one or more users’ equipment, *e.g.*, two users’ equipment UE-A

and UE-B. EX1005, ¶111, Fig. 22; *see also id.*, ¶¶120, 133, 164, 186, 193 (examples describing how the session identifier is generated and distributed to "SIP level entities" including the mobile terminal (UE)). In addition, Widegren discloses that the session identifier may be generated "locally" (*i.e.*, a different session identifier for each network element in a particular session) or "globally" or "remotely" (*i.e.*, the same session identifier for all network elements in a particular session). *Id.*, ¶122. In other words, if a global session identifier is used, then the same composition session identifier would be sent (*i.e.*, ***exchanged***) to all of the UEs in a particular multimedia session. Thus, when two or more UEs are part of the session (*e.g.*, as illustrated in Figure 26), then the session identifier would be sent ***from the network elements*** (*e.g.*, the PCF block of the multimedia system) ***to the UEs*** at least two times (*i.e.*, once for each UE in the session). *Id.*; EX1005, Fig. 26 (annotated below). Any of these exchanges could be the ***first exchange***.

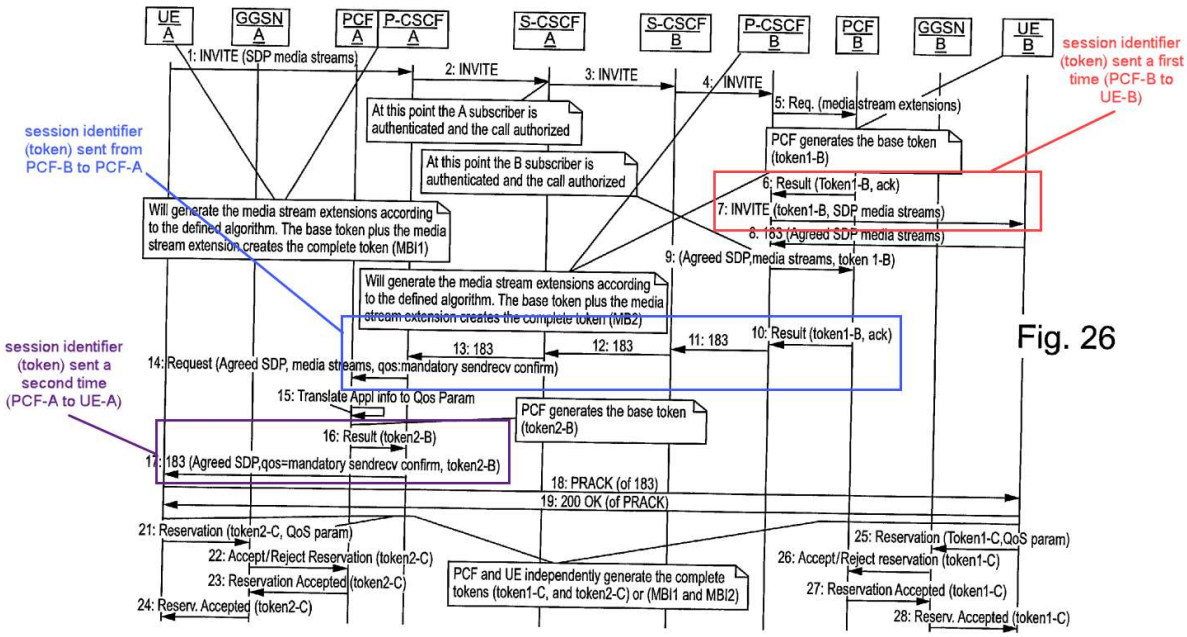


Fig. 26

91. In addition, ***after the composition session identifier is provided*** to the UEs (*e.g.*, mobile terminals), each UE "generates media binding information (MBI) for each media data stream in the session," *i.e.*, each ***associated session***. EX1005, ¶112. As discussed below, the purpose of the MBI is to set up the respective media stream for managing by the multimedia system. The MBI includes the ***composition session identifier***, specifically by "using a base token corresponding to the session identifie[r] or authorization token and combin[ing] it with media stream-specific parameters to generate the MBI to explicitly identify the individual media stream." *Id.*, ¶120; *see also id.*, ¶¶108 ("The mobile terminal determines media binding information specific to each media flow in the session."), 133, 164, 184, 186, 194 (examples describing generating the MBI using the composition session identifier). In other words, the MBI for each media stream includes the composition session

identifier. The MBI for each media stream is sent from the mobile terminal (UE) to one or more network elements to set up the packet access bearer for each media stream in the session, and, in the case of GPRS networks, for GPRS quality of service reservation procedures. EX1005, ¶108 ("The media binding information is included in packet access bearer setup signaling for each media flow packet access bearer established for the session between the mobile terminal 10 and the access point 14), Fig. 20 (showing MBI exchanged between the Mobile Terminal and PDN Access Point), ¶194 ("The complete local tokens are employed in the GPRS quality of service reservation procedures (PDP context activation/creation) shown in signals 21-28 binding the media streams to their corresponding GPRS bearers."), Fig. 26 (reproduced and annotated below). Thus, each UE sends (*i.e.*, ***exchanges***) the ***composition session identifier to the network elements*** multiple times, once for each media stream. In my opinion, any of these exchanges could be the ***first exchange***.

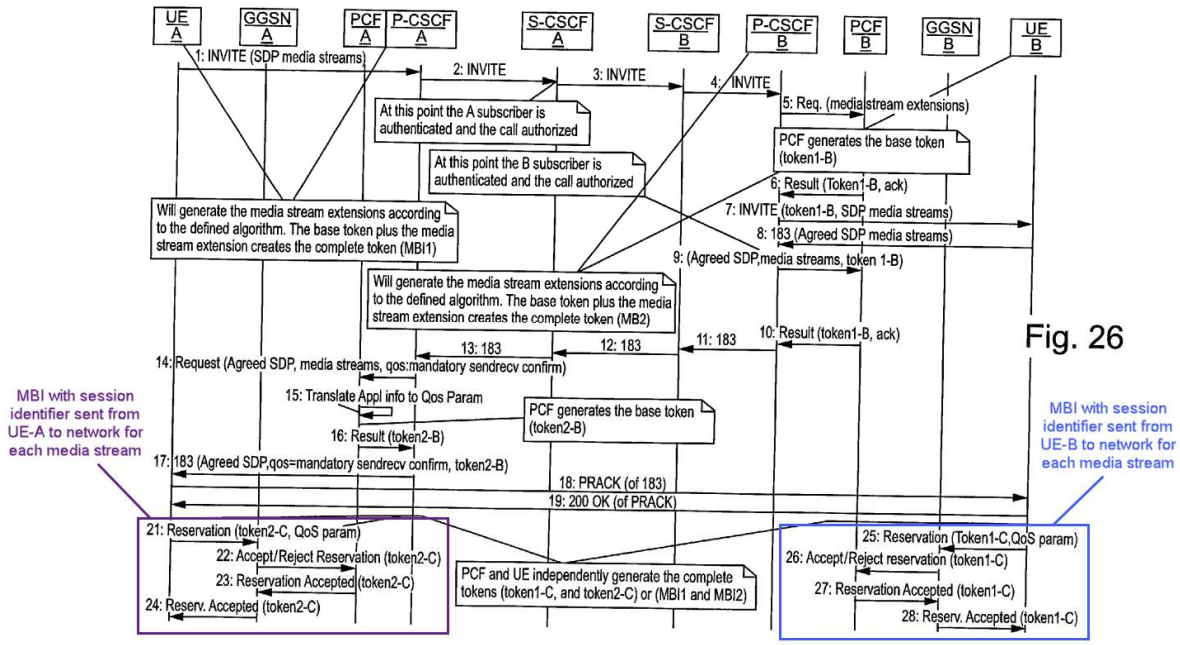


Fig. 26

(d) 1c: associating two or more sessions with the composition session identifier by exchanging the composition session identifier at least a second time, wherein exchanging the composition session identifier at least a second time comprises the network element exchanging the composition session identifier with the user equipment;

92. Widegren discloses associating two or more media streams (***associated sessions***) with a multimedia session and its session identifier/authorization token (***composition session identifier***). For example, Widegren discloses that a multimedia session includes "a plurality of media data streams." EX1005, ¶107. In the example shown in Figure 19 (reproduced below), two media streams (orange) are associated with the multimedia session (yellow).

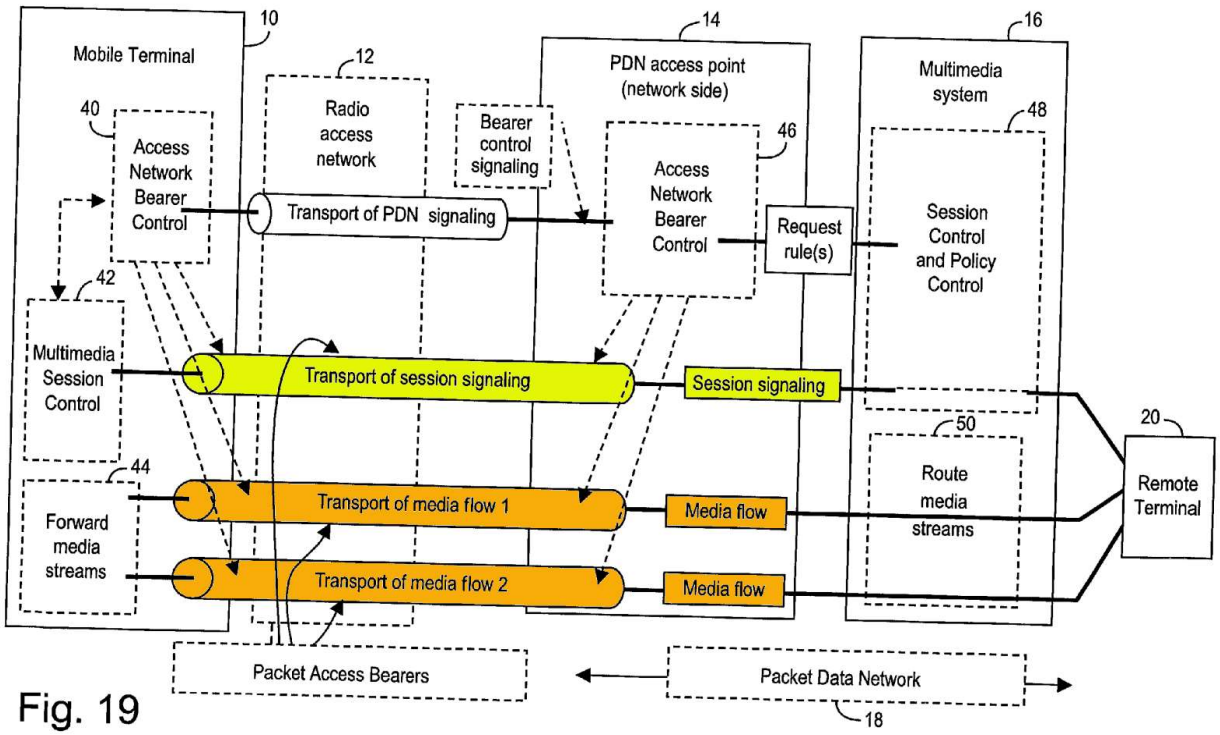


Fig. 19

93. Widegren further discloses that the media streams are associated with the multimedia session by ***exchanging the session identifier between the network elements and the user equipment at least two times***, as I discuss above in Limitation 1b. Specifically, the session identifier is sent from the PCF (***network element***) to a ***user equipment*** at least a first time as part of the session initiation process. EX1005, ¶¶111, 120, 133, 164, 186, 193, Figs. 24, 26. For each of the UE's media streams, the UE sends (*i.e.* ***exchanges***) to the PCF an MBI containing the session identifier as a reservation signal that ***associates*** that media stream with the multimedia session—each of these exchanges from UE to PCF could be the claimed ***first or second exchange***. *Id.*, ¶¶112 ("One MBI may be included per PDP context…."), 186 (describing generating the MBI for each media stream by combining the

"session ID/authorization token … with each media stream identifier"), 194 ("The complete local tokens [corresponding to the media binding information] are employed in the GPRS quality of service reservation procedures (PDP context activation/creation) shown in signals 21-28 binding the media streams to their corresponding GPRS bearers."), 67 ("PDP context activation … link[s] [*i.e.*, ***associates***] each of plural media PDP contexts/data streams to a multimedia session"); *see also id.*, ¶¶108, 120, 133, 164, 184, Fig. 26.

(e) 1d: initiating establishment of a composition session, the composition session being a signaling session for facilitating management of the two or more sessions and exchanging the composition session identifier between the user equipment and the network element as part of said establishment, the composition session being different from the two or more sessions; and

94. **Initiating establishment of a composition session, the composition session being a signaling session for facilitating management of the two or more sessions**: Widegren discloses "setting up and orchestrating" (***establishing***) a "multimedia session" (***composition session***) "with plural media data streams" (***associated sessions***). EX1005, ¶68. Widegren's system uses "***session signaling***" to "***initiate[]***" and manage the multimedia session. *Id.* In particular, Widegren discloses using "session initiation protocol (SIP)" for the session signaling. *Id.*, ¶70; *see also id.*, ¶110 ("The session is ***established*** and ***managed*** using Session Initiation Protocol (SIP)."), 123-184 (example using SIP signaling "to set up a multimedia

session"). The '669 patent similarly discloses that its composition sessions are initiated and established using SIP. EX1001, 9:40-52 (describing how a "PSC [composition] session is initiated … using the SIP protocol").

95. Widegren further discloses that the multimedia sessions ***facilitate management*** of the plural media streams. For example, Widegren discloses that its multimedia sessions "permit session level control of" the media streams, including "requesting, reserving, supplying, and enforcing IP level resources needed to support the session." EX1005, ¶67; *see also id.*, ¶72 (discussing "session level monitoring and control … using the media binding information"), 113 ("The media binding information is used by the UE-A, GGSN 96, and the PCF 100 to uniquely identify, monitor, and control the IP media flows and bearers from the session level."), 196 ("The media binding information … enables control of multiple GPRS bearers corresponding to multiple multimedia data streams from the session level."). The '669 patent similarly discloses the use of composition sessions to manage resources (such as bandwidth) collectively for the media streams associated with that session. *See, e.g.*, EX1001, 12:24-54.

96. **Exchanging the composition session identifier between the user equipment and the network element as part of said establishment:** Widegren discloses sending (***exchanging***) the session identifier (***composition session identifier***) from the PCF (***network element***) to each UE when establishing a

multimedia session between them. EX1005, ¶111 (describing Fig. 22, which "outlines in flowchart form example procedures for ***establishing a multimedia session*** between UE-A and UE-B," which includes the step of "the Policy Control Function 100 generates an authorization 'token' for the session (session identifier) and ***sends it to UE-A and UE-***B"); *see also* Limitation 1b.

97. Widegren also discloses sending the composite session identifier as part of the MBI for each media stream of each UE, from the UE to the PCF, to associate the media streams to the multimedia session. *See* Limitations 1b, 1c.

98. **The composition session being different from the two or more sessions:** As I discuss above and as shown in Figure 19, Widegren discloses that the multimedia session (***composition session***) (yellow) is different from the two or more media streams (***associated sessions***) (orange). *See* Limitation 1a.

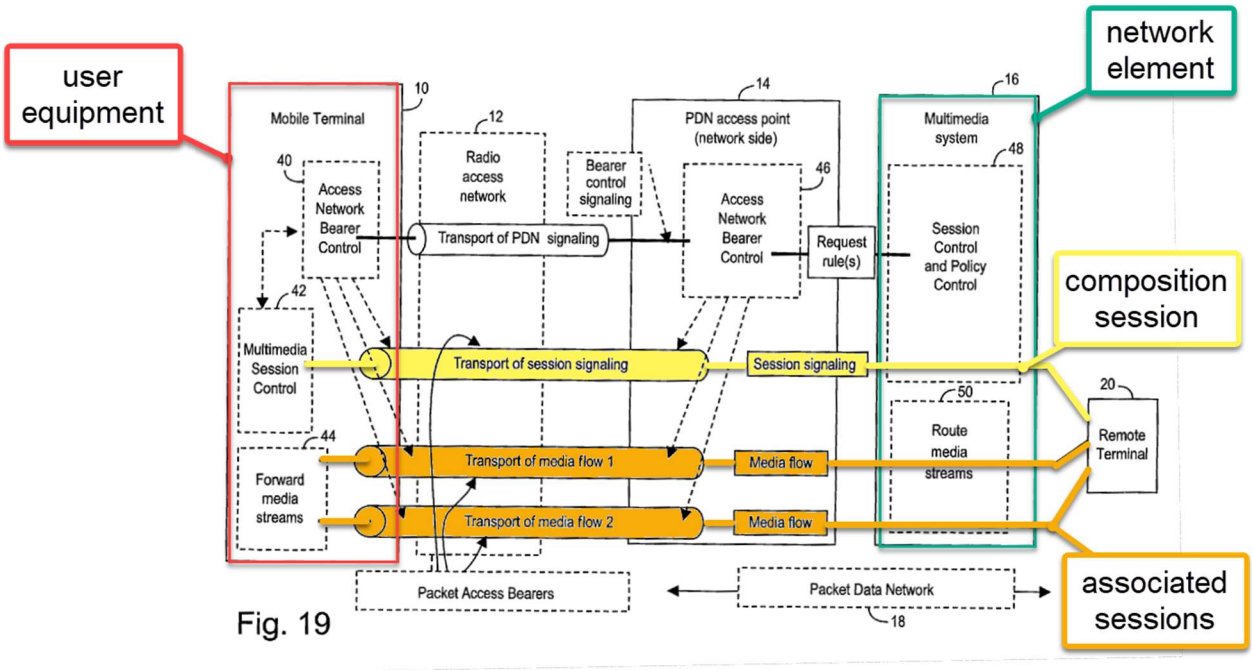


Fig. 19

(f) 1e: modifying the composition session, wherein modifying the composition session comprises using signaling in the composition session to terminate all of the two or more sessions.

99. Widegren discloses modifying the multimedia session (***composition session***) using ***session signaling***. For example, Widegren discloses "[s]ession level policy controls" and associated "Session Control" and "Policy Control" modules that "utilize[] the ***session signaling*** from the ***Multimedia Session Control block*** … to establish necessary admission and policy enforcement rules for the session." EX1005, ¶¶65, 107. In my opinion, the session signaling may include a "session-related event trigger" that modifies the multimedia session, *e.g.*, by "providing access to resources reserved for traffic accessing a specific IP multimedia service." *Id.*, ¶195. Widegren further discloses that parameters of a media data stream (*i.e.* ***associated session***) in a multimedia session may change, and media streams may be added to or removed from the multimedia session, and "the corresponding media binding information" that associates the media streams to the multimedia session "also changes." *Id.*, ¶72.

100. In my opinion, it would have been obvious to include such session-level controls in Widegren in view of Widegren-793.

101. Widegren-793 discloses policy control mechanisms for packet data networks using Session Initiation Protocol (SIP) to provide enhanced data flow and filter control. EX1006, Abstract, 11:33-42. Among other things, Widegren-793

discloses a "session termination" event that "terminates the session directly to the UE" and "results in the termination of the bearer." *Id.*, 14:24-35. Specifically, when the session terminates, the "SIP proxy server … sends a 'session termination' event trigger to the PCF, which informs the PCF to send a gate close command to the GGSN, resulting in the closing of the gate at the GGSN." *Id.*, 14:28-32. In addition, "the SIP proxy server sends information to the PCF that results in the termination of the bearer." *Id.*, 14:32-35. As noted above, the bearer corresponds to a media stream (*i.e.*, ***associated session***). In the combined system, Widegren-793's policy controls would be applied at the session level, as expressly taught by Widegren, such that all of the media streams associated with a multimedia session would be terminated.

102. In my opinion, a POSITA would have been motivated to add a "session termination" functionality, as suggested by Widegren-793, to Widegren's system, and would have reasonably expected the combination to succeed, for the reasons provided in Section VII.A.1 above.

3. Claim 2

(a) 2a: The method according to claim 1, wherein providing the composition identifier comprises: the user equipment generating the composition session identifier; and

103. Widegren discloses that the session identifier/authorization token (***composition session identifier***) is "received from SIP signaling … at session level/SIP entities in the network and at the mobile terminal." EX1005, ¶186. In one

example, the session identifier is "*e.g.*, generated at the PCF," *i.e.*, at a network element. *Id.*

104. In my opinion, it would have been obvious to a POSITA to generate the session identifier (***composition session identifier***) at the user equipment because that is one of a limited number of predictable options as to where the session identifier can be generated (*i.e.*, at a user equipment, at a network element, or at a third party provider), particularly in view of Widegren's disclosure that the session identifier is provided using SIP signaling at ***both*** the network elements ***and*** the mobile terminal.

105. Furthermore, a POSITA would have understood that whether a particular function (in this case, generating the session identifier) is performed at the user equipment (*e.g.*, a mobile terminal) or at a remote network element or third-party server is a straightforward design choice. A POSITA would have been aware of all three options, and would have been aware of the advantages and disadvantages of each, as well as the scenarios in which each design choice would be more appropriate. For example, when multiple, different media access bearers are used, it makes more sense for the UE to generate the composition session identifier. Each of the design choices would have been well within the skill of a POSITA, and could have been implemented by a POSITA with predictable results. The '669 patent confirms that my conclusion is correct by acknowledging that there are only three options for generating the composition session identifier (*i.e.*, at the user equipment,

at a network element, or at a third party provider), and does not suggest any particular difficulty or innovation in selecting one option over the others. EX1001, 3:12-24.

(b) 2b: sending a request for initiating the composition session from the user equipment to the network element, the request comprising the composition session identifier.

106. **Sending a request for initiating the composition session from the user equipment to the network element:** Widegren discloses that the user equipment sends a request to initiate a multimedia session (***composition session***) via the network. EX1005, ¶111 ("UE-A ***requests a multimedia session*** with the SIP UA remote UE-B over the session signaling GPRS bearer via the RAN 90, ***the GPRS network 92, the IP multimedia subsystem 82, the IP backbone network 84, and UE-B's home cellular network 86***."). The request is received at the Policy Control Function of the multimedia system (*i.e.* a ***network element***), which "authorize[s]" the multimedia session and "stores session information for each of the media flows in the session." *Id.*

107. As another example, Widegren illustrates the signaling used to establish a multimedia session in Figure 26 (reproduced and annotated below). EX1005, ¶¶188, 192. Specifically, "[t]he UE-A ***initiates the multimedia session with an INVITE command***, which is sent over a session signaling bearer to the GGSN and forwarded by the GGSN to the multimedia system A" (*i.e.*, a ***network element***). *Id.*, ¶188.

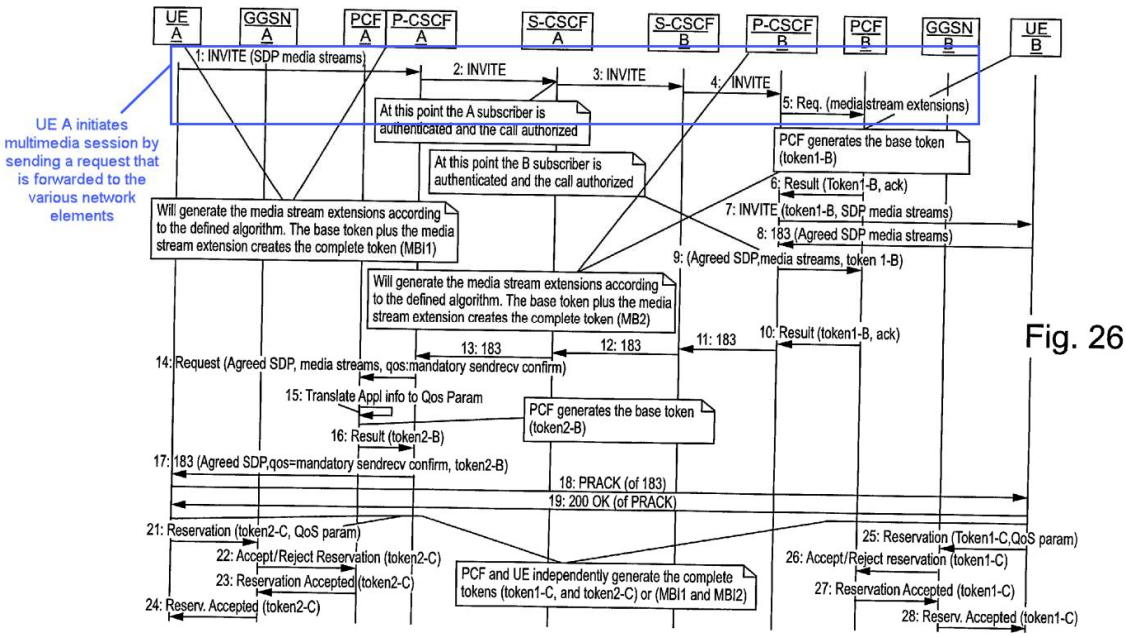


Fig. 26

108. As I explain above for Limitation 2a, in my opinion it would have been obvious to a POSITA to generate the session identifier (***composition session identifier***) at the user equipment. Further, Widegren expressly teaches that the session identifier is "received from SIP signaling … at session level/SIP entities in the network and at the mobile terminal." EX1005, ¶186. In my opinion, a POSITA would have understood that if the session identifier is generated at the user equipment, then the session identifier would have to be provided to the other SIP entities in the network as part of the multimedia session initiation request. That is necessarily true because subsequent steps of the multimedia session initiation process include, for example, storing the session identifier at the P-CSCF. EX1005, ¶186. In addition, where the multimedia session includes two UEs (*e.g.*, UE-A and UE-B in Fig. 26), the receiving UE must receive the session identifier so that it can

be used to generate media binding information for each media stream. EX1005, ¶¶193-194.

4. Claim 3: The method according to claim 2, wherein the request for initiating the composition session further comprises one or more session identifiers and, optionally, resource reservation information and/or resource allocation information associated with the one or more sessions identified by the session identifiers.

109. **The request for initiating the composition session further comprises one or more session identifiers**: As I explained with respect to Limitation 1a, Widegren discloses that the "session signaling" for initiating the multimedia session (***composition session***) "may employ … session initiation protocol (SIP) with a message portion that uses session description protocol (SDP)." EX1005, ¶70. The SDP message describes each media stream to be included in the session. *Id.*, ¶63. For example, "[t]he SIP INVITE message used to set up a multimedia session includes SDP that describes the media for the session." *Id.*, ¶123. The SDP description would then include a separate description of each media stream (***associated session***) to be associated with the multimedia session, provided as several lines in the SDP description beginning with "m=". *Id.*, ¶¶145-163. Widegren discloses that a "media flow identifier" (***session identifier***), used to uniquely identify each media stream in the MBI, may be determined by "number[ing] the 'm=' lines of the media streams in increasing order." *Id.*, ¶184; *see also id.*, ¶121 ("The media stream identifier may be formed by its position in the

SDP messages, for example, by assigning a consecutive number to the media streams in the SDP message."). The media flow identifiers would thus be included in the SIP INVITE message requesting initiation of the multimedia session, as the ordered sequence of "m=" lines in the SDP.

110. **Optionally, resource reservation information and/or resource allocation information associated with the one or more sessions identified by the session identifiers**: I understand that this element is not limiting, as it may only be "optionally" included. Nevertheless, Widegren discloses that the multimedia session initiation request includes at least ***resource allocation information associated with the one or more sessions identified by the session identifiers***. For example, Widegren discloses that the SDP message portion of the request (which, as above, provides the media flow identifiers) "contains sufficient information about the session," including at least resource allocation information such as "bandwidth requirements." EX1005, ¶111.

5. Claim 4: The method according to claim 1, wherein providing the composition identifier comprises: sending a request for initiating the composition session from the user equipment to the network element; the network element generating the composition session identifier in response to the receipt of the request for initiating the composition session; and the network element sending the composition session identifier to the user equipment.

111. As I explained above for Limitation 2a, Widegren discloses that the session identifier/authorization token (***composition session identifier***) is "received

from SIP signaling … at session level/SIP entities in the network and at the mobile terminal." EX1005, ¶186.

112. Widegren expressly discloses examples where the session identifier is provided as recited in claim 4. For example, a ***user equipment*** (*e.g.*, UE-A) may "request[] a multimedia session … in the form of an SIP/SDP message" (*i.e.*, ***send a request for initiating the composition session***). EX1005, ¶111. The request is received by the Proxy-Call State Control Function (P-CSCF) and the Policy Control Function (PCF) of the multimedia system (*i.e.*, ***network element***). *Id.* The PCF then "generates an authorization 'token' for the session (session identifier)" (*i.e.*, ***generates the composition session identifier in response to the receipt of the request***). *Id.* The PCF then "sends [the session identifier] to UE-A and UE-B" (*i.e.*, ***sends the composition session identifier to the user equipment***). *Id.* This process is also illustrated in Fig. 26 (reproduced and annotated below).[5]

[5] As noted above for Limitation 1b, Fig. 26 illustrates an example where the session identifier is generated "locally" at each UE's local network, such that there are different session identifiers used with each UE. However, Widegren discloses that the session identifier may be generated "globally" for all elements in the session, in which case the same session identifier (*i.e.* ***composition session identifier***) would be provided from PCF-B to UE-B, and from PCF-A to UE-A.

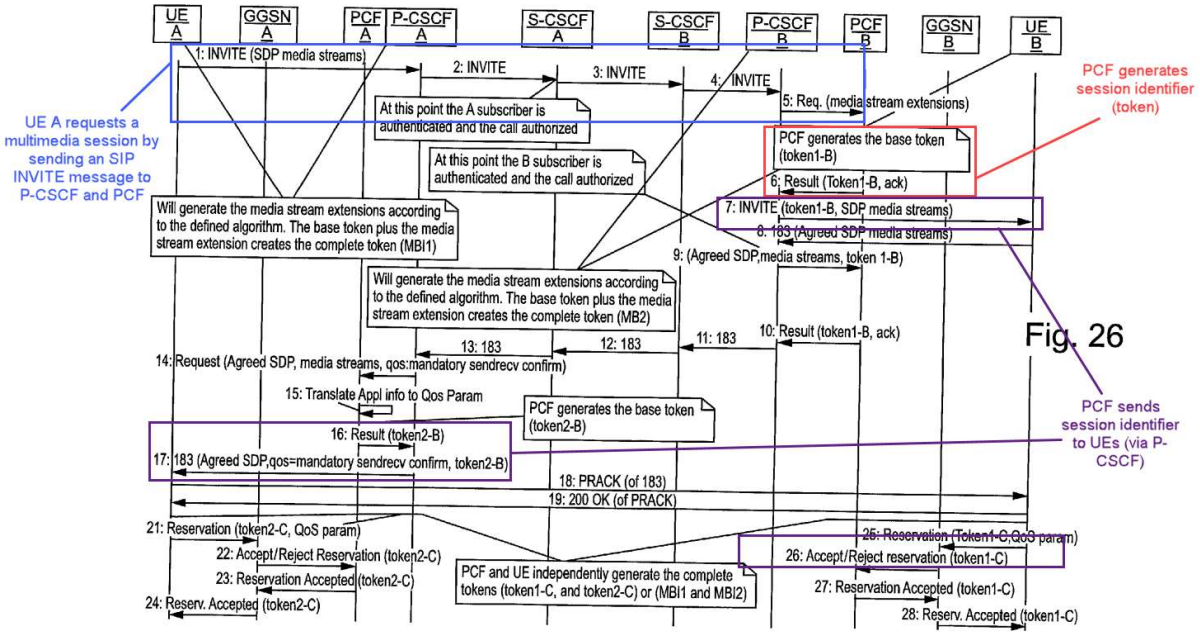


Fig. 26

6. **Claim 5: The method according to claim 4, wherein the request for initiating a composition session further comprises one or more session identifiers and, optionally, resource reservation information and/or resource allocation information associated with the one or more sessions identified by the session identifiers.**

113. This claim language is identical to Claim 3, and is disclosed by Widegren for the reasons I discuss above for Claim 3.

7. **Claim 6: The method according to claim 1, wherein the method further comprises: the user equipment initiating the two or more associated sessions by sending two or more session initiation requests for a session to the network element, each request comprising the composition session identifier.**

114. **The user equipment initiating the two or more associated sessions by sending two or more session initiation requests for a session to the network element:** Widegren discloses that a multimedia session may have two or more

media streams (***associated sessions***). For example, Widegren discloses that a multimedia session includes "a plurality of media data streams." EX1005, ¶107. In the example shown in Figure 19 (reproduced below), two media streams (orange) are associated with the multimedia session (yellow).

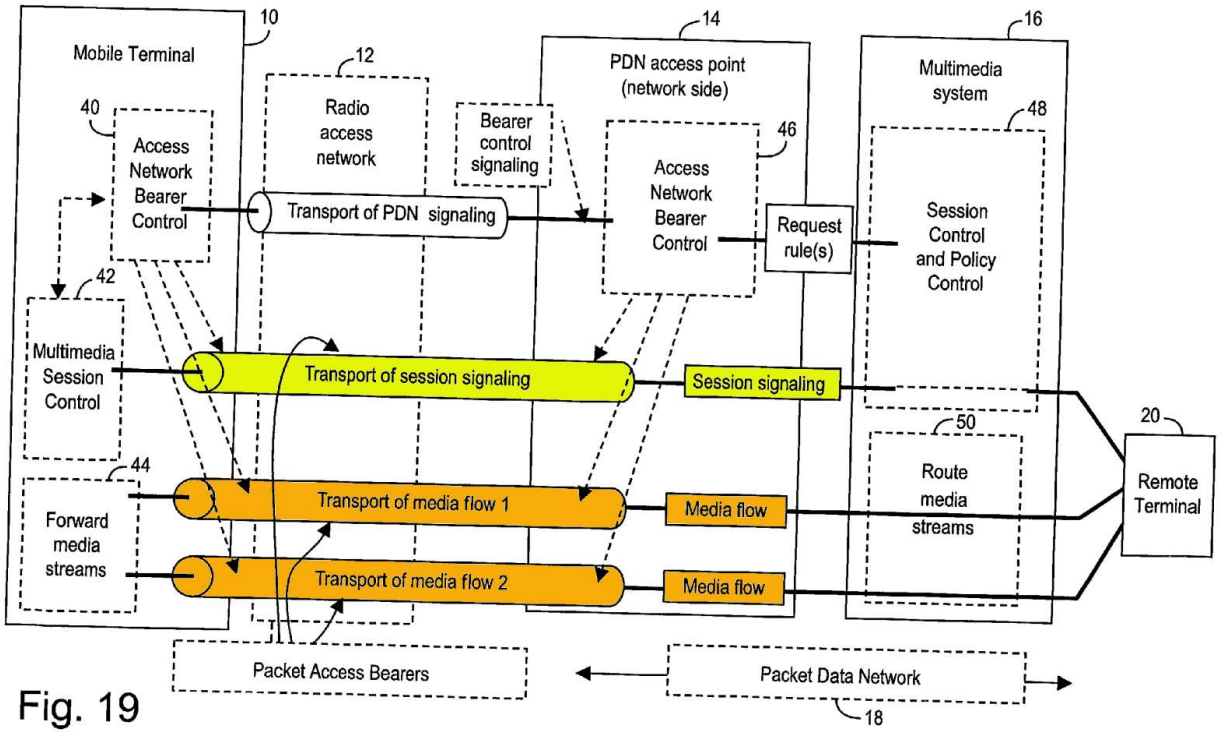


Fig. 19

115. Widegren further discloses that each of the media streams may be initiated by a separate ***request*** sent from the ***user equipment*** to the GGSN and PCF of the multimedia system (***network element***). For example, as illustrated in Figure 26 (reproduced and annotated below), a "reservation" request is sent from each UE to its corresponding GGSN, and forwarded to the corresponding PCF (signals 21-28), comprising media binding information. EX1005, ¶194. The reservation procedure uses the media binding information to perform "PDP context

activation/creation" (***session initiation request***), which initiates each media stream, establishes a corresponding logical link over the network, and associates it with the multimedia session. *Id.*, ¶¶194 (a "complete local token … which correspond to media binding information" is "employed in the GPRS quality of service reservation procedures," which include "PDP context activation/creation"), 108 ("The media binding information is included in packet access bearer setup signaling for each media flow packet access bearer established for the session between the mobile terminal 10 and the access point 14."), 21 ("PDP attach procedure" is used to "establish a logical link" to a network resource, including establishing a "PDP context … between the mobile host and a GGSN," and establishes an "application flow" over the PDP context), 23 ("network resources are managed on a per PDP context level, which corresponds to one or more user flows/data streams"), 67 ("PDP context activation … link[s] [*i.e.*, ***associates***] each of plural media PDP contexts/data streams to a multimedia session"). "One MBI [corresponding to one media stream] may be included per PDP context." *Id.*, ¶112. Thus, for two or more media streams, ***at least two*** PDP context activation/creation requests will be sent—one for each media stream/MBI.

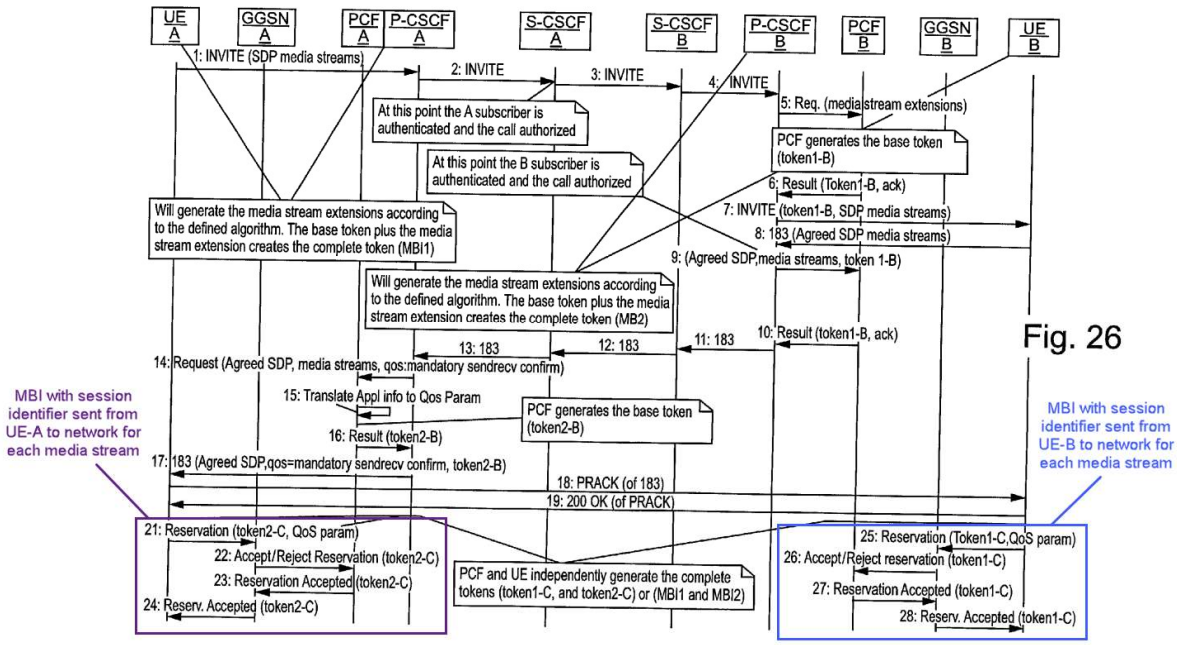


Fig. 26

116. In addition, as I have discussed above with respect to Limitation 1b, Widegren discloses that additional reservation requests (PDP context activation/creation requests) for each media stream will be sent by a second UE to its corresponding GGSN and PCF when two or more UEs are part of the multimedia session. *Id.*, ¶¶67, 112, 194, Fig. 26.

117. **Each request comprising the composition session identifier:** As I explained with respect to Limitation 1b, the session identifier/authorization token (***composition session identifier***) is included in the MBI used for reservation signaling (PDP context activation/creation requests). EX1005, ¶¶186 (describing generating the MBI for each media stream by combining the "session ID/authorization token … with each media stream identifier"), 194 ("The complete local tokens [corresponding to the media binding information] are employed in the

GPRS quality of service reservation procedures (PDP context activation/creation) shown in signals 21-28 binding the media streams to their corresponding GPRS bearers."); *see also id.*, ¶¶108, 120, 133, 164, 184, Fig. 26. Thus, each PDP context activation/creation request, which includes the MBI, will comprise the session identifier.

8. Claim 8: The method according to claim 1, wherein the method further comprises: the network element initiating the two or more associated sessions by sending two or more requests for a session to the user equipment, each request comprising the composition session identifier.

118. As described for Claim 6, Widegren discloses initiating two or more media streams (***associated sessions***) by sending two or more PDP context activation/creation requests (***requests for a session***), each of which comprises the session identifier/authorization token (***composition session identifier***).

119. In my opinion, it would have been obvious to a POSITA to generate the requests at the network element and send them to the user equipment because that is one of two predictable options for initiating a session (*i.e.*, network element sends a request to user equipment, or user equipment sends a request to the network element). Furthermore, a POSITA would have understood that whether a particular function (in this case, sending a request to initiate a media stream) is performed at the user equipment (*e.g.*, a mobile terminal) or at a remote network element or third-party server is a simple design choice. A POSITA would have been aware of all

three options, and all would have been well within the skill of a POSITA, and could have been implemented by a POSITA with predictable results.

9. Claim 14: A non-transitory computer readable medium having stored thereon software instructions that, if executed by a user equipment or a network element, cause the user equipment or the network element to perform operations comprising the method according to claim 1.

120. Widegren discloses that all of its disclosed functions "may be implemented using … software functioning in conjunction with a suitably programmed digital microprocessor or general purpose computer." EX1005, ¶101. In my opinion, a POSITA would have thus understood that the method recited in claim 1 may be implemented as software instructions executed by a user equipment or network element.

10. Claim 15

(c) 15pre: A system for managing associated sessions in a network, the system comprising:

121. This Limitation includes similar claim language as Limitation 1pre, and, to the extent limiting here, is disclosed by Widegren for the reasons I discuss above for that limitation. *See* Limitation 1pre (discussion of "a method for managing associated sessions in a network"). To the extent there are any differences in the language of the two limitations, I considered these differences in my analysis, but ultimately relied on the same evidence and reached the same conclusions with respect to both limitations.

(d) 15a: a network element; and

122. This limitation is identical to language in Limitation 1pre, and is disclosed by Widegren for the reasons I discuss above for that limitation. *See* Limitation 1pre (discussion of "the network having a network element").

(e) 15b: a user equipment,

123. This limitation is identical to language in Limitation 1pre, and is disclosed by Widegren for the reasons I discuss above for that limitation. *See* Limitation 1pre (discussion of "the network having … at least one user equipment").

(f) 15c(i): wherein the network element is configured to (i) manage sessions between the network element and the user equipment,

124. This limitation is substantially the same as language in Limitation 1pre, and is disclosed by Widegren for the reasons I discuss above for that limitation. *See* Limitation 1pre (discussion of "configured for managing associated sessions"). To the extent there are any differences in the language of the two limitations, I considered these differences in my analysis, but ultimately relied on the same evidence and reached the same conclusions with respect to both limitations.

(g) 15c(ii): (ii) exchange a composition session identifier with the user equipment a first time, and

125. This limitation is substantially the same as Limitation 1b, and is disclosed by Widegren for the reasons I discuss above for that limitation. To the extent there are any differences in the language of the two limitations, I considered

these differences in my analysis, but ultimately relied on the same evidence and reached the same conclusions with respect to both limitations. *See* Limitation 1b.

(h) 15c(iii): (iii) associate two or more sessions with the composition session identifier by exchanging the composition session identifier at least a second time, wherein exchanging the composition session identifier at least a second time comprises the network element exchanging the composition session identifier with either the user equipment or a second user equipment different from the user equipment,

126. This limitation is substantially the same as Limitation 1c, and is disclosed by Widegren for the reasons I discuss above for that limitation. To the extent there are any differences in the language of the two limitations, I considered these differences in my analysis, but ultimately relied on the same evidence and reached the same conclusions with respect to both limitations. *See* Limitation 1c.

(i) 15d(i): wherein the user equipment is configured to (i) provide the composition session identifier and

127. This limitation is substantially the same as Limitation 1a, and is disclosed by Widegren for the reasons I discuss above for that limitation. To the extent there are any differences in the language of the two limitations, I considered these differences in my analysis, but ultimately relied on the same evidence and reached the same conclusions with respect to both limitations. *See* Limitation 1a.

(j) 15d(ii): (ii) after providing the composition identifier, exchange the composition session identifier with the network element, and

128. This limitation is substantially the same as Limitation 1b, and is disclosed by Widegren for the reasons I discuss above for that limitation. To the extent there are any differences in the language of the two limitations, I considered these differences in my analysis, but ultimately relied on the same evidence and reached the same conclusions with respect to both limitations. *See* Limitation 1b.

(k) 15e: at least one of the network element or the user equipment is configured to initiate a composition session, the composition session being a signaling session for facilitating management of the two or more sessions and exchanging the composition session identifier between the user equipment and the network element, the composition session being different from the two or more associated sessions, and

129. This limitation is substantially the same as Limitation 1d, and is disclosed by Widegren for the reasons I discuss above for that limitation. To the extent there are any differences in the language of the two limitations, I considered these differences in my analysis, but ultimately relied on the same evidence and reached the same conclusions with respect to both limitations. *See* Limitation 1d.

(l) 15f: wherein the network element is configured to modify the composition session using signaling in the

composition session to terminate all of the two or more sessions.

130. This limitation is substantially the same as Limitation 1e, and is disclosed by or rendered obvious by Widegren in view of Widegren-793 for the reasons I discuss above for that limitation. To the extent there are any differences in the language of the two limitations, I considered these differences in my analysis, but ultimately relied on the same evidence and reached the same conclusions with respect to both limitations. *See* Limitation 1e.

11. Claim 16

(m) 16a: The user equipment of claim 15, wherein the user equipment comprises: an ID generator for generating the composition session identifier; and

131. As I explained with respect to in Limitation 2a, it would have been obvious to a POSITA to generate Widegren's session identifier (***composition session identifier***) at the user equipment. A POSITA would have understood that in the modified system, the user equipment would necessarily include software or hardware for generating the session identifier (*i.e.*, an ***ID generator***). For example, Widegren discloses that the UE (***user equipment***) may "generate a media stream identifier using a predetermined algorithm or procedure." EX1005, ¶120. In my opinion, a POSITA would have understood that a similar "predetermined algorithm or procedure" would be utilized to generate a session identifier in the modified system. The '669 patent provides no detail or limitation regarding the structure of

the ID generator, except that it used to generate a composition session identifier. *See* EX1001, 6:10-34.

(n) 16b: a multimedia client configured to (i) receive the composition session identifier from the ID generator, (ii) exchange the composition session identifier with the network element, (iii) initiate one or more multimedia sessions with the network element, and (iv) exchange the composition session identifier with the network element during set up of the multimedia sessions.

132. **A multimedia client:** The '669 patent provides no detail or limitation regarding the structure of the multimedia client, except that it is used to perform the claimed functions (*i.e.*, receiving the composition session identifier, exchanging the composition session identifier with the network element, initiating one or more multimedia sessions, and exchanging the composition session identifier with the network element during set up of the multimedia sessions). *See* EX1001, 6:10-21. As detailed below, Widegren discloses or renders obvious a user equipment that performs each of the recited functions. Further, Widegren expressly discloses a mobile terminal (***user equipment***) that includes a "Multimedia Session Control" block (***multimedia client***) that "correlates each multimedia flow and its corresponding quality of service requirements with the session to establish necessary admission and policy enforcement rules for the session." EX1005, ¶107, Fig. 19. In my opinion, a POSITA would have understood that the steps recited in Limitation 16b are performed by Widegren's Multimedia Session Control block.

133. **Receive the composition session identifier from the ID generator:** Widegren discloses that the Multimedia Session Control block engages in "Session signaling" with the "Multimedia system." EX1005, Fig. 19. Widegren further discloses that "session signaling" is used to initiate a "multimedia session with plural media data streams … between the mobile terminal and remote host." *Id.*, ¶68. "The session identifier [***composition session identifier***] is carried in the session signaling," and thus would be received by the Multimedia Session Control. *Id.*, ¶71.

134. As discussed for Limitation 16a, it would have been obvious to a POSITA to generate the session identifier at the user equipment using an ID generator. In my opinion, a POSITA would have understood that in the modified system, the Multimedia Session Control block would still receive the session identifier, because the session identifier is used in session signaling to establish the multimedia session and associated media streams. *See also* Limitation 1d.

135. **Exchange the composition session identifier with the network element:** As discussed for Limitation 2b, Widegren discloses that session signaling between the user equipment and the multimedia system (***network element***) is used to establish a multimedia session. EX1005, ¶¶111 ("UE-A ***requests a multimedia session*** with the SIP UA remote UE-B over the session signaling GPRS bearer via the RAN 90, ***the GPRS network 92, the IP multimedia subsystem 82, the IP backbone network 84, and UE-B's home cellular network 86***."), 188 ("The UE-A

initiates the multimedia session with an INVITE command, which is sent over a session signaling bearer to the GGSN and forwarded by the GGSN to the multimedia system."), 192, Fig. 26.

136. As further discussed in Limitation 2b, it would have been obvious to a POSITA to generate the session identifier (***composition session identifier***) at the user equipment. In my opinion, a POSITA would have understood that if the session identifier is generated at the user equipment, then the session identifier would have to be provided to (***exchanged with***) the other SIP entities in the network as part of the multimedia session initiation request. *See also* EX1005, ¶¶186, 193-194.

137. **Initiate one or more multimedia sessions with the network element:** As discussed in Claim 6, Widegren discloses that the user equipment initiates media streams (***multimedia sessions***) with the multimedia system, and in particular, the PCF (***network element***). *See* Claim 6; EX1005, ¶¶21, 23, 67, 108, 112, 194, Fig. 26. In my opinion, a POSITA would have understood that the Multimedia Session Control initiates the media streams because it "correlates each multimedia flow and its corresponding quality of service requirements with the session," which is performed as part of the PDP context activation/creation request for initiating a media stream. EX1005, ¶67 ("PDP context activation … link[s] each of plural media PDP contexts/data streams to a multimedia session").

138. **Exchange the composition session identifier with the network element during set up of the multimedia sessions:** As I explained with respect to Claim 6, the session identifier/authorization token (***composition session identifier***) is sent to (***exchanged with***) the GGSN and PCF (***network elements***), included in the MBI, which is provided as part of reservation signaling (PDP context activation/creation requests) that sets up each media stream (***multimedia session***). *See* Claim 6; EX1005, ¶¶186, 194, Fig. 26. As I noted in the preceding paragraph, the Multimedia Session Control performs this process.

12. Claim 17: The user equipment according to claim 16, wherein the user equipment is configured to initiate the composition session.

139. This limitation is substantially the same as language in Limitation 2b, and is disclosed by or rendered obvious by Widegren for the reasons I discuss above for that limitation. To the extent there are any differences in the language of the two limitations, I considered these differences in my analysis, but ultimately relied on the same evidence and reached the same conclusions with respect to both limitations. *See* Limitation 2b.

13. Claim 18

(o) 18a: The network element of claim 15, wherein the network element comprises: a session manager configured to exchange the composition session

identifier with the user equipment and to set up and modify multimedia sessions; and

140. Widegren discloses a multimedia system (*e.g.*, an IP Multimedia Subsystem) (***network element***) that includes a Policy Control Function (PCF) block (***session manager***). *E.g.*, EX1005, ¶110, Fig 21. The PCF is configured to generate the session identifier/authorization token (***composition session identifier***) and send (***exchange***) it to the user equipment. *See* Limitation 1b; EX1005, ¶111, 120, 133, 164, 186, 193, Fig. 22, Fig. 26. The PCF is also configured to set up and modify multimedia sessions in response to PDP context activation/creation requests and PDP context modification messages. *See* Claim 6; EX1005, ¶¶21, 23, 67, 108, 194, Fig. 26; *see also* EX1005, ¶¶112-113 (separately discussing PDP context modification messages).

(p) 18b: storage configured to store composition session information, the composition session information comprising information regarding composition session identifiers and the two or more associated sessions.

141. Widegren discloses that the multimedia system (***network element***) stores "the session identifier" and "session-related data" (***information regarding composition session identifiers***), and "media-related information" (***information regarding the two or more associated sessions***) for requested sessions. EX1005, ¶108, Fig. 20; *see also id.* ¶¶188 (P-CSCF stores "a session ID" and "SDP information relating to each of the medias being requested for the session"). In my

opinion, a POSITA would have understood that Widegren's multimedia system must include storage in order to store this information.

14. Claim 19: The network element according to claim 18, further configured for at least one of initiating, terminating or modifying the composition session.

142. As discussed above for Limitation 1e, Widegren discloses modifying the composition session, and Widegren in view of Widegren-793 renders obvious terminating the composition session. *See* Limitation 1e.

15. Claim 20: The network element according to claim 18, the network element further comprising: an ID generator configured to generate the composition session identifier.

143. This limitation is substantially the same as language in Claim 4, and is disclosed by Widegren for the reasons I discuss above for that limitation. To the extent there are any differences in the language of the two limitations, I considered these differences in my analysis, but ultimately relied on the same evidence and reached the same conclusions with respect to both limitations. *See* Claim 4.

16. Claim 21

(q) 21pre-21d:

144. Limitations 21pre through 21d are identical to Limitations 1pre through 1d, and are therefore disclosed by Widegren for the reasons I discuss above for those limitations. *See* identical Limitations 1pre-1d, respectively.

(r) 21e: modifying, using signaling in the composition session, all of the two or more sessions.

145. This limitation is substantially the same as language in Limitation 1e, and is disclosed by or rendered obvious by Widegren in view of Widegren-793 for the reasons I discuss above for that limitation. To the extent there are any differences in the language of the two limitations, I considered these differences in my analysis, but ultimately relied on the same evidence and reached the same conclusions with respect to both limitations. *See* Limitation 1e.

B. <u>Ground 2:</u> Claims 7, 9, are Rendered Obvious by Widegren in view of Widegren-793, in Further View of ETSI TS 183 063

146. As I explained in Ground 1 above, Widegren discloses a multimedia session comprising a plurality of associated media streams for use in an IP Multimedia Subsystem, and in view of Widegren-793, discloses every limitation of the challenged independent claims. Additionally, ETSI TS 183 063, discussed above in Section VI.D, discloses an IP television (IPTV) service and associated protocols and enhancements, based on an IMS architecture, which supports services such as broadcast, content on-demand, and network-side personal video recorder services.

147. Below, I explain that, in my opinion, a POSITA would have been motivated to combine Widegren's multimedia sessions and session-level controls with the particular IPTV services disclosed by ETSI TS 183 063 to create an improved IPTV delivery system, rendering claims 7 and 9 obvious.

1. Motivation to Combine and Reasonable Expectation of Success

148. In my opinion, a POSITA would have been motivated to combine Widegren/Widegren-793's multimedia sessions with ETSI TS 183 063's Internet Protocol television ("IPTV") services based on an IMS architecture. IPTV is a service that delivers television broadcasts over IP networks.

149. First, Widegren expressly teaches that its invention may be used for video applications, such as "streaming services (audio or video)," and would thus be particularly suitable for implementing IPTV functionality as disclosed by ETSI TS 183 063. EX1005, ¶4; *see also id.*, ¶5 (describing communication with an "application server 103, which may be configured as a video server"). Based on this teaching, a POSITA would be motivated to consider how an IPTV service could be implemented on top of Widegren system and services. As such, a POSITA would be motivated to look at references that provide an architecture to support, for example, IPTV services. One such reference a POSITA could turn to would be ETSI TS 183-063. A POSITA would have been particularly motivated to consider ETSI TS 183 063 in combination given its use of IMS and SIP, for example.

150. Second, ETSI TS 183 063 expressly discloses building IPTV services, including broadcast, contend on-demand, and network personal video services, on an IMS architecture, *e.g.*, the IMS architecture disclosed by Widegren and Widegren-793. EX1008, 10, 14. In my opinion, a POSITA would thus be motivated

to apply ETSI TS 183 063's teachings to provide additional functionality in the form of IPTV services in a standardized IMS system such as Widegren's. A POSITA would be further motivated by consumer demand for IPTV services, which are often cheaper than other television services (such as satellite or cable). *Id.*

151. Third, Widegren, Widegren-793, and ETSI TS 183 063 all build on the same underlying technology, *i.e.*, IP Multimedia Subsystems using IP application signaling, namely, Session Initiation Protocol. EX1005, ¶63; EX1006, 9:18-24; EX1008, 10, 14, 17-37.

152. In my opinion, a POSITA would have reasonably expected the combination to succeed. As the '669 patent, Widegren, Widegren-793, and ETSI TS 183 063 all recognize, IP Multimedia Subsystems and Session Initiation Protocol were well known, standardized technologies well before the date of the '669 patent, and would have been familiar to a POSITA. Further, ETSI TS 183 063 expressly contemplates providing IPTV services using an IMS architecture such as Widegren's. Accordingly, applying and combining techniques using these well-known standardized technologies would have been well within the capabilities of a POSITA, and would have required nothing more than the application of known techniques to improve similar devices in a predictable way.

153. Finally, Widegren, Widegren-793, and ETSI TS 183 063 are analogous art to the '669 patent because all four are directed to managing sessions in a network,

and in particular, in an IP Multimedia Subsystems using Session Initiation Protocol. EX1001, Abstract, 1:23-29; EX1005, Abstract, ¶63; EX1006, Abstract, 9:18-24; EX1008, 10 (describing "protocols and their possible enhancements to support IPTV services"), 14 (describing "functional architecture" for an "IMS-based IPTV service"), 17-47 (disclosing the use of "the SIP/SDP protocol" to implement "IMS-based IPTV" services). Therefore, a POSITA confronted with Widegren would have also been aware of Widegren-793 and ETSI TS 183 063.

2. Claims 7 / 9: The method according to claim [6 / 8], wherein the two or more associated sessions comprise at least one of a broadcast (BC) session associated with a BC identifier (BCServiceID), a content-on-demand (CoD) session associated with a CoD identifier (CoDID), a Targeted Advertisement Insertion (TAI) session associated with a TAI identifier, network personal video content (NPVC) session associated with a NPVR identifier (NPVRContentID), a user generated content (UGC) session associated with a UGC identifier, a Public Switched Telecommunications Network (PSTN) emulation session associated with a PSTN emulation identifier, or a shared content (SC) session associated with a SC identifier.

154. Widegren discloses that its multimedia sessions may be used in IP networks that support applications such as "real time applications (IP Telephony, video conferencing), streaming services (audio or video), or high quality data services (browsing with unbounded download delays)." EX1005, ¶4.

155. In my opinion, it would have been obvious to a POSITA to include the claimed functionality in Widegren's system in view of ETSI TS 183 063. ETSI TS

183 063 discloses "protocols and their possible enhancements to support IPTV services." EX1008, 10. In particular, ETSI TS 183 063's IPTV service is implemented on an IMS architecture. *Id.*, 14.

156. ETSI TS 183 063 expressly discloses that the IPTV services may include ***broadcast sessions, content-on-demand sessions, and network personal video sessions***. EX1008, 13-14 (defining abbreviations "BC – BroadCast", "CoD – Content On Demand", and "nPVR – network-side Personal Video Recorder"), 19-20 (disclosing procedures for "BC session initiation"), 22-23 (disclosing procedures for "COD session initiation"), 31 (disclosing procedures for "NPVR Session"). Each service has an associated ID, including a ***BCServiceId*** for broadcast services, a ***CoDId*** for content on demand services, and an ***NPVRContentId*** for network personal video recording services. *Id.*, 20 (session initiation messaging for broadcast service includes "[a]n a=bc_service:***BCServiceId*** line to indicate the BC service which the UE intends to join first"), 53 (describing "contend identified by a ***CoDId***), 31 (NPVR session procedures require "[t]he user part of the 'Request-URI' parameter shall contain the ***NPVRContentId***"); *see also id.*, 88 (Table D.1, showing data associated with each service type, including BCServiceId for IPTV BC service, CoDId for IPTV COD service, and NPVRContentId for IPTV NPVR service).

157. In my opinion, a POSITA would have been motivated to add IPTV services as described by ETSI TS 183 063 to Widegren's IMS architecture, and

would have reasonably expected the combination to succeed, for the reasons provided in Section VII.B.1 above.

C. <u>Ground 3:</u> Claims 13 and 23 are Rendered Obvious by Widegren in view of Widegren-793, and in further view of Astrom

158. As discussed in Ground 1 above, Widegren discloses a multimedia session comprising a plurality of associated media streams for use in an IP Multimedia Subsystem, and in view of Widegren-793, discloses every limitation of the independent claims. Astrom discloses an IPTV system built atop an IMS architecture using SIP signaling. Astrom further discloses details regarding the architecture and functionality of IPTV and IMS, including pausing an IPTV broadcast when an incoming call is received at the user equipment. In the combined system, Astrom's IPTV data stream pausing functionality would be applied as a session level control to Widegren's multimedia session to enable selectively pausing data streams of associated sessions.

159. As I explain below, in my opinion a POSITA would have been motivated to combine Widegren's multimedia sessions and session-level controls with Astrom's IMS architecture and data stream pausing functionality, rendering claims 13 and 23 obvious.

1. Motivation to Combine and Reasonable Expectation of Success

160. In my opinion, a POSITA would have been motivated to combine Widegren/Widegren-793's multimedia sessions with Astrom's IPTV system and associated IMS architecture.

161. First, Widegren expressly teaches that its invention may be used for video applications, such as "streaming services (audio or video)," and would thus be particularly suitable for implementing IPTV functionality as disclosed by Astrom. EX1005, ¶4; *see also id.*, ¶5 (describing communication with an "application server 103, which may be configured as a video server"). A POSITA would be further motivated by consumer demand for IPTV services, which are often cheaper than other television services (such as satellite or cable). In particular, a POSITA would have been motivated to add a pause capability as disclosed in Astrom to an IPTV functionality implemented on Widegren's IMS architecture because pause is one of the standard user control functions in video streaming (along with other basic functions such as rewind and fast forward). Widegren's "pause" capability would thus be one of the most obvious functions to include in Widegren to provide better user control.

162. Second, Astrom expressly teaches that IPTV is a "popular choice" for "telecommunication operators," and provides improved functionality for IPTV solutions "utiliz[ing] the standardized IMS communication system and its network

architecture." EX1007, 2:7-29. In my opinion, a POSITA would thus be motivated to apply Astrom's teachings to provide improved IPTV functionality in a standardized IMS system such as Widegren's.

163. Third, in my opinion, a POSITA would have been specifically motivated to apply Astrom's teachings regarding IPTV stream management as session-level controls in Widegren's system. Widegren expressly teaches that session-level control of media streams "ensures control of the end-to-end QoS" for multimedia services "and enhanced interworking between GPRS/UMTS and other networks." EX1005, ¶196. Widegren further discloses that session level signaling "is particularly useful when the terminal accesses the network over a radio interface" (*e.g.*, a mobile telecommunications network "because scarce radio resources are saved." *Id.*, ¶197.

164. Fourth, Widegren, Widegren-793, and Astrom are all references assigned to Ericsson, and directed to related improvements in IP multimedia services, particularly as part of telecommunication services. Therefore, a POSITA confronted with Widegren would have been motivated to look to the teachings of Widegren-793 and Astrom. For example, both Widegren and Widegren-793 are directed to improved quality-of-service in IP multimedia subsystems built on telecommunication networks such as UMTS and GRPS. EX1005, ¶3 ("The present invention generally relates to … coordinating Quality of Service (QoS) provisioning

mechanisms in IP networks with multimedia applications."), ¶5 ("Of particular interest to this invention is the specific case where at least one of the access networks is a UMTS or GSM/GPRS network."); EX1006, 11:33-37 ("The present invention … employ[s] policy mechanisms ... to provide policy driven filtering and gating of data flow over a QoS connection in a packet data network, such as a UMTS/GPRS network."); EX1007, 1:21-25 ("IP Multimedia Subsystem (IMS) is the technology defined by the Third Generation Partnership Project (3GPP) to provide IP Multimedia services over mobile communication networks."). In addition, all three references build on the same underlying technology, *i.e.*, IP Multimedia Subsystems built on a GPRS bearer service and using IP application signaling, namely, Session Initiation Protocol. EX1005, ¶63; EX1006, 9:18-24; EX1007, 1:21-2:2.

165. In my opinion, a POSITA would have reasonably expected the combination to succeed. As the '669 patent, Widegren, Widegren-793, and Astrom all recognize, IP Multimedia Subsystems and Session Initiation Protocol were well known, standardized technologies well before the date of the '669 patent, and would have been familiar to a POSITA. In my opinion, applying and combining techniques using these well-known standardized technologies would have been well within the capabilities of a POSITA, and would have required nothing more than the application of known techniques to improve similar devices in a predictable way.

166. Finally, Widegren, Widegren-793, and Astrom are analogous art to the '669 patent because all four are directed to managing sessions in a network, and in particular, in an IP Multimedia Subsystems using Session Initiation Protocol. EX1001, Abstract, 1:23-29; EX1005, Abstract, ¶63; EX1006, Abstract, 9:18-24; EX1007, Abstract (describing an "IPTV System" that "utilizes the standardized IMS communication system"), 1:21-2:2 (discussing IMS and SIP). Therefore, a POSITA confronted with Widegren would have also been aware of Widegren-793 and Astrom.

2. Claim 13: The method according to claim 1, wherein the network is an IP Multimedia Subsystem (IMS) network comprising an IMS core connected to a Service Control Function (SCF), wherein the SCF is configured for managing associated sessions between the network and the User Equipment, wherein the network element is the SCF.

167. **Wherein the network is an IP Multimedia Subsystem (IMS) network:** Widegren expressly discloses using its invention in a network including an "IP multimedia subsystem" network. EX1005, ¶109. In addition, the network elements that establish and manage the multimedia session (in particular, the PCF and P-CSCF) are part of the IMS network. *Id.*, Fig. 21 (reproduced and annotated below).

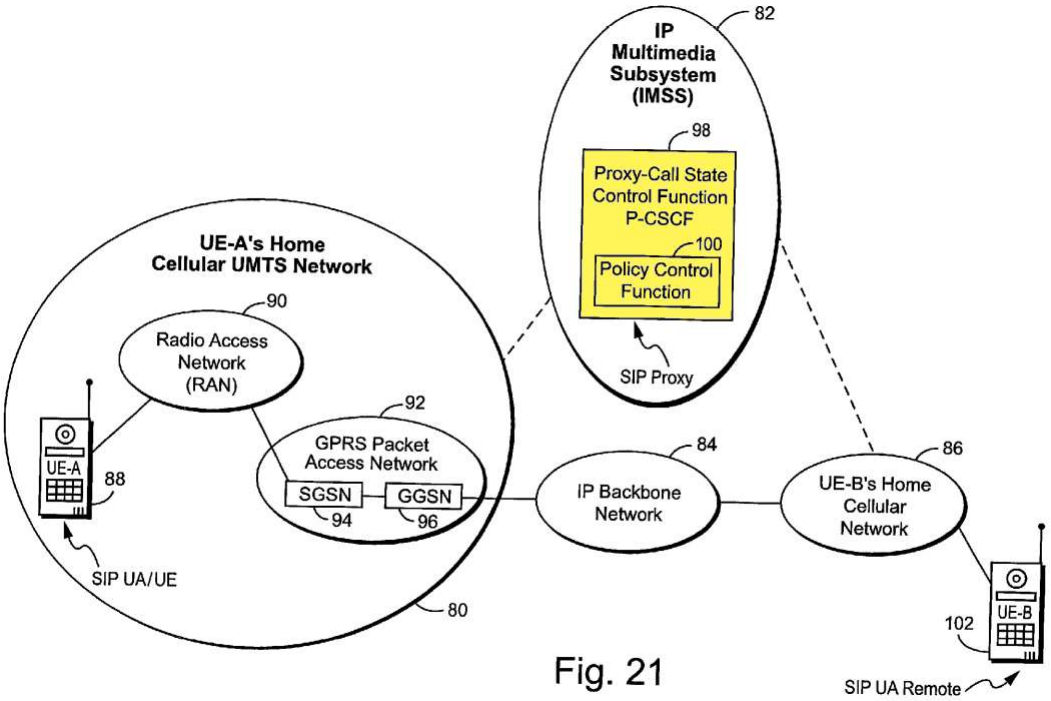


Fig. 21

168. **Comprising an IMS core**: The '669 patent describes an IMS core as comprising "a set of Call/Session Control Functions (CSCF)," which include "a Proxy-CSCF (P-CSCF), an Interrogating-CSCF (I-CSCF) and an Serving-CSCF (S-CSCF)." EX1001, 7:2-6. A POSITA would have understood that Widegren's IMS network includes the IMS core components because they are standardized elements defined in and required by the applicable 3GPP standards. *See* EX1007, 6:8-17 ("Call/Session Control Functions (CSCFs) operate as SIP proxies within the IMS. The 3GPP architecture defines three types of CSCFs: the Proxy CSCF (P-CSCF) which is the first point of contact within the IMS for a SIP terminal; the Serving CSCF (S-CSCF) which provides services to the user that the user is subscribed to; and the Interrogating CSCF (I-CSCF) whose role is to identify the correct S-CSCF

and to forward to that S-CSCF a request received from a SIP terminal via a P-CSCF.").

169. Alternatively, it would have been obvious to a POSITA to include the standardized CSCFs comprising the IMS Core in Widegren's IMS network in view of Astrom, and a POSITA would have been motivated to do so in order to provide an IMS network compliant with 3GPP standards. Further, in my opinion a POSITA would have reasonably expected the combination to succeed since it merely involves the application of well-known elements defined and published in 3GPP standards.

170. **Connected to a Service Control Function (SCF):** The '669 patent describes the SCF as "IPTV service control functions … for controlling IPTV services in the network." EX1001, 7:7-9. "[A]pplication servers" may "compris[e] the SCFs." *Id.*, 7:39-42. Widegren expressly discloses communication with an "application server 103, which may be configured as a video server." EX1005, ¶5. Further, Widegren-793 discloses that the application server may be an SIP proxy server, working in conjunction with the PCF to apply policy controls to a data stream. EX1006, 11:37-42, 14:10-35, 15:1-4, 15:34-47. Thus, in my opinion the application server together with the PCF comprise an ***SCF***.

171. I understand that Patent Owner may argue that the SCF of the '669 patent must include an IPTV application server. However, in my opinion it would

have been obvious to add IPTV functionality, including an IPTV application server, to Widegren's system in view of Astrom.

172. Astrom expressly discloses an IMS network that includes an "IPTV Application Server (IPTV-AS)." EX1007, 3:4-16. In addition, Astrom discloses that the IPTV Application Server is connected to and communicates with the IMS core (*i.e.*, the three CSCFs). EX1007, Fig. 1 (illustrating communications between the IPTV AS, S-CSCF, I-CSCF, and P-CSCF), Fig. 5 (same for time-shift feature specifically).

173. In my opinion, a POSITA would have been motivated to add a IPTV functionality, including an IPTV Application Server, as suggested by Astrom, to Widegren's system, and would have reasonably expected the combination to succeed, for the reasons provided in Section VII.C.1 above.

174. **Wherein the SCF is configured for managing associated sessions between the network and the User Equipment**: As discussed for the prior limitation, Widegren and Widegren-793 disclose an SCF in the form of an SIP proxy (application server, and in the combined system, IPTV-AS) working together with the PCF. EX1006, 11:37-42, 14:10-35, 15:1-4, 15:34-47. In addition, the SIP proxy and PCF may together comprise the P-CSCF. *Id.*, Fig. 19. As I discussed in Ground 1, Widegren discloses that the P-CSCF and the PCF manage multimedia sessions

(***composition sessions***) and their associated media streams (***associated sessions***) between the network and the user equipment. *See* Ground 1, Claims 4, 18.

175. **Wherein the network element is the SCF**: As discussed in the preceding limitation, the SCF in the combined system of Widegren, Widegren-793, and Astrom is the P-CSCF, which includes the SIP proxy (application server) and PCF. Further, as described in Ground 1, the P-CSCF and PCF are the network element that manages media streams (***associated sessions***) between the network and the user equipment. *See* Ground 1, Limitation 1b, Claims 4, 18.

3. Claim 23: The method according to claim 21, wherein modifying the composition session, using the signaling in the composition session, comprises selectively pausing data streams of the two or more sessions in response to a detection of an incoming call destined for the user equipment.

176. Widegren discloses that its multimedia sessions may be used in IP networks that support applications such as "streaming services (audio or video)." EX1005, ¶4. In my opinion it would have been obvious to a POSITA to include the claimed functionality in Widegren's system in view of Astrom.

177. Astrom discloses a method of handling incoming calls in an IPTV system using an "Incoming Call Notification sequence with Time-Shift functionality." EX1007, 18:6-21:3. In this scenario, when an incoming call is received on the IPTV device, the user may accept the call and start a time-shift operation. *Id.*, 19:16-25. In response, the IPTV application server begins recording

the currently viewed television channel, and display of television content on the user's device is interrupted in order to accept the incoming call. *Id.*, 19:27-20:20. When the call completes, the user may resume viewing the time-shifted (recorded) content, and the application server delivers the recorded content to the user's device for playback. *Id.*, 20:22-21:22. The '669 patent states that in Astrom's solution, "a ***broadcast stream (channel) is paused upon receipt of an incoming call***." EX1001, 2:34-39. When combined with Widegren, in my opinion it would have been obvious to a POSITA to apply Astrom's pause functionality as a session level control, so that all data streams associated with a session may be collectively managed, consistent with Widegren's teachings.

178. A POSITA would have been motivated to add a data stream pause on received call functionality, as suggested by Astrom, to Widegren's system, implemented as a session-level control, and would have reasonably expected the combination to succeed, for the reasons provided in Section VII.C.1 above.

VIII. CONCLUSION

179. I hereby declare that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I further declare that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both,

under Section 1001 of the Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this proceeding.

Executed on this January 17, 2025 by:

Kevin C. Almeroth, Ph. D.