UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AFFINITY NETWORK, INC.
Petitioner,

v.

TELIAX TECHNOLOGY LLC,
Patent Owner.

U.S. Patent No. 9,807,249 B2
Case No. TBD

DECLARATION OF BENEDICT OCCHIOGROSSO IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,807,249 UNDER 35 U.S.C. §312 AND 37 C.F.R. §42.104

TABLE OF CONTENTS

Page

I. INTRODUCTION 1
II. BACKGROUND AND QUALIFICATIONS 1
III. MATERIALS REVIEWED 10
IV. UNDERSTANDING OF PATENT LAW 10
V. OVERVIEW OF OPINION 15
VI. THE '249 PATENT 17
A. Technology Overview And Overview Of The '249 Patent 17
B. The '249 Patent's Prosecution History 26
VII. PERSON OF ORDINARY SKILL IN THE ART 28
VIII. CLAIM CONSTRUCTION 28
IX. OVERVIEW OF THE PRIOR ART 29
A. Barghouthi (EX1005) 29
B. Breuer (EX1006) 31
C. Eng (EX1007) 35
D. Goode (EX1008) 36
X. OPINIONS ON UNPATENTABILITY OF THE CHALLENGED CLAIMS 37
A. Ground 1: Claims 1-4, 6-8 and 10-12 are Obvious over Barghouthi in view of Breuer 37
B. Ground 2: Claims 5 and 13 are Obvious over Barghouthi (EX1005) in view of Breuer (EX1006) and Eng (EX1007) 73
C. Ground 3: Claims 9 and 14-19 are Obvious over Barghouthi (EX 1005) in
view of Breuer (EX1006) and Goode (EX1008) 79
D. Ground 4: Claim 20 is Obvious over Barghouthi (EX1005) in view of Breuer (EX1006), Eng (EX1007), and Goode (EX1008) 100
XI. AVAILABILITY FOR CROSS-EXAMINATION 104
XII. RIGHT TO SUPPLEMENT 104
XIII. CONCLUSION 105

XIV. JURAT 106

Petitioner Affinity Network, Inc. - Ex. 1003, 0003

LIST OF EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 9,807,249
1002	File History for U.S. Patent No. 9,807,249
1003	Declaration of Mr. Benedict Occhiogrosso
1004	Curriculum Vitae of Mr. Benedict Occhiogrosso
1005	U.S. Patent No. 8,064,354 (“Barghouthi”)
1006	U.S. Patent No. 6,222,912 (“Breuer”)
1007	U.S. Patent No. 7,515,697 (“Eng”)
1008	U.S. Patent No. 8,130,662 (“Goode”)
1009	U.S. Patent No. 6,131,087 (“Luke”)

I, **BENEDICT OCCHIOGROSSO**, hereby declare as follows:

I. INTRODUCTION

1. I have been retained by Petitioner Affinity Network, Inc. ("Petitioner") to provide my opinion regarding whether Claims 1-20 ("Challenged Claims") of U.S. Patent No. 9,807,249 (Ex. 1001, the "'249 Patent") would have been obvious to a person of ordinary skill in the art at the time of the claimed invention of the '249 Patent, as part of the above-captioned petition for *Inter Partes* Review (IPR) of the '249 Patent.

2. I am being compensated for my time at my standard hourly consulting rate of $500 per hour. My compensation does not depend on the outcome of this proceeding or the opinions I form in relation to this proceeding.

3. In forming my opinions expressed in this declaration, I have relied on my extensive knowledge, training, and experience, as well as all of the materials cited herein.

II. BACKGROUND AND QUALIFICATIONS

4. My qualifications and publications can be found in my Curriculum Vitae ("CV"), which is Exhibit 1004 in this proceeding. My background and experience qualify me to offer the opinions as detailed in this Declaration and are described below.

5. I am a citizen of the United States, and presently reside at 1 Cedar Court, Perrineville, New Jersey 08535

6. I presently work as a consultant in the fields of telecommunications, security and information technology. My CV sets forth further details about my background.

7. A list of publications and a list of matters in which I have given deposition or trial testimony are included with my CV.

8. I provide herein a brief summary of my qualifications. A more complete listing of my qualifications may be found in my CV (*see* EX1004).

9. I hold a bachelor of science degree in electrical engineering and a master of science degree in electrical engineering, both from the Polytechnic Institute of Brooklyn (now part of New York University).

10. I have authored or co-authored nearly three dozen articles in peer-reviewed journals, conference proceedings, texts, industry trade publications, and monographs. These publications span a range of topics, including: telecommunications networking for voice and data, integrated voice-data communications/switching, integrated packet-circuit switching, voice digitization, packet voice, Internet of Things, indoor wireless distribution, disaster recovery and business continuity, data center engineering, switching processor architecture,

telephone and voice mail systems, PBX & LAN switching premises-based systems, and related technologies.

11. I have also served as a technology editor for Perspective NY Magazine.

12. I have over 40 years of telecommunications, security and information technology experience. I am the co-founder and President of DVI Communications Inc. ("DVI"), a telecommunications, security, audio-visual & information processing technology and business consulting firm.

13. Since I co-founded DVI in 1979, I have planned, designed, implemented, and managed large-scale projects involving wired and wireless communications systems, which included switching and transmission of voice and data.

14. Over the course of my professional career, I have deployed various telecommunications systems involving switched and dedicated networks, legacy analog/digital networks using CO/PBX-based technologies as well as Internet Protocol (IP) networks using soft switches. I have also deployed and supported a variety of telecommunication systems, including switched and dedicated voice communications, and data and video multi-media under a variety tariff structures (e.g., toll-free, distance based, capacity dependent, usage based and time of day, and flat rate). These telecommunications systems further include wide area and

local area networking technology, data, voice, and video switching systems, and both wired transmission (such as cable and fiber optic) and wireless transmission (such as UHF/VHF, Microwave, satellite, cellular, and Wi-Fi), for private and public networks, Intranets, and the Internet.

15. I have also deployed various similar technology systems, including networks, switching and transmission systems, cabling plants, voicemail, e-mail, unified messaging, and audio/video recording, for a variety of facility types, including call/contact centers, data centers, trading floors, and mission-critical communications centers (supporting network operations, command and control, and emergency dispatch and communications).

16. My technical expertise encompasses several disciplines, such as telecommunications network design, transaction processing systems design for various industries and applications, IT platform engineering, and data centers. In addition, I have extensive experience with numerous interfaces and protocols, real-time synchronization as well as selected applications systems in various industries. These include telecommunications switching and operational support systems (order entry, billing, trouble reporting), financial services (including call centers, trading floors, supporting consumer, commercial and investment banking), health information systems (including patient information, clinical and laboratory systems), transportation and energy utilities (including dispatch, customer service,

and trouble reporting), and military aerospace (including Command and Control, position tracking and fusion centers). Over the course of my career, I developed hardware and software for telecommunications systems, and I have also managed engineering development teams engaged in product development for telecommunications systems.

17. I have extensive expertise in voice-data-video switching, and transmission systems deployed in networks, based on both circuit switching and packet switching technologies using wireline and wireless distribution methods (including Land Mobile radio, Satellite, microwave, cellular, and Wi-Fi). In addition, I have developed various applications systems including voicemail, e-mail, unified messaging, and audio/video recording. I have detailed knowledge of Internet Protocol (IP) technology in general, and also Voice over Internet Protocol (VoIP). I also extensive expertise in call routing, voice digitization, buffering, relay and delay techniques, as well as digital signal processing of voice and data signals. At present, my primary responsibilities encompass strategic planning and systems design of client telecommunications and IT Infrastructures and program management for major projects undertaken by DVI.

18. Prior to founding DVI and for several years thereafter, I held a U.S. Department of Defense security clearance and worked on classified programs within the defense industry, where I supported the development of several

pioneering technologies that have served as prototypes for many telecommunications and IT systems later utilized in commercial practice.

19. I have served in many leadership positions, including project and program manager for both research and development, and on consulting projects for various organizations, including: the U.S. Department of Defense's Defense Advanced Research Projects Agency (DARPA); the Defense Communications Agency (now the Defense Information Systems Agency); Xerox; United Technologies – Norden Systems; Metropolitan Transportation Authority; Citicorp; Con Edison; and various financial services, healthcare, utility and educational institutions.

20. Over the course of my career, I have designed, engineered and implemented telecommunications networks for various enterprise clients serving regional, national and international communities of interest. These networks employed various switched and dedicated services from multiple telecommunications carriers and service providers and used a mix of toll free, dedicated, and switched services for incoming/outgoing traffic. Typically, automatic route selection technology was employed to accommodate both incoming and outgoing traffic loads while optimizing cost with surplus capacity for peak traffic conditions. Among the clients supported included Citicorp, United Nations, and the Metropolitan Transportation Authority (MTA).

21. For both DARPA and Defense Communications Agency (DCA), I conducted studies comparing circuit, packet and hybrid or integrated (circuit/packet) switching systems of voice and data traffic comparing them relative to cost, expandability, complexity, performance and reliability/survivability. As part of typical reliability considerations, I would deploy manual and automatic recovery processes which provided fault-tolerant and resilient voice and data networking offering graceful degradation in the presence of errors or failures. Techniques employed encompassed error detection/retransmission, vigilant monitoring of correct operation coupled with switchover to backup, bypass and/or rerouting around failed switching and transmission facilities and reconnection.

22. I have supported call/contact center design and deployment for enterprise and institutional clients, encompassing many technologies in call centers supporting several dozen to a few thousand agents and including migration and integration of multi-media contact center technology (chat, web, email and fax) into previously voice-centric call centers. These applications incorporated speech recognition, analog and digital voice recording, as well as call routing and primarily relied on toll-free services to ease customer engagement with the enterprise.

23. During the course of my over 40 years of experience with call/contact center design and deployment, I have supported clients in several different vertical markets (financial services, healthcare, utilities, education) encompassing both revenue-generating and non-revenue-generating call center applications. I have worked with Automatic Call Distribution (ACD) technology supporting ANI/DNIS and Computer Telephony Integration (CTI) with intelligent skills-based routing, dynamic gate control, call back queueing and blended inbound/outbound services.

24. In this context, I also have worked with and have much experience with call routing and call routing over PSTN and VoIP networks. For example, with telecommunication services and associated devices for the switching and transmission of voice and data over Plain Old Telephone Service (POTS) lines, digital transmission facilities (such as T1, E1 and ISDN PRI and BRI), cellular voice and data and other wireless-based technologies (Line of Sight Microwave, Land Mobile Radio, Satellite) and IP- and VoIP-based communications, I have deployed various types of switching and routing systems (supporting numerous voice and data communications networks) at major institutional clients such as Citicorp, City University of New York, Bear Stearns, Societe Generale, RPCI, and Bertelsmann. For these projects, among other things, I had to understand the technical implications, shortcomings, and advantages of deploying different types of switching systems interconnecting voice and data channels, and the manner in

which various communication protocols transmit voice and data and would use available bandwidth on different transmission facilities. The transmission facilities included both terrestrial (wired and wireless) as well as satellite-based communications. I also had to understand the compatibility issues with various end-user devices and central network components, both at my client's locale as well as with the telephone provider/network provider's switching systems. This encompassed both signaling and switching protocols and interfaces to support compatibility and interoperability.

25. I also have experience with automated out-dialer systems supporting various modes of operation (Preview, Progressive and Predictive) for telemarketing, fund raising and collections applications as well as mass notification/media blasts using recorded messages.

26. I have expertise in voice-data-video switching, switching processor architecture for legacy Time Division Multiplex Private Branch Exchange (TDM PBX) & VoIP call processing systems (both circuit switching and packet switching) and premises-based and central office-based/hosted systems, LAN networking, and related technologies.

27. I have also supported interconnection of switching systems with various switch protocols and telecommunications service offerings, including

POTS, ISDN, digital services, ANI, DNIS, Session Initiation Protocol (SIP), and tie lines supporting single, campus, regional, and national network configurations.

28. I also have extensive experience related to the digitization of voice. For many of my projects related to call routing and switching, calls can come into the systems as digital communications or as analog POTS calls. I have frequently designed and implemented systems that can detect the digital or analog nature of the incoming voice and when analog, utilize an appropriate sample rate and codec to convert the analog voice into digital transmission.

III. MATERIALS REVIEWED

29. In preparing this declaration, I have reviewed and/or considered the documents cited in this declaration, as well as the documents listed in the appended List of Exhibits and the Petitioner's petition for *Inter Parties* Review.

IV. UNDERSTANDING OF PATENT LAW

30. I am not an attorney, but I have been provided with an understanding of certain legal principles relevant to my analysis and opinions in this matter.

31. I understand that a person of ordinary skill in the art (a "POSITA") is a hypothetical person who is presumed to have known the relevant art at the time of the invention, and that the factors that may be considered in determining the level of ordinary skill in the art may include: (a) type of problems encountered in the art; (b) prior art solutions to those problems; (c) rapidity with which

innovations are made; (d) sophistication of the technology; and (e) educational level of active workers in the field. In a given case, every factor may not be present, and one or more factors may predominate.

32. I have been informed that patent claims are construed or interpreted from the perspective of a POSITA at the time of the claimed invention. I understand that the most important evidence to consider in construing the claims is the "intrinsic" evidence. This includes the claim language, the patent's specification, and the prosecution history (including references cited in the prosecution history). I understand that the POSITA must read the claim terms in the context of the claim and in the context of the entire patent specification. I understand that the patentee may explicitly define a claim term in a way that differs from the plain and ordinary meaning in the art.

33. I further understand that a POSITA may also consider "extrinsic" evidence when interpreting the meaning of claim terms, which are documents and testimony beyond the patent to ensure that a claim is construed consistently with the understanding of those of skill in the art at the time of the claimed invention. I also understand that extrinsic evidence may not be relied on if it deviates from the meaning of the claim provided by the intrinsic evidence.

34. I understand that a patent claim is invalid if it is anticipated or obvious. I understand that anticipation of a claim requires that every element of a

claim be disclosed expressly or inherently in a single prior art reference, arranged in the prior art reference as arranged in the claim.

35. It is my understanding that a patent claim is invalid for obviousness if the claimed invention would have been obvious to a POSITA at the time the invention was made. This means that, even if all of the elements of a claim are not found in a single prior art reference, the claim is still not patentable if the differences between the prior art and the subject matter in the claim would have been obvious to a POSITA at the time of the claimed invention.

36. I understand that the following factors are considered in an obviousness analysis: (1) the scope and content of the prior art; (2) the differences, if any, between the prior art and the claims at issue; (3) the level of ordinary skill in the art at the time the claimed invention was made; and (4) objective evidence of non-obviousness also known as secondary considerations of non-obviousness. In order to determine whether claim elements are found in the prior art, it is necessary to compare the properly construed claim language of the patent with the teachings of the prior art.

37. I understand that a single reference can render a patent claim obvious if any differences between that reference and the claims would have been obvious to a POSITA at the time the claimed invention was made. Alternatively, it is my understanding that the teachings of two or more prior art references may be

combined in the same way as disclosed in the claims, if such combination would have been obvious to a POSITA at the time the claimed invention was made.

38. I further understand that a patent claim can be found obvious if it unites old elements with no change to their respective functions, or alters prior art by mere substitution of one known element for another known in the field, with that combination yielding predictable results. It is also my understanding that, while it may be helpful to identify a reason for this combination, common sense should guide, and there is no rigid requirement for a teaching, suggestion, or motivation to combine prior art references. For example, design incentives and other market forces can prompt variations of a product, either in the same field or a different one. If a POSITA can implement a predictable variation, obviousness can bar patentability. Similarly, if a technique has been used to improve one device, and a POSITA would recognize that the technique would improve similar devices in the same way, use of the technique is obvious. I further understand that a claim may be obvious if common sense directs one to combine multiple prior art references or add missing features to reproduce the claimed invention recited in the claims.

39. I also understand that any one or more of the following rationales may support a finding of obviousness:

a. Combining prior art elements according to known methods to yield predictable results;

b. Simple substitution of one known element for another to obtain predictable results;

c. Use of a known technique to improve similar devices (methods, or products) in the same way;

d. Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

e. "Obvious to try" – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

f. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; and

g. Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill in the art to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

40. I also understand that in considering obviousness, I should keep in mind that a POSITA has ordinary creativity and is not an automaton.

41. I further understand that it is impermissible to use the claimed invention itself as a blueprint for piecing together elements in the art. In other words, it is impermissible to use hindsight reconstruction to pick and choose among disclosures in the prior art to reconstruct the claimed invention.

V. OVERVIEW OF OPINION

42. I cite many documents in this declaration in support of my analysis, but my opinion regarding the obviousness of the Challenged Claims is fundamentally based on the four references listed below: As further explained, the priority date for the '249 Patent is August 26, 2015.

- **U.S. Patent No. 8,064,354 ("Barghouthi") (EX1005)**, filed on July 21, 2010 and issued on November 22, 2011. I understand that, based on Barghouthi's issue date, it is prior art to the '249 Patent.
- **U.S. Patent No. 6,222,912 ("Breuer") (EX1006)**, filed on February 18, 1999 and issued on April 24, 2001. I understand that, based on Breuer's issue date, it is prior art to the '249 Patent.
- **U.S. Patent No. 7,515,697 ("Eng") (EX1007)**, filed on April 1, 2004 and issued on April 7, 2009. I understand that, based on Eng's issue date, it is prior art to the '249 Patent.

- **U.S. Patent No. 8,130,662 ("Goode") (EX1008)**, filed on December 31, 2006 and issued on March 6, 2012. I understand that, based on Goode's issue date, it is prior art to the '249 Patent.

I note that none of the above references were considered by the Examiner during the prosecution of the '249 Patent.

43. In my opinion, in view of these prior art references, the following sets of claims would have been obvious to a POSITA before August 26, 2015, as summarized in the following table:

Ground No.	Claims	Proposed Statutory Grounds
1	1-4, 6-8 and 10-12	Obvious under §103 over Barghouthi in view of Breuer
2	5 and 13	Obvious under §103 over Barghouthi in view of Breuer and Eng
3	9 and 14-19	Obvious under §103 over Barghouthi in view of Breuer and Goode
4	20	Obvious under §103 over Barghouthi in view of Breuer, Goode, and Eng

Grounds 1, 2, 3, and 4 are explained in detail in Sections X. A., B., C., and D., respectively, of my declaration.

VI. THE '249 PATENT

A. Technology Overview And Overview Of The '249 Patent

44. I have read the '249 Patent in detail and provide a brief overview of the patent, as well as a general overview of the technology.

45. The '249 Patent issued on October 31, 2017, and is entitled "Routing Of Toll-Free Numbers Using A Toll-Free Exchange." EX1001, cover page. The application that led to the '249 patent was filed on August 26, 2015 and does not claim priority to any earlier filed application. As such, I understand that the earliest effective filing date of the '249 Patent is its actual filing date – August 26, 2015.

46. The '249 Patent generally describes a system and method for routing toll-free telephone calls using a toll-free exchange. EX1001, Abstract. The objective of the '249 Patent was to simplify the traditional routing of toll-free calls in the conventional public switched telephone network ("PSTN"), which had to rely upon one or more individual service providers' switches connected to a tandem switch. Instead, the '249 Patent posits reliance on packet switching in order to bypass one or more intermediate service providers and connect directly into a single exchange in order to reduce complexity and cost, increase scalability and efficiencies, and provide features only possible in an IP-enabled network, such as routing calls containing high definition voice and video data. *Id.*, 1:42-49, 2:63-

3:6, 10:54-57. The '249 Patent teaches that these benefits may be achieved via the use of a single toll-free exchange. *Id.* Importantly, the problem the '249 Patent was attempting to solve was to improve the efficiency and reduce the high cost of routing toll-free calls through the old PSTN, which required calls to go through potentially several different networks, tandem switches, Local Exchange Carriers ("LECs"), and service providers to reach its destination. *Id.*, 1:26-37, 3:7-30, 3:56-61, 4:12-20, 4:24-33.

47. As background to the '249 Patent, traditional toll-free systems provide originating callers with the ability to place free telephone calls to toll-free subscribers. More particularly, toll-free telephone numbers are set up such that the called party, also referred to as the subscriber of the toll-free number, pays for each call received rather than the calling/originating party. The introduction of toll-free service goes back over a half century in the United States. The earliest systems utilized a technology introduced by AT&T back in the mid-1960s known as Inbound Wide-Area Telecommunications Service (InWATS), which required toll-free subscribers to use dedicated WATS lines. In the early 1980s, AT&T enhanced the InWATS service upgrading it to Advanced 800 service which no longer required the use of dedicated WATS lines. Following the breakup of the Bell System in 1984, AT&T no longer enjoyed exclusivity on toll-free services and alternate Inter-exchange carriers (IXC) (such as MCI and Sprint) entered the

marketplace and could compete to offer toll-free service to subscribers. In 1993 Responsible Organizations (RESPORGs) were established to provide toll-free number portability, relying on the SMS/800 database. Today in the United States, toll-free numbers typically begin with a "1" followed by a three-digit code such as 800, 888, 877, 866, 855, or 844.

48. As further background, typically, toll-free numbers are assigned by "Responsible Organizations," or "RESPORGs." RESPORGs maintain the registration and routing of individual toll-free numbers that are stored in the Service Management System SMS/800 database. Accordingly, each RESPORG has access to the SMS/800 database, which is a central registry of all toll-free numbers. In particular, SMS/800, Inc. (now known as Somos, Inc.) is an administrative entity responsible for assigning RESPORG IDs to RESPORGs and storing toll-free numbers and routing information related to each toll-free number in the SMS/800 database. Routing information may include the individual or company that subscribes to each toll-free number and the carrier associated with handling the routing of each toll-free call.

49. In traditional systems, toll-free calls are typically routed from the service provider of the originating caller, wherein the service provider looks up the carrier identification code (CIC) associated with the service provider responsible for handling the toll-free number. A CIC is a unique code that identifies a

telephone service provider. The call is thereafter connected to the identified service provider, which routes the call to the toll-free subscriber (sometimes also referred to as the terminating client). Toll-free subscribers are generally assessed a per minute fee based on a Local Exchange Carrier (LEC) tariff plus a margin for each network and service provider that routes the call to the subscriber. In these prior art toll-free calling systems, it was understood that there may be multiple components and providers, such as multiple PSTN, SS7, LECs, RESPORGs, service providers, and tandem switches involved in the routing of a toll-free call from the calling to the called party. All of these entities and components add additional costs to the toll-free subscriber and additional complexity to the call routing process.

50. Accordingly, the problem the ’249 Patent claimed to solve was to improve the efficiency and reduce the high cost of routing toll-free calls via the legacy toll-free calling systems. EX1001, 1:26-37, 3:7-30, 3:56-61, 4:12-20, and 4:24-33.

51. The ’249 Patent attempted to solve these problems by implementing a system and method for routing toll-free calls using a toll-free exchange. *Id.* At its core, the ’249 Patent’s call routing system comprises: (1) service providers or Responsible Organizations (“RESPORGs”) for handling incoming and outgoing toll-free calls (*id.*, Figure 3, 5:55-65, 7:12-15), (2) a toll-free exchange for routing

toll-free calls to the RESPORGs responsible for the dialed toll-free calls (*id.*, Figure 3, 7:15-18), (3) a database for storing routing information of the RESPORGs (*id.*, Fig. 3, 5:34-36, 7:51-59), and (4) IP switching (*id.*, 8:18-25, discussing Session Initiation Protocol (SIP); *id.*, 6:1-20, discussing Media Servers using Real time Transport Protocol (RTP) and IP addresses; *id.*, 8:31-33, discussing VoIP; and *id.*, 5:26-34, discussing Session Border Controllers (SBCs)) instead of the traditional legacy PSTN switching (relying on LECs, IXCs, SS7 signaling and TDM) to connect to the toll-free subscriber.

52. In operation, the toll-free exchange routes toll-free calls based on the Responsible Organization identification ("RESPORG ID") of the RESPORG associated with the called toll-free subscriber (i.e., the "terminating RESPORG"). *Id.*, 4:24-26. Specifically, the '249 Patent's toll-free call routing process begins when a caller places a toll-free call by dialing a toll-free number (e.g., a 1-800 number). *Id.*, 5:55-56, 1:11-13. The toll-free exchange receives the call from the calling party's service provider (i.e., the "originating RESPORG"). *Id.*, 5:66-6:1. Upon receipt of the call, the toll-free exchange queries the database to determine the RESPORG ID of the terminating RESPORG (i.e., the service provider that is responsible for routing calls to the called toll-free subscriber). *Id.*, 7:12-18. The toll-free exchange then routes the call, based on the RESPORG ID, to the terminating RESPORG, which connects the call to the called toll-free subscriber.

Id., 8:57-9:3. Put in simpler terms, the '249 Patent describes a method for routing toll-free calls whereby the toll-free exchange receives a toll-free call, looks up the RESPORG ID of the terminating RESPORG using the dialed toll-free number, and routes the call using that RESPORG ID. This call routing process is depicted in Figure 3 of the '249 Patent, set forth below. The **green** annotation depicts the call routing path of the claimed invention, as just described; and the **red** annotation depicts the call routing path of a legacy system.

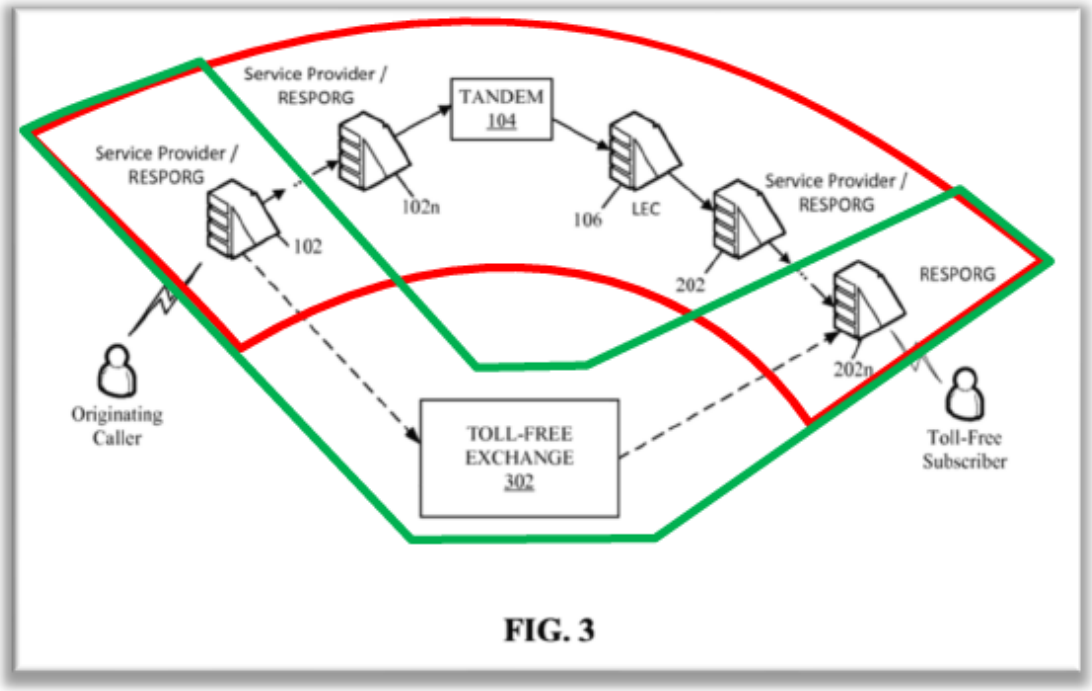


FIG. 3

53. The '249 Patent further describes utilizing a VoIP network to carry out the aforementioned call routing process, which allows for routing calls containing voice and video data. EX1001, 8:31-33, 10:54-57.

54. In my opinion, based upon the background and evolution of the underlying technology I previously outlined, the ’249 Patent represents a straightforward combination of standard, time-honored techniques and methods to improve the efficiency of the call routing process that existed well before the filing date of the ’249 Patent. That is, the ’249 Patent achieved its improvement by combining nothing more than well-known methods to yield predictable results. The combination of these methods would have been obvious to try for a person of ordinary skill in the art (“POSITA”) at the time of the claimed invention, and do not represent innovations in and of themselves. Rather, they were stimulated by regulatory mandates and/or rulemaking (from the Department of Justice and/or the Federal Communications Commission) as well as ongoing technological improvements, that came to be well before the ’249 Patent, in switching systems technology that led to the application of packet switching of voice (not just data).

55. I summarize this series of developments which would have made it obvious for a POSITA to develop the technical processes claimed in the ’249 Patent. Specifically, the use of toll-free telecommunications services (introduced over a half century ago by AT&T in the 1960s), coupled with the subsequent 1984 breakup of the Bell system (nearly 40 years ago) led to the creation of Inter-Exchange Carriers (IXCs), Carrier Identification Codes (CICs) and Local Exchange Carriers (LECs), which fostered a competitive marketplace where

multiple carriers could offer toll-free 800 services. The FCC Toll-free Number portability ruling in 1993 (nearly 30 years ago) made the SMS/800 carrier database available to so-called Responsible Organizations (RESPORGs created by the ruling, who could also be telecommunications carriers). I also note that the exhaustion of numbers with the 800-prefix also led to the introduction of 8xx services. These RESPORGs administer the 8xx numbers allowing subscribers to migrate (or "port") their 8xx numbers to a service provider of their choice, similar to number portability benefits enjoyed by residential and business customers, who can port their Direct Distance Dial (DDD) numbers for traditional telecommunication services. Finally in parallel and completely independent of these regulatory initiatives, the United States Defense Advanced Research Projects Agency (DARPA) experimented with voice packet switching technology in the late 1970s (over 40 years ago), refining it through the 1980s until the point that it became commercially viable in the mid-1990s (nearly a quarter of a century ago). The packet voice technology relied on packet switching networks (most notably the Internet) using Internet Protocol (IP) which, beginning in the early 2000s and coupled with additional protocols developed by the Internet Engineering Task Force (IETF), evolved into the ubiquitous service now commonly referred to as Voice over Internet Protocol (VoIP). The substitution of VoIP packet switching in place of legacy Time-Division Multiplex (TDM) circuit switching (as employed in

the older, traditional public switched network (PSTN)) was well understood and wholly embraced by the telecommunications industry by 2010 due to its greater flexibility to support multiple types of traffic (different types of data, audio, video, and multi-media), enhanced routing and reduced operating costs in both switching and transmission. Indeed, based on the success of VoIP in enterprise networking (i.e. business telecommunications) throughout the first decade of the 21st century (2001-2010), beginning in 2012 the FCC addressed petitions by major telecommunications carriers to facilitate the transition of the PSTN from TDM to IP switching for all customers (business and residential) albeit gradually in order to minimize disruption. This transition began in earnest shortly thereafter and is currently well underway. Just as VoIP replaced legacy TDM switching in the enterprise/corporate networking domain (with innovations such a soft switches and SIP trunking), it is expected that by 2025 the PSTN will be fully migrated from TDM to IP.

56. Therefore by August 26, 2015, it is my opinion that it is inconceivable that a POSITA would not have been fully aware of toll-free telecommunications services with number portability, administered by RespOrgs as well as VoIP switching technology, which is all that the ’249 Patent is directed to. Accordingly, as I previously stated, I believe both the benefits and methods to combine these

elements would have been obvious to a POSITA at the time of the claimed invention of the ’249 Patent.

B. The ‘249 Patent’s Prosecution History

57. I have read the ’249 Patent’s prosecution history and briefly summarize it here.

58. The ’249 Patent issued from U.S. Patent Application Serial No. 14/836,396 (the “’396 Application”), which was filed on August 26, 2015. I understand from reviewing the prosecution history and the face of the ’249 Patent that the ’396 Application does not claim priority to any earlier filed application.

59. The ’396 Application was filed with 20 claims – three independent claims and 17 dependent claims. EX1002, 0033-0038.

60. On September 12, 2016, the Examiner issued a Non-Final Office Action rejecting originally filed Claims 1-20 under 35 U.S.C. §102(a)(2) as anticipated by U.S. Patent Publication No. 2010/0014651 (“Bajpay”). EX1002, 0137-0145. Patent Owner submitted a Response to the Non-Final Office Action on December 7, 2016 in which Patent Owner amended independent Claims 1 and 10 to require the database to be “associated with the toll-free exchange” and to “store[] the RESPORG identification associated with the terminating RESPORG.” *Id.*, 0168-0173.

61. The Examiner issued a Final Office Action on March 2, 2017 rejecting Claims 17-20 under 35 U.S.C. §102(a)(2) as anticipated by Bajpay and rejecting Claims 1-16 under 35 U.S.C. §103 as obvious over Bajpay and further in view of U.S. Patent No. 6,343,123 ("Lehmacher"). EX1002, 0177-0188. Patent Owner submitted a Response to the Final Office Action on July 11, 2017 in which Patent Owner distinguished the claimed invention over the cited prior art by arguing that none of the cited references teach or suggest the recited limitation of "routing … the toll-free call based in part on the RESPORG identification [of the terminating RESPORG]." *Id.*, 0214-215. Specifically, Patent Owner argued that "until the Applicant's innovation described in the present Application, RESPORG identifications have never before been used for call routing purposes, much less as a way to route calls directly to the termination RESPORG by skipping the traditional telephone system." *Id.* It is my opinion that a POSITA reviewing Patent Owner's response would understand that the claimed novel feature of the claimed invention of the '249 Patent is simply the use of RESPORG IDs to directly route calls to the terminating RESPORG. *Id.*

62. A Notice of Allowance was subsequently mailed on September 13, 2017 allowing Claims 1-20. *Id.*, 0236-0244. The '249 Patent issued on October 31, 2017 with three independent claims (Claims 1, 10, and 17) and 20 total claims.

VII. PERSON OF ORDINARY SKILL IN THE ART

63. In my opinion, based on the '249 Patent disclosures, at or around the time of the earliest effective filing date of the '249 Patent (i.e., August 26, 2015), a POSITA would have had at least a Bachelor's degree in Electrical Engineering, or an equivalent or related field, and at least two years of industry experience with telecommunication systems and network services, including VoIP switching technology. Additional industry experience or technical training may offset less formal education, while advanced degrees or additional formal education may offset lesser levels of industry experience.

64. Based on my education and experience, I am familiar with the level of knowledge that one of ordinary skill would have possessed during the relevant period of time. By the earliest possible priority date (August 26, 2015), I was at least a person of ordinary skill in the art, as by that time I had over 30 years of experience working with telecommunication systems and network services. I am also familiar with how a POSITA would have understood and interpreted the '249 Patent.

VIII. CLAIM CONSTRUCTION

65. It is my opinion that none of the claim terms of the '249 Patent require explicit construction to resolve the particular grounds presented in the IPR Petition

and, therefore, each term should be given its plain and ordinary meaning as understood by a POSITA at the time of the claimed invention.

IX. OVERVIEW OF THE PRIOR ART

A. Barghouthi (EX1005)

66. Barghouthi discloses a system and method for routing calls from a calling party to a called party based on an identifier associated with the called party's communication device. EX1005, 1:58-2:21. Barghouthi's method for routing calls includes the following steps: (1) receiving the call, (2) looking up the identifier associated with the communication device of the called party, and (3) routing the call directly to the called party based on the identifier. *Id.*

67. Barghouthi seeks to solve the same claimed problem as the '249 Patent. That is, like the '249 Patent, Barghouthi seeks to improve efficiencies and reduce costs in the call routing process by eliminating the need to route calls through multiple switching components (e.g., PSTNs, LECs, service providers, etc.) as was done in prior art call routing systems. EX1005, 1:14-31, 1:44-48, 1:53-54. And, like the '249 Patent, Barghouthi solves this problem by routing calls directly to the called party using an identifier associated with the called party (*id.*, 1:58-2:3).

68. Barghouthi's Figure 1 depicts the network 100 and the components involved for routing calls, including: communication devices (e.g., ingress point

110 and egress point 120); interexchange carrier 150; routing component 130; service provider 160; circuit-switched networks (e.g., PSTN 180 and Local Exchange Carrier 190); and packet-switched networks (e.g., Internet 170). EX1005, Figure 1, 2:65-3:7, 3:53-57, 5:1-4.

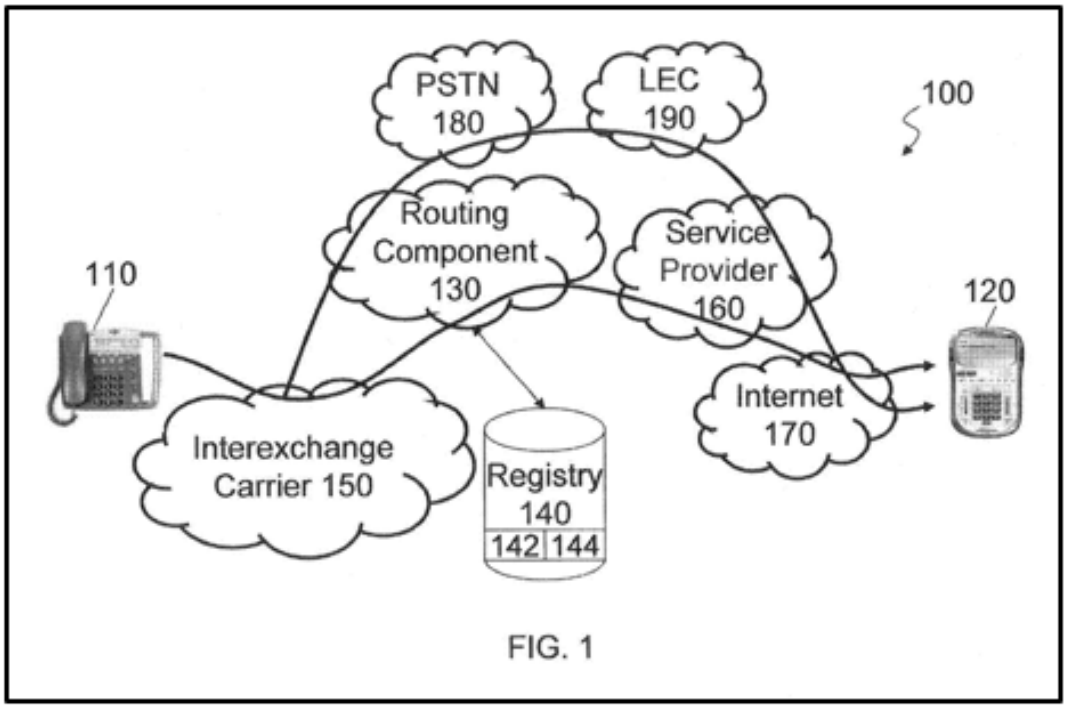


FIG. 1

69. Barghouthi teaches a method for routing a call from a calling party to a called party based on an identifier of the called party's communication device. EX1005, 1:58-2:3. The call is initiated at the calling party's communication device (e.g., ingress point 110) by entering a number or identifier associated with the called party's communication device (e.g., egress point 120). *Id.*, 4:8-12. The identifier associated with the called egress point 120 may contain any length of digits, and may be a standard 10-digit telephone number. *Id.*, 4:22-38. The call is

then received at the routing component 130. *Id.*, 4:18-21. Upon receipt of the call, the routing component 130 queries its associated database (e.g., registry 140) to determine if it contains an entry that includes the identifier associated with the egress point 120 being called. *Id.*, 4:39-51, 7:1-5. In one embodiment, the routing component 130 may initially query the direct routing portion 142 of the registry 140 to determine if the identifier being called is stored in the direct routing portion 142. *Id.*, 4:43-47. The database 140 contains entries for each device registered with the system, whereby each entry may include: information related to the user's communication device, the phone number or other identifier associated with the user's communication device (i.e., the device identifier), and the IP address associated with the user's communication device. *Id.*, 3:8-15. If an entry exists for the identifier associated with the called egress point 120 in the direct routing portion 142 of the registry 140, the routing component 130 may route the call directly to either the called egress point 120, or to the service provider 160 of the egress point 120 and then to the egress point 120, via the IP address stored in the entry. *Id.*, 4:52-67.

B. Breuer (EX1006)

70. Breuer teaches a system and method for accurately billing toll-free calls to the RESPORGs responsible for managing the called toll-free subscribers and maintaining call records regarding the same. EX1006, 3:30-33, Abstract.

Breuer achieves this by utilizing RESPORG IDs to identify the RESPORG responsible for the called toll-free subscriber so that the correct RESPORG is billed for the call. *Id.*, Abstract. Specifically, as shown in Figure 2, identifying the RESPORG responsible for the called toll-free subscriber includes the steps of: (1) querying the database for the RESPORG ID of the RESPORG associated with the dialed toll-free number, and (2) retrieving the RESPORG ID in response to the database query. *Id.*, Figure 2, 5:30-48, 6:17-41. The retrieved RESPORG ID is then stored in a call detail record, which may later be used to bill the corresponding RESPORG responsible for handling the called toll-free number. *Id.* Breuer further contemplates including the aforementioned RESPORG ID query in the same query seeking the call routing data (i.e., the information needed to route the call to the correct destination). *Id.*, 5:34-46.

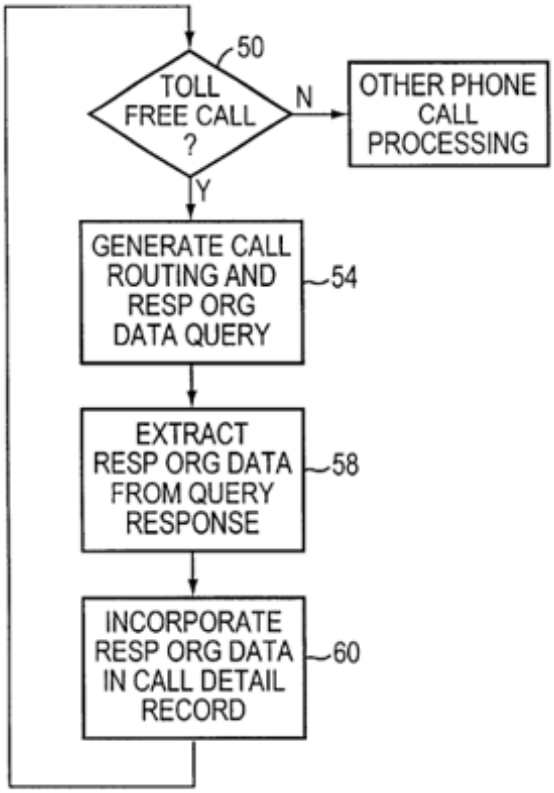


FIG. 2

71. Breuer's system and method identifies the RESPORG at the time a toll-free call is received by extracting its RESPORG ID, in order to ensure the correct RESPORG is billed for the call. *Id.*, Abstract.

72. Breuer's method and system is implemented using a standard telecommunications system. The components of the telecommunications system include communication devices (e.g., communication stations or telephones 12); an originating Local Exchange Carrier network 10; a toll switch network, such as a long distance carrier 20; and a destination local exchange area network 30. *Id.*,

Figure 1, 4:46-5:6. A call placed in Breuer's system is routed via "typical toll-free call processing." *Id.*, 6:26-28.

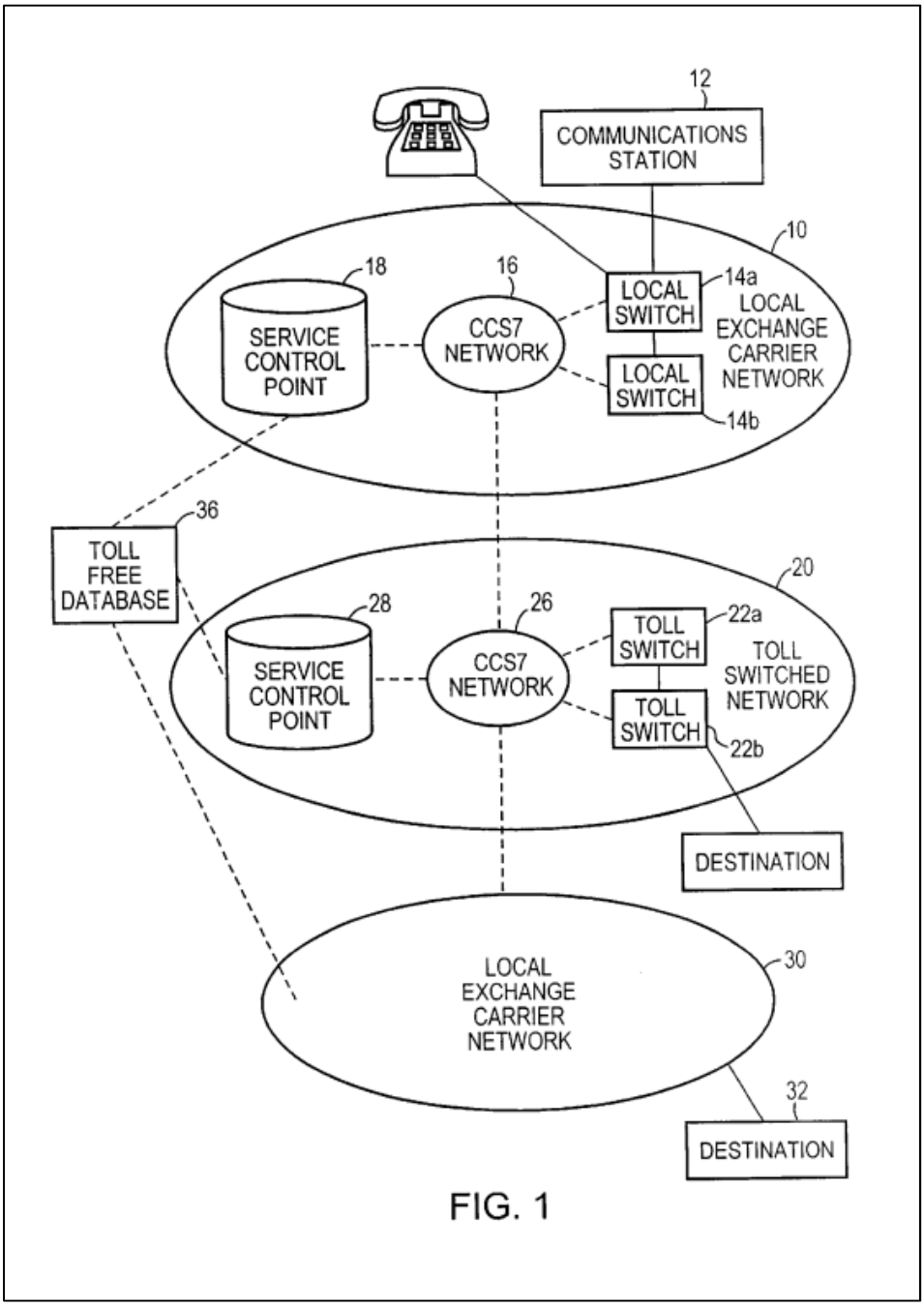


FIG. 1

Petitioner Affinity Network, Inc. - Ex. 1003, 0038

C. Eng (EX1007)

73. Eng teaches an "online telecommunications trading exchange that is capable of automatically settling trading accounts for buyers and sellers of telecommunications services." EX1007, 1:29-33. Specifically, Eng teaches a telecommunications system whereby some service providers submit offers to sell telecommunications services (i.e., sellers), and some service providers submit requests to purchase telecommunications services (i.e., buyers). *Id.*, 2:44-47. Each of the service offers and service requests includes price or rate information and the level of quality associated with a telecommunications route defined by an origination location and a destination location. *Id.*, 2:47-50. A server node then matches a service request to the service offer, based on (among other things) the price each service provider submitted, and generates routing instructions to initiate communications between the service providers. *Id.*, 2:54. Upon receiving the routing instructions, a network switch connected to the networks of the service providers routes communications (e.g., voice, fax, data packets) from a requesting service provider (i.e., buyer) to the corresponding matched offering service provider (i.e., seller). *Id.*, 2:57-61.

D. Goode (EX1008)

74. Goode teaches a method and apparatus for providing centralized or regionalized transcoding functions in a communications network, e.g., a packet network such as a VoIP network. EX1008, Abstract, 1:4-8. The purpose of Goode is to provide a transcoding function after a codec or media format mismatch error is received. *Id.* For example, Goode's method is designed to detect a media format mismatch during a call setup between a calling party's device and a called party's device. *Id.*, Abstract, 1:38-48. The method then invokes a transcoding function directly by at least one border element to handle the detected mismatch and allow for the desired media to be successfully transferred from the calling party to the called party. *Id*.

75. Goode specifically teaches the use of a centralized or regionalized transcoding server and media resource, whereby the media resource performs the actual transcoding between two different codecs. Id., 5:14-20. The transcoding performed by the media resource can be applied to audio, video, or multimedia codec mismatches. *Id.*, 5:20-22.

X. OPINIONS ON UNPATENTABILITY OF THE CHALLENGED CLAIMS

76. The following sections set forth my opinions that the Challenged Claims (Claims 1–20) of the '249 patent are obvious in view of the prior art.

A. Ground 1: Claims 1-4, 6-8 and 10-12 are Obvious over Barghouthi in view of Breuer

1. Motivation to Combine Barghouthi and Breuer

77. It is my opinion that a POSITA at the time of the claimed invention of the '249 Patent would have been motivated to modify Barghouthi with Breuer because both references are in the same field of endeavor as the '249 Patent – telecommunications and call routing. *Compare* EX1005 (Barghouthi), Abstract ("[a] process for routing a call between an ingress point and an egress point is based on an identifier, such as a number, assigned to the egress point and a registry in which identifiers are stored"), *with* EX1006 (Breuer), 6:17-28 ("When an SS7 enabled switch (SSP) detects a toll-free number has been dialed[,] … [t]he SCP retrieves the call routing data [and] the SSP [] uses the routing information to conduct typical toll-free call processing"). Further, as described in the overview sections above, while Barghouthi teaches the use of a more modern call processing architecture (e.g., the use of the packet-switching networks such as the Internet 170), both Barghouthi and Breuer rely on a similar network architecture, employing network components with similar functionality throughout. *Compare*

EX1005 (Barghouthi), Figure 1 (elements 180, 190 and 160), *with* EX1006 (Breuer), Figure 1 (elements 10, 30). Moreover, both Barghouthi and Breuer teach the use of the traditional Signaling System No. 7 (SS7) for routing calls between the calling party and the called party. *See*, *e.g.*, EX1005 (Barghouthi), 5:1-7; EX1006 (Breuer), 6:17-23. Thus, it is my opinion that both Barghouthi and Breuer are in the same field of endeavor as the '249 Patent – telecommunications and call routing – and, therefore, a POSITA, at the time of the claimed invention of the '249 Patent, would have been motivated to modify Barghouthi with Breuer as explained further below.

78. A POSITA also would have been motivated to combine the references to use Breuer's teachings to improve Barghouthi in order to help achieve Barghouthi's expressly desired advantages in a toll-free environment. As background, Barghouthi describes an improved call routing process that routes calls directly from the calling party to the called party without having to go through the several exchanges and switches of old telephony networks, such as PSTN – thereby improving system efficiency and reducing cost. EX1005, Abstract. Barghouthi accomplishes this by querying a database in order to locate the identifier and IP address of the called party's device. *Id.*, 4:39-67, 7:1-5. In the same field of endeavor, Breuer teaches identifying a RESPORG responsible for handling a toll-free telephone call at the time the call is placed. EX1006, Abstract.

And, similar to Barghouthi, Breuer accomplishes this by querying a database to locate the RESPORG ID of the RESPORG associated with the dialed toll-free number. *Id.*, Figure 2, 5:30-48, 6:17-41. It is therefore my opinion that a POSITA thus would have been motivated to combine Breuer with Barghouthi to help Barghouthi achieve its process for directly routing calls from a calling party to the called party in a toll-free environment.

79. Specifically, at the time of the filing date of the '249 Patent, a POSITA would have been motivated to modify Barghouthi's direct call routing system for use in a toll-free environment by querying Breuer's database in order to identify the RESPORG ID of the RESPORG responsible for handling the toll-free call because the RESPORG ID, instead of the device identifier of Barghouthi, would be needed to achieve Barghouthi's goal of routing toll-free calls directly to the toll-free subscriber. Thus, it is my opinion that basic market forces for enhanced reach and operability to direct call routing in toll-free environments would have prompted improving Barghouthi's design in accordance with Breuer's teachings.

80. It is further my opinion that a POSITA would have had a reasonable expectation of success in combining Barghouthi with Breuer. Barghouthi implements circuit-switching (PSTN and LEC technology) in the context of call

routing, which Breuer also employs. *Compare* EX1005 (Barghouthi), Figure 1 (elements 180 and 190), *with* EX1006 (Breuer), Figure 1 (elements 10 and 30).

81. Further, Barghouthi expressly discloses that it can perform database queries to identify the called party using the E.164 numbering format. EX1005, 4:22-28 ("An identifier or number associated with the egress point 120 may contain any desired length of digits. As just one example, the identifier may comprise an E.164 number, which is an international standardized numbering plan used in voice and data networks that defines the numbering format, which typically varies by geographic region. For example, in the United States, an E.164 number is a 10-digit number."). It is well understood that toll-free numbers – i.e., numbers in the form of 1-8xx-xxx-xxxx – adhere to E.164 numbering format. Breuer's database querying, which includes querying a database using the dialed toll-free number (e.g., a number in the form of 1-8xx-xxx-xxxx – E.164 format) to locate the RESPORG ID of the RESPORG responsible for managing the dialed number, may thus be readily incorporated into Barghouthi's call routing system, which is by its nature sufficiently flexible to accommodate the adoption of features such as Breuer's.

82. Further, because Barghouthi and Breuer both involve routing calls using standard telecommunications networks and components, it is my opinion that this combination represents no more than the combination of familiar elements that

would yield a predictable result. Lastly, it is my opinion that this combination represents nothing more than an arrangement of old elements with each performing the same function disclosed in their respective prior art references (Barghouthi directly routing a call between a calling party and called party, and Breuer identifying the RESPORG responsible for handling a toll-free call). It is my opinion that this combination would yield no more than a POSITA would expect from such an arrangement at the time of the claimed invention of the '249 Patent.

2. Claim 1

a. Element 1[preamble]: "A method for routing toll-free calls through a toll-free exchange, the method, performed by a policy router of the toll-free exchange, comprising:"

83. In my opinion, Barghouthi in combination with Breuer teaches a method for routing calls through a toll-free exchange, whereby the method is performed by a policy router of the toll-free exchange.

84. Specifically, Barghouthi teaches a "routing component 130" for routing calls:

> A process for routing a call between an ingress point and an egress point is based on an identifier, such as a number, assigned to the egress point and a registry in which identifiers are stored. A ***routing component*** receives the call from the ingress point and consults the registry to determine if an entry with the identifier of the egress point being called is stored therein. If a corresponding

> entry exists, a delivery route for routing the call to the egress point is determined. The delivery route may be a first path to the egress point if available. If the first path is not available, one or more secondary paths are determined, where one is utilized for sending the call to the egress point. The utilized secondary path may be the most optimal path for the call based upon established preferences and call features.

EX1005, Abstract (emphasis added). Notably, Barghouthi expressly teaches "utiliz[ing] the routing component 130 for direct routing of calls" between the ingress point (calling party's communication device, 110) and egress point (called party's communication device, 120). *Id.*, 3:24-28; *see also id.*, 4:8-67 ("The call is initiated at the ingress point 110"; "[t]he call may be received at the routing component 130 directly from the ingress point 110"; "[t]he routing component 130 may then determine a delivery route for the call, which may, according to an embodiment, be … a path from the routing component 130 directly to the egress point 120").

85. The '249 Patent teaches that the claimed toll-free exchange is nothing more than a "computing device" "used to route calls." EX1001, 4:24-26; 10:64-11:15. The '249 Patent further teaches that the claimed "policy router" includes nothing more than "the routing logic and decision-making of the toll-free exchange." *Id.*, 5:31-34. Similarly, Barghouthi describes its "routing component

130" as a "processing element embodied as a processor, a co-processor, a controller, or various other processing means or devices including circuits," which includes "a memory element" "for storing information, instructions, or the like to enable the routing component 130 to perform various functions," including call routing. EX1005, 3:58-4:67. As such, it is my opinion that Barghouthi's "routing component" discloses the '249 Patent's claimed "toll-free exchange" and corresponding "policy router" for routing calls.

86. Barghouthi further contemplates the ability to route toll-free calls using the routing component 130, explaining that the dialed number may be in E.164 format. EX1005, 4:22-28 ("An identifier or number associated with the egress point 120 … may comprise an E.164 number, which … in the United States … is a 10-digit number."). It is well understood by a POSITA that toll-free numbers – i.e., numbers in the form of 1-8xx-xxx-xxxx – adhere to 10-digit E.164 numbering format. Thus, it is my opinion that Barghouthi contemplates and is capable of routing toll-free calls.

87. To the extent Barghouthi does not expressly disclose routing toll-free calls, Breuer does. EX1006, 6:17-28 ("[R]etrieved data [is] routed back to the SSP which uses the routing information to conduct typical toll-free call processing"); *see also id.*, 4:46-57 (describing toll-free network and corresponding components for routing toll free calls), 4:65-5:6 (same). It is my opinion that it would have

been obvious to a POSITA at the time of the claimed invention of the '249 Patent to modify Barghouthi, to the extent it even needed to be modified, according to Breuer to route toll-free calls using Barghouthi's call routing system, which in the modified Barghouthi/Breuer system would include a toll-free routing component 130 (i.e., a toll-free exchange).

88. Thus, to the extent the preamble is limiting, it is my opinion that Barghouthi in view of Breuer discloses the preamble of Claim 1.

b. Element 1[a]: "receiving, from an originating responsible organization (RESPORG), a toll-free call, wherein the toll-free call is directed to a toll-free subscriber that is served by a terminating RESPORG;"

89. It is my opinion that Barghouthi in combination with Breuer discloses receiving, from an originating responsible organization (RESPORG), a toll-free call, wherein the toll-free call is directed to a toll-free subscriber that is served by a terminating RESPORG.

90. The '249 Patent discloses that an originating RESPORG is merely "the entity responsible for handling each of the incoming and outgoing calls of the originating caller" (i.e., the calling party), and specifically identifies Verizon Wireless as one such originating RESPORG. EX1001, 5:55-65.

91. Barghouthi teaches a method for routing a call from a calling party to a called party based on an identifier of the called party's communication device.

EX1005, 1:58-2:3. The call is initiated at the calling party's communication device (e.g., ingress point 110) by entering an identifier associated with the called party's communication device (e.g., egress point 120). *Id.*, 4:8-12. The identifier associated with the called egress point 120 may contain any length of digits and may be a standard 10-digit telephone number. *Id.*, 4:22-38.

92. Barghouthi further discloses that after a call is placed on the calling party's device (e.g., ingress point 110), the call is then "received at the routing component 130 directly from the ingress point 110 or from the interexchange carrier 150 associated with the ingress point 110." EX1005, 4:8-21; *see also id.*, 3:46-49 ("The routing component 130 may connect directly to the ingress point 110 and the egress point 120, or the connection may be through an interexchange carrier 150, a service provider 160, and/or a network such as the Internet 170."). It is my opinion that a POSITA would understand that an incoming call received by the routing component 130 must come from the calling party's (i.e., originating caller's) service provider (e.g., either the interexchange carrier (150) or service provider (160)), which may be for example, Verizon Wireless, AT&T, T-Mobile, etc.

93. Barghouthi also discloses that the placed call is directed to a called party (e.g., egress point 120) that is served by a terminating RESPORG (e.g., service provider 160), which is responsible for handling each of the incoming and

outgoing calls of the called party. EX1005, 4:52-67 ("The direct path [for routing the call to egress point 120] may be a path from the routing component 130 directly to the egress point 120, or may be a path to the service provider 160 of the egress point 120 via the Internet 170 to the egress point 120.").

94. As explained above, Barghouthi contemplates routing toll-free calls, which would include routing toll-free calls to a toll-free subscriber. *See* Section X.A.2.a. To the extent Barghouthi does not expressly disclose routing toll-free calls, Breuer does. EX1006, 6:17-28; *see also id.*, 4:46-57, 4:65-5:6 (same). To that end, Breuer expressly discloses receiving, from an originating RESPORG (i.e., originating LEC network 10), a toll-free call, wherein the toll-free call is directed to a toll-free subscriber that is served by a terminating RESPORG (i.e., destination LEC network 30):

> For toll-free calls originating within LEC network 10, local switch 14a generates a call routing data query that is provided by CCS7 network 16 to SCP 18. SCP 18 responds with call routing data that identifies the carrier to which the call is to be routed. … When the call requires handling by another carrier, local switch 14a uses the carrier data from SCP 18 to route the call to toll switch 22a [of toll switch network 20]. … In response to receiving a toll-free call from LEC network 10, toll switch 22a generates a call routing data query which is provided by CCS7 network 26 to SCP 28 for call routing information. This information may identify LEC network

> 10, LEC network 30 or another toll network for further routing. Eventually, the call is transported to a destination LEC network 30 which routes the call to destination number 32.

EX1006, 5:7-30. Breuer further expressly discloses that LECs are RESPORGs (*id.*, 5:13-17) and that RESPORGs may be companies such as AT&T (*id.*, 7:10-19).

95. It is my opinion that it would have been obvious to a POSITA at the time of the claimed invention of the ’249 Patent to modify Barghouthi, to the extent it even needed to be modified, according to Breuer such that Barghouthi’s routing component 130 is modified to receive a toll-free call from Breuer’s originating RESPORG and further wherein the toll-free call is directed to a toll-free subscriber that is served by one of Breuer’s terminating RESPORGs, in order to route toll-free calls using Barghouthi’s call routing system.

96. Therefore, it is my opinion that Barghouthi in view of Breuer discloses Element 1[a].

c. Element 1[b]: “querying a database to determine a RESPORG identification associated with the terminating RESPORG, wherein the database is associated with the toll-free exchange and stores the RESPORG identification associated with the terminating RESPORG; and”

97. It is my opinion that Barghouthi in combination with Breuer discloses querying a database to determine a RESPORG identification associated with the

terminating RESPORG, wherein the database is associated with the toll-free exchange and stores the RESPORG identification associated with the terminating RESPORG.

98. As an initial matter, a POSITA at the time of the claimed invention of the '249 Patent would understand that a "RESPORG identification" is simply data, which may be in the form of a string of characters, that identifies a RESPORG. EX1006, 6:30-33 ("The switch of the present invention also extracts the Resp Org identifying data from the query response (Block 58) and stores the data for later access.").

99. Barghouthi discloses that after a call is placed by the calling party at ingress point 110 and received by the routing component 130, the routing component 130 queries its associated database 140 to determine the identification associated with the called party's device (e.g., egress point 120). For example, as disclosed by Barghouthi: "Upon receipt of the call, the routing component 130 consults the registry 140 to determine if the identifier being called is stored therein. Consulting the registry 140 ***may include querying the registry 140 to determine if a registry entry exists for the identifier being called***." EX1005, 4:39-51; *see also id.*, 7:1-5 ("when a call is being placed via the routing component 130, the registry is searched or otherwise accessed to determine if a stored registry entry includes the identifier and/or IP address associated with an egress point attempting to be

called."). It is my opinion that a POSITA would have readily understood and appreciated, at the time of the claimed invention of the '249 Patent, that it likewise would have been obvious to query the registry 140 to determine if a stored registry entry includes the identifier of the service provider 160 that serves the called egress point 120, as that would require nothing more than merely looking up the identifier of the service provider 160 instead of the called party 120.

100. It is also my opinion that a POSITA would further readily understand that querying a registry (e.g., a database) to determine if an entry exists in the database that includes the identifier associated with equipment being called satisfies the claimed querying step because to query a database is to determine or identify whether certain information of interest (in this case, the identification of the called party) is contained in the database. In other words, to query a database is to do nothing more than determine whether a piece of data of interest is stored in the database.

101. Barghouthi also discloses that the registry (e.g., database) (EX1005, 3:3-4 ("registry [140] may be a database")) is associated with the routing component 130 (e.g., toll-free exchange) and stores the identifier associated with the called party's device (e.g., RESPORG identification associated with the terminating RESPORG). For example, Barghouthi discloses that "the registry [140] may be integral with the routing component [130]" (EX1005, 2:66-67), and

that "registry [140] may include registry entries, [] with each entry including one or more of: information related to the user, information related to the user's device, the phone number or other identifier associated with the user's device (i.e., the device identifier), an Internet Protocol (IP) number associated with the user's device …" (*id.*, 3:8-12).

102. In light of the above, it is my opinion that Barghouthi discloses this limitation. Further, and as explained above, Barghouthi contemplates routing toll-free calls, which would include routing toll-free calls to a toll-free subscriber. *See* Section X.A.2.a. To the extent Barghouthi does not expressly disclose routing toll-free calls or the precise requirements of this limitation, Breuer does. EX1006, 5:30:43, 6:17-34. Specifically, Breuer expressly discloses querying a database to determine a RESPORG identification associated with the terminating RESPORG, wherein the database is associated with the toll-free exchange and stores the RESPORG identification associated with the terminating RESPORG:

> In the system and method of the present invention, local switches 14a and 14b are provided with computer software that ***generates a database query for Resp Org data***. Preferably, this Resp Org query is included in the query for call routing data although it may be generated as a separate query. The Resp Org query is received by CCS7 network 16 and delivered to SCP 18. Because the database downloads from SMS/800 database 36 contain Resp Org

> data, ***SCP [18] provides the Resp Org data in a response to one of the local switches***. The software in local switch 14 a ***extracts the identity of the Resp Org from the response to the Resp Org query*** and generates a call detail record for the toll-free call that includes data identifying the Resp Org.

EX1006, 5:30-43 (emphasis added); *see also id.*, 6:17-33. Breuer's SCP 18 is the database that is queried to determine the RESPORG identification associated with the terminating RESPORG as it "contains call routing data and Resp Org data for toll-free telephone number that SCP 18 periodically receives from toll-free number database 36." *Id.*, 4:62-64. SCP 18 is also associated with LEC network 10 (e.g., a toll-free exchange). *Id.*, Figure 1 (showing SCP 18 contained within LEC network 10), 5:13-17 ("For toll-free telephone calls that originate and terminate at numbers serviced by LEC network 10, and for which that LEC is the Resp Org, local switch 14a may route a call from the originating number to the destination number, after the routing query is sent to the SCP."). Breuer's "Resp Org data" is "Resp Org identification data" (*id.*, 3:42-45, i.e., RESPORG identification) associated with the "Resp Org responsible for [the called] toll-free number" (*id.*, 3:21-22, i.e., terminating RESPORG).

103. It is my opinion that a POSITA would understand, at the time of the claimed invention of the '249 Patent, that Breuer's aforementioned process for querying a database to determine a RESPORG identification associated with the

terminating RESPORG could be implemented into Barghouthi's call routing system such that Barghouthi's routing component 130 could be programmed to query the registry 140 to determine the RESPORG identification of service provider 160 associated with egress point 120. Further, modifying Barghouthi in this way would result in a process that is nearly identical as the process Barghouthi currently uses to query its database, except that instead of querying the database for the identification of the called party's device, Barghouthi's routing component 130 would be programmed to query the database for the identification of the terminating RESPORG, which would be an easy modification in light of Breuer. Moreover, a POSITA would understand that Barghouthi's registry 140 could be modified as described in Breuer to store the RESPORG identification associated with Barghouthi's service provider 160. This is supported by the fact that Barghouthi expressly states that various "[o]ther types of information may be included in the registry entries" stored within registry 140. EX1005, 3:15-17.

104. It is my opinion that a POSITA would have been motivated at the time of the claimed invention of the '249 Patent to make these simple modifications to Barghouthi in order to allow Barghouthi's system to route toll-free calls directly from the calling party to the called toll-free subscriber using a modified version of Barghouthi's direct call routing system. It is further my opinion that a POSITA would have had a reasonable expectation of success when

combining Barghouthi and Breuer in this way because this combination represents no more than the combination of familiar elements that would yield a predictable result. Likewise, this combination represents nothing more than arrangement of old elements with each performing the same function disclosed in their respective prior art references and therefore this combination would yield no more than a POSITA would expect from such an arrangement.

105. In light of the above, it is my opinion that Barghouthi in view of Breuer discloses Element 1[b].

d. Element 1[c]: "routing, to the terminating RESPORG, the toll-free call based in part on the RESPORG identification."

106. It is my opinion that Barghouthi in combination with Breuer discloses routing, to the terminating RESPORG, the toll-free call based in part on the RESPORG identification.

107. Barghouthi's routing component 130 routes the call directly to the service provider 160 associated with the called party's device 120 (i.e., the terminating RESPORG) based on the identifier of the called party's device (i.e., egress point 120). For example, "if the identifier or number [associated with the called egress point 120] is stored in the direct routing portion 142 of the registry 140," routing component 130 retrieves the IP address of the called egress point, which is contained in the stored registry entry, and routes the call directly "to the

service provider 160 of the egress point 120 via the Internet 170 [which then gets routed] to the egress point 120." EX1005, 4:56-67; id., 7:1-9; *see also id.*, 3:8-13 (explaining that registry entries for called egress points 120 include, among other things, the IP number associated with the user's device).

108. As explained in the preceding Section, Breuer discloses querying a database to determine a RESPORG identification associated with the terminating RESPORG.

109. It is my opinion that it would have been obvious to a POSITA, at the time of the claimed invention of the '249 Patent, to combine Barghouthi's method for direct call routing with Breuer's process for determining the RESPORG identification associated with the terminating RESPORG to yield this claimed limitation. To explain, a POSITA could easily implement Breuer's process for determining the RESPORG identification associated with the terminating RESPORG into Barghouthi's system such that once the RESPORG identification is obtained, Barghouthi's routing component 130 would then route the call directly to the terminating RESPORG (i.e., service provider 160) using the RESPORG identification instead of the identifier of the called egress point 120. This process would be nearly identical as the process Barghouthi currently uses to route calls directly to the service provider 160 of egress point 120 except that it would merely

base the routing of the call on the identification of the service provider 160 instead of the egress point 120.

110. It is my opinion that a POSITA would have been motivated to make these simple modifications to Barghouthi in order to allow Barghouthi's system to route toll-free calls directly from the calling party to the called party. A POSITA would have had a reasonable expectation of success when combining Barghouthi and Breuer in this way because this combination represents no more than the combination of familiar elements that would yield a predictable result. Likewise, this combination represents nothing more than arrangement of old elements with each performing the same function disclosed in their respective prior art references and therefore this combination would yield no more than a POSITA would expect from such an arrangement.

111. In light of the above, it is my opinion that Barghouthi in view of Breuer discloses Element 1[c].

3. Claim 2: "The method of claim 1, wherein the originating RESPORG and the terminating RESPORG are enrolled in the toll-free exchange."

112. It is my opinion that Barghouthi in combination with Breuer discloses that the originating RESPORG and the terminating RESPORG are enrolled in the toll-free exchange.

113. Barghouthi discloses the general idea that every user device (e.g., ingress point 110 and egress point 120) is enrolled or stored in the system's registry 140, which is integrated with routing component 130. For example, Barghouthi teaches:

> The registry 140 may include registry entries, and with each entry including one or more of: information related to the user, information related to the user's device, the phone number or other identifier associated with the user's device (i.e., the device identifier), an Internet Protocol (IP) number associated with the user's device, settings and/or preferences established by the user and/or service provider, or a subset thereof.

EX1005, 3:8-15.

114. Barghouthi further explains that all the devices in its system may be enrolled or stored in the system's registry:

> The registry entries stored in the other routing portions 144 may include publicly-available information related to phone numbers, identifiers, and call routes for various devices. For example, such information may include routing information for the devices over the public switched telephone network (PSTN) and various local area exchanges (LECs).

EX1005, 3:28-34. Thus, in my opinion, Barghouthi expressly contemplates that the originating and terminating service providers (i.e., the originating and

terminating RESPORGs) would be enrolled or stored with the registry of the routing component (i.e., toll-free exchange).

115. It is my opinion that Breuer also discloses this limitation. For example, Breuer discloses a system where each RESPORG is enrolled in the system: "Each Resp Org provides the call routing and other network information for each toll-free number it manages to the SMS/800 toll-free database as is known. … The alternative method of the present invention uses the SMS/800 SCP updates to maintain a Resp Org/toll-free database." EX1006, Figure 3, 6:42-7:46.

116. Accordingly, in my opinion Barghouthi in view of Breuer discloses Claim 2.

4. Claim 3: "The method of claim 1, wherein the RESPORG identification is obtained by a service control point."

117. It is my opinion that Barghouthi in combination with Breuer discloses that the RESPORG identification is obtained by a service control point.

118. Breuer's service control point 18 obtains the RESPORG identification of the terminating RESPORG. Specifically, Breuer discloses: "The Resp Org query is received by CCS7 network 16 and delivered to SCP 18. …. SCP 18 provides the Resp Org data in response …" EX1006, 5:35-40.

119. As I explained above in Section X.A.2.c, it is my opinion that it would have been obvious to a POSITA to implement Breuer's process for determining the

RESPORG identification of the terminating RESPORG into Barghouthi's call processing system, which would include having Breuer's service control point obtain the RESPORG identification. And, a POSITA would have been motivated to make this simple modification to Barghouthi in order to allow Barghouthi's system to route toll-free calls directly from the calling party to the called party.

120. Thus, it is my opinion that Barghouthi in view of Breuer discloses Claim 3.

5. Claim 4: "The method of claim 1, further comprising: monitoring the toll-free call to generate a call detail record, wherein the call detail record includes at least one of: a time duration of the toll-free call, an identification of the originating RESPORG and the terminating RESPORG, buy-rate of the terminating RESPORG, a floor rate of the originating RESPORG, and a cost associated with the toll-free call."

121. It is my opinion that Barghouthi in combination with Breuer discloses the limitations of Claim 4.

122. Specifically, Breuer discloses monitoring a toll-free call to generate a call detail record, wherein the call detail record includes an identification of the originating RESPORG and the terminating RESPORG. For example, Breuer discloses that "the [Service Switching Point] in the LEC service area in which the call originated, stores the dialed number and the initial carrier [i.e., the identification of the originating RESPORG] as part of a call detail record"

(EX1006, 2:34-37), and also that "the call detail record for the toll-free call [] includes data identifying the Resp Org [i.e., the identification of the terminating RESPORG] (*id.*, 5:36-48).

123. As I explained above in Section X.A.2.c, it would have been obvious to a POSITA to implement Breuer's process for determining the RESPORG identification of the terminating RESPORG into Barghouthi's call processing system, which would include implementing Breuer's monitoring a toll-free call to generate a call detail record that includes the aforementioned information. And, a POSITA would have been motivated to make this simple modification to Barghouthi in order to allow Barghouthi's system to route toll-free calls directly from the calling party to the called party and maintain accurate call detail records so the appropriate RESPORGs are charged for the toll-free call.

124. Thus, it is my opinion that Barghouthi in view of Breuer discloses Claim 4.

6. Claim 6[preamble]: "The method of claim 1, further comprising:"

a. Element 6[a]: "determining whether the terminating RESPORG is enrolled with the exchange;"

125. It is my opinion that Barghouthi in combination with Breuer discloses determining whether the terminating RESPORG is enrolled with the exchange.

Petitioner Affinity Network, Inc. - Ex. 1003, 0063

126. Barghouthi discloses determining whether the called egress point 120 is enrolled with the exchange: "At [step] 204, a determination is made to establish if the identifier [of called egress point 120] is stored in a registry, such as the registry 140. EX1005, Figure 2, 5:39-40. As I explained above in Section X.A.2.c, the registry 140 is integral with the routing component 130 (i.e., the exchange).

127. As I also explained above in Section X.A.2.c, it is my opinion that a POSITA would have readily understood and appreciated at the time of the claimed invention of the '249 Patent that it likewise would have been obvious to determine if the identifier of the service provider 160 (i.e., the terminating RESPORG) that serves the called egress point 120 is enrolled with the routing component 130. As I explained throughout this declaration, making such a minor change would require no more than a simple modification well within a POSITA's capabilities at the time of the claimed invention of the '249 Patent.

128. As such, it is my opinion that Barghouthi renders this limitation obvious to a POSITA. Further, and as explained above, Barghouthi contemplates routing toll-free calls, which would include routing toll-free calls to a toll-free subscriber. *See* Section X.A.2.a. Thus, to the extent Barghouthi does not expressly disclose this limitation, it is my opinion that it would have been obvious to a POSITA, by combining Barghouthi's call routing system with Breuer's toll-

free system as described above, to use Barghouthi's call routing system to route toll-free calls as well as to implement the minor change of determining whether the service provider 160 is enrolled with the routing component 130 instead of whether the egress point 120 is.

129. Thus, it is my opinion that Barghouthi in view of Breuer discloses Element 6[a].

b. Element 6[b]: "based on a determination that the terminating RESPORG is not enrolled with the exchange, rejecting the toll-free call; and"

130. It is my opinion that Barghouthi in combination with Breuer discloses rejecting the toll-free call based on a determination that the terminating RESPORG is not enrolled with the exchange.

131. Barghouthi specifically discloses that "[i]f the identifier [of the called egress point 120] is not stored in the registry 140, then the process ends" (EX1005, Figure 2, 5:42-43), and an alternate routing procedure through the PSTN or "another call routing procedure" (*id.*, 5:45-46) can be executed.

132. For reasons similar to that provided in Section X.A.2.c, it is my opinion that a POSITA would have readily understood and appreciated that it likewise would have been obvious to reject the call if the identifier of the service provider 160 (i.e., the terminating RESPORG) that serves the called egress point 120 is not enrolled with the routing component 130. As I explained throughout

this declaration, making such a minor change would require no more than a simple modification well within a POSITA's capabilities at the time of the claimed invention of the '249 Patent.

133. Barghouthi therefore renders this limitation obvious to a POSITA. Further, and as explained above, Barghouthi contemplates routing toll-free calls, which would include routing toll-free calls to a toll-free subscriber. *See* Section X.A.2.a. To the extent Barghouthi does not expressly disclose this limitation, it would have been obvious to a POSITA, by combining Barghouthi's call routing system with Breuer's toll-free system as described above, to use Barghouthi's call routing system to route toll-free calls as well as to implement the minor change of rejecting the call based on the determination that the service provider 160 is not enrolled with the routing component 130 instead of the determination that the egress point 120 is not enrolled with the routing component 130.

134. To the extent that Barghouthi's alternate routing procedure is not considered "rejecting the toll-free call," it is further my opinion that at the time of the claimed invention of the '249 Patent, a POSITA could easily have modified Barghouthi's alternate routing procedure to completely reject the call with no possibility of alternate routing if the identifier is not part of the registry. This would have been one of several common sense and viable procedures, and would

be considered "another call routing procedure," as contemplated by Barghouthi. EX1005, 5:45-46.

135. Therefore, it is my opinion that Barghouthi in view of Breuer discloses Element 6[b].

c. Element 6[c]: "based on a determination that the terminating RESPORG is enrolled with the exchange, connecting the toll-free call to the terminating RESPORG."

136. It is my opinion that Barghouthi in combination with Breuer discloses connecting the toll-free call to the terminating RESPORG based on a determination that the terminating RESPORG is enrolled with the exchange.

137. Barghouthi specifically discloses that "if the identifier [of the called egress point 120] is stored in the direct routing portion 142 [of the registry 140] and the first path is available, then the call is transmitted to the egress point 120 via the first path." EX1005, Figure 2, 5:59-60.

138. As I explained above in Section X.A.2.c, it is my opinion that a POSITA would have readily understood and appreciated that it likewise would have been obvious to connect the call if the identifier of the service provider 160 (i.e., the terminating RESPORG) that serves the called egress point 120 is enrolled with the routing component 130.

139. In light of the above, it is my opinion that Barghouthi renders this limitation obvious. Further, and as explained above, Barghouthi contemplates routing toll-free calls, which would include routing toll-free calls to a toll-free subscriber. *See* Section X.A.2.a. To the extent Barghouthi does not expressly disclose this limitation, it would have been obvious to a POSITA, by combining Barghouthi's call routing system with Breuer's toll-free system as described above, to use Barghouthi's call routing system to route toll-free calls as well as to implement the minor change of connecting the call based on the determination that the service provider 160 is enrolled with the routing component 130 instead of the determination that the egress point 120 is enrolled with the routing component 130.

140. Therefore, it is my opinion that Barghouthi in view of Breuer discloses Claim Element 6[c].

7. Claim 7: "The method of claim 6, wherein based on a determination that the terminating RESPORG is not enrolled with the exchange, further comprises: determining whether the originating RESPORG requested to connect the toll-free call to a public switched telephone network."

141. It is my opinion that Barghouthi in combination with Breuer discloses determining whether the originating RESPORG requested to connect the toll-free call to a public switched telephone network based on a determination that the terminating RESPORG is not enrolled with the exchange.

142. Barghouthi discloses that "[i]f the identifier [of the called egress point 120] is not stored in the registry 140, then … [a]t this point, the call may be rerouted to a PSTN, other peering grid, or a component to be routed according to another call routing procedure." EX1005, Figure 2, 5:42-43.

143. It is my opinion that a POSITA would have readily understood and appreciated that it likewise would have been obvious to reroute the call if the identifier of the service provider 160 (i.e., the terminating RESPORG) that serves the called egress point 120 is not enrolled with the routing component 130.

144. It is therefore my opinion that Barghouthi renders this limitation obvious. Further, and as explained above, Barghouthi contemplates routing toll-free calls, which would include routing toll-free calls to a toll-free subscriber. *See* Section X.A.2.a. To the extent Barghouthi does not expressly disclose this limitation, it is my opinion that it would have been obvious to a POSITA, by combining Barghouthi's call routing system with Breuer's toll-free system as described above, to use Barghouthi's call routing system to route toll-free calls as well as to implement the minor change of rerouting the call through a PSTN based on the determination that the service provider 160 is not enrolled with the routing component 130 instead of the determination that the egress point 120 is not enrolled with the routing component 130.

145. Moreover, while Barghouthi does not expressly disclose "determining whether the originating RESPORG requested to connect the toll-free call to a public switched telephone network," it is my opinion that a POSITA would understand this limitation to be obvious in light of the fact that Barghouthi does expressly disclose rerouting the call through a PSTN based on a determination that the terminating RESPORG is not enrolled with the exchange. In other words, it would have been obvious to a POSITA to make the minor modification to Barghouthi/Breuer's originating RESPORG to allow the originating RESPORG to request that calls be routed through the standard PSTN when the terminating RESPORG is not enrolled with the system, since Barghouthi already provides this functionality. Such a minor modification would require no more than adding the code for this task (a task the Barghouthi system is already performing) to the originating RESPORG.

146. Therefore, it is my opinion that Barghouthi in view of Breuer discloses Claim 7.

8. Claim 8: "The method of claim 1, wherein a carrier identification code (CIC) of the terminating RESPORG is not used by the method."

147. It is my opinion that Barghouthi in combination with Breuer discloses a method for routing calls where the carrier identification code (CIC) of the terminating RESPORG is not used by the method.

148. As I explained above with respect to Elements 1[b] and 1[c], the call routing system of Barghouthi as modified by Breuer routes toll-free calls using the RESPORG identification of the terminating RESPORG. *See* Sections X.A.2.c-d. In addition, Claim 9 of Barghouthi posits the routing circuit configured to receive the call originated by the ingress point from an interexchange carrier ***associated*** with the ingress point. EX1005, Claim 9. Such *a priori* associations would preclude the need for a CIC. As such, it is my opinion that this modified Barghouthi/Breuer call system for routing toll-free calls does not use the carrier identification code (CIC) of the terminating RESPORG.

149. Therefore, it is my opinion that Barghouthi in view of Breuer discloses Claim 8.

9. Claim 10

a. Element 10[preamble]: "A method for routing toll-free calls without using a carrier identification code (CIC), comprising:"

150. It is my opinion that Barghouthi in combination with Breuer discloses a method for routing toll-free calls without using a carrier identification code (CIC).

151. Specifically, the preamble of Claim 10 is similar in scope to the preamble of Claim 1 and to Claim 8, and therefore, to the extent the preamble of

Claim 10 is limiting, it is disclosed in the prior art as discussed above for the preamble of Claim 1 and Claim 8.

152. Therefore, it is my opinion that Barghouthi in view of Breuer discloses Claim element 10[preamble].

b. Element 10[a]: "receiving, from an originating responsible organization (RESPORG), a toll-free call, wherein the toll-free call is directed to a toll-free subscriber that is served by a terminating RESPORG;"

153. It is my opinion that Barghouthi in combination with Breuer discloses receiving, from an originating responsible organization (RESPORG), a toll-free call, wherein the toll-free call is directed to a toll-free subscriber that is served by a terminating RESPORG.

154. Specifically, Element 10[a] is identical to Element 1[a], and is therefore disclosed in the prior art for the same reasons discussed above for Element 1[a].

c. Element 10[b]: "querying a database to determine a RESPORG identification associated with the terminating RESPORG, wherein the database is associated with the toll-free exchange and stores the RESPORG identification associated with the terminating RESPORG; and"

155. It is my opinion that Barghouthi in combination with Breuer discloses querying a database to determine a RESPORG identification associated with the

terminating RESPORG, wherein the database is associated with the toll-free exchange and stores the RESPORG identification associated with the terminating RESPORG.

156. Element 10[b] is identical to Element 1[b], and is therefore disclosed in the prior art for the same reasons discussed above for Element 1[b].

d. Element 10[c]: "routing, to the terminating RESPORG, the toll-free call through a protected network based in part on the RESPORG identification."

157. It is my opinion that Barghouthi in combination with Breuer discloses routing, to the terminating RESPORG, the toll-free call through a protected network based in part on the RESPORG identification.

158. It is my opinion that Element 10[c] is similar in scope to Element 1[c], and is therefore disclosed in the prior art for the same reasons discussed above for Element 1[c].

159. Further, Element 10[c] contains the added limitation that the toll-free call is routed through a "protected network."

160. As an initial matter, the '249 Patent is silent as to what is meant by a "protected network." The term is ambiguous without further clarification, and there is no clarification forthcoming from the '249 Patent's specification. Consequently, a POSITA to better qualify the term, would ask the question

"protected against what?" In the case of a telecommunications network, this could mean protection against physical damage; such threats could be alleviated by selectively hardening switching and transmission facilities (e.g., guarding switching centers, burying cables in conduits, etc.). Or it could mean protection against eavesdropping, wiretapping, or signal interception that would compromise the security of the information being transmitted; this is often protected via encryption. However, although plausible, there are no hardening of facilities or encryption capabilities disclosed in the specification of the '249 Patent. I believe that the protection contemplated is to prevent RESPORGs that are not enrolled with the toll-free exchange from accepting toll-free calls. My support for this is derived from dependent Claim 11 and specifically claim element 11[b], which indicates that if the terminating RESPORG is not enrolled with the exchange, the toll-free call is rejected. EX1001, Claim 11. This is further supported by the '249 Patent's use of access control lists and authentication processes to permit or reject toll-free calls (as described at 9:31-10:30). Based upon my reasoning above and for purposes of my analysis, I understand (and a POSITA at the time of the claimed invention would understand) that the claim term "protected network" in claim element 10[c] refers to a network protected against the unauthorized acceptance of toll-free calls by RESPORGs that are not enrolled with the toll-free exchange.

161. It is my opinion that Barghouthi in view of Breuer discloses this claim element. Specifically, Barghouthi discloses at Steps 202 and 204 of Figure 2 (as discussed in detail at 5:35-46) the routing component 130 (e.g., the claimed toll-free exchange) receives a call from the ingress point 110 that is initiated through entry of an identifier, such as a telephone number, associated with the desired egress point 120 (the called or terminating point). At step 204, a determination is made to see if that identifier (associated with the egress point 120) is stored in the registry (e.g., database). If it is not, the direct routing "process ends" (*see* EX1005, 5:42-43, and "no" branch in Fig. 2), and an alternate routing procedure through the PSTN or "another call routing procedure" (*id.*, 5:45-46) can be executed. *See also* Section X.A.6.b (regarding Claim Element 6[b]). Barghouthi thus expressly teaches a network that is protected against the unauthorized acceptance of calls by a called party that is not enrolled with the routing component. And, as I previously explained in Section X.A.1 regarding the motivation to combine Barghouthi and Breuer, as well as Section X.A.2.d regarding Claim Element 1[c], the Barghouthi/Breuer toll-free call routing system would use the RESPORG ID of the terminating RESPORG (instead of the identifier of the called device of Barghouthi) to route toll-free calls through the protected network.

162. Accordingly, it is my opinion that this claim limitation is obvious over Barghouthi in view of Breuer.

163. Therefore, Barghouthi in view of Breuer discloses Element 10[c].

10. Claim 11[preamble]: "The method of claim 10, further comprising:"

a. Element 11[a]: "determining whether the terminating RESPORG is enrolled with the exchange;"

164. It is my opinion that Barghouthi in combination with Breuer discloses determining whether the terminating RESPORG is enrolled with the exchange.

165. Element 11[a] is identical to Element 6[a] and is therefore disclosed in the prior art for the same reasons discussed above for Claim Element 6[a].

b. Element 11[b]: "based on a determination that the terminating RESPORG is not enrolled with the exchange, rejecting the toll-free call; and"

166. It is my opinion that Barghouthi in combination with Breuer discloses based on a determination that the terminating RESPORG is not enrolled with the exchange, rejecting the toll-free call.

167. Element 11[b] is identical to Element 6[b] and is therefore disclosed in the prior art for the same reasons discussed above for Element 6[b].

c. Element 11[c]: "based on a determination that the terminating RESPORG is enrolled with the exchange, connecting the toll-free call to the terminating RESPORG."

168. It is my opinion that Barghouthi in combination with Breuer discloses based on a determination that the terminating RESPORG is enrolled with the exchange, connecting the toll-free call to the terminating RESPORG.

169. Claim Element 11[c] is identical to Claim Element 6[c] and is therefore disclosed in the prior art for the same reasons discussed above for Claim Element 6[c].

11. Claim 12: "The method of claim 10, further comprising: monitoring the toll-free call to generate a call detail record, wherein the call detail record includes at least one of: a time duration of the toll-free call, an identification of the originating RESPORG and the terminating RESPORG, buy-rate of the terminating RESPORG, a floor rate of the originating RESPORG, and a cost associated with the toll-free call."

170. It is my opinion that Barghouthi in combination with Breuer discloses monitoring the toll-free call to generate a call detail record, wherein the call detail record includes at least one of: a time duration of the toll-free call, an identification of the originating RESPORG and the terminating RESPORG, buy-rate of the terminating RESPORG, a floor rate of the originating RESPORG, and a cost associated with the toll-free call.

171. Claim 12 is identical to Claim 4 and is therefore disclosed in the prior art for the same reasons discussed above for Claim 4.

B. Ground 2: Claims 5 and 13 are Obvious over Barghouthi (EX1005) in view of Breuer (EX1006) and Eng (EX1007)

1. Motivation to Combine Barghouthi, Breuer and Eng

172. It is my opinion that A POSITA at the time of the claimed invention of the '249 Patent would have been motivated to combine Barghouthi, Breuer and

Eng because they are all generally in the same field of endeavor as the '249 Patent – telecommunications and cost-effective call routing. *See* Section X.A.1; *compare with* EX1007 (Eng), 1:29-33 ("the present invention relates to online trading exchange systems and, more particularly, to an online telecommunications trading exchange that is capable of automatically settling trading accounts for buyers and sellers of telecommunications services."). Specifically, Barghouthi and Eng are both directed to cost-effective call routing. Compare EX1005 (Barghouthi), 5:10-24 ("The routing component 130 may utilize the most optimal route of the various possible secondary paths. For example, the most optimal route may be … the path that is the least expensive route.") with EX1007 (Eng), 3:13-16 ("The server node may be programmed to substantially optimize the routing plan or rate table with respect to one or more parameters such as price …"). Further, Barghouthi, Breuer and Eng all rely on a similar network architecture, employing network components with similar functionality throughout. *E.g.*, EX1005 (Barghouthi), Figure 1 (elements 180, 190 and 160), EX1006 (Breuer), Figure 1 (elements 10, 30), EX1007 (Eng), Figure 1 (element 6).

173. It is also my opinion that a POSITA further would have been motivated to combine the references to use Eng's teachings to improve the Barghouthi/Breuer toll-free call routing system in order achieve Barghouthi's expressly desired advantages.

174. While Barghouthi and Breuer disclose routing calls in a telecommunications system, they do not explicitly describe a way for service providers to determine whether it is cost beneficial for them to connect calls. Eng does disclose this feature. Specifically, Eng teaches a telecommunications system that routes communications between a requesting telecommunications service provider and an offering telecommunications service provider when the offering telecommunications service provider's offer to provide its telecommunications services matches the requesting telecommunication service provider's request to buy telecommunication services. *See, e.g.*, EX1007, 2:44-61. And, Eng provides a detailed explanation of how to do so. *Id.*, Figure 5, 11:43-14:27.

175. It is my opinion that at the time of the claimed invention of the '249 Patent, a POSITA would have been motivated to combine Eng's simple price matching feature with the Barghouthi/Breuer toll-free call routing system discussed above to achieve the benefits of allowing service providers to select optimal routes based on the cost of routing the call as well to set the rates at which they are willing to accept to provide telecommunications services, and rates at which they are willing to pay to receive telecommunications services; and to only provide telecommunications where it is cost beneficial to the telecommunications service providers.

176. It is further my opinion that implementing the price matching feature of Eng to the Barghouthi/Breuer system would have been easily within the skill of a POSITA at the time of the claimed invention of the ’249 Patent. In this combination the systems of Barghouthi, Breuer and Eng would be performing the same functions they were known to perform, and the resulting combined system would provide the predictable result of price matching between service providers in a toll-free communications system.

177. It is therefore my opinion that a POSITA would have been motivated to combine Eng’s price matching feature with the Barghouthi/Breuer toll-free call routing system at the time of the claimed invention of the ’249 Patent.

2. Claim 5: “The method of claim 4, wherein routing to the terminating RESPORG further comprises: determining that the floor rate of the originating RESPORG is less than the buy rate of the terminating RESPORG.”

178. It is my opinion that Barghouthi in combination with Breuer and further in combination with Eng discloses determining whether that the floor rate of the origination RESPORG is less than the buy rate of the terminating RESPORG.

179. The ’249 Patent explains that the floor rate of the originating RESPORG is the “minimum rate [the originating RESPORG] will accept in order to route the call through the toll-free exchange 302 and to the terminating

RESPORG." EX1001, 4:53-57. The '249 Patent further explains that the buy rate of the terminating RESPORG is the "rate at which [the terminating RESPORG] may pay an originating RESPORG or service provider for connecting a call." Id., 4:47-50. Thus, as explained by the '249 Patent, routing a call based on whether the fee charged to a route call is less than the amount the buyer is willing to pay is nothing more than simply determining "whether it is cost beneficial for the originating RESPORG 102 to connect the call to the terminating RESPORG 202." *Id.*, 10:38-40. It is therefore my opinion that Claim 5 is directed to nothing more than a longstanding economic principle (i.e., completing a transaction when what a buyer is willing to pay for an item is less than what a seller is willing to accept for the item) to toll-free calling. *See*, *e.g.*, EX1009 (U.S. Patent No. 6,131,087), Abstract.

180. Further, Eng expressly discloses routing communications between a requesting telecommunications service provider (i.e., terminating RESPORG) and an offering telecommunications service provider (i.e., originating RESPORG) when the offering telecommunications service provider's offer to provide its telecommunications services (i.e., its floor rate) matches (i.e., is less than or equal to) the requesting telecommunication service provider's request to buy telecommunication services (i.e., buy rate). *See*, *e.g.*, EX1007, 2:44-61.

181. It is my opinion that a POSITA would have been motived to combine Eng's simple price matching feature with the system of Barghouthi/Breuer discussed above to achieve the benefits of allowing service providers to set the rates at which they are willing to accept to provide telecommunications services, and rates at which they are willing to pay to receive telecommunications services; and to only provide telecommunications where it is cost beneficial to the telecommunications service providers. Such a modification would have been well within a POSITA's capabilities at the time of the claimed invention and would have yielded predictable results. Thus, it is my opinion that a POSITA would have found it obvious to apply Eng's price matching feature to the Barghouthi/Breuer system.

182. Therefore, it is my opinion that Barghouthi in view of Breuer and further in view of Eng discloses Claim 5.

3. Claim 13: "The method of claim 12, wherein routing to the terminating RESPORG further comprises: determining that the floor rate of the originating RESPORG is less than the buy rate of the terminating RESPORG."

183. It is my opinion that Barghouthi in view of Breuer and further in view of Eng discloses determining that the floor rate of the originating RESPORG is less than the buy rate of the terminating RESPORG.

184. Claim 13 is identical to Claim 5 and is therefore disclosed in the prior art for the same reasons discussed above for Claim 5.

C. Ground 3: Claims 9 and 14-19 are Obvious over Barghouthi (EX 1005) in view of Breuer (EX1006) and Goode (EX1008)

1. Motivation to Combine Barghouthi, Breuer and Goode

185. It is my opinion that a POSITA at the time of the claimed invention of the '249 Patent would have been motivated to combine Barghouthi, Breuer and Goode because they are all in the same field of endeavor as the '249 Patent – telecommunications and call routing. *See* Section X.A.1, *compare with* EX1008 (Goode), Figures 1 and 2, 3:22-4:4 (describing the call routing process in a VoIP network in detail). Specifically, each of these references discloses and/or claims systems and methods that are intended to improve telecommunications and call routing. Further, Barghouthi, Breuer and Goode all rely on a similar network architecture, employing network components with similar functionality throughout. *E.g.*, EX1005 (Barghouthi), Figure 1 (elements 180, 190 and 160), EX1006 (Breuer), Figure 1 (elements 10, 30), EX1008 (Goode), Figure 1 (elements 120, 130, 140).

186. A POSITA also would have been motivated to combine the references to use Goode's teachings to improve the Barghouthi/Breuer toll-free call routing system.

187. Coincident with the introduction of VoIP transport into telecommunications networks in the late 1990s and based on economies in digital signal processing, several sophisticated voice digitization techniques (used in codecs) became commercially available, which significantly reduced the data rates required to provide toll-quality voice signals. Unlike the PSTN, which used a one-size-fits-all digitization method, it was widely recognized that IP networks needed to be able to transport voice in multiple digitization formats due to the availability of the different codecs using different voice digitization algorithms. Over the course of a decade beginning in the early 2000s, with the growing proliferation of VoIP, the continued migration away from traditional PSTNs and the increase in mobile voice networks, the number of different codec types significantly expanded. For example, in the traditional wireline PSTN, legacy codecs were still widely deployed, which used higher digitization rates; but in other networks such as wireless networks, where bandwidth was at a premium, codecs with more sophisticated compression techniques were being used to digitize the voice signal. This resulted in voice signals being processed in different formats and at different digitization rates.

188. Hence, as readily understood by a POSITA, in order for a VoIP network to provide interoperability among many different voice networks and applications potentially employing many different data formats, voice transcoding

was required. Voice transcoding bridges the differences between format mismatches created by the various devices within telecommunications networks and allows seamless communication between the calling and called parties who may be using different codecs to digitize the analog voice signal. Barghouthi expressly acknowledges this need for transcoding for routing the media stream of VoIP calls. EX1005, 6:18-22.

189. Transcoding is also performed so that different network service providers can communicate with one another regardless of the state of their networks' evolution (e.g., all-IP network (IP-core), hybrid IP (IP network and PSTN), and legacy network (all PSTN)), as well as mobile network operators supporting different generation cellular formats (e.g., 2G, 3G, 4G, etc.). Indeed, fundamental VoIP transport protocols such as session initiation protocol (SIP) (discussed in both the '249 Patent (Ex. 1001, 9:35-38) and Barghouthi (EX1005, 5:56-58)) employ methods to identify the type of algorithm used to digitize the voice signal (i.e., the codecs in use at both the calling party / ingress point and the called party / egress point). In short, the protocol determines the need for and type of transcoding required to ensure that intelligible communications between the parties is possible.

190. While Barghouthi and Breuer disclose routing calls in a telecommunications system, and Barghouthi acknowledges the need for resolving

format mismatches, neither reference explicitly describes methods for addressing format mismatches, which is a necessary capability intrinsic to VoIP networks due to the use of different codecs from the calling party to the called party. Goode, however, does disclose this feature. Specifically, Goode describes a telecommunications system that detects a format or codec mismatch between the parties' devices and corrects the mismatch by transcoding the media format into one that is compatible with the called party's device. *See*, *e.g.*, EX1008, 4:64-5:58. And, Goode provides a detailed explanation of how to do so. *Id.*, Figures 2-4, 4:64-5:58.

191. Notably, and while not providing a specific solution to the problem, Barghouthi expressly states that there is a need to "transcode[] or convert[] the call to a format that is compatible with the destination device (i.e., the egress point 120)." EX1006, 6:19-22. Thus, it is my opinion that a POSITA would have been motivated to combine Goode's codec mismatch correction feature with the system of Barghouthi/Breuer discussed above to achieve the benefits of efficiently transcoding the mismatched media in a telecommunications network, so as to provide seamless and efficient call routing. This is further support that a POSITA would have been motivated to combine Goode's codec mismatch correction feature with the Barghouthi/Breuer toll-free call routing system.

192. It is also my opinion that implementing Goode's transcoding feature to the Barghouthi/Breuer system would have been easily within the skill of a POSITA at the time of the claimed invention of the '249 Patent. In this combination the systems of Barghouthi, Breuer and Goode would be performing the same functions they were known to perform, and the resulting system would provide the predictable result of correcting codec or format mismatches.

193. It is therefore my opinion that a POSITA would have been motivated to combine Goode's transcoding feature with the Barghouthi/Breuer toll-free call routing system at the time of the claimed invention of the '249 Patent.

2. Claim 9: "The method of claim 1, further comprising routing a media portion of the toll-free call through a media server farm, wherein the media server farm configures the media portion of the toll-free call for routing."

194. It is my opinion that Barghouthi in combination with Breuer and further in combination with Goode discloses routing a media portion of the toll-free call through a media server farm, wherein the media server farm configures the media portion of the toll-free call for routing.

195. Often times in telecommunications systems, the media being routed needs to be configured in a certain format so that it may be carried over the network to the called party. EX1001, 8:26-36. The '249 Patent explains that a media server farm, which may include one or more servers, "processes the media

portion of the call, such as voice or video data of the call." *Id.*, 8:26-28. Processing media may include "compressing and configuring the media to be carried over a network to the terminating RESPORG." *Id.*, 8:28-31.

196. While Barghouthi describes the need to "transcode[] or convert[] the call to a format that is compatible with the destination device (i.e., the egress point 120)," it does not identify or describe the method(s) or component(s) for doing so. EX1005, 6:19-22. Goode, however, does. Specifically, Goode describes routing a media portion of a call (audio, video, or multimedia) through a transcoding function server 430 of Border Element 433 (i.e., the media server farm). The transcoding function server 430 includes a transcoding server 431 and a media resource 432. EX1008, Figure 3 and 4, 5:10-22, 5:53-58. Specifically, the "transcoding server provides the control function of the transcoding service while the media resource performs the actual transcoding between two different codecs." *Id.*, 5:17-20. In other words, the transcoding server converts the media to be routed into a format that is compatible with the called party – i.e., configures the media potion of the call for routing.

197. It is my opinion that a POSITA at the time of the claimed invention of the '249 Patent would have found it obvious to combine Goode's method for transcoding mismatched media formats with the Barghouthi/Breuer toll-free call routing system discussed above in order to overcome the common issue of

mismatched media in VoIP networks. Thus, a POSITA would have found it obvious to apply the transcoding feature of Goode to the Barghouthi/Breuer system.

198. Therefore, it is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses Claim 9.

3. Claim 14: "The method of claim 10, further comprising routing a media portion of the toll-free call through a media server farm, wherein the media server farm configures the media portion of the toll-free call for routing."

199. It is my opinion that Barghouthi in combination with Breuer and further in combination with Goode discloses routing a media portion of the toll-free call through a media server farm, wherein the media server farm configures the media portion of the toll-free call for routing.

200. Claim 14 is identical to Claim 9, and is therefore disclosed in the prior art for the same reasons discussed above for Claim 9.

4. Claim 15[preamble]: "The method of claim 10, wherein receiving, from an originating RESPORG, a toll-free further comprises:"

a. Element 15[a]: "receiving, at a session border controller, a data portion of the toll-free call; and"

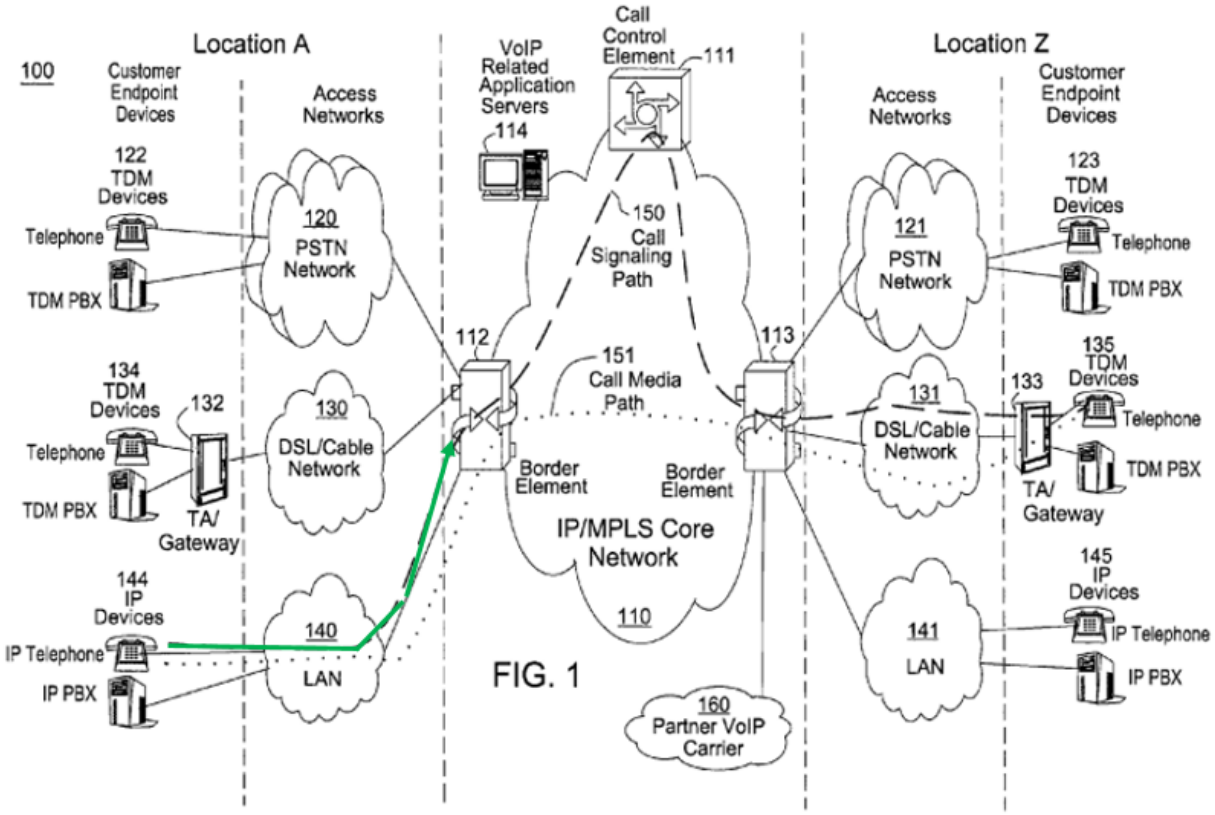
201. It is my opinion that Barghouthi in combination with Breuer and further in combination with Goode discloses receiving, at a session border controller, a data portion of the toll-free call.

202. The ’249 Patent describes a session border controller as a switch that routes the data portion of a call (i.e., the information indicating where the call needs to be routed, such as the IP address associated with the called party or the RESPORG of the called party). EX1001, 5:66-6:14; 8:62-65.

203. Goode discloses this exact component. Specifically, Goode discloses a Border Element (BE) 112, which “is typically implemented as a Media Gateway or a ***Session Border Controller*** and performs signaling, media control, security, and call admission control and related functions.” EX1008, 2:65-3:1 (emphasis added). As shown in Figure 1 and explained by Goode, the BE 112 receives called party information (i.e., the data portion of the call) from the LAN 140:

> A customer using IP device 144 at location A places a call to another customer at location Z using TDM device 135. During the call setup, ***a setup signaling message [which contains the called party information] is sent*** from IP device 144, through the LAN 140, the Router 142, and the associated packet based access network, ***to BE 112***. BE 112 will then send a setup signaling message [which contains the called party information], such as a SIP-INVITE message if SIP is used, to CCE 111. CCE 111 looks at the called party information and queries the necessary VoIP service related application server 114 to obtain the information to complete this call

EX1008, Figure 1, 3:25-34. Figure 1 further shows the BE 112 receives the called party information (i.e., data portion of the call) from the LAN 140 (i.e., originating RESPORG) via the "Call Signaling Path 150":



Id., Figure 1 (showing in **green** "Call Signaling Path 150," which contains the data portion of the call, flowing from IP Device 144 to LAN 140 and to BE 112).

204. As I explained above in Section X.C.1, it is my opinion that a POSITA would have been motivated to combine, at the time of the claimed invention of the '249 Patent, Goode's method for transcoding mismatched media

formats with the Barghouthi/Breuer toll-free call routing system in order to overcome the common issue of mismatched media in VoIP networks.

205. Therefore, it is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses Element 15[a].

b. Claim 15[b]: "receiving, at a media gateway server farm, a media portion of the call."

206. It is my opinion that Barghouthi in combination with Breuer and further in combination with Goode discloses receiving, at a media gateway server farm, a media portion of the toll-free call.

207. The '249 Patent explains that a media server farm, which may include one or more servers, "processes the media portion of the call, such as voice or video data of the call." EX1001, 8:26-28. Processing media may include "compressing and configuring the media to be carried over a network to the terminating RESPORG." *Id.*, 8:28-31.

208. Goode discloses this exact component. Specifically, Goode discloses a Border Element 112, which is "typically implemented as a Media Gateway" (EX1008, 2:66-3:1) and is "responsible for the necessary signaling protocol translation, e.g., SS7 to and from SIP, and ***media format conversion***, such as TDM voice format to and from IP based packet voice format" (*id.*, 3:66-4:2, emphasis

added). As shown in Figure 1, the BE 112 receives the media portion of the call from the LAN 140 (i.e., originating RESPORG) via the "Call Media Path 151":

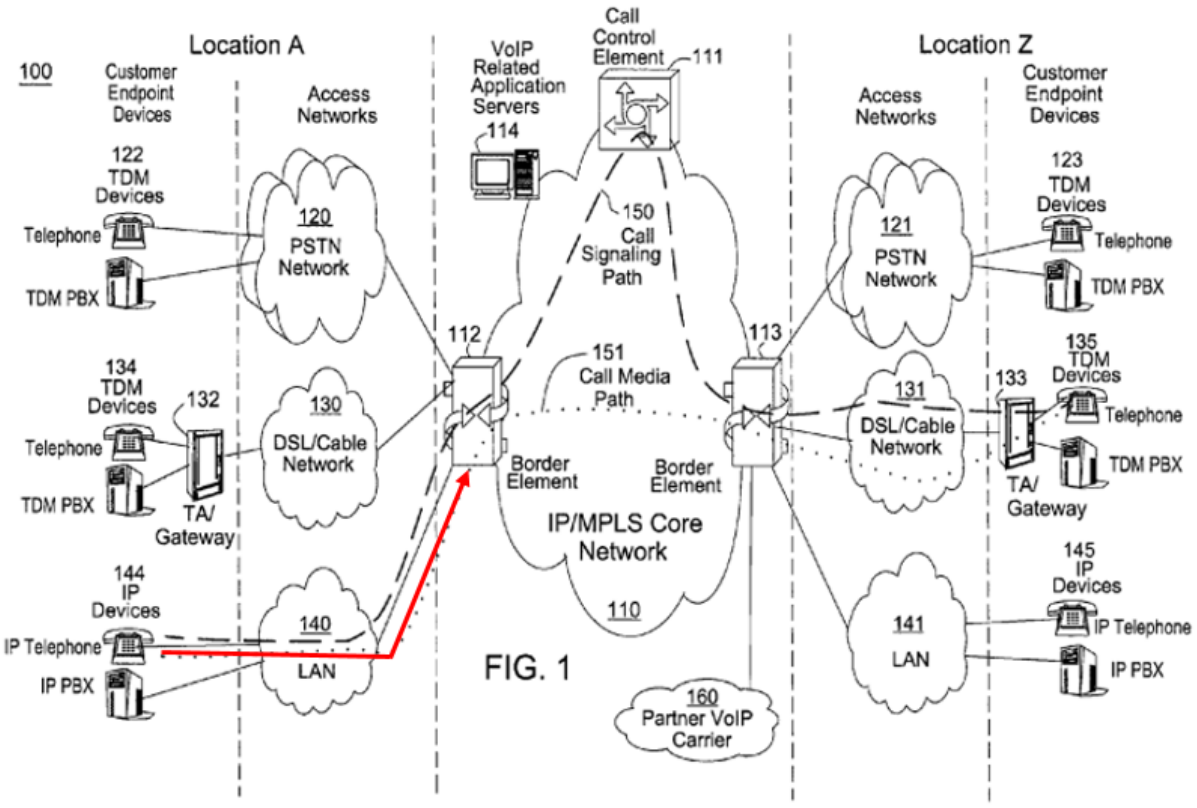


FIG. 1

Id., Figure 1 (showing in **red** "Call Media Path 151" which contains the media portion of the call, flowing from IP Device 144 to LAN 140 to BE 112), 4:16-17 ("BEs are always in the call signaling and the call media path").

209. As I explained above in Section X.C.1, a POSITA would have been motivated to combine, at the time of the claimed invention of the '249 Patent, Goode's method for transcoding mismatched media formats with the

Barghouthi/Breuer toll-free call routing system discussed above in order to overcome the common issue of mismatched media in VoIP networks.

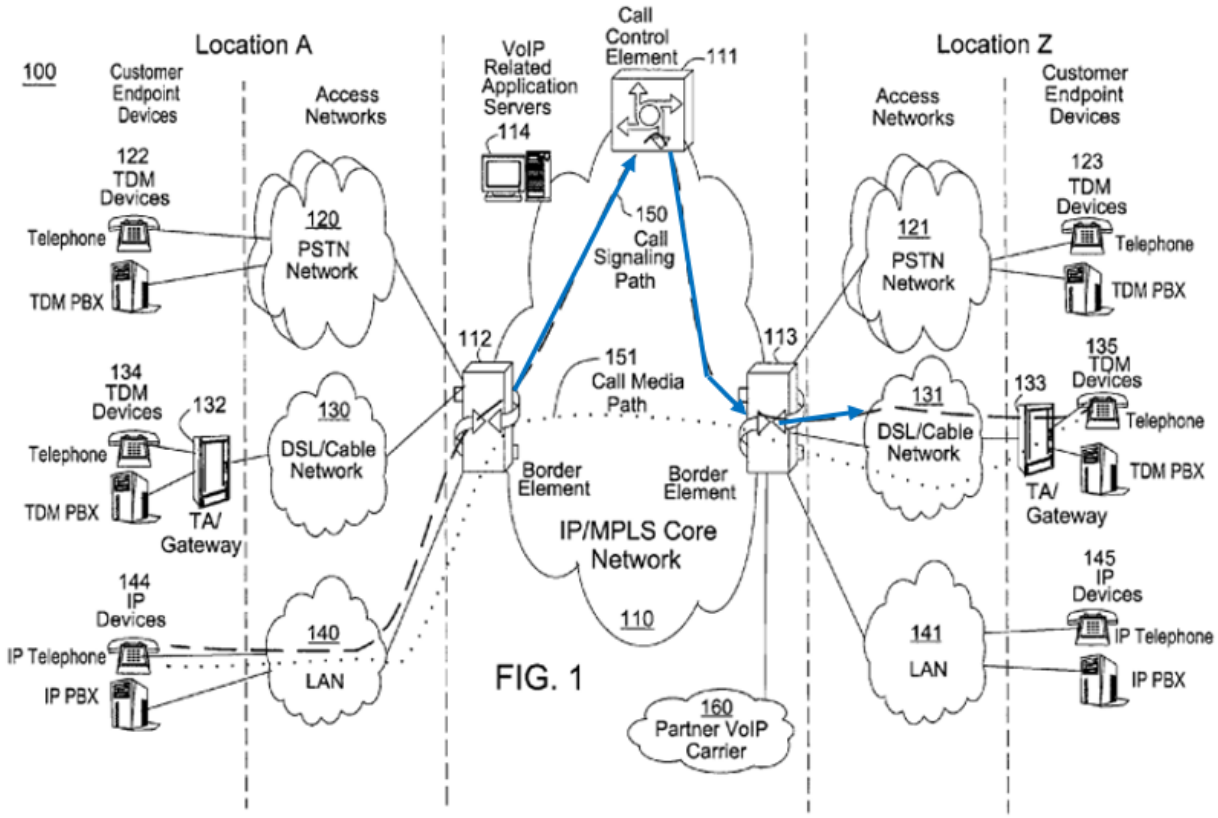
210. Therefore, it is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses Element 15[b].

5. Claim 16[preamble]: "The method of claim 15, wherein routing, to the terminating RESPORG further comprises:"

a. Claim 16[a]: "routing, from a second session border controller to the terminating RESPORG, the data portion of the toll-free call;"

211. It is my opinion that Barghouthi in combination with Breuer and further in combination with Goode discloses routing, from a second session border controller to the terminating RESPORG, the data portion of the toll-free call.

212. Goode discloses this exact component. Specifically, Goode discloses a Border Element (BE) 113, which "is typically implemented as a Media Gateway or a ***Session Border Controller*** and performs signaling, media control, security, and call admission control and related functions." EX1008, 2:65-3:1 (emphasis added). As shown in Goode's Figure 1, BE 113 (i.e., the second session border controller) routes the called party information (i.e., data portion of the call) to DSL/Cable Network 131 (i.e., the terminating RESPORG) via the "Call Signaling Path 150":



Id., Figure 1 (showing in **blue** "Call Signaling Path 150," which contains the data portion of the call, flowing from BE 112 to CCE 111 to BE 113 and to DSL/Cable Network 131).

213. As I explained above in Section X.C.1, a POSITA would have been motivated to combine, at the time of the claimed invention of the '249 Patent, Goode's method for transcoding mismatched media formats with the Barghouthi/Breuer toll-free call routing system discussed above in order to overcome the common issue of mismatched media in VoIP networks.

214. Therefore, it is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses Element 16[a].

b. Claim 16[b]: "routing, from the media gateway server farm to the terminating RESPORG, the media portion of the call."

215. It is my opinion that Barghouthi in combination with Breuer and further in combination with Goode discloses routing, from the media gateway server farm to the terminating RESPORG, the media portion of the toll-free call.

216. As shown in Goode's Figure 1, BE 112 and BE 113 together (i.e., the media gateway server farm) route the media portion of the call to DSL/Cable Network 131 (i.e., the terminating RESPORG) via the "Call Media Path 151":

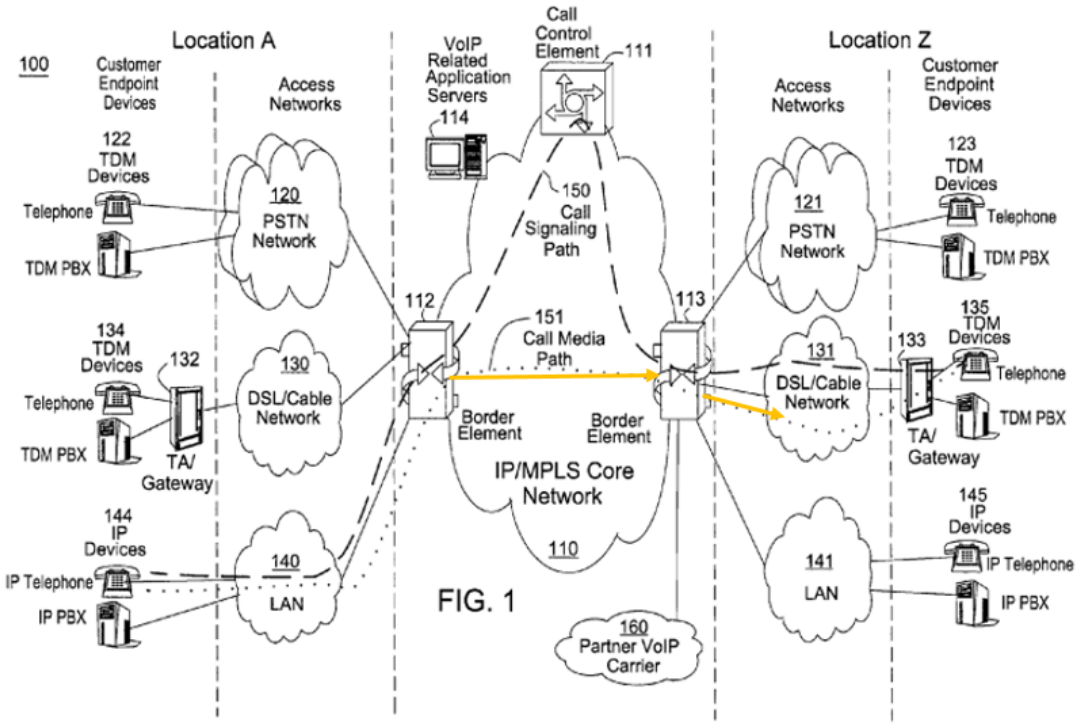


FIG. 1

Petitioner Affinity Network, Inc. - Ex. 1003, 0096

Id., Figure 1 (showing in **orange** "Call Media Path 151," which contains the media portion of the call, flowing from BE 112 to BE 113 and to DSL/Cable Network 131).

217. It is my opinion that it would have been obvious to a POSITA to implement just one BE instead of the two BEs (112 and 113) implemented in the telecommunications system depicted in Goode's Figure 1, as using a particular number of BEs to implement in a telecommunications system is a matter of design choice that may depend on the network design (based on the locations to be served, mix of formats to be supported at a given location, number of transcoding conversions that can be tolerated for a given algorithm, and the engineered traffic load associated with each format that needs to be supported).

218. As I explained above in Section X.C.1, a POSITA would have been motivated to combine, at the time of the claimed invention of the '249 Patent, Goode's method for transcoding mismatched media formats with the Barghouthi/Breuer toll-free call routing system in order to overcome the common issue of mismatched media in VoIP networks.

219. Therefore, it is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses Element 16[b].

6. Claim 17

a. Element 17[preamble]: "A system for routing a toll-free call using a toll-free exchange, the system comprising:"

220. It is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses a system for routing a toll-free call using a toll-free exchange.

221. The only substantive difference between this preamble and the preamble of Claim 1 is that Claim 17 is for a system rather than a method. Barghouthi states that its invention is both a method and a system. EX1005, 1:58-59 ("A method is provided for routing a call between an ingress point and an egress point"); 2:4-5 ("A system [is provided] for routing a call between an ingress and an egress point").

222. Thus, it is my opinion that the preamble of Claim 17 is disclosed in the prior art for the same reasons discussed above for the preamble of Claim 1.

b. Element 17[a]: "at least one session border controller for routing a data portion of the toll-free call within the toll-free exchange;"

223. It is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses at least one session border controller for routing a data portion of the toll-free call within the toll-free exchange.

224. It is my opinion that Element 17[a] is disclosed by the prior art for the same reasons as Element 1[a], Element 15[a], and Element 16[a].

c. Element 17[b]: "a policy router for determining, based at least on data included within the data portion, a responsible organization (RESPORG) identification (ID) associated with a terminating RESPORG;"

225. It is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses a policy router for determining, based at least on data included within the data portion, a responsible organization (RESPORG) identification (ID) associated with a terminating RESPORG.

226. It is my opinion that Element 17[b] is disclosed by the prior art for the same reasons as the preamble of Claim 1 and Element 1[b].

227. Further, it is my opinion that it would have been obvious to a POSITA, at the time of the claimed invention of the '249 Patent, to use the data within the data portion of the call described in Goode (i.e., the called party information, which may be the dialed telephone number) to lookup the RESPORG ID of the terminating RESPORG as disclosed in the Barghouthi/Breuer system.

228. As explained above in Section X.C.1, a POSITA would have been motivated to combine, at the time of the claimed invention of the '249 Patent, Goode's method for transcoding mismatched media formats with the Barghouthi/Breuer toll-free call routing system in order to overcome the common issue of mismatched media in VoIP networks.

229. Therefore, it is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses Element 17[b].

d. Element 17[c]: "a service control point for storing the RESPORG ID of the terminating RESPORG;"

230. It is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses a service control point for storing the RESPORG ID of the terminating RESPORG.

231. Breuer specifically discloses a service control point (i.e., SCP 18) that stores the RESPORG IDs of all the RESPORGs, and therefore Breuer's SCP 18 stores the RESPORG ID of the terminating RESPORG. EX1006, 4:62-64 ("SCP 18 contains call routing data and Resp Org data for toll-free telephone numbers that SCP 18 periodically receives from toll-free number database 36.").

232. It is my opinion that a POSITA would have been motivated to combine Breuer's SCP for storing RESPORG IDs of the terminating RESPORG with the call routing system of Barghouthi for the same reasons discussed above with respect to Element 1[b].

233. Therefore, it is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses Element 17[c].

e. Element 17[d]: "a database for storing enrollment information associated with the terminating RESPORG; and;"

234. It is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses a database for storing enrollment information associated with the terminating RESPORG.

235. Specifically, Element 17[d] is disclosed by the prior art for the same reasons as Element 1[b] and Claim 2.

f. Element 17[e]: "a media gateway server farm having one or more server computing devices for routing a media portion of the toll-free call based in part on the RESPORG ID of the terminating RESPORG."

236. It is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses a media gateway server farm having one or more server computing devices for routing a media portion of the toll-free call based in part on the RESPORG ID of the terminating RESPORG.

237. Element 17[e] is disclosed by the prior art for the same reasons as Element 1[c], Element 15[b], and Element 16[b].

7. Claim 18: "The system of claim 17, further comprising a thrasher component for storing a call data record of the toll-free call."

238. It is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses a thrasher component for storing a call data record of the toll-free call.

239. The ’249 Patent describes a “thrasher” as merely an unspecified, generic computing device that is “used to collect call detail records (CDRs).” EX1001, 5:43-46. The ‘249 Patent further explains that the “thrasher saves the call records in a database 418.” *Id.*, 9:14-16.

240. Breuer discloses that a Service Switching Point (SSP), which “is a telecommunications switch that is enabled by software” (EX1006, 1:59-62), “in the LEC service area in which the call originated, stores the dialed number and the initial carrier as part of the ***call detail record [CDR]***” (*id.*, 2:34-36) (emphasis added). Breuer further explains that the “Resp Org identifying data is stored in the CDR for the call,” which “may then be provided to PSPs to bill and/or audit the Resp Orgs responsible for managing a toll-free number.” *Id.*, 5:43-48.

241. It is my opinion that a POSITA would understand that Breuer’s SSP includes the claimed thrasher component that stores a call data record of the toll-free call since they both are generic computing components used to store call data records in a telecommunications system.

242. It is my opinion that it would have been obvious to a POSITA, at the time of the claimed invention of the ’249 Patent, to modify Barghouthi to include Breuer’s SSP so that the Barghouthi/Breuer system is able to store call detail records.

243. Therefore, it is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses Claim 18.

8. Claim 19[preamble]: "The system of claim 17, further comprising:"

a. Claim 19[a]: "a first session border controller for receiving the data portion of the toll-free call, wherein the first session border controller is further configured to read data from a header of the data portion of the toll-free call and to write data to the header of the data portion of the toll-free call; and"

244. It is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses a first session border controller for receiving the data portion of the toll-free call, wherein the first session border controller is further configured to read data from a header of the data portion of the toll-free call and to write data to the header of the data portion of the toll-free call.

245. Element 19[a] is disclosed by the prior art for the same reasons as Element 15[a].

246. Further, it is my opinion that a POSITA, at the time of the claimed invention of the '249 Patent, would have understood that Goode's BE 112 is capable (and does) read data from a header of the data portion of the call as well as writes data to the header of the data portion of the call, as these are well-known functions for components that are responsible for handling the call control related functions of a received call.

247. Therefore, it is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses Element 19[a].

b. Claim 19[b]: "a second session border controller for routing the data portion of the toll-free call to the terminating RESPORG based in part on the data read from the data portion of the toll-free call."

248. It is my opinion that Barghouthi in view of Breuer and further in view of Goode discloses a second session border controller for routing the data portion of the toll-free call to the terminating RESPORG based in part on the data read from the data portion of the toll-free call.

249. Element 19[b] is disclosed by the prior art for the same reasons as Element 1[c], Element 16[a] and Element 19[a].

D. Ground 4: Claim 20 is Obvious over Barghouthi (EX1005) in view of Breuer (EX1006), Eng (EX1007), and Goode (EX1008)

1. Motivation to Combine Barghouthi, Breuer, Goode, and Eng

250. It is my opinion that a POSITA, at the time of the claimed invention of the '249 Patent would have been motivated to combine Barghouthi, Breuer, Eng, and Goode for the reasons discussed in Sections X.A.1, X.B.1, and X.C.1.

2. Claim 20[preamble]: "The system of claim 17, wherein the database stores at least one of:"

a. Claim 20[a]: "enrollment status information of one or more enrolled RESPORGs;"

251. It is my opinion that Barghouthi in view of Breuer, Eng, and Goode discloses a database that stores at least one of enrollment status information of one or more enrolled RESPORGs.

252. Element 20[a] is disclosed by the prior art for the same reasons as Element 1[b] and Claim 2.

b. Claim 20[b]: "payment information of each of the one or more enrolled RESPORGs, comprising: a buy rate; and a floor rate;"

253. It is my opinion that Barghouthi in combination with Breuer, Eng, and Goode discloses a database that stores payment information of each of the one or more enrolled RESPORGs, including a buy rate and a floor rate.

254. As I explained above in Section X.B.2, Eng discloses routing communications between a requesting telecommunications service provider (i.e., terminating RESPORG) and an offering telecommunications service provider (i.e., originating RESPORG) when the offering telecommunications service provider's offer to provide its telecommunications services (i.e., its floor rate) matches (i.e., is less than or equal to) the requesting telecommunication service provider's request to buy telecommunication services (i.e., buy rate). *See*, *e.g.*, EX1007, 2:44-61.

Further, Eng expressly discloses that these offers (i.e., floor rate) and requests (i.e., buy rate) are stored in a database. *Id.*, Figures 1B, 2, 3A, 4, 6:45-9:61 (explaining that Eng's system "collect[s] rate information from carriers around the world regarding cost and service parameters of routing various classes of calls from a first location to a second location" (*id.*, 9:27-30), and then "derives rate-tables from the collected rate information which list cost of connecting any two locations within the telecommunication node network via various routes … [which] is then stored in a rate-table database 400 representative of rates charged by different carriers for various routes" (*id.*, 9:50-61)).

255. It is therefore my opinion that Element 20[b] is disclosed by Barghouthi in combination Breuer, Eng, and Goode.

c. Claim 20[c]: "identification information of each of the one or more enrolled RESPORGs; and"

256. It is my opinion that Barghouthi in view of Breuer, Eng, and Goode discloses a database that stores identification information of each of the one or more enrolled RESPORGs.

257. Element 20[c] is disclosed by the prior art for the same reasons as Element 1[b] and Claim 2.

d. Claim 20[d]: "an access control list for listing each enrolled RESPORG."

258. It is my opinion that Barghouthi in view of Breuer, Eng, and Goode discloses a database that stores an access control list for listing each enrolled RESPORG.

259. Element 20[d] is disclosed by the prior art for the same reasons as Element 1[b] and Claim 2.

260. To further explain, the '249 Patent describes an "access control list (ACL)" as a list that contains "each of the RESPORGs enrolled on the toll-free exchange 302," (EX1001, 6:21-23), and further describes that the ACL is used to "determine[] whether the originating RESPORG 102 is an authorized RESPORG" (*id.*, 9:31-35). "If the database 410 determines that the originating RESPORG is not listed on the access control list, … the call is rejected." *Id.*, 9:48-53.

261. Barghouthi performs the same function, and may only allow calls to be processed if the device initiating the call is stored in the registry: "According to an additional embodiment, the routing component 130 may query the direct routing portion 142 only if the identifier or number of the device initiating the call (i.e., the ingress point 110) is stored in the direct routing portion 142 of the registry 140." EX1005, 4:47-51. It is my opinion that in this situation, a POSITA would have understood that Barghouthi's direct routing portion 142 of registry 140 acts as the

claimed access control list, which lists or contains each enrolled device. Further, a POSITA would have understood that a similar registry or access control list could be maintained for originating RESPORGs, as disclosed in Breuer.

262. It is therefore my opinion that Element 20[d] is disclosed by Barghouthi in combination Breuer, Eng, and Goode.

XI. AVAILABILITY FOR CROSS-EXAMINATION

263. In signing this declaration, I recognize that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during a time as mutually agreed between the parties.

XII. RIGHT TO SUPPLEMENT

264. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises. This declaration represents only those opinions that I have formed to date. I reserve the right to revise, supplement, and/or amend my opinions stated herein based on new information that becomes available to me and on my continuing analysis of the materials already provided.

XIII. CONCLUSION

265. Based on my analysis above, in my opinion the Challenged Claims of the ’249 Patent would have been obvious to a POSITA before August 26, 2015, as summarized in the following table:

Ground No.	Claims	Proposed Statutory Grounds
1	1-4, 6-8 and 10-12	Obvious under §103 over Barghouthi in view of Breuer
2	5 and 13	Obvious under §103 over Barghouthi in view of Breuer and Eng
3	9 and 14-19	Obvious under §103 over Barghouthi in view of Breuer and Goode
4	20	Obvious under §103 over Barghouthi in view of Breuer, Goode, and Eng

XIV. JURAT

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further 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 Title 18 of the United States Code.

Benedict Occhiogrosso

Dated: December 23, 2022

Petitioner Affinity Network, Inc. - Ex. 1003, 0110

APPENDIX A

Claim No.	Claim Language
1[preamble]	A method for routing toll-free calls through a toll-free exchange, the method, performed by a policy router of the toll-free exchange, comprising:
1[a]	receiving, from an originating responsible organization (RESPORG), a toll-free call, wherein the toll-free call is directed to a toll-free subscriber that is served by a terminating RESPORG;
1[b]	querying a database to determine a RESPORG identification associated with the terminating RESPORG, wherein the database is associated with the toll-free exchange and stores the RESPORG identification associated with the terminating RESPORG; and
1[c]	routing, to the terminating RESPORG, the toll-free call based in part on the RESPORG identification.
2	The method of claim 1, wherein the originating RESPORG and the terminating RESPORG are enrolled in the toll-free exchange.
3	The method of claim 1, wherein the RESPORG identification is obtained by a service control point.
4	The method of claim 1, further comprising: monitoring the toll-free call to generate a call detail record, wherein the call detail record includes at least one of: a time duration of the toll-free call, an identification of the originating RESPORG and the terminating RESPORG, buy-rate of the terminating RESPORG, a floor rate of the originating RESPORG, and a cost associated with the toll-free call.
5	The method of claim 4, wherein routing to the terminating RESPORG further comprises: determining that the floor rate of the originating RESPORG is less than the buy rate of the terminating RESPORG.
6[preamble]	The method of claim 1, further comprising:
6[a]	determining whether the terminating RESPORG is enrolled with the exchange;
6[b]	based on a determination that the terminating RESPORG is not enrolled with the exchange, rejecting the toll-free call; and

Claim No.	Claim Language
6[c]	based on a determination that the terminating RESPORG is enrolled with the exchange, connecting the toll-free call to the terminating RESPORG.
7	The method of claim 6, wherein based on a determination that the terminating RESPORG is not enrolled with the exchange, further comprises: determining whether the originating RESPORG requested to connect the toll-free call to a public switched telephone network.
8	The method of claim 1, wherein a carrier identification code (CIC) of the terminating RESPORG is not used by the method.
9	The method of claim 1, further comprising routing a media portion of the toll-free call through a media server farm, wherein the media server farm configures the media portion of the toll-free call for routing.
10[preamble]	A method for routing toll-free calls without using a carrier identification code (CIC), comprising:
10[a]	receiving, from an originating responsible organization (RESPORG), a toll-free call, wherein the toll-free call is directed to a toll-free subscriber that is served by a terminating RESPORG;
10[b]	querying a database to determine a RESPORG identification associated with the terminating RESPORG, wherein the database is associated with the toll-free exchange and stores the RESPORG identification associated with the terminating RESPORG; and
10[c]	routing, to the terminating RESPORG, the toll-free call through a protected network based in part on the RESPORG identification.
11[preamble]	The method of claim 10, further comprising:
11[a]	determining whether the terminating RESPORG is enrolled with the exchange;
11[b]	based on a determination that the terminating RESPORG is not enrolled with the exchange, rejecting the toll-free call; and
11[c]	based on a determination that the terminating RESPORG is enrolled with the exchange, connecting the toll-free call to the terminating RESPORG.
12	The method of claim 10, further comprising: monitoring the toll-free call to generate a call detail record, wherein the call detail record includes at least one of: a time duration of the toll-free

Claim No.	Claim Language
	call, an identification of the originating RESPORG and the terminating RESPORG, buy-rate of the terminating RESPORG, a floor rate of the originating RESPORG, and a cost associated with the toll-free call.
13	The method of claim 12, wherein routing to the terminating RESPORG further comprises: determining that the floor rate of the originating RESPORG is less than the buy rate of the terminating RESPORG.
14	The method of claim 10, further comprising routing a media portion of the toll-free call through a media server farm, wherein the media server farm configures the media portion of the toll-free call for routing.
15[preamble]	The method of claim 10, wherein receiving, from an originating RESPORG, a toll-free further comprises:
15[a]	receiving, at a session border controller, a data portion of the toll-free call; and
15[b]	receiving, at a media gateway server farm, a media portion of the call.
16[preamble]	The method of claim 15, wherein routing, to the terminating RESPORG further comprises:
16[a]	routing, from a second session border controller to the terminating RESPORG, the data portion of the toll-free call;
16[b]	routing, from the media gateway server farm to the terminating RESPORG, the media portion of the call.
17[preamble]	A system for routing a toll-free call using a toll-free exchange, the system comprising:
17[a]	at least one session border controller for routing a data portion of the toll-free call within the toll-free exchange;
17[b]	a policy router for determining, based at least on data included within the data portion, a responsible organization (RESPORG) identification (ID) associated with a terminating RESPORG;
17[c]	a service control point for storing the RESPORG ID of the terminating RESPORG;
17[d]	a database for storing enrollment information associated with the terminating RESPORG; and;
17[e]	a media gateway server farm having one or more server computing devices for routing a media portion of the toll-free call

Claim No.	Claim Language
	based in part on the RESPORG ID of the terminating RESPORG.
18	The system of claim 17, further comprising a thrasher component for storing a call data record of the toll-free call.
19[preamble]	The system of claim 17, further comprising:
19[a]	a first session border controller for receiving the data portion of the toll-free call, wherein the first session border controller is further configured to read data from a header of the data portion of the toll-free call and to write data to the header of the data portion of the toll-free call; and
19[b]	a second session border controller for routing the data portion of the toll-free call to the terminating RESPORG based in part on the data read from the data portion of the toll-free call.
20[preamble]	The system of claim 17, wherein the database stores at least one of:
20[a]	enrollment status information of one or more enrolled RESPORGs;
20[b]	payment information of each of the one or more enrolled RESPORGs, comprising: a buy rate; and a floor rate;
20[c]	identification information of each of the one or more enrolled RESPORGs; and
20[d]	an access control list for listing each enrolled RESPORG.