EXPERT DECLARATION OF DR. KEVIN NEGUS FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 6,775,235

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I. INTRODUCTION

1. I, Dr. Kevin Negus, submit this declaration in support of a Petition for *Inter Partes* Review of United States Patent No. 6,775,235 ("the '235 Patent"), owned by FatPipe Networks India Limited ("Fatpipe" or "Patent Owner"). I have been retained in this matter by Pepper Hamilton LLP ("Counsel") on behalf of Talari Networks, Inc. ("Petitioner"). I understand that Petitioner Talari is the Real Party-in-Interest to this Petition. Talari is a leading provider of Software Defined WAN (SD-WAN) solutions that proactively manage capacity, reliability and performance.

2. I make this declaration based upon my personal knowledge. I am over the age of 21 and am competent to make this declaration.

3. The statements herein include my opinions and the bases for those opinions, which relate to at least the following documents of the pending *inter partes* review petition:

- U.S. Patent No. 6,775,235 by Sanchaita Datta and Ragula Bhaskar entitled "Tools and Techniques for Directing Packets over Disparate Networks" ("the '235 Patent") (Ex. 1001).
- File History for U.S. Patent No. 6,775,235 (Ex. 1002).
- U.S. Patent No. 7,406,048 by Sanchaita Datta and Ragula Bhaskar entitled "Tools and Techniques for Directing Packets over Disparate Networks"

("the '048 Patent") (Ex. 1003).

- File History for U.S. Patent No. 7,406,048 (Ex. 1004).
- U.S. Patent No. 6,628,617 by Mark John Karol and Malathi Veeraraghavan entitled "Technique for Interconnecting Traffic on Connectionless and Connection-Oriented Networks" ("Karol") (Ex. 1006).
- *TCP/IP Illustrated Volume 1, The Protocols* by W. Richard Stevens, Addison-Wesley Professional Computing Series, 1994, ISBN 0-201-63346-9, ("Stevens") (Excerpts provided in Ex. 1007).
- *Data and Computer Communications* by William Stallings, Prentice-Hall, 5th Edition, 1997, ISBN-81-203-1240-6, ("Stallings") (Excerpts provided in Ex. 1011).
- U.S. Patent No. 6,317,431 by Terence G Hodgkinson and Alan W O'Neill entitled "ATM Partial Cut-Through" ("Hodgkinson") (Ex. 1015).
- U.S. Patent No. 6,748,439 by David R. Monachello et al. entitled "System and Method for Selecting Internet Service Providers from a Workstation that is Connected to a Local Area Network" ("Monachello") (Ex. 1009).
- PLAINTIFF FATPIPE, INC.'S PATENT RULE 3-1 DISCLOSURE OF ASSERTED CLAIMS AND INFRINGEMENT CONTENTIONS (Ex. 1010).
- Fatpipe's proposed modifications to the claim construction (Ex. 1014).

4. My materials considered for forming my opinions herein have included at least the above-referenced documents.

5. Although I am being compensated for my time at a rate of $500 per hour in preparing this declaration, the opinions herein are my own, and I have no stake in the outcome of the review proceeding. My compensation does not depend in any way on the outcome of the Petitioner's petition.

II. QUALIFICATIONS

6. I am qualified by education and experience to testify as an expert in the field of telecommunications. Attached, as Attachment A, is a copy of my resume detailing my experience and education. Additionally, I provide the following overview of my background as it pertains to my qualifications for providing expert testimony in this matter.

7. I am a Full Professor of Electrical Engineering at Montana Tech University in Butte, MT. I lead a research program at Montana Tech to improve the delivery of mobile broadband communications services to rural and remote areas. I mentor, supervise and teach both senior undergraduate and graduate students of Electrical Engineering in the general fields of telecommunications and networking with an emphasis on wireless systems.

8. In 1988, I received my Ph.D. in Engineering from the University of Waterloo in Canada. My Ph.D. research on the modeling of bipolar semiconductor devices was jointly supervised by the Departments of Electrical Engineering and Mechanical Engineering. My graduate course work was primarily in Electrical Engineering and included such subjects as semiconductor device physics and fabrication, wireless circuit design, and wireless propagation analysis. For my Ph.D. work, I received the Faculty Gold Medal in 1988 for the best Ph.D. thesis in the entire Faculty of Engineering across all Departments for that year. My Ph.D.

thesis research also formed the basis of a paper published in 1989 that won the award for Best Paper in 1989 for the IEEE (Institute of Electrical and Electronic Engineers) journal in which it was published.

9. In 1984 and 1985, respectively, I received the B.A.Sc. and M.A.Sc. degrees in Mechanical Engineering from the University of Waterloo in Canada. My coursework and research work included, amongst many other topics, extensive embedded firmware development for automation applications and implementation of networks and communications protocols. For my M.A.Sc. research and academic achievements, I received the prestigious University Gold Medal in 1985 for the best Masters thesis in the entire University of Waterloo for that year.

10. In 1986, I joined the Palo Alto Research Center of Fairchild Semiconductor in Palo Alto, CA. I worked directly for Dr. James Early who was the well known discoverer of the Early effect in bipolar semiconductor devices and pioneer of the common emitter amplifier topology that forms the basis of many wireless circuits to this day. At Fairchild, I participated in the development of devices and products for high speed applications such as wired networking, RISC microprocessors and wireless communications.

11. In 1988, I took the position of Member of the Technical Staff at Avantek, Inc. in Newark, CA. I was hired to develop products for both wireless and wired data networking applications. Some of the components I developed early

in my career at Avantek were used for 1st generation wireless local area network (WLAN) products, voiceband modem equipment, wired data networking both in the LAN and WAN and 1st generation cellular handsets and base stations based on AMPS or TACS.

12. In 1991, Avantek, Inc. was purchased by the Hewlett-Packard Company. I continued to work for Hewlett-Packard until 1998 in such roles as IC Design Manager, Director of Chipset Development and Principal System Architect. In 1992, Hewlett-Packard assigned me to work on the "Field of Waves" project, which was a major multi-division effort to build WLAN products for mobile computers. The project was cancelled in 1993. However, the work I did on the project was leveraged into producing the world's first IEEE 802.11 chipset, which my division at Hewlett-Packard first offered for sale in 1994. I led the project to develop and market this chipset for many early WLAN product companies including Proxim, Symbol (now part of Motorola) and Aironet (now part of Cisco). I also helped coordinate efforts within Hewlett-Packard's many product divisions to guide extensive research projects on WLAN protocols and technology at Hewlett-Packard's central research laboratories in Palo Alto, CA and Bristol, U.K.

13. I developed or led the development of multiple chips and chipsets for 2G cellular radio systems based on GSM, IS-54 (TDMA), and IS-95 (CDMA). A

number of these chips were directed solely to cellular mobile stations and done specifically for major Hewlett-Packard customers and cellular handset and module manufacturers such as Motorola, Ericsson and Siemens. I was also involved in the development of power amplifier chips and modules for cellular mobile stations, cordless phones, wireless networking devices and cellular infrastructure products including those directed towards then emerging 3rd generation cellular standards such as WCDMA, 1xRTT and EV-DO.

14. During my time at Avantek and Hewlett-Packard, I also developed or led development teams for numerous chipsets or general purpose chips used in other wired and wireless communications applications such as fiber optic transceivers, cordless telephones, cable set-top receivers, wired networking equipment, cellular infrastructure equipment, voiceband and broadband wired modems and satellite TV receivers.

15. In 1998, I joined Proxim, Inc. in Mountain View, CA. At that time, Proxim was engaged in the development and sale of wired and wireless products for home and enterprise networking applications based on several different wired and wireless networking protocols. I stayed at Proxim through 2002 and was the Chief Technology Officer for this publicly-traded company at the time of my departure. During my career at Proxim, I led or participated in the development of many WLAN and WWAN products and/or chipsets for network adapters, OEM

design-in modules, access points, bridges, switches, and routers that used a wide variety of bus, LAN, or WAN wired interfaces. I have supervised many engineers including those responsible for embedded firmware development to implement various wired and wireless networking, reservation, and security protocols at the MAC layer and above, those responsible for HDL code creation of baseband chips to implement PHY and MAC algorithms, as well as other engineers that developed hardware reference designs, modem algorithms and chipsets.

16. During my many years of development of products providing voice, data and/or streaming media capabilities, I have acquired a deep understanding of the cellular radio system, the Public Switched Telephone Network (PSTN) and the public Internet network architectures and protocols. A partial list of networking and telephony protocols that I am familiar with includes DHCP, SNMP, TCP, UDP, IP, SIP, ICMP, SS7, ISDN, ISUP, TCAP, and MTP.

17. I have been involved over the course of my career specifically with voiceband modems for both wireless and wired networks including the PSTN on multiple occasions. I am familiar with many ITU-T (or CCITT) Recommendations for voiceband modems including at least V.8, V.25, V.34, V.90 and V.92.

18. Over the past 25+ years I have personally developed, modified, or analyzed numerous software or firmware modules for many different applications as well as supervised many engineers performing the same tasks. I have

implemented or supervised the implementation of software and firmware code and/or hardware description language (HDL) code for many different communications protocols across all layers. I have developed or supervised the development of chips with both wireless baseband modem functionality and embedded processors including those licensed by ARM and MIPS. I have programmed with multiple high level languages for software and firmware code including C, C++, Fortran, Forth, BASIC, Pascal, Lisp and COBOL. I have developed products with HDL code including VHDL and Verilog. I also have firsthand experience with assembly language programming. I have personally designed a wide variety of analog, RF, and digital circuit elements at both the chip and board level using various netlist-driven, schematic capture and manual or automated layout CAE/CAD tools.

19. Since 2002, I have been an independent consultant and have provided services to a number of companies including some that have developed IEEE 802.11 products. In particular, from 2002 until 2007 I was Chairman of WiDeFi, Inc. – a company that developed chips and embedded firmware for 802.11 repeater products based on 802.11a, b, g and draft n amendments. From 2007-2011, I was Chairman of Tribal Shout – a company that delivered IP voice and audio streaming media using VoIP to any cellular or landline phone including those reachable only by the circuit-switched connections such as the PSTN and 2nd generation cellular

radio. Since 2010, I have been Chairman and Chief Technology Officer of CBF Networks, Inc. (dba Fastback Networks) – a company that develops fiber extension products for backhaul of data networks including WiFi, HSPA, CDMA2000, WiMax and LTE cellular radio systems. I have architected the products of Fastback Networks specifically around the re-use of chips originally developed and intended for LTE standards-based operation.

20. I have been or am currently a Board Observer on behalf of the venture capital firm Camp Ventures at two companies that develop semiconductor components including one that is developing technology specifically to improve the system performance of HSPA and LTE cellular radio systems (Quantance) and another that provides system on a chip (SOC) microcontrollers, OEM design-in modules and firmware with 802.11 and wired interfaces for embedded applications (GainSpan). I have also been a technology and/or business strategy advisor to multiple early stage companies that are developing such products as new wireless communications systems (AirTight), radios (Mojix) and components (SiTime).

21. I have actively monitored or participated in the IEEE 802.11 standards process continuously since 1989. I am a listed contributor to the highly successful IEEE 802.11g standard published in 2003 that describes the wireless communications protocols used by over 1 billion wireless network adapters deployed to date. In 2002 and 2003, I participated in the IEEE 802.11 Wireless

Next Generation Committee that was responsible for launching the 802.11n standards development process.

22. In 1996, I was assigned the responsibility within the Hewlett-Packard Company for developing the HomeRF standard for WLANs specifically for home networking applications. I eventually became Chairman of the Technical Subcommittee of HomeRF that wrote the HomeRF standard. The HomeRF standard was essentially a modification of the IEEE 802.11 standard with significant changes to the PHY and MAC layers to lower cost and improve performance and security for home networking applications including integrated voice capability over both IP and circuit-switched connections. From 1998 to 2002, millions of wireless network adapters and access points from several different companies were shipped based upon compliance to the HomeRF standard.

23. I have specific experience with many wired and wireless networking standards including IEEE 802.1 and 802.3 (the "Ethernet" family of wired LANs), IEEE 802.11 (the "WiFi" family of wireless LANs), IEEE 802.15 (personal area networks or "PAN"), IEEE 802.16 (also known as "WiMax"), various cellular communications standards (such as IS-19, IS-41, IS-54, IS-95, IS-136, IS-826, IS-707, IS-856, IS-2000, GSM, GPRS, EDGE, UMTS, CAMEL, WCDMA, HSPA, and LTE), various cordless telephone standards (such as CT-2, DECT, and PHS), and other wired networking standards (such as DOCSIS, SONET and FDDI).

24. I am an author or co-author of many papers that have been published in distinguished engineering journals or conferences such as those of the IEEE or ASME. An exemplary list of these publications is included in my resume.

25. I am also a former member of the Federal Communication Commission's Technological Advisory Committee as an appointee of then Chairman Michael Powell. I have also served on the Wyoming Telecommunications Council as an appointee of then Governor Jim Geringer after confirmation by the Wyoming State Senate.

26. I am named as an inventor on numerous U.S. patents all of which have related in at least some way to products for wired and/or wireless networks. I believe that the following is a complete list of my issued US Patents: 4,839,717, 5,111,455, 5,150,364, 5,436,595, 5,532,655, 6,587,453, 7,035,283, 7,085,284, 7,187,904, 8,095,067, D704174, 8,238,318, 8,300,590, 8,311,023, 8,385,305, 8,422,540, 8,467,363, 8,502,733, 8,638,839, 8,649,418, 8,761,100, 8,811,365, 8,824,442, 8,830,943, 8,872,715, 8,897,340, 8,928,542, 8,942,216, 8,948,235, 8,982,772, 8,989,762, 9,001,809, 9,049,611, 9,055,463, 9,178,558, 9,179,240, 9,226,315, 9,226,295, 9,252,857.

27. During the past several years, I have provided expert testimony, reports or declarations in the cases of Agere v. Sony (on behalf of plaintiff Agere), Linex v. Belkin et al (on behalf of defendant Cisco), CSIRO v. Toshiba et al

(multiple related cases on behalf of plaintiff CSIRO), Freedom Wireless v. Cingular et al (on behalf of plaintiff Freedom Wireless), Rembrandt v. HP et al (on behalf of defendant HP), DNT v. Sprint et al (on behalf of the defendants), Teles v. Cisco (on behalf of defendant Cisco), WiAV v. HP (on behalf of defendant HP), SPH v. Acer et al (on behalf of the defendants), LSI v. Funai (on behalf of plaintiff LSI), WiAV v. Dell and RIM (on behalf of the defendants), Wi-LAN v. RIM (on behalf of defendant RIM), LSI v. Barnes&Noble (on behalf of plaintiff LSI), Novatel v. Franklin and ZTE (on behalf of plaintiff Novatel), LSI v. Realtek (on behalf of plaintiff LSI), Wi-LAN v. Apple et al (on behalf of the defendants), EON v. Sensus et al (on behalf of defendants Motorola, US Cellular and Sprint), M2M v Sierra et al (multiple related cases on behalf of defendants Sierra and Novatel), Intellectual Ventures v. AT&T et al (on behalf of the defendants), Intellectual Ventures v. Motorola (on behalf of defendant Motorola), TQ Beta v. Dish et al. (on behalf of the defendants), and Qurio v. Dish et al. (on behalf of the defendants).

III. PERSON OF ORDINARY SKILL IN THE ART

28. I understand that the content of a patent (including its claims) and prior art should be interpreted the way a person of ordinary skill in the art would have interpreted the material at the time of invention.

29. I understand that the "time of invention" here is the date that the applicants for the '235 Patent first filed a related application in the United States Patent and Trademark Office, namely, Dec. 29, 2000.

30. It is my opinion that one of ordinary skill in the art at the time of the filing date of the '235 Patent would have had at least a Bachelor of Science in Computer Science, Computer Engineering, Electrical Engineering, or an equivalent field as well as at least 2 years of academic or industry experience in any type of networking field.

31. In addition to my testimony as an expert, I am prepared to testify as someone who actually practiced in the field from 1986 to present, who actually possessed at least the knowledge of a person of ordinary skill in the art in that time period, and who actually worked with others possessing at least the knowledge of a person of ordinary skill in the art in that time period.

32. I understand that the person of ordinary skill is a hypothetical person who is assumed to be aware of all the pertinent information that qualifies as prior

art. In addition, the person of ordinary skill in the art makes inferences and takes creative steps.

IV. LEGAL UNDERSTANDING

33. I have a general understanding of validity based on my experience with patents and my discussions with counsel.

34. I have a general understanding of prior art and priority date based on my experience with patents and my discussions with counsel.

35. I understand that inventors are entitled to a priority date up to one year earlier than the date of filing to the extent that they can show complete possession of particular claimed inventions at such an earlier priority date and reasonable diligence to reduce the claims to practice between such an earlier priority date and the date of filing of the patent. I understand that if the Patent Owner contends that particular claims are entitled to an earlier priority date than the date of filing of the patent, then the Patent Owner has the burden to prove this contention with specificity.

36. I understand that an invention by another must be made before the priority date of a particular patent claim in order to qualify as "prior art" under 35 U.S.C. § 102 or § 103, that a printed publication or a product usage must be publicly available before the priority date of a particular patent claim in order to qualify as "prior art" under 35 U.S.C. § 102(a), that a printed publication or a product usage or offer for sale must be publicly available more than one year prior to the date of the application for patent in the United States in order to qualify as

"prior art" under 35 U.S.C. § 102(b), or that the invention by another must be described in an application for patent filed in the United States before the priority date of a particular patent claim in order to qualify as "prior art" under 35 U.S.C. § 102(e). I understand that the Petitioner has the burden of proving that any particular reference or product usage or offer for sale is prior art.

37. I have a general understanding of anticipation based on my experience with patents and my discussions with counsel.

38. I understand that anticipation analysis is a two-step process. The first step is to determine the meaning and scope of the asserted claims. Each claim must be viewed as a whole, and it is improper to ignore any element of the claim. For a claim to be anticipated under U.S. patent law: (1) each and every claim element must be identically disclosed, either explicitly or inherently, in a single prior art reference; (2) the claim elements disclosed in the single prior art reference must be arranged in the same way as in the claim; and (3) the identical invention must be disclosed in the single prior art reference, in as complete detail as set forth in the claim. Where even one element is not disclosed in a reference, the anticipation contention fails. Moreover, to serve as an anticipatory reference, the reference itself must be enabled, i.e., it must provide enough information so that a person of ordinary skill in the art can practice the subject matter of the reference without undue experimentation.

39. I further understand that where a prior art reference fails to explicitly disclose a claim element, the prior art reference inherently discloses the claim element only if the prior art reference must necessarily include the undisclosed claim element. Inherency may not be established by probabilities or possibilities. The fact that an element may result from a given set of circumstances is not sufficient to prove inherency. I have applied these principles in forming my opinions in this matter.

40. I have a general understanding of obviousness based on my experience with patents and my discussions with counsel.

41. I understand that a patent claim is invalid under 35 U.S.C. § 103 as being obvious only if the differences between the claimed invention and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person of ordinary skill in that art. An obviousness analysis requires consideration of four factors: (1) scope and content of the prior art relied upon to challenge patentability; (2) differences between the prior art and the claimed invention; (3) the level of ordinary skill in the art at the time of the invention; and (4) the objective evidence of non-obviousness, such as commercial success, unexpected results, the failure of others to achieve the results of the invention, a long-felt need which the invention fills, copying of the invention by

competitors, praise for the invention, skepticism for the invention, or independent development.

42. I understand that a prior art reference is proper to use in an obviousness determination if the prior art reference is analogous art to the claimed invention. I understand that a prior art reference is analogous art if at least one of the following two considerations is met. First a prior art reference is analogous art if it is from the same field of endeavor as the claimed invention, even if the prior art reference addresses a different problem and/or arrives at a different solution. Second, a prior art reference is analogous art if the prior art reference is reasonably pertinent to the problem faced by the inventor, even if it is not in the same field of endeavor as the claimed invention.

43. I understand that it must be shown that one having ordinary skill in the art at the time of the invention would have had a reasonable expectation that a modification or combination of one or more prior art references would have succeeded. Furthermore, I understand that a claim may be obvious in view of a single prior art reference, without the need to combine references, if the elements of the claim that are not found in the reference can be supplied by the knowledge or common sense of one of ordinary skill in the relevant art. However, I understand that it is inappropriate to resolve obviousness issues by a retrospective

analysis or hindsight reconstruction of the prior art and that the use of "hindsight reconstruction" is improper in analyzing the obviousness of a patent claim.

44. I further understand that the law recognizes several specific guidelines that inform the obviousness analysis. First, I understand that a reconstructive hindsight approach to this analysis, i.e., the improper use of post-invention information to help perform the selection and combination, or the improper use of the listing of elements in a claim as a blueprint to identify selected portions of different prior art references in an attempt to show that the claim is obvious, is not permitted. Second, I understand that any prior art that specifically teaches away from the claimed subject matter, i.e., prior art that would lead a person of ordinary skill in the art to a specifically different solution than the claimed invention, points to non-obviousness, and conversely, that any prior art that contains any teaching, suggestion, or motivation to modify or combine such prior art reference(s) points to the obviousness of such a modification or combination. Third, while many combinations of the prior art might be "obvious to try", I understand that any obvious to try analysis will not render a patent invalid unless it is shown that the possible combinations are: (1) sufficiently small in number so as to be reasonable to conclude that the combination would have been selected; and (2) such that the combination would have been believed to be one that would produce predictable and well understood results. Fourth, I understand that if a claimed invention that

arises from the modification or combination of one or more prior art references uses known methods or techniques that yield predictable results, then that factor also points to obviousness. Fifth, I understand that if a claimed invention that arises from the modification or combination of one or more prior art references is the result of known work in one field prompting variations of it for use in the same field or a different one based on design incentives or other market forces that yields predicable variations, then that factor also points to obviousness. Sixth, I understand that if a claimed invention that arises from the modification or combination of one or more prior art references is the result of routine optimization, then that factor also points to obviousness. Seventh, I understand that if a claimed invention that arises from the modification or combination of one or more prior art references is the result of a substitution of one known prior art element for another known prior art element to yield predictable results, then that factor also points to obviousness.

45. I understand that a dependent claim incorporates each and every limitation of the claim from which it depends. Thus, my understanding is that if a prior art reference fails to anticipate an independent claim, then that prior art reference also necessarily fails to anticipate all dependent claims that depend from the independent claim. Similarly, my understanding is that if a prior art reference or combination of prior art references fails to render obvious an independent claim,

then that prior art reference or combination of prior art references also necessarily fails to render obvious all dependent claims that depend from the independent claim.

V. THE ‘235 PATENT

46. According to the “Field of the Invention” section, the ‘235 Patent, entitled “Tools and Techniques for Directing Packets over Disparate Networks” relates to “computer network data transmission” or more specifically, “tools and techniques for communications using disparate parallel networks, such as a virtual private network (“VPN”) or the Internet in parallel with a point-to-point, leased line, or frame relay network, in order to help provide benefits such as load balancing across network connections, greater reliability, and increased security” (see, for example, Ex. 1001 at 1:17-24).

47. I note that the ‘235 Patent was filed on Feb. 7, 2003 (see, for example, Ex. 1001 at (22)). I also note that the ‘235 Patent is a continuation-in-part of US Patent Application No. 10/034,197 (the “‘197 Application”) filed on Dec. 28, 2001 and that the ‘197 Application claims priority to US Provisional Patent Application No. 60/259,269 filed Dec. 29, 2000 (see, for example, Ex. 1001 at (63), (60) or 1:7-13). I further note that the ‘235 Patent also claims priority to US Provisional Patent Application No. 60/355,509 filed Feb. 8, 2002 (see, for example, Ex. 1001 at (60) or 1:7-13).

48. I understand that in the District Court litigation, the Patent Owner has alleged that claims 4 and 19 of the ‘235 Patent should be entitled to a priority date of Dec. 29, 2000 (see, for example, Ex. 1010 at p. 3). Additionally, I understand

that in the District Court litigation, the Patent Owner has alleged that claims 5-15 of the '235 Patent should be entitled to a priority date of Feb. 8, 2002 (see, for example, Ex. 1010 at p. 3). I am not aware at this time of any basis for an assertion of a priority date for any claim of the '235 Patent that would be earlier than Dec. 29, 2000. My usage of the foregoing alleged priority dates for my analyses to follow does not mean that I agree that any claims of the '235 Patent should be accorded these priority dates as alleged by the Patent Owner.

49. In the "Technical Background of the Invention" section, the '235 Patent specification notes that the "present application focuses on architectures involving disparate networks in parallel, such as a proprietary frame relay network and the Internet" (see, for example, Ex. 1001 at 2:17-19). The '235 Patent specification explicitly explains that "the term "private network" is used herein in a manner consistent with its use in the '197 application (which comprises frame relay and point-to-point networks), except that a "virtual private network" as discussed herein is not a "private network"" because "Virtual private networks are Internet-based, and hence disparate from private networks, i.e., from frame relay and point-to-point networks" (see, for example, Ex. 1001 at 2:19-26). The '235 Patent specification explicitly calls out "frame relay" and a "point-to-point network, such as a T1 or T3 connection" as being "an example of a network that is

"disparate" from the Internet and from Internet-based virtual private networks for purposes of the present invention" (see, for example, Ex. 1001 at 1:56-60).

50. The '235 Patent specification also describes "FIG. 5" as "a prior art approach having a frame relay network configured in parallel with a VPN or other Internet-based network that is disparate to the frame relay network" (see, for example, Ex. 1001 at 5:24-27).

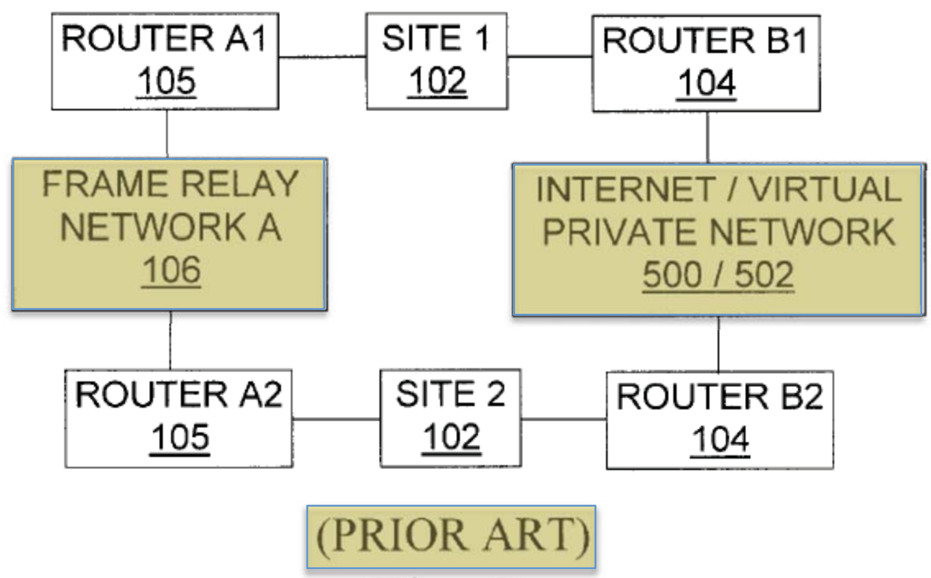
51. 

Fig. 5

52. Thus, the '235 Patent specification explicitly admits that the fact that "Organizations" can "use Internet-based redundant connections to backup the primary frame relay networks" was already well known in the prior art (see, for example, Ex. 1001 at 4:25-27 and FIG. 5 as annotated herein). Similarly, the '235 Patent specification also admits that such prior art usage of parallel disparate

networks not only provides “redundancy” but also “load balancing” subject to the alleged restriction that the prior art “allowed load-balancing only on a very broad granularity, and did not load-balance dynamically in response to actual traffic” (see, for example, Ex. 1001 at 9:4-9). Additionally, the ‘235 Patent specification admits that secure routing paths to “Internet-based communication solutions such as VPNs and Secure Sockets Layer (SSL)” are also known in the prior art and are “advantageous in the flexibility and choice they offer in cost, in service providers, and in vendors” (see, for example, Ex. 1001 at 4:5-10).

53. According to the ‘235 Patent specification, “By placing inventive modules **602** between locations and their routers as illustrated in FIG. 10, however, the invention allows load-balancing, redundancy, or other criteria to be used dynamically, on a granularity as fine as packet-by-packet, to direct packets to an Internet router and/or a frame relay/point-to-point router according to the criteria” (see, for example, Ex. 1001 at 9:12-17). As evident from annotated FIG. 10 herein and the foregoing citation, the alleged invention of the ‘235 Patent is thus not the use of parallel disparate networks between locations (or “sites”) but instead the allegedly novel functional characteristics of the “Controller **602**” that routes data traffic from a local site to a remote site over either or both of the Internet and frame relay or point-to-point networks (see, for example, Ex. 1001 at 9:12-10:58 and FIG. 10 as annotated herein).

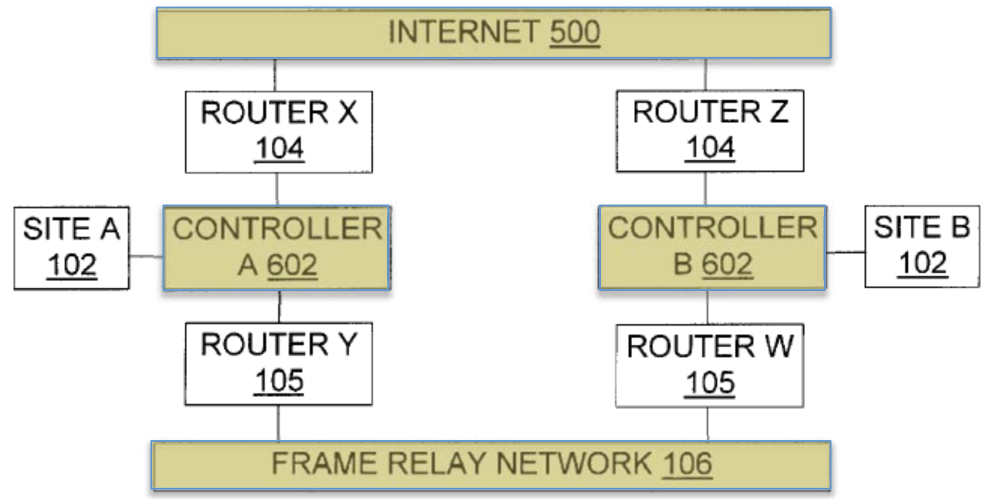


Fig. 10

54.

55. The '235 Patent specification also depicts the "controller **602** of the present invention" in FIG. 7, which is described as comprising "an interface component for each network to which the controller connects, and a path selector in the controller which uses one or more of the following as criteria: destination address, network status (up/down), network load, use of a particular network for previous packets in a given logical connection or session" as well as a "site interface **702**" that "connects the controller **602** to the LAN at the site" (see, for example, Ex. 1001 at 5:37-44, 10:59-62 and FIG. 7 as annotated herein). According to the '235 Patent specification, "controller **602**" may be "implemented in custom hardware, or implemented as software configuring semi-custom or general-purpose hardware" (see, for example, Ex. 1001 at 10:66-11:2).

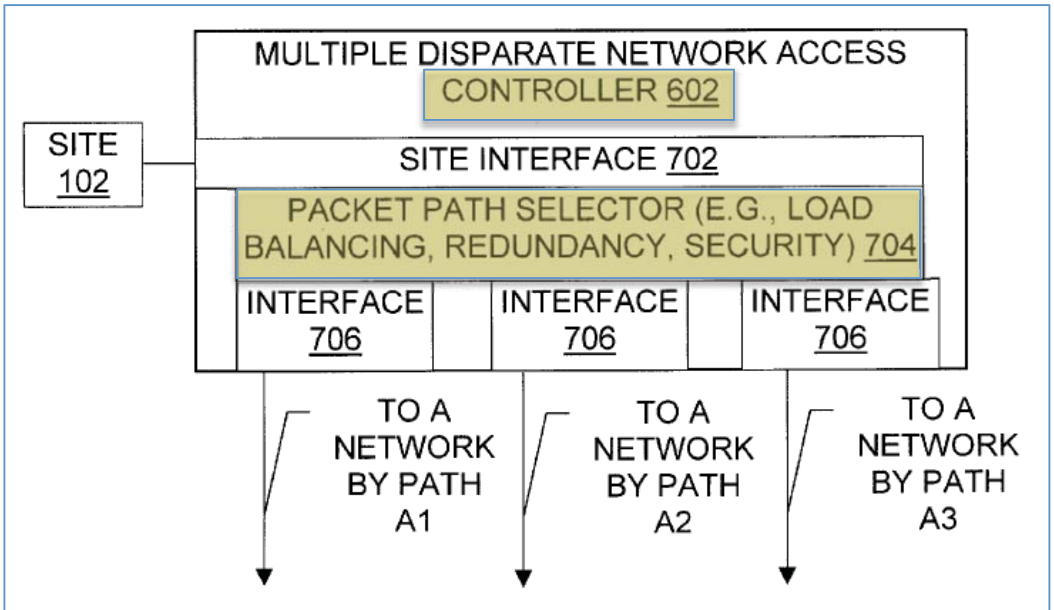
56. 

Fig. 7

57. According to the '235 Patent specification, the "path selector **704** determines which path to send a given packet on" according to enumerated criteria that "may be used to select a path for a given packet, for a given set of packets, and/or for packets during a particular time period" (see, for example, Ex. 1001 at 11:2-10).

58. The first of these enumerated criteria is "Redundancy", which the '235 Patent specification describes as "use devices (routers, network switches, bridges, etc.) that will still carry packets after the packets leave the selected network interfaces, when other devices that could have been selected are not functioning" (see, for example, Ex. 1001 at 11:11-17). However, the '235 Patent specification explicitly admits that "Techniques and tools for detecting network

path failures are generally well understood" (see, for example, Ex. 1001 at 11:17-18).

59. The second of these enumerated criteria is "Load-balancing", which the '235 Patent specification describes as "send packets in distributions that balance the load of a given network, router, or connection relative to other networks, routers, or connections available to the controller **602**" (see, for example, Ex. 1001 at 11:21-24). According to the '235 Patent specification, such "load balancing" is "preferably done on a per-packet basis for site-to-site data traffic or on a TCP or UDP session basis for Internet traffic", which the '235 Patent specification alleges to be "opposed to prior art approaches which use a per-department and/or per-router basis for dividing traffic" (see, for example, Ex. 1001 at 11:33-38). However, the '235 Patent specification explicitly admits that "Load-balancing algorithms in general are well understood" (see, for example, Ex. 1001 at 11:38-39).

60. The third of these enumerated criteria is "Security", which the '235 Patent specification describes as "divide the packets of a given message (session, file, Web page, etc.) so they travel over two or more disparate networks" (see, for example, Ex. 1001 at 11:41-43). Alternatively, the '235 Patent specification describes this "security" criterion as simply "one network may be viewed as more

secure than another, encryption may be enabled, or other security measures may be taken" (see, for example, Ex. 1001 at 11:61-63).

61. According to the '235 Patent specification, the "Path selection criteria may be specified" by "configuration files, hardware jacks or switches, ROM values, remote network management tools, or other means" (see, for example, Ex. 1001 at 12:62-65).

62. The '235 Patent specification also states that "FIG. 9 is a flowchart illustrating methods of the present invention for combining connections to send traffic over multiple parallel independent disparate networks for reasons such as enhanced reliability, load balancing, and/or security" (see, for example, Ex. 1001 at 5:48-51, 13:32-35 and FIG. 9 as annotated herein).

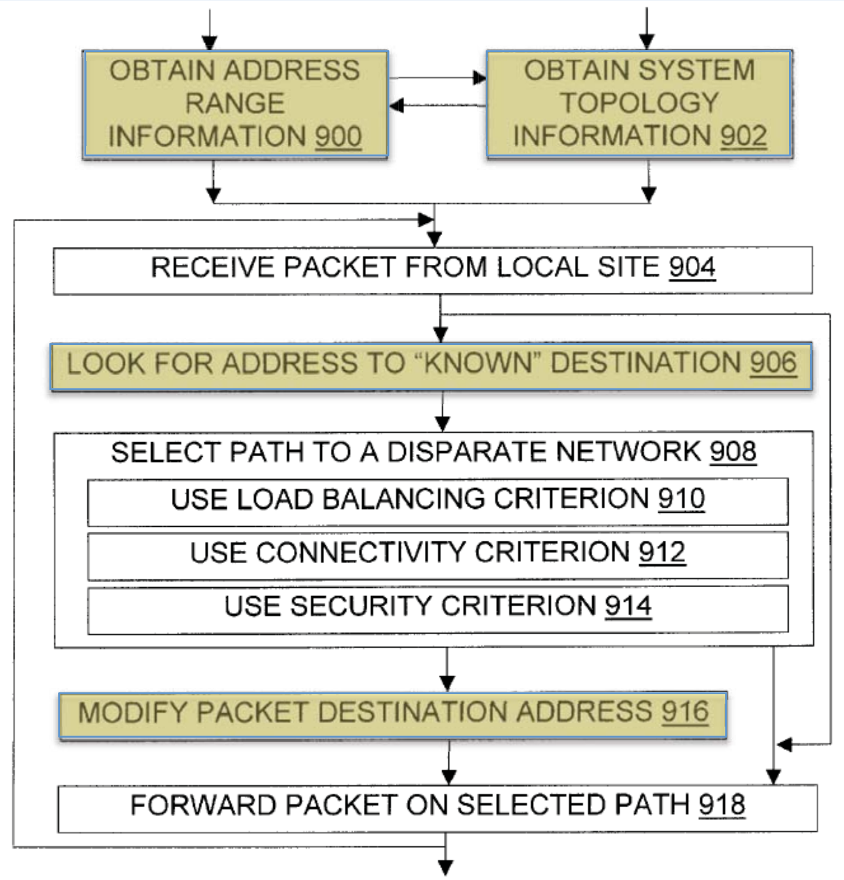
63. 

Fig. 9

64. The '235 Patent specification describes an "address range information obtaining step **900**" during which "address ranges for known locations are obtained" (see, for example, Ex. 1001 at 13:39-40). According to the '235 Patent specification, "Each address range has an associated network; a network may have more than one associated contiguous range of addresses which collectively constitute the address range for that network" (see, for example, Ex. 1001 at 13:39-40). Additionally, the '235 Patent specification states that "The locations reachable through the network have addresses in the address range associate with

the network" and thus "a location reachable through two networks has two addresses, which differ in their network identifying bits but are typically the same in their other bits" (see, for example, Ex. 1001 at 13:49-54). The '235 Patent specification also discloses that "Address ranges may be obtained **900** by reading a configuration file, querying routers, receiving input from a network administrator, and/or other data gathering means" (see, for example, Ex. 1001 at 13:55-57).

65. The '235 Patent specification further describes a "topology information obtaining step **902**" wherein "topology information for the system of parallel disparate networks is obtained" (see, for example, Ex. 1001 at 13:58-60). The '235 Patent specification also discloses that "Topology information may be obtained **902** by reading a configuration file, querying routers, receiving input from a network administrator, and/or other data gathering means" (see, for example, Ex. 1001 at 13:67-14:3).

66. The '235 Patent specification also describes a "determining step **906**" in which "the controller **602** (or some other device used in implementing the method) looks at the packet destination address to determine whether the destination address lies within a known address range" by comparing "destination address" to the "known location address ranges that were obtained during step **900**, in order to see whether the destination location is a known location" (see, for example, Ex. 1001 at 14:24-30). According to the '235 Patent specification, "Only

packets destined for known locations are potentially rerouted by the invention to balance loads, improve security, and/or improve reliability" and in contrast, other "Packets destined for unknown locations are simply sent to the network indicated in their respective destination addresses" (see, for example, Ex. 1001 at 14:31-35).

67. The '235 Patent specification further describes a "path selecting step **908**" wherein the "path selector **704** selects the path over which the packet will be sent; selection is made between at least two paths, each of which goes over a different network **106** than the other" (see, for example, Ex. 1001 at 14:40-43). According to the '235 Patent specification, "This path selecting step **908** may be performed once per packet, or a given selection may pertain to multiple packets" and further for some embodiments, "selecting a network will also select a path, as in the system shown in FIG. 10" (see, for example, Ex. 1001 at 14:44-48).

68. The '235 Patent specification similarly describes an "address modifying step **916**" wherein "the packet destination address is modified as needed to make it lie within an address range (obtained during step **900**) which is associated with the selected path to the selected network (selected during step **908**)" as in the example of "if a packet is received **904** with a destination address corresponding to travel through the Internet but the path selection **908** selects a path for the packet through a frame relay network **106** to the same destination, then the packet's destination IP address is modified **916** by replacing the IP address

with the IP address of the appropriate interface of the controller at Site B" and "the packet's source IP address is replaced with the IP address of the appropriate interface of the source controller" (see, for example, Ex. 1001 at 15:61-16:6).

69. The '235 Patent includes 24 claims. I have been informed by Counsel that Claims 4-5, 7-15 and 19 are the subject of the *Inter Partes* Review petition. Note that for solely purposes of my analyses herein, I have denoted certain elements of Claims 4, 5, and 19 as (a), (b), etc. even though such nomenclature does not appear in the '235 Patent.

VI. CLAIM CONSTRUCTION

70. I understand that claim construction is a matter of law. However, I understand that in an *Inter Partes* Review proceeding the claims are to be given a broadest reasonable interpretation consistent with the '235 Patent specification such that specific claim terms are given their ordinary and customary meaning as would be understood by a person of ordinary skill in the art in the context of the entire disclosure. I also understand that limitations from the specification are not to be read into the claims. The specification, however, can inform a person of ordinary skill in the art as to a broadest reasonable interpretation of the claims. In addition, I understand that a person of ordinary skill in the art would look to explanations and arguments made by the applicants during prosecution history to inform a broadest reasonable interpretation of the claims of the '235 Patent.

71. I understand that indefiniteness is not an issue that can be addressed as part of an *Inter Partes* Review proceeding. Therefore, I have, solely for the purposes of my prior art invalidity analyses herein as relevant to this *Inter Partes* Review proceeding, used a broadest reasonable interpretation for all claim terms without regard to the consideration that certain of these claim terms may be found indefinite as a matter of law.

72. The term "**private network**" appears in at least Claim 4 of the '235 Patent. In the District Court litigation, the Patent Owner has alleged that no

construction of the claim term is necessary, or alternatively that this claim term should mean "a communication path that is unavailable to the general public" (see, for example, Ex. 1014 at p. 1). For the purposes of my analysis in this declaration solely, I have accepted Patent Owner's proposed constructions as being within a broadest reasonable interpretation of the term "private network".

73. The term "**Internet based network**" (or alternatively, "network based on the Internet") appears in at least Claim 4 of the '235 Patent. In the District Court litigation, the Patent Owner has alleged that no construction of the claim term is necessary, or alternatively that this claim term should mean "a communication path that is available on the public Internet" (see, for example, Ex. 1014 at p. 1). For the purposes of my analysis in this declaration solely, I have accepted Patent Owner's proposed constructions as being within a broadest reasonable interpretation of the term "Internet based network".

74. The term "**disparate networks**" appears in at least Claims 5 and 13 of the '235 Patent. In the District Court litigation, the Patent Owner has alleged that this claim term should be construed to mean "networks that are different in kind, e.g. a private network and an Internet based network" (see, for example, Ex. 1014 at p. 1). For the purposes of my analysis in this declaration solely, I have accepted Patent Owner's proposed construction as being within a broadest reasonable interpretation of the term "disparate networks".

75. The term "**per-packet basis**" (or alternatively, "packet by packet basis") appears in at least Claims 4 and 9 of the '235 Patent. In the District Court litigation, the Patent Owner has alleged that no construction of the claim term is necessary, or alternatively that this claim term should mean "packet by packet" (see, for example, Ex. 1014 at p. 2). For the purposes of my analysis in this declaration solely, I have accepted Patent Owner's proposed constructions as being within a broadest reasonable interpretation of the term "per-packet basis".

76. The term "**per-session basis**" appears in at least Claims 10 and 19 of the '235 Patent. In the District Court litigation, the Patent Owner has alleged that no construction of the claim term is necessary, or alternatively that this claim term should mean "session by session" (see, for example, Ex. 1014 at p. 2). For the purposes of my analysis in this declaration solely, I have accepted Patent Owner's proposed constructions as being within a broadest reasonable interpretation of the term "per-session basis".

77. The term "**packet path selector**" appears in at least Claims 4 and 19 of the '235 Patent. In the District Court litigation, the Patent Owner has alleged that no construction of the claim term is necessary, or alternatively that this claim term should mean "module(s) that selects which path to send a given packet on" (see, for example, Ex. 1014 at p. 2). For the purposes of my analysis in this

declaration solely, I have accepted Patent Owner's proposed constructions as being within a broadest reasonable interpretation of the term "packet path selector".

78. The term "**repeated instances of the selecting step make network path selections**" appears in at least Claims 9, 10, 12 and 13 of the '235 Patent. In the District Court litigation, the Patent Owner has alleged that no construction of the claim term is necessary, or alternatively that this claim term should mean "more than one occurrence of selecting a network path" (see, for example, Ex. 1014 at p. 3). For the purposes of my analysis in this declaration solely, I have accepted Patent Owner's proposed constructions as being within a broadest reasonable interpretation of the term "repeated instances of the selecting step make network path selections".

79. The term "**parallel network**" appears in at least Claims 4, 5 and 19 of the '235 Patent. In the District Court litigation, the Patent Owner has alleged that this claim term should be construed to mean "at least two networks configured to allow alternate data paths" (see, for example, Ex. 1014 at p. 3). For the purposes of my analysis in this declaration solely, I have accepted Patent Owner's proposed construction as being within a broadest reasonable interpretation of the term "parallel network".

80. The term "**session**" appears in at least Claims 4, 5 and 19 of the '235 Patent. In the District Court litigation, the Patent Owner has alleged that this claim

term should be construed to mean "an active communications connection, measured from beginning to end, between computers or applications over a network" (see, for example, Ex. 1014 at pp. 3-4). For the purposes of my analysis in this declaration solely, I have accepted Patent Owner's proposed construction as being within a broadest reasonable interpretation of the term "session".

81. I have applied the plain and ordinary meaning to all remaining claim terms for the purposes of this review proceeding.

82. In the event that one or more of these constructions is changed, I reserve the right to revisit my analysis under the different construction(s).

VII. STATE OF THE ART

83. As of Dec. 29, 2000, when the first of the applications that later became the '235 Patent was filed, the state of the art in the field of "architectures involving disparate networks in parallel" already fully encompassed the concepts of and the implementation for routing based upon "load-balancing, redundancy, or other criteria to be used dynamically, on a granularity as fine as packet-by-packet" as evidenced by the following sample of art.

Karol (Ex. 1006)

84. For example, amongst the numerous prior art references in this field, U.S. Patent No. 6,628,617 by Mark John Karol and Malathi Veeraraghavan entitled "Technique for Interconnecting Traffic on Connectionless and Connection-Oriented Networks" ("Karol") was filed on Mar. 3, 1999, which is more than 1 year before the earliest priority date of the '235 Patent (see, for example, Ex. 1006 at (22)). Thus, I understand that Karol qualifies as prior art to the '235 Patent at least under § 102(e).

85. As Karol discloses in its "Field of the Invention" section, the Karol patent is directed towards "internetworking of connectionless (e.g. Internet Protocol or "IP") and connection oriented (e.g. ATM, MPLS, RSVP) networks" (see, for example, Ex. 1006 at 1:7-10). The Karol patent defines the terms "connectionless" by the abbreviation "CL" and "connection oriented" by the abbreviation "CO" throughout the specification and figures (see, for example, Ex.

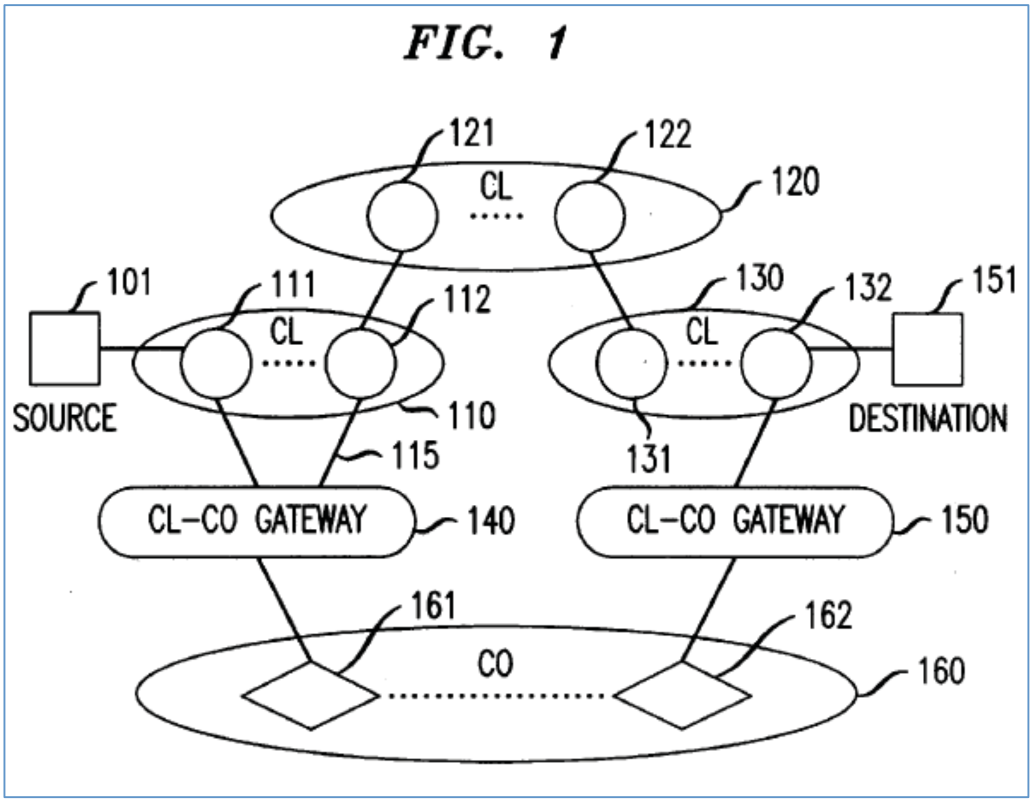
1006 at 1:12-14 and 1:19-20). At least because Karol is directed to an analogous field of art (data networking) and directed to solving analogous problems (routing to parallel disparate networks), Karol is analogous art to the ‘235 Patent (see also, ¶¶ 42 and 46 above).

86. More specifically, Karol discloses “nodes called CL-CO gateways, are arranged to have connectivity to both the CL network and the CO network” wherein “each CL-CO gateway includes hardware and software modules that typically comprise” at least “interfaces to the CO network”, “interfaces to the CL network”, “a database for storing forwarding, flow control, header translation and other information”, and “a processor containing logic for controlling the gateway packet handling operations” (see, for example, Ex. 1006 at 2:13-28). Karol further discloses that for the “parallel configuration” where there are always “at least two paths” such as “one using the CL network and the other using the CO network”, then there “is always a routing choice, i.e., CL to CO to CL or entirely CL” and the “gateway” should “make the routing selection based on maximizing efficiency” (see, for example, Ex. 1006 at 2:61-66). Thus, Karol is clearly from the same field of art as the ‘235 Patent and is clearly addressing similar problems as those purportedly addressed by the ‘235 Patent.

87. Karol discloses that the “CO network can be an MPLS (MultiProtocol Label Switching) or RSVP (Resource reSerVation Protocol) based IP network, a

WDM (Wavelength Division Multiplexed) network, an ATM (Asynchronous Transfer Mode) network, or an STM (Synchronous Time Multiplexing) network, such as the telephony network or a SONET network" and that the "CL network is typically, although not necessarily, an IP network" (see, for example, Ex. 1006 at 2:61-66). Karol also discloses that the "CO network" can be comprised of an "X.25 network" or "point-to-point links" (see, for example, Ex. 1006 at 13:62-67).

88. FIG. 1 of Karol is a diagram of "internetworking CO and CL networks" in a "parallel" configuration in order to "offer enterprises "long-distance" connectivity of their geographically distributed networks" (see, for example, Ex. 1006 at 2:65-67, 3:46-51 and FIG. 1). Karol describes the operation of the network in FIG. 1 as "Traffic from source endpoint **101** destined for destination endpoint **151** (which is directly connected to and served by a node **132** in a CL network **130**) can be routed in at least two different, parallel routes, and this choice of routes is reflected in how the CL-CO gateway **140** operates" (see, for example, Ex. 1006 at 4:40-44 and FIG. 1).

89. 

90. Karol continues in reference to the "two different, parallel routes" of FIG. 1 by nothing that "In the first route, the datagram can follow a path that traverses only connectionless nodes" including "eventually through node **112**, which routes traffic" to "CL network **120**" while "The second path that a datagram in FIG. 1 can follow extends at least partially over a CO network **160**, using the CL-CO gateways **140** and **150**" (see, for example, Ex. 1006 at 4:43-58 and FIG. 1). Karol also discloses that for every "datagram" (or "packet") that "arrives at a CL-CO gateway **140** of FIG. 1, a determination is made if that packet should be carried by CO network **160**" (see, for example, Ex. 1006 at 5:23-25 and FIG. 1). Karol also specifically discloses for the CL and CO networks that the "parallel

configuration could occur, for example, if two service providers, one with an IP-router-based network and the other with a CO-switch-based network, offer enterprises "long-distance" connectivity of their geographically distributed networks" (see, for example, Ex. 1006 at 3:47-51).

91. More specifically with respect to FIG. 1 Karol discloses that "Connections are set up through CO network **160** for some, but not necessarily all, of the arriving CL traffic" such that "if a CO connection is not used, the path might extend from gateway **140** back to node **112** in CL network **110** via path **115**, and thence through CL networks **120** and **130** to destination endpoint **151**" and thus "CL-CO gateway **140** handles traffic both from flows for which CO connections are set up, as well as continues forwarding packets through the CL network if a CO connection is not set up" (see, for example, Ex. 1006 at 5:28-35 and FIG. 1).

92. As Karol explicitly recites in reference to FIG. 1, "The decision to set up CO connections is made at CL-CO gateway **140**, based on the *user-specified service requirements* and the *traffic situation* in the CL and CO networks" (emphasis added, see, for example, Ex. 1006 at 5:35-38 and FIG. 1).

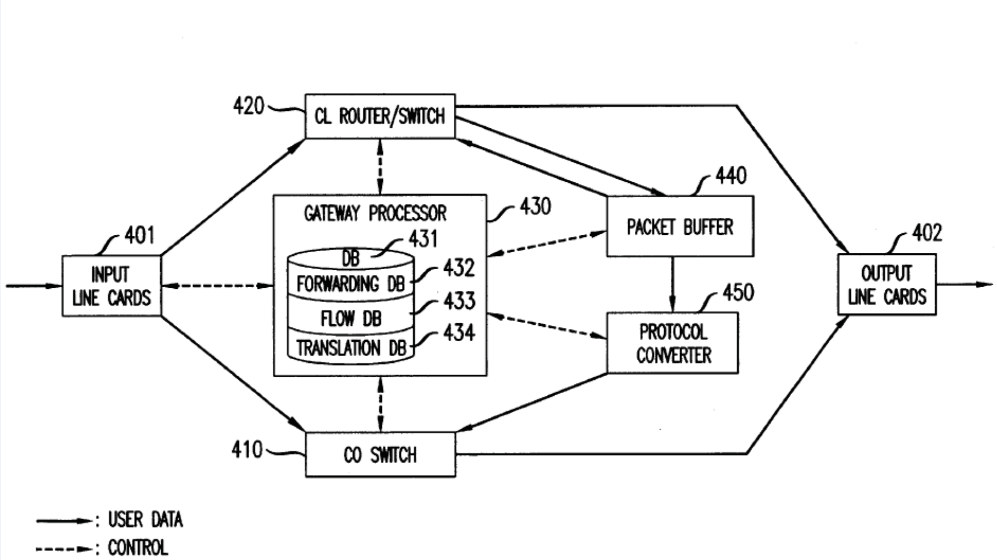
93. Thus, a person of ordinary skill in the art at the time of filing of the '235 Patent would also readily understand that Karol, just from FIG. 1 and its corresponding description alone, describes a system wherein a combination of one or more local switches and/or routers with a path selection gateway at each of

multiple enterprise sites can have long-distance connectivity for transporting each packet from one enterprise site to the other over either of an Internet-based network or a private non-Internet based network arranged in parallel based on user set criteria and the instant traffic situation in both of the disparate parallel networks.

94. FIG. 4 of Karol "shows the internal arrangement of CL-CO gateway **140**" that "includes hardware and software modules that typically comprise" at least "a switch fabric for CO networking, shown in FIG. 4 as CO switch **410**", "a CL packet forwarding engine, shown in FIG. 4 as CL router/switch **420**", "a protocol converter **450**", and "a processor **430** and associated database **431** for controlling the gateway packet handling operations and for storing forwarding, flow control, header translation and other information" (see, for example, Ex. 1006 at 6:31-44 and FIG. 4). FIG. 4 of Karol also discloses "Input line cards **401** and output line cards **402**" that "connect the gateway of FIG. 4 to external networks" such that "datagrams received in input line cards **401** can be directed either to CO switch **410** or CL router/switch **420**" and such that "output line cards **402** can receive datagrams from either of the last mentioned elements and direct them to external networks" (see, for example, Ex. 1006 at 6:44-50 and FIG. 4).

95.

FIG. 4



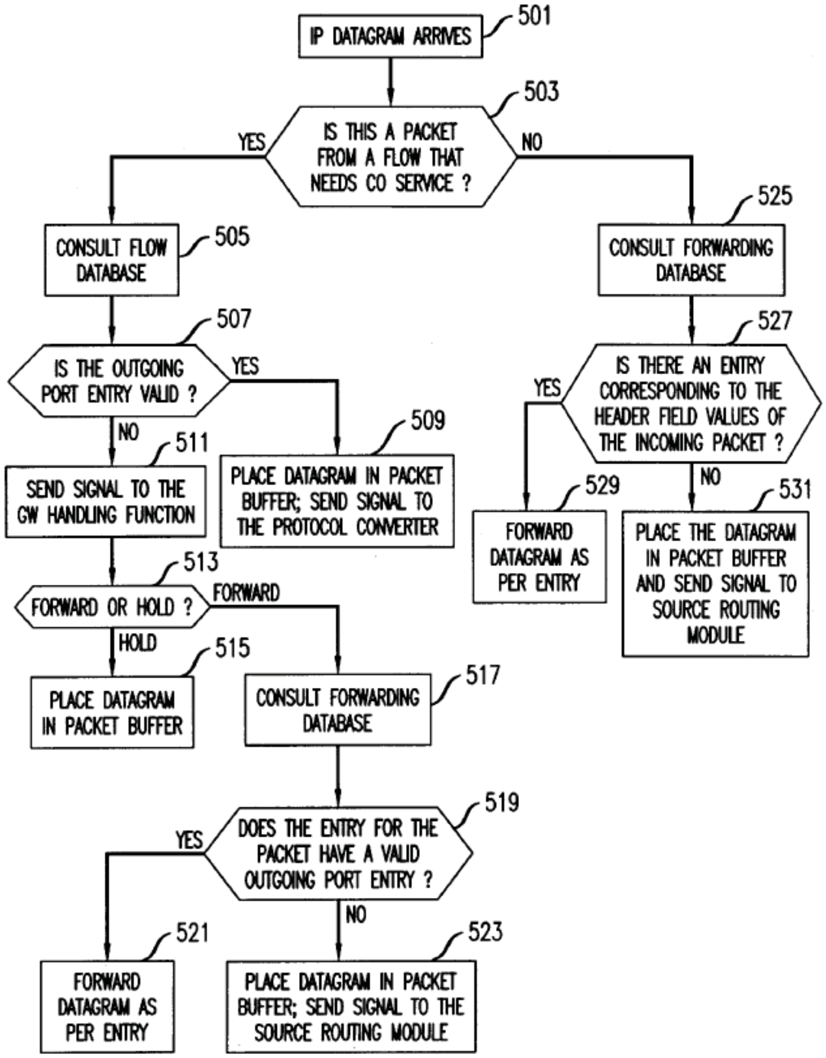
96. Karol discloses the structural elements involved in selecting the CL or CO path for a given packet primarily in the description of the "gateway processor **430**" and the "database **431**". In particular, Karol discloses that "Database **431** includes a series of individual databases arranged to store information used in various of the functions performed by processor **430**, and may include, as an example, a datagram forwarding database **432**, a flow database **433**, and a header translation database **434**" (see, for example, Ex. 1006 at 7:31-35 and FIG. 4). More specifically, "datagram forwarding database **432**" is described as "the database used in typical CL IP routers" that "stores the next hop router address and outgoing port number corresponding to each destination address" and thus the "fields in each record in this database would be: Destination IP address; Next hop router; Outgoing port (interface)" (see, for example, Ex. 1006 at 7:36-41).

97. Additionally, Karol discloses that "Flow database **433** stores information used to determine how to handle packets from flows requiring a connection-oriented service" wherein "Typical fields in each record in this database include: (a) an outgoing port field, which indicates the port on which a datagram whose entries match a particular record's entries is forwarded; (b) if the outgoing port is "invalid," the next field "forward or hold" entry indicates whether packet should be forwarded or held in packet buffer **440**; (c) destination address; (d) source address; (e) source port; (f) destination port; (g) type of service; (h) protocol field; (i) TCP Flags; (j) outgoing port; (k) forward or hold flag, and (l) a mask which indicates which of the data entries is applicable to the particular record" (see, for example, Ex. 1006 at 7:42-54).

98. Thus, Karol discloses in reference to FIG. 4 that "the processes performed in CL-CO gateways that enable the internetworking of connectionless IP networks and CO networks" accomplish two primary functions that are i) handling "IP packets that arrive at CL-CO gateways to be carried on (not-yet-established) connections in the CO network, plus IP packets that arrive at CL-CO gateways but then remain in the CL network", and ii) creating "routing tables that enable data flow from the CL network to the CO network" (see, for example, Ex. 1006 at 7:60-8:2).

99. In Karol, "FIG. 5 is a flow diagram illustrating the steps performed when the gateway of FIG. 4 performs its packet forwarding process" such that "When an IP datagram arrives at the CL-CO gateway of FIG. 4, the handling procedure that occurs in CL router/switch **420** is shown in FIG. 5" (see, for example, Ex. 1006 at 3:6-8, 8:56-58 and FIG. 5). With respect to FIG. 5, Karol describes that "CL packets arriving on the input line cards **401** in step **501** are sent to CL router/switch **420**, while a determination is made by gateway processor **430** in step **503** as to whether the flow should be handled via the CO network or not" (see, for example, Ex. 1006 at 8:58-62 and FIG. 5). More specifically, "If the logic in processor **430** determines to use the CO network for a given flow, a "YES" result is achieved in step **503**, and flow database **433** is consulted in step **505**" wherein "If flow database **433** determines that there is a record whose entries match the incoming packet header fields, a YES result occurs in step **507**, and the packet is sent to packet buffer **440**" and subsequently upon appropriate protocol conversion and confirmation of availability of the CO network, "the datagram is forwarded in accordance with the entry, in step **521**" to the CO network path via the appropriate output line card (see, for example, Ex. 1006 at 8:62-9:22 and FIG. 5).

FIG. 5



100.

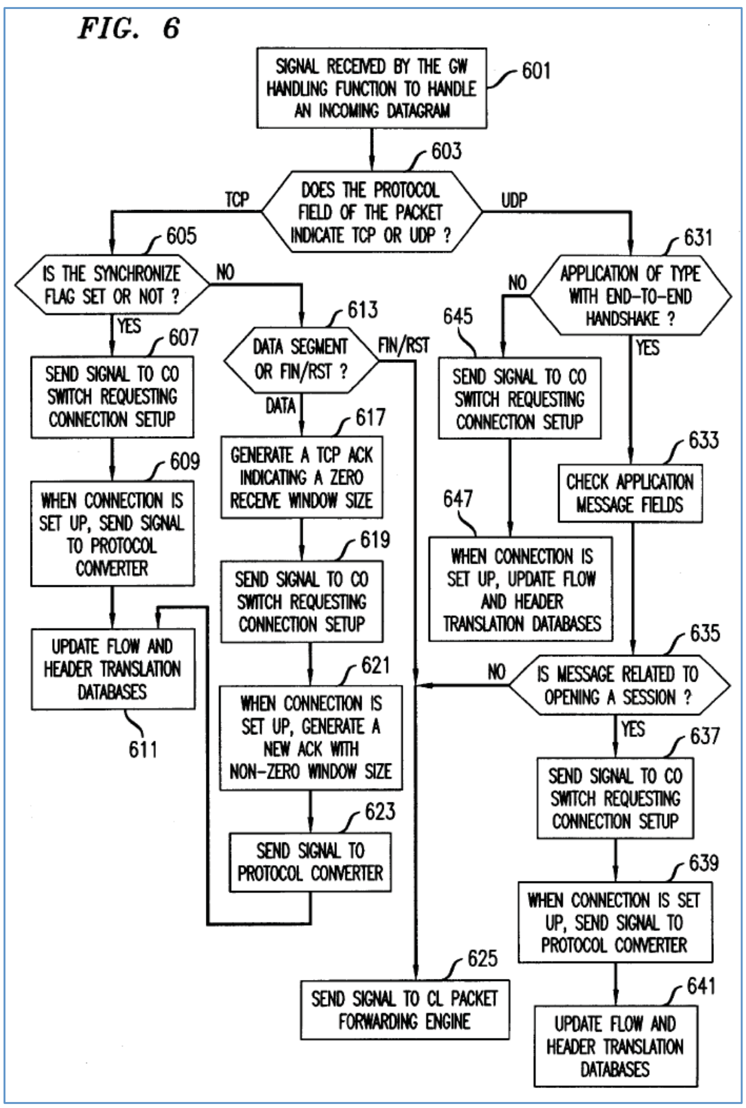
101. Alternatively according to Karol, "If the flow classification functionality within processor **430** determines that the packet should be handled in a CL mode, a NO result occurs in step **503**" and then "In that event, forwarding database **432** is consulted in step **525** to determine if there is an entry corresponding to the header field values of the incoming datagram" such as the

comparison of the packet destination address with that of known addresses as described above (see, for example, Ex. 1006 at 9:26-31 and FIG. 5). Furthermore, "If the result of step **527** is YES, indicating that there is an entry in forwarding database **432** that matches the incoming packet header fields, the datagram is forwarded in accordance with that entry, in step **529**" and "Otherwise, if a NO result occurs in step **527**, the datagram is dropped in step **531**", which causes the source routing module from which the packet came to route the packet in an alternative manner independent of the CL-CO gateway such as by the Internet (see, for example, Ex. 1006 at 9:31-36, 11:17-31, FIG. 5 and FIG. 7).

102. Karol provides numerous examples of how the "gateway processor **430**" and "flow database **433**" interact to determine whether a particular packet belongs to a flow directed to the CO network or the CL network. For example, some flows correspond to sessions or applications such as "web access, telnet, file transfer, electronic mail, etc" that utilize the TCP transport layer while others such as "Internet telephony and other multimedia traffic" may use the "RTP (Real Time Protocol)" that "has been defined to use UDP" transport layer (see, for example, Ex. 1006 at 10:25-39 and FIG. 6). As Karol explains, certain packets carrying either TCP or UDP segments within certain sessions or applications as listed above are appropriate for a flow to the CO network while others are better directed to the CL network (see, for example, Ex. 1006 at 10:51-11:26 and FIG. 6).

103. Karol also describes exemplary embodiments in which for particular sessions, such as "Internet telephony and other multimedia traffic" that use UDP transport layer, the CL-CO gateway forwards some datagrams over the CO network and forwards other datagrams over the CL network (see, for example, Ex. 1006 at 10:51-67 and FIG. 6). More specifically, Karol teaches that "If it is determined in step **603** that the incoming packet is a UDP datagram, a determination is next made in step **631** as to whether the datagram is from an application that has an end-to-end handshake prior to data transfer, or a UDP datagram from an application that does not have such a handshake" because "based on the packet type, the gateway selects the corresponding "halting" or "turning around" action to take" (see, for example, Ex. 1006 at 10:51-58). Karol continues the description of this exemplary embodiment by nothing that "If the result in step **631** is YES, the application message fields are checked in step **633**, so that a determination can be made in step **635** as to whether the message is related to opening a session" and "If so, a YES result occurs in step **635**, after which the gateway sends a signal in step **637** requesting connection setup" (see, for example, Ex. 1006 at 10:58-63). Thus, once the connection is setup, datagrams carrying UDP segments from the source endpoint to the destination endpoint associated with this flow or session (i.e. an Internet telephony call) will be routed at the CL-CO gateway to the CO network (see, for example, Ex. 1006 at 10:51-11:26).

However, as clearly shown in FIG. 6, if a "NO result occurs in step **635**", then additional datagrams carrying UDP segments from the same source endpoint to the same destination endpoint, even if associated with this flow or session, will be routed at the CL-CO gateway to the CL network as shown in FIG. 6 at step 635 to 625 until such time as the "flow database **433**" is "updated at step **641**" (see, for example, Ex. 1006 at 10:63-67 and steps **635** and **625** of FIG. 6).

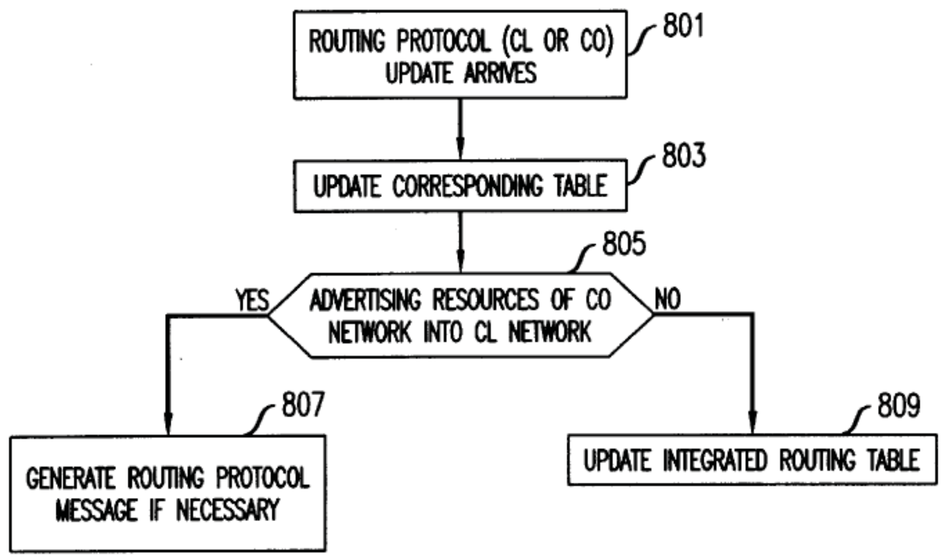
104. 

105. Additionally, Karol informs that "gateways in accordance with the present invention decide whether a datagram flow should be handled via the CO network or not. (See step 503 in FIG. 5)" and thus "If the routing scheme used maintains integrated IP-CO routing tables at the CL-CO gateways, neither type of traffic poses a serious problem, since the default path expected by CL network **901** provides a path from the CL-CO gateways **960-962** through CL network **901** to the destination" (see, for example, Ex. 1006 at 15:31-39).

106. Karol also discloses that "FIG. 8 is a flow diagram illustrating the routing related processes performed in the gateway of FIG. 4" (see, for example, Ex. 1006 at 3:17-18 and FIG. 8). More specifically, "When a routing protocol update is received from CL router/switch **420** or from CO switch **410**, network, the process shown in FIG. 8 is executed" such that "After the update arrives in step **801**, and the corresponding table is updated in step **803**, a determination is made in step **805** as to whether the resources of the CO network need to be communicated to or "advertised" in the CL network" (see, for example, Ex. 1006 at 13:6-12 and FIG. 8).

107.

FIG. 8



108. Note that in the system of Karol, such routing topology information is propagated locally when “a YES result occurs in step **805**, and an appropriate routing protocol message is generated in step **807**” or when “a NO result occurs in step **805**, and the integrated routing table is updated in step **809**” so that the system routes packets to the CL and CO networks based at least upon conventional IP routing techniques such as OSPF as well as “Link State Advertisements (LSAs) that report point-to-point links” that are expressed by associated “link weights” so that “integrated IP-CO routing tables are maintained at the CL-CO gateways” (see, for example, Ex. 1006 at 14:23-67, FIG. 8 and FIG. 9).

109. Karol further discloses that the “CL-CO gateways arranged in accordance with the present invention perform two principal functions: first, they

act as nodes in a CL network (e.g., as IP routers) that are equipped to decide when to redirect traffic on to a switched CO network, and second, they act as nodes of the CO network, and therefore execute the routing and signaling protocols of the CO network" (see, for example, Ex. 1006 at 13:17-23). Thus, the CL-CO gateways must maintain routing tables for both of the conventional CL networks and of the CL to CO network routing translation based on their respective addressing schemes as Karol explains can be done using any of three ways to "create the routing tables that will enable data flow from CL network 901 to CO network 950" (see, for example, Ex. 1006 at 13:43-44). More specifically, Karol discloses that "CO network 950 can be represented as a "non-broadcast network" in the IP routing protocol (this affects routing information at CL-CO gateways 960-962 and other routers)", that "integrated routing tables for both the IP and CO networks 901 and 950, respectively, can be maintained at the CL-CO gateways 960-962", or that "user-specific routing information to be maintained at the CL-CO gateways 960-962, can be used in conjunction with either of the above two approaches" (see, for example, Ex. 1006 at 13:45-53). Furthermore, Karol teaches that "if users specify their desired service requirements at subscription time, the network provider can set user-specific routing tables at the CL-CO gateways" so that "the user-specific routing then determines which users' flows are sent to the CO network" (see, for example, Ex. 1006 at 16:3-9).

110. As discussed also herein, the specific information relevant to these "routing tables" is maintained in the various "databases" associated with the "gateway processor" including the "datagram forwarding database **432**, a flow database **433**, and a header translation database **434**" (see, for example, Ex. 1006 at 7:31-35 and ¶ 96 above). In addition to the address, routing identification, and network port information described above, the "header translation database **434**" is also updated when the "integrated routing table" that obtains the "resources of the CO network" to include at least "CO packet header field values or circuit identifiers" (see, for example, Ex. 1006 at 7:55-59, 13:6-16, and FIG. 8).

111. Karol also explains that this system of parallel CL and CO networks with path selection for each packet based on flow characteristics has numerous advantages for long distance enterprise connectivity. For example, Karol discloses that "the advantage to a user is that the user can ask for and receive a guaranteed quality of service for a specific flow" and "The advantage to a service provider is that bandwidth utilization in a packet-switched CO network is better than in a CL network with precomputed routes since bandwidth can be dynamically allocated to flows on an as-needed basis" (see, for example, Ex. 1006 at 17:18-26). In particular Karol notes that "dynamically adjusting link weights in the routing protocol can also be extended to include diverting connections away from

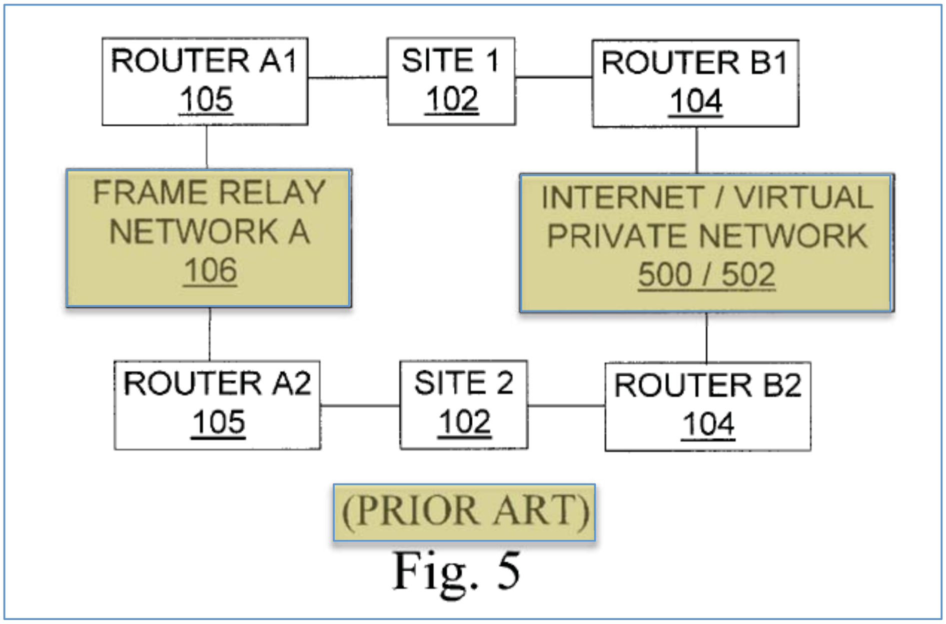
congested links" or "In other words, link weights can be adjusted to reflect bandwidth availability" (see, for example, Ex. 1006 at 17:63-18:2).

112. Thus, in addition to the disclosure summary given at ¶ 93 above, a person of ordinary skill in the art at the time of filing of the '235 Patent would also readily understand that Karol describes a system where the path selection gateway is coupled to local site interfaces and to interfaces to at least CL and CO disparate parallel networks, and wherein this path selection gateway can route each individual packet to the appropriate one of multiple CL or CO disparate parallel networks based at least upon: i) a comparison of the individual packet's destination address with known destination addresses that correspond to particular outgoing ports (or interfaces) associated with each of the CL or CO disparate parallel networks, ii) particular flows for various session types or applications associated with the packet, and iii) current routing table parameters including bandwidth availability and network congestion, and further describes methodologies for obtaining router tables based upon destination address identifiers to support such path selections.

Admitted Prior Art in the '235 Patent Specification

113. As described above the '235 Patent specification clearly admits that the prior art includes the disclosure of disparate parallel network paths comprising at least one private network path (such as a frame relay network) and one Internet-protocol based network path (such as the public Internet or a VPN) as illustrated in

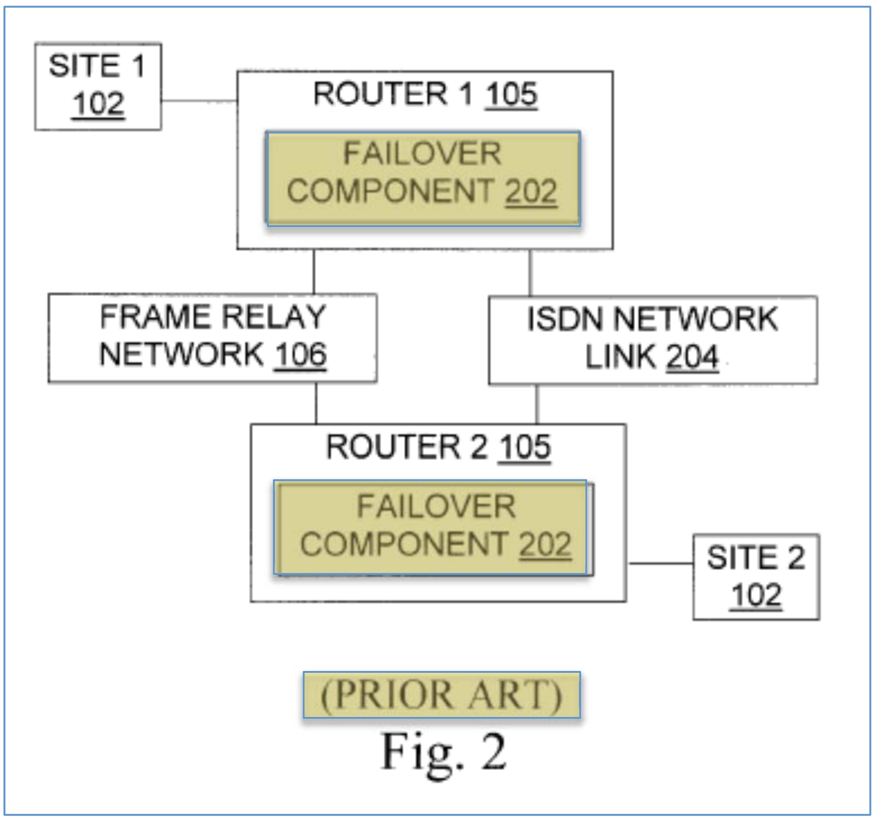
FIG. 5 of the '235 Patent (see, for example, Ex. 1001 at 4:25-27 and FIG. 5 as annotated herein).

114. 

115. In particular, the '235 Patent specification discloses that the admitted prior art of Fig. 5 specifically includes routing decisions for packets originating at one site and destined for another site over at least two disparate parallel networks wherein such routing decision considerations include a security criterion such as the availability of a secure virtual private network (or VPN) link (see, for example, Ex. 1001 at 4:5-14 and FIG. 5 as annotated herein).

116. The '235 Patent specification also clearly admits that the prior art includes the disclosure of a router that selects a network path for data packets to one or the other of at least two disparate parallel network paths on the basis of a reliability criterion (i.e. for purposes of "fault tolerance", "redundancy", "backup",

"disaster recovery", "continuity", or "failover") (see, for example, Ex. 1001 at 3:19-28, 9:52-60 and FIG. 2). Additionally, the '235 Patent specification also clearly admits that the prior art includes the disclosure of "Techniques and tools for detecting network path failures" that are "generally well understood" (see, for example, Ex. 1001 at 11:17-18).

117. 

118. Similarly, with respect to the disparate parallel networks of FIG. 5, the disclosure of the '235 Patent specification also clearly admits that the prior art includes the disclosure of configuring the packet routing to "send all traffic over a VPN 502" whenever the "frame relay" network "fails" (see, for example, Ex. 1001 at 4:21-23 and FIG. 5 as annotated herein).

119. The ‘235 Patent specification also clearly admits that the prior art includes the disclosure of “Load-balancing algorithms” that “in general are well understood” (see, for example, Ex. 1001 at 11:38-39).

Stevens Reference (Ex. 1007)

120. For example, amongst the numerous prior art references in this field, the book *TCP/IP Illustrated, Volume 1* by W. Richard Stevens, Addison-Wesley Professional Computing Series, ISBN 0-201-63346-9, 1994 (“Stevens”) was a printed publication available in the USA more than 1 year before the earliest priority date of the ‘235 Patent (see, for example, Ex. 1007 at inside cover page). Thus, I understand that Stevens qualifies as prior art to the ‘235 Patent at least under § 102(b).

121. According to Stevens, this “book describes the TCP/IP protocol suite” and “provides a look into the implementation of the protocols” (see, for example, Ex. 1007 at p. xv). Amongst the topics covered in Stevens are “TCP/IP Layering”, “Internet Addresses”, “The Domain Name System”, “Port Numbers”, and “The Internet” (see, for example, Ex. 1007 at pp. 6-16). At least because Stevens is directed to an analogous field of art (data networking) and directed to solving analogous problems (routing to redundant networks), Stevens is analogous art to the ‘235 Patent (see also, ¶¶ 42 and 46 above).

122. More specifically, Stevens describes “IP: Internet Protocol” in considerable detail including discussions on the “IP Header” and “IP Routing”

(see, for example, Ex. 1007 at pp. 33-41). In particular, Stevens discloses that every IP datagram (or packet) comprises at least a 32 bit source address and a 32 bit destination address wherein each address comprises at least a network identifier and a host identifier (see, for example, Ex. 1007 at pp. 8, 34-37, and 42). Stevens further discloses that IP routers maintain "routing tables" that can associate particular routes amongst multiple possible routes with particular network interfaces to such routes based upon stored "network addresses" (the range of addresses corresponding to a network identifier) to which the destination address in a given packet is compared (see, for example, Ex. 1007 at pp. 37-39).

123. Stevens also describes that "routing performs the following actions" for each packet arriving at a router or gateway: i) "Search the routing table for an entry that matches the complete destination IP address (matching network ID and host ID)", ii) "Search the routing table for an entry that matches just the destination network ID", and iii) "Search the routing table for an entry labeled "default"" (see, for example, Ex. 1007 at p. 39). Stevens notes that only if i) and ii) above "fail is a default route used" – that is when the packet's destination network address does not match any of those stored in the routing tables (see, for example, Ex. 1007 at p. 39). Stevens also provides a specific example wherein a "first search of the routing table for a matching host address fails, as does the second search for a matching network address" and thus the "final step is a search for a default entry, and this

succeeds" thereby "sending a datagram across the Internet to the host" (see, for example, Ex. 1007 at p. 115).

124. Stevens also describes "ping" and the "Internet Control Message Protocol" (or "ICMP") that can be used, for example, to perform a "basic connectivity test between two systems running TCP/IP" (see, for example, Ex. 1007 at p. 96).

125. Stevens also discloses that "dynamic routing is normally used" in networks with "redundant routes" (see, for example, Ex. 1007 at p. 127). Stevens describes a particular dynamic routing protocol "Open Shortest Path First" (or "OSPF") as an example of a "link state protocol" that is advantageous when "something changes, such as a router going down or a link going down" (see, for example, Ex. 1007 at p. 138). More specifically, Stevens notes that when several "routes to a destination exist, OSPF distributes traffic equally among the routes" and that "This is called *load balancing*" (emphasis in original, see, for example, Ex. 1007 at p. 138).

126. Note that Stevens is explicitly referenced within the specification of the Karol patent to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 10:1-8) and thus a person of ordinary skill in the art at the time of the invention would be specifically motivated to apply the disclosures of the Stevens reference in combination with the disclosures of the Karol patent.

Stallings Reference (Ex. 1011)

127. For example, amongst the numerous prior art references in this field, the book Data and Computer Communications by William Stallings, Prentice-Hall, 5th Edition, 1997, ISBN-81-203-1240-6, ("Stallings") was a printed publication available in the USA more than 1 year before the earliest priority date of the '235 Patent (see, for example, Ex. 1011 at inside cover page). Thus, I understand that Stevens qualifies as prior art to the '235 Patent at least under § 102(b).

128. According to Stallings, this "book attempts to provide a unified overview of the broad field of data and computer communications" (see, for example, Ex. 1011 at p. vii). Amongst the topics covered in Stallings are "ATM", "Frame Relay", "Packet Switching (Routing)", "Internetworking", and "Network Security" (see, for example, Ex. 1011 at pp. 24-26). At least because Stallings is directed to an analogous field of art (data and computer communication) and directed to solving analogous problems (routing to redundant networks), Stallings is analogous art to the '235 Patent (see also, ¶¶ 42 and 46 above).

129. More specifically, Stallings describes "frame relay" as "designed for ISDN" but also used "in a variety of public and private networks that do not follow the ISDN standards" (see, for example, Ex. 1011 at p. 302). In particular, Stallings discloses that the "frame relay connection" that is "analogous to a packet-switching virtual circuit" to support "multiple connections over a single link" wherein each "connection" has "a unique data link connection identifier (DLCI)" (see, for

example, Ex. 1011 at p. 310). Stallings further discloses that in Frame Relay "routing is controlled by entries in a connection table based on DLCI" (see, for example, Ex. 1011 at p. 315).

130. Stallings discloses that a router "routes packets between potentially different networks" including "connection-oriented (e.g. virtual circuit)" and "connectionless (datagram)" service (see, for example, Ex. 1011 at pp. 528-531). Additionally, Stallings informs that "Routing is generally accomplished by maintaining a routing table" that "gives, for each possible destination network, the next router to which the internet datagram should be sent" (see, for example, Ex. 1011 at p. 539). Stallings notes that though the "routing table may be static or dynamic", a "dynamic table is more flexible in responding to both error and congestion conditions" (see, for example, Ex. 1011 at p. 539). Stallings provides the example that "when a router goes down, all of its neighbors will send out a status report, allowing other routers and stations to update their routing tables" (see, for example, Ex. 1011 at p. 539). Stallings also notes that a similar routing table updating scheme "can be used to control congestion" and that "this is a particularly important function because of the mismatch in capacity between local and wide-area networks" (see, for example, Ex. 1011 at p. 539).

131. Stallings further discloses that "Routing tables may also be used to support other internetworking services such as those governing security" (see, for

example, Ex. 1011 at p. 539). Stallings provides an example where "individual networks might be classified to handle data up to a given security classification" and thus the "routing mechanism must assure that data of a given security level are not allowed to pass through networks not cleared to handle such data" (see, for example, Ex. 1011 at p. 539).

132. Stallings also describes "source routing" whereby the "source station specifies the route by including a sequential list of routers in the datagram" (see, for example, Ex. 1011 at p. 539).

133. Stallings also describes "IP Protocol" in considerable detail including discussions on the "IP Header", "IP Addresses" and "Routing Protocols" (see, for example, Ex. 1011 at pp. 543-549). In particular, Stallings discloses that every IP datagram (or packet) comprises at least a 32 bit source address and a 32 bit destination address wherein each address comprises at least a network identifier and a host (or end system) identifier (see, for example, Ex. 1011 at pp. 535, 544-545). Stallings further discloses that IP routers maintain "routing tables" that can route packets to one of multiple network interfaces based upon the network identifier (or "network portion of the IP address" that corresponds to the range of end-system addresses associated with a particular route) to which the destination address in a given packet is compared (see, for example, Ex. 1011 at pp. 535-536, 539, and 549). Per Stallings, each "constituent network" as identified by its

"network identifier" is a "subnetwork" that comprises all of the range of host (or end system) identifiers within the subset range of possible destination or source addresses (see, for example, Ex. 1011 at p. 528).

134. Stallings also describes the "Internet Control Message Protocol" (or "ICMP") that "provides feedback about problems in the communication environment" and can be used, for example, to determine if a "datagram cannot reach its destination" or to update a router that it can "send traffic on a shorter route" (see, for example, Ex. 1011 at pp. 546-549).

135. Stallings further describes that a router "must avoid portions of the network that have failed and should avoid portions of the network that are congested" and that "In order to make such dynamic routing decisions, routers exchange routing information using a special routing protocol" (see, for example, Ex. 1011 at p. 549). In particular, Stallings discloses that such "routing information" includes "Information about the topology" and the "delay characteristics of various routes" (see, for example, Ex. 1011 at p. 549). Exemplary "routing protocols" disclosed in Stallings include "Border Gateway Protocol" (or "BGP") and "Open Shortest Path First (OSPF) Protocol" (see, for example, Ex. 1011 at pp. 550 and 556).

136. Stallings notes that for BGP, "Each router maintains a database of the subnetworks that it can reach and the preferred route for reaching that subnetwork"

and that “Whenever a change is made to this database, the router issues an Update message that is broadcast to all other routers” (see, for example, Ex. 1011 at p. 552). Furthermore, Stallings concludes that these “Update” messages enable “all of the BGP routers” to “build up and maintain routing information” (see, for example, Ex. 1011 at p. 552).

137. Stallings describes OSPF in terms of a “link state routing algorithm” wherein “Each router maintains descriptions of the state of its local links to subnetworks, and from time to time transmits updated state information to all of the routers of which it is aware” such that OSPF computes routes based on a “user-configurable” function of “delay, data rate, dollar cost, or other factors” and thus “is able to equalize loads over multiple equal-cost paths” (see, for example, Ex. 1011 at p. 557).

138. Stallings also teaches the use of “Encapsulating Security Payload” or (“ESP”) and in particular “Tunnel-mode ESP is used to encrypt an entire IP packet” (see, for example, Ex. 1011 at p. 660). Stallings illustrates an exemplary corporate WAN whereby a “virtual private network via tunnel mode” is used over the Internet via a “security gateway” to each “internal network” for each corporate site location (see, for example, Ex. 1011 at pp. 661-662 and FIGURE 18.23).

139. Note that Stallings is explicitly referenced within the specification of the Karol patent to describe attributes of the CL-CO gateway (see, for example,

Ex. 1006 at 12:59-64) and thus a person of ordinary skill in the art at the time of the invention would be specifically motivated to apply the disclosures of the Stallings reference in combination with the disclosures of the Karol patent.

Hodgkinson (Ex. 1015)

140. For example, amongst the numerous prior art references in this field, U.S. Patent No. 6,317,431 by Terence G Hodgkinson and Alan W O'Neill entitled "ATM Partial Cut-Through" ("Hodgkinson") was filed on Jun. 20, 1997, which is more than 1 year before the earliest priority date of the '235 Patent (see, for example, Ex. 1015 at (22)). Thus, I understand that Hodgkinson qualifies as prior art to the '235 Patent at least under § 102(e).

141. As Hodgkinson discloses in its "Background of the Invention" section, the Hodgkinson patent is directed towards "transmission of data over networks" (see, for example, Ex. 1015 at 1:4-5). The Hodgkinson patent distinguishes between "connectionless" and "connection-oriented" networks (see, for example, Ex. 1015 at 1:6-20). More specifically with respect to the common knowledge of a person of ordinary skill in the art at that time, Hodgkinson describes that "Telecommunication networks such as telephony, *FR (Frame Relay)* and x25 are what is know as "*connection-oriented*"", in contrast to "connectionless" networks of which "the *most significant connectionless network is the Internet*" (emphasis added, see, for example, Ex. 1015 at 1:9-10 and 1:18-20). At least because Hodgkinson is directed to an analogous field of art (data

networking), Hodgkinson is analogous art to the ‘235 Patent (see also, ¶¶ 42 and 46 above).

142. At least because Hodgkinson explicitly discloses such default routing to the Internet behavior as prior art to Hodgkinson’s filing in 1997, then Hodgkinson’s description of frame relay as an example of connection-oriented networking represents the common knowledge of a person of ordinary skill in the art at the time of the alleged invention of the ‘235 Patent.

143. Note that the Hodgkinson patent was cited by the examiner of the Karol patent (see, for example, Ex. 1006 at (56)) and thus a person of ordinary skill in the art at the time of the invention would be specifically motivated to apply the disclosures of the Hodgkinson patent in combination with the disclosures of the Karol patent.

Monachello (Ex. 1009)

144. For example, amongst the numerous prior art references in this field, U.S. Patent No. 6,748,439 by David R. Monachello et al. entitled “System and Method for Selecting Internet Service Providers from a Workstation that is Connected to a Local Area Network” (“Monachello”) was filed on Aug. 6, 1999, which is more than 1 year before the earliest priority date of the ‘235 Patent (see, for example, Ex. 1009 at (22)). Thus, I understand that Monachello qualifies as prior art to the ‘235 Patent at least under § 102(e).

145. As Monachello discloses in its "Field of the Invention" section, the Monachello patent is directed towards "establishing a connection to a network service provider, and specifically to dynamically selecting a service" (see, for example, Ex. 1009 at 1:10-12). At least because Monachello is directed to an analogous field of art (connections to networks) and directed to solving analogous problems (routing to multiple network paths), Monachello is analogous art to the '235 Patent (see also, ¶¶ 42 and 46 above).

146. Monachello provides an overview of previously-known attributes for routers in its "Discussion of Related Art" section, which states "routers often use a router table which provides specific instructions as to what path to take to arrive at certain locations" such that "router tables often specify a default route that is used when another route is not specified" (see, for example, Ex. 1009 at 1:14-19). More specifically with respect to the common knowledge of a person of ordinary skill in the art at that time, Monachello informs that "when a message being transferred has an Internet Protocol (IP) address, the router takes the destination address from the header of the IP address and attempts to match the address to one stored in the router table" and thus "If a match exists, then the entry in the table having the matching address specifies the path to take for that message" but "If a match doesn't exist, then the default route is taken" wherein "The default route is usually

the one taken when accessing an internet service provider or the internet at large" (see, for example, Ex. 1009 at 1:19-27).

147. At least because Monachello explicitly discloses such default routing to the Internet behavior as prior art to Monachello's filing in 1999, then Monachello's description of router functionality to default route to the Internet when no matching destination address is found for a given packet fairly represents the common knowledge of a person of ordinary skill in the art at the time of the alleged invention of the '235 Patent.

VIII. ANTICIPATION AND/OR OBVIOUSNESS OF CLAIMS 4-5, 7-15 AND 19 OF THE '235 PATENT UNDER 35 U.S.C. §§ 102-103

148. In my opinion, Karol anticipates at least Claims 4-5, 7-11, 14 and 19 of the '235 Patent for at least the reasons described herein.

149. In my opinion, Karol in view of Stallings renders obvious at least Claims 12, 13 and 15 of the '235 Patent for at least the reasons described herein.

150. In my opinion, Karol in view of one or more of the knowledge of the person of ordinary skill in the art or of Stallings renders obvious at least Claims 4-5, 7-15 and 19 of the '235 Patent for at least the reasons described herein.

151. A general overview of Karol is given at ¶¶ 84-112 above.

152. In my opinion, Karol fully enabled a person of ordinary skill in the art to practice the subject matter as described above and as applied to relevant elements of Claims 4-5, 7-15 and 19 of the '235 Patent without undue experimentation at least to the extent that the '235 Patent is considered to provide an enabling written description of the same elements of such claims and at least based on the standard that Patent Owner sets regarding alleged infringement contentions for Petitioner's products with respect to the same elements of such claims. In addition, to the extent that Karol is used as an obviousness reference to Claims 4-5, 7-15 and 19 of the '235 Patent in my analyses herein, Karol is also analogous art to the '235 Patent (see ¶ 85 above). Similarly, to the extent that

Stallings is used as an obviousness reference to Claims 4-5, 7-15 and 19 of the '235 Patent in my analyses herein, Stallings is also analogous art to the '235 Patent (see ¶ 128 above).

153. My specific analysis of Karol, as well as Stallings, with respect to every claim element of Claims 4-5, 7-15 and 19 of the '235 Patent is given herein.

'235 Patent: Claim 4

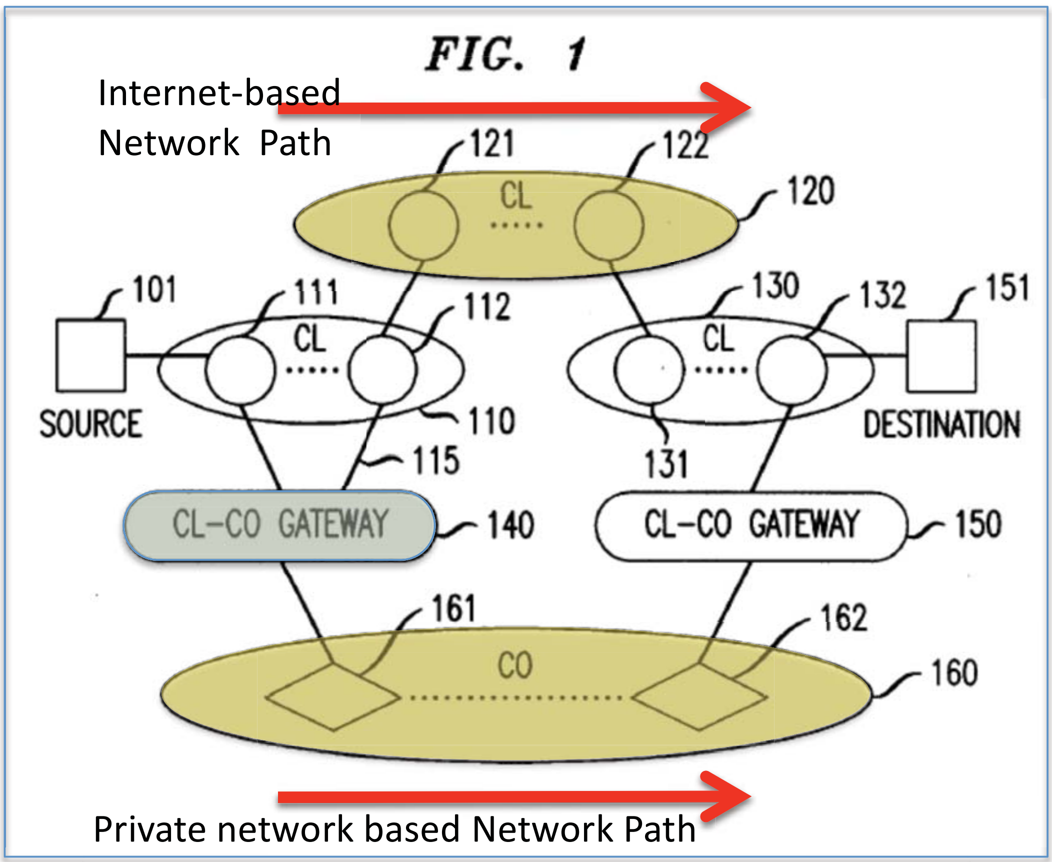
> 4. A controller which controls access to multiple networks in a parallel network configuration, suitable networks comprising Internet-based networks and private networks from at least one more provider, in combination, the controller comprising:
>
> a site interface connecting the controller to a site;
>
> at least two network interfaces which send packets toward the networks;
>
> and a packet path selector which selects between network interfaces on a per-packet basis according to at least: a destination of the packet, an optional presence of alternate paths to that destination, and at least one specified criterion for selecting between alternate paths when such alternate paths are present;
>
> wherein the controller receives a packet through the site interface and sends the packet through the network interface that was selected by the packet path selector.

4(a). A controller which controls access to multiple networks in a parallel network configuration, suitable networks comprising Internet-based networks and private networks from at least one more provider, in combination, the controller comprising:

154. In my opinion, this preamble is a claim limitation.

155. Karol discloses systems and methods of operation thereof whereby a "CL-CO gateway", alone or in combination with one or more routers and/or switches, controls access to either a "connectionless" (or "CL") network data path or to a "connection oriented" (or "CO) network data path (see, for example, Ex.

1006 at 1:7-16). Karol specifically describes the CL network as being based upon the "Internet Protocol or "IP"" and the CO network as being based upon "ATM, MPLS, RSVP" or a "telephony network" (see, for example, Ex. 1006 at 1:7-16, 2:52-58). This is further illustrated in and described with respect to FIG. 1 of Karol (see, for example, ¶¶ 85-93 above, Ex. 1006 at 2:65-67, 4:36-67, and FIG. 1 as annotated herein).

156. 

157. In view of Karol's detailed description, either of the CL-CO gateway or the combination of the CL-CO gateway with one or more routers and/or switches discloses a "controller" that controls the network path that an IP datagram

(or "packet") from the "source" at a first site or location would take to a "destination" at second site or location. Karol describes the available network paths as "two different, parallel routes" with one route being based upon the connectionless Internet protocol and the other based upon a connection oriented protocol such as "MPLS" (see, for example, ¶¶ 85-93 above). Karol also specifically discloses for the CL and CO networks that the "*parallel configuration* could occur, for example, if *two service providers*, one with an IP-router-based network and the other with a CO-switch-based network, offer enterprises "long-distance" connectivity of their geographically distributed networks" (emphasis added, see, for example, Ex. 1006 at 3:47-51).

158. Thus, Karol discloses a "controller" (for example, either of the CL-CO gateway or the combination of the CL-CO gateway with one or more routers and/or switches shown in annotated FIG. 1 herein), that such controller "controls access to multiple networks in a parallel network configuration in combination" (for example, either of the CL-CO gateway or the combination of the CL-CO gateway with one or more routers and/or switches shown in annotated FIG. 1 herein is disclosed to route any given IP datagram or packet from source to destination over one of the CL network path based on, for example, the Internet protocol or the CO path based on, for example, the ATM or MPLS protocol) and that such multiple networks are chosen from "suitable networks comprising

Internet-based networks and private networks from at least one more provider" (for example, the CL path is based on Internet protocol service from a first service provider and the CO path is based on ATM or MPLS protocol service from a second service provider).

159. Note that Patent Owner specifically alleges that a combination of a packet routing appliance with other routers and/or switches connected to a first network using an Internet protocol and a second network using an MPLS protocol meets the limitations of this claim element under Patent Owner's proposed claim constructions (see, for example, Ex. 1010 at Appendix I at p. 1, as reproduced herein). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

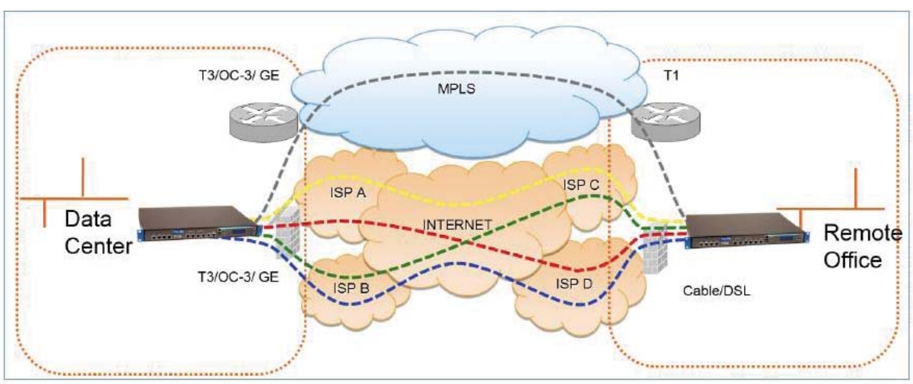


Figure 2: Customer Network with Talari APN

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160.

161. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶¶ 72, 73 and 79 above).

162. To the extent that in the alternative, the broadest reasonable interpretation for meeting this claim element were considered to require that the term “private network” should mean “a frame relay or point-to-point network”, for example, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such an interpretation at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results as evident by at least the following reasons.

163. First, Karol discloses that the CO network can be represented as a “non-broadcast network” that includes “point-to-point links” and that the CO network can be a “telephony network” (see, for example, Ex. 1006 at 2:52-58, 13:55-67).

164. Second, the ‘235 Patent disclose in reference to “private networks” that are “disparate” from networks based upon Internet protocol that such networks may be “a point-to-point network, such as a T1 or T3 connection” (see, for example, Ex. 1001 at 1:59-60).

165. Third, a person of ordinary skill in the art at the time of the invention would understand that Karol's disclosure that the CO network can be a "telephony network" teaches that the CO network is a "private network" under the alternate interpretation at least because the '235 Patent admits that "a point-to-point network" can be a "T1 or T3 connection", both of which are well known to a person of ordinary skill in the art at the time of the invention to be examples of Karol's "point-to-point links" within a "telephony network".

166. Fourth, a person of ordinary skill in the art at the time of the invention would consider a "frame relay" network to be a well known example of a connection oriented or CO network as described in Karol and moreover such description is explicitly provided within the intrinsic record of Karol (see, for example, ¶¶ 129 and 141 above). At least because only a finite number of CO networks appropriate to the disclosures in Karol of a "controller" that controls access to an Internet-based network in parallel with a CO network from a second provider were known at the time of the invention, such as MPLS, ATM or frame relay CO networks, a person of ordinary skill in the art at the time of the invention would have found substituting for an MPLS or ATM exemplary CO network as explicitly disclosed in Karol with a known frame relay exemplary CO network to be obvious to try in the context of Karol and this claim element. Furthermore, at least because the characteristics of such MPLS, ATM, or frame relay exemplary

CO networks would have been readily understood by a person of ordinary skill in the art at the time of the invention, such a substition to a frame relay CO network would be highly likely to produce a successful and predictable result.

167. Fifth, the '235 Patent explicitly admits a person of ordinary skill in the art at the time of the invention would have known about routing packets across multiple parallel networks wherein a first network is Internet-based and a second network that is frame relay based (see, for example, ¶¶ 113-114 above). At least because only a finite number of CO networks appropriate to the disclosures in Karol of a "controller" that controls access to an Internet-based network in parallel with a CO network from a second provider were known at the time of the invention, such as MPLS, ATM or frame relay CO networks, a person of ordinary skill in the art at the time of the invention would have found substituting for an MPLS or ATM exemplary CO network as explicitly disclosed in Karol with a known frame relay exemplary CO network to be obvious to try in the context of Karol and this claim element. Furthermore, at least because the characteristics of such MPLS, ATM, or frame relay exemplary CO networks would have been readily understood by a person of ordinary skill in the art at the time of the invention, such a substition to a frame relay CO network would be highly likely to produce a successful and predictable result.

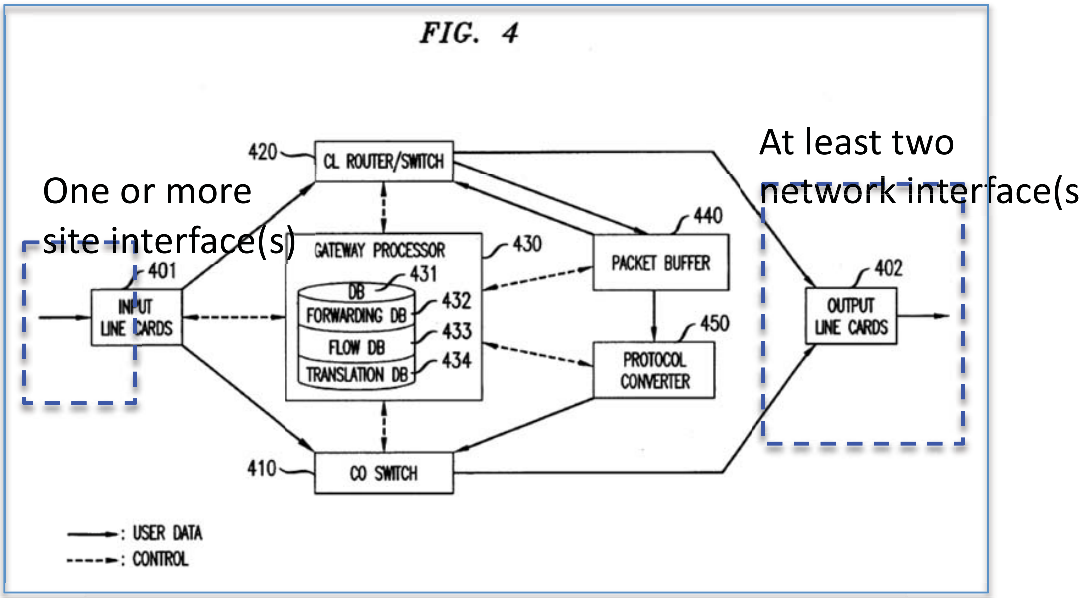
168. At least because Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the narrower alternative interpretation described above (see ¶ 162 above), then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element (see ¶¶ 72, 73 and 79 above).

169. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element either under the broadest reasonable interpretation of this claim element (see ¶¶ 72, 73 and 79 above) or under the alternative interpretation described above (see ¶ 162 above).

4(b): a site interface connecting the controller to a site;

170. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, comprises at least one "interface" that connects the "controller" of Karol (see, for example, ¶¶ 155-158 above) with "a source endpoint" or "a destination endpoint" at an "enterprise" location (see, for example, Ex. 1006 at 3:44-51, 4:36-44, 4:65-67, and FIG. 1 as annotated herein in ¶ 156 above). More specifically, Karol discloses an exemplary depiction of structural elements within the CL-CO gateway wherein one or more "input line cards **401**" are utilized to connect the CL-CO gateway to local network routers/switches and source/destination endpoints via

a network connection as further illustrated in and described with respect to FIG. 4 of Karol (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein).

171. 

172. Alternatively, the combination of the CL-CO gateway and with one or more routers and/or switches shown in annotated FIG. 1 herein also depicts an “interface” to an exemplary “source endpoint **101**” that is “directly connected to and served by” a local router (“node **111**” in “CL network **110**”) at an “enterprise” location in the form of a network connection (see, for example, Ex. 1006 at 3:44-51, 4:36-44, 4:65-67, and FIG. 1 as annotated herein in ¶ 156 above).

173. Thus, Karol discloses a “controller” (for example, the CL-CO gateway) that is connected to a “site” (for example, local network routers/switches and/or source/destination endpoints) via a “site interface” (for example, one or

more of the input line cards and/or a network connection). Alternatively, Karol also discloses a "controller" (for example, the CL-CO gateway in combination with one or more routers and/or switches) that is connected to a "site" (for example, source/destination endpoints) via a "site interface" (for example, a network connection).

174. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

175. At least because Karol discloses the limitations of this claim element, then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element.

4(c): at least two network interfaces which send packets toward the networks;

176. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, comprises at least two "network interfaces" that connect the "controller" of Karol (see, for example, ¶¶ 155-158 above) to both of the CL network and the CO network (see, for example, Ex. 1006 at 3:58-66, 4:45-65, and FIG. 1 as annotated herein in ¶ 156 above). More specifically, Karol discloses an exemplary depiction of structural elements within the CL-CO gateway wherein at least two "output line cards **402**" are utilized to "receive datagrams from either of" the "CO

switch **410** or CL router/switch **420**" and then "direct them to external networks" as further illustrated in and described with respect to FIG. 4 of Karol (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein in ¶ 171 above). Note that while FIG. 4 of Karol illustrates only one symbol "**402**" for the "output line cards", this clearly discloses at least two such "output line cards" that send packets over network interfaces to the two respective CL and CO networks as evident at least by the two paths depicted into symbol "**402**" in FIG. 4, the written description of FIG. 4 within Karol, the use of the plural "output line *cards*" instead of the singular "output line *card*" within symbol "**402**" in FIG. 4, and the two network interfaces depicted from the CL-CO gateway to nodes "**112**" and "**161**" in FIG. 1 (see, for example, Ex. 1006 at 4:36-67, FIG. 1, and FIG. 4).

177. Alternatively, the combination of the CL-CO gateway and with one or more routers and/or switches shown in annotated FIG. 1 herein also depicts at least two "network interfaces" to both of the CL network and the CO network that are depicted as exemplary router "node **121**" and exemplary CO switching element "node **161**" (see, for example, Ex. 1006 at 3:58-66, 4:45-65, and FIG. 1 as annotated herein in ¶ 156 above).

178. Thus, Karol discloses a "controller" (for example, the CL-CO gateway) that has at least two "network interfaces" (for example, the output line cards respectively coupling the CL router to the CL network and the CO switch to

the CO network), which "send packets toward" the "networks" (for example, the CL and CO networks). Alternatively, Karol also discloses a "controller" (for example, the CL-CO gateway in combination with one or more routers and/or switches) that has at least two "network interfaces" (for example, the network connections to respective CL and CO networks), which "send packets toward" the "networks" (for example, the CL and CO networks).

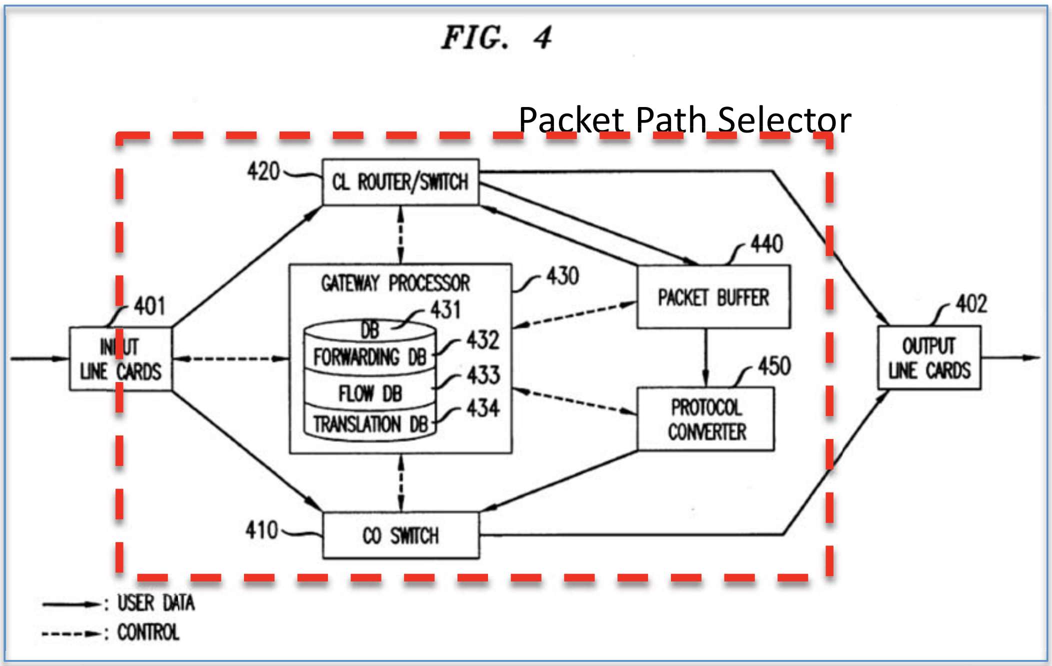
179. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

180. At least because Karol discloses the limitations of this claim element, then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element.

4(d): and a packet path selector which selects between network interfaces on a per-packet basis according to at least: a destination of the packet, an optional presence of alternate paths to that destination, and at least one specified criterion for selecting between alternate paths when such alternate paths are present;

181. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, comprises at least a "gateway processor", a "CL router/switch", a "CO switch", a "packet buffer", a "protocol converter" and one or more "input line cards" that together are used to determine if a particular packet (or "datagram")

from a "source endpoint" should be forwarded to either of the "CL network" or the "CO network" based on multiple criteria including whether or not a valid connection through the CO network is presently available for the particular packet as further illustrated in and described with respect to FIG. 4 of Karol (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:31-50 and FIG. 4 as annotated herein).

182. 

183. As Karol discloses explicitly, "datagrams received in input line cards **401** can be directed either to CO switch **410** or CL router/switch **420**" so that "output line cards **402** can receive datagrams from either of the last mentioned elements and direct them to external networks" (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein in ¶ 182 above). One exemplary methodology for routing particular packets or datagrams within Karol is

the use of the "forwarding database **432**" within the gateway processor to determine if a particular packet matches a combination of "Destination IP address; Next hop router; Outgoing port (interface)" that would cause such a packet to be routed to the CL network or to be considered for routing over the CO network (see, for example, Ex. 1006 at 7:36-41).

184. For those particular packets that are candidates for the CO network, Karol also discloses that each such packet is compared at the gateway processor with the "flow database **433**" to determine if a particular packet matches a desired combination of "(a) an outgoing port field, which indicates the port on which a datagram whose entries match a particular record's entries is forwarded; (b) if the outgoing port is "invalid," the next field "forward or hold" entry indicates whether packet should be forwarded or held in packet buffer **440**; (c) destination address; (d) source address; (e) source port; (f) destination port; (g) type of service; (h) protocol field; (i) TCP Flags; (j) outgoing port; (k) forward or hold flag, and (l) a mask which indicates which of the data entries is applicable to the particular record" in order to route such a packet to the CO network instead of the CL network depending on availability of a valid connection in the CO network for a flow associated with the particular packet (see, for example, Ex. 1006 at 7:42-54).

185. Thus, Karol summarizes the use of the gateway processor by noting that "the processes performed in CL-CO gateways that enable the internetworking

of connectionless IP networks and CO networks" accomplish two primary functions that are i) handling "IP packets that arrive at CL-CO gateways to be carried on (not-yet-established) connections in the CO network, plus IP packets that arrive at CL-CO gateways but then remain in the CL network", and ii) creating "routing tables that enable data flow from the CL network to the CO network" (see, for example, Ex. 1006 at 7:60-8:2).

186. Karol further describes that such routing selections between the CL and CO networks be based at least upon "bandwidth availability" that can be "dynamically allocated to flows on an as-needed basis" and thus be "diverting connections away from congested links" (see, for example, Ex. 1006 at 17:18-26 and 17:63-18:2).

187. Thus, Karol discloses a "packet path selector" (for example, the structural elements depicted in annotated FIG. 4 herein in ¶ 182 above) that "selects between network interfaces on a per-packet basis" (for example, the depicted packet path selector of FIG. 4 compares information in each packet received at the CL-CO gateway to determine if the packet will be routed to the CL network interface output line card or to the CO network interface output line card) according to at least "a destination of the packet" (for example, gateway processor in the CL-CO gateway compares the destination address of each received packet to fields in both the forwarding and flow databases), "an optional presence of

alternate paths to that destination" (for example, the gateway processor will only forward a particular packet to the CO network when a valid connection exists for the flow associated with the particular packet), and "at least one specified criterion for selecting between alternate paths when such alternate paths are present" (for example, based upon the needs of a particular flow or to avoid congested links).

188. Note that Patent Owner specifically alleges in the District Court litigation that this claim 4 of the '235 Patent should be given a priority date of Dec. 29, 2000, or thus be disclosed entirely within US Provisional Patent Application No. 60/259,269 (see ¶¶ 47-48 above). However, my examination of US Provisional Patent Application No. 60/259,269 finds no explicit mention, discussion or depiction either of a "packet path selector" structural element or of routing to one of an "Internet-based network" or a "private network from at least one more provider" on a "per-packet" basis. Thus, to the extent that Patent Owner's alleged infringement priority date basis for this claim has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

189. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶¶ 75 and 77 above).

190. To the extent that in the alternative, the broadest reasonable interpretation for meeting this claim element were considered to require that the term “per-packet basis” should mean “for each packet, selects between network interfaces regardless of the session with which the packet is associated”, for example, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such an interpretation at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results as evident by at least the following reasons.

191. First, the ‘235 Patent explicitly admits that a person of ordinary skill in the art at the time of the invention would have known about routing packets across multiple parallel networks wherein a first network is Internet-based and a second network that is frame relay (or private network) based (see, for example, ¶¶ 113-114 above).

192. Second, the ‘235 Patent explicitly admits that a person of ordinary skill in the art at the time of the invention would have known that for the situation described above that prior art discloses routing decisions that are based entirely upon the origin (for example, source address) of the packet independent of the

particular flows or sessions that particular packets from such an origin are associated with (see, for example, Ex. 1001 at 4:15-23).

193. Third, because Karol discloses that a routing selection to the CL or CO network can be made at a CL-CO gateway using a gateway processor and a flow database that includes a "source address" or origin for each packet, a person of ordinary skill in the art at the time of the invention would have found substituting the packet by packet path selection process that considers multiple criteria including associated flows as explicitly disclosed in Karol with a much simpler and known packet path selection process that considers source address only to be obvious to try in the context of Karol and this claim element. Furthermore, at least because the characteristics of such a source address only packet path selection process would have been readily understood by a person of ordinary skill in the art at the time of the invention, such a substition would be highly likely to produce a successful and predictable result.

194. Fourth, selecting between network interfaces regardless of the session with which each packet is associated with was also common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stallings, a common reference textbook on data and computer communications, describes "source routing" whereby the "source station specifies the route by including a sequential list of routers in the datagram" (see, for example, Ex. 1011 at p. 539).

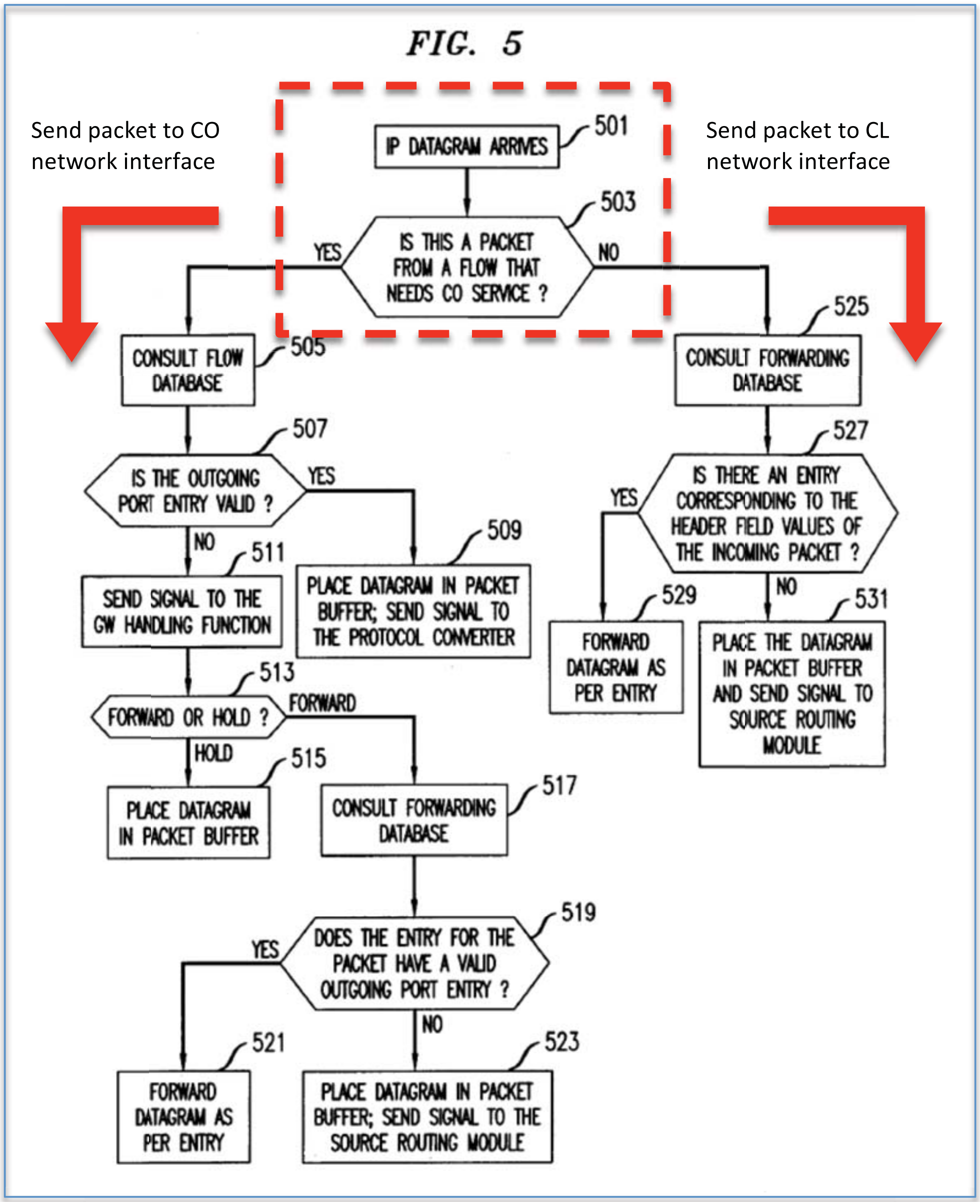
Thus, a person of ordinary skill in the art at the time of the invention would have found substituting the packet by packet path selection process that considers multiple criteria including associated flows as explicitly disclosed in Karol with a source routing process that considers only the source route chosen by the source endpoint to be obvious to try in the context of Karol and this claim element. Furthermore, at least because the characteristics of such a source routing only packet path selection process would have been readily understood by a person of ordinary skill in the art at the time of the invention, such a substition would be highly likely to produce a successful and predictable result.

195. At least because Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the narrower alternative interpretation described above (see ¶ 190 above), then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element (see ¶¶ 75 and 77 above).

196. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element either under the broadest reasonable interpretation of this claim element (see ¶¶ 75 and 77 above) or under the alternative interpretation described above (see ¶ 190 above).

4(e): wherein the controller receives a packet through the site interface and sends the packet through the network interface that was selected by the packet path selector.

197. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, receives datagrams (or "packets") and such "datagrams received in input line cards **401** can be directed either to CO switch **410** or CL router/switch **420**" so that "output line cards **402** can receive datagrams from either of the last mentioned elements and direct them to external networks" (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein in ¶ 182 above). An exemplary process for determining the network path selection and actual forwarding to the CL or CO network interface is described in detail at FIG. 5 of Karol (see, for example, ¶¶ 99-102 above, Ex. 1006 at 8:56-9:36 and FIG. 5 as annotated herein).



198.

199. Thus, Karol discloses a "packet path selector" (for example, the structural elements depicted in annotated FIG. 4 herein in ¶ 182 above) within a "controller" (for example, the CL-CO gateway) that "receives a packet" (for example, IP datagram from the source endpoint is routed to the CL-CO gateway) through the "site interface" (for example, one or more of the input line cards and/or

a network connection) and then "sends the packet through the network interface that was selected by the packet path selector" (for example, the depicted packet path selector of FIG. 4 compares information in each packet received at the CL-CO gateway and then routes each packet either to the CL network interface output line card or to the CO network interface output line card according to the process described in FIG. 5).

200. See also ¶ 188 above.

201. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

202. At least because Karol discloses the limitations of this claim element, then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element.

'235 Patent: Claim 5

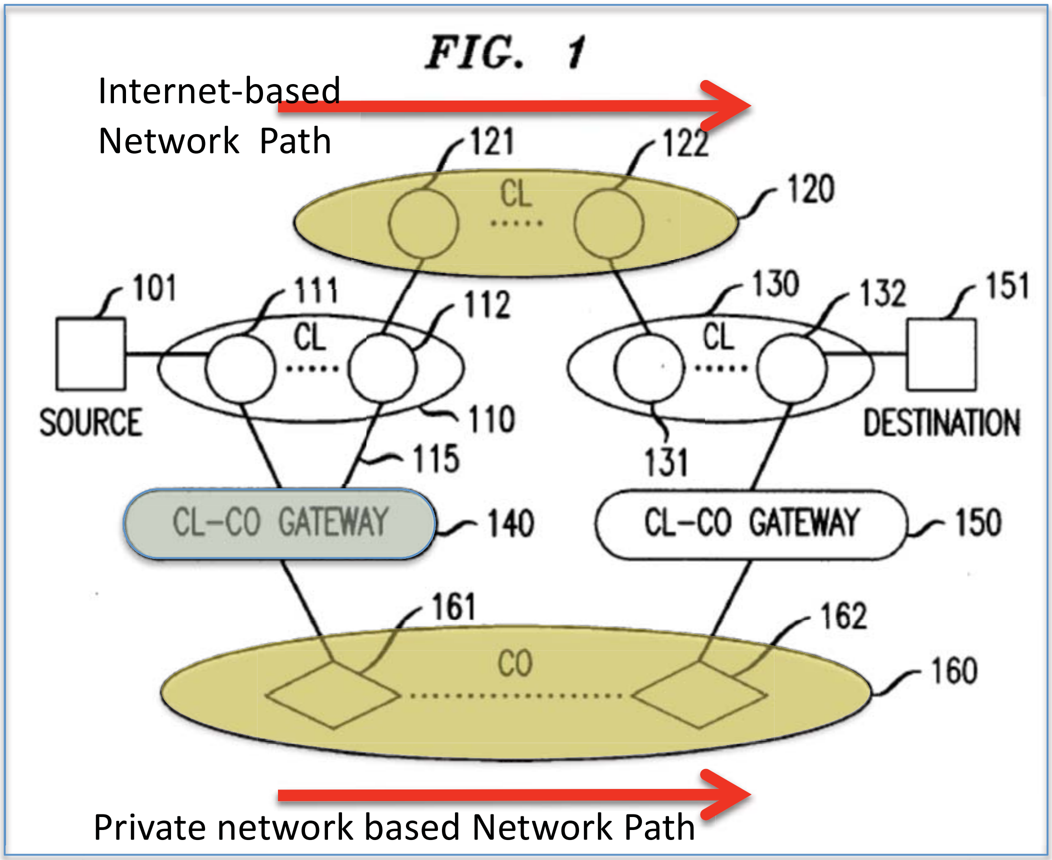
> 5. A method for combining connections for access to multiple parallel disparate networks, the method comprising the steps of:
>
> obtaining at least two known location address ranges which have associated networks;
>
> obtaining topology information which specifies associated networks that provide, when working, connectivity between a current location and at least one destination location;
>
> receiving at the current location a packet which identifies a particular destination location by specifying a destination address for the destination location;
>
> determining whether the destination address lies within a known location address range;

> selecting a network path from among paths to disparate associated networks, said networks being in parallel at the current location, each of said networks specified in the topology information as capable of providing connectivity between the current location and the destination location;
>
> forwarding the packet on the selected network path.

5(a). A method for combining connections for access to multiple parallel disparate networks, the method comprising the steps of:

203. In my opinion, this preamble is a claim limitation.

204. Karol discloses systems and methods of operation thereof whereby a “CL-CO gateway”, alone or in combination with one or more routers and/or switches, controls access to either a “connectionless” (or “CL”) network data path or to a “connection oriented” (or “CO) network data path (see, for example, Ex. 1006 at 1:7-16). Karol specifically describes the CL network as being based upon the “Internet Protocol or "IP"” and the CO network as being based upon “ATM, MPLS, RSVP” or a “telephony network” (see, for example, Ex. 1006 at 1:7-16, 2:52-58). This is further illustrated in and described with respect to FIG. 1 of Karol (see, for example, ¶¶ 85-93 above, Ex. 1006 at 2:65-67, 4:36-67, and FIG. 1 as annotated herein).

205. 

206. In view of Karol's detailed description, either of the CL-CO gateway or the combination of the CL-CO gateway with one or more routers and/or switches discloses a combination of connections for the access network path that an IP datagram (or "packet") from the "source" at a first site or location would take to a "destination" at second site or location. Karol describes the available network paths as "two *different, parallel* routes" with one route being based upon the connectionless Internet protocol and the other based upon a connection oriented protocol such as "MPLS" (emphasis added, see, for example, Ex. 1006 at 4:40-44, ¶¶ 85-93 above). Karol also specifically discloses for the CL and CO networks

that the "*parallel configuration* could occur, for example, if *two service providers*, one with an IP-router-based network and the other with a CO-switch-based network, offer enterprises "long-distance" connectivity of their geographically distributed networks" (emphasis added, see, for example, Ex. 1006 at 3:47-51).

207. Thus, Karol discloses a "method for combining connections" (for example, either of the CL-CO gateway or the combination of the CL-CO gateway with one or more routers and/or switches shown in annotated FIG. 1 herein when operated as described), that such method is "for access to multiple parallel disparate networks" (for example, either of the CL-CO gateway or the combination of the CL-CO gateway with one or more routers and/or switches shown in annotated FIG. 1 herein is disclosed to route any given IP datagram or packet from source to destination over one of the CL network path based on, for example, the Internet protocol or the CO path based on, for example, the ATM or MPLS protocol), and wherein such multiple networks are "disparate" and "parallel" per the broadest reasonable construction at least because they are "different in kind" and provide for "alternate data paths" (for example, the CL path and the CO path are described as "two *different, parallel* routes").

208. Note that Patent Owner specifically alleges that a combination of a packet routing appliance with other routers and/or switches connected to a first network using an Internet protocol and a second network using an MPLS protocol

meets the limitations of this claim element under Patent Owner's proposed claim constructions (see, for example, Ex. 1010 at Appendix I at p. 1, as reproduced herein). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

209.

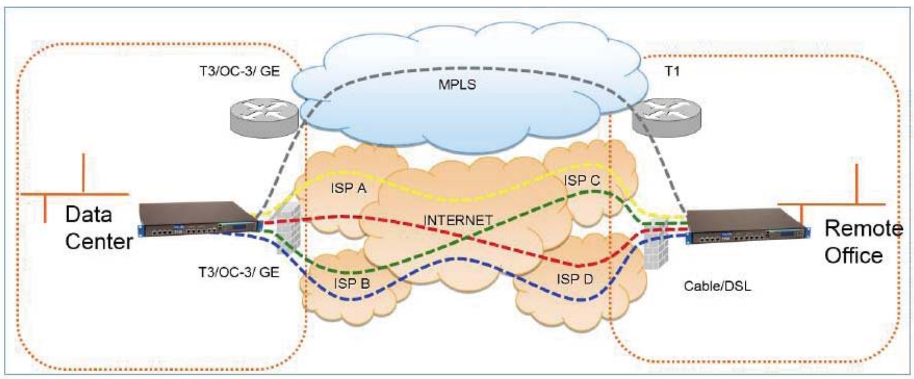


Figure 2: Customer Network with Talari APN

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210. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶¶ 74 and 79 above).

211. To the extent that in the alternative, the broadest reasonable interpretation for meeting this claim element were considered to require that the term "disparate networks" should mean that at least one of the "alternate data paths" be over "a frame relay or point-to-point network", for example, then in my opinion the knowledge and common sense of the person of ordinary skill in the art

at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such an interpretation at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results as evident by at least the following reasons.

212. First, Karol discloses that the CO network can be represented as a "non-broadcast network" that includes "point-to-point links" and that the CO network can be a "telephony network" (see, for example, Ex. 1006 at 2:52-58, 13:55-67).

213. Second, the '235 Patent discloses in reference to "private networks" that are "disparate" from networks based upon Internet protocol that such networks may be "a point-to-point network, such as a T1 or T3 connection" (see, for example, Ex. 1001 at 1:59-60).

214. Third, a person of ordinary skill in the art at the time of the invention would understand that Karol's disclosure that the CO network can be a "telephony network" teaches that the CO network is a "private network" under the alternate interpretation at least because the '235 Patent admits that "a point-to-point network" can be a "T1 or T3 connection", both of which are well known to a person of ordinary skill in the art at the time of the invention to be examples of Karol's "point-to-point links" within a "telephony network".

215. Fourth, a person of ordinary skill in the art at the time of the invention would consider a "frame relay" network to be a well known example of a connection oriented or CO network as described in Karol and moreover such description is explicitly provided within the intrinsic record of Karol (see, for example, ¶¶ 129 and 141 above). At least because only a finite number of CO networks appropriate to the disclosures in Karol of "combining connections for access" to an Internet-based network in parallel with a CO network from a second provider were known at the time of the invention, such as MPLS, ATM or frame relay CO networks, a person of ordinary skill in the art at the time of the invention would have found substituting for an MPLS or ATM exemplary CO network as explicitly disclosed in Karol with a known frame relay exemplary CO network to be obvious to try in the context of Karol and this claim element. Furthermore, at least because the characteristics of such MPLS, ATM, or frame relay exemplary CO networks would have been readily understood by a person of ordinary skill in the art at the time of the invention, such a substition to a frame relay CO network would be highly likely to produce a successful and predictable result.

216. Fifth, the '235 Patent explicitly admits a person of ordinary skill in the art at the time of the invention would have known about routing packets across multiple parallel disparate networks wherein a first network is Internet-based and a second network that is frame relay based (see, for example, ¶¶ 113-114 above). At

least because only a finite number of CO networks appropriate to the disclosures in Karol of "combining connections for access" to an Internet-based network in parallel with a CO network from a second provider were known at the time of the invention, such as MPLS, ATM or frame relay CO networks, a person of ordinary skill in the art at the time of the invention would have found substituting for an MPLS or ATM exemplary CO network as explicitly disclosed in Karol with a known frame relay exemplary CO network to be obvious to try in the context of Karol and this claim element. Furthermore, at least because the characteristics of such MPLS, ATM, or frame relay exemplary CO networks would have been readily understood by a person of ordinary skill in the art at the time of the invention, such a substition to a frame relay CO network would be highly likely to produce a successful and predictable result.

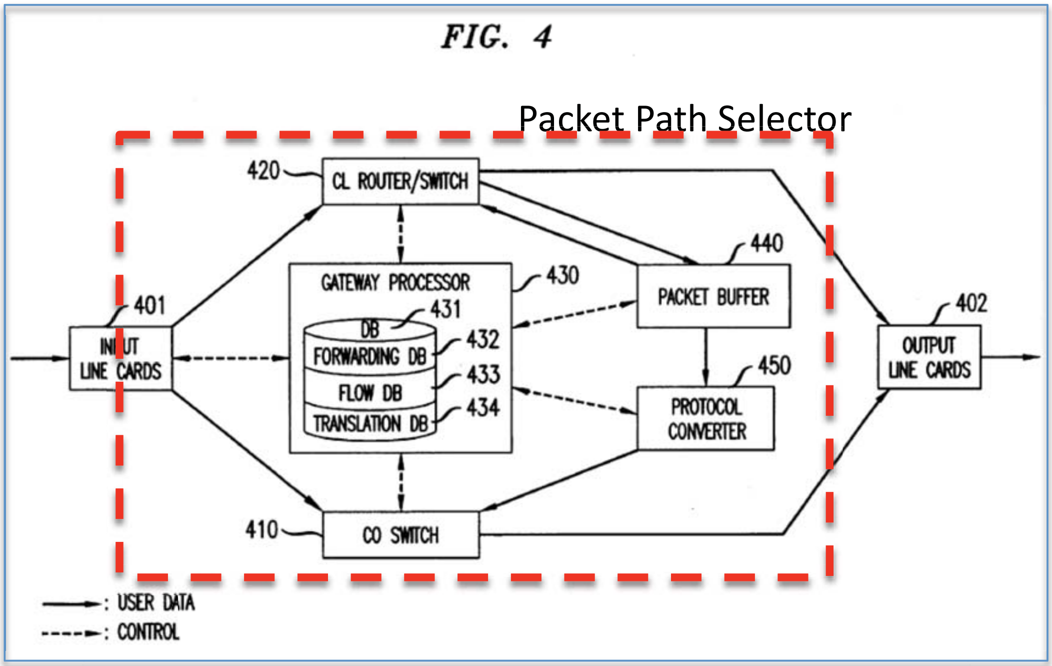
217. At least because Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the narrower alternative interpretation described above (see ¶ 211 above), then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element (see ¶¶ 74 and 79 above).

218. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim

element either under the broadest reasonable interpretation of this claim element (see ¶¶ 74 and 79 above) or under the alternative interpretation described above (see ¶ 211 above).

5(b): obtaining at least two known location address ranges which have associated networks;

219. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, obtains routing information associated with the CL (or "IP") and CO networks so that "integrated routing tables for both the IP and CO networks" can be "maintained at the CL-CO gateways" (see, for example, Ex. 1006 at 13:48-50). Karol discloses that such routing tables that are maintained at the CL-CO gateway are comprised of various "databases" associated with the "gateway processor" including the "datagram forwarding database **432**, a flow database **433**, and a header translation database **434**" (see, for example, Ex. 1006 at 7:31-35, FIG. 4 as annotated herein and ¶ 96 above).

220. 

221. Karol discloses with respect to the CL network that the "datagram forwarding database **432**" is "the database used in typical CL IP routers" that "stores the *next hop router address* and outgoing port number *corresponding to each destination address*" and thus the "fields in each record in this database would be: *Destination IP address*; *Next hop router*; Outgoing port (interface)" (emphasis added, see, for example, Ex. 1006 at 7:36-41 and ¶ 96 above).

222. Similarly, Karol discloses with respect to the CO network that "flow database **433**" is used to "determine how to handle packets from flows requiring a connection-oriented service" wherein "Typical fields in each record in this database include: (a) an *outgoing port field*, which indicates the port on which a datagram whose entries match a particular record's entries is forwarded; (b) if the

outgoing port is "invalid," the next field "forward or hold" entry indicates whether packet should be forwarded or held in packet buffer **440**; (c) *destination address*; (d) source address; (e) source port; (f) destination port; (g) type of service; (h) protocol field; (i) TCP Flags; (j) outgoing port; (k) forward or hold flag, and (l) a mask which indicates which of the data entries is applicable to the particular record" (emphasis added, see, for example, Ex. 1006 at 7:42-54 and ¶ 97 above).

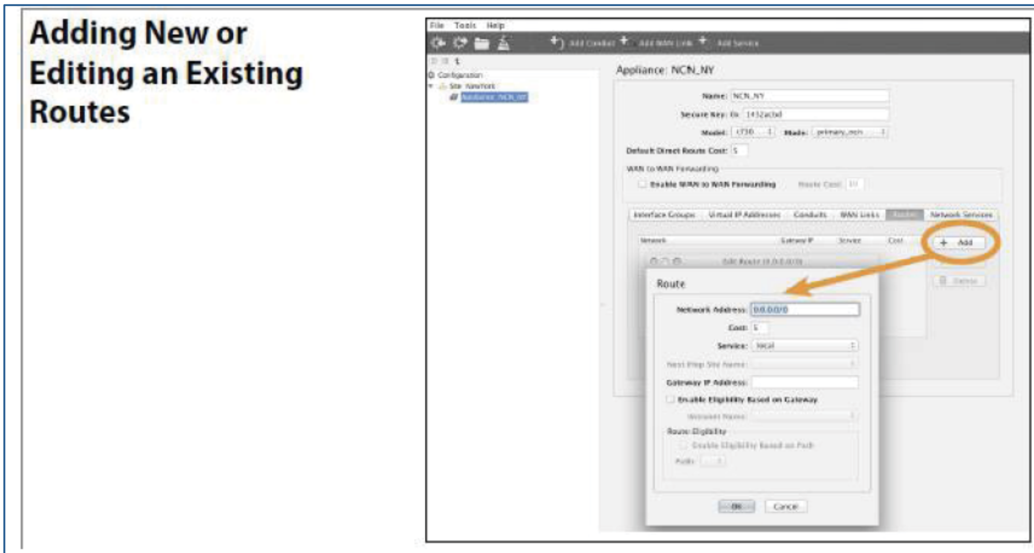
223. Karol also discloses methodologies for obtaining the routing table information, which include the location address ranges associated with the CL and CO network paths as shown above, such as having "the *network provider* can *set user-specific routing tables at the CL-CO gateways*" so that "the *user-specific routing* then *determines* which users' *flows* are *sent to the CO network*" versus those that are routed to the CL network (emphasis added, see, for example, Ex. 1006 at 16:3-9 and ¶¶ 106-110 above). Karol similarly discloses processes for obtaining "updates" to such routing tables (see, for example, Ex. 1006 at 13:6-16, FIG. 8, and ¶¶ 106-110 above).

224. Thus, Karol discloses "at least two known location address ranges" (for example, the addresses stored in the routing tables for routing packets to the CL network and the addresses stored in the routing tables for routing packets to the CO network) that "have associated networks" (for example, the CL and CO networks respectively), and Karol discloses the step of "obtaining" such "known

location address ranges" (for example, by user input to a network provider to set the addresses in the routing tables).

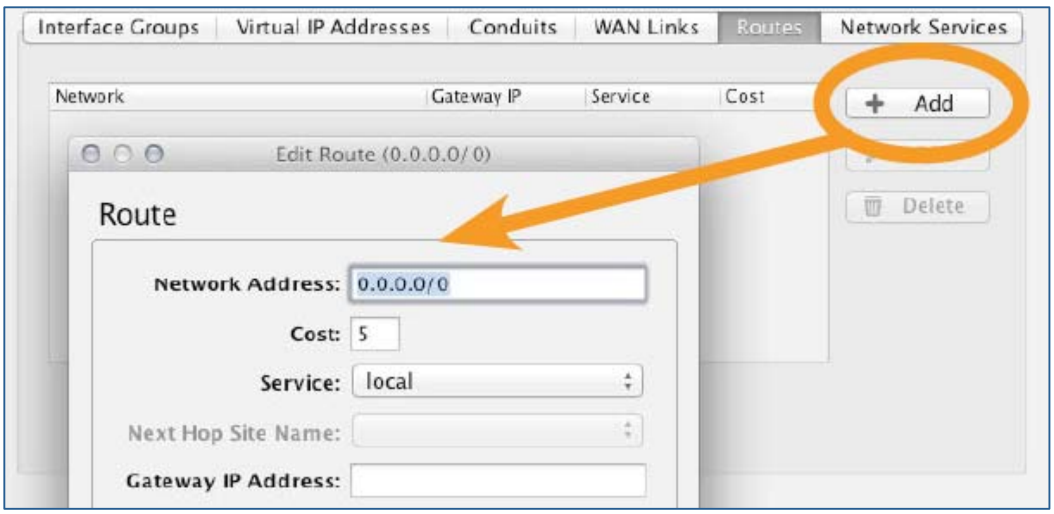
225. Note that Patent Owner specifically alleges that setting a network address for a particular route available to a packet routing appliance meets the limitations of this claim element under Patent Owner's proposed claim constructions (see, for example, Ex. 1010 at Appendix I at p. 10, as reproduced herein, and also a close up view of Patent Owner's alleged evidence that a user-set network address on a route meets this limitation from the source document "Adaptive Private Networking Configuration Editor User's Guide" at Bates # FATPIPE-001392). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

226.



Adaptive Private Networking Configuration Editor User's Guide at p. 20

227.



228. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

229. Although the forgoing description of the disclosures within Karol clearly shows meeting the limitations of this claim element, to the extent that

additional information regarding "known location address ranges" for "associated networks" (or regarding the process of "obtaining" such "address ranges") were deemed to be necessary to fully disclose this claim element, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such additional information at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results as evident by at least the following reasons.

230. First, the '235 Patent describes these "known location address ranges" as simply destination addresses that are associated with particular routing paths to particular destinations such that "a location reachable through two networks has two addresses" and thus when a packet "destination address is compared to the known location address ranges" in order to "see whether the destination location is a known location" (see, for example, Ex. 1001 at 13:52-53 and 14:24-30).

231. Second, the '235 Patent discloses that "Address ranges may be obtained" by "receiving input from a network administrator" (see, for example, Ex. 1001 at 13:55-57).

232. Third, associating a particular routing path to a destination address, although thoroughly described in Karol, was also common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stevens, a

common reference textbook on TCP/IP data networking protocols, describes the information in the routing tables of all IP routers as comprising: i) Destination IP address, ii) IP address of a next hop router, iii) Flags, and iv) Specification of the network interface (see, for example, Ex. 1007 at p. 38). Note that this is substantially the same information described in Karol for the "datagram forwarding database **432**" (see ¶ 96 above). Stevens further describes that the "destination IP address" can be "either a complete host address or a network address" and explains that a "network address" has a "host ID of 0" and thus "identifies all the hosts on that network (e.g., Ethernet, token ring)" (see, for example, Ex. 1007 at p. 38 or ¶ 123 above). Hence it was common knowledge to a person of ordinary skill in the art at the time of the invention that a "location address range" associated with a network path, or thus a "destination address" that includes all of the destination hosts reachable by a routing path to a location, is expressly implied by Karol's disclosure of "Destination IP address" in its description of the routing table within the "CL-CO gateway" that determines if a given packet routes over the connectionless Internet-based network or the connection-oriented MPLS or ATM network to reach a geographically remote enterprise location.

233. Fourth, Stallings, a common reference textbook on data and computer communications, describes that every IP datagram (or packet) comprises at least a

32 bit source address and a 32 bit destination address wherein each address comprises at least a network identifier and a host (or end system) identifier (see, for example, Ex. 1011 at pp. 535, 544-545). Stallings further discloses that IP routers maintain "routing tables" that can route packets to one of multiple network interfaces based upon the network identifier (or "network portion of the IP address" that corresponds to the range of end-system addresses associated with a particular route) to which the destination address in a given packet is compared (see, for example, Ex. 1011 at pp. 535-536, 539, and 549). Per Stallings, each "constituent network" as identified by its "network identifier" is a "subnetwork" that comprises all of the range of host (or end system) identifiers within the subset range of possible destination or source addresses (see, for example, Ex. 1011 at p. 528).

234. Fifth, obtaining such routing table information via "user-specific router tables" such as described for the CL-CO gateway in Karol was also common knowledge to a person of ordinary skill in the art at the time of the invention. For example, a person of ordinary skill in the art at the time of the invention would have known and Stevens discloses that "Routes to hosts or networks that are not directly connected must be entered into the routing table somehow" and further that "One common way" is from "initialization files when the system is bootstrapped" (see, for example, Ex. 1007 at p. 116). Similarly, Stallings discloses

that "Routing is generally accomplished by maintaining a routing table" that "gives, for each possible destination network, the next router to which the internet datagram should be sent" (see, for example, Ex. 1011 at p. 539). Stallings notes that though the "routing table may be static or dynamic", a "dynamic table is more flexible in responding to both error and congestion conditions" (see, for example, Ex. 1011 at p. 539). Stallings provides the example that "when a router goes down, all of its neighbors will send out a status report, allowing other routers and stations to update their routing tables" (see, for example, Ex. 1011 at p. 539). See also ¶¶ 134-137 above.

235. Sixth, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stevens and Stallings reference textbooks to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stevens and Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 10:1-8 and 12:59-64).

236. Seventh, for a person of ordinary skill in the art at the time of the invention it would have been obvious to try this common knowledge regarding the association of Destination IP address in Karol as a known address range for a route to a location at least because no other alternative was in common usage for IP protocol based networking such as described in Karol at the time of the alleged

invention of the '235 Patent. Thus, a person of ordinary skill in the art at the time of the invention would also be highly likely to produce a successful and predictable result.

237. Eighth, the Patent Owner admits in reference to an inherency argument for an infringement contention regarding the term "known location address range" that "*location address ranges are known*" (emphasis added, see, for example, Ex. 1010 at Appendix I at p. 13).

238. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

239. Although the forgoing description of the disclosures within Karol and other references within Karol clearly shows that either of Karol alone or Karol in view of the knowledge of the person of ordinary skill in the art meets the limitations of this claim element, to the extent that explicit combining of Karol with a second reference disclosing "known location address ranges" for "associated networks" (or regarding the process of "obtaining" such "address ranges") were deemed to be necessary to fully meet the limitations of this claim element, then in my opinion a person of ordinary skill in the art at the time of the invention would have found the combination of Karol and Stallings to be obvious

to try and to yield the predictable result that Karol and Stallings combined fully meet the limitations of this claim element as evident by at least the reasons described in ¶¶ 229-237 above.

240. Additionally, a person of ordinary skill in the art at the time of the invention would have been specifically motivated to combine Karol and Stallings at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64) and both Karol and Stallings describe the characteristics of network addresses in routers that can route packets over multiple parallel routes to a destination address as well as methods to obtain such network addresses.

241. Therefore, in my opinion, Karol in view of Stallings also renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

5(c): obtaining topology information which specifies associated networks that provide, when working, connectivity between a current location and at least one destination location;

242. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, obtains routing information associated with the CL (or "IP") and CO networks so that "integrated routing tables for both the IP and CO networks" can be "maintained at the CL-CO gateways" (see, for example, Ex. 1006 at 13:48-50). Karol discloses that such routing tables that are maintained at the CL-CO gateway

are comprised of various "databases" associated with the "gateway processor" including the "datagram forwarding database **432**, a flow database **433**, and a header translation database **434**" (see, for example, Ex. 1006 at 7:31-35).

243. Karol discloses with respect to the CL network that the "datagram forwarding database **432**" is "the database used in typical CL IP routers" that "stores the *next hop router address* and outgoing port number *corresponding to each destination address*" and thus the "fields in each record in this database would be: *Destination IP address*; *Next hop router*; Outgoing port (interface)" (emphasis added, see, for example, Ex. 1006 at 7:36-41). Similarly, Karol discloses with respect to the CO network that "flow database **433**" is used to "determine how to handle packets from flows requiring a connection-oriented service" wherein "Typical fields in each record in this database include: (a) an *outgoing port field*, which indicates the port on which a datagram whose entries match a particular record's entries is forwarded; (b) *if the outgoing port is "invalid*," the next field "forward or hold" entry indicates whether packet should be forwarded or held in packet buffer **440**; (c) *destination address*; (d) source address; (e) source port; (f) destination port; (g) type of service; (h) protocol field; (i) TCP Flags; (j) outgoing port; (k) forward or hold flag, and (l) a mask which indicates which of the data entries is applicable to the particular record" (emphasis added, see, for example, Ex. 1006 at 7:42-54). Karol further discloses that the

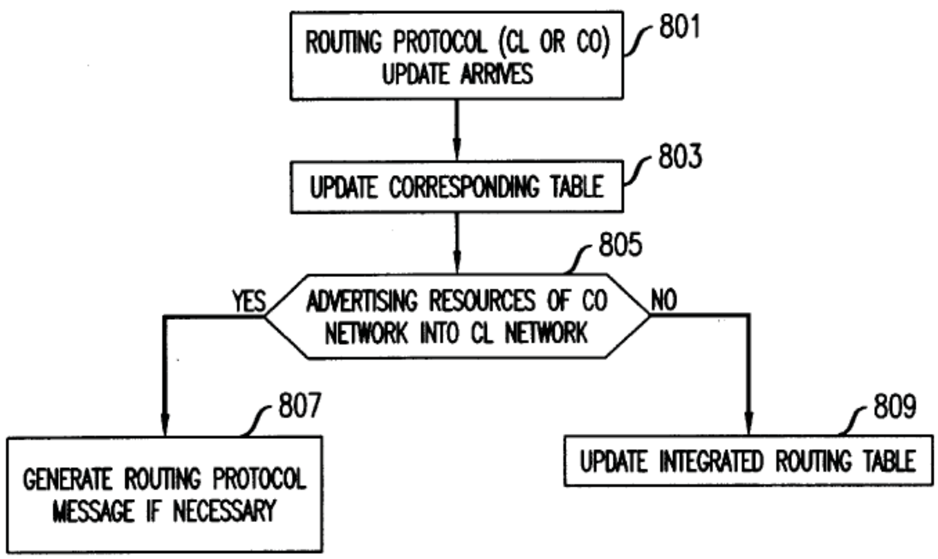
"header translation database **434**" is also updated when the "integrated routing table" that obtains the "resources of the CO network" to include at least "*CO* packet header field values or *circuit identifiers*" (emphasis added, see, for example, Ex. 1006 at 7:55-59, 13:6-16). Thus for both the CL and CO network topologies, Karol discloses routing tables with information about the specific route topology that a particular packet would take based on currently-available parallel CL and CO paths to from a source endpoint to a destination endpoint.

244. Karol also discloses methodologies for obtaining the routing table information, such as initially having "the *network provider* can *set user-specific routing tables at the CL-CO gateways*" (emphasis added, see, for example, Ex. 1006 at 16:3-9 and ¶¶ 106-110 above). Karol similarly discloses processes for obtaining "updates" to such routing tables while the network is in operation (see, for example, Ex. 1006 at 13:6-16, FIG. 8, and ¶¶ 106-110 above). More specifically, Karol also discloses that "FIG. 8 is a flow diagram illustrating the routing related processes performed in the gateway of FIG. 4" (see, for example, Ex. 1006 at 3:17-18 and FIG. 8). More specifically, "When a routing protocol update is received from CL router/switch **420** or from CO switch **410**, network, the process shown in FIG. 8 is executed" such that "After the update arrives in step **801**, and the corresponding table is updated in step **803**, a determination is made in step **805** as to whether the resources of the CO network need to be communicated

to or "advertised" in the CL network" (see, for example, Ex. 1006 at 13:6-12 and FIG. 8).

245.

FIG. 8



246. Note that in the system of Karol, such routing topology information is propagated locally when "a YES result occurs in step **805**, and an appropriate routing protocol message is generated in step **807**" or when "a NO result occurs in step **805**, and the integrated routing table is updated in step **809**" so that the system routes packets to the CL and CO networks based at least upon conventional IP routing techniques such as OSPF as well as "Link State Advertisements (LSAs) that report point-to-point links" that are expressed by associated "link weights" so that "integrated IP-CO routing tables are maintained at the CL-CO gateways" (see, for example, Ex. 1006 at 14:23-67, FIG. 8 and FIG. 9).

247. Thus, Karol describes the step of "obtaining topology information" (for example, when a network provider sets user-specified routing preferences or when the system obtains and propagates updated routing table information) that "specifies associated networks" (for example, the routing tables at the CL-CO gateway include entries specific to the CL network and to the CO network respectively) wherein such "information" indicates whether or not "connectivity between a current location and at least one destination location" is "working" for each "associated network" (for example, the CL network table updates the "next hop router" address for a particular "destination address" when an update arrives and similarly updates for the CO network if an "output port" associated with a "CO circuit identifier" is currently "invalid").

248. Note that Patent Owner specifically alleges that obtaining "topology information is obtained during configuration" by manual entry of user-specified routes per the "User Manual" for a packet routing appliance meets the limitations of this claim element under Patent Owner's proposed claim constructions (see, for example, Ex. 1010 at Appendix I at pp. 10-12). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

249. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

250. Although the forgoing description of the disclosures within Karol clearly shows meeting the limitations of this claim element, to the extent that additional information regarding "obtaining topology information" or particularly for the case of determining if "connectivity between a current location and at least one destination location" via "associated networks" is "working" were deemed to be necessary to fully disclose this claim element, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such additional information at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results as evident by at least the following reasons.

251. First, at least because many methods for obtaining network addresses are also applicable to obtaining topology information, then the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such additional information relevant to limitations of this claim element at least for the reasons described in ¶¶ 230-236 above.

252. Second, in addition to the methods for obtaining topology information as explicitly disclosed in Karol (see, for example, ¶¶ 242-247 above), other methods specifically directed to "connectivity" status were also common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stevens, a common reference textbook on TCP/IP data networking protocols, describes "ping" and the "Internet Control Message Protocol" (or "ICMP") that can be used, for example, to perform a "basic *connectivity test between two systems* running TCP/IP" (emphasis added, see, for example, Ex. 1007 at p. 96).

253. Third, even more methods for obtaining topology information were also common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stallings, a common reference textbook on data and computer communications, describes "dynamic" routing tables that are "flexible in responding to both error and congestion conditions" such that "*when a router goes down*, all of its neighbors will *send out a status report*, *allowing other routers* and stations to *update their routing tables*" (emphasis added, see, for example, Ex. 1011 at p. 539). See also ¶¶ 134-137 above.

254. Fourth, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stevens reference textbook to be the implied meaning of terminology and concepts described in

Karol at least because Karol explicitly references Stevens to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 10:1-8).

255. Fifth, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stallings reference textbook to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64).

256. Sixth, for a person of ordinary skill in the art at the time of the invention it would have been obvious to try this common knowledge regarding methods for obtaining topology information at least because few, if any, other alternatives were in common usage for obtaining such topology information with IP protocol based networking such as described in Karol beyond those techniques described herein within Stevens and/or Stallings at the time of the alleged invention of the '235 Patent. Thus, a person of ordinary skill in the art at the time of the invention would also be highly likely to produce a successful and predictable result.

257. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

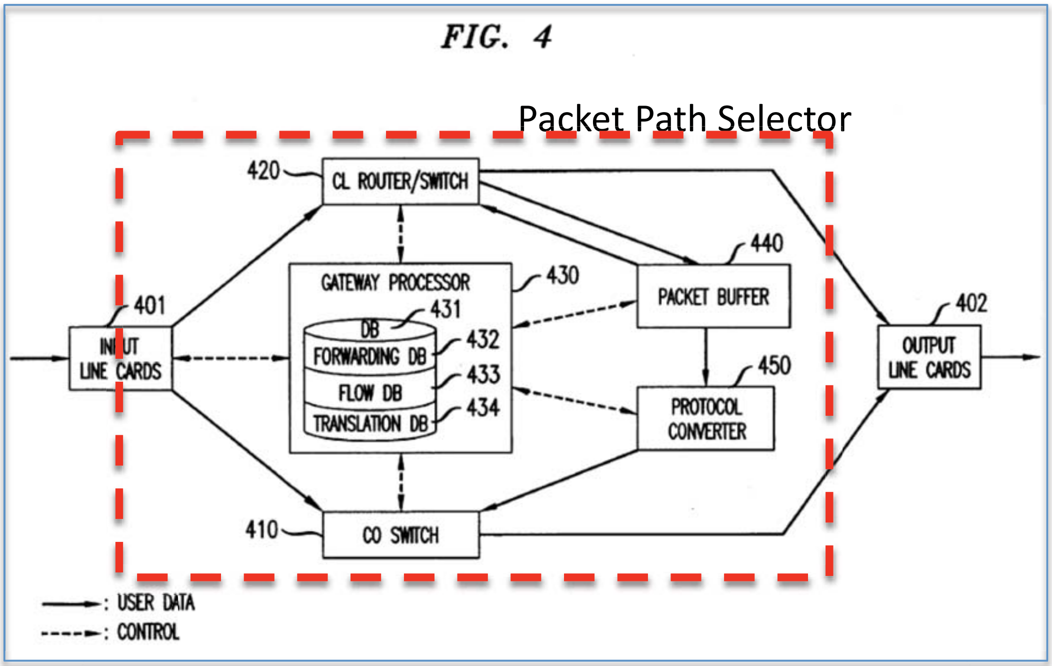
258. Although the forgoing description of the disclosures within Karol and other references within Karol clearly shows that either of Karol alone or Karol in view of the knowledge of the person of ordinary skill in the art meets the limitations of this claim element, to the extent that explicit combining of Karol with a second reference disclosing methods for “obtaining topology information” or particularly for the case of determining if “connectivity between a current location and at least one destination location” via “associated networks” is “working” were deemed to be necessary to fully meet the limitations of this claim element, then in my opinion a person of ordinary skill in the art at the time of the invention would have found the combination of Karol and Stallings to be obvious to try and to yield the predictable result that Karol and Stallings combined fully meet the limitations of this claim element as evident by at least the reasons described in ¶¶ 251-256 above.

259. Additionally, a person of ordinary skill in the art at the time of the invention would have been specifically motivated to combine Karol and Stallings at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64) and both Karol and Stallings describe obtaining topology information including the ability to determine if connectivity between a current location and at least one destination location via associated networks is working.

260. Therefore, in my opinion, Karol in view of Stallings also renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

5(d): receiving at the current location a packet which identifies a particular destination location by specifying a destination address for the destination location;

261. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, comprises at least a "gateway processor", a "CL router/switch", a "CO switch", a "packet buffer", a "protocol converter" and one or more "input line cards" that together are used to determine if a particular packet (or "datagram") from a "source endpoint" should be forwarded to either of the "CL network" or the "CO network" based on multiple criteria including whether or not a valid connection through the CO network is presently available for the particular packet as further illustrated in and described with respect to FIG. 4 of Karol (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:31-50 and FIG. 4 as annotated herein).



262.

263. As Karol discloses explicitly, “datagrams received in input line cards **401** can be directed either to CO switch **410** or CL router/switch **420**” so that “output line cards **402** can receive datagrams from either of the last mentioned elements and direct them to external networks” (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein in ¶ 182 above). One exemplary methodology for routing particular packets or datagrams within Karol is the use of the “forwarding database **432**” within the gateway processor to determine if a particular packet matches a combination of “Destination IP address; Next hop router; Outgoing port (interface)” that would cause such a packet to be routed to the CL network or to be considered for routing over the CO network (see, for example, Ex. 1006 at 7:36-41).

264. For those particular packets that are candidates for the CO network, Karol also discloses that each such packet is compared at the gateway processor with the "flow database **433**" to determine if a particular packet matches a desired combination of "(a) an outgoing port field, which indicates the port on which a datagram whose entries match a particular record's entries is forwarded; (b) if the outgoing port is "invalid," the next field "forward or hold" entry indicates whether packet should be forwarded or held in packet buffer **440**; (c) destination address; (d) source address; (e) source port; (f) destination port; (g) type of service; (h) protocol field; (i) TCP Flags; (j) outgoing port; (k) forward or hold flag, and (l) a mask which indicates which of the data entries is applicable to the particular record" in order to route such a packet to the CO network instead of the CL network depending on availability of a valid connection in the CO network for a flow associated with the particular packet (see, for example, Ex. 1006 at 7:42-54).

265. Thus, Karol discloses "receiving at the current location a packet" (for example, each datagram received at the input line card of the CL-CO gateway) and that each such packet "identifies a particular destination location by specifying a destination address for the destination location" (for example, the CL-CO gateway inspects each packet for its Destination IP address which is associated with the destination location).

266. Note that Patent Owner specifically alleges that a packet routing appliance meets the limitations of this claim element under Patent Owner's proposed claim constructions based entirely on a citation to a "Theory of Operation" document that states "Within the APN, routes are the binding of IP networks to a particular network service, such as for example, a Conduit between two sites. When an APN Appliances Ethernet interface receives a packet, the packet is evaluated against the set of routes available and an appropriate route is selected. The route selected directs the packet to a specified service. The service then directs the traffic to its destination whether it is the local network, Conduit Service, Intranet Service, Internet Service or Passthrough." (see, for example, Ex. 1010 at Appendix I at p. 12-13). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

267. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

268. At least because Karol discloses the limitations of this claim element, then Karol in view of the knowledge of the person of ordinary skill in the art also

renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element.

5(e): determining whether the destination address lies within a known location address range;

269. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, comprises at least a "gateway processor", a "CL router/switch", a "CO switch", a "packet buffer", a "protocol converter" and one or more "input line cards" that together are used to determine if a particular packet (or "datagram") from a "source endpoint" should be forwarded to either of the "CL network" or the "CO network" based on multiple criteria including whether or not a valid connection through the CO network is presently available for the particular packet as further illustrated in and described with respect to FIG. 4 of Karol (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:31-50 and FIG. 4 as shown in ¶ 262 above).

270. As Karol discloses explicitly, "datagrams received in input line cards **401** can be directed either to CO switch **410** or CL router/switch **420**" so that "output line cards **402** can receive datagrams from either of the last mentioned elements and direct them to external networks" (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein in ¶ 182 above). One exemplary methodology for routing particular packets or datagrams within Karol is

the use of the "forwarding database **432**" within the gateway processor to determine if a particular packet matches a combination of "Destination IP address; Next hop router; Outgoing port (interface)" that would cause such a packet to be routed to the CL network or to be considered for routing over the CO network (see, for example, Ex. 1006 at 7:36-41).

271. For those particular packets that are candidates for the CO network, Karol also discloses that each such packet is compared at the gateway processor with the "flow database **433**" to determine if a particular packet matches a desired combination of "(a) an outgoing port field, which indicates the port on which a datagram whose entries match a particular record's entries is forwarded; (b) if the outgoing port is "invalid," the next field "forward or hold" entry indicates whether packet should be forwarded or held in packet buffer **440**; (c) destination address; (d) source address; (e) source port; (f) destination port; (g) type of service; (h) protocol field; (i) TCP Flags; (j) outgoing port; (k) forward or hold flag, and (l) a mask which indicates which of the data entries is applicable to the particular record" in order to route such a packet to the CO network instead of the CL network depending on availability of a valid connection in the CO network for a flow associated with the particular packet (see, for example, Ex. 1006 at 7:42-54).

272. Thus, Karol discloses "determining whether the destination address lies within a known location address range" (for example, by comparing the

destination IP address in each packet received at the CL-CO gateway to entries in the databases within the routing tables that include a known location address range for the destination location).

273. Note that Patent Owner specifically alleges that a packet routing appliance meets the limitations of this claim element under Patent Owner's proposed claim constructions based on an inherency argument for any IP router that "location address ranges are known" and thus "When a packet is received on a port, it is typically routed to an outgoing port. This routing *necessarily* makes a determination if the destination address of the IP packet lies within the known location address range(s)" (emphasis added, see, for example, Ex. 1010 at Appendix I at p. 13). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

274. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

275. Although the forgoing description of the disclosures within Karol clearly shows meeting the limitations of this claim element, to the extent that additional information regarding the "known location address range" were deemed

to be necessary to fully disclose this claim element, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such additional information at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results as evident by at least the same reasons provided for claim element 5(b) at ¶¶ 230-237 above.

276. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

277. Similarly, although the forgoing description of the disclosures within Karol and other references within Karol clearly shows that either of Karol alone or Karol in view of the knowledge of the person of ordinary skill in the art meets the limitations of this claim element, to the extent that explicit combining of Karol with a second reference disclosing a "known location address range" were deemed to be necessary to fully meet the limitations of this claim element, then in my opinion a person of ordinary skill in the art at the time of the invention would have found the combination of Karol and Stallings to be obvious to try and to yield the predictable result that Karol and Stallings combined fully meet the limitations of

this claim element as evident by at least the reasons described in ¶¶ 229-237 and 269-273 above.

278. Additionally, a person of ordinary skill in the art at the time of the invention would have been specifically motivated to combine Karol and Stallings at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64) and both Karol and Stallings describe the characteristics of network addresses in routers that can route packets over multiple parallel routes to a destination address.

279. Therefore, in my opinion, Karol in view of Stallings also renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

5(f): selecting a network path from among paths to disparate associated networks, said networks being in parallel at the current location, each of said networks specified in the topology information as capable of providing connectivity between the current location and the destination location;

280. Karol discloses systems and methods of operation thereof whereby a "CL-CO gateway", alone or in combination with one or more routers and/or switches, controls access to either a "connectionless" (or "CL") network data path or to a "connection oriented" (or "CO) network data path (see, for example, Ex. 1006 at 1:7-16). Karol specifically describes the CL network as being based upon the "Internet Protocol or "IP"" and the CO network as being based upon "ATM, MPLS, RSVP" or a "telephony network" (see, for example, Ex. 1006 at 1:7-16,

2:52-58). This is further illustrated in and described with respect to FIG. 1 of Karol (see, for example, ¶¶ 85-93 above, Ex. 1006 at 2:65-67, 4:36-67, and FIG. 1 as shown in ¶ 205 above).

281. In view of Karol's detailed description, either of the CL-CO gateway or the combination of the CL-CO gateway with one or more routers and/or switches discloses a combination of connections for the access network path that an IP datagram (or "packet") from the "source" at a first site or location would take to a "destination" at second site or location. Karol describes the available network paths as "two *different, parallel* routes" with one route being based upon the connectionless Internet protocol and the other based upon a connection oriented protocol such as "MPLS" (emphasis added, see, for example, Ex. 1006 at 4:40-44, ¶¶ 85-93 above). Karol also specifically discloses for the CL and CO networks that the "*parallel configuration* could occur, for example, if *two service providers*, one with an IP-router-based network and the other with a CO-switch-based network, offer enterprises "long-distance" connectivity of their geographically distributed networks" (emphasis added, see, for example, Ex. 1006 at 3:47-51).

282. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, comprises at least a "gateway processor", a "CL router/switch", a "CO switch", a "packet buffer", a "protocol converter" and one or more "input line

cards" that together are used to determine if a particular packet (or "datagram") from a "source endpoint" should be forwarded to either of the "CL network" or the "CO network" based on multiple criteria including whether or not a valid connection through the CO network is presently available for the particular packet as further illustrated in and described with respect to FIG. 4 of Karol (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:31-50 and FIG. 4 as shown in ¶ 262 above).

283. As Karol discloses explicitly, "datagrams received in input line cards **401** can be directed either to CO switch **410** or CL router/switch **420**" so that "output line cards **402** can receive datagrams from either of the last mentioned elements and direct them to external networks" (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein in ¶ 182 above). One exemplary methodology for routing particular packets or datagrams within Karol is the use of the "forwarding database **432**" within the gateway processor to determine if a particular packet matches a combination of "Destination IP address; Next hop router; Outgoing port (interface)" that would cause such a packet to be routed to the CL network or to be considered for routing over the CO network (see, for example, Ex. 1006 at 7:36-41).

284. For those particular packets that are candidates for the CO network, Karol also discloses that each such packet is compared at the gateway processor

with the “flow database **433**” to determine if a particular packet matches a desired combination of “(a) an outgoing port field, which indicates the port on which a datagram whose entries match a particular record's entries is forwarded; (b) if the outgoing port is “invalid,” the next field “forward or hold” entry indicates whether packet should be forwarded or held in packet buffer **440**; (c) destination address; (d) source address; (e) source port; (f) destination port; (g) type of service; (h) protocol field; (i) TCP Flags; (j) outgoing port; (k) forward or hold flag, and (l) a mask which indicates which of the data entries is applicable to the particular record” in order to route such a packet to the CO network instead of the CL network depending on availability of a valid connection in the CO network for a flow associated with the particular packet (see, for example, Ex. 1006 at 7:42-54).

285. Thus, Karol summarizes the use of the gateway processor by noting that “the processes performed in CL-CO gateways that enable the internetworking of connectionless IP networks and CO networks” accomplish two primary functions that are i) handling “IP packets that arrive at CL-CO gateways to be carried on (not-yet-established) connections in the CO network, plus IP packets that arrive at CL-CO gateways but then remain in the CL network”, and ii) creating “routing tables that enable data flow from the CL network to the CO network” (see, for example, Ex. 1006 at 7:60-8:2).

286. Karol further describes that such routing selections between the CL and CO networks be based at least upon "bandwidth availability" that can be "dynamically allocated to flows on an as-needed basis" and thus be "diverting connections away from congested links" (see, for example, Ex. 1006 at 17:18-26 and 17:63-18:2).

287. Thus, Karol discloses a "selecting a network path" (for example, either of the CL-CO gateway or the combination of the CL-CO gateway with one or more routers and/or switches shown in annotated FIG. 1 herein when operated as described selects either of the CL network path or the CO network path for each packet received from the source endpoint), that such network paths are "from among paths to disparate associated networks, said networks being in parallel at the current location" (for example, as shown in annotated FIG. 1 herein the CL network path based on, for example, the Internet protocol and the CO path based on, for example, the ATM or MPLS protocol, are described as "two ***different, parallel*** routes" to each other at the source endpoint location), and wherein "each of said networks specified in the topology information as capable of providing connectivity between the current location and the destination location" (for example, the routing tables in the CL-CO gateway maintain databases that indicate current validity of the CL path and the CO path to connect packets from the source endpoint to the destination endpoint).

288. Note that Patent Owner specifically alleges that a packet routing appliance meets the limitations of this claim element under Patent Owner's proposed claim constructions based upon the same network diagram where an MPLS network is shown parallel to the Internet (see, for example, ¶ 209 above and Ex. 1010 at Appendix I at p. 13). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

289. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶¶ 74 and 79 above).

290. To the extent that in the alternative, the broadest reasonable interpretation for meeting this claim element were considered to require that the term "disparate networks" should mean that at least one of the "alternate data paths" be over "a frame relay or point-to-point network", for example, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such an interpretation at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded

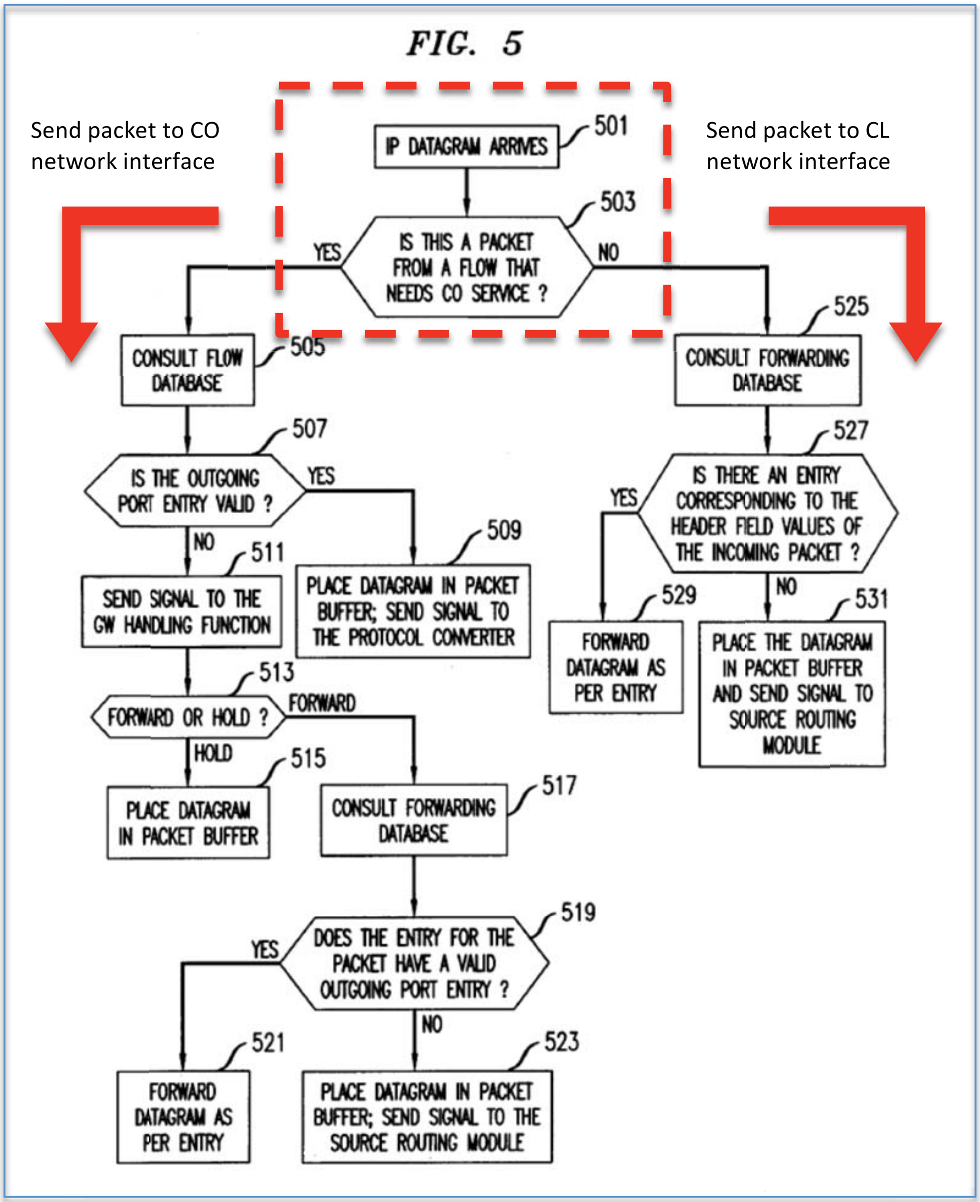
predictable results as evident by at least the same reasons provided for claim element 5(a) at ¶¶ 212-216 above.

291. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶¶ 74 and 79 above).

5(g): forwarding the packet on the selected network path.

292. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, receives datagrams (or "packets") and such "datagrams received in input line cards **401** can be directed either to CO switch **410** or CL router/switch **420**" so that "output line cards **402** can receive datagrams from either of the last mentioned elements and direct them to external networks" (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein in ¶ 182 above). An exemplary process for determining the network path selection and actual forwarding to the CL or CO network interface is described in detail at FIG. 5 of Karol (see, for example, ¶¶ 99-102 above, Ex. 1006 at 8:56-9:36 and FIG. 5 as annotated herein).

293.



294. Thus, Karol discloses a "forwarding the packet on the selected network path" (for example, the depicted packet path selector of FIG. 4 compares information in each packet received at the CL-CO gateway and then routes each packet either to the CL network interface output line card or to the CO network interface output line card according to the process described in FIG. 5).

295. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

296. At least because Karol discloses the limitations of this claim element, then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element.

<u>'235 Patent: Claim 7</u>

> 7. The method of claim 5, wherein the forwarding step forwards the packet toward the Internet when the packet's destination address does not lie within any known location address range.

7. The method of claim 5, wherein the forwarding step forwards the packet toward the Internet when the packet's destination address does not lie within any known location address range.

297. Karol either anticipates or one or more of Karol in view of the knowledge of the person of ordinary skill in the art or Karol in view of Stallings renders obvious the recited Claim 5 of this claim element under either the broadest reasonable interpretation or the various alternative interpretations described above for at least the reasons summarized in ¶¶ 203-296 above.

298. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, receives datagrams (or "packets") such that "gateways in accordance with the present invention decide whether a datagram flow should be handled via

the CO network or not" (see, for example, Ex. 1006 at 15:31-33) and such that packet path selection is based at least upon comparison of the packet destination address with network addresses maintained at the CL-CO gateway (see, for example, ¶¶ 96-101 above).

299. Karol continues by noting "If the routing scheme used maintains <u>*integrated IP-CO routing tables at the CL-CO gateways*</u>, neither type of traffic poses a serious problem, since the <u>*default path*</u> expected by CL network **901** <u>*provides a path from the CL-CO gateways*</u> **960-962** <u>*through CL network*</u> **901** to the <u>*destination*</u>" (emphasis added, see, for example, Ex. 1006 at 15:31-39). As Karol explains, the "CL network", which includes this "default path", is a "connectionless network" based upon the "Internet protocol" (see, for example, Ex. 1006 at 1:7-8 and 5:60-66).

300. Thus, Karol discloses the "forwarding step" (for example, as described in ¶¶ 292-294 above), and further that "when the packet's destination address does not lie within any known location address range" (for example, if the comparison of the packet destination address with network addresses maintained at the CL-CO gateway does not produce a match) then "the forwarding step forwards the packet toward the Internet" (for example, by routing to the default path that causes the packet to forward over the CL network based upon Internet protocol).

301. Note that Patent Owner specifically alleges that a packet routing appliance meets the limitations of this claim element under Patent Owner's proposed claim constructions based upon Patent Owner's allegation that the "Talari controller can be configured to have a "*default route*" such that *when the packet's destination address does not lie within any known location address range, it is forwarded over the default route*" (emphasis added, see, for example, Ex. 1010 at Appendix I at p. 16). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

302. Note also the antecedent reference to "the Internet" in this Claim 7 that depends on Claim 5 where the word "Internet" does not appear. In Patent Owner's infringement contentions, the Patent Owner points specifically to routing over a parallel network (the "default Internet route") connecting two sites via a connectionless network using the Internet protocol as showing that "the packets can be forwarded toward the Internet" (see, for example, Ex. 1010 at Appendix I at p. 17). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

303. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

304. Although the forgoing description of the disclosures within Karol clearly shows meeting the limitations of this claim element, to the extent that additional information regarding the "known location address range" were deemed to be necessary to fully disclose this claim element, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such additional information at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results as evident by at least the same reasons provided for claim element 5(b) at ¶¶ 230-237 above.

305. Similarly, although the forgoing description of the disclosures within Karol clearly shows meeting the limitations of this claim element, to the extent that additional information regarding the "default path" and its relationship to an "Internet" were deemed to be necessary to fully disclose this claim element, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such additional information at least because this was within the skill of

person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results for at least the following reasons.

306. First, in a description of an exemplary embodiment, the '235 Patent discloses only that for "traffic destined for the Internet, as opposed to one of the three "known" locations" then "send the traffic over the Internet lines" (see, for example, Ex. 1001 at 7:60-65).

307. Second, routing a packet over a "default path" based on Internet protocol to a destination address, although thoroughly described in Karol, was also common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stevens, a common reference textbook on TCP/IP data networking protocols, describes "a default route used" when the packet's destination network address does not match any of those stored in the routing tables (see, for example, Ex. 1007 at p. 39). Stevens also provides a specific example wherein a "first search of the routing table for a matching host address fails, as does the second search for a matching network address" and thus the "final step is a search for a default entry, and this succeeds" thereby "sending a datagram across the Internet to the host" (see, for example, Ex. 1007 at p. 115).

308. Third, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stevens reference textbook to be the implied meaning of terminology and concepts described in

Karol at least because Karol explicitly references Stevens to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 10:1-8).

309. Fourth, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Monachello patent to include that "when a message being transferred has an Internet Protocol (IP) address, the *router takes the destination address from the header of the IP address and attempts to match the address* to one stored in the router table" and thus "*If a match exists*, then the entry in the *table having the matching address specifies the path* to take for that message" but "*If a match doesn't exist*, then the *default route is taken*" wherein "The *default route is* usually the one taken when accessing *an internet service provider or the internet at large*" (see, for example, Ex. 1009 at 1:19-27).

310. Fifth, for a person of ordinary skill in the art at the time of the invention it would have been obvious to try this common knowledge regarding methods for forwarding packets over a default path to an Internet based network (or "the Internet") at least because few other alternatives were in common usage for IP protocol based networking such as described in Karol at the time of the alleged invention of the '235 Patent. Thus, a person of ordinary skill in the art at the time of the invention would also be highly likely to produce a successful and predictable result.

311. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

<u>'235 Patent: Claim 8</u>

> 8. The method of claim 5, wherein the destination address identifies a destination location to which only a single associated network provides connectivity from the current location, and the forwarding step forwards the packet to that single associated network.

8. The method of claim 5, wherein the destination address identifies a destination location to which only a single associated network provides connectivity from the current location, and the forwarding step forwards the packet to that single associated network.

312. Karol either anticipates or one or more of Karol in view of the knowledge of the person of ordinary skill in the art or Karol in view of Stallings renders obvious the recited Claim 5 of this claim element under either the broadest reasonable interpretation or the various alternative interpretations described above for at least the reasons summarized in ¶¶ 203-296 above.

313. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, receives datagrams (or "packets") such that "gateways in accordance with the present invention decide whether a datagram flow should be handled via the CO network or not" (see, for example, Ex. 1006 at 15:31-33) and such that packet path selection is based at least upon comparison of the packet destination

address with network addresses maintained at the CL-CO gateway (see, for example, ¶¶ 96-101 above).

314. Karol discloses in reference to FIG. 4 that the use of the "forwarding database **432**" within the gateway processor to determine if a particular packet matches a combination of "Destination IP address; Next hop router; Outgoing port (interface)" that would cause such a packet to be routed to the CL network or to be considered for routing over the CO network (see, for example, Ex. 1006 at 7:36-41 and ¶¶ 94-105 above). As shown at steps **517**, **519**, and **523** in FIG. 5 of Karol, a packet with a destination address different from that of any valid network address associated with the CO network and the destination endpoint will always be directed only to CL network (see, for example, annotated FIG. 5 shown in ¶ 293 above).

315. Thus, Karol discloses the "forwarding step" (for example, as described in ¶¶ 292-294 above), and further that when "the destination address identifies a destination location to which only a single associated network provides connectivity from the current location" (for example, if the comparison of the packet destination address with network addresses maintained at the CL-CO gateway does not produce a match any address served by the CO network – only the CL network can be used to route such a packet) then "the forwarding step forwards the packet to that single associated network" (for example, by routing to

the CL network based upon Internet protocol whenever the destination address does not correspond to network addresses then served by the CO network).

316. Note that Patent Owner specifically alleges that a packet routing appliance meets the limitations of this claim element under Patent Owner's proposed claim constructions based upon Patent Owner's allegation that such accused devices "include the ability select a route by reference to routing tables" and "Selecting a route for a packet identifies an associated network interface, and hence a particular network, over which a packet should be forwarded" (see, for example, Ex. 1010 at Appendix I at p. 18). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

317. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

318. At least because Karol discloses the limitations of this claim element, then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element.

'235 Patent: Claim 9

> 9. The method of claim 5, wherein repeated instances of the selecting step make network path selections on a packet-by-packet basis.

9. The method of claim 5, wherein repeated instances of the selecting step make network path selections on a packet-by-packet basis.

319. Karol either anticipates or one or more of Karol in view of the knowledge of the person of ordinary skill in the art or Karol in view of Stallings renders obvious the recited Claim 5 of this claim element under either the broadest reasonable interpretation or the various alternative interpretations described above for at least the reasons summarized in ¶¶ 203-296 above.

320. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, receives datagrams (or "packets") such that "gateways in accordance with the present invention decide whether a datagram flow should be handled via the CO network or not" (see, for example, Ex. 1006 at 15:31-33) and such that packet path selection is based at least upon comparison of the packet destination address with network addresses maintained at the CL-CO gateway (see, for example, ¶¶ 96-101 above).

321. As Karol discloses explicitly, "datagrams received in input line cards **401** can be directed either to CO switch **410** or CL router/switch **420**" so that "output line cards **402** can receive datagrams from either of the last mentioned elements and direct them to external networks" (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein in ¶ 182 above). One

exemplary methodology for routing particular packets or datagrams within Karol is the use of the "forwarding database **432**" within the gateway processor to determine if a particular packet matches a combination of "Destination IP address; Next hop router; Outgoing port (interface)" that would cause such a packet to be routed to the CL network or to be considered for routing over the CO network (see, for example, Ex. 1006 at 7:36-41).

322. For those particular packets that are candidates for the CO network, Karol also discloses that each such packet is compared at the gateway processor with the "flow database **433**" to determine if a particular packet matches a desired combination of "(a) an outgoing port field, which indicates the port on which a datagram whose entries match a particular record's entries is forwarded; (b) if the outgoing port is "invalid," the next field "forward or hold" entry indicates whether packet should be forwarded or held in packet buffer **440**; (c) destination address; (d) source address; (e) source port; (f) destination port; (g) type of service; (h) protocol field; (i) TCP Flags; (j) outgoing port; (k) forward or hold flag, and (l) a mask which indicates which of the data entries is applicable to the particular record" in order to route such a packet to the CO network instead of the CL network depending on availability of a valid connection in the CO network for a flow associated with the particular packet (see, for example, Ex. 1006 at 7:42-54).

323. Thus, Karol summarizes the use of the gateway processor by noting that "the processes performed in CL-CO gateways that enable the internetworking of connectionless IP networks and CO networks" accomplish two primary functions that are i) handling "IP packets that arrive at CL-CO gateways to be carried on (not-yet-established) connections in the CO network, plus IP packets that arrive at CL-CO gateways but then remain in the CL network", and ii) creating "routing tables that enable data flow from the CL network to the CO network" (see, for example, Ex. 1006 at 7:60-8:2).

324. Thus, Karol discloses the "selecting step" that makes "network path selections" (for example, as described in ¶¶ 280-291 above), and further that when there are "repeated instances" of the "selecting step" such instances can be on a "packet-by-packet basis" (for example, each packet received at the CL-CO gateway has a comparison of the packet destination address with network addresses maintained at the CL-CO gateway that is independent of the previous packet received).

325. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 75 above).

326. To the extent that in the alternative, the broadest reasonable interpretation for meeting this claim element were considered to require that the

term "packet-by-packet basis" should mean "for each packet, selects between network interfaces regardless of the session with which the packet is associated", for example, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such an interpretation at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results as evident by at least the reasons given in ¶¶ 191-194 above.

327. At least because Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the narrower alternative interpretation described above (see ¶ 326 above), then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element (see ¶ 75 above).

328. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element either under the broadest reasonable interpretation of this claim element (see ¶ 75 above) or under the alternative interpretation described above (see ¶ 326 above).

'235 Patent: Claim 10

> 10. The method of claim 5, wherein repeated instances of the selecting step make network path selections on a per session basis.

10. The method of claim 5, wherein repeated instances of the selecting step make network path selections on a per session basis.

329. Karol either anticipates or one or more of Karol in view of the knowledge of the person of ordinary skill in the art or Karol in view of Stallings renders obvious the recited Claim 5 of this claim element under either the broadest reasonable interpretation or the various alternative interpretations described above for at least the reasons summarized in ¶¶ 203-296 above.

330. See ¶¶ 320-323 above.

331. Karol provides numerous examples of how the "gateway processor **430**" and "flow database **433**" interact to determine whether a particular packet belongs to a flow directed to the CO network or the CL network. For example, some flows correspond to sessions or applications such as "web access, telnet, file transfer, electronic mail, etc" that utilize the TCP transport layer while others such as "Internet telephony and other multimedia traffic" may use the "RTP (Real Time Protocol)" that "has been defined to use UDP" transport layer (see, for example, Ex. 1006 at 10:25-39 and FIG. 6). As Karol explains, certain packets carrying either TCP or UDP segments within certain sessions or applications as listed above are appropriate for a flow to the CO network while others are better directed to the CL network (see, for example, Ex. 1006 at 10:51-11:26 and FIG. 6).

332. Thus, Karol discloses the "selecting step" that makes "network path selections" (for example, as described in ¶¶ 280-291 above), and further that when there are "repeated instances" of the "selecting step" such instances can be on a "per session basis" (for example, each packet received at the CL-CO gateway has a comparison of the packet destination address with network addresses maintained at the CL-CO gateway and additionally a determination if the packet corresponds to a session to be directed to the CO network).

333. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 76 above).

334. At least because Karol discloses the limitations of this claim element, then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element.

'235 Patent: Claim 11

> 11. The method of claim 5, wherein the selecting step selects the network path at least in part on the basis of a dynamic load-balancing criterion.

11. The method of claim 5, wherein the selecting step selects the network path at least in part on the basis of a dynamic load-balancing criterion.

335. Karol either anticipates or one or more of Karol in view of the knowledge of the person of ordinary skill in the art or Karol in view of Stallings renders obvious the recited Claim 5 of this claim element under either the broadest

reasonable interpretation or the various alternative interpretations described above for at least the reasons summarized in ¶¶ 203-296 above.

336. See ¶¶ 320-323 above.

337. Karol also explains that this system of parallel CL and CO networks with path selection for each packet based on flow characteristics has numerous advantages for long distance enterprise connectivity. For example, Karol discloses that "the advantage to a user is that the user can ask for and receive a guaranteed quality of service for a specific flow" and "The advantage to a service provider is that *bandwidth utilization* in a packet-switched CO network is better than in a CL network with precomputed routes since bandwidth can be *dynamically allocated to flows on an as-needed basis*" (emphasis added, see, for example, Ex. 1006 at 17:18-26). In particular Karol notes that "*dynamically adjusting link weights* in the routing protocol can also be extended *to include diverting connections away from congested links*" or "In other words, *link weights can be adjusted to reflect bandwidth availability*" (emphasis added, see, for example, Ex. 1006 at 17:63-18:2).

338. Thus, Karol discloses the "selecting step" that makes "network path selections" (for example, as described in ¶¶ 280-291 above), and further that such step be made "at least in part on the basis of a dynamic load-balancing criterion" (for example, the flows at CL-CO gateway that get routed to the CL or CO

network are dynamically allocated in an as-needed basis to dynamically divert away from congested links based upon a bandwidth availability criterion).

339. Note that Patent Owner specifically alleges that a packet routing appliance meets the limitations of this claim element under Patent Owner's proposed claim constructions based upon a documented description of "Load Balancing option" as "traffic is put on the best path until that path runs out of available bandwidth. The additional traffic will then spill over to the next best path" (see, for example, Ex. 1010 at Appendix I at p. 21). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

340. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

341. Although the forgoing description of the disclosures within Karol clearly shows meeting the limitations of this claim element, to the extent that additional information regarding the "selecting step" and its relationship to a "a dynamic load-balancing criterion" were deemed to be necessary to fully disclose this claim element, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to

extrapolate from the disclosures of Karol to such additional information at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results for at least the following reasons.

342. First, the '235 Patent specification also clearly admits that the prior art includes the disclosure of "Load-balancing algorithms" that "in general are well understood" (see, for example, Ex. 1001 at 11:38-39).

343. Second, selecting a network path at least in part on the basis of a dynamic load-balancing criterion, although thoroughly described in Karol, was also common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stevens, a common reference textbook on TCP/IP data networking protocols, describes that "*dynamic routing is normally used*" in networks with "redundant routes" (emphasis added, see, for example, Ex. 1007 at p. 127). Stevens describes a particular dynamic routing protocol "Open Shortest Path First" (or "OSPF") as an example of a "link state protocol" that is advantageous when "something changes, such as a router going down or a link going down" (see, for example, Ex. 1007 at p. 138). More specifically, Stevens notes that when several "routes to a destination exist, *OSPF distributes traffic equally among the routes*" and that "This is called *load balancing*" (emphasis in original but also added, see, for example, Ex. 1007 at p. 138).

344. Third, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stevens reference textbook to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stevens to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 10:1-8).

345. Fourth, even more disclosures of methods for selecting a network path at least in part on the basis of a dynamic load-balancing criterion were common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stallings, a common reference textbook on data and computer communications, describes "Routing is generally accomplished by maintaining a routing table" and that though the "*routing table may be* static or *dynamic*", a "*dynamic table is more flexible in responding to* both error and *congestion conditions*" (emphasis added, see, for example, Ex. 1011 at p. 539).

346. Fifth, Stallings further describes that a router "must avoid portions of the network that have failed and *should avoid portions of the network that are congested*" and that "In order to make such *dynamic routing decisions*, routers exchange routing information using a special routing protocol" with one example being "Open Shortest Path First (OSPF) Protocol" (emphasis added, see, for example, Ex. 1011 at pp. 549, 550, and 556). Stallings describes OSPF in terms of a "*link state routing algorithm*" wherein "Each router maintains descriptions of the

state of its local links to subnetworks, and *from time to time transmits updated state information* to all of the routers of which it is aware" such that OSPF computes routes based on a "user-configurable" function of "delay, data rate, dollar cost, or other factors" and thus "is *able to equalize loads over multiple* equal-cost *paths*" (emphasis added, see, for example, Ex. 1011 at p. 557).

347. Sixth, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stallings reference textbook to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64).

348. Seventh, for a person of ordinary skill in the art at the time of the invention it would have been obvious to try this common knowledge regarding routing to a dynamic load-balancing criterion at least because few other specific routing criterion alternatives (for example, routing based on a link reliability or security criterion instead of load-balancing) were in common usage with IP protocol based networking such as described in Karol beyond those techniques described herein within Stevens and/or Stallings at the time of the alleged invention of the '235 Patent, and furthermore, the '235 Patent explicitly admits that specific load-balancing algorithms were well understood. Thus, a person of

ordinary skill in the art at the time of the invention would also be highly likely to produce a successful and predictable result.

349. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

350. Although the forgoing description of the disclosures within Karol and other references within Karol clearly shows that either of Karol alone or Karol in view of the knowledge of the person of ordinary skill in the art meets the limitations of this claim element, to the extent that explicit combining of Karol with a second reference disclosing methods for selecting a network path "at least in part on the basis of a dynamic load-balancing criterion" were deemed to be necessary to fully meet the limitations of this claim element, then in my opinion a person of ordinary skill in the art at the time of the invention would have found the combination of Karol and Stallings to be obvious to try and to yield the predictable result that Karol and Stallings combined fully meet the limitations of this claim element as evident by at least the reasons described in ¶¶ 342-348 above.

351. Additionally, a person of ordinary skill in the art at the time of the invention would have been specifically motivated to combine Karol and Stallings at least because Karol explicitly references Stallings to describe attributes of the

CL-CO gateway (see, for example, Ex. 1006 at 12:59-64) and both Karol and Stallings describe selecting a network path dynamically based upon either or both of avoiding congested links or equalizing loads over multiple paths.

352. Therefore, in my opinion, Karol in view of Stallings also renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

'235 Patent: Claim 12

> 12. The method of claim 11, wherein repeated instances of the selecting step select between network paths at least in part on the basis of a dynamic load-balancing criterion which tends to balance line loads by distributing packets between lines.

12. The method of claim 11, wherein repeated instances of the selecting step select between network paths at least in part on the basis of a dynamic load-balancing criterion which tends to balance line loads by distributing packets between lines.

353. Karol either anticipates or one or more of Karol in view of the knowledge of the person of ordinary skill in the art or Karol in view of Stallings renders obvious the recited Claim 11 of this claim element under either the broadest reasonable interpretation or the various alternative interpretations described above for at least the reasons summarized in ¶¶ 335-352 above.

354. See at least ¶¶ 320-323 above regarding the selecting step and at least ¶¶ 337-339 above regarding the selection based at least in part on the basis of a dynamic load-balancing criterion.

355. Additionally, Karol provides numerous examples of how the "gateway processor **430**" and "flow database **433**" interact to determine whether a

particular packet belongs to a flow directed to the CO network or the CL network. For example, some flows correspond to sessions or applications such as "web access, telnet, file transfer, electronic mail, etc" that utilize the TCP transport layer while others such as "Internet telephony and other multimedia traffic" may use the "RTP (Real Time Protocol)" that "has been defined to use UDP" transport layer (see, for example, Ex. 1006 at 10:25-39 and FIG. 6). As Karol explains, certain packets carrying either TCP or UDP segments within certain sessions or applications as listed above are appropriate for a flow to the CO network while others are better directed to the CL network (see, for example, Ex. 1006 at 10:51-11:26 and FIG. 6).

356. Thus, in addition to Karol's explicit disclosure of the "method of claim 11, wherein repeated instances of the selecting step select between network paths at least in part on the basis of a dynamic load-balancing criterion" (for example, see the analysis at ¶¶ 335-352 above), Karol also discloses "distributing packets between lines" (for example, by directing packets associated with some flows to the CL network and by directing packets associated with other flows to the CO network).

357. Although the forgoing description of the disclosures within Karol clearly shows meeting the "repeated instances of the selecting step select between network paths at least in part on the basis of a dynamic load-balancing criterion"

and "distributing packets between lines" limitations of this claim element, to the extent that explicit additional disclosure that the outcome of such a step "tends to balance line loads" were deemed to be necessary to fully disclose this claim element, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such additional information at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results for at least the following reasons.

358. First, the '235 Patent specification also clearly admits that the prior art includes the disclosure of "Load-balancing algorithms" that "in general are well understood" (see, for example, Ex. 1001 at 11:38-39).

359. Second, selecting a network path at least in part on the basis of a dynamic load-balancing criterion is thoroughly described in Karol, but more specifically the case where such selection "tends to balance line loads" was also common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stevens, a common reference textbook on TCP/IP data networking protocols, describes that "*dynamic routing is normally used*" in networks with "redundant routes" (emphasis added, see, for example, Ex. 1007 at p. 127). Stevens describes a particular dynamic routing protocol "Open Shortest

Path First" (or "OSPF") as an example of a "link state protocol" that is advantageous when "something changes, such as a router going down or a link going down" (see, for example, Ex. 1007 at p. 138). More specifically, Stevens notes that when several "routes to a destination exist, *OSPF distributes traffic equally among the routes*" and that "This is called *load balancing*" (emphasis in original but also added, see, for example, Ex. 1007 at p. 138).

360. Third, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stevens reference textbook to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stevens to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 10:1-8).

361. Fourth, even more disclosures of methods for selecting a network path at least in part on the basis of a dynamic load-balancing criterion that "tends to balance line loads" were common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stallings, a common reference textbook on data and computer communications, describes "Routing is generally accomplished by maintaining a routing table" and that though the "*routing table may be* static or *dynamic*", a "*dynamic table is more flexible in responding to* both error and *congestion conditions*" (emphasis added, see, for example, Ex. 1011 at p. 539).

362. Fifth, Stallings further describes that a router "must avoid portions of the network that have failed and *should avoid portions of the network that are congested*" and that "In order to make such *dynamic routing decisions*, routers exchange routing information using a special routing protocol" with one example being "Open Shortest Path First (OSPF) Protocol" (emphasis added, see, for example, Ex. 1011 at pp. 549, 550, and 556). Stallings describes OSPF in terms of a "*link state routing algorithm*" wherein "Each router maintains descriptions of the state of its local links to subnetworks, and *from time to time transmits updated state information* to all of the routers of which it is aware" such that OSPF computes routes based on a "user-configurable" function of "delay, data rate, dollar cost, or other factors" and thus "is *able to equalize loads over multiple* equal-cost *paths*" (emphasis added, see, for example, Ex. 1011 at p. 557).

363. Sixth, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stallings reference textbook to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64).

364. Seventh, Patent Owner specifically alleges that a packet routing appliance meets the limitations of this claim element under Patent Owner's proposed claim constructions based upon a documented description of "Load

Balancing option" as "traffic is put on the best path until that path runs out of available bandwidth. The additional traffic will then spill over to the next best path" (see, for example, Ex. 1010 at Appendix I at p. 21). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol in view of the common knowledge to a person of ordinary skill in the art at the time of the invention meet the limitations of this claim element.

365. Eighth, for a person of ordinary skill in the art at the time of the invention it would have been obvious to try this common knowledge regarding routing to a dynamic load-balancing criterion that "tends to balance line loads" at least because no specific _*dynamic load-balancing criterion*_ alternatives that "tend to _*not*_ balance line loads" were in common usage with IP protocol based networking such as described in Karol – instead only those techniques that do "tend to balance line loads", such as those described herein within Stevens and/or Stallings, were in common usage. Thus, a person of ordinary skill in the art at the time of the invention would also be highly likely to produce a successful and predictable result.

366. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim

element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

367. Although the forgoing description of the disclosures within Karol and other references within Karol clearly shows that Karol in view of the knowledge of the person of ordinary skill in the art meets the limitations of this claim element, to the extent that explicit combining of Karol with a second reference disclosing methods for selecting a network path "at least in part on the basis of a dynamic load-balancing criterion" that "tends to balance line loads by distributing packets between lines" were deemed to be necessary to fully meet the limitations of this claim element, then in my opinion a person of ordinary skill in the art at the time of the invention would have found the combination of Karol and Stallings to be obvious to try and to yield the predictable result that Karol and Stallings combined fully meet the limitations of this claim element as evident by at least the reasons described in ¶¶ 358-365 above.

368. Additionally, a person of ordinary skill in the art at the time of the invention would have been specifically motivated to combine Karol and Stallings at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64) and both Karol and Stallings describe selecting a network path dynamically based upon either or both of avoiding congested links or equalizing loads over multiple paths.

369. Therefore, in my opinion, Karol in view of Stallings also renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

<u>'235 Patent: Claim 13</u>

> 13. The method of claim 11, wherein repeated instances of the selecting step select between network paths at least in part on the basis of a dynamic load-balancing criterion which tends to balance network loads by distributing packets between disparate networks.

13. The method of claim 11, wherein repeated instances of the selecting step select between network paths at least in part on the basis of a dynamic load-balancing criterion which tends to balance network loads by distributing packets between disparate networks.

370. Karol either anticipates or one or more of Karol in view of the knowledge of the person of ordinary skill in the art or Karol in view of Stallings renders obvious the recited Claim 11 of this claim element under either the broadest reasonable interpretation or the various alternative interpretations described above for at least the reasons summarized in ¶¶ 335-352 above.

371. See at least ¶¶ 320-323 above regarding the selecting step and at least ¶¶ 337-339 above regarding the selection based at least in part on the basis of a dynamic load-balancing criterion.

372. Additionally, Karol provides numerous examples of how the "gateway processor **430**" and "flow database **433**" interact to determine whether a particular packet belongs to a flow directed to the CO network or the CL network. For example, some flows correspond to sessions or applications such as "web

access, telnet, file transfer, electronic mail, etc" that utilize the TCP transport layer while others such as "Internet telephony and other multimedia traffic" may use the "RTP (Real Time Protocol)" that "has been defined to use UDP" transport layer (see, for example, Ex. 1006 at 10:25-39 and FIG. 6). As Karol explains, certain packets carrying either TCP or UDP segments within certain sessions or applications as listed above are appropriate for a flow to the CO network while others are better directed to the CL network (see, for example, Ex. 1006 at 10:51-11:26 and FIG. 6).

373. Thus, in addition to Karol's explicit disclosure of the "method of claim 11, wherein repeated instances of the selecting step select between network paths at least in part on the basis of a dynamic load-balancing criterion" (for example, see the analysis at ¶¶ 335-352 above), Karol also discloses "distributing packets between disparate networks" (for example, by directing packets associated with some flows to the CL network and by directing packets associated with other flows to the CO network).

374. Although the forgoing description of the disclosures within Karol clearly shows meeting the "repeated instances of the selecting step select between network paths at least in part on the basis of a dynamic load-balancing criterion" and "distributing packets between disparate networks" limitations of this claim element, to the extent that explicit additional disclosure that the outcome of such a

step “tends to balance network loads” were deemed to be necessary to fully disclose this claim element, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such additional information at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results for at least the following reasons.

375. First, the ‘235 Patent specification also clearly admits that the prior art includes the disclosure of “Load-balancing algorithms” that “in general are well understood” (see, for example, Ex. 1001 at 11:38-39).

376. Second, selecting a network path at least in part on the basis of a dynamic load-balancing criterion is thoroughly described in Karol, but more specifically the case where such selection “tends to balance network loads” was also common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stevens, a common reference textbook on TCP/IP data networking protocols, describes that “*dynamic routing is normally used*” in networks with “redundant routes” (emphasis added, see, for example, Ex. 1007 at p. 127). Stevens describes a particular dynamic routing protocol “Open Shortest Path First” (or “OSPF”) as an example of a “link state protocol” that is advantageous when “something changes, such as a router going down or a link

going down" (see, for example, Ex. 1007 at p. 138). More specifically, Stevens notes that when several "routes to a destination exist, *OSPF distributes traffic equally among the routes*" and that "This is called *load balancing*" (emphasis in original but also added, see, for example, Ex. 1007 at p. 138).

377. Third, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stevens reference textbook to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stevens to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 10:1-8).

378. Fourth, even more disclosures of methods for selecting a network path at least in part on the basis of a dynamic load-balancing criterion that "tends to balance network loads" were common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stallings, a common reference textbook on data and computer communications, describes "Routing is generally accomplished by maintaining a routing table" and that though the "*routing table may be* static or *dynamic*", a "*dynamic table is more flexible in responding to* both error and *congestion conditions*" (emphasis added, see, for example, Ex. 1011 at p. 539).

379. Fifth, Stallings further describes that a router "must avoid portions of the network that have failed and *should avoid portions of the network that are*

congested" and that "In order to make such *dynamic routing decisions*, routers exchange routing information using a special routing protocol" with one example being "Open Shortest Path First (OSPF) Protocol" (emphasis added, see, for example, Ex. 1011 at pp. 549, 550, and 556). Stallings describes OSPF in terms of a "*link state routing algorithm*" wherein "Each router maintains descriptions of the state of its local links to subnetworks, and *from time to time transmits updated state information* to all of the routers of which it is aware" such that OSPF computes routes based on a "user-configurable" function of "delay, data rate, dollar cost, or other factors" and thus "is *able to equalize loads over multiple* equal-cost *paths*" (emphasis added, see, for example, Ex. 1011 at p. 557).

380. Sixth, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stallings reference textbook to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64).

381. Seventh, Patent Owner specifically alleges that a packet routing appliance meets the limitations of this claim element under Patent Owner's proposed claim constructions based upon a documented description of "Load Balancing option" as "traffic is put on the best path until that path runs out of available bandwidth. The additional traffic will then spill over to the next best

path" (see, for example, Ex. 1010 at Appendix I at p. 21). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol in view of the common knowledge to a person of ordinary skill in the art at the time of the invention meet the limitations of this claim element.

382. Eighth, for a person of ordinary skill in the art at the time of the invention it would have been obvious to try this common knowledge regarding routing to a dynamic load-balancing criterion that "tends to balance network loads" at least because no specific *dynamic load-balancing criterion* alternatives that "tend to *not* balance network loads" were in common usage with IP protocol based networking such as described in Karol – instead only those techniques that do "tend to balance network loads", such as those described herein within Stevens and/or Stallings, were in common usage. Thus, a person of ordinary skill in the art at the time of the invention would also be highly likely to produce a successful and predictable result.

383. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 74 above).

384. Although the forgoing description of the disclosures within Karol and other references within Karol clearly shows that Karol in view of the knowledge of the person of ordinary skill in the art meets the limitations of this claim element, to the extent that explicit combining of Karol with a second reference disclosing methods for selecting a network path "at least in part on the basis of a dynamic load-balancing criterion" that "tends to balance network loads by distributing packets between disparate networks" were deemed to be necessary to fully meet the limitations of this claim element, then in my opinion a person of ordinary skill in the art at the time of the invention would have found the combination of Karol and Stallings to be obvious to try and to yield the predictable result that Karol and Stallings combined fully meet the limitations of this claim element as evident by at least the reasons described in ¶¶ 375-382 above.

385. Additionally, a person of ordinary skill in the art at the time of the invention would have been specifically motivated to combine Karol and Stallings at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64) and both Karol and Stallings describe selecting a network path dynamically based upon either or both of avoiding congested links or equalizing loads over multiple paths.

386. Therefore, in my opinion, Karol in view of Stallings also renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 74 above).

‘235 Patent: Claim 14

14. The method of claim 5, wherein the selecting step selects the network path at least in part on the basis of a reliability criterion.

14. The method of claim 5, wherein the selecting step selects the network path at least in part on the basis of a reliability criterion.

387. Karol either anticipates or one or more of Karol in view of the knowledge of the person of ordinary skill in the art or Karol in view of Stallings renders obvious the recited Claim 5 of this claim element under either the broadest reasonable interpretation or the various alternative interpretations described above for at least the reasons summarized in ¶¶ 203-296 above.

388. See ¶¶ 320-323 above.

389. Karol also explains that this system of parallel CL and CO networks with path selection for each packet based on flow characteristics has numerous advantages for long distance enterprise connectivity. For example, Karol discloses that “the advantage to a user is that the user can ask for and *receive a guaranteed quality of service for a specific flow*” and “The advantage to a service provider is that bandwidth utilization in a packet-switched CO network is better than in a CL network with precomputed routes since *bandwidth can be dynamically allocated to flows on an as-needed basis*” (emphasis added, see, for example, Ex. 1006 at

17:18-26). In particular Karol notes that "dynamically adjusting link weights in the routing protocol can also be extended to include *diverting connections away from congested links*" or "In other words, link weights can be adjusted to *reflect bandwidth availability*" (emphasis added, see, for example, Ex. 1006 at 17:63-18:2).

390. Thus, Karol discloses the "selecting step" that "selects the network path" (for example, as described in ¶¶ 280-291 above), and further that such step be made "at least in part on the basis of a reliability criterion" (for example, the flows at CL-CO gateway that get routed to the CL or CO network are selected based upon ensuring reliability for such flows by guaranteeing quality of service, meeting bandwidth needs, and diverting away from congested links).

391. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

392. Although the forgoing description of the disclosures within Karol clearly shows meeting the limitations of this claim element, to the extent that additional information regarding the "selecting step" and its relationship to a "a reliability criterion" were deemed to be necessary to fully disclose this claim element, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate

from the disclosures of Karol to such additional information at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results for at least the following reasons.

393. First, the '235 Patent specification clearly admits that the prior art includes the disclosure of a router that selects a network path for data packets to one or the other of at least two disparate parallel network paths on the basis of a reliability criterion (i.e. for purposes of "fault tolerance", "redundancy", "backup", "disaster recovery", "continuity", or "failover") (see, for example, Ex. 1001 at 3:19-28, 9:52-60 and FIG. 2).

394. Second, the '235 Patent specification also clearly admits that the prior art includes the disclosure of "Techniques and tools for detecting network path failures" that are "generally well understood" (see, for example, Ex. 1001 at 11:17-18).

395. Third, with respect to the disparate parallel networks of FIG. 5, the disclosure of the '235 Patent specification also clearly admits that the prior art includes the disclosure of configuring the packet routing to "send all traffic over a VPN 502" whenever the "frame relay" network "fails" (see, for example, Ex. 1001 at 4:21-23 and FIG. 5).

396. Fourth, selecting a network path at least in part on the basis of a reliability criterion, although thoroughly described in Karol, was also common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stevens, a common reference textbook on TCP/IP data networking protocols, describes that "*dynamic routing* is normally used" in networks with "*redundant routes*" (emphasis added, see, for example, Ex. 1007 at p. 127). Stevens describes a particular dynamic routing protocol "Open Shortest Path First" (or "OSPF") as an example of a "*link state protocol*" that is advantageous when "*something changes, such as* a router going down or a *link going down*" (emphasis added, see, for example, Ex. 1007 at p. 138).

397. Fifth, Stevens also describes "ping" and the "Internet Control Message Protocol" (or "ICMP") that can be used, for example, to perform a "*basic connectivity test* between two systems running TCP/IP" (emphasis added, see, for example, Ex. 1007 at p. 96).

398. Sixth, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stevens reference textbook to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stevens to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 10:1-8).

399. Seventh, even more disclosures of methods for selecting a network path at least in part on the basis of reliability criterion were common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stallings, a common reference textbook on data and computer communications, describes "Routing is generally accomplished by maintaining a routing table" and that though the "*routing table may be* static or *dynamic*", a "*dynamic table is more flexible in responding to* both *error* and congestion *conditions*" (emphasis added, see, for example, Ex. 1011 at p. 539).

400. Eighth, Stallings further describes that a router "*must avoid portions of the network that have failed* and should avoid portions of the network that are congested" and that "In order to make such *dynamic routing decisions*, routers exchange routing information using a special routing protocol" with one example being "Open Shortest Path First (OSPF) Protocol" (emphasis added, see, for example, Ex. 1011 at pp. 549, 550, and 556). Stallings describes OSPF in terms of a "*link state routing algorithm*" wherein "*Each router maintains descriptions of the state of its local links to subnetworks*, and from time to time transmits updated state information to all of the routers of which it is aware" (emphasis added, see, for example, Ex. 1011 at p. 557).

401. Ninth, Stallings also describes the "Internet Control Message Protocol" (or "ICMP") that "*provides feedback about problems in the*

communication environment" and can be used, for example, to determine if a "*datagram cannot reach its destination*" or to update a router that it can "send traffic on a shorter route" (emphasis added, see, for example, Ex. 1011 at pp. 546-549).

402. Tenth, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stallings reference textbook to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64).

403. Eleventh, for a person of ordinary skill in the art at the time of the invention it would have been obvious to try this common knowledge regarding routing to a reliability criterion at least because only a few other routing criteria such as load-balancing or security were in common usage with IP protocol based networking such as described in Karol and within Stevens and/or Stallings. Thus, a person of ordinary skill in the art at the time of the invention would also be highly likely to produce a successful and predictable result.

404. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

405. Although the forgoing description of the disclosures within Karol and other references within Karol clearly shows that Karol in view of the knowledge of the person of ordinary skill in the art meets the limitations of this claim element, to the extent that explicit combining of Karol with a second reference disclosing methods for selecting a network path "at least in part on the basis of a reliability criterion" were deemed to be necessary to fully meet the limitations of this claim element, then in my opinion a person of ordinary skill in the art at the time of the invention would have found the combination of Karol and Stallings to be obvious to try and to yield the predictable result that Karol and Stallings combined fully meet the limitations of this claim element as evident by at least the reasons described in ¶¶ 393-403 above.

406. Additionally, a person of ordinary skill in the art at the time of the invention would have been specifically motivated to combine Karol and Stallings at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64) and both Karol and Stallings describe selecting a network path dynamically based upon either or both of avoiding congested links or avoiding portions of the network that have failed.

407. Therefore, in my opinion, Karol in view of Stallings also renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

<u>'235 Patent: Claim 15</u>

15. The method of claim 5, wherein the selecting step selects the network path at least in part on the basis of a security criterion.

15. The method of claim 5, wherein the selecting step selects the network path at least in part on the basis of a security criterion.

408. Karol either anticipates or one or more of Karol in view of the knowledge of the person of ordinary skill in the art or Karol in view of Stallings renders obvious the recited Claim 5 of this claim element under either the broadest reasonable interpretation or the various alternative interpretations described above for at least the reasons summarized in ¶¶ 203-296 above.

409. See ¶¶ 320-323 above.

410. Although the forgoing description of the disclosures within Karol clearly shows meeting the "the selecting step selects the network path at least in part on the basis of" a routing "criterion" limitations of this claim element, to the extent that explicit additional disclosure that the routing criterion is specifically a "security criterion" were deemed to be necessary to fully disclose this claim element, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such additional information at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results for at least the following reasons.

411. First, the '235 Patent specification clearly admits that the prior art includes the disclosure of disparate parallel network paths comprising at least one private network path (such as a frame relay network) and one Internet-protocol based network path (such as the public Internet or a VPN) as illustrated in FIG. 5 of the '235 Patent (see, for example, Ex. 1001 at 4:25-27 and FIG. 5). More specifically, the '235 Patent specification discloses that the admitted prior art of Fig. 5 specifically includes routing decisions for packets originating at one site and destined for another site over at least two disparate parallel networks wherein such routing decision considerations include a security criterion such as the availability of a secure virtual private network (or VPN) link (see, for example, Ex. 1001 at 4:5-14 and FIG. 5).

412. Second, disclosures of methods for selecting a network path at least in part on the basis of security criterion were common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stallings, a common reference textbook on data and computer communications, describes "*Routing tables may also be used to support* other internetworking *services such as those governing security*" (emphasis added, see, for example, Ex. 1011 at p. 539). Stallings provides an example where "*individual networks* might be classified to *handle data up to a given security classification*" and thus the "*routing mechanism must assure that data of a given security level are not allowed to pass through*

networks not cleared to handle such data" (emphasis added, see, for example, Ex. 1011 at p. 539).

413. Third, Stallings illustrates an exemplary corporate WAN whereby a "*virtual private network* via tunnel mode" is used over the Internet via a "*security gateway*" to each "internal network" for each corporate site location (emphasis added, see, for example, Ex. 1011 at pp. 661-662 and FIGURE 18.23).

414. Fourth, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stallings reference textbook to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64).

415. Fifth, Patent Owner specifically alleges that a packet routing appliance meets the limitations of this claim element under Patent Owner's proposed claim constructions based upon an excerpted document that never describes a routing selection based upon a security criterion but instead simply describes routing based upon a "failover" criterion (see, for example, Ex. 1010 at Appendix I at p. 25 and image shown below). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol in view of Stallings or the common knowledge to a person of

ordinary skill in the art at the time of the invention meet the limitations of this claim element.

416.

> local access to websites. If the Internet connection or its firewall fails, users may lose access to the Internet. It is possible to have the APN failover the Internet Service into a Conduit for backhauling to a data center, where it can be firewalled and directed to the Internet. While this ability is useful, it is only applicable for one-ended WAN Link availability sensitivity. In some networks, there exists a need for Intranet routes to be sensitive to network-wide health status.
>
> It is also possible to have route eligibility contingent on a single WAN Path instead of on a WAN Link.
>
> For example, let us say we have an Intranet Service bound to an MPLS network that has two sites connected with an APN node on each site. If we utilized the above method of having the route eligibility tied to the one-sided WAN Link state, then the WAN Link being down would be identified and the traffic would fall into the backup service as noted prior. At the remote site, the problem may occur such that when a packet is sent in a return direction, traditional routers may not be aware that the MPLS link is down and of the inability to reach the site across the MPLS network. The remote site would send the packet to the initiating site using the Intranet Service bound to the still operational local MPLS link. Because the last mile MPLS link is still down, the return packet will be lost in the MPLS cloud and never arrive at its intended destination. A health check of the network is needed to determine the eligibility end–to-end across the WAN. For this reason, you may choose to have a particular route's eligibility tied to the WAN Path that travels between these sites using the MPLS link at both sites in each unidirectional direction.

417. Sixth, for a person of ordinary skill in the art at the time of the invention it would have been obvious to try this common knowledge regarding routing to a security criterion at least because only a few other routing criteria such as load-balancing or reliability were in common usage with IP protocol based networking such as described in Karol and within Stevens and/or Stallings. Thus, a person of ordinary skill in the art at the time of the invention would also be highly likely to produce a successful and predictable result.

418. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

419. Although the forgoing description of the disclosures within Karol and other references within Karol clearly shows that Karol in view of the knowledge of the person of ordinary skill in the art meets the limitations of this claim element, to the extent that explicit combining of Karol with a second reference disclosing methods for selecting a network path "at least in part on the basis of a security criterion" were deemed to be necessary to fully meet the limitations of this claim element, then in my opinion a person of ordinary skill in the art at the time of the invention would have found the combination of Karol and Stallings to be obvious to try and to yield the predictable result that Karol and Stallings combined fully meet the limitations of this claim element as evident by at least the reasons described in ¶¶ 411-417 above.

420. Additionally, a person of ordinary skill in the art at the time of the invention would have been specifically motivated to combine Karol and Stallings at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64) and both Karol and Stallings describe selecting a network path dynamically based upon either or both of avoiding congested links or avoiding links with an inadequate security level.

421. Therefore, in my opinion, Karol in view of Stallings also renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

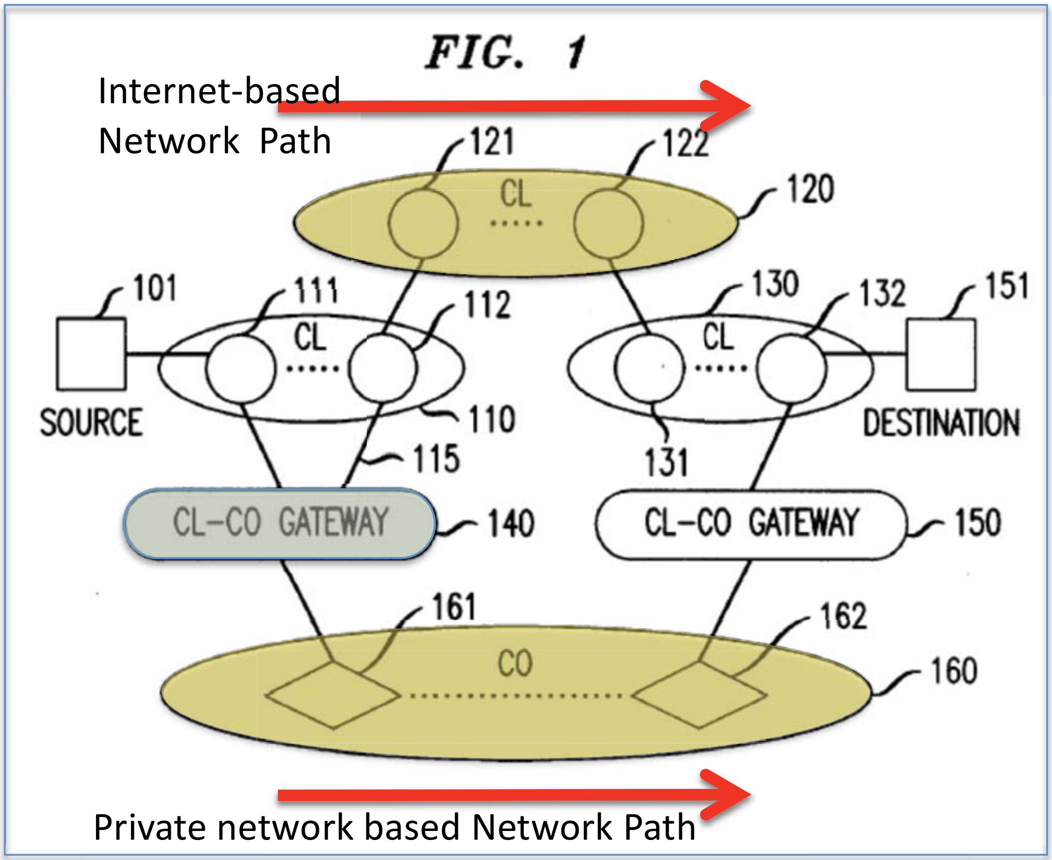
'235 Patent: Claim 19

> 19. A method for combining connections for access to parallel networks, the method comprising the steps of:
>
> sending a packet to a site interface of a controller, the controller comprising the site interface which receives packets, at least two network interfaces to parallel networks, and a packet path selector which selects between the network interfaces on a per-session basis to promote load-balancing;
>
> and forwarding the packet-through the network interface selected byte packet path selector;
>
> wherein the step of sending a packet to the controller site interface is repeated as multiple packets are sent, and the controller sends different packets of a given message to different parallel networks.

19(a). A method for combining connections for access to parallel networks, the method comprising the steps of:

422. In my opinion, this preamble is a claim limitation.

423. Karol discloses systems and methods of operation thereof whereby a "CL-CO gateway", alone or in combination with one or more routers and/or switches, controls access to either a "connectionless" (or "CL") network data path or to a "connection oriented" (or "CO) network data path (see, for example, Ex. 1006 at 1:7-16). Karol specifically describes the CL network as being based upon the "Internet Protocol or "IP"" and the CO network as being based upon "ATM, MPLS, RSVP" or a "telephony network" (see, for example, Ex. 1006 at 1:7-16, 2:52-58). This is further illustrated in and described with respect to FIG. 1 of Karol (see, for example, ¶¶ 85-93 above, Ex. 1006 at 2:65-67, 4:36-67, and FIG. 1 as annotated herein).



424.

425. In view of Karol's detailed description, either of the CL-CO gateway or the combination of the CL-CO gateway with one or more routers and/or switches discloses a combination of connections for the access network path that an IP datagram (or "packet") from the "source" at a first site or location would take to a "destination" at second site or location. Karol describes the available network paths as "two *different, parallel* routes" with one route being based upon the connectionless Internet protocol and the other based upon a connection oriented protocol such as "MPLS" (emphasis added, see, for example, Ex. 1006 at 4:40-44, ¶¶ 85-93 above). Karol also specifically discloses for the CL and CO networks

that the "*parallel configuration* could occur, for example, if *two service providers*, one with an IP-router-based network and the other with a CO-switch-based network, offer enterprises "long-distance" connectivity of their geographically distributed networks" (emphasis added, see, for example, Ex. 1006 at 3:47-51).

426. Thus, Karol discloses a "method for combining connections" (for example, either of the CL-CO gateway or the combination of the CL-CO gateway with one or more routers and/or switches shown in annotated FIG. 1 herein when operated as described), that such method is "for access to parallel networks" (for example, either of the CL-CO gateway or the combination of the CL-CO gateway with one or more routers and/or switches shown in annotated FIG. 1 herein is disclosed to route any given IP datagram or packet from source to destination over one of the CL network path based on, for example, the Internet protocol or the CO path based on, for example, the ATM or MPLS protocol), and wherein such multiple networks "parallel" per the broadest reasonable construction at least because they provide for "alternate data paths" (for example, the CL path and the CO path are described as "two *different, parallel* routes").

427. Note that Patent Owner specifically alleges that a combination of a packet routing appliance with other routers and/or switches connected to a first network using an Internet protocol and a second network using an MPLS protocol meets the limitations of this claim element under Patent Owner's proposed claim

constructions (see, for example, Ex. 1010 at Appendix I at p. 1, as reproduced herein). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

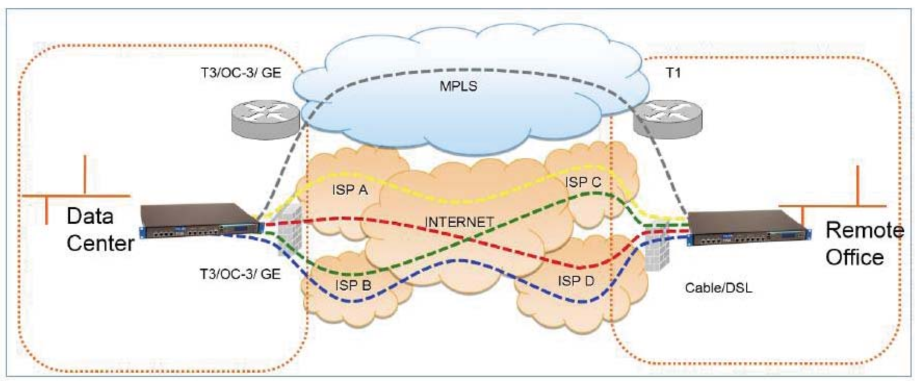


Figure 2: Customer Network with Talari APN

428. © Talari Networks, Inc., 2015 30

429. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 79 above).

430. To the extent that in the alternative, the broadest reasonable interpretation for meeting this claim element were considered to require that the term "parallel networks" should mean that at least one of the "alternate data paths" be over "a frame relay or point-to-point network", for example, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to

such an interpretation at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results as evident by at least the following reasons.

431. First, Karol discloses that the CO network can be represented as a "non-broadcast network" that includes "point-to-point links" and that the CO network can be a "telephony network" (see, for example, Ex. 1006 at 2:52-58, 13:55-67).

432. Second, the '235 Patent discloses in reference to "private networks" that are "disparate" from networks based upon Internet protocol that such networks may be "a point-to-point network, such as a T1 or T3 connection" (see, for example, Ex. 1001 at 1:59-60).

433. Third, a person of ordinary skill in the art at the time of the invention would understand that Karol's disclosure that the CO network can be a "telephony network" teaches that the CO network is a "private network" under the alternate interpretation at least because the '235 Patent admits that "a point-to-point network" can be a "T1 or T3 connection", both of which are well known to a person of ordinary skill in the art at the time of the invention to be examples of Karol's "point-to-point links" within a "telephony network".

434. Fourth, a person of ordinary skill in the art at the time of the invention would consider a "frame relay" network to be a well known example of a

connection oriented or CO network as described in Karol and moreover such description is explicitly provided within the intrinsic record of Karol (see, for example, ¶¶ 129 and 141 above). At least because only a finite number of CO networks appropriate to the disclosures in Karol of "combining connections for access" to an Internet-based network in parallel with a CO network from a second provider were known at the time of the invention, such as MPLS, ATM or frame relay CO networks, a person of ordinary skill in the art at the time of the invention would have found substituting for an MPLS or ATM exemplary CO network as explicitly disclosed in Karol with a known frame relay exemplary CO network to be obvious to try in the context of Karol and this claim element. Furthermore, at least because the characteristics of such MPLS, ATM, or frame relay exemplary CO networks would have been readily understood by a person of ordinary skill in the art at the time of the invention, such a substition to a frame relay CO network would be highly likely to produce a successful and predictable result.

435. Fifth, the '235 Patent explicitly admits that a person of ordinary skill in the art at the time of the invention would have known about routing packets across multiple parallel disparate networks wherein a first network is Internet-based and a second network that is frame relay based (see, for example, ¶¶ 113-114 above). At least because only a finite number of CO networks appropriate to the disclosures in Karol of "combining connections for access" to an Internet-based

network in parallel with a CO network from a second provider were known at the time of the invention, such as MPLS, ATM or frame relay CO networks, a person of ordinary skill in the art at the time of the invention would have found substituting for an MPLS or ATM exemplary CO network as explicitly disclosed in Karol with a known frame relay exemplary CO network to be obvious to try in the context of Karol and this claim element. Furthermore, at least because the characteristics of such MPLS, ATM, or frame relay exemplary CO networks would have been readily understood by a person of ordinary skill in the art at the time of the invention, such a substition to a frame relay CO network would be highly likely to produce a successful and predictable result.

436. At least because Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the narrower alternative interpretation described above (see ¶ 430 above), then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element (see ¶ 79 above).

437. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element either under the broadest reasonable interpretation of this claim element

(see ¶ 79 above) or under the alternative interpretation described above (see ¶ 430 above).

19(b): sending a packet to a site interface of a controller, the controller comprising the site interface which receives packets, at least two network interfaces to parallel networks, and a packet path selector which selects between the network interfaces on a per-session basis to promote load-balancing;

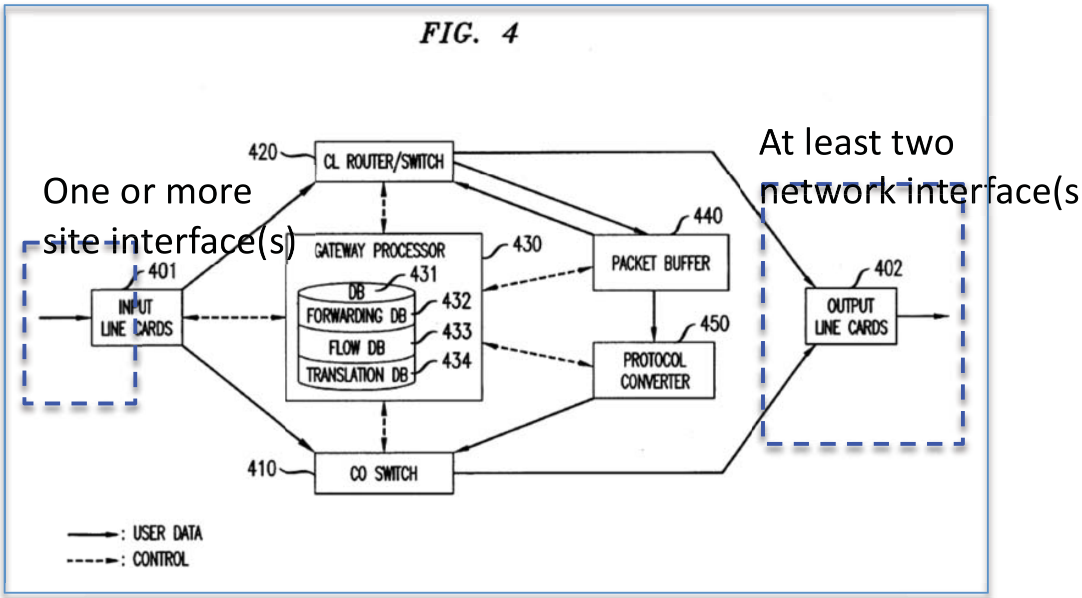
438. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, comprises at least one "interface" that connects the "controller" of Karol (see, for example, ¶¶ 155-158 above) with "a source endpoint" or "a destination endpoint" at an "enterprise" location (see, for example, Ex. 1006 at 3:44-51, 4:36-44, 4:65-67, and FIG. 1 as annotated herein in ¶ 424 above).

439. In view of Karol's detailed description, either of the CL-CO gateway or the combination of the CL-CO gateway with one or more routers and/or switches discloses a "controller" that controls the network path that an IP datagram (or "packet") that has been sent from the "source" at a first site or location would take to a "destination" at second site or location (see, for example, ¶¶ 85-93 above).

440. More specifically, Karol discloses an exemplary depiction of structural elements within the CL-CO gateway wherein one or more "input line cards **401**" are utilized to receive packets at the CL-CO gateway sent from local network routers/switches and source/destination endpoints via a network

connection as further illustrated in and described with respect to FIG. 4 of Karol (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein).

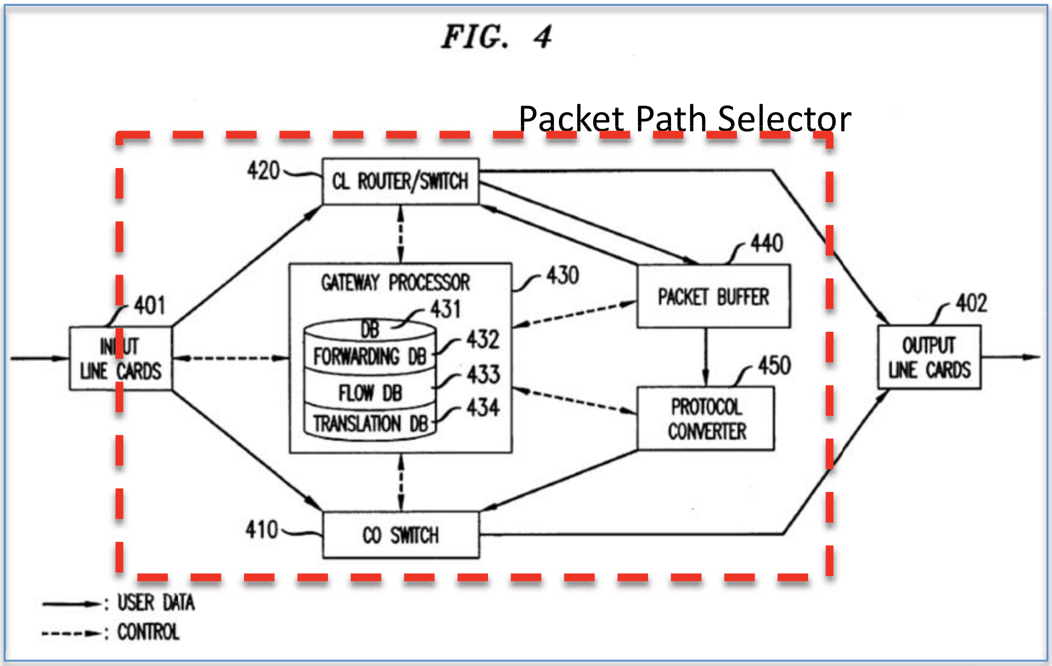
441.



442. Additionally, Karol discloses an exemplary depiction of structural elements within the CL-CO gateway wherein at least two "output line cards **402**" are utilized to "receive datagrams from either of" the "CO switch **410** or CL router/switch **420**" and then "direct them to external networks" as further illustrated in and described with respect to FIG. 4 of Karol (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein in ¶ 171 above). Note that while FIG. 4 of Karol illustrates only one symbol "**402**" for the "output line cards", this clearly discloses at least two such "output line cards" that send packets over network interfaces to the two respective CL and CO networks as

evident at least by the two paths depicted into symbol "**402**" in FIG. 4, the written description of FIG. 4 within Karol, the use of the plural "output line *cards*" instead of the singular "output line *card*" within symbol "**402**" in FIG. 4, and the two network interfaces depicted from the CL-CO gateway to nodes "**112**" and "**161**" in FIG. 1 (see, for example, Ex. 1006 at 4:36-67, FIG. 1, and FIG. 4).

443. Karol further discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, comprises at least a "gateway processor", a "CL router/switch", a "CO switch", a "packet buffer", a "protocol converter" and one or more "input line cards" that together are used to determine if a particular packet (or "datagram") from a "source endpoint" should be forwarded to either of the "CL network" or the "CO network" based on multiple criteria including whether or not a valid connection through the CO network is presently available for the particular packet as further illustrated in and described with respect to FIG. 4 of Karol (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:31-50 and FIG. 4 as annotated herein).

444. 

445. As Karol discloses explicitly, "datagrams received in input line cards **401** can be directed either to CO switch **410** or CL router/switch **420**" so that "output line cards **402** can receive datagrams from either of the last mentioned elements and direct them to external networks" (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein in ¶ 182 above). One exemplary methodology for routing particular packets or datagrams within Karol is the use of the "forwarding database **432**" within the gateway processor to determine if a particular packet matches a combination of "Destination IP address; Next hop router; Outgoing port (interface)" that would cause such a packet to be routed to the CL network or to be considered for routing over the CO network (see, for example, Ex. 1006 at 7:36-41).

446. For those particular packets that are candidates for the CO network, Karol also discloses that each such packet is compared at the gateway processor with the "flow database **433**" to determine if a particular packet matches a desired combination of "(a) an outgoing port field, which indicates the port on which a datagram whose entries match a particular record's entries is forwarded; (b) if the outgoing port is "invalid," the next field "forward or hold" entry indicates whether packet should be forwarded or held in packet buffer **440**; (c) destination address; (d) source address; (e) source port; (f) destination port; (g) type of service; (h) protocol field; (i) TCP Flags; (j) outgoing port; (k) forward or hold flag, and (l) a mask which indicates which of the data entries is applicable to the particular record" in order to route such a packet to the CO network instead of the CL network depending on availability of a valid connection in the CO network for a flow associated with the particular packet (see, for example, Ex. 1006 at 7:42-54).

447. Thus, Karol summarizes the use of the gateway processor by noting that "the processes performed in CL-CO gateways that enable the internetworking of connectionless IP networks and CO networks" accomplish two primary functions that are i) handling "IP packets that arrive at CL-CO gateways to be carried on (not-yet-established) connections in the CO network, plus IP packets that arrive at CL-CO gateways but then remain in the CL network", and ii) creating

"routing tables that enable data flow from the CL network to the CO network" (see, for example, Ex. 1006 at 7:60-8:2).

448. Karol provides numerous examples of how the "gateway processor **430**" and "flow database **433**" interact to determine whether a particular packet belongs to a flow directed to the CO network or the CL network. For example, some flows correspond to sessions or applications such as "web access, telnet, file transfer, electronic mail, etc" that utilize the TCP transport layer while others such as "Internet telephony and other multimedia traffic" may use the "RTP (Real Time Protocol)" that "has been defined to use UDP" transport layer (see, for example, Ex. 1006 at 10:25-39 and FIG. 6). As Karol explains, certain packets carrying either TCP or UDP segments within certain sessions or applications as listed above are appropriate for a flow to the CO network while others are better directed to the CL network (see, for example, Ex. 1006 at 10:51-11:26 and FIG. 6).

449. Karol also explains that this system of parallel CL and CO networks with path selection for each packet based on flow characteristics has numerous advantages for long distance enterprise connectivity. For example, Karol discloses that "the advantage to a user is that the user can ask for and receive a guaranteed quality of service for a specific flow" and "The advantage to a service provider is that ***bandwidth utilization*** in a packet-switched CO network is better than in a CL network with precomputed routes since bandwidth can be ***dynamically allocated to***

flows on an as-needed basis" (emphasis added, see, for example, Ex. 1006 at 17:18-26). In particular Karol notes that "*dynamically adjusting link weights* in the routing protocol can also be extended *to include diverting connections away from congested links*" or "In other words, *link weights can be adjusted to reflect bandwidth availability*" (emphasis added, see, for example, Ex. 1006 at 17:63-18:2).

450. Thus, Karol discloses a "controller" (for example, the CL-CO gateway) that is connected to a "site" (for example, local network routers/switches and/or source/destination endpoints) via a "site interface" (for example, one or more of the input line cards and/or a network connection) and the step of "sending a packet" to such a "site interface" (for example, the source endpoint sends a packet to the CL-CO gateway for routing to the destination endpoint). Karol further discloses a "controller" (for example, the CL-CO gateway) that has at least two "network interfaces" (for example, the output line cards respectively coupling the CL router to the CL network and the CO switch to the CO network), which are interfaces to "parallel networks" (for example, the CL and CO networks). Karol also discloses a "packet path selector" (for example, the structural elements depicted in annotated FIG. 4 herein in ¶ 444 above) that "selects between network interfaces on a per-session basis" (for example, each packet received at the CL-CO gateway has a comparison of the packet destination address with network

addresses maintained at the CL-CO gateway and additionally a determination if the packet corresponds to a session to be directed to the CO network) wherein such packet path selection is "to promote load-balancing" (for example, the flows at CL-CO gateway that get routed to the CL or CO network are dynamically allocated in an as-needed basis to dynamically divert away from congested links based upon a bandwidth availability criterion).

451. Note that Patent Owner specifically alleges that a packet routing appliance meets the limitations of this claim element under Patent Owner's proposed claim constructions based upon a documented description of "Load Balancing option" as "traffic is put on the best path until that path runs out of available bandwidth. The additional traffic will then spill over to the next best path" (see, for example, Ex. 1010 at Appendix I at p. 21). Thus, to the extent that Patent Owner's theory of alleged infringement by Petitioner's products has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

452. Note that Patent Owner specifically alleges in the District Court litigation that this claim 19 of the '235 Patent should be given a priority date of Dec. 29, 2000, or thus be disclosed entirely within US Provisional Patent Application No. 60/259,269 (see ¶¶ 47-48 above). However, my examination of US Provisional Patent Application No. 60/259,269 finds no explicit mention,

discussion or depiction of a "packet path selector" structural element. Thus, to the extent that Patent Owner's alleged infringement priority date basis for this claim has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

453. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶¶ 76 and 77 above).

454. Although the forgoing description of the disclosures within Karol clearly shows meeting the limitations of this claim element, to the extent that additional information regarding the "packet path selector" and its relationship to "promote load-balancing" were deemed to be necessary to fully disclose this claim element, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such additional information at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results for at least the following reasons.

455. First, the '235 Patent specification also clearly admits that the prior art includes the disclosure of "Load-balancing algorithms" that "in general are well understood" (see, for example, Ex. 1001 at 11:38-39).

456. Second, using a packet path selector to promote load-balancing, although thoroughly described in Karol, was also common knowledge to a person of ordinary skill in the art at the time of the invention. For example, Stevens, a common reference textbook on TCP/IP data networking protocols, describes that "*dynamic routing is normally used*" in networks with "redundant routes" (emphasis added, see, for example, Ex. 1007 at p. 127). Stevens describes a particular dynamic routing protocol "Open Shortest Path First" (or "OSPF") as an example of a "link state protocol" that is advantageous when "something changes, such as a router going down or a link going down" (see, for example, Ex. 1007 at p. 138). More specifically, Stevens notes that when several "routes to a destination exist, *OSPF distributes traffic equally among the routes*" and that "This is called *load balancing*" (emphasis in original but also added, see, for example, Ex. 1007 at p. 138).

457. Third, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stevens reference textbook to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stevens to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 10:1-8).

458. Fourth, even more disclosures of using a packet path selector to promote load-balancing were common knowledge to a person of ordinary skill in

the art at the time of the invention. For example, Stallings, a common reference textbook on data and computer communications, describes "Routing is generally accomplished by maintaining a routing table" and that though the "*routing table may be* static or *dynamic*", a "*dynamic table is more flexible in responding to* both error and *congestion conditions*" (emphasis added, see, for example, Ex. 1011 at p. 539).

459. Fifth, Stallings further describes that a router "must avoid portions of the network that have failed and *should avoid portions of the network that are congested*" and that "In order to make such *dynamic routing decisions*, routers exchange routing information using a special routing protocol" with one example being "Open Shortest Path First (OSPF) Protocol" (emphasis added, see, for example, Ex. 1011 at pp. 549, 550, and 556). Stallings describes OSPF in terms of a "*link state routing algorithm*" wherein "Each router maintains descriptions of the state of its local links to subnetworks, and *from time to time transmits updated state information* to all of the routers of which it is aware" such that OSPF computes routes based on a "user-configurable" function of "delay, data rate, dollar cost, or other factors" and thus "is *able to equalize loads over multiple* equal-cost *paths*" (emphasis added, see, for example, Ex. 1011 at p. 557).

460. Sixth, a person of ordinary skill in the art at the time of the invention would consider such common knowledge as expressed in the Stallings reference

textbook to be the implied meaning of terminology and concepts described in Karol at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64).

461. Seventh, for a person of ordinary skill in the art at the time of the invention it would have been obvious to try this common knowledge of using a packet path selector to promote load-balancing at least because few other specific routing criterion alternatives (for example, routing based on a link reliability or security criterion instead of load-balancing) were in common usage with IP protocol based networking such as described in Karol beyond those techniques described herein within Stevens and/or Stallings at the time of the alleged invention of the '235 Patent, and furthermore, the '235 Patent explicitly admits that specific load-balancing algorithms were well understood. Thus, a person of ordinary skill in the art at the time of the invention would also be highly likely to produce a successful and predictable result.

462. Therefore, in my opinion, Karol in view of the knowledge of the person of ordinary skill in the art renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶¶ 76 and 77 above).

463. Although the forgoing description of the disclosures within Karol and other references within Karol clearly shows that either of Karol alone or Karol in

view of the knowledge of the person of ordinary skill in the art meets the limitations of this claim element, to the extent that explicit combining of Karol with a second reference disclosing methods for selecting a network path "at least in part on the basis of a dynamic load-balancing criterion" were deemed to be necessary to fully meet the limitations of this claim element, then in my opinion a person of ordinary skill in the art at the time of the invention would have found the combination of Karol and Stallings to be obvious to try and to yield the predictable result that Karol and Stallings combined fully meet the limitations of this claim element as evident by at least the reasons described in ¶¶ 455-461 above.

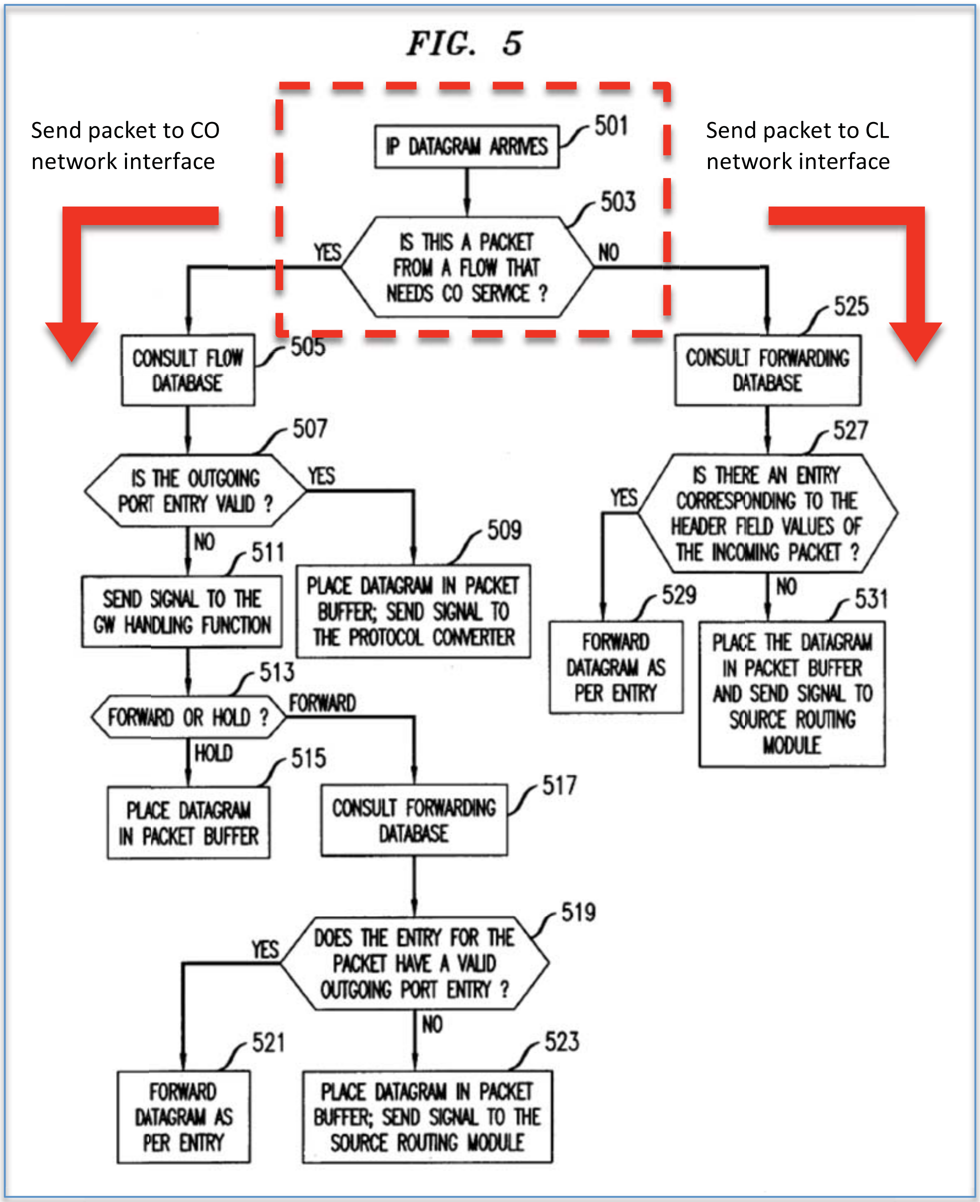
464. Additionally, a person of ordinary skill in the art at the time of the invention would have been specifically motivated to combine Karol and Stallings at least because Karol explicitly references Stallings to describe attributes of the CL-CO gateway (see, for example, Ex. 1006 at 12:59-64) and both Karol and Stallings describe selecting a network path dynamically based upon either or both of avoiding congested links or equalizing loads over multiple paths.

465. Therefore, in my opinion, Karol in view of Stallings also renders obvious the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶¶ 76 and 77 above).

19(c): and forwarding the packet-through the network interface selected byte packet path selector;

466. Presumably, "packet-through" means "packet through" and "byte" means "by the" in this claim element.

467. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, receives datagrams (or "packets") and such "datagrams received in input line cards **401** can be directed either to CO switch **410** or CL router/switch **420**" so that "output line cards **402** can receive datagrams from either of the last mentioned elements and direct them to external networks" (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein in ¶ 424 above). An exemplary process for determining the network path selection and actual forwarding to the CL or CO network interface is described in detail at FIG. 5 of Karol (see, for example, ¶¶ 99-102 above, Ex. 1006 at 8:56-9:36 and FIG. 5 as annotated herein).

468. 

469. Thus, Karol discloses a "forwarding the packet through the network interface selected by the packet path selector" (for example, the depicted packet path selector of FIG. 4 compares information in each packet received at the CL-CO gateway and then routes each packet either to the CL network interface output line

card or to the CO network interface output line card according to the process described in FIG. 5).

470. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 81 above).

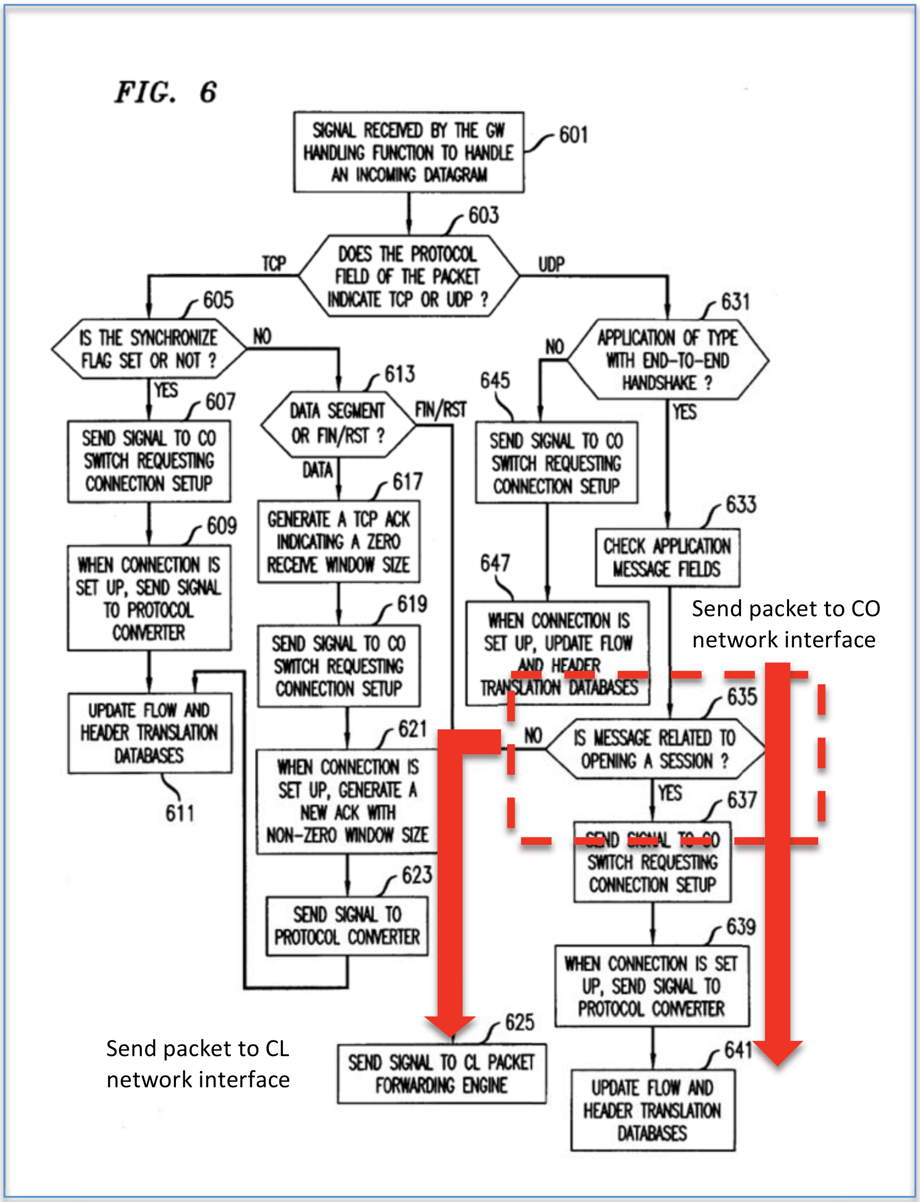
471. At least because Karol discloses the limitations of this claim element, then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element.

19(d): wherein the step of sending a packet to the controller site interface is repeated as multiple packets are sent, and the controller sends different packets of a given message to different parallel networks.

472. Karol discloses systems and methods of operation thereof whereby the "CL-CO gateway", alone or in combination with one or more routers and/or switches, receives datagrams (or "packets") and such "datagrams received in input line cards **401** can be directed either to CO switch **410** or CL router/switch **420**" so that "output line cards **402** can receive datagrams from either of the last mentioned elements and direct them to external networks" (see, for example, ¶¶ 94-97 above, Ex. 1006 at 6:44-50 and FIG. 4 as annotated herein in ¶ 424 above).

473. Karol provides numerous examples of how the "gateway processor **430**" and "flow database **433**" interact to determine whether a particular packet belongs to a flow directed to the CO network or the CL network. For example,

some flows correspond to sessions or applications such as “web access, telnet, file transfer, electronic mail, etc” that utilize the TCP transport layer while others such as “Internet telephony and other multimedia traffic” may use the “RTP (Real Time Protocol)” that “has been defined to use UDP” transport layer (see, for example, Ex. 1006 at 10:25-39 and FIG. 6). As Karol explains, certain packets carrying either TCP or UDP segments within certain sessions or applications as listed above are appropriate for a flow to the CO network while others are better directed to the CL network (see, for example, Ex. 1006 at 10:51-11:26 and FIG. 6 as annotated herein). See also ¶¶ 94-111 above.

474. 

475. Additionally, Karol also describes exemplary embodiments in which for particular sessions, such as “Internet telephony and other multimedia traffic” that use UDP transport layer, the CL-CO gateway forwards some datagrams over the CO network and forwards other datagrams over the CL network (see, for example, Ex. 1006 at 10:51-67 and FIG. 6 as annotated herein). More specifically,

Karol teaches that "If it is determined in step **603** that the incoming packet is a UDP datagram, a determination is next made in step **631** as to whether the datagram is from an application that has an end-to-end handshake prior to data transfer, or a UDP datagram from an application that does not have such a handshake" because "based on the packet type, the gateway selects the corresponding "halting" or "turning around" action to take" (see, for example, Ex. 1006 at 10:51-58). Karol continues the description of this exemplary embodiment by nothing that "If the result in step **631** is YES, the application message fields are checked in step **633**, so that a *determination can be made* in step **635** as to whether the *message* is related to *opening a session*" and "If so, a YES result occurs in step **635**, after which the gateway sends a signal in step **637** requesting connection setup" (emphasis added, see, for example, Ex. 1006 at 10:58-63). Thus, once the connection is setup, datagrams carrying UDP segments from the source endpoint to the destination endpoint associated with this flow or session (i.e. an Internet telephony call) will be routed at the CL-CO gateway to the CO network (see, for example, Ex. 1006 at 10:51-11:26). However, as clearly shown in FIG. 6, if a "NO result occurs in step **635**", then additional datagrams carrying UDP segments within this message from the same source endpoint to the same destination endpoint, even if associated with this flow or session, will be routed at the CL-CO gateway to the CL network as shown in FIG. 6 at step 635 to 625 until such time as the “flow database **433**” is “updated at step **641**” (see, for example, Ex. 1006 at 10:63-67 and steps **635** and **625** of FIG. 6 as annotated herein).

476. Thus, Karol discloses “the step of sending a packet to the controller site interface is repeated as multiple packets are sent” (for example, sessions such as Internet telephony involve multiple packets sent to the input line card of the CL-CO gateway from a particular source endpoint) and that “the controller sends different packets of a given message to different parallel networks” (for example, some datagrams carrying UDP segments within a message from the same source endpoint to the same destination endpoint are routed to the CL network while other datagrams carrying UDP segments within the same message from the same source endpoint to the same destination endpoint are routed to the CO network).

477. Note that Patent Owner specifically alleges in the District Court litigation that this claim 19 of the ‘235 Patent should be given a priority date of Dec. 29, 2000, or thus be disclosed entirely within US Provisional Patent Application No. 60/259,269 (see ¶¶ 47-48 above). However, my examination of US Provisional Patent Application No. 60/259,269 finds no explicit mention, discussion or depiction of a “controller” that performs the step of sending “*different packets*” of a “*given message*” to “*different parallel networks*”. Thus, to the extent that Patent Owner’s alleged infringement priority date basis for this

claim has any relevance to an analysis of this claim element, then this also at least indicates that the disclosures of Karol meet the limitations of this claim element.

478. Therefore, in my opinion, Karol discloses the limitations of this claim element under the broadest reasonable interpretation proposed herein (see ¶ 79 above).

479. At least because Karol discloses the limitations of this claim element, then Karol in view of the knowledge of the person of ordinary skill in the art also renders obvious the limitations of this claim element under the broadest reasonable interpretation of this claim element.

480. To the extent that in the alternative, the broadest reasonable interpretation for meeting this claim element were considered to require that the term "parallel networks" should mean that at least one of the "alternate data paths" be over "a frame relay or point-to-point network", for example, then in my opinion the knowledge and common sense of the person of ordinary skill in the art at the time of the invention was sufficient to extrapolate from the disclosures of Karol to such an interpretation at least because this was within the skill of person of ordinary skill in the art at the time of the invention, obvious to try and yielded predictable results as evident by at least the reasons given at ¶¶ 431-435 above.

IX. CONCLUSION

481. In my opinion, the claims of the '235 Patent are invalid for at least the reasons stated above.

482. I reserve the right to supplement my opinions in the future to respond to any arguments raised by the owner of the '235 Patent and to take into account new information that becomes available to me.

483. I declare under penalty of perjury that all statements made herein are of my own knowledge and are true and correct.

Respectfully submitted,

Date: April 28, 2016

Kevin J. Negus

Exhibit A

Dr. Kevin J. Negus

Contact Information: kevin@tctwest.net, 650-472-1548
Updated: April 26, 2016 522 Moose Lake Road, Philipsburg, MT, 59858

2015 – Present: Montana Tech University
Current Position: Professor, Department of Electrical Engineering
Responsibilities: Wireless Communications Teaching and 5G Mobile Broadband Research

2010 – Present: Fastback Networks
Current Position: Co-Founder and Consultant (as Chief Technology Officer)
Responsibilities: Corporate management, technology roadmap and team development

2004 – Present: Camp Ventures
Current Position: Chief Technology Partner (General Partner)
Responsibilities: Early Stage Investments, Product Development, Team Mentoring

2003 – Present: Technology Consultant
Example Clients: Cisco, Nokia, Motorola, Apple, RIM, HP, Dell, LSI, Verizon, Sprint, CSIRO
Responsibilities: Primarily expert witness consulting for patent litigations

2003 –2007: WiDeFi, Inc (acquired by Qualcomm in 2007).
Last Position Held: Executive Chairman
Responsibilities: Corporate Management, RF/baseband ASIC Development

1998 – 2003: Proxim Corporation
Last Position Held: Chief Technology Officer
Responsibilities: ASIC Development, Standards, M&A Deals, OEM Deals, Patent Licensing

1988 – 1998: Hewlett-Packard Company (acquired Avantek, Inc. in 1991)
Last Position Held: Principal Systems Architect
Responsibilities: Management, RFIC Design, RF Systems, Core Technology Development

1977 –1988: Student Employment
Organizations: Fairchild Semiconductor, Waterloo Engineering Software, University of Waterloo, Wabush Mines, Chalk River Nuclear Labs, McDonald's, Canadian Armed Forces

Past Positions: Member of the FCC Technological Advisory Council (2000-2002)
Member of the Wyoming State Telecommunications Council (2001-2003)

Education: Ph.D., 1988, University of Waterloo (UW), Joint ME/EE Departments
M.A.Sc., 1985, University of Waterloo, Department of Mech. Engineering
B.A.Sc., 1984, University of Waterloo, Department of Mech. Engineering

Awards: 1985 UW Gold Medal, 1989 IEEE Best Paper, 2010 UW Alumni Award

Publications: Over 40 published articles and approximately 40 US patents

Start-up Company Engagements (1999 – Present)

Company	Products	Status	Engagement Type
Atheros	WiFi Chips	Sold to Qualcomm	Investor
Resonext	WiFi Chips	Sold to RFMD	Advisor
Athena	WiFi & Mobile TV Chips	Sold to Broadcom	Advisor
WinNet	Outdoor wireless systems	Sold to Alvarion	Investor
Cayman	DSL Modems	Sold to Motorola	Investor
Simple Devices	WLAN appliances	Sold to Motorola	Investor
MobileStar	WiFi Public Access	Sold to T-Mobile	Investor
Cymil	WiMax Chips	Liquidated	Advisor
Clarus	IP Telephony Tools	Liquidated	Investor
Mirra	Network Storage Devices	Sold to Seagate	Investor
WiDeFi	WiFi Chips	Sold to Qualcomm	Executive Chairman
Quorum	Cellular Terminal Chips	Sold to Spreadtrum	Investor, Advisor
Larian	IP Telephony Software	Sold to SS8	Investor, Chairman
TXE	Internet Software	Liquidated	Investor, Board
SiTime	MEMS-based Chips	Sold to MegaChips	Investor, Advisor
Picaboo	Digital Photo Books	Ongoing	Investor
MetroFi	WiFi Public Access	Liquidated	Investor
AirTight	Wireless Security Devices	Ongoing	Advisor
Seabridge	Internet Sports Marketing	Liquidated	Investor
Zing	Portable Music Appliances	Sold to Dell	Investor
Mojix	RFID Readers	Ongoing	Advisor
Tribal Shout	Telephony Internet Access	Liquidated	Investor, Chairman
Quantance	Cellular Terminal Chips	Ongoing	Investor, Advisor, Board
Lemon	Mobile Payment System	Sold to LifeLock	Investor
GainSpan	WiFi Chips and Modules	Ongoing	Board, Advisor, Investor
Tasting Room	Internet Commerce	Liquidated	Investor
Work Simple	Internet Software	Liquidated	Investor
Cloud	IP Telephony Appliances	Liquidated	Investor
Qik	Mobile Video Sharing	Sold to Skype	Investor
Small Demons	Online books	Liquidated	Investor
All Trails	Mobile application	Ongoing	Investor
Nimble Heart	Wireless ECG monitor	Ongoing	Investor, Advisor
Guerrilla RF	Infrastructure RF Chips	Ongoing	Investor, Advisor

Detailed Past Employment Experience:

June 2003 – Oct. 2007 - WiDeFi, Inc.
Location: Melbourne, FL
Position Held: Executive Chairman
Earlier Position: Management and Technology Advisor (prior to June 2003)
Responsibilities: Management, RF/baseband ASIC Development

Management:
- Led Board of Directors as Independent representative of both common and preferred shareholders
- Responsible for performance evaluation of the CEO and executive staff
- Conducted search for and hired new CEO while retaining early stage CEO as a critical technology contributor (CTO)
- Participated in all financing rounds and the eventual sale of the company

ASIC Development:
- Provided key technology and management interface to outsourced ASIC design partner Atmel in Colorado Springs
- Co-inventor of core technology architecture
- Conducted detailed technical reviews of ASIC development at both circuit and system design levels
- Assisted in debugging technical problems encountered with prototype devices

Oct. 1998 – Nov. 2002 - Proxim Corporation

Location: Sunnyvale, CA
Last Position Held: Chief Technology Officer
Earlier Positions: VP Corporate Development, VP Business Development
Responsibilities: ASIC Development, Standards, M&A Deals, OEM Deals, Patent Licensing

ASIC Development:
- Recruited and managed a 20 person ASIC development team including systems architects, modem designers, ASIC designers, verification engineers, and firmware engineers
- Defined product requirements for Phoenix - a 130 nm 4M gate ASIC based on software defined radio for 802.11/16 WLAN/WMAN (project was cancelled in Nov 2002 about 3 months prior to tapeout)
- Phoenix contained full MAC and PHY for 802.11a/b/g, draft 802.11n and 802.16a/d/e with Proxim-proprietary MAC and PHY extensions and additional modes for point to point communication up to 200 Mb/s
- Core of Phoenix was an SDR fabric that extended a MIPS 4KE processor core to implement blocks such as an iterative soft-input/output Viterbi decoder, IFFT/FFT, FEC encoders, interleavers, mappers, etc
- MAC in Phoenix was 95%+ firmware based on a second MIPS core
- Security features in Phoenix included support for 802.11i (AES), TKIP, 802.1x, Radius, WEP, and Proxim proprietary modes
- I/O's included Ethernet, PCI, and USB 2.0
- Analog I/F's included dual 12 bit ADCs and DACs at 80 Ms/s
- Also drove development of the PX82475 – a 0.18 um 1M gate ARM-based ASIC for HomeRF 2.0, 1.2 and OpenAir standards that included world's first

MLSE-based equalizer operating at 10 Mb/s for 4-level GMSK in a 3.5 MHz channel bandwidth (project started May 1999, taped out Nov 2000, volume production Jun 2001)

Standards:

- Directed Proxim's involvement with 802.11 and 802.16 standards groups
- Voting member of the 802.11 standards committee – most active with 802.11g, 802.11h and the WNG-SC process that launched 802.11n
- Directed Proxim's involvement with the HomeRF Working Group
- Former Chairman of both the Technical Subcommittee and the Board of Directors of HomeRF
- Successfully led a coalition of over 50 companies to convince the FCC to significantly modify the Part 15.247 2.4 GHz band rules in 1999 and 2000 against a powerful and organized opposition with much greater funding
- Accepted nomination to the FCC's Technological Advisory Committee and served alongside CTOs of major companies such as Motorola, Intel, Disney, Panasonic, Siemens and many others to advise the FCC on wireless broadband strategies to benefit all US residents
- Nominated by the Governor and elected by Senate confirmation to the Wyoming State Telecommunications Council to advise the Governor on pending state legislation regarding telecom matters

M&A Deals:

- Completed eight separate M&A transactions including Wavespan, Farallon, Micrilor, Siemens US Cordless R&D, Card Access, nBand, Orinoco, and Western Multiplex
- Last deal was an ~$600M sale of Proxim, Inc. (Nasdaq: PROX) to Western Multiplex Corp (Nasdaq: WMUX) in Mar. 2002
- After the sale of Proxim, Inc., WMUX changed its company name to Proxim Corporation, changed its stock symbol to PROX, filed for bankruptcy in 2005, sold assets to Terabeam, Inc. (Nasdaq: TRBM) and the WMUX business unit was renamed Proxim Wireless Corporation
- Responsibilities for M&A deals included all technical diligence including patents, retaining key employees, negotiating purchase terms, and in two cases assuming direct line reporting for the purchased companies
- Led 5 venture investments including Atheros, WinNet, Cayman, Simple Devices and MobileStar

OEM Deals:

- Developed and negotiated 3 largest OEM deals in the company's history with Intel, Motorola and Siemens
- Each OEM partner made $10M equity investments in Proxim, Inc. (these investments each represented ~3-4% of the market capitalization of Proxim at the time they were made)

Patent Licensing:

- Corporate representative for licensing program including patent litigation
- Provided numerous 30(b)6 depositions for technical and business issues
- Testified at trial as fact witness on technical issues
- Filed 5 US patent applications for WLAN PHY & MAC layer inventions

Feb. 1988 – Oct. 1998 - Hewlett-Packard Company (acquired Avantek, Inc. Nov 1991)

Location:	Palo Alto, CA
Last Position Held:	Principle Systems Architect
Earlier Positions:	Director of RFIC Chipset Development, Manager of Silicon RFIC Design, Member of the Technical Staff
Responsibilities:	Management, RFIC Development, RF Systems, Core Technology

Management:
- At departure, the RF Components division had over $100M per year in revenue from products developed under my leadership
- Negotiated strategic supply agreements for wafer fabrication
- Managed a team of about 20 engineers reporting via 3 1st level managers for RFIC development in multiple technology specialties
- Ran complex chipset development programs, such as the world's first 802.11 RF chipset, or such as a complete IS-95 transmit and receive chain with resources spread across Europe, North America and Asia
- Organized and led a joint venture program with a former East German microelectronics company

RFIC Development:
- Personally designed over 20 RFIC products
- Designed world's first highly integrated digital cell phone transmit RFIC
- Designed world's first highly integrated receive RFIC for GPS
- Designed world's first 4 Gb/s 4:1 MUX/DEMUX ICs in silicon bipolar
- Designed world's first spec-compliant, fully monolithic silicon VCO for wireless communications standards
- Designed RFICs specifically for GSM, DECT, IS-95, 802.11, HomeRF, CT-2, DBS and other wireless standards
- Designed in silicon bipolar, gallium arsenide MESFET and BiCMOS
- Designed such RF blocks as mixers, synthesizers, low noise amplifiers, power amplifiers, switches, variable gain amplifiers, phase shifters, limiters, discriminators, voltage-controlled oscillators, modulators and demodulators

RF Systems:
- Defined complete chipsets including performance characteristics and system architecture for HomeRF, 802.11, IS-95B and GSM
- Partnered with baseband suppliers such as TI, VLSI, AMD, and others on reference designs for various wireless devices
- Partnered with reference design consultancies including Symbionics, TTPCom, Wavecom, RTX and others

Core Technology:
- Developed a proprietary silicon device simulation model used by HP/Avantek to enhance first pass design success
- Primary standards monitor for HP RF Components on such efforts as 802.11, HomeRF, IS-54, IS-95, GSM, DECT, HiperLAN, and 3GPP
- Lead liaison with HP Labs on wireless research
- Lead liaison with HP Product Divisions for WLAN products and FCC policy
- Co-author of HP Company Strategic Plan for Wireless Technology across all of HP's Measurement, Components, Computing and Printing businesses
- Filed several patent applications for RFIC designs

May 1986 – Nov. 1987 - Fairchild Semiconductor

Location:	Palo Alto, CA
Position Held:	Research Engineer (consultant-basis only Sep. 1986 – Nov. 1987)
Projects:	- Design of bipolar circuits for high speed ECL and telecom applications - Development of packages for high speed circuits (patent granted) - Optimization of clock chip for Clipper (world's first RISC processor)

Sep. 1986 – Dec. 1987 - Waterloo Engineering Software

Location:	Waterloo, Canada
Position Held:	Sales Engineer
Projects:	- Venture-funded startup with 10 employees sold in late 1987 - Sold silicon device simulation software worldwide

May. 1981 – Dec. 1987 - University of Waterloo

Location:	Waterloo, Canada
Last Position Held:	Research Engineer
Earlier Positions:	Teaching Assistant, Research Associate, Undergrad Research Assistant
Projects:	- Senior researcher for multi-disciplinary research lab on microelectronics device modeling and thermal analysis - Consulted to or performed research on behalf of companies such as IBM, DEC, Nortel, Thomson CSF, GEC, and Westinghouse on bipolar transistor modeling and cooling of high power bipolar and CMOS transistors and circuits - Tutored for numerous undergraduate courses

May. 1980 – Apr. 1981 - Wabush Mines

Location:	Sept-Iles, Canada
Position Held:	Engineer
Projects:	- Designed numerous facilities and machinery "fixes" in an iron ore mining operation located in Labrador and Northern Quebec

Summer 1979 - Chalk River Nuclear Laboratories

Location:	Chalk River, Canada
Position Held:	Decontamination Technician
Tasks:	- Decontaminated radioactive waste, trained for reactor meltdown

Summer/Fall 1978 - McDonald's Restaurant

Location:	Pembroke, Canada
Position Held:	Associate
Tasks:	- Flipped burgers, made fries, took orders, cleaned everything

1977 – 1979 - Canadian Armed Forces Army Cadet Program

Location:	CFB Petawawa, Canada
Position Held:	Infantry Sergeant
Tasks:	- completed military basic training, received training on infantry small unit tactics to counter Soviet ground invasion forces

Detailed University Education Background:

Ph.D., Feb 1988, University of Waterloo, Waterloo, Canada

Department:	Joint Electrical and Mechanical Engineering
Thesis Title:	"Thermal and Electrical Modeling of Bipolar Transistors"
Supervisors:	Prof. David J. Roulston (EE) and Prof. M. Michael Yovanovich (ME)
Research Topic:	- Developed novel analytical techniques for predicting the performance of bipolar semiconductor devices in multiple applications such as power, RF or high speed data communications - Key advantage was computational efficiency to enable unprecedented analysis of combined thermal and electrical effects to optimize performance of leading-edge bipolar transistors and circuits - Foundations for research came from novel application of classical mathematic techniques dating back as far as Euler combined with the application of numerical advances made for fluid mechanics to the drift-diffusion equations governing semiconductor devices
Coursework:	Advanced Topics in Semiconductor Device Physics and Circuits Computational Fluid Mechanics and Convective Heat Transfer Advanced Topics in Heat Conduction Graduate Level Applied Mathematics

M.A.Sc., May 1985, University of Waterloo, Waterloo, Canada

Department:	Mechanical Engineering
Thesis Title:	"Temperature Distributions in Contacting Electrical Conductors"
Supervisor:	Prof. M. Michael Yovanovich (ME)
Research Topic:	- Solved the classic coupled problem of determining the temperatures of rough surfaces that conduct electricity with self-heating due electrical constriction resistance by developing novel approximate analytical numerical techniques based on images - Practical applications for determining contact pressures in any metal to metal electrical contact
Coursework:	Semiconductor Device Physics, Fabrication and Circuits Electromagnetics, RF Propagation and Field Theory Fluid Mechanics, Conductive, Convective and Radiative Heat Transfer Advanced Topics in Numerical Analysis Theory of Models

B.A.Sc., May 1984, University of Waterloo, Department of Mechanical Engineering.

- 5-year undergraduate program that alternates 4-month coursework semesters with 4-month "co-op" work terms in industry with engineering project work requirements.
- Studied all basic ME subjects including heat transfer, fluid mechanics, machine design, stress analysis, automation, manufacturing techniques, and basic electrical circuit design

Academic Achievements:

1989 IEEE "Best Paper" Award for an IEEE Journal publication, this paper was based upon my Ph.D. thesis work.

1988 University of Waterloo, Faculty of Engineering Award for Outstanding Ph.D. work and Faculty sole nominee for University-wide Gold Medal Award.

1985 University of Waterloo, Gold Medal Award for Outstanding Master's Degree work on a University-wide basis.

1984 University of Waterloo, Dept. of Mechanical Engineering, Graduated 3rd out of 200.

1981 University of Waterloo, Faculty of Engineering, Award for Outstanding Co-Op Work Term Report.

1979 Valedictorian and graduated 1st out of 200 for High School in Pembroke, Ontario.

1979 Descartes High School Math contest winner for Eastern Ontario Region.

Selected Personal Highlights:

2010 Recipient of the University of Waterloo, Faculty of Engineering Alumni Achievement Award for technical innovations in and contributions to the development of wireless Internet and cellular communications technology products over the past 25 years

US Citizen since Feb 2006, US Permanent Resident since 1989, US H1 Visa 1986-1989.

Born in Fredericton, New Brunswick, Canada on Dec. 30, 1961.

Member of the IEEE since 1988. Co-chair of the RFIC Subcommittee for the IEEE BCTM Conference from 1996 to 1998.

Past Owner and operator with wife Eva of a working 200-cow cattle ranch in rural Wyoming.

Past Chairman (2003-2014), Hyattville Community Center Association.

Past Board Member, Hyattville Water Company.

Past Director, Youth Ice Hockey Program, Big Horn County in Wyoming.

Former provincial ("State") high school champion in the pole vault.

Avid outdoorsman, water skier, hockey player and snow skier.

Selected Publications:

Wiles, E., Negus, K., et al., “Measurement and Analysis of Spectrum Occupancy from 140 to 1000 MHz in Rural Western Montana”, European Conference on Antennas and Propagation, Davos, Switzerland, Apr. 10-15, 2016.

Lea, A., Negus, K., et al., “Spectrum Options for Wireless Backhaul of Small Cells”, European Conference on Antennas and Propagation, The Hague, Netherlands, Apr. 6-11, 2014.

Negus, K.J., “Spectrum Options for Wireless Backhaul of Small Cells”, Small Cell Forum, Dallas, TX, December 4, 2013.

Negus, K.J. and Petrick, A., “History of Wireless Local Area Networks (WLANs) in the Unlicensed Bands”, George Mason University Law School Conference, Information Economy Project, Arlington, VA., April 4, 2008.

Primary co-author of the HomeRF 2.01 Technical Specification (526 pages), July 2002, published by the HomeRF Working Group.

Negus, K.J. and Swan, B., “HomeRF: Design-in Module Practices”, Intel Developer Forum, San Jose, CA, Feb. 2001.

Negus, K.J., “Designing with HomeRF Technology”, Intel Developer Forum, San Jose, CA, Aug. 2000.

Negus, K.J., Stephens, A., and Lansford, J., “HomeRF: Wireless Networking for the Connected Home”, IEEE Journal of Personal Communications, Vol. 7, No. 1, Feb. 2000, pp. 20-27.

Negus, K.J., Waters, J., et. al., “HomeRF and SWAP: Wireless Networking for the Connected Home”, ACM Mobile Computing and Comms Review, Vol. 2, No. 4, Oct. 1998, pp. 28-37.

Morkner, H., Frank, M. and Negus, K., “A Novel Integrated Microwave Bias Network for Low-Cost Multistage Amplifiers”, IEEE MTT-S Symposium Digest, Vol. 1, Jun. 1997, pp. 9-12.

Jansen, B., Negus, K., and Lee, D., “Silicon Bipolar VCO Family for 1.1 to 2.2 GHz with Fully-Integrated Tank and Tuning Circuits”, 44th IEEE ISSCC Digest of Technical Papers, Feb. 1997, pp. 392-393.

Hutchinson, C., Frank, M., and Negus, K., “Silicon Bipolar 12 GHz Downconverter for Satellite Receivers”, Proc. 1995 IEEE Bipolar Circuits and Technology Meeting, Oct. 1995, pp. 198-201.

Negus, K., et. al., “Highly-Integrated Transmitter RFIC with Monolithic Narrowband Tuning for Digital Cellular Handsets”, 41st IEEE ISSCC Digest of Technical Papers, Feb. 1994, pp. 38-39.

Negus, K. and Millicker, D., “RFICs for Reduced Size, Cost and Power Consumption in Handheld Wireless Transceivers”, Proceedings of the IEEE 2nd International Conference on Universal Personal Communications, Oct. 1993, pp. 919-925.

Negus, K.J., et. al., “3.3V GPS Receiver MMIC Implemented on a Mixed-Signal, Silicon Bipolar Array”, IEEE MTT-S Symposium Digest, Vol. 2, Jun. 1992, pp. 1071-1074.

Negus, K., et. al., "Silicon Bipolar Mixed-Signal Parameterized-Cell Array for Wireless Applications to 4 GHz", 39th IEEE ISSCC Digest of Technical Papers, Feb. 1992, pp. 230-231.

Negus, K. J., "Multi-Gbits/s Silicon Bipolar Multiplexer and Demultiplexer with Interleaved Architectures", Proc. 1991 IEEE Bipolar Circuits and Technology Meeting, Oct. 1991, pp. 35-38.

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Negus, K.J. and Wholey, J.N., "Implementation of RF/Microwave Receiver Components on a Semi-Custom Silicon Bipolar Array", IEEE MTT-S Symposium Digest, Jun. 1990, pp. 67-72.

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Dr. Kevin J. Negus

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