UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZTE Corporation and ZTE (USA) Inc.

Petitioners

v.

InterDigital Technology Corporation

Patent Owner

U.S. Patent No.: 8,380,244
Filed: November 9, 2009
Issued: February 19, 2013

Title: Dual Mode Unit for Short Range, High Rate and Long Range, Lower Rate Data Communications

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DECLARATION OF DR. HARRY BIMS IN SUPPORT OF THE PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,380,244

Case No.: IPR2014-00525

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I. INTRODUCTION

A. Identification of the 244 Patent and Scope of Opinions

1. My name is Harry Bims. I have been retained by ZTE Corporation and ZTE (USA), Inc. (collectively "ZTE") to investigate and opine on certain issues relating to U.S. Patent No. 8,380,244 ("the 244 Patent").

2. I understand that InterDigital Communications, LLC, InterDigital Technology Corporation, and IPR Licensing (collectively "InterDigital") have Challenged Claims 1-8, 14-16, 19-29, 36-38, and 41-44 of the 244 Patent in an amended complaint the United States District Court of Delaware against ZTE (Case No. 13-0009-RGA). The amended complaint that first identified the 244 patent was filed on March 21, 2013. I will refer to this litigation as the "Delaware Litigation."

3. I understand that Claims 1-8, 14-16, 19-29, 36-38, and 41-44 of the 244 Patent are challenged in this petition. I may refer to these claims as the "Challenged Claims."

4. I understand that InterDigital owns the 244 Patent. *See* Ex. 1020 [Assignment Records for the 244 Patent].

5. In a previous litigation, I provided an expert report, invalidity opinion, and testimony with respect to the parent of the 244 Patent: U.S. Patent No. 7,616,970 ("the 970 Patent"). That report, opinion, and testimony was part of an International Trade Commission Investigation, 337-TA-800, in which the 970 Patent was invalidated. I will refer to that matter as the "800 Investigation."

6. This declaration is based on information currently available to me. I note that while the claims of the 244 Patent may be slightly different from those 970 Patent claims I analyzed in the 800 Investigation, the specification, drawings, and abstract of the 244 Patent are identical to those of the 970 Patent. Given the close relationship between the 970 Patent and the

244 Patent, I have used my prior report, opinions, and testimony as a starting point for my declaration and opinions in this matter.

7. I have been asked to determine if any or all of the claims of the 244 Patent are invalid under 35 U.S.C. §§ 102 and/or 103. As set forth in more detail in this declaration, I have determined that all Challenged Claims of the 244 Patent are invalid. In this declaration, I explain the manner in which the technical art, known prior to the applicable dates of the claimed inventions, discloses each and every limitation of the Challenged Claims or would render these claims obvious to a person of ordinary skill in the art at the time the inventions were made.

8. To support my opinions contained in this declaration, I have further been asked to provide an overview of the technology and discuss the particular technology related to the 244 Patent, including an overview of that technology as it was known at the time of the earliest available priority date for the 244 Patent.

9. To the extent that additional information becomes available, I reserve the right to continue my investigation and study, which may include a review of documents and information that recently have been or may be made available, as well as testimony from depositions that may yet be taken in this matter. I may thus expand or modify my opinions as my investigation and study continues. I may also supplement my opinions in response to any additional information that becomes available to me, any matters raised by InterDigital and/or opinions provided by InterDigital's experts, or in light of any relevant orders from the Patent Trial and Appeal Board (the "PTAB Panel").

B. Education and Work Experience

1. Qualifications

10. My qualifications are set forth in my *curriculum vitae*, which is attached to this report as Attachment A.

11. I have worked extensively in the field of digital communications. I have studied telecommunications and systems engineering since approximately 1981. Further, I have over twenty (20) years of industry experience in telecommunications, including wireless communications. During this period, I have designed and implemented various products that involve technologies related to the subject matter of the 244 Patent.

12. I received a B.S. in Computer and Systems Engineering from Rensselaer Polytechnic Institute in 1985. In 1988, I received a M.S. in Electrical Engineering from Stanford University. In 1993, I received a Ph.D. in Electrical Engineering, also from Stanford University. As a graduate student at Stanford University, I studied the principles of Digital Communications theory, including data modulation and demodulation, signal constellations and lattices, channel estimation, equalization, filtering, precoding, synchronization, and trellis coding. My Ph.D. thesis at Stanford addressed the application of trellis coding and precoding to a digital modulation system, and was titled "Trellis Coding for Multi-Level, Partial Response Continuous Phase Modulation with Precoding."

13. After receiving my Ph.D. in 1993, I worked for Glenayre Technologies – Wireless Access Group, where I worked on applications for wireless communication, including inventing, designing, and building a patented two-way pager test system and co-developing a wireless application protocol. From 1999 to 2001, I was responsible for the software architecture for core SGSN (Serving GPRS Support Node) and GGSN (Gateway GPRS Support Node) products for the GPRS (Generic Packet Radio Services) market. I also held management responsibility for the Firmware, Hardware, Performance, and Systems Engineering Groups. In 2001, I developed a business plan for building network infrastructure for 802.11 enterprise networks, and then later

that year founded AirFlow Networks, Inc. where I invented and received nineteen patents on its core technology, based on the 802.11 wireless local area network specification.

14. For example, U.S. Patent 7,236,470 ("the 470 Patent") issued on June 26, 2007, and currently names Broadcom Corporation as its assignee. The application for the '470 Patent was filed with the United States Patent Office on September 15, 2003, with priority to an earlier application filing date of January 11, 2002. Entitled "Tracking Multiple Interface Connections by Mobile Stations," this patent discloses a method allowing a mobile station to have a first connection to a network over a first interface and determining that the mobile station is attempting to have a second connection to the network over a second interface other than the first interface.

15. I am currently an expert consultant for Protocomm Systems, LLC and Bims Laboratories, LLC, both of which I founded. The services I provide include consulting in standards setting, technology assessments, engineering lab testing, and product analysis—and I am named as an inventor on twelve telecommunications-related patents.

16. In addition, I am currently the Vice-Chair and Secretary of the Institute of Electrical and Electronics Engineers (hereafter "IEEE") 802.16 Working Group, which develops standards for long range, lower data rate wireless networks. Within the IEEE 802.16 Working Group, I am also Chair of the Study Group on Heterogeneous Networks. This study group was formed to facilitate a discussion of future standardization activities related to, among other things, a common network infrastructure that supports a plurality of radio access technologies in the mobile station.

2. Recent Consulting and Testimony

17. I have been retained as an expert witness in the following litigations:

- *Broadcom v. Netgear Inter Partes Review*. I was retained by counsel on behalf of Broadcom. I have not provided any expert reports or declarations in this matter.
- *Hernandez v. Motorola Solutions, Inc. et. al.*, in the United States District Court for the Southern District of Florida. I was retained by counsel on behalf of Motorola Mobility LLC. I have provided an expert report, and declarations in this matter.
- *Fujifilm Corporation v. Motorola Mobility LLC*, in the United States District Court for the Northern District of California. I was retained by counsel on behalf of Motorola Mobility LLC. I have not provided testimony or expert reports in this matter.
- *In the Matter of Certain Wireless Devices with 3G Capabilities and Components Thereof*, United States International Trade Commission, Investigation No. 337-TA-800. I was retained by counsel on behalf of Nokia, Huawei, and ZTE. I provided deposition testimony and expert reports in this matter.
- *EON Corp. IP Holdings, LLC v. Landis+Gyr, Inc., et. al.*, in the United States District Court for the Eastern District of Texas Tyler Division, I was retained by counsel on behalf of EON Corp. IP Holdings, LLC. I have provided deposition testimony, and an expert report in this matter.
- *EON Corp. IP Holdings, LLC v. Cantaloupe Systems, Inc., et. al.*, in the United States District Court for the Eastern District of Texas Tyler Division, I was retained by counsel on behalf of EON Corp. IP Holdings, LLC. I have provided expert reports in this matter.
- *Harris Corporation v. Ruckus Wireless, Inc.*, in the United States District Court for the Middle District of Florida Orlando Division. I was retained by Harris Corporation. I have provided deposition testimony, expert reports and declarations in this matter.
- *In the Matter of Certain Mobile Telephones and Modems*, United States International Trade Commission, Investigation No. 337-TA-758, I was retained by LG Electronics, Inc. I have not provided any testimony in this matter.
- *EON Corp. IP Holdings, LLC v. Sensus USA, Inc., et. al.*, in the United States District Court for the Eastern District of Texas Tyler Division. I was retained by Eon Corp. IP Holdings, LLC. I provided deposition testimony, expert reports, and declarations in this matter.
- *Stragent, LLC, et. al. v. Intel Corporation*, in the United States District Court for the Eastern District of Texas. I was retained by Intel Corporation. I have not provided any testimony in this matter.

- *Smartphone Technologies, LLC. v. Research in Motion Corp., et. al.* in the United States District Court for the Eastern District of Texas Tyler Division. I was retained by Apple, Inc. I have not provided any testimony in this matter.
- *EON Corp. IP Holdings, LLC v. Landis+Gyr, Inc., et. al.*, in the United States District Court for the Eastern District of Texas Tyler Division. I was retained by EON Corp. IP Holdings, LLC. I have not provided any testimony in this matter.
- *SimpleAir, Inc., v. Research in Motion Limited and Research in Motion Corporation, et. al.*, in the United States District Court for the Eastern District of Texas Tyler Division. I was retained by Research in Motion Limited, Research in Motion Corporation, and Apple, Inc. I provided deposition testimony, and a declaration in this matter.
- *Marvell Semiconductor, Inc., et. al. v. Commonwealth Scientific Industrial Research Organisation*, in the United States District Court for the Eastern District of Texas Tyler Division. I was retained by Marvell Semiconductor, Inc. I provided deposition testimony, and an expert report in this matter.
- *Saxon Innovations, LLC v. Apple, Inc., et. al.*, in the United States District Court for the Eastern District of Texas Tyler Division. I was retained by Intel Corporation. I provided deposition testimony, and a declaration in this matter.
- *Eon Corp. IP Holdings, LLC v. Verizon Clinton Center Drive Corp., et. al.*, in the United States District Court for the Eastern District of Texas Tyler Division. I was retained by Eon Corp. IP Holdings, LLC. I provided deposition testimony, and expert reports in this matter.
- *CIF Licensing, LLC d/b/a GE Licensing v. Agere Systems, Inc.*, in the United States District Court for the District of Delaware. I was retained by CIF Licensing, LLC d/b/a GE Licensing. I provided deposition testimony, an expert report, and trial testimony.
- *Commil USA, LLC v. Cisco Systems, Inc., et. al.*, in the United States District Court for the Eastern District of Texas Marshall Division. I was retained by Cisco Systems, Inc. I provided deposition testimony, and an expert report in this matter.
- *Commonwealth Scientific and Industrial Research Organisation v. Toshiba America Information Systems, Inc., et. al.*, in the United States District for the Eastern District of Texas Tyler Division. I was retained by Toshiba America Information Systems, Inc., et. al. I provided deposition testimony, expert reports, and declarations in this matter.
- *Rembrandt Technologies, Inc. v. Comcast Corporation*, in the United States District Court for the Eastern District of Texas Marshall Division. I was retained by Comcast Corporation. I provided deposition testimony, and a declaration in this matter.

- *MLR, LLC v. Kyocera Wireless Corporation and Novatel Wireless, Inc.*, in the United States District Court for the Southern District of California. I was retained by MLR, LLC. I provided an expert report in this matter.
- *Fenner Investments, Ltd., v. Juniper Networks, Inc., et. al.*, in the United States District Court for the Eastern District of Texas Marshall Division. I was retained by Ericsson, Inc. I provided an expert report in this matter.
- *McKesson Information Solutions, Inc. v. Bridge Medical, Inc.*, in the United States District Court for the Eastern District of California. I was retained by McKesson Information Solutions, Inc. I provided deposition testimony, declarations, and bench trial testimony.

C. Compensation

18. I am being compensated at $600 per hour for services I provide in this matter. This compensation is not contingent upon my performance, the outcome of this matter, or any issues involved in or related to this matter.

D. Documents and Other Materials Relied Upon

19. I have reviewed and considered in the preparation of this report materials and testimony referred to herein, principally including the 244 Patent, its file history, and the prior art references described below, including the 244 patent, the applications and patents related to the 244 patent, the prosecution histories of the 244 patent and of applications and patents related to the 244 patent, and the exhibits to the petition for *inter partes* review of the 244 patent. Additionally, I have considered my own experience and expertise of the knowledge of the person of ordinary skill in the relevant art in the timeframe of the claimed priority date of the 244 patent. I doing so, I have reviewed information generally available to, and relied upon, by a person of ordinary skill at the time of the invention, including publicly available wireless communication standards, wireless communication patents, technical reference materials, and well-known principles of wireless data communications networks.

20. I also reviewed the materials I prepared and publically available documents I reviewed in preparation for my report, opinion, and testimony in the 800 Investigation related to the invalidity of the 970 patent. In that matter, the ALJ found my testimony credible.

21. I anticipate using some of the above referenced documents and information, or other information and material that may be made available during the course of this proceeding (such as by deposition testimony), as well as representative charts, graphs, schematics, and diagrams, animations, and models that will be based on those documents, information, and material, to support and to explain my testimony before the PTAB panel regarding the invalidity of the 244 Patent.

II. SUMMARY OF OPINIONS

22. I have been asked to compare the subject matter recited in the Challenged Claims of the 244 Patent to each of the prior art references, including publications, products, and patents that predate the filing date of the 244 Patent. As to the Challenged Claims of the 244 Patent, I have been asked to express my opinion as to whether each is anticipated or rendered obvious to a person of ordinary skill in the art in light of prior art references or combinations of references and the knowledge of a person of ordinary skill in the art at the time of the purported invention of the 244 Patent. I expect to testify about the scope of the Challenged Claims of the 244 Patent as understood by those of ordinary skill in the art.

23. In performing my analysis, I have relied on my own personal knowledge and extensive experience in the design, development, network design and operation of the applicable equipment as well as my review of the materials considered as listed in the associated *inter partes* review petition.

24. It is my opinion that each of the Challenged Claims of the 244 Patent are invalid because they are rendered obvious by one or more of the prior art references, alone or in

combination with other references. In other words, the Challenged Claims would have been obvious to a person of ordinary skill in the art in light of certain single prior art references, or in the combination of prior art references, in light of the knowledge of a person of ordinary skill in the art at the time of the 244 Patent.

III. LEGAL PRINCIPLES

25. This section summarizes my understanding of the basic legal principles of patent law, as they have been explained to me by counsel.

26. I understand that there is no presumption of validity in an *inter partes* review proceeding. As a result, I understand that invalidity need only be shown through a preponderance of evidence. I understand this burden to be lower than the clear and convincing standard used in Federal Courts or the International Trade Commission ("ITC") to overcome the presumption of validity afforded a patent in the Federal Courts or ITC proceedings.

27. I understand the first step in determining whether or not a patent claim is valid is to consider the proper construction of the claims from the point of view of a person of ordinary skill in the art at the time of the invention, then determining whether the construed claims are anticipated or rendered obvious in light of the prior art.

A. Anticipation

28. I have been informed by counsel and understand that a patent is invalid on the basis of anticipation (under 35 U.S.C. § 102) if a single prior art reference discloses, either expressly or inherently, each and every limitation of the claimed invention. Under the principles of inherency if the prior art necessarily functions in accordance with, or includes the claimed limitations, it anticipates. Artisans of ordinary skill need not recognize the inherent characteristics or functioning of the prior art. In addition, a new scientific explanation for the

functioning of the prior art does not render the old composition patentable. Such a reference, if it contained each and every element of a claim, would anticipate the claim.

29. I understand that a claim is invalid under 35 U.S.C. § 102(b) if the invention was patented or published anywhere, or was in public use, on sale, or offered for sale in this country, more than one year prior to the filing date of the patent application. And a claim is invalid, as I understand, under 35 U.S.C. § 102(e), if an invention described by that claim was described in a U.S. patent granted on an application for a patent by another that was filed in the U.S. before the date of the invention for such a claim.

B. Obviousness

30. I further understand that a claimed invention is unpatentable under 35 U.S.C. § 103 if the differences between the invention and the prior art are such that the subject matter as a whole would have been obvious at the time of the invention to a person having ordinary skill in the art to which the subject matter pertains. Obviousness, as I understand, is based on the scope and content of the prior art, the differences between the prior art and the claim, the level of ordinary skill in the art, and secondary indicia of non-obviousness to the extent they exist.

31. I understand that whether there are any relevant differences, between the prior art and the claimed invention, is to be analyzed from the view of a person of ordinary skill in the art at the time of the invention. A person of ordinary skill in the art is a hypothetical person who is presumed to be aware of all of the relevant art at the time of the invention. The person of ordinary skill is not an automaton, and may be able to fit together the teachings of multiple patents employing ordinary creativity and the common sense that familiar items may have obvious uses in another context or beyond their primary purposes.

32. In analyzing the relevance of the differences between the claimed invention and the prior art, I understand that I must consider the impact, if any, of such differences on the

obviousness or non-obviousness of the invention as a whole, not merely some portion of it. The person of ordinary skill faced with a problem is able to apply his or her experience and ability to solve the problem and also look to any available prior art to help solve the problem.

33. An invention is obvious if a designer of ordinary skill in the art, facing the wide range of needs created by developments in the field, would have seen an obvious benefit to the solutions tried by the applicant. When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, it would be obvious to a person of ordinary skill to try the known options. If a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique would have been obvious.

34. I understand that I do not need to look for precise teaching in the prior art directed to the subject matter of the claimed invention. I understand that I may take into account the inferences and creative steps that a person of ordinary skill in the art would have employed in reviewing the prior art at the time of the invention. For example, if the claimed invention combined elements known in the prior art and the combination yielded results that were predictable to a person of ordinary skill in the art at the time of the invention, then this evidence would make it more likely that the claim was obvious. On the other hand, if the combination of known elements yielded unexpected or unpredictable results, or if the prior art teaches away from combining the known elements, then this evidence would make it more likely that the claim that successfully combined those elements was not obvious.

35. In determining whether a claimed invention is invalid for obviousness, one should consider the scope and content of the prior art, the level of ordinary skill in the relevant art, the differences between the claimed invention and the prior art, and whether the claimed invention

would have been obvious to a person having ordinary skill in the art in light of those differences. I understand that hindsight must not be used when comparing the prior art to the invention for obviousness.

1. Motivations to Combine

36. I understand that a claimed invention may be obvious if some teaching, suggestion or motivation exists that would have led a person of ordinary skill in the art to combine the invalidating references. I also understand that this suggestion or motivation may come from such sources such as explicit statements in the prior art, or from the knowledge of a person having ordinary skill in the art. Alternatively, any need or problem known in the field at the time and addressed by the patent may provide a reason for combining elements of the prior art. I also understand that when there is a design need or market pressure, and there are a finite number of predictable solutions, a person of ordinary skill may be motivated to apply both his skill and common sense in trying to combine the known options in order to solve the problem.

37. Obviousness may also be shown by demonstrating that it would have been obvious to modify what is taught in a single piece of prior art to create the patented invention. Obviousness may be shown by showing that it would have been obvious to combine the teachings of more than one item of prior art. In determining whether a piece of prior art could have been combined with other prior art or with other information within the knowledge of a person having ordinary skill in the art, the following are examples of approaches and rationales that may be considered:

- Combining prior art elements according to known methods to yield predictable results;
- Simple substitution of one known element for another to obtain predictable results;

- Use of a known technique to improve similar devices (methods, or products) in the same way;
- Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- Applying a technique or approach that would have been "obvious to try" (choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success);
- Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to a person having ordinary skill in the art; or
- Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

2. Secondary Considerations

38. I understand that certain objective factors, sometimes known as "secondary considerations," may also be taken into account in determining whether a claimed invention would have been obvious. In most instances, these secondary considerations of non-obviousness are raised by the patentee. In that context, the patentee argues an invention would not have been obvious in view of these considerations, which include: (a) commercial success of a product due to the merits of the claimed invention; (b) a long-felt, but unsatisfied need for the invention; (c) failure of others to find the solution provided by the claimed invention; (d) deliberate copying of the invention by others; (e) unexpected results achieved by the invention; (f) praise of the invention by others skilled in the art; (g) lack of independent simultaneous invention within a

comparatively short space of time; (h) teaching away from the invention in the prior art. I also understand that these objective indications are only relevant to obviousness if there is a connection, or nexus, between them and the invention covered by the patent claims.

39. I understand that certain "secondary considerations," such as independent invention by others within a comparatively short space of time, indicates obviousness.

40. I also understand that secondary considerations of nonobviousness are inadequate to overcome a strong showing on the primary considerations of obviousness. For example, where the inventions represented no more than the predictable use of prior art elements according to their established functions, the secondary considerations are inadequate to establish nonobviousness.

C. Date of Invention

41. I understand that absent clear and convincing evidence of invention date prior to the filing date of a patent, the invention date of the patent is presumed to be its filing date. A prior invention requires a complete conception of the invention and a reduction to practice of that invention. The patentee has the burden of establishing by clear and convincing evidence a date of conception earlier than the filing date of the patent.

42. Conception is the formation in the mind of the inventor of a definite and permanent idea of the complete and operative invention. Conception must be proved by corroborating evidence which shows that the inventor disclosed to others his complete thought expressed in such clear terms as to enable those skilled in the art to make the claimed invention. The inventor must also show possession of every feature recited in the claims, and that every limitation was known to the inventor at the time of the alleged conception. Furthermore, the patentee muse show that he or she has exercised reasonable diligence in later reducing the

invention to practice, either actual or constructive. The filing of a patent application can serve as a constructive reduction to practice.

IV. THE 244 WIRELESS COMMUNICATIONS PATH PATENT

A. Background of Wireless Communication Path Technology

43. If asked, I expect to provide a tutorial concerning data communications technology over shorter-range wireless LAN and longer-range cellular wireless communication paths.

44. A wireless communication path allows for the packet-based transport of data between two nodes in a network, using communication links that include at least one link over a wireless medium. The movement of data over a wireless medium is facilitated through the use of antennas that transmit and receive electromagnetic signals. Wireless devices process these signals in order to establish a communication session, or logical connection, over a wireless medium if a wireless communication path is requested.

45. Before IPR Licensing, Inc. ever filed the earliest application in the chain or priority that led to the 244 Patent, data communications over wireless LAN and cellular wireless communications paths were already well known, as were technologies for permitting communication sessions to be maintained despite changed physical wireless connections resulting from moving a portable communications device from one location to another.

1. Wireless Local Area Networks

46. With respect to wireless LAN (Local Area Network) communication paths, NCR was first to commercialize wireless LAN technology in 1988 when they introduced the WaveLAN wireless system to the market. Each of the WaveLAN products used spread spectrum transmissions to establish a short-range, high-speed connection of up to 2 Mbit/s between mobile stations and an access point. WaveLAN technology also included a link-layer mechanism

termed WaveAround that allowed mobile device connections to roam within a pre-defined group of WaveLAN access points. The WaveLAN technology was later incorporated into the open-architecture IEEE 802.11 standard.

47. WaveLAN is the trade name for IEEE 802.11 compliant networking devices that were available from Lucent Technologies, Inc. (the assignment of U.S. Appln. No. 09/130,979, which issued as U.S. Patent No. 6,198,941, was recorded at the Patent Office on October 16, 1998).

48. The roaming feature included in this WaveLAN technology established a new connection with an alternative access point after the current connection with the current access point was no longer available. The feature supported instances where neighboring access point coverage overlapped, as well as when the coverage did not overlap. When access point coverage overlapped, the WaveAround mechanism first formed a connection with the new access point before terminating the connection with the current access point, and maintaining the communication session despite the change in the physical connection.

2. Cellular data networks

49. With respect to cellular wireless communication paths, Motorola and IBM were first to commercialize a long-range wireless WAN (Wide Area Networks) when they introduced the nationwide ARDIS system in the early 1980s. This was a cellular wireless network that supported packet-based communication paths over the wireless medium. The raw data rate throughput of the ARDIS system was between 4,800 and 19,200 bits per second, far below that of the WaveLAN system. Yet, the ARDIS system provided nationwide coverage for its mobile users. The ARDIS system was well suited for session-oriented applications that send short, bursty messages, and allowed nationwide roaming of ARDIS mobile devices across the network of base stations.

50. Subsequently, the CDPD standard was released in 1995 as an alternative long-range wireless WAN. CDPD extended the capability of the AMPS (Analog Mobile Phone Service) cellular network by adding packet-based networking sessions on unused AMPS frequency channels. The raw data rate throughput of the CDPD system was 19,200 bits per second, and allowed for nationwide roaming between CDPD mobile devices and base stations.

B. Overview of the 244 Patent

51. I have personally reviewed the specification, claims, all drawings, and the prosecution history of the 244 Patent. Based on my personal review, I am prepared to provide this declaration and testify about the invalidity of this patent in light of the teachings that already existed prior to the 244 Patent.

1. Background

52. The 244 Patent purports to identify an open problem in need of a solution:

> Unfortunately, there still is no widely available satisfactory solution for providing low cost, broad geographical coverage, high speed access to the Internet and other networks using the existing wireless infrastructure which has been built at some expense to support cellular telephony. Indeed, at the present time, the users of wireless modems that operate with the existing cellular telephone network often experience a difficult time when trying to, for example, access the Internet to view web pages. The same frustration level is felt in any situation when attempting to perform other tasks that require the transfer of relatively large amounts of data between computers.

Ex. 1001 [244 Patent] at 1:33-44.

53. According to the 244 Patent, the above identified problem stems from the use of voice grade bandwidth on cellular wireless networks to provide communication channels. This bandwidth was thought to lack the minimum acceptable data rates for Internet access, and to exhibit a bit error rate that is cumbersome for data transmission.

> For example, cellular networks were originally designed to deliver voice grade services, having an information bandwidth of approximately three kilohertz (kHz). While techniques exist for communicating data over such radio channels at the rate of 9600 kilobits per second (kbps), such low frequency channels do not lend themselves directly

> to transmitting data rates of 28.8 kbps or even the 56.6 kbps that is now commonly available using inexpensive wireline modems. These rates are presently thought to be the minimum acceptable data rates for Internet access. This situation is true for advanced digital wireless communication protocols as well, such as Code Division Multiple Access (CDMA). Even though such systems convert input voice information to digital signals, they too were designed to provide communication channels at voice grade bandwidth. As a result, they use communication channels that may exhibit a bit error rate (BER) as high as one in one thousand bits in multipath fading environments. While such a bit error rate is perfectly acceptable for the transmission [of] voice signals, it becomes cumbersome for most data transmission environments.

Ex. 1001 [244 Patent] at 1:53-2:6.

54. However, the inventor of the 244 Patent did not invent data communications over wireless communication paths. As discussed in the Background of the Invention section of the 244 Patent, data communications over both wireless LANs or cellular networks was already well known in the art:

> For example, cellular networks were originally designed to deliver voice grade services, having an information bandwidth of approximately three kilohertz (kHz). While techniques exist for communicating data over such radio channels at the rate of 9600 kilobits per second (kbps) . . .

Ex. 1001 [244 Patent] at 1:53-57.

> On the other hand, wireless local area networks (W-LANs) have been developed to allow communications between users over a relatively small range without the need for a physical connection . . .

Ex. 1001 [244 Patent] at 2:20-23.

55. The inventor further admits in the 244 Patent that he did not invent the handoff of a wireless connection between wireless communication paths within the same network. As discussed in the Background of the Invention section of the 244 Patent, wireless connection handoffs within the same network were already well known in the art:

> As with cellular systems, a W-LAN connection can be handed off from one area of coverage (a "basic service set" in IEEE 802.11 parlance) to the next.

Ex. 1001 [244 Patent] at 2:28-30.

56. The 244 Patent identifies its "present invention" as follows.

> The present invention, on the other hand, is a single device which connects directly to a W-LAN using a protocol such as IEEE 802.11 when such a connection is possible, and automatically reverts to connecting to the long range network only when out of range of the W-LAN base stations.
>
> Thus, the same equipment can be used without any reconfiguration and even without the knowledge of the user. For example, when the user is on a company campus and within range of the less expensive, faster W-LAN, the user's laptop or PDA automatically communicates with the W-LAN. If the user leaves the office, for example, for lunch, or at the end of the day, heads home, the same laptop or PDA, being out of range of the W-LAN, will automatically communicate instead with the wider range, more expensive cellular network.

Ex. 1001 [244 Patent] at 2:63-3:10.

57. The Challenged Claims do not expressly require a handover of the communication session. The communication session may simply be maintained by using the WLAN communication path in an absence of assigned physical channels of the cellular communication path.

58. The two independent claims of the Challenged Claims are Claim 1 and Claim 23. Claim 1 and its dependents are directed to a device while Claim 23 and its dependents are directed to a method with aspects similar to that of the device claims. There are no appreciable differences between the features of the device claims as compared to features of the method claims. As such, I have analyzed the corresponding limitations from each set of claims together.

2. Disclosure of the 244 Patent

59. The 244 Patent was filed in the USPTO on November 9, 2009, claiming priority through a chain of continuation and continuation-in-part applications to an application filed on September 21, 1999. Ex. 1001 [244 Patent]. The patent identifies as it is only named inventor Mr. Thomas E. Gorsuch.

60. The Summary of the Invention section of the 244 Patent attempts to address the identified problem by preferably establishing in a single device, a connection with a local area network (LAN) or the Internet through a short-range, high-speed, wireless communication path when available, or alternatively to resort to establishing a connection through a longer range, lower-speed wireless communication path when the short-range, high-speed wireless communication path is not available.

> A technique for communicating with a local area network (LAN) via a wireless connection determines whether a first short-range, high-speed, wireless communication path is available and connects to the LAN using a longer range, lower-speed wireless communication path if the short-range, high-speed wireless communication path is not available.

Ex. 1001 [244 Patent] at Abstract.

> It would therefore be desirable to have a device which can automatically select the cheaper and faster W-LAN when possible, e.g., when within its range, and to resort to the long range cellular network when access to the W-LAN is not possible or practical. Previously, two devices would have been required, one for accessing the W-LAN and one for accessing the long range network . . . The present invention, on the other hand, is a single device which connects directly to a W-LAN using a protocol such as IEEE 802.11 when such a connection is possible, and automatically reverts to connecting to the long range network only when out of range of the W-LAN base stations. Thus, the same equipment can be used without any configuration and even without the knowledge of the user.

Ex. 1001 [244 Patent] at 2:50-3:2.

> Therefore, the present invention is also a method which uses a first wireless digital communication path and a second wireless digital communication path for coupling data communication signals with a local wireless transceiver at a first site. The second digital communication path provides wider coverage and a slower communication rate than the first digital communication path. The local wireless transceiver conducts wireless communications with a remote wireless transceiver at a second site. One of the wireless communication path is selected upon a request to establish a communication session between first and second sites by first determining whether the first wireless digital communication path is available.

Ex. 1001 [244 Patent] at 3:11-23.

> One of the wireless communication path [sic] is selected upon a request to establish a communication session between the first and second sites by first determining whether the first wireless digital communication path is available.

Ex. 1001 [244 Patent] at 3:20-23.

> Because communication within the short range wireless LAN 613A or 613B is faster and less expensive as compared to the long range network, it is desirable to communicate using the short range path, i.e., the W-LAN protocol, rather than the more costly long range network, when a user's computer terminal 615 is within range of a W-LAN base station 611, i.e., within the region of coverage 613A, 613B.

Ex. 1001 [244 Patent] at 8:53-59.

61. The wireless communication paths discussed in the 244 Patent are wireless connections over either a WLAN or a cellular network.

> The low-range, high-speed wireless communication path is a wireless LAN connection such as an IEEE 802.11-compliant wireless LAN and the long-range, low-speed wireless communication mode is a cellular CDMA-type connection.

Ex. 1001 [244 Patent] at Abstract.

> The present invention, on the other hand, is a single device which connects directly to a W-LAN using a protocol such as IEEE 802.11 when such a connection is possible, and automatically reverts to connecting to the long range network only when out of range of the W-LAN base stations.

Ex. 1001 [244 Patent] at 2:63-67.

62. These wireless communication paths are selected without the requirement of user intervention.

> Thus, the same equipment can be used without any reconfiguration and even without the knowledge of the user. For example, when the user is on a company campus and within range of the less expensive, faster W-LAN, the user's laptop or PDA automatically communicates with the W-LAN. If the user leaves the office, for example, for lunch, or at the end of the day, heads home, the same laptop or PDA, being out of range of the W-LAN, will automatically communicate instead with the wider range, more expensive cellular network.

Ex. 1001 [244 Patent] at 3:1-10.

3. Detection of a Preferred Communication Path

63. The Summary of the Invention section of the 244 Patent discloses within an embodiment a step of determining whether a first wireless communication path is available when a subscriber unit is within range of the first wireless communication path, enabling the subscriber unit to switch to the first path if preferable to a second wireless communication path. There are three techniques described for detecting the wireless communication path; detecting a beacon frame, receiving a probe response frame, and listening for activity:

> In one embodiment, the step of determining whether the first wireless communication mode is available is performed by passive scanning, such as by detecting a beacon signal. In another embodiment, active scanning is used, for example, by transmitting a probe request message and detecting a probe response message in response to the probe request which indicates the presence of the first wireless communication path. In yet another embodiment, determining whether the first wireless communication path is available comprises simply detecting activity on the first wireless communication path.

Ex. 1001 [244 Patent] at 3:45-55.

> Thus it is a primary feature of the present invention that a terminal such as 615 or 617 detects the presence or availability of a wireless LAN hub 611A or 611B, such as an IEEE 802.11-compliant W-LAN hub. This can be done in several ways. For example, IEEE 802.11 specifies that a beacon frame should be transmitted at regular intervals. A terminal 615, 617 can detect the beacon frame by waiting a minimum period of time equal to the beacon interval.

Ex. 1001 [244 Patent] at 8:64-9:4.

> Alternatively, a terminal such as 615 may actively transmit a probe request frame. A wireless LAN base station 611 receiving such a probe request frame will respond with a probe response frame. Receipt of the probe response frame by the terminal 615 indicates accessibility of the wireless LAN, and the terminal 615 will use the wireless LAN and bypass the long range network.

Ex. 1001 [244 Patent] at 9:9-15.

> Yet another alternative is simply to listen for activity on the wireless LAN 611. If no activity is heard, the terminal 615, 617 assumes that the LAN is not accessible, and uses the long range communication system.

Ex. 1001 [244 Patent] at 9:23-26.

64. Within this embodiment, the longer range, lower-speed wireless communication path is controlled by the wireless transceiver within the single user device to make it appear to this connection that bandwidth were continuously available during the communication session, irrespective of an actual need to transport data. This allows the actual wireless channel bandwidth to be utilized by other users.

> If the first wireless digital communication path is not available, a communication session between the first and second sites using the second wireless digital communication path is established. In this case, the local wireless transceiver is controlled to make it appear to the second wireless digital communication path as though the bandwidth were continuously available during the communication session, irrespective of any actual need to transport data communication signals between said first and second sites. In the absence of such a need to transport data communication signals between the first and second sites, the bandwidth is made available for wireless communication by other wireless transceivers.

Ex. 1001 [244 Patent] at 3:60-4:5.

> In response to relatively low utilization of the wireless channel, the physical layer channel is released while maintaining the appearance of a network layer connection to the higher level protocols.

Ex. 1001 [244 Patent] at 4:14-18.

> This has two consequences. First, it frees wireless channel bandwidth for use by other subscriber units, without the overhead associated with having to set up an end to end connection each time that data needs to be transferred.

Ex. 1001 [244 Patent] at 4:19-22.

65. In the only disclosed embodiment, the 244 Patent discloses a technique it calls "spoofing," which provides for allocating wireless channels only when needed, while appearing to terminal equipment that a connection to the Internet is maintained at all times. Through this technique, the lower layers of the CDMA cellular wireless protocol are stripped off and the higher layer messages are reformatted for transmission over the CDMA cellular wireless

protocol. This allows for a temporary, high-speed connection over a cellular wireless network when a WLAN connection is not available. *See* Figures 5 and 6 below.

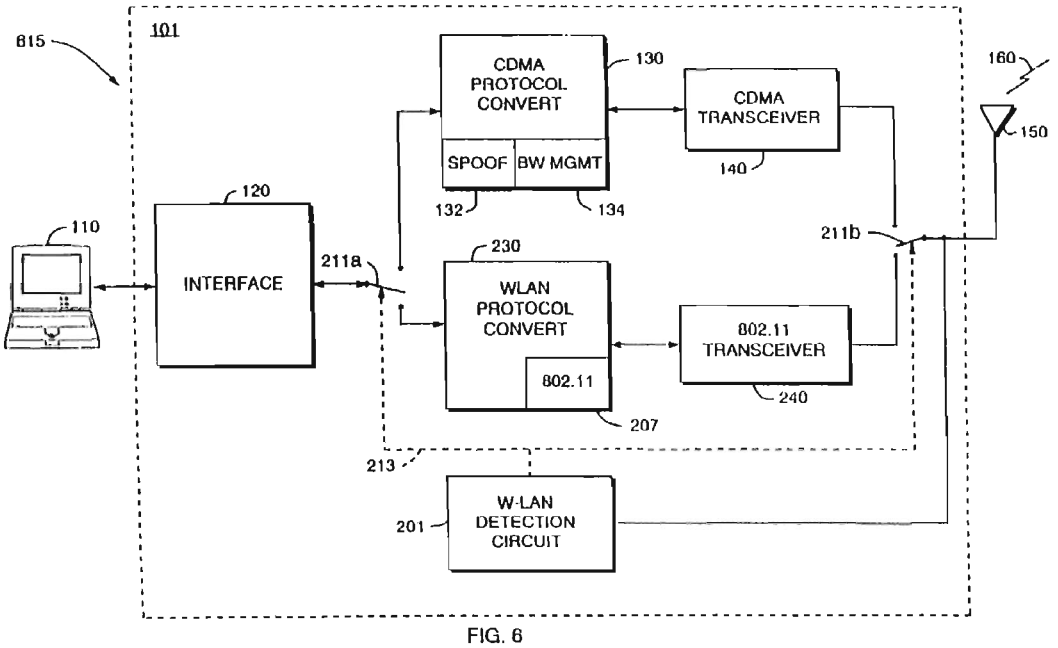


FIG. 6

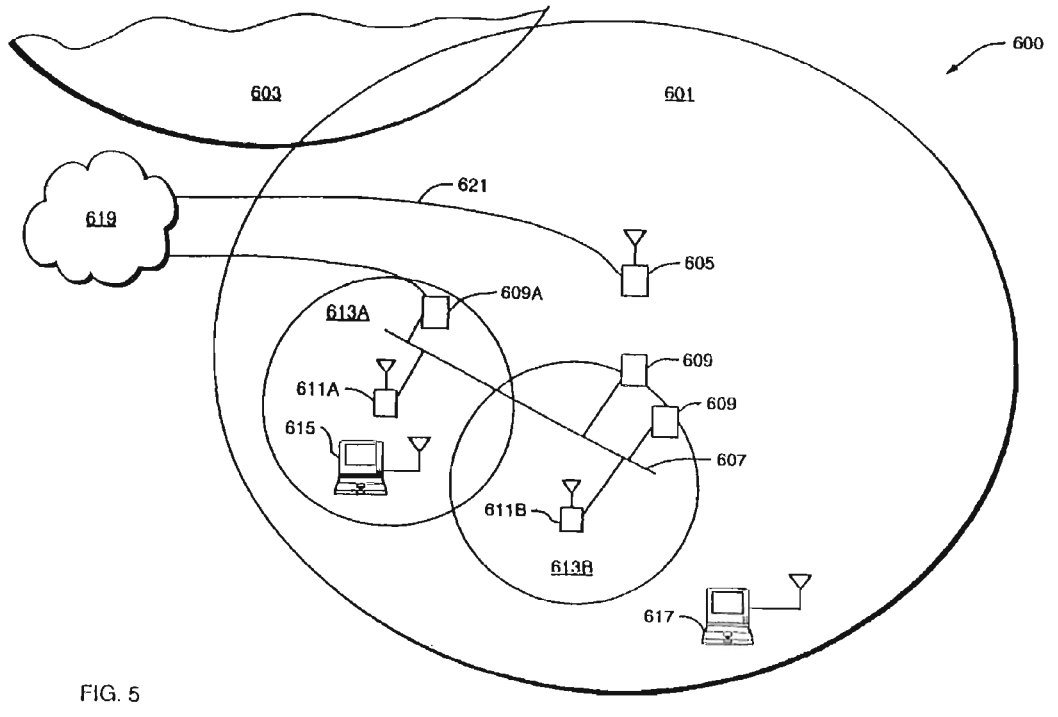


FIG. 5

> On the other hand, if the first wireless digital communication path is not available, a communication session between the first and second sites using the second wireless digital communication path is established . . . In one preferred embodiment, the second wireless digital communication path is provided by establishing a logical connection using a higher layer protocol, such as a network layer protocol, from a subscriber unit, such as may be connected to a portable computer node, to an intended peer node, such as another computer . . . In addition, and perhaps more importantly, by allocating wireless channels only when needed, the bandwidth necessary to provide a temporary but very high speed connection is available at critical times. More specifically, the technique, which is here called spoofing, involves stripping off the lower layers of the protocol while reformatting higher layer messages for transmission using a more efficient CDMA based encapsulated protocol.

Ex. 1001 [244 Patent] at 3:60-4:33.

> The CDMA protocol converter 130 performs spoofing 132 and basic bandwidth management 134 functions. In general, spoofing 132 consists of insuring that the subscriber unit 101 appears, to the terminal equipment 110, to be connected to the public network 619 (FIG. 5) on the other side of the base station 605 at all times.

Ex. 1001 [244 Patent] at 9:58-63.

> Continuing to refer to FIG. 6 briefly, in the long range, lower data rate mode, the spoofing function 132 involves having the CDMA transceiver 140 loop back synchronous data bits to spoof the terminal equipment 110 into believing that sufficiently wide wireless communication link 160 is continuously available. However, wireless bandwidth is allocated only when there is actual data present from the terminal equipment to the CDMA transceiver 140. Therefore, the network layer need not allocate the assigned wireless bandwidth for the entirety of the communications session. That is, when data is not being presented upon the terminal equipment to the network equipment, the bandwidth management function 134 deallocates initially assigned radio channel bandwidth 160 and makes it available for another transceiver and another subscriber unit 101.

Ex. 1001 [244 Patent] at 10:28-42.

66. These higher layer messages are sent through a wireless communication path that is a network layer connection (e.g. TCP/IP connection).

> At a network layer, the data provided by the interface 24 is preferably formatted in a manner consistent with suitable network communication protocols such as TCP/IP to permit the terminal equipment 22 to connect to other computers over networks such as the Internet.

Ex. 1001 [244 Patent] at 5:17-21.

> Turning attention now more particularly to FIG. 3, the operations of the protocol converter 25 or 46 at the sender will be more particularly described. As shown, the input frame 50 as received from the network layer is relatively large, such as for example 1480 bits long, in the case of a TCP/IP frame.

Ex. 1001 [244 Patent] at 7:15-19.

67. At the time the parent patent was filed in 1999, spoofing was required to maintain a communication session when the physical connected was severed.

4. Summary of Prosecution History of the 244 Patent and Related Patents

68. U.S. Application Serial No. 12/615,098, which issued as the 244 Patent was filed on November 9, 2009, naming Thomas E. Gorusch as the inventor. The 244 Patent claims priority to a series of four predecessor patent applications, the first of which was filed on September 21, 1999. Notably, the parent of the 244 Patent was asserted in the 337-TA-800 ITC Investigation, and that patent was found by clear and convincing evidence to be invalid over the prior art.

- US 6,526,034, App. No. 09/400,136 filed on Sept. 21, 1999
- US 7,024,222, App. No. 10/341,528 filed on Jan. 13, 2003
- US 7,013,162, App. No. 10/358,082 filed on Feb. 3, 2003
- US 7,616,970, App. No. 11/326,809 filed on Jan. 6, 2006 (invalidated in 337-TA-800)
- US 8,380,244, App. No. 12/615,098 filed on Nov. 9, 2009 (subject to this IPR)

69. Of particular note are the prosecution of the second application in the chain, U.S. Application Serial No. 10/341,528, and the prosecution of the application that led to the 244 Patent, U.S. Application Serial No. 12/615,098. Additionally, while InterDigital was prosecuting the patents in the 244 Patent family, an earlier, closely related patent from the same inventor, Thomas E. Gorsuch, was undergoing reexamination in the U.S. Patent and Trademark office at InterDigital's request. The prosecution of each of these patent applications is discussed below:

a) Prosecution of U.S. Application Serial No. 10/341,528

70. As explained in greater detail below, InterDigital sought to obtain claims in the second application in the chain, U.S. App. Ser. No. 10/341,528 ("the '528 Application"), that were directly solely to having both W-LAN and cellular functionality in one device and then choosing between the two. The Examiner, however, found that simply combining W-LAN and cellular functionality together was obvious and expressly disclosed in prior art.

71. In a May 5, 2005 Office Action, the Examiner rejected claim 31 as obvious over U.S. Patent No. 5,406,643 in view of the admitted prior art IEEE 802.11 standard. Ex. 1024 ['528 Application, May 5, 2005 Office Action]. The Examiner explained that U.S. Patent No. 5,406,643 discloses choosing between two different wireless data communication paths, where one path is a cellular network and the other path is a W-LAN network. The Examiner continued and explained that having the capability to communicate with a W-LAN, such as with prior art IEEE 802.11 W-LANs, and a cellular network, and selecting one or the other based on selection criteria including the availability of the respective networks, was obvious to a person having ordinary skill in the art at the relevant time. Ex. 1024 ['528 Application, May 5, 2005 Office Action] at pp. 6-8.

b) Prosecution of U.S. Application Serial No. 12/615,098

72. InterDigital filed a continuation patent application, U.S. Application Serial No. 12/615,098 ("the '098 Application") that eventually led to the 244 Patent at issue in this IPR. The 098 Application claims priority to the same specification and chain of continuations as the parent 970 Patent. The originally filed claims in the 098 Application are similar to the claims that issued in the parent 970 Patent, but appear broader in that they were not necessarily directed to specific types of wireless networks such as CDMA or with W-LANs. For example, originally filed claim 1 of the 098 Application is:

> A subscriber unit comprising:
>
> A first transceiver configured to communicate with a first wireless network via a plurality of assigned physical layer channels;
>
> A second transceiver configured to communicate with a second wireless network; and
>
> A processor coupled to the first transceiver and the second transceiver, and configured to maintain a communication session, above a physical layer, with the first wireless network in the absence of the plurality of assigned physical layer channels.

See Ex. 1018 ['098 Application Prosecution History] Original Application at 20.

73. On July 28, 2010, the Examiner rejected all the claims based on enablement on prior art grounds. *See* Ex. 1018 ['098 Application Prosecution History] July 28, 2010 Office Action.

74. For the enablement rejection, the Examiner stated that:

> The specification provides no basis for the claimed subject matter. Specifically, as by way of example, independent claim 1 recites "a processor coupled to the first transceiver and the second transceiver, and configured to maintain a communication session, above a physical layer, with the first wireless network in the absence of the plurality of assigned physical layer channels".
>
> The Examiner is unable to find support in Applicants original filed application. In contrast, **Applicants specification recites the physical layer channel is released while <u>maintaining the appearance</u> of a network layer connection to the higher level protocols.** However, Applicants specification never discloses or defines "a processor coupled to the first transceiver and the second transceiver, and configured to maintain a communication session, above a physical layer, with the first wireless network in the absence of the plurality of assigned physical layer channels".

See Ex. 1018 ['098 Application Prosecution History] July 28, 2010 Office Action at 2-3.

75. The Examiner also raised an obviousness rejection based on a prior art reference that discloses a device which can communicate with both CDMA cellular networks and wireless LANs. The Examiner then combined that reference with another reference showing various handoff methods, such as virtual subnets or Mobile IP, such that application layer is not interrupted even though there is a change in networks.

76. After the July 28, 2010 Office Action, InterDigital requested and received an interview with the Examiner. The Examiner's October 27, 2010 Interview Summary provides little detail of what was discussed during the Examiner interview, but notes that claims 1 and 11 were discussed, that the parties did not reach agreement, and that InterDigital would propose an amendment.

77. On January 28, 2011, InterDigital amended its claims and responded to the previous rejection. Specifically, it amended the "maintain a communication" limitation of claim 1 as follows:

> A processor coupled to the first transceiver and the second transceiver, and configured to maintain a communication session~~, above a physical layer,~~ with the first wireless network in the absence of the plurality of assigned physical layer channels while communicating packet data with the IEEE 802.11 wireless local area network via the second transceiver.

See Ex. 1018 ['098 Application Prosecution History] January 28, 2011 Amendment at 2.

78. In its response to the enablement rejection, InterDigital pointed to language in the specification that relates to the spoofing functionality:

> For example, the present specification states that a subscriber unit may establish a logical connection "using a higher layer protocol, such as a network layer protocol" (U.S. Patent Application Publication No. 2010/0202425 at [0023]). The logical connection is initially made though at least one physical wireless channel (id.). As noted in the specification, "the network layer need not allocate the assigned wireless bandwidth ***for the entirety of the communication session***" if there is no data available for transmission (id. at [0078]). In other words, the communication session may be maintained via the logical connection (for example, the higher layer protocol) even as one or more physical wireless channels are released. The physical wireless channels may subsequently be reallocated when there is data present for transmission (id. at [0023] and [0078]).

See Ex. 1018 ['098 Application Prosecution History] January 28, 2011 Response at 8-9.

79. In its response to the obviousness rejection, InterDigital argued that the cited prior art died not disclose "maintaining[ing] a communication session with the first wireless network in the absence of the plurality of assigned physical channels while communicating packet data with the IEEE 802.11 wireless local area network via the second transceiver".

80. A month later, the Examiner again rejected the claims on obviousness grounds based on references that disclose dual-mode cellular/W-LAN devices and the ability to handoff communications from one network to the other. In addressing the obviousness rejection, the examiner also explained that InterDigital had defined the "maintain a communication session" limitation to mean some sort of spoofing disclosed in the specification:

> The Examiner notes that Applicants have defined "a processor configured to maintain a communication session, with the first wireless network in the absence of the plurality of assigned physical layer channels while communicating packet data with the IEEE 802.11 wireless local area network via the second transceiver". For example, Applicants generally point to paragraphs 0023 and 0078 (see paper dated 1/28/2011 at page 9 which basically indicates some sort of spoofing (i.e. spoof the terminal into believing that a sufficient wired wireless communication link is continuously available). Furthermore, the Examiner the Examiner notes that during the interview 10/27/2010, Applicants generally pointed to items 25 and 46 of figure 1 for support wherein items 25 and 46 are basic protocol converters. Applicants indicated that paragraphs 0045 and 0046 describe the protocol converters are nothing more than a middle layer (i.e. intermediate layer) within the context of the OSI model.

See Ex. 1018 ['098 Application Prosecution History] February 23, 2011 Office Action at 3.

81. The Examiner's February 23, 2011 Office Action, however, did not address to what extent the cellular systems discussed in the invalidating references, including systems such as GPRS, UMTS, and IS-95/IS-657, inherently disclosed the disputed claim limitation.

82. On August 23, InterDigital filed a response where it argued that the claims were nonobvious based on the same spoofing-related limitation it identified previously. Additionally, InterDigital did not disagree with the Examiner's understanding that applicant had defined the term "maintain a communication session with the first wireless network in the absence of the plurality of assigned physical channels while communicating packet data with the IEEE 802.11 wireless local area network via the second transceiver" as disclosing some sort of spoofing.

83. Shortly thereafter, on October 20, 2011, the Examiner issued an Office Action, again rejecting the claims based in part on references that disclose dual-mode cellular/W-LAN

devices. These references include U.S Pat. No. 7,502,626 issued to Lemiläinen and U.S. Patent No. 6,243,581, issued to Jawanda. The reasoning in this latest rejection largely followed the Examiner's previous reasoning.

84. After the Examiner's October rejection, InterDigital requested, and received an interview with the Examiner. That interview took place on April 11, 2012. InterDigital then amended the claims and repeated its prior argument that handoff methods identified by the Examiner, including virtual subnets and Mobile IP, did not disclose the spoofing-related limitation "maintain a communication session with the cellular wireless network in an absence of the plurality of assigned physical channels while the IEEE 802.11 transceiver communicates packet data with the IEEE 802.11 wireless local area network."

85. On May 31, 2012, the Examiner issued a Notice of Allowance. Confusingly, the Notice of Allowance did not explain what was patentable over the prior art of record. The Notice of Allowance did not explain how or why the applicants claims could be distinguished over the previous rejections—in particular, the rejections that included the Jawanda 581 patent or the Lemiläinen 626 patent. Instead, the Notice of Allowance listed only U.S. Patent No. 5,577,033 (Chang et. al), even though that patent was never used in any rejection, never considered by the examiner in any "Notice of References Cited," never appeared in any written discussion, and never listed in any IDS submission.

86. Neither that Notice of Allowance, nor any other portion of the prosecution history for the 244 Patent address whether the cellular networks identified in the prior art of record inherently disclosed "maintain a communication session with the cellular wireless network in an absence of the plurality of assigned physical channels while the IEEE 802.11 transceiver communicates packet data with the IEEE 802.11 wireless local area network."

5. Challenged Claims of the 244 Patent

87. As noted above, the Challenged Claims of the 244 Patent are claims 1-8, 14-16, 19-29, 36-38, and 41-44 of the 244 Patent. I have reproduced these claims below:

1. A subscriber unit comprising:
   a cellular transceiver configured to communicate with a cellular wireless network via a plurality of assigned physical channels;
   an IEEE 802.11 transceiver configured to communicate with an IEEE 802.11 wireless local area network; and
   a processor configured to maintain a communication session with the cellular wireless network in an absence of the plurality of assigned physical channels while the IEEE 802.11 transceiver communicates packet data with the IEEE 802.11 wireless local area network.

2. The subscriber unit of claim 1, wherein the packet data is transmission control protocol and Internet protocol (TCP/IP) packet data.

3. The subscriber unit of claim 1, wherein the communication session is a transmission control protocol (TCP) layer session, an Internet protocol (IP) layer session, or a network layer session.

4. The subscriber unit of claim 1, further comprising:
   a detector configured to detect the IEEE 802.11 wireless local area network; and
   a circuit configured to select the IEEE 802.11 transceiver in response to the detector detecting the IEEE 802.11 wireless local area network.

5. The subscriber unit of claim 4, wherein the processor is further configured to release the plurality of assigned physical channels.

6. The subscriber unit of claim 4, wherein the detector is configured to detect a beacon frame or a probe response frame received by the IEEE 802.11 transceiver from the IEEE 802.11 wireless local area network.

7. The subscriber unit of claim 1, wherein at least one of the plurality of assigned physical channels is a data channel.

8. The subscriber unit of claim 1, wherein the cellular wireless network is a code division multiple access (CDMA) wireless network, and the cellular transceiver is a cellular code division multiple access (CDMA) transceiver.

14. The subscriber unit of claim 1, wherein the packet data is communicated to the Internet via the IEEE 802.11 wireless local area network, and not via the cellular wireless network.

15. The subscriber unit of claim 1, wherein the processor is further configured to allocate and deallocate at least one of the plurality of assigned physical channels.

16. The subscriber unit of claim 1, further comprising:
a detector configured to detect whether the IEEE 802.11 wireless local area network is available, wherein packet data is automatically communicated to the IEEE 802.11 wireless local area network when the IEEE 802.11 wireless local area network is available.

19. The subscriber unit of claim 1, wherein the processor is further configured to automatically communicate with the cellular wireless network on a condition that the IEEE 802.11 wireless local area network is unavailable.

20. The subscriber unit of claim 19, wherein the processor is configured to automatically communicate with the cellular wireless network by utilizing the communication session with the cellular wireless network.

21. The subscriber unit of claim 1, wherein the processor is configured to release the plurality of assigned physical channels in response to a low utilization of the plurality of assigned physical channels or in response to a detection of the IEEE 802.11 wireless local area network.

22. The subscriber unit of claim 1, wherein the packet data is transmission control protocol and Internet protocol (TCP/IP) data.

23. A method for use in a dual mode subscriber unit, the method comprising:
establishing a communication session with a cellular wireless network;
maintaining the communication session in an absence of any physical channels associated with the cellular wireless network; and
communicating packet data with an IEEE 802.11 wireless local area network while maintaining the communication session with the cellular wireless network.

24. The method of claim 23, wherein the packet data is transmission control protocol and Internet protocol (TCP/IP) packet data.

25. The method of claim 23, wherein the communication session is a transmission control protocol (TCP) layer session, an Internet protocol (IP) layer session, or a network layer session.

26. The method of claim 23, further comprising:
detecting the IEEE 802.11 wireless local area network; and
communicating with the IEEE 802.11 wireless local area network in response to detecting the IEEE 802.11 wireless local area network.

27. The method of claim 26, further comprising:

releasing all assigned physical channels associated with the first cellular wireless network.

28. The method of claim 26, wherein detecting the IEEE 802.11 wireless local area network comprises receiving a beacon frame or a probe response frame from the IEEE 802.11 wireless local area network.

29. The method of claim 23, wherein at least one of the physical channels is a data channel.

36. The method of claim 23, wherein the packet data is communicated to the Internet via the IEEE 802.11 wireless local area network, and not via the cellular wireless network.

37. The method of claim 23, further comprising:
allocating and deallocating at least one physical channel associated with the cellular wireless network.

38. The method of claim 23, further comprising:
detecting whether the IEEE 802.11 wireless local area network is available; and
automatically communicating packet data with the IEEE 802.11 wireless local area network upon detection of the IEEE 802.11 wireless local area network being available.

41. The method of claim 23, further comprising:
automatically communicating with the cellular wireless network on a condition that the IEEE 802.11 wireless local area network is unavailable.

42. The method of claim 41, wherein automatically communicating with the cellular wireless network includes utilizing the communication session with the cellular wireless network.

43. The method of claim 23, further comprising:
releasing all assigned physical channels in response to a low utilization of the assigned physical channels or in response to a detection of the IEEE 802.11 wireless local area network.

44. The method of claim 23, wherein the packet data is transmission control protocol and Internet protocol (TCP/IP) data.

C. Person of Ordinary Skill in the Art for the 244 Patent

88. I expect to offer testimony regarding the level of ordinary skill in the art relevant to the 244 Patent. I understand that factors such as the education level of those working in the

field, the sophistication of the technology, the types of problems encountered in the art, the prior art solutions to those problems, and the speed at which innovations are made may help establish the level of skill in the art.

89. Around the time of the filing of the application that issued as 244 Patent, I had already obtained a Ph.D. in electrical engineering concentrating on wireless technology, associated with many engineers in the field of the invention as an employee in the industry, and had already worked in the wireless industry for seven years.

90. The field of data communications over wireless networks was a rapidly changing field, with complicated standards defining the technical requirements of protocol layers to allow for communication and roaming. Based on the materials I have considered in this case and my personal experience, it is my opinion that the person of ordinary skill in the art of the 244 Patent would have a master's degree or the equivalent in electrical engineering and three or more years of work experience relating to data communications over wireless networks.

91. For convenience, where I refer to the knowledge that a person of ordinary skill in the art would have had, I am referring to that knowledge in the timeframe of the apparent priority date of the 244 patent, *i.e.*, September 21, 1999.

D. Date of Invention for the 244 Patent

92. I understand InterDigital previously contended that the parent 970 patent is entitled to a date of invention as early as April 6, 1999. That reasoning was rejected by the International Trade Commission in its final determination. Ex. 1011 (337-800 ALJ's Initial Determination); Ex. 1010 (337-TA-800 Comm'n Op.) (adopting the ALJ's Initial Determination). Consistent with the Commission's opinion and consistent with my previous view, it is my opinion that InterDigital is not entitled to a date of invention prior to the

September 21, 1999 as listed on the face of the 244 Patent. InterDigital will not be able to show conception and actual reduction to practice prior to the filing date of the priority application.

93. Accordingly, it is my opinion that the date of invention for the 244 Patent is no earlier than the September 21, 1999 application filing date.

94. Should InterDigital provide information in this proceeding alleging conception and reduction to practice prior to September 21, 1999, I reserve the right to provide an opinion on whether or not the evidence provides sufficient detail to corroborates any such allegation of an earlier date of invention.

E. Claim Construction Issues

95. I understand that in the Delaware district court case where InterDigital has asserted the 244 Patent, there is a dispute between the parties with respect to the meaning of certain claim terms used in the Challenged Claims of the 244 Patent. Notwithstanding that District Court dispute, I understand that the PTAB uses a different standard when interpreting the meaning of claims for an *inter partes* review proceeding, which is to use the broadest reasonable interpretation in light of the specification and knowledge of a person having ordinary skill in the art.

96. For informational purposes, I reproduce the joint claim construction chart from the parallel District Court proceeding (Case No. 13-cv-00009-RGA) related to the 244 Patent showing each party's proposed constructions:

Term	InterDigital's Position Case No. 13-cv-00009-RGA	ZTE's Position Case No. 13-cv-00009-RGA
configured to	operable/arranged to	set up to
configured to communicate with an IEEE 802.11 wireless local area network	No construction required. If needed: [operable/arranged to] transmit information to	[set up to] always connect directly to an IEEE 802.11 wireless local area network when such a connection is

	and/or receive information from an IEEE 802.11 wireless local area network.	possible
a circuit configured to select the IEEE 802.11 transceiver	hardware alone or in combination with software [operable/arranged to] select [hardware alone or in combination with software operable to transmit and/or receive IEEE 802.11 signals]	No construction necessary. If needed: hardware alone [set up to] choose exclusively the IEEE 802.11 transceiver
maintain a communication session with the cellular wireless network in an absence of the plurality of assigned physical channels	maintain a logical connection with the cellular wireless network when none of the [two or more physical layer channels allocable by the subscriber unit as needed to transfer data] are in use by the subscriber unit	spoof the subscriber unit to make it appear that a cellular wireless communication link is continuously available in an absence of the plurality of assigned physical channels
[a] plurality of assigned physical channels	two or more physical layer channels allocable by the subscriber unit as needed to transfer data	[a] plurality of physical channels available for the subscriber unit to select for use
release	stop the subscriber unit from using	make no longer assigned
allocate	assign	select for use
deallocate	stop the subscriber unit from using	select to stop using

(Ex. 1008 (Amended Joint Cl. Const. Chart.)

97. InterDigital's proposed constructions for the terms "assigned physical channels," "release," and "allocate" are unclear, and in my opinion, ZTE's proposed constructions for these terms properly capture the teaching of the 244 patent in light of the specification and of knowledge of a person having ordinary skill in the art at the time of the 244 patent. Further, ZTE's constructions do not comport with my understanding of cellular networks in that a mobile device cannot assign itself a physical network resource for transmitting user data, such as a physical data channel in GPRS networks, until the mobile device has been given permission by the network to do so.

98. To the extent InterDigital's constructions imply that the "subscriber unit" could assign network resources, it simply cannot be correct. In fact, the specification does not explicitly address what entity "assigns" a physical channel and provides no disclosure as to how a physical channel becomes an "assigned physical channel." Rather, the specification describes what actions to perform on those assigned channels that have been made available to the subscriber unit. "For example a bandwidth management function may make only a certain number of channels available at any time" (Ex. 1001 (244 patent) at 7:24-26). "A *subset* of the available channels 30 is selected, and then the optimum number of bits for each subframe intended to be transmitted over respective one of the channels, is then chosen" (Ex. 1001 (244 patent) at 7:26-29).

99. The specification calls this the function of "allocating" or "deallocating." "The bandwidth management function 134 is responsible for allocating and deallocating CDMA radio channels 160 *as required*" (Ex. 1001 (244 patent) at 9:64-66). And it later describes the "allocation" function as selecting bandwidth to use "only when there is actual data present from the terminal equipment to the CDMA transceiver 140" and "the network layer need not allocate the assigned wireless bandwidth for the entirety of the communications session" (Ex. 1001 (244 patent) at 10:34-38. Accordingly, it is my opinion that in the context of "assigned physical channels," "allocate" means to "select for use" and "deallocate" means "select to stop using" the channel.

100. Nevertheless, I understand from the proposed constructions and from arguments made by InterDigital in its claim construction brief, that InterDigital treats the terms "assign" and "allocate" as synonyms for use of a cellular channel for data transmission and the terms "release" and "deallocate" as synonyms for stopping to use that cellar channel (or channels) for data

transmission. *See* Ex. 1009 (Joint Cl. Const. Br.) at 74 ("'assign' and 'allocate,' as well as their derivatives, are synonyms" and that the specification uses "the term 'release' and 'deallocate' interchangeably to connote non-use"). Even though InterDigital makes that argument, its proposed constructions do not reflect that understanding and instead introduce ambiguity. However, with the understanding that InterDigital's construction simply implies that "assign" and "allocate" describe *using* a channel for data transmission and "release" and "deallocate" describe *stopping use* of a channel for data transmission, at least for purposes of the analysis required in this proceeding, it is my opinion that InterDigital's construction and ZTE's construction do not have appreciable distinctions to a person having ordinary skill in the art.

101. As to the term "maintain a communication session with the cellular wireless network in an absence of the plurality of assigned physical channels," I provided an opinion on claim construction in the 800 Investigation for a very similar limitation recited in the 970 patent. In that case, the parties proposed claim constructions for the 970 patent that are similar to what they proposed in Delaware for the 244 patent. Ultimately, the ALJ in the 800 Investigation found that InterDigital's broader construction should be adopted (*see* Ex. 1011 [337-800 Initial Determination]).

102. InterDigital opined that the term: "maintain a communication session above a physical layer . . . when none of the plurality of physical layer channels are assigned" means "a connection above the physical layer . . . is maintained when the allocable physical layer channels are not in use by the subscriber unit." It is my view that the specification does not support such a broad construction. Even though I disagree with the ALJ's finding and believe that InterDigital's proposed construction is overly broad, for the purposes of this proceeding, I have adopted InterDigital's proposed construction for this term from the Delaware case.

103. In applying InterDigital's apparent constructions in my analysis, I make no representation that InterDigital's apparent constructions meet the requirements set forth in 35 U.S.C. § 112. I understand that in an *inter partes* review proceeding, a petitioner is not able to challenge the claims on grounds other than those found in 35 U.S.C. §§ 102-103.

F. Overview of Relevant Prior Art

1. U.S. Patent No. 6,243,581 to Jawanda

104. Jastinder Jawanda filed the application for U.S. Patent No. 6,243,581 ("Jawanda Patent") with the United States Patent Office on December 11, 1998. Ex. 1003 [Jawanda Patent]. Titled "Method and System for Seamless Roaming Between Wireless Communication Networks with a Mobile Terminal," the Jawanda Patent issued on June 5, 2001, and named Nortel Networks Limited as its assignee.

105. To the extent that Jawanda does not explicitly disclose one or more limitations of the Challenged Claims of the 244 Patent, it is also my opinion that such claim(s) would have been obvious to a person of ordinary skill in the art based on Jawanda alone or in combination with the teachings of other prior art references that sought to solve similar problems in the field of wireless data communications.

106. Jawanda identifies as an open problem that a portable computer user cannot move outside the range of a wireless network and maintain an active session.

> While the mobility of portable computer users is greatly enhanced by the availability of wireless data communication, the mobility of a portable computer is currently restricted when the user has an active session. That is, the user cannot move out of the service area of the wireless data communication network through which the user is connected to the target network without terminating the session. Thus, if the portable computer user has initiated a time consuming operation such as a download of a large file, the heretofore mobile user must remain within a confined service area if the operation is to complete successfully. As should thus be apparent, it would be desirable to provide a method and system for data communication that permit a portable computer user to move outside the service area of a wireless data communication network through which a connection to a computer network is established without terminating an active session.

Ex. 1003 [Jawanda Patent] at 1:39-57.

> As should be apparent, it would be desirable to provide a method and system for data communication that permit a portable computer user to move outside the service area of a wireless data communication network through which a connection to a computer network is established without terminating an active session.

Ex. 1003 [Jawanda Patent] at 1:52-57.

107. The Summary of the Invention section of Jawanda suggests addressing this identified problem with a subscriber unit that is capable of seamless roaming between higher bandwidth wireless LANs and lower bandwidth cellular wireless networks.

> A mobile computer system capable of seamless roaming between wireless communication networks includes data processing resources for executing software, a plurality of wireless interfaces that supports simultaneous wireless connections with first and second wireless communication networks, and a network access arbitrator that routes data communicated between the software executed by the data processing resources and the first and second wireless communication networks. To permit seamless roaming, the network access arbitrator routes the data to the first wireless communication network via a first wireless interface and then seamlessly reroutes the data to a second wireless communication network via a second wireless interface.

Ex. 1003 [Jawanda Patent] at Abstract.

> The present invention relates in general to data communication and in particular to a method and system for wireless data communication. Still more particularly, the present invention relates to a method and system for seamless roaming between wireless data communication networks with a mobile terminal.

Ex. 1003 [Jawanda Patent] at 1:9-14.

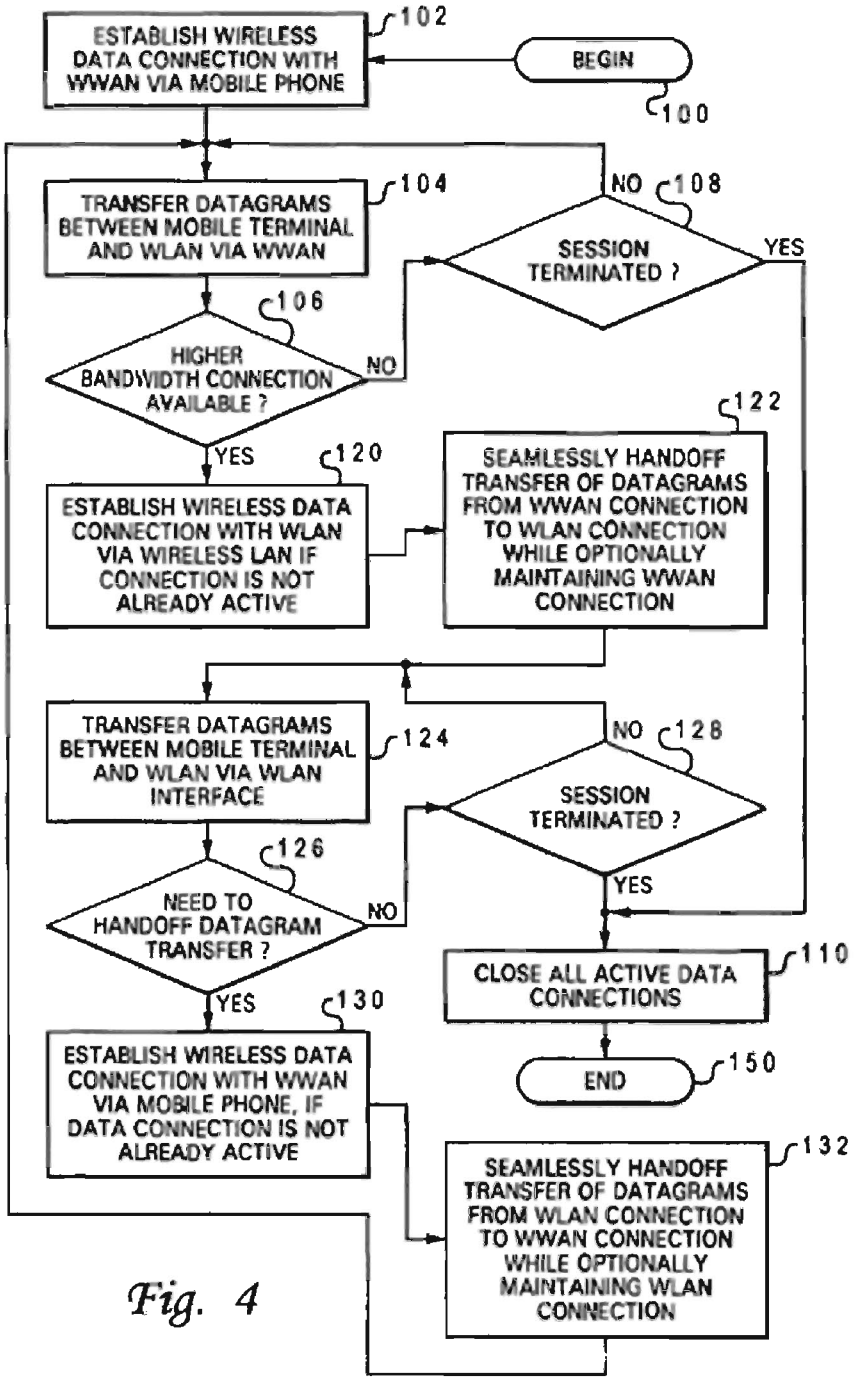


Fig. 4

FIG. 4 is a high level logical flowchart depicting a method of wireless data communication in which a data communication session is seamlessly handed off between wireless data communication networks.

Ex. 1003 [Jawanda Patent] at 2:31-34.

108. Jawanda discloses a mobile terminal and a mobile phone that are coupled together as a single unit to provide wireless data communications over either a WLAN or a cellular wireless network, such as a CDMA, CDPD, or GPRS network.

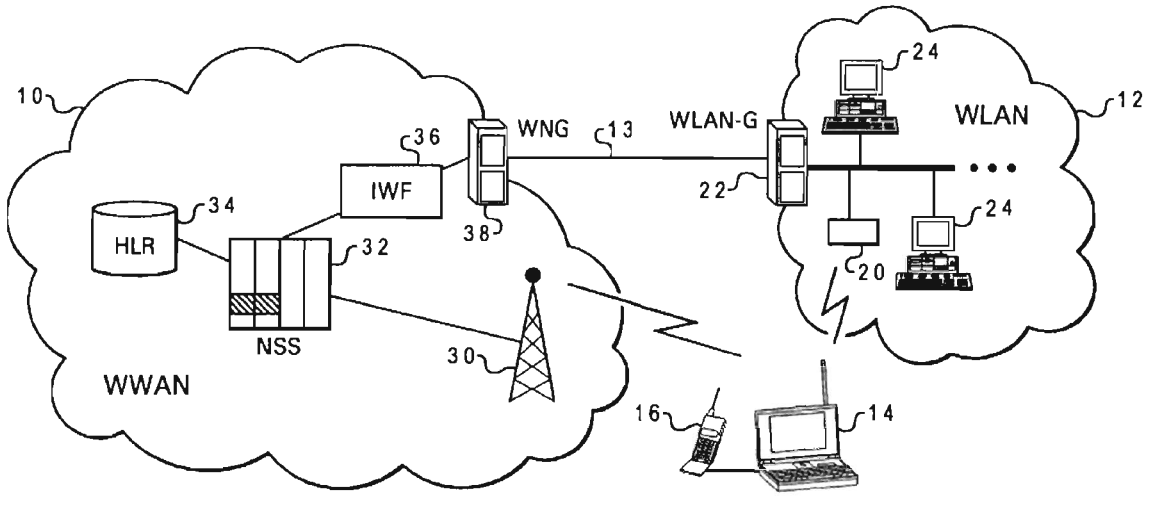


Fig. 1

FIG. 1 depicts an illustrative embodiment of a wireless data communication environment in accordance with the present invention;

Ex. 1003 [Jawanda Patent] at 2:22-24.

Wireless network adapter 20 is in all respects like the conventional network adapter cards utilized to interface fixed terminals 24 to WLAN 12, except that one or more mobile terminals 14 can obtain a high bandwidth wireless connection to WLAN 12 via wireless network adapter 20.

Ex. 1003 [Jawanda Patent] at 2:62-67.

As further illustrated in FIG. 1, WWAN 10 is a cellular communication system that can be utilized for both voice and data communication. For example, WWAN 10 includes a base station 30, which transmits wireless signals to and receives wireless signals from one or more mobile phones 16. For data connections, such wireless signals can be transmitted according to any currently available or future wireless data protocol such as code division multiple access (CDMA), CDPD, or GPRS.

Ex. 1003 [Jawanda Patent] at 3:1-9.

109. Jawanda discloses establishing a connection with a cellular network and transmitting data over the cellular network using a layered mobile internet protocol.

> As illustrated, the process begins at block 100 and thereafter proceeds to block 102, which illustrates mobile terminal 14 first establishing a wireless data connection with WWAN 10 via mobile phone 16 while located outside the service area of WLAN 12 . . . In any event, a signal is transmitted via I/O adapter 78 to mobile phone 16, which responds to the signal by establishing the wireless data connection utilizing a conventional technique, for example, by requesting a connection from the MSC within NSS 32 using a message transmitted to base station 30 via a control channel. As indicated at block 104, datagrams may thereafter be transferred between application 90 executed by mobile terminal 14 and application 91 executed by a fixed terminal 24 within WLAN 12. As discussed above with respect to FIG. 3, at the higher layers of connectivity the outward-bound datagrams are passed from application 90 to network access arbitrator 92, which routes the datagrams to CAI 94. CAI 94 transmits the datagrams via I/O adapter 78, mobile phone 16, base station 30, NSS 32 and IWF 36 to the CAI 94 executed by WNG 38. The CAI 94 executed by WNG 38 in turn transmits the datagrams to WLAN-G 22 utilizing the mobile IP protocol.

Ex. 1003 [Jawanda Patent] at 4:31-55.

> As discussed further herein below, datagrams are preferably communicated between WWAN 10 and WLAN 12 across external network 13 utilizing the mobile internet protocol (IP) described in detail in Perkins, C., "IP Mobility Standard," RFC 2002, October 1996 available from the Internet Engineering Task Force (IETF) and incorporated herein by reference.

Ex. 1003 [Jawanda Patent] at 6:1-20.

110. Jawanda discloses detecting the availability of a higher bandwidth WLAN connection, establishing a wireless connection with the WLAN, and automatically handing off data transmission from the cellular network to the WLAN while maintaining a higher level communication session. In other words, Jawanda describes a device that can stop using the cellular network for data transmission and instead use an available WLAN for those data transmissions.

> As has been described, the present invention provides an improved method and system for wireless data communication in which the transfer of datagrams may be seamlessly

> handed off between multiple concurrent wireless data connections while maintaining an application-level session.

Ex. 1003 [Jawanda Patent] at 6:11-15.

> As depicted at block 106, a determination can be made at any time following block 102 whether or not a higher bandwidth data connection is available. The determination illustrated at block 106 can be made by WLAN interface 96, for example, which may periodically poll to determine whether a connection can be obtained directly with WLAN 12 via wireless network adapter 20. This polling behavior may entail WLAN interface 96 periodically determining whether an "advertisement" message has been received by wireless LAN adapter 64 from wireless network adapter 20. Alternatively, and less preferably since mobile terminal 14 is typically powered by a limited life battery, the determination illustrated at block 106 can represent WLAN interface 96 detecting whether an "advertisement" message transmitted by wireless LAN adapter 64 has received a response from WLAN interface 96.

Ex. 1003[Jawanda Patent] at 4:61-5:9.

> Returning to block 106, in response to a determination that a higher bandwidth data connection (i.e., a direct connection to WLAN via wireless network adapter 20) is available, for example, due to mobile terminal 14 being moved into the service area of WLAN 12, the process proceeds to block 120. Block 120 depicts mobile terminal 14 establishing a second wireless data connection by logging on to WLAN 12 via wireless network adapter 20. To logon to WLAN 12, mobile terminal 14 performs the conventional registration procedures dictated by the network and followed by fixed terminals 24, except that logon information is conveyed between mobile terminal 14 and wireless LAN adapter 64 by wireless communication. Thus, following block 120, the user has concurrent wireless data connections with both WWAN 10 and WLAN 12. Then, as depicted at block 122, network access arbitrator 92 causes the transfer of datagrams to be seamlessly handed off from the wireless connection with WWAN 10 to the wireless connection with WLAN 12 while maintaining the session between applications 90 and 91. Thus, following block 122, datagrams are routed between application 90 and application 91 utilizing the higher bandwidth data path between WLAN interfaces 96 rather than between CAIs 94, as shown at block 124.

Ex. 1003 [Jawanda Patent] at 5:20-42.

111. Jawanda also discloses maintaining the communication session while automatically handing data transmission back to the WLAN from the cellular network based on any number of factors, including signal deterioration or network unavailability.

> Next, as illustrated at block 126, network access arbitrator 92 determines whether or not the transfer of datagrams should be handed off to the connection with WWAN 10, for example, in response to mobile terminal 14 being moved out of range of WLAN 12 due

> to the user leaving the business premises housing WLAN 12. The determination made at block 126 can be based on one or more factors, including the number of transmission errors detected by WLAN interface 96 and the received signal strength (RSS) of signals received by wireless LAN adapter 64. In response to a determination at block 126 that the transfer of datagrams should not be handed off, the process passes to block 128, which illustrates a determination of whether or not the user or application 90 has terminated the session with application 91. If so, network access arbitrator 94 closes all active wireless data connections at block 110, and the process ends at block 150. If, on the other hand, a determination is made at block 128 that the session has not been terminated, the process returns to block 124, which has been described.

Ex. 1003 [Jawanda Patent] at 5:43-61.

> Returning to block 126, in response to a determination by network access arbitrator 92 that the transfer of datagrams should be handed off, the process passes to block 130. Block 130 illustrates network access arbitrator 92 causing a wireless data connection to be reestablished with WWAN 10 in the manner described above with respect to block 102, if such a connection is not already active. Thereafter, network access arbitrator 92 reroutes the flow of datagrams from WLAN interface 96 to CAI 94. As indicated at block 132, the data wireless connection with WLAN 12 can thereafter optionally be maintained, if possible, until such time as the condition that prompted the handoff is no longer present and datagram transfer can again be handed off to the high bandwidth connection with WLAN 12. The process illustrated in FIG. 4 then returns to block 104, which has been described.

Ex. 1003 [Jawanda Patent] at 5:62-6:10.

2. U.S. Patent No. 6,681,259 to Lemiläinen and Haverinen

112. Jussi Lemiläinen and Henry Haverinen filed the application for U.S. Patent No. 6,681,259 ("Lemiläinen") with the United States Patent Office on May 10, 1999, with priority to a foreign application filing date of May 12, 1998. Ex. 1004 [Lemiläinen]. Titled "Method for Coupling a Wireless Terminal to a Data Transmission Network and a Wireless Terminal," Lemiläinen issued on January 20, 2004 and named Nokia Mobile Phones Ltd, as its assignee.

113. To the extent that Lemiläinen does not disclose one or more limitations of the Challenged Claims of the 244 Patent, it is also my opinion that such claim(s) would have been obvious to a person of ordinary skill in the art based on Lemiläinen alone, or when combined with other prior art references, discussed later in this report.

114. Lemiläinen identifies as an open problem that it is not possible to change data transmission networks without terminating an active connection.

> Thus, when using methods and local area networks currently known, it is possible to change the network interface card in the portable computer whereby the connection can be set up via a mobile communication network. Also in this situation it is not possible to change the connection by using methods and terminals of prior art without terminating the active connections.

Ex. 1004 [Lemiläinen] at 2:29-35.

> For example, when the user moves inside the office and uses the wireless local area network WLAN, in some parts of the office the quality of the connection may become so poor that data transmission is disturbed or delayed significantly. Thus, the user should try to shift to such a data transmission network, in which a better connection quality is achieved, for example to a landline local area network LAN, if such is in the vicinity, or to the GSM mobile communication network, if the user is in its coverage area. This change of the data transmission network causes the problems described above: termination of the existing connections, setting up new connections and, if necessary, also cutting off or setting up a telephone connection.

Ex. 1004 [Lemiläinen] at 2:51-63.

115. The Summary of the Invention section of Lemiläinen suggests addressing this identified problem by providing a method for changing connections among different wireless networks without the knowledge of applications running on the subscriber unit.

> It is a purpose of the present invention to provide a method for coupling a portable terminal in a flexible manner to a data transmission network, and for changing the data transmission connection used at a given time to another data transmission network when necessary, as well as to a portable terminal according to the method.

Ex. 1004 [Lemiläinen] at 2:66-3:4.

> Thus, such a multi-mode terminal can be used in several local area networks of different types and in other communication networks, and even in such a way that the communication network used at a given time can be changed without terminating active connections. This transition can be arranged to be conducted in such a way that the user does not even notice the transition. Thus, it is possible to use one network layer address in the terminal, wherein it is not necessary for the applications used in the terminal to know which physical data transmission network is used at a given time.

Ex. 1004 [Lemiläinen] at 3:19-30.

116. Lemiläinen discloses a multi-mode terminal capable of communicating with a short range, higher speed WLAN, such as an IEEE 802.11-based WLAN, and a lower speed mobile communication network, such as a GSM or GPRS cellular wireless network.

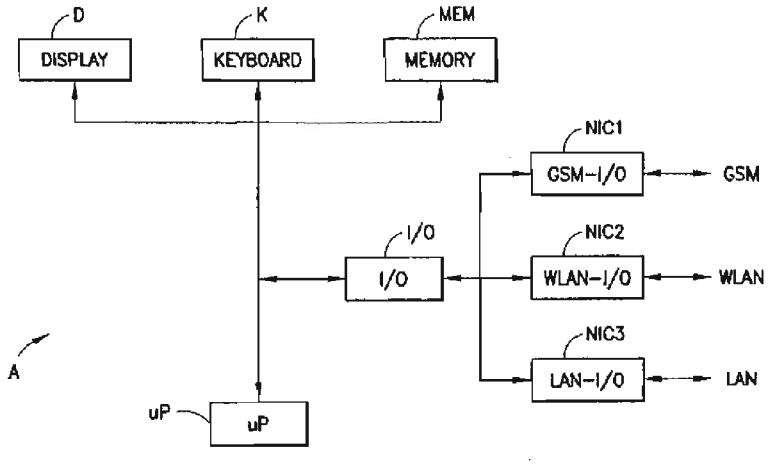


FIG.2

FIG. 2 shows a terminal according to an advantageous embodiment of the invention in a reduced block diagram,

Ex. 1004 [Lemiläinen] at Fig. 2 & 3:49-50.

Furthermore, in a terminal A there are several network interface adapters NIC1, NIC2, NIC3 available for coupling to data transmission networks of different types, of which an Ethernet type landline local area network, a wireless local area network WLAN according to the IEEE standard 802.11, and a GSM mobile communication network are mentioned as examples, but also other data transmission solutions, such as the packet switched data transmission system GPRS (General Packet Radio Service) of the GSM system and LPRF (Low Power RF) based on a low power radio signaling, can be applied in connection with the present invention. Such terminal A is also called a multi-mode terminal.

Ex. 1004 [Lemiläinen] at 4:19-32.

117. Lemiläinen discloses communicating data over the mobile communication network using a TCP/IP protocol at the transport and network layer and an IEEE 802.11 protocol at the physical and link layer.

It is presumed that the terminal A is connected to a second terminal B via a GSM mobile communication network. The connection is for example a TCP connection. The terminal

> A transmits IP packets to the second terminal B directly, without tunneling, via a server 728 located in the GSM mobile communication network.

Ex. 1004 [Lemiläinen] at 13:6-11.

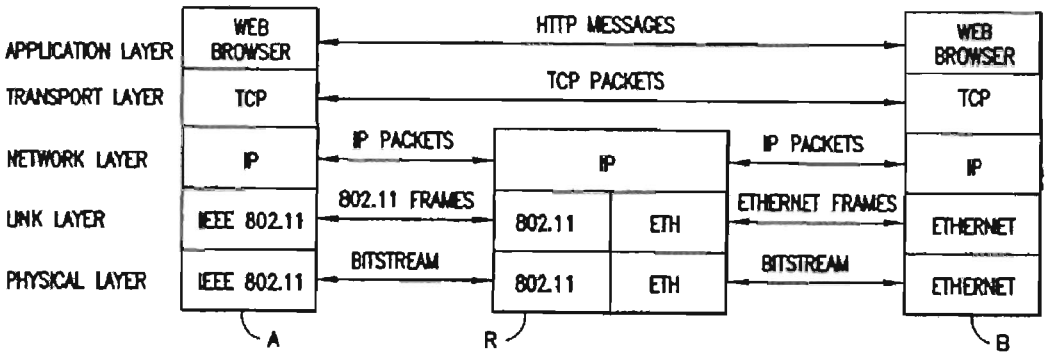


FIG.4

> The appended FIG. 4 presents by means of the TCP/IP protocol stack the coupling of and communication between two such hosts, A, B via a router R.

Ex. 1004 [Lemiläinen] at Fig. 4 & 6:6-8.

118. Lemiläinen discloses automatically connecting to a WLAN or mobile communication network, based on certain conditions or in response to an advertisement message, and shifting an active connection between the mobile communication network and the WLAN, while maintaining a higher level communication session throughout.

> After it is started, the management application MA of the network interface selection driver examines which NIC drivers D1, D2, D3 are started in the terminal A and what is the quality of each active connection. It is also possible that a network interface card has received from the corresponding data network an advertisement message from an agent, such as an home agent or a foreign agent, by means of which the agent aims at defining the address information of the terminals A connected to the data network. On the basis of the defined information, the management application MA of the network interface selection driver directs the network interface selection driver NSID to transmit, when necessary, a registration message to the data network NW1, NW2, NW3, MN2, to which the network interface selection driver management application MA or the user of the terminal A desires to be connected at that moment. At this stage, the network interface selection driver NISD indicates to the protocol driver PD that the coupling to the data network is activated, wherein the network interface selection driver NISD can start transmitting packets.

> On the basis of the defined information, the management application MA of the network interface selection driver directs the network interface selection driver NSID to transmit, when necessary, a registration message to the data network NW1, NW2, NW3, MN2, to which the network interface selection driver management application MA or the user of the terminal A desires to be connected at that moment. At this stage, the network interface selection driver NISD indicates to the protocol driver PD that the coupling to the data network is activated, wherein the network interface selection driver NISD can start transmitting packets.

Ex. 1004 [Lemiläinen] at 10:31-51.

> Next, we shall discuss a situation where the terminal A shifts an active connection from one data network to another. The reason for the connection transition can be that the terminal A is transferred outside the service area of an active data network, or for another reason the connection quality in the active data network deteriorates at that moment to such an extent that the network interface selection driver NISD starts to change the connection to another data network. A reason for the connection change can also be that the terminal A enters the operation range of such a data network which the user has given a higher priority than the data network active at the moment. The terminal A is, for example, connected to a GSM mobile communication network and the user of the terminal arrives in an office where a wireless local area network is available. The appended FIG. 8c shows this data transmission network change in a reduced arrow diagram. It is presumed that the terminal A is connected to a second terminal B via a GSM mobile communication network. The connection is for example a TCP connection. The terminal A transmits IP packets to the second terminal B directly, without tunneling, via a server 728 located in the GSM mobile communication network.

Ex. 1004 [Lemiläinen] at 12:57-13:11.

3. Cellular Standards (GPRS and Draft UMTS)

119. I understand that GSM and CDMA were both well-known "2G" cellular network technologies, providing for primarily voice communications over wireless channels. GSM was developed by the European Telecommunications Standards Institute (ETSI) in the late 1990's, and CDMA was first implemented by Qualcomm in the mid 1990's as TIA Interim Standard 95 (IS-95). Packet data overlays for GSM (GPRS) and CDMA (IS-657) were developed shortly thereafter to improve data communications using such wireless networks. GSM and CDMA matured into the UMTS and CDMA2000 Standards, and ultimately into the 4G LTE popular today.

120. GSM, GPRS, and UMTS were developed as open standards. This means that interested members of the public could easily obtain such documents, and the standards group in charge of the GSM, GPRS, and UMTS standards publishes the standards, whether updated or not, up to four times a year. A person of ordinary skill in the art working in the cellular industry would certainly be aware of the publication and availability of the GSM, GPRS, and UMTS standards, including the GPRS Standards and Draft UMTS Standards identified as exhibits to the petition. The documents were widely available as of the dates listed on the top of the specification. An example of the policy and developing policy at the time for the 3GPP organization for naming, dating, and distributing documents is listed in Ex. 1007 [3GPP TR 21.900 v. 3.1.0] of the IPR.

121. For example, engineers developing cellular devices intended to be compliant with the GSM, GPRS, or UMTS standards would be able to easily access the available standards, and could even sign up for email distribution lists of the various working groups developing the standards, who would receive notifications of newly available documents.

122. Given the complexity of each release of the GSM, GPRS, and UMTS cellular standards, it is common for various portions of each standards release to be developed and published in separate documents. Although located in separate documents, these documents form a cohesive cellular standard. A person of ordinary skill would understand that all portions of the standard associated with the same release must be read together as a whole to understand, for example, how to make a cell phone compliant with the standard. With this motivation, it would have been obvious to a person having ordinary skill in the art to combine all of these references and view them as a single reference.

a) GPRS Standards prior to Sept. 21, 1999

123. The GPRS Standards listed in the petition as Ex. 1005 were all published and widely available as of November 1998. As I explained before, the date on the top of each document shows when it would have been made available to the interested members of the public.

124. Generally, GPRS is a packet data overlay for GSM cellular networks. In GPRS standards-based cellular wireless networks, there are eight basic physical channels per carrier, each of which is identified by a time slot number and frequency hopping sequence. Each channel has an associated Packet Data Traffic Channel and Packet Associated Control Channel, which can be used to transmit either packet data traffic or packet control information. GPRS provides for mobile terminals to aggregate packet data traffic channels so that multiple channels are provided for the mobile terminal to use when it has packet data to transmit. By aggregating multiple packet data traffic channels, faster data transmission is possible.

125. The GPRS provided the data overlay in the form of the Mobility Management layer.

> These procedures are used to establish, maintain and release a MM connection between the mobile station and the network, over which an entity of the upper CM layer can exchange information with its peer. A MM connection establishment can only be performed if no MM specific procedure is running. More than one MM connection may be active at the same time.

Ex. 1005.05 [GPRS Standards, GSM 04.08 v. 6.1.1 R97] at §4.1.1 Type of MM procedures.

126. Subscriber units configured to communicate with GPRS Standard-based cellular wireless networks are configured to establish packet data communication sessions with the cellular network on the Session Management Layer. The Session Management Layer can activate a PDP context in order to send and receive packet data:

> Session Management services are provided at the SMREG-SAP and the SNSM-SAP for anonymous and non-anonymous access. The non-anonymous and anonymous access procedures for PDP context activation and PDP context deactivation are available at the SMREG-SAP. In addition there exists a PDP context modification for non-anonymous PDP contexts.

Ex. 1005.05 [GPRS Standards, GSM 04.07 v. 6.1.0 R97] at §6.5 Session Management Services for GPRS-Services.

127. The PDP context includes a number of routing and session management parameters including, for example, PDP Type, PDP Address, and QoS Profile Negotiated parameters. *See* Ex. 1005.03 [GPRS Standards, GSM 03.60 v. 6.1.1] at §13.4 MS.

128. The GPRS Standards disclose a PDP context that is "maintained when all assigned physical layer channels have been released" as described by Claim 1 of the 244 Patent. When the radio link connection between the user device and the network has been released, one or more active PDP contexts are preserved.

> In the non-anonymous access case, the MM state relates only to GPRS MM activities of a subscriber. The MM state is independent of the number and state of PDP contexts for that subscriber.

Ex. 1005.03 [GPRS Standards, GSM 03.60 v. 6.1.1] at §6.1 Definition of Mobility Management States.

129. The GPRS Standards also disclose the ability of the subscriber unit to select to use or selecting to stop using assigned physical channels associated with the cellular wireless network.

130. The GPRS Standards do not require permanently allocated PDCHs. The allocation of capacity for GPRS can be based on the needs for actual packet transfers which is referred to as the "capacity on demand" principle. Accordingly, the mobile station is able select when to stop using and when to resume packet transfer on available channels.

> The GPRS does not require permanently allocated PDCHs. The allocation of capacity for GPRS can be based on the needs for actual packet transfers which is here referred to as the "capacity on demand" principle.

Ex. 1005.10 [GPRS Standards, GSM 03.64 v. 6.1.0] at §6.1.1.2 Capacity on demand concept.

> When selecting a new cell, mobile station leaves the packet transfer mode, enters the packet idle mode where it switches to the new cell, read the system information and may then resume to packet transfer mode in the new cell.

Ex. 1005.10 [GPRS Standards, GSM 03.64 v. 6.1.0] at §6.2.2 Packet transfer mode.

b) Draft UMTS Standards as of August 20, 1999

131. The Draft Universal Mobile Terrestrial Standards listed in the petition as Ex. 1006 were all published and widely available as of August 20, 1999 ("Draft UMTS Standards") are prior art to the 244 Patent. *See* Ex. 1006 [Draft UMTS Standards]. As I explained before, the date on the top of each document shows when it would have been made available to the interested members of the public.

132. To the extent that the Draft UMTS Standards do not disclose one or more limitations of the Challenged Claims of the 244 Patent, it is also my opinion that such claim(s) would have been obvious to a person of ordinary skill in the art based on the Draft UMTS Standards alone or when combined with the teachings of other prior art references, as discussed later in this report.

133. The Draft UMTS Standards disclose a mobile station (UE) that is capable of communication with either a cellular network, such as a UMTS Terrestrial Radio Access Network (UTRAN), or a WLAN, such as a BRAN or HIPERLAN/2 network. The Draft UMTS Standards discloses combining the UTRAN with the HIPERLAN/2 in a common network, the UMTS Radio Access Network (URAN), which provides support for roaming between different networks.

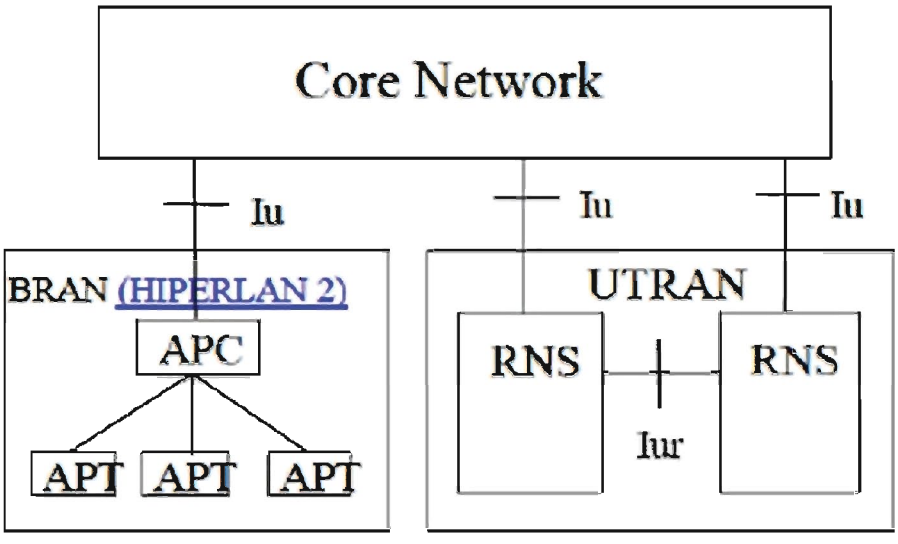


Figure 50: HIPERLAN 2 UMTS Interworking.

Ex. 1006.04 [Draft UMTS Standards, 3GPP 23.121 v. 3.0.0] at Figure 50.

> UMTS will incorporate a new generic radio access network, the UMTS Radio Access Network (URAN). The URAN may include several different realisations, of which the UTRAN (UMTS Terrestrial Radio Access Network) is one. The Iu reference point forms the boundary between URAN and the UMTS core network. By connecting HIPERLAN/2 to the Iu interface. HIPERLAN/2 will form a complimentary realization of the URAN concept for broadband data services. UMTS interworking will provide HIPERLAN/2 with roaming support using the UMTS mobility infrastructure.
>
> .

Ex. 1006.04 [Draft UMTS Standards, 3GPP 23.121 v. 3.0.0] at §4.7.2.

134. The Draft UMTS Standards disclose a CDMA-based cellular system that is capable of communicating data using a layered communications protocol and allowing users to conveniently move between different types of wireless data networks—either a long range, slower cellular wide area network (W-CDMA) or a short range wireless local area network (HiperLan/2). When moving between networks, the physical data transmission is handed over from one data network to another while a communication session is maintained at a higher level.

> A HIPERLAN/2 realisation of URAN should provide the same logical interface to the higher layers (i.e. layers belonging to the non-access stratum) as UTRAN. Hence, no

> changes in higher layers should be required . . . Handovers between UTRAN and HIPERLAN/2, in case of dual mode terminals, should be supported via the core network.

Ex. 1006.04 [Draft UMTS Standards, 3GPP 23.121 v. 3.0.0] at §4.7.2.

> A single generic mobility handling mechanism that allows roaming between all types of access networks would allow the user to conveniently move between fixed and mobile networks, between public and private as well as between PLMN's with different access technologies. The ongoing work in IETF Mobile IP working group [MIP WG] is targeted towards such a mechanism[3] and a set of standards are planned to be finalized during 1999. Thus, it is important to offer Mobile IP also to UMTS and GPRS users to allow them to roam to and from other access technologies while keeping ongoing data sessions, e.g. TCP or UDP. A typical UMTS network supporting Mobile IP is shown in Figure 2.

Ex. 1006.04 [Draft UMTS Standards, 3GPP 23.121 v. 3.0.0] at §4.10.1

135. Like GPRS, draft UMTS used a PDP Context for session management and routing information. The Draft UMTS Standards allow for the determining the number of DPDCHs (zero or more) assigned to a Layer 1 connection, based on the number of Transport Blocks in the Transport Block Set. This can be determined as the ratio of the Transport Block Set Size over the Transport Block Size for a given Transport Format.

> This is defined as a set of Transport Blocks which are exchanged between L1 and MAC at the same time instance using the same transport channel.

Ex. 1006.09 [Draft UMTS Standard, 3GPP TS 25.302 v. 2.3.0] at §7.1.2 Transport Block Set

> This is defined as a format offered by L1 to MAC (and vice versa) for the delivery of a Transport Block Set during a Transmission Time Interval on a Transport Channel. The Transport Format constitutes of two parts – one *dynamic* part and one *semi-static* part.

Ex. 1006.09 [Draft UMTS Standard, 3GPP TS 25.302 v. 2.3.0] at §7.1.6 Transport Format

> The layer 1 multiplexes one or several Transport Channels, and for each Transport Channel, there exists a list of transport formats (Transport Format Set) which are applicable. Nevertheless, at a given point of time, not all combinations may be submitted to layer 1 but only a subset, the Transport Format Combination. This is defined as an authorized combination of the combination of currently valid Transport Formats that can be submitted simultaneously to the layer 1 for transmission on a Coded Composite Transport Channel of a UE, i.e. containing one Transport Format form each Transport Channel.

Ex. 1006.09 [Draft UMTS Standard, 3GPP TS 25.302 v. 2.3.0] at §7.1.8

> The Transport Format Combination Set is what is given to MAC for control. However, the assignment of the Transport Format Combination Set is done by L3. When mapping data onto L1, MAC chooses between the different Transport Format Combinations given in the Transport Format Combination Set. Since it is only the dynamic part that differ between the Transport format Combinations, it is in fact only the dynamic part that MAC has any control over.

Ex. 1006.09 [Draft UMTS Standard, 3GPP TS 25.302 v. 2.3.0] at §7.1.9

> Note that a Transport Format Combination Set need not contain all possible Transport Format Combinations that can be formed by Transport Format Sets of the corresponding Transport Channels. It is only the allowed combinations that are included. Thereby a maximum total bit rate of all transport channels of a Code Composite Transport Channel can be set appropriately. That can be achieved by only allowing Transport Format Combinations for which the included Tranport Formats (one for each Tranport Channel) do not correspond to high bit rates simultaneously. The selection of Transport Format Combinations can be seen as a fast part of the radio resource control. The dedication of these fast parts of the radio resource control to MAC, close to L1, means that the flexible variable rate scheme provided by L1 can be fully utilized. These parts of the radio resource control should be distinguished from the slower parts, which are handled by L3. Thereby the bit rate can be changed very fast, without any need for L3 signalling.

Ex. 1006.09 [Draft UMTS Standard, 3GPP TS 25.302 v. 2.3.0] at §7.1.9.

G. The Prior Art Landscape

136. In order to understand the disclosure in the 244 patent, Jawanda, Lemiläinen, and the Draft UMTS Standards, they should be viewed from the perspective of a person having ordinary skill in the art at the time of the claimed invention.

137. In doing so, it is important to consider what was known to those of ordinary skill in the art at that time of the claimed invention. Importantly, several of the prior art technologies known in the art were expressly identified in Jawanda, Lemiläinen, and the Draft UMTS Standards, which may also inform the broader prior art landscape known to those of ordinary skill in the art at the time of the 244 Patent.

a) It was well-known to a person having ordinary skill in the art at the time of the claimed invention to design a WLAN in compliance with the IEEE 802.11 standard.

138. The implementation of a WLAN compliant with the IEEE 802.11 standard was well-known to a person of ordinary skill in the art at the time of the claimed invention. This is confirmed, for example, by the express identification of 802.11 in the 244 Patent and Lemiläinen as a preferable design choice for a high speed, short range WLAN. Further, it is implicit that a person having ordinary skill in the art would look to the publically available WLAN standards, including IEEE 802.11, in order to implement the WLAN referenced in Jawanda.

139. The 244 Patent itself admits that IEEE 802.11 was an accepted standard at the time of the claimed invention, and relies on it to provide enabling disclosure.

> A newly accepted standard, IEEE 802.11, specifies a protocol for the media access control (MAC) and physical (PHY) layers of a wireless LAN. As with cellular systems, a W-LAN connection can be handed off from one area of coverage (a "basic service set" in IEEE 802.11 parlance) to the next. A good description of wireless LANs, and the IEEE 802.11 standard in particular, may be found in Geier, J., *Wireless LANs* (Macmillan Technical Publishing, 1999).

Ex. 1001 [244 Patent] at 2:27-34.

> "For example, IEEE 802.11 specifies that a beacon frame should be transmitted at regular intervals. A terminal 615, 617 can detect the beacon frame by waiting a minimum period of time equal to the beacon interval. See, for example, Geier, J., Wireless Lans, pages 137 and 149, (Macmillan Technical Publishing, 1999), incorporated herein by reference, which describes how a W-LAN beacon signal is formatted)."

Ex. 1001 [244 Patent] at 9:1-8.

140. The 244 Patent also identifies a helpful description of WLANs provided in a book authored by Jim Geier, *Wireless LANs* (Macmillan Technical Publishing, 1999) ("Geier Treatise"). In particular, the applicant admitted that this reference provides "a good description" of the "accepted" IEEE 802.11 Standard for implementing a WLAN.

141. The Geier Treatise includes a description of the IEEE 802.11a amendment to the IEEE 802.11 Standard ("IEEE 802.11a"), which generally provides for high speed, short-range wireless communications.

> 802.11a: Extension of the IEEE Standard 802.11-1997 with a higher data rate PHY in the 5 GHz band: This project was initiated to develop a high speed (about 20 Mbps) wireless PHY suitable for data, voice, and image information services in fixed, moving, or portable area networks. The project concentrates on improving spectrum efficiency and will review the existing 802.11 MAC to ensure its capability to operate at the higher speeds.

Ex. 1012 [Geier Treatise] at p. 124.

142. In fact, most of the Geier Treatise discusses implementation of a WLAN using the 802.11 standard, and it describes IEEE 802.11 as "the first internationally recognized wireless LAN standard." Ex. 1012 [Geier Treatise] at p. 90.

143. As the IEEE 802.11 Standard was one of few accepted WLAN technologies and one of few known substitutes for HIPERLAN/2, it would have been obvious to a person having ordinary skill in the art to use the internationally recognized IEEE 802.11 standard for implementing the WLAN disclosed in Jawanda or substitute IEEE 802.11 for the HIPERLAN/2 standard disclosed in the Draft UMTS Standards.

144. This is further supported by the prosecution of the great-grandparent application to the 244 Patent: U.S. Application Serial No. 10/341,528. During prosecution of that application, the examiner rejected a claim requiring an IEEE 802.11 transceiver as obvious over U.S. Patent No. 5,406,643 to Burke [Ex. 1022] which disclosed a WLAN transceiver, finding that the disclosure of a WLAN transceiver made an IEEE 802.11 transceiver obvious. Ex. 1024 ['528 Application, May 5, 2005 Office Action].

145. A look at the prior art landscape further supports the fact that a person having ordinary skill in the art would have known to design a mobile device that is capable of

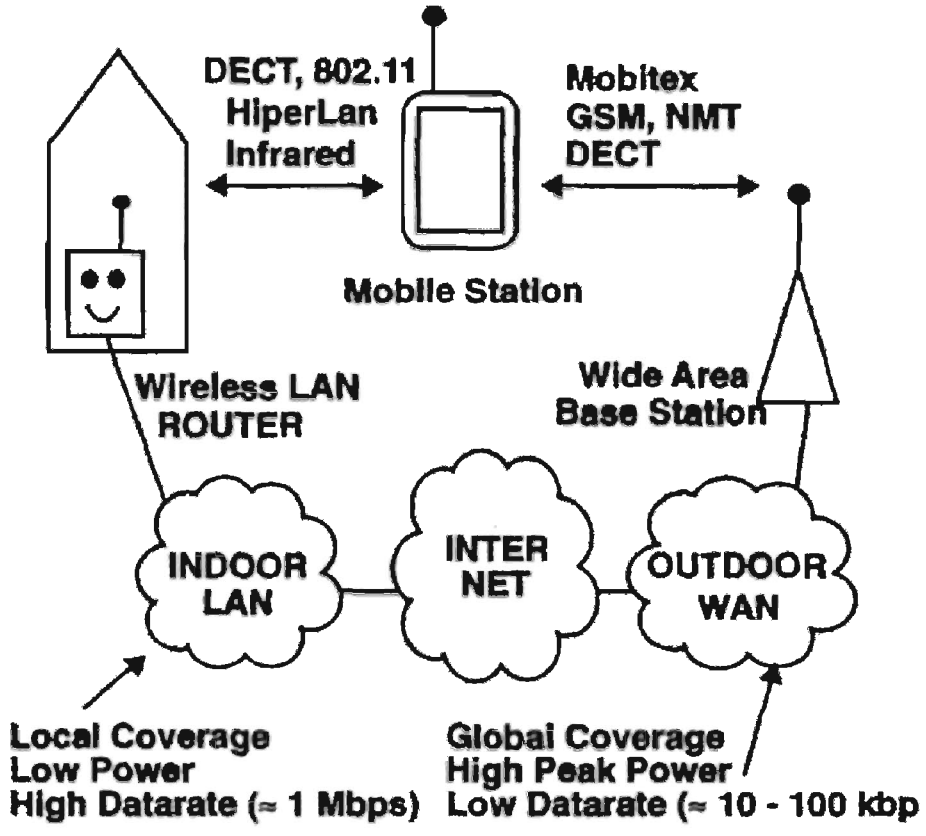
communicating with an IEEE 802.11 compliant WLAN because it was one of few known wireless standards available at the time of the claimed invention. By way of example, Franck Reichert wrote an IEEE paper titled "The Workstation Project On Mobile Computing" ("Reichert Publication") while employed at the Royal Institute of Technology, Department of Teleinformatics Electrum 204, S-164 40 (Stockholm, Sweden) in 1999. *See* Ex. 1013 [Reichert Publication].

146. The Reichert Publication identifies as an open problem how WLANs will be connected to the Internet and how mobile users will appear as guests when they roam onto foreign networks.

> Wireless LANs (WLAN) will soon be as popular as Ethernet is today. First products for DECT and 2.4 GHz systems will be available this year. How can these WLANs be connected to the Internet? Which problems arise when mobile users appear as guests in foreign networks?

Ex. 1013 [Reichert Publication] at p. 974.

147. The Reichert Publication suggests addressing this identified problem by realizing a testbed for the Walkstation project which simulates a WLAN in communication with a mobile station, providing for the use of certain protocols of which IEEE 802.11 was one option. Figure 6 shows that IEEE 802.11 was listed among the few substitutes (DECT, HiperLan, and Infrared) for implementing a WLAN at the time of the 244 Patent.



Ex. 1013 [Reichert Publication] at Figure 6.

148. The prior art also makes it clear that HIPERLAN/2 was widely viewed as a European analog to IEEE 802.11 and that the two technologies could be referenced interchangeably, as they were similar standards developed at the same time and implementing similar, if not identical, functionality. For example, Torsner & Malmgren presented an IEEE paper titled "Radio Network Solutions for HIPERLAN/2" at the Vehicular Technology Conference held on May 16-20, 1999. *See* Ex. 1014 [Torsner & Malmgren Publication].

> Currently a strong alignment has been achieved between three standardization bodies, IEEE 802.11a (U.S.), ETSI BRAN (Europe) and MMAC (Japan) on the PHY layer. All have adopted OFDM with 64 subcarriers, where 48 subcarriers are modulated for data transmission and 4 subcarriers are used for pilot signals. The remaining 12 subcarriers are set to zero. In order to support link adaptation a number of PHY modes have been defined, where a PHY mode corresponds to a signal constellation and code rate combination. These are shown in Table 1.

Ex. 1014 [Torsner & Malmgren Publication] at p. 1218.

149. There was an equally well recognized desire for global harmonization of WLAN standards, and HIPERLAN/2 and IEEE 802.11 were already in the process of convergence at the time of the claimed invention. For example, Zeisberg presented an IEEE paper titled "WLAN Evolution from HIPERLAN Type 2 to MEDIAN" at the Vehicular Technology Conference held on Sep. 19-22, 1999. *See* Ex. 1015 [Zeisberg Publication].

> Recent changes in the HIPERLAN type 2 standardisation due to harmonization with IEEE 802.11a show the need of world wide harmonization in system design and development in order to ensure mass market production for component manufacturer. Decreasing production costs due to high volumes enable fast market introduction because of cost dependent higher customer acceptance.

Ex. 1015 [Zeisberg Publication] at p. 2656.

150. Considering that at the time of the 244 Patent, the WLAN standards were converging toward the IEEE 802.11 standard, it would have been obvious to a person having ordinary skill in the art at the time of the 244 Patent to implement the WLAN disclosed in Jawanda or the HIPERLAN/2 disclosed in the Draft UMTS Standards using the IEEE 802.11 protocol.

b) It was well-known to a person having ordinary skill in the art at the time of the claimed invention to design a mobile device that would maintain a communication session while switching across various data networks.

151. At the time of the claimed invention, mobile devices were capable of communicating with different data networks, and it was a well-recognized problem that such devices would frequently switch between networks, potentially interrupting existing communication sessions. In fact, solutions had already been developed to transparently maintain a communication session when handing off the session to a different type of physical connection.

152. Various communication standards had been developed with the understanding that handoffs between different types of networks would be required. As I explain below, the Draft UMTS Standards formalized the concept of seamless handoffs between cellular and WLAN networks.

153. It is important to note that GPRS and Interim Standard 657 (IS-657) used packet-switched mobile data services instead of conventional circuit-switched protocols. Unlike circuit-switched protocols, GPRS and other packet-data networks do not require a constant, end-to-end physical connection. A packet-switched protocol separates a communication session into logical layers so that physical connection can be separated from the higher layers. This allows logical connections to be maintained on higher layers, even if the physical layer is interrupted. For cellular wireless networks, this is particularly important because wireless signals may be frequently interrupted due to lack of reception, loss of signal quality, or multi-path fading. In short, packet-switched, layered protocols inherently allow for a logical connection to exist at a logical layer even though the end-to-end physical link may be broken.

154. GPRS provides an example of a packet-switched data protocol, showing the various layers of the type of layered protocol used for cellular data communications at the time of the 244 Patent.

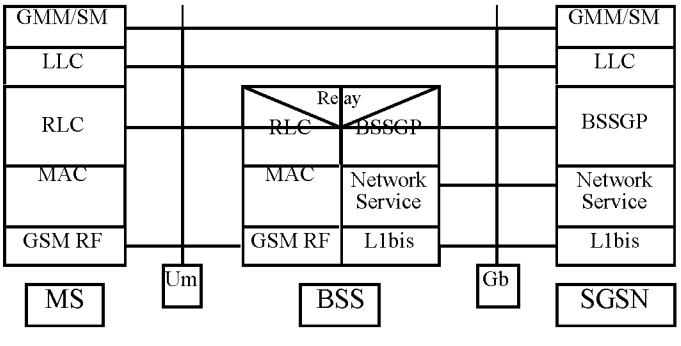


Figure 1: Signalling Plane MS - SGSN

Ex. 1005.03 [GPRS Standards, GSM 03.60 v. 6.1.1] at Figure 1.

(1) Data Connection Information in GPRS

155. The GPRS Standards allow for communication with various data networks and allow for switching between the different cellular networks.

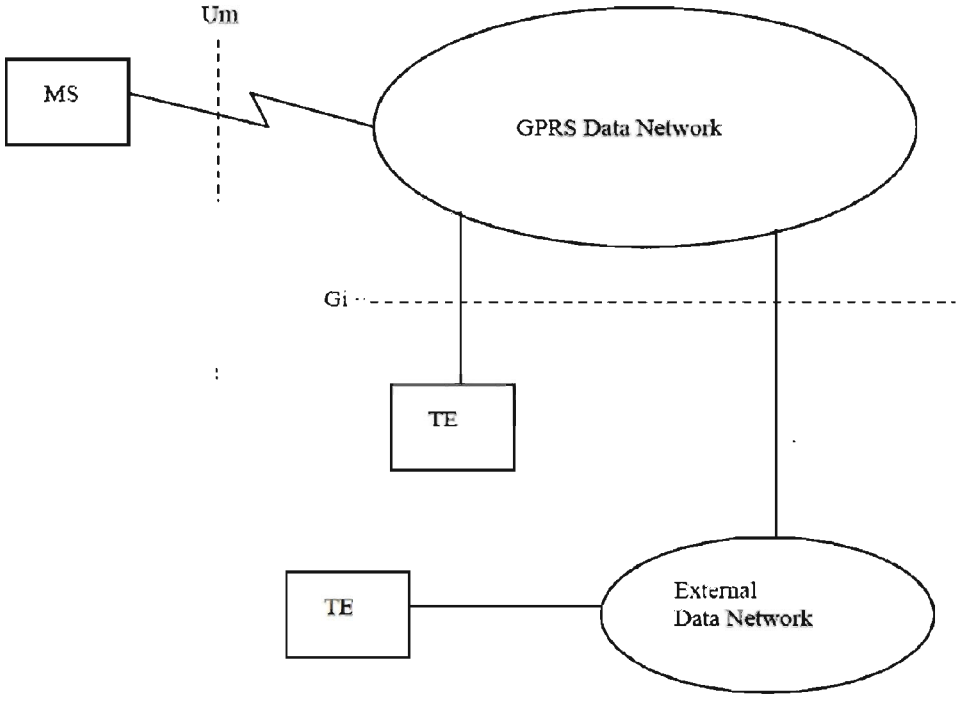


Figure 1: GPRS simplified reference model

Ex. 1005.01 [GPRS Standards, GSM 02.60 v. 6.1.1] at Figure 1.

> GPRS provides data transfer capabilities between a sending entity and one or more receiving entities. These entities may be an MS or a Terminal Equipment, the latter being attached either to a GPRS network or to an external data network.

Ex. 1005.01 [GPRS Standards, GSM 02.60 v. 6.1.1] at §5.1 GPRS reference model.

156. The GPRS Standards disclose maintaining a communication session in the form of routing information contained in a PDP context and implemented using a "capacity on demand" principle. This allows the logical information associated with a cellular data connection to be maintained even in an absence of all assigned physical layer channels.

> GPRS Mobility Management and Session Management (GMM/SM): This protocol supports mobility management functionality such as GPRS attach, GPRS detach, security, routeing area update, location update, PDP context activation, and PDP context deactivation, as described in subclauses "Mobility Management Functionality" and "PDP Context Activation, Modification, and Deactivation Functions".

Ex. 1005.03 [GPRS Standards, GSM 03.60 v. 6.1.1] at §5.6.2.1 MS - SGSN.

157. The GPRS Standards do not require permanently allocated PDCHs. The allocation of capacity for GPRS can be based on the needs for actual packet transfers which is here referred to as the "capacity on demand" principle.

> The GPRS does not require permanently allocated PDCHs. The allocation of capacity for GPRS can be based on the needs for actual packet transfers which is here referred to as the "capacity on demand" principle.

Ex. 1005.10 [GPRS Standards, GSM 03.64 v. 6.1.0] at §6.1.1.2 Capacity on demand concept.

> When selecting a new cell, mobile station leaves the packet transfer mode, enters the packet idle mode where it switches to the new cell, read the system information and may then resume to packet transfer mode in the new cell.

Ex. 1005.10 [GPRS Standards, GSM 03.64 v. 6.1.0] at §6.2.2 Packet transfer mode.

(2) Handoffs in Wireless Systems Generally

158. A broader look at the prior art also suggests that it was commonly known to design a mobile device that is capable of roaming from one network to another without interrupting existing communication sessions. A solution for handling such "handoffs" between dissimilar networks was known to those of ordinary skill in in the art.

159. For example, Aaron D. Hanson, Emil A. Sturniolo, Anatoly Menn, D. Olson, and Joseph T. Savarese filed the application for U.S. Patent No. 6,546,425 (the "Hanson Patent") with the United States Patent Office on June 11, 1999, with priority to an earlier application filing date of October 9, 1998. Ex. 1016 [Hanson Patent]. Titled "Method and Apparatus for

Providing Mobile and Other Intermittent Connectivity in a Computing Environment," the Hanson Patent issued on April 8, 2003.

160. The Hanson Patent provides a solution for handoffs that occur when mobile devices roam from one network to another, causing the established application sessions to be lost if the network address needs changing.

> Mobile networks are generally segmented for manageability purposes. But the intent of mobile devices is to allow them to roam. Roaming from one network interconnect to another can mean a change of network address. If this happens while the system is operational, the routing information must be changed for communications to continue between the associated peers. Furthermore, acquiring a new network address may require all of the previously established stateful application sessions to be terminated – again presenting the reconnection problems noted above.

Ex. 1016 [Hanson Patent] at 2:19-28.

161. The Summary of the Invention section of the Hanson Patent suggests a Mobility Management Server to maintain communication sessions when a mobile device roams from one network to another, even when the physical connection is unavailable.

> Mobile networks are generally segmented for manageability purposes. But the intent of mobile devices is to allow them to roam. Roaming from one network interconnect to another can mean a change of network address. If this happens while the system is operational, the routing information must be changed for communications to continue between the associated peers. Furthermore, acquiring a new network address may require all of the previously established stateful application sessions to be terminated – again presenting the reconnection problems noted above.

Ex. 1016 [Hanson Patent] at 2:19-28.

> In this particular example, Mobile End Systems 104 are sometimes but not always actively connected to Mobility Management Server 102. For example: Some Mobile End Systems 104a-104k may communicate with Mobility Management Server 102 via a mobile interconnect (wirelessly in this case), e.g. conventional electromagnetic (e.g., radio frequency) transceivers 106 coupled to wireless (or wire-line) local area or wide area network 108. Such mobile interconnect may allow Mobile End Systems 104a-104k to "roam" from one cover area 107a to another coverage area 107k. Typically, there is a temporary loss of communications when a Mobile End System 104 roams from one coverage area 107 to another, moves out of range of the closest transceiver 106, or has its

> signal temporarily obstructed (e.g., when temporarily moved behind a building column or the like).

Ex. 1016 [Hanson Patent] at 7:49-65.

(3) IP Mobility (the "Mobile IP" Protocol)

162. The IP Mobility Standard (also known as "Mobile IP") is a standard communications protocol maintained by Internet Engineering Task Force (IETF), that was first released in October 1996 as RFC 2002, which is prior art to the 244 Patent.

163. Mobile IP identifies as a problem the difficulty in maintaining active TCP connections on a mobile device when the mobile device changes locations.

> IP version 4 assumes that a node's IP address uniquely identifies the node's point of attachment to the Internet. Therefore, a node must be located on the network indicated by its IP address in order to receive datagrams destined to it; otherwise, datagrams destined to the node would be undeliverable. For a node to change its point of attachment without losing its ability to communicate, currently one of the two following mechanisms must typically be employed:
>
> > a) the node must change its IP address whenever it changes its point of attachment, or
> >
> > b) host-specific routes must be propagated throughout much of the Internet routing fabric.
>
> Both of these alternatives are often unacceptable. The first makes it impossible for a node to maintain transport and higher-layer connections when the node changes location. The second has obvious and severe scaling problems, especially relevant considering the explosive growth in sales of notebook (mobile) computers.

Ex. 1017 [RFC 2002, IP Mobility Support] at § 1 Introduction.

164. Mobile IP solves this identified problem by providing location independent routing of IP packet data to the Internet. Mobile IP implements this functionality without modifying the underlying TCP/IP protocol.

> A new, scalable, mechanism is required for accommodating node mobility within the Internet. This document defines such a mechanism, which enables nodes to change their point of attachment to the Internet without changing their IP address.

Ex. 1017 [RFC 2002, IP Mobility Support] at § 1 Introduction.

> This document specifies protocol enhancements that allow transparent routing of IP datagrams to mobile nodes in the Internet. Each mobile node is always identified by its home address, regardless of its current point of attachment to the Internet. While situated away from its home, a mobile node is also associated with a care-of address, which provides information about its current point of attachment to the Internet. The protocol provides for registering the care-of address with a home agent. The home agent sends datagrams destined for the mobile node through a tunnel to the care-of address. After arriving at the end of the tunnel, each datagram is then delivered to the mobile node.

Ex. 1017 [RFC 2002, IP Mobility Support] at Abstract.

> A mobile node must be able to communicate with other nodes that do not implement these mobility functions. No protocol enhancements are required in hosts or routers that are not acting as any of the new architectural entities introduced in Section 1.5.

Ex. 1017 [RFC 2002, IP Mobility Support] at § 1.1 Protocol Requirements.

H. Motivation to Combine Prior Art

165. It is my opinion that each of the Challenged Claims of the 244 Patent would have been obvious to a person of ordinary skill in the art based on combinations of (i) the disclosure of Jawanda, (ii) the disclosure of Lemiläinen, (iii) the IEEE 802.11 Standards, (iv) the Draft UMTS Standards available as of August 20, 1999, (v) the GPRS Standards; and (vi) the knowledge of a person of ordinary skill in the art at the time of the filing of the 244 Patent. A person skilled in the art would combine these teachings because these references relate to seamless roaming across different wireless communication networks, particularly wireless LAN and cellular wireless networks. The combination of these prior art elements or substitution of one element for another, based either on the reasons identified above or on the knowledge or common sense of a skilled artisan, involves known methods and yield predictable results in this field of technology.

166. There is a strong motivation to combine Jawanda with the GPRS Standards and the IEEE 802.11 Standard. Jawanda teaches a dual-mode mobile device that can communicate with

a cellular network or a wireless local area network (WLAN). For the cellular network, Jawanda explains that "any currently available or future wireless data protocol such as code division multiple access (CDMA), CDPD, or GPRS" could be used. Ex. 1003 [Jawanda Patent] at 3:6-9. In order to implement the GPRS protocol suggested by Jawanda, a person having ordinary skill in the art would use the GPRS standards available at the time of the Jawanda patent. The GPRS standards define a protocol for transmitting and receiving wireless signals over cellular channels for data communications.

167. Similarly, there would be a strong motivation to combine Jawanda with the IEEE 802.11 Standard in order to implement the WLAN of Jawanda. Like the GPRS Standards, the IEEE 802.11 standard would have been an obvious choice to those of ordinary skill in the art. In fact, IEEE 802.11 was the "first internationally recognized wireless LAN standard." Ex. 1012 [Geier Treatise] at 90.

168. There is also a strong motivation to combine the teachings of Lemiläinen with the GPRS Standards and the IEEE 802.11 Standard. Lemiläinen discloses a mobile terminal containing several network interface adapters that have the capability to couple to data transmission networks of different types, such as an Ethernet local area network, an IEEE 802.11 wireless local area network (WLAN), a GSM mobile communication network, or a packet switched data transmission system GPRS (General Packet Radio Service) of the GSM system. Ex. 1004 [Lemiläinen] at 4:21-32.

169. In order to implement the GPRS network interface adapter taught by Lemiläinen, a person having ordinary skill in the art would have been motivated to use the GPRS standards documents available at the time of the Lemiläinen patent because the GPRS standards documents

define a data transmission network as suggested in Lemiläinen. *See* Ex. 1004 [Lemiläinen] at 4:21-23.

170. In order to implement the IEEE 802.11 WLAN network interface adapter taught by Lemiläinen, a person having ordinary skill in the art would have been motivated to use the IEEE 802.11 standards documents available at the time of the Lemiläinen patent.

171. Further, as to the IEEE 802.11 Standard, the 244 Patent itself teaches the reader to reference the IEEE 802.11 standards documents. Several iterations of the IEEE 802.11 standards are listed on the face of the patent and the reader is directed to a book authored by Jim Geier entitled *Wireless LANs* ("Geier Treatise"). Ex. 1001 [244 Patent] at p.4 (listing draft 802.11 standards at the top of the right-hand column); Ex. 1001 [244 Patent] at 2:31-34 (suggesting the Geier Treatise as a "good description" of the 802.11 standard in particular).

172. It is my opinion that one would have been motivated to combine the teachings of the Draft UMTS Standards with IEEE 802.11. A person having ordinary skill in the art at that time would know that IEEE 802.11 was an alternative to the HIPERLAN/2 standard for a WLAN. For example, by April of 1999, there were IEEE papers disclosing the similarities of the IEEE 802.11 Standard and HIPERLAN/2. *See* Ex. 1014 [Torsner & Malmgren Publication]. There was also a trend in the industry to harmonize these WLAN standards. *See* Ex. 1015 [Zeisberg Publication]. Thus, it would have been obvious to substitute IEEE 802.11 Standard for HIPERLAN in the dual-mode terminal disclosures.

I. Invalidity of the 244 Patent In Light of the Prior Art

173. It is my opinion that Challenged Claims of the 244 Patent are invalid in light of the prior art. Although I only identify three combinations, it is my opinion that any combination of these prior art references would render the Challenged Claims obvious and, therefore, invalid.

174. The 244 patent contains two sets of claims: one set of device claims and one set of corresponding method claims. In my review of the claims and in light of the specific prior art evidence supporting my opinions, it is my opinion that the method claims are simply the device claims written in method form. In other words, the method claims do not add any additional limitations. As such, I have considered each method claim along with its corresponding device claim. In my opinion, the evidence in the prior art that renders obvious each device claim also renders obvious each corresponding method claim.

175. Similarly, it is my opinion that many of the dependent claims include similar limitations that are disclosed or rendered obvious by the same disclosure, teaching, motivation, or suggestion. Thus, to avoid repeating the same evidence, I have considered these claims together in my analysis below.

1. U.S. Patent No. 6,243,581 to Jawanda

176. Because Jawanda was filed on December 11, 1998, I understand that Jawanda qualifies as prior art against the 244 Patent under at least 35 U.S.C. §§ 102(e).

a) Claims 1 and 23 are rendered obvious by Jawanda alone or in combination with GPRS and IEEE 802.11

(1) "a subscriber unit comprising" (Claim 1)

"a method for use in a dual mode subscriber unit, the method comprising" (Claim 23)

177. I understand that this preamble is not limiting, and as such is not required to invalidate the claim. In the event that the PTAB determines that this preamble is limiting, it is my opinion that Jawanda discloses the preamble of Claim1 and 23.

178. Jawanda discloses the combination of a mobile terminal (block 14) and a mobile phone (block 16) as shown in Figure 1 as the "subscriber unit" of the 244 Patent. Each of the

components of the "subscriber unit" described by Claim 1 of the 244 Patent is disclosed by this combination, as subsequently described in this report.

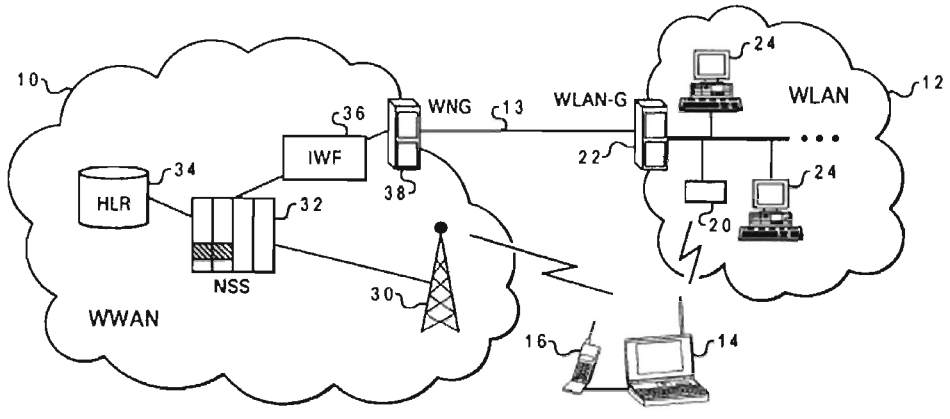


Fig. 1

Ex. 1003 [Jawanda Patent] at Figure 1.

179. Jawanda teaches a subscriber unit that includes the same type of functionality and seeks to solve the same problem as the 244 patent:

> A mobile computer system capable of seamless roaming between wireless communication networks includes data processing resources for executing software, a plurality of wireless interfaces that supports simultaneous wireless connections with first and second wireless communication networks, and a network access arbitrator that routes data communicated between the software executed by the data processing resources and the first and second wireless communication networks."

Ex. 1003 [Jawanda Patent] at Abstract.

> Referring now to FIG. 2, there is illustrated a more detailed block diagram of mobile terminal 14 . . . Coupled to expansion bus 74 is an input/output adapter 78, which provides an interface to mobile terminal 14 for both conventional input devices, such as a keyboard and pointing device, and mobile phone 16. The link connecting mobile phone 16 and I/O adapter 78 may be a conventional RS-232 connection, for example.

Ex. 1003 [Jawanda Patent] at 3:28-55.

(2) "a cellular transceiver configured to communicate with a cellular wireless network via a plurality of assigned physical channels" (Claim 1)

"establishing a communication session with a cellular wireless network" (Claim 23)

180. It is my opinion that Jawanda and the GPRS Standards both disclose this claim element.

181. Jawanda discloses a mobile phone (mobile phone 16) that necessarily contains a cellular transceiver configured to communicate with a cellular wireless network (WWAN 10), since the mobile phone transmits wireless signals to and receives wireless signals from a cellular wireless base station over the cellular wireless network (WWAN 10).

> As further illustrated in Fig. 1, WWAN 110 is a cellular communication system that can be utilized for both voice and data communication. For example, WWAN 10 includes a base station 30, which transmits wireless signals to and receives wireless signals from one or more mobile phones 16. For data connections, such wireless signals can be transmitted according to any currently available or future wireless data protocol such as code division multiple access (CDMA), CDPD, or GPRS.

Ex. 1003 [Jawanda Patent] at 3:1-9.

> As illustrated, the process begins at block 100 and thereafter proceeds to block 102, which illustrates mobile terminal 14 first establishing a wireless data connection with WWAN 10 via mobile phone 16 while located outside the service area of WLAN 12. The wireless data connection to WWAN 10 can be established, for example, as part of the power-on procedures of mobile terminal 14 or in response to a user input while interacting with application 90. In any event, a signal is transmitted via I/O adapter 78 to mobile phone 16, which responds to the signal by establishing the wireless data connection utilizing a conventional technique, for example, by requesting a connection from the MSC within NSS 32 using a message transmitted to base station 30 via control channel.

Ex. 1003 [Jawanda Patent] at 4:31-44.

182. Jawanda notably discloses the use of "any currently available or future wireless data protocol" by the cellular wireless network, and specifically identifies CDMA and GPRS. To one of skill in the art at the relevant timeframe, the use of the phrase "code division multiple access (CDMA)," alongside data protocols such as CDPD or GPRS, would refer to the IS-95 / IS-657 and related standards.

183. These protocols disclose a "plurality of assigned physical channels" as recited in Claim 1 of the 244 Patent.

184. For example, in GPRS Standards-based cellular wireless networks, there are eight basic physical channels per carrier, each of which is identified by a time slot number and frequency hopping sequence. The two primary types of logical uplink channels that can be mapped to these physical channels for assignment are the Packet Data Traffic Channel (PDTCH), and Packet Associated Control Channel (PACCH). GPRS provides for mobile terminals to aggregate packet data traffic channels so that multiple channels are provided for the mobile terminal to use when it has packet data to transmit.

> A physical channel is therefore defined as a sequence of TDMA frames, a time slot number (modulo 8) and a frequency hopping sequence.

Ex. 1005.09 [GPRS Standards, GSM 05.01 v. 6.1.1] at §5 Multiple access and timeslot structure.

> Multislot configurations for packet switched connections are defined as multiple (1 up to 8) PDTCH/Us and one PACCH for one mobile originated communication, or multiple (1 up to 8) PDTCH/Ds and one PACCH for one mobile terminated communication respectively, allocated to the same MS. In this context allocation refers to the list of PDCH that may dynamically carry the PDTCHs for that specific MS. The PACCH shall be mapped onto one PDCH carrying one PDTCH/U or PDTCH/D. That PDCH shall be indicated in the resource allocation message (see GSM 04.60).

Ex. 1005.09 [GPRS Standards, GSM 05.01 v. 6.1.1] at §2 Set of channels.

185. As known to a person having ordinary skill in the art, the CDMA systems identified in Jawanda (IS-95-based cellular wireless networks) are known to have a Forward CDMA Channel and a Reverse CDMA Channel which are a plurality of physical channels.

186. Accordingly, Jawanda inherently, or through the combination of Jawanda with the GPRS Standards, discloses a mobile phone 16 "configured to communicate with a cellular wireless network via a plurality of assigned physical channels" as described by Claim 1 of the 244 Patent.

(3) "an IEEE 802.11 transceiver configured to communicate with an IEEE 802.11 wireless local area network" (Claim 1)

187. It is my opinion that Jawanda render this claim element obvious, and that the claim element is disclosed in the IEEE 802.11 Standard.

188. Jawanda describes a WLAN transceiver (wireless LAN adapter 64), which is configured to communicate with a WLAN (WLAN 12).

> The PCI devices connected to PCI local bus 60 include a wireless LAN adapter 64, which handles network communication between mobile terminal 14 and WLAN 12.

Ex. 1003 [Jawanda Patent] at 3:43-45.

> This polling behavior may entail WLAN interface 96 periodically determining whether an "advertisement" message has been received by wireless LAN adapter 64 from wireless network adapter 20. Alternatively, and less preferably since mobile terminal 14 is typically powered by a limited life battery, the determination illustrated at block 106 can represent WLAN interface 96 detecting whether an "advertisement" message transmitted by wireless LAN adapter 64 has received a response from WLAN interface 96.

Ex. 1003 [Jawanda Patent] at 4:67-5:9.

> To logon to WLAN 12, mobile terminal 14 performs the conventional registration procedures dictated by the network and followed by fixed terminals 24, except that logon information is conveyed between mobile terminal 14 and wireless LAN adapter 64 by wireless communication.

Ex. 1003 [Jawanda Patent] at 5:27-32.

189. A person of ordinary skill in the art at the time of the 244 Patent would have understood that communication with a wireless LAN inherently requires the use of a WLAN layered communication protocol, since a communication protocol establishes the manner in which a network operates. A person having ordinary skill in the art would look to the available WLAN standards, including IEEE 802.11, in order to implement the WLAN referenced in Jawanda.

And similar to Jawanda, the author of the 244 patent provided no disclosure for implementing a WLAN other than pointing the reader to the IEEE 802.11 WLAN standard as well as a secondary source providing a description of WLANs, including IEEE 802.11. *See* Ex. 1001 [244 Patent] at 2:27-34, 9:1-8 (relying on the IEEE 802.11 Standard for an enabling disclosure and directing one to the Geier Treatise); *see also* Ex. 1012 [Geier Treatise] at pp. 90, 124 (describing IEEE 802.11 as "the first internationally recognized wireless LAN standard.")

190. Thus, it would have been obvious for a person having ordinary skill in the art that the WLAN in Jawanda renders obvious "an IEEE 802.11 transceiver configured to communicate with an IEEE 802.11 wireless local area network" as described in Claim 1 of the 244 Patent.

(4) "a processor configured to maintain a communication session with the cellular wireless network in an absence of the plurality of assigned physical channels while the IEEE 802.11 transceiver communicates packet data with the IEEE 802.11 wireless local area network" (Claim 1)

"maintaining the communication session in an absence of any physical channels associated with the cellular wireless network; and communicating packet data with an IEEE 802.11 wireless local area network while maintaining the communication session with the cellular wireless network" (Claim 23)

191. It is my opinion that Jawanda and the GPRS Standards both disclose this claim element.

192. As discussed above, Jawanda discloses a dual-mode unit capable of communication with a cellular wireless network and an IEEE 802.11 wireless local area network.

193. Jawanda also teaches that the unit can "maintain a communication session with the cellular wireless network in an absence of the plurality of assigned physical channels while the IEEE 802.11 transceiver communicates packet data with the IEEE 802.11 wireless local area network." This is disclosed by the seamless handoff of datagram transmission from using the

WWAN path (cellular) to using the WLAN path. Further, Jawanda also indicates that the cellular connection may be maintained so that it can switch the transmission of datagrams back to the WWAN path (cellular), if needed. Thus, a logical connection with the WWAN is maintained while the datagrams are transferred using the WLAN.

With reference now to FIG. 3, there is depicted a data flow diagram illustrating the relationship between the various software components utilized to facilitate data communication in accordance with the present invention. As illustrated, a first application 90 is executed by mobile terminal 14, and a second application 91 is executed by fixed terminal 24 of WLAN 12. Applications 90 and 91, which may be the same or different applications, are compatible in the sense that data can be shared between applications 90 and 91 via program-to-program transfer. In addition to application 90, mobile terminal 14 executes communication software including network access arbitrator 92, cellular access interface (CAI) 94 and WLAN interface 96. As discussed further below, network access arbitrator 92 routes datagrams output by application 90 to either CAI 94 or WLAN interface 96 and transfers datagrams received from CAI 94 and WLAN interface 96 to application 90. CAI 94 and WLAN interface 96 form the lowest level of the communication software and provide software support within mobile terminal 14 for data transfer with CAI 94 executed by WNG 38 and WLAN interface 96 executed by WLAN-G 22, respectively. Ex. 1003 [Jawanda Patent] at 3:66-4:19.

> As illustrated, the process begins at block 100 and thereafter proceeds to block 102, which illustrates mobile terminal 14 first establishing a wireless data connection with WWAN 10 via mobile phone 16 while located outside the service area of WLAN 12. The wireless data connection to WWAN 10 can be established, for example, as part of the power-on procedures of mobile terminal 14 or in response to a user input while interacting with application 90. In any event, a signal is transmitted via I/O adapter 78 to mobile phone 16, which responds to the signal by establishing the wireless data connection utilizing a conventional technique, for example, by requesting a connection from the MSC within NSS 32 using a message transmitted to base station 30 via a control channel.

Ex. 1003 [Jawanda Patent] at 4:31-44.

> Returning to block 106, in response to a determination that a higher bandwidth data connection (i.e., a direct connection to WLAN via wireless network adapter 20) is available, for example, due to mobile terminal 14 being moved into the service area of WLAN 12, the process proceeds to block 120. Block 120 depicts mobile terminal 14 establishing a second wireless data connection by logging on to WLAN 12 via wireless network adapter 20. To logon to WLAN 12, mobile terminal 14 performs the conventional registration procedures dictated by the network and followed by fixed terminals 24, except that logon information is conveyed between mobile terminal 14 and wireless LAN adapter 64 by wireless communication.

Ex. 1003 [Jawanda Patent] at 5:20-5:32.

194. Figure 4 of the Jawanda Patent is particularly instructive. It discloses a method of data communication in which a data communication session is seamlessly handed off from a cellular wireless network (WWAN 10) to a wireless local area network (WLAN 12).

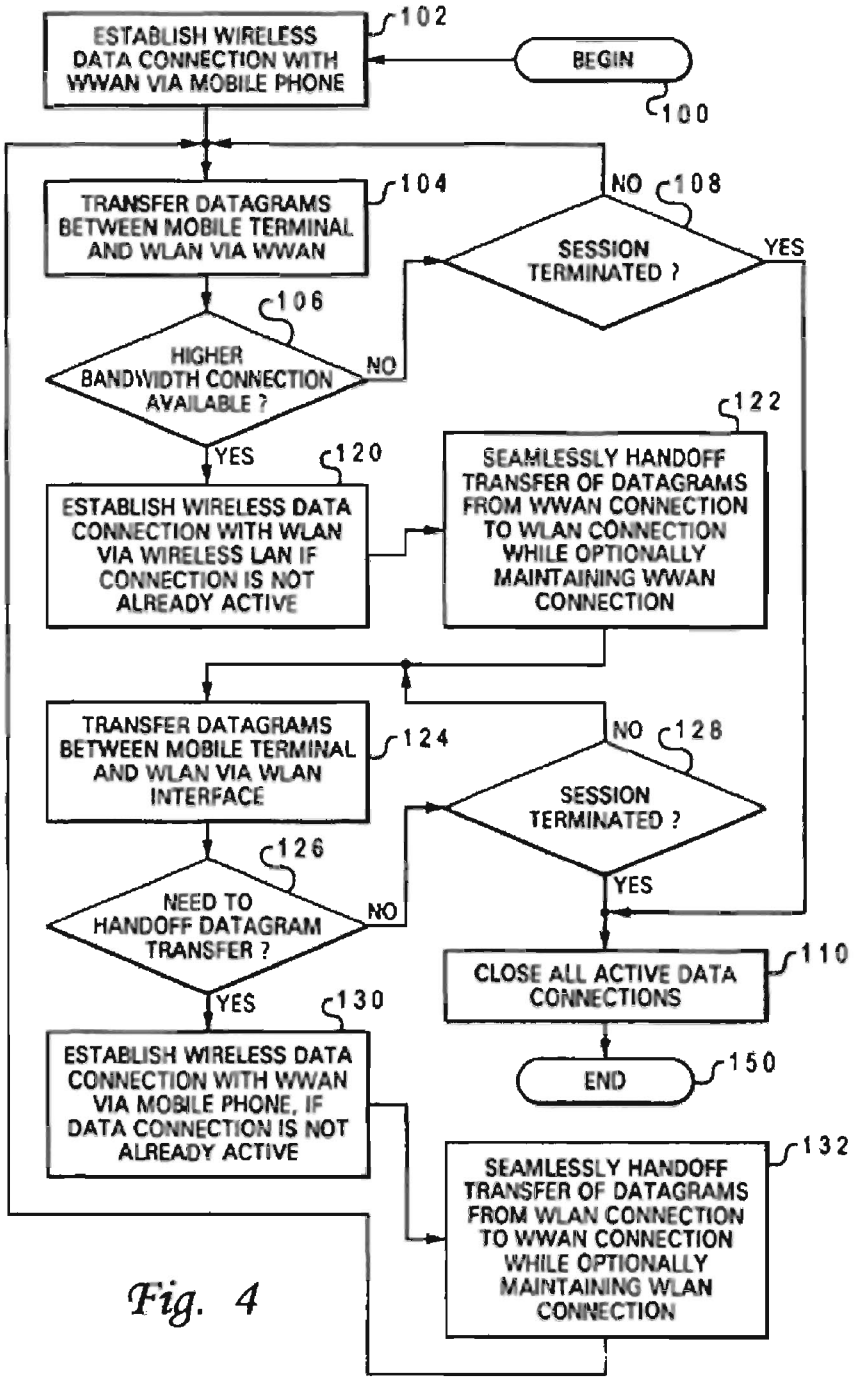


Fig. 4

FIG. 4 is a high level logical flowchart depicting a method of wireless data communication in which a data communication session is seamlessly handed off between wireless data communication networks.

Ex. 1003 [Jawanda Patent] at 2:31-34.

> Referring now to FIG. 4, there is depicted a high level logical flowchart of a method of wireless data communication in which a data communication session is seamlessly handed off between wireless data communication networks. For illustrative purposes, the process will be described with respect to an exemplary processing scenario in which the service area of WWAN 10 includes a business premises or campus housing WLAN 12 and in which a user of mobile terminal 14 travels from a location distant from WLAN 12 into the service area of WLAN 12 and then returns to the remote location.

Ex. 1003 [Jawanda Patent] at 4:20-30.

> Thus, following block 120, the user has concurrent wireless data connections with both WWAN 10 and WLAN 12. Then, as depicted at block 122, network access arbitrator 92 causes the transfer of datagrams to be seamlessly handed off from the wireless connection with WWAN 10 to the wireless connection with WLAN 12 while maintaining the session between applications 90 and 91. Thus, following block 122, datagrams are routed between application 90 and application 91 utilizing the higher bandwidth data path between WLAN interfaces 96 rather than between CAIs 94, as shown at block 124.

Ex. 1003 [Jawanda Patent] at 5:32-42.

195. Jawanda teaches that following the handoff of data transmission from the cellular wireless network (WWAN 10) to the wireless local area network (WLAN 12), the cellular wireless network connection is "optionally maintain[ed]." (*See* Ex. 1003 [Jawanda Patent] at Figure 4, block 122). The connection with the cellular wireless network, however, may be maintained, or reestablished when needed, *i.e.*, when the mobile terminal is moved outside the range of the WLAN or connection quality has degraded such that the mobile terminal must resume use of the WWAN for transferring datagrams. (*See* Ex. 1003 [Jawanda Patent] at Figure 4, block 130).

196. Beyond the express disclosure of this element in Claim 1, Jawanda implicitly teaches maintaining routing information, such as an IP address, through incorporation of the "IP Mobility Standard," namely RFC 2002, from the Internet Engineering Task Force (IETF).

> As discussed further herein below, datagrams are preferably communicated between WWAN 10 and WLAN 12 across external network 13 utilizing the mobile internet protocol (IP) described in detail in Perkins, C., "IP Mobility Standard," RFC 2002,

> October 1996 available from the Internet Engineering Task Force (IETF) and incorporated herein by reference.

Ex. 1003 [Jawanda Patent] at 6:1-20.

197. As discussed above, Mobile IP was a technology developed by the IETF to address problems associated with maintaining connection information on a mobile device when the mobile device changes locations.

> IP version 4 assumes that a node's IP address uniquely identifies the node's point of attachment to the Internet. Therefore, a node must be located on the network indicated by its IP address in order to receive datagrams destined to it; otherwise, datagrams destined to the node would be undeliverable. For a node to change its point of attachment without losing its ability to communicate, currently one of the two following mechanisms must typically be employed:
>
> > a) the node must change its IP address whenever it changes its point of attachment, or
> >
> > b) host-specific routes must be propagated throughout much of the Internet routing fabric.
>
> Both of these alternatives are often unacceptable. The first makes it impossible for a node to maintain transport and higher-layer connections when the node changes location. The second has obvious and severe scaling problems, especially relevant considering the explosive growth in sales of notebook (mobile) computers.

Ex. 1017 [RFC 2002, IP Mobility Support] at § 1 Introduction.

198. Mobile IP provides location independent routing of IP packet data to the Internet, allowing a mobile device to maintain logical connection information when the physical path for data transmission is changed.

> A new, scalable, mechanism is required for accommodating node mobility within the Internet. This document defines such a mechanism, which enables nodes to change their point of attachment to the Internet without changing their IP address.

Ex. 1017 [RFC 2002, IP Mobility Support] at § 1 Introduction.

> This document specifies protocol enhancements that allow transparent routing of IP datagrams to mobile nodes in the Internet. Each mobile node is always identified by its home address, regardless of its current point of attachment to the Internet. While situated away from its home, a mobile node is also associated with a care-of address, which

> provides information about its current point of attachment to the Internet. The protocol provides for registering the care-of address with a home agent. The home agent sends datagrams destined for the mobile node through a tunnel to the care-of address. After arriving at the end of the tunnel, each datagram is then delivered to the mobile node.

Ex. 1017 [RFC 2002, IP Mobility Support] at Abstract.

199. Similarly, Jawanda also discloses this element, either implicitly or in combination with the GPRS Standards, by way of its reference to "any currently available or future wireless data protocol such as code division multiple access (CDMA), CDPD, or GPRS."

200. GPRS networks, for example, disclose the ability to maintain logical connection information in the absence of a plurality of physical channels. The GPRS Standards disclose communication sessions on the Mobility Management layer.

> These procedures are used to establish, maintain and release a MM connection between the mobile station and the network, over which an entity of the upper CM layer can exchange information with its peer. A MM connection establishment can only be performed if no MM specific procedure is running. More than one MM connection may be active at the same time.

Ex. 1005.05 [GPRS Standards, GSM 04.08 v. 6.1.1] at §4.1.1 Type of MM procedures.

201. Subscriber units configured to communicate with GPRS Standard-based cellular wireless networks are configured to establish packet data communication sessions with the cellular network on the Session Management Layer. The Session Management Layer activates a PDP context in order to create a communication session.

> Session Management services are provided at the SMREG-SAP and the SNSM-SAP for anonymous and non-anonymous access. The non-anonymous and anonymous access procedures for PDP context activation and PDP context deactivation are available at the SMREG-SAP. In addition there exists a PDP context modification for non-anonymous PDP contexts.

Ex. 1005.04 [GPRS Standards, GSM 04.07 v. 6.1.0] at §6.5 Session Management Services for GPRS-Services.

202. The PDP context includes a number of session management and logical connection parameters including, for example, PDP Type, PDP Address, and QoS Profile Negotiated parameters. *See* Ex. 1005.03 [GPRS Standards, GSM 03.60 v. 6.1.1] at §13.4 MS.

203. The GPRS Standards disclose a PDP context in an absence of physical channels, because when the physical radio link between the user device and the network is absent, one or more active PDP contexts may be preserved. Preserving the PDP context allows the mobile device to avoid the set-up time involved in establishing a data connection so the device can more quickly transmit data using the preserved PDP context.

> In the non-anonymous access case, the MM state relates only to GPRS MM activities of a subscriber. The MM state is independent of the number and state of PDP contexts for that subscriber.

Ex. 1005.03 [GPRS Standards, GSM 03.60 v. 6.1.1] at §6.1 Definition of Mobility Management States

204. For these reasons, it is my opinion that Jawanda alone or in combination with the GPRS Standards discloses "a processor configured to maintain a communication session with the cellular wireless network in an absence of the plurality of assigned physical channels while the IEEE 802.11 transceiver communicates packet data with the IEEE 802.11 wireless local area network" as recited in Claim 1 of the 244 Patent.

b) Claims 2, 3, 22, 24, 25 and 44 are rendered obvious by Jawanda alone or in combination with GPRS and IEEE 802.11

205. It is my opinion that Jawanda alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 2, 3, 22, 24, 25 and 44. Claims 2, 3 and 22 depend from Claim 1, and Claims 24, 25 and 44 depend from Claim 3; therefore, all of the arguments of Claims 1 and 23 apply, and are incorporated by reference.

206. Claims 2, 3, 22, 24, 25, and 44 are all dependent claims reciting similar limitations that are generally directed towards the use of a layered communication protocol, namely the TCP/IP protocol.

Claim Number	Claim Language
2	The subscriber unit of claim 1, wherein the packet data is transmission control protocol and Internet protocol (TCP/IP) packet data.
3	The subscriber unit of claim 1, wherein the communication session is a transmission control protocol (TCP) layer session, an Internet protocol (IP) layer session, or a network layer session.
22	The subscriber unit of claim 1, wherein the packet data is transmission control protocol and Internet protocol (TCP/IP) data
24	The method of claim 23, wherein the packet data is transmission control protocol and Internet protocol (TCP/IP) packet data.
25	The method of claim 23, wherein the communication session is a transmission control protocol (TCP) layer session, an Internet protocol (IP) layer session, or a network layer session.
44	The method of claim 23, wherein the packet data is transmission control protocol and Internet protocol (TCP/IP) data.

207. Jawanda discloses the use of TCP/IP packet data when it discloses utilizing the internet mobility protocol (IP) for communications with the WWAN and WLAN.

> As discussed further herein below, datagrams are preferably communicated between WWAN 10 and WLAN 12 across external network 13 utilizing the mobile internet protocol (IP) described in detail in Perkins, C., "IP Mobility Standard," RFC 2002, October 1996 available from the Internet Engineering Task Force (IETF) and incorporated herein by reference.

Ex. 1003 [Jawanda Patent] at 6:1-20.

208. As discussed with respect to Claim 1, Mobile IP facilitates movement between different data networks by providing "transparent routing of IP datagrams to mobile nodes in the Internet." Mobile IP necessarily implies the use of the TCP/IP protocol to encapsulate and transmit packet data across a wireless network.

> This document specifies protocol enhancements that allow transparent routing of IP datagrams to mobile nodes in the Internet. Each mobile node is always identified by its

> home address, regardless of its current point of attachment to the Internet. While situated away from its home, a mobile node is also associated with a care-of address, which provides information about its current point of attachment to the Internet. The protocol provides for registering the care-of address with a home agent. The home agent sends datagrams destined for the mobile node through a tunnel to the care-of address. After arriving at the end of the tunnel, each datagram is then delivered to the mobile node.

Ex. 1017 [RFC 2002, IP Mobility Support] at Abstract.

209. As discussed earlier, it would have been obvious to use IEEE 802.11 for the WLAN disclosed in the Jawanda Patent. A wireless transceiver that communicates packet data with the Internet using an IEEE 802.11 wireless local area network or a GPRS cellular network will inherently use transmission control protocol and Internet protocol (TCP/IP) packet data.

210. Accordingly, a person of ordinary skill in the art would understand that Jawanda, alone or in combination with the IEEE 802.11 and/or the GPRS Standards discloses this limitation.

c) Claims 4, 6, 16, 26, 28, and 38 are rendered obvious by Jawanda alone or in combination with GPRS and IEEE 802.11

211. It is my opinion that Jawanda alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 4, 6, 16, 26, 28, and 38. Claims 4, 6 and 16 depend either directly or indirectly from Claim 1, and Claims 26, 28 and 38 depend either directly or indirectly from Claim 23; therefore, all of the arguments of Claims 1 and 23 apply, and are incorporated by reference.

212. Claims 4, 6, 16, 26, 28, and 38 are all dependent claims reciting similar limitations that are generally directed towards detecting the availability of and connecting to an IEEE 802.11 wireless LAN, as well as automatically communicating packet data over the IEEE 802.11 wireless LAN when available.

Claim Number	Claim Language

4	The subscriber unit of claim 1, further comprising: a detector configured to detect the IEEE 802.11 wireless local area network; a circuit configured to select the IEEE 802.11 transceiver in response to the detector detecting the IEEE 802.11 wireless local area network.
6	The subscriber unit of claim 4, wherein the detector is configured to detect a beacon frame or a probe response frame received by the IEEE 802.11 transceiver from the IEEE 802.11 wireless local area network.
16	The subscriber unit of claim 1, further comprising: a detector configured to detect whether the IEEE 802.11 wireless local area network is available, wherein packet data is automatically communicated to the IEEE 802.11 wireless local area network when the IEEE 802.11 wireless local area network is available.
26	The method of claim 23, further comprising: detecting the IEEE 802.11 wireless local area network; and communicating with the IEEE 802.11 wireless local area network in response to detecting the IEEE 802.11 wireless local area network.
28	The method of claim 26, wherein detecting the IEEE 802.11 wireless local area network comprises receiving a beacon frame or a probe response frame from the IEEE 802.11 wireless local area network.
38	The method of claim 23, further comprising: detecting whether the IEEE 802.11 wireless local area network is available; and automatically communicating packet data with the IEEE 802.11 wireless local area network upon detection of the IEEE 802.11 wireless local area network being available.

213. Jawanda discloses a WLAN interface 96 that is "a detector configured to detect the IEEE 802.11 wireless local area network" as described in Claim 4 of the 244 Patent, where the wireless LAN is detected based on a response to an "advertisement" message. Or, when the WLAN interface 96 detects a wireless LAN after when polling to determine whether an "advertisement" message has been received.

> As depicted at block 106, a determination can be made at any time following block 102 whether or not a higher bandwidth data connection is available. The determination illustrated at block 106 can be made by WLAN interface 96, for example, which may periodically poll to determine whether a connection can be obtained directly with WLAN 12 via wireless network adapter 20. This polling behavior may entail WLAN interface 96 periodically determining whether an "advertisement" message has been received by wireless LAN adapter 64 from wireless network adapter 20. Alternatively, and less preferably since mobile terminal 14 is typically powered by a limited life battery, the determination illustrated at block 106 can represent WLAN interface 96 detecting whether an "advertisement" message transmitted by wireless LAN adapter 64 has received a response from WLAN interface 96.

Ex. 1003 [Jawanda Patent] at 4:61-5:9.

214. To the extent that Jawanda does not specifically identify an IEEE 802.11 WLAN as the particular WLAN being discussed, it would have been obvious for a person of ordinary skill in the art to combine Jawanda with the IEEE 802.11 Standard since Jawanda discloses a WLAN transceiver and the IEEE 802.11 Standard discloses a WLAN.

215. Furthermore, the IEEE 802.11 Standard itself discloses "a detector configured to detect the IEEE 802.11 wireless local area network" through its disclosure of beacon frame or probe response frame mechanisms.

> Beacon generation in an IBSS is distributed. The beacon period is included in Beacon and Probe Response frames, and STAs shall adopt that beacon period when joining the IBSS. All members of the IBSS participate in beacon generation.

Ex. 1019 [IEEE 802.11 Standard] at §11.1.2.2.

> To become a member of a particular ESS using passive scanning, a STA shall scan for Beacon frames containing that ESS's SSID, returning all Beacon frames matching the desired SSID in the BSSDescriptionSet parameter of the corresponding MLME-SCAN.confirm primitive with the appropriate bits in the Capabilities Information field indicating whether the beacon came from an Infrastructure BSS or IBSS. To actively scan, the STA shall transmit Probe frames containing the desired SSID. Upon completion of scanning, an MLME-SCAN.confirm is issued by the MLME indicating all of the BSS information received.

Ex. 1019 [IEEE 802.11 Standard] at §11.1.3.

> 11.1.3.2 Active scanning. Active scanning involves the generation of Probe frames and the subsequent processing of received Probe Response frames. The details of the active scanning procedures are as specified in the following subclauses.
>
> 11.1.3.2.1 Sending a probe response. STAs, subject to criteria below, receiving Probe Request frames shall respond with a probe response only if the SSID in the probe request is the broadcast SSID or matches the specific SSID of the STA. Probe Response frames shall be sent as directed frames to the address of the STA that generated the probe request. The probe response shall be sent using normal frame transmission rules.

Ex. 1019 [IEEE 802.11 Standard] at §11.1.3.2.

216. In response to the detection of the WLAN network, Jawanda discloses, in the method illustrated in Figure 4, a device configured to connect to and communicate with the IEEE 802.11 wireless local area network, using the WLAN transceiver:

> Referring now to FIG. 4, there is depicted a high level logical flowchart of a method of wireless data communication in which a data communication session is seamlessly handed off between wireless data communication networks . . . Returning to block 106, in response to a determination that a higher bandwidth data connection (i.e., a direct connection to WLAN via wireless network adapter 20) is available, for example, due to mobile terminal 14 being moved into the service area of WLAN 12, the process proceeds to block 120. Block 120 depicts mobile terminal 14 establishing a second wireless data connection by logging on to WLAN 12 via wireless network adapter 20. To logon to WLAN 12, mobile terminal 14 performs the conventional registration procedures dictated by the network and followed by fixed terminals 24, except that logon information is conveyed between mobile terminal 14 and wireless LAN adapter 64 by wireless communication.

Ex. 1003 [Jawanda Patent] at 4:20-5:32.

> As depicted at block 106, a determination can be made at any time following block 102 whether or not a higher bandwidth data connection is available. The determination illustrated at block 106 can be made by WLAN interface 96, for example, which may periodically poll to determine whether a connection can be obtained directly with WLAN 12 via wireless network adapter 20. This polling behavior may entail WLAN interface 96 periodically determining whether an "advertisement" message has been received by wireless LAN adapter 64 from wireless network adapter 20. Alternatively, and less preferably since mobile terminal 14 is typically powered by a limited life battery, the determination illustrated at block 106 can represent WLAN interface 96 detecting whether an "advertisement" message transmitted by wireless LAN adapter 64 has received a response from WLAN interface 96.

Ex. 1003 [Jawanda Patent] at 4:61-5:9.

d) Claims 5, 21, 27, and 43 are rendered obvious by Jawanda alone or in combination with GPRS and IEEE 802.11

217. It is my opinion that Jawanda alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 5, 21, 27, and 43. Claims 5 and 21 depend directly from Claims 1 and 4, and Claims 27 and 43 depend indirectly from Claims 23 and 26; therefore, all of the arguments of Claims 1, 4, 23 and 26 apply, and are incorporated by reference.

218. Claims 5, 21, 27, and 43 are all dependent claims reciting similar limitations that are generally directed towards the release of assigned physical channels.

Claim Number	Claim Language
5	The subscriber unit of claim 4, wherein the processor is further configured to release the plurality of assigned physical channels.
21	The subscriber unit of claim 1, wherein the processor is configured to release the plurality of assigned physical channels in response to a low utilization of the plurality of assigned physical channels or in response to a detection of the IEEE 802.11 wireless local area network.
27	The method of claim 26, further comprising: releasing all assigned physical channels associated with the first cellular wireless network.
43	The method of claim 23, further comprising: releasing all assigned physical channels in response to a low utilization of the assigned physical channels or in response to a detection of the IEEE 802.11 wireless local area network.

219. As noted above, Jawanda discloses a mobile terminal 14 that is capable of communication with a cellular network or a wireless local area network. Jawanda also discloses a method of data communication in which a data communication session is seamlessly handed off from a cellular network (WWAN 10) to a wireless LAN (WLAN 12).

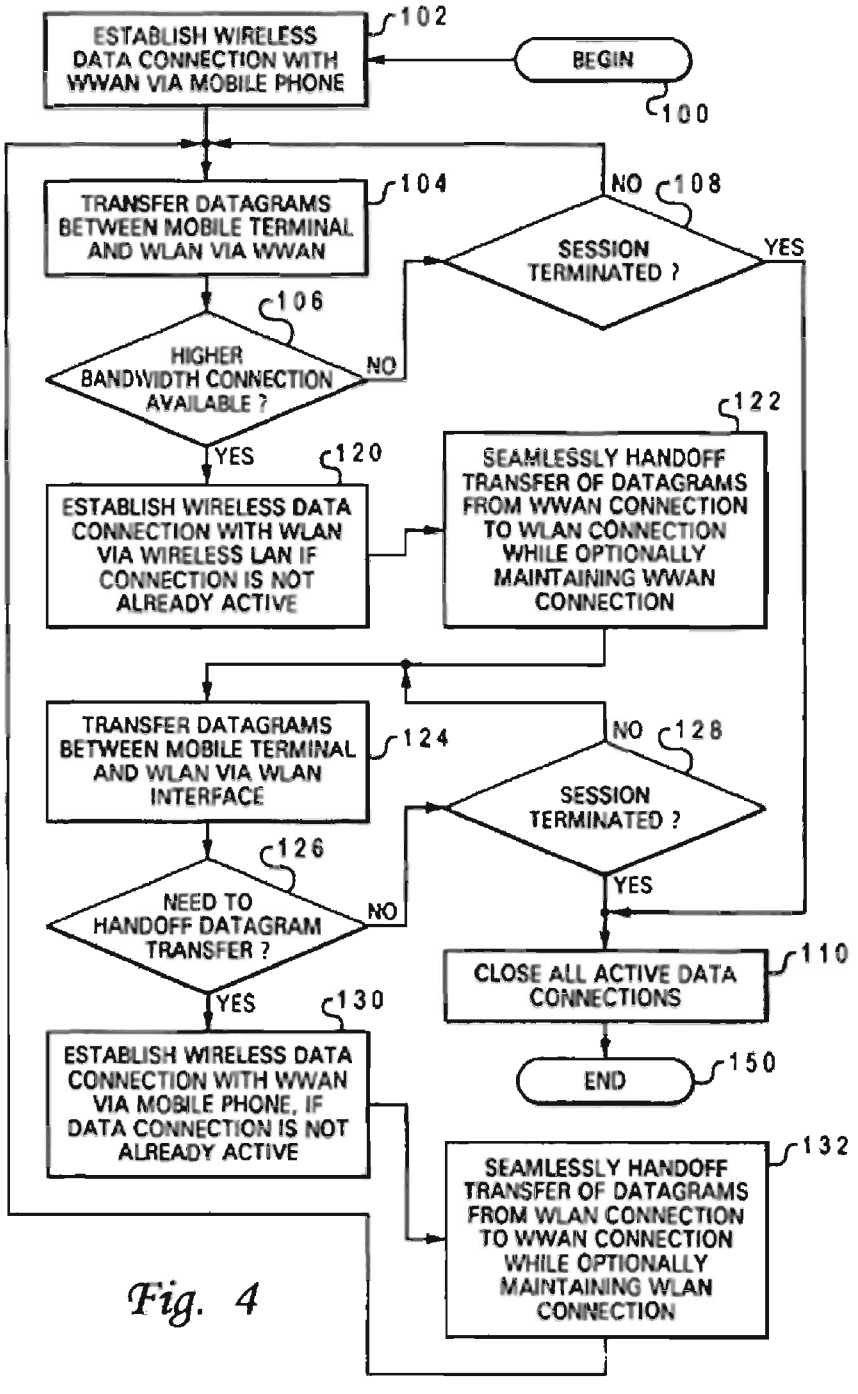


Fig. 4

FIG. 4 is a high level logical flowchart depicting a method of wireless data communication in which a data communication session is seamlessly handed off between wireless data communication networks.

Ex. 1003 [Jawanda Patent] at 2:31-34.

220. In particular, Jawanda teaches that following the handoff of data transmission from the WWAN 10 to the WLAN 12, the WWAN connection may be "optionally maintain[ed]." (*See* Ex. 1003 [Jawanda Patent] at Figure 4, block 122). When the connection is not maintained, the connection is closed and the physical channels are released.

> "[T]he process passes to block 108, which illustrates a determination of whether or not the session has been terminated by the user or by application 90. If not, the process simply returns to block 104, which has been described. If, however, a determination is made at block 108 that the session has been terminated, the process passes to block 110, which illustrates network access arbitrator 92 terminating all active wireless data connections. The process then ends at block 150."

Ex. 1003 [Jawanda Patent] at 5:11-19.

e) Claim 7, 8, and 29 are rendered obvious by Jawanda alone or in combination with GPRS and IEEE 802.11

221. It is my opinion that Jawanda alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 7, 8, and 29. Claims 7 and 8 depend from Claim 1, and Claim 29 depends from Claim 23; therefore, all of the arguments of Claims 1 and 23 apply, and are incorporated by reference.

222. Claims 7, 8, and 29 are all dependent claims reciting similar limitations that are generally directed towards cellular systems or physical channels being data channels.

Claim Number	Claim Language
7	The subscriber unit of claim 1, wherein at least one of the plurality of assigned physical channels is a data channel.
8	The subscriber unit of claim 1, wherein the cellular wireless network is a code division multiple access (CDMA) wireless network, and the cellular transceiver is a cellular code division multiple access (CDMA) transceiver.
29	The method of claim 23, wherein at least one of the physical channels is a data channel.

223. Jawanda discloses a cellular access interface (CAI 94), operating at the physical layer, that transmits control signals via a control channel and transmits packet data over a cellular data channel. Ex. 1003 [Jawanda Patent] at 3:66-4:19.

224. Jawanda also discloses a cellular wireless network (WWAN 10) capable of transmitting and receiving wireless signals from one or more cellular transceivers (mobile phones 16) using a code division multiple access (CDMA) protocol for transmitting data over a wireless channel.

> As further illustrated in FIG. 1, WWAN 10 is a cellular communication system that can be utilized for both voice and data communication. For example, WWAN 10 includes a base station 30, which transmits wireless signals to and receives wireless signals from one or more mobile phones 16. For data connections, such wireless signals can be transmitted according to any currently available or future wireless data protocol such as code division multiple access (CDMA), CDPD, or GPRS.

Ex. 1003 [Jawanda Patent] at 3:1-9.

f) Claim 14 and 36 are rendered obvious by Jawanda alone or in combination with GPRS and IEEE 802.11

225. It is my opinion that Jawanda alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 14 and 36. Claim 14 depends from Claim 1 and Claims 36 depends from Claim 23; therefore, all of the arguments of Claims 1 and 23 apply, and are incorporated by reference.

226. Claims 14 and 36 are both dependent claims reciting similar limitations that are generally directed towards selecting a particular communication path for communicating data to the Internet, either a wireless LAN or cellular wireless network.

Claim Number	Claim Language
14	The subscriber unit of claim 1, wherein the packet data is communicated to the Internet via the IEEE 802.11 wireless local area network, and not via the cellular wireless network.

Claim Number	Claim Language
36	The method of claim 23, wherein the packet data is communicated to the Internet via the IEEE 802.11 wireless local area network, and not via the cellular wireless network.

227. Jawanda discloses a method of data communication in which a data communication session is seamlessly handed off from a cellular network (WWAN 10) to a wireless LAN (WLAN 12). Put differently, the datagrams are communicated to the Internet via the IEEE 802.11 wireless local area network, and not via the cellular wireless network

> Referring now to FIG. 4, there is depicted a high level logical flowchart of a method of wireless data communication in which a data communication session is seamlessly handed off between wireless data communication networks. For illustrative purposes, the process will be described with respect to an exemplary processing scenario in which the service area of WWAN 10 includes a business premises or campus housing WLAN 12 and in which a user of mobile terminal 14 travels from a location distant from WLAN 12 into the service area of WLAN 12 and then returns to the remote location.

Ex. 1003 [Jawanda Patent] at 4:20-30.

> Returning to block 106, in response to a determination that a higher bandwidth data connection (i.e., a direct connection to WLAN via wireless network adapter 20) is available, for example, due to mobile terminal 14 being moved into the service area of WLAN 12, the process proceeds to block 120. Block 120 depicts mobile terminal 14 establishing a second wireless data connection by logging on to WLAN 12 via wireless network adapter 20. To logon to WLAN 12, mobile terminal 14 performs the conventional registration procedures dictated by the network and followed by fixed terminals 24, except that logon information is conveyed between mobile terminal 14 and wireless LAN adapter 64 by wireless communication. Thus, following block 120, the user has concurrent wireless data connections with both WWAN 10 and WLAN 12. Then, as depicted at block 122, network access arbitrator 92 causes the transfer of datagrams to be seamlessly handed off from the wireless connection with WWAN 10 to the wireless connection with WLAN 12 while maintaining the session between applications 90 and 91. Thus, following block 122, datagrams are routed between application 90 and application 91 utilizing the higher bandwidth data path between WLAN interfaces 96 rather than between CAIs 94, as shown at block 124.

Ex. 1003 [Jawanda Patent] at 5:20-42.

g) Claim 15 and 37 are rendered rendered obvious by Jawanda alone or in combination with GPRS and IEEE 802.11

228. It is my opinion that Jawanda alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 15 and 37. Claim 15 depends from Claim 1 and Claims 37 depends from Claim 23; therefore, all of the arguments of Claims 1 and 23 apply, and are incorporated by reference.

229. Claims 15 and 37 are both dependent claims reciting similar limitations that are generally directed towards the subscriber unit selecting to use or selecting to stop using physical channels associated with the cellular wireless network.

Claim Number	Claim Language
15	The subscriber unit of claim 1, wherein the processor is further configured to allocate and deallocate at least one of the plurality of assigned physical channels.
37	The method of claim 23, further comprising: allocating and deallocating at least one physical channel associated with the cellular wireless network.

230. Jawanda teaches that the application or the user may decide when start using or stop using the cellular connection and it does so by monitoring the activity of the session, which is associated with the transfer of datagrams from one end point in the network to another endpoint. When describing the prior art problem with wireless mobility in the face of a user's need to download a large set of data, Jawanda states:

> That is, the user cannot move out of the service area of the wireless data communication network through which the user is connected to the target network without terminating the session. Thus, if the portable computer user has initiated a time consuming operation such as a download of a large file, the heretofore mobile user must remain within a confined service area if the operation is to complete successfully.

Ex. 1003 [Jawanda Patent] at 1:66-4:19.

231. In this context, the solution proposed in Jawanda allows the network access arbitrator to monitor the activity of the session in order to decide when to start using and stop using the cellular wireless data connection. If datagrams need to be sent on the cellular connection, the network access arbitrator may elect to use the already-established cellular connection.

> If so, network access arbitrator 94 closes all active wireless data connections at block 110, and the process ends at block 150. If, on the other hand, a determination is made at block 128 that the session has not been terminated, the process returns to block 124, which has been described. Returning to block 126, in response to a determination by network access arbitrator 92 that the transfer of datagrams should be handed off, the process passes to block 130. Block 130 illustrates network access arbitrator 92 causing a wireless data connection to be reestablished with WWAN 10 in the manner described above with respect to block 102, if such a connection is not already active.

Ex. 1003 [Jawanda Patent] at 5:56-6:1.

232. To the extent that Jawanda does not explicitly disclose or teach these limitations, it would have been obvious in combination with the GPRS Standards, which as discussed above, disclose the ability of the subscriber unit to select to use or selecting to stop using assigned physical channels associated with the cellular wireless network.

233. Also as discussed above, the GPRS Standards do not require permanently allocated PDCHs. The allocation of capacity for GPRS can be based on the needs for actual packet transfers which is referred to as the "capacity on demand" principle. Accordingly, the mobile station is able select when to stop using and when to resume packet transfer on available channels.

> The GPRS does not require permanently allocated PDCHs. The allocation of capacity for GPRS can be based on the needs for actual packet transfers which is here referred to as the "capacity on demand" principle.

Ex. 1005.10 [GPRS Standards, GSM 03.64 v. 6.1.0] at §6.1.1.2 Capacity on demand concept.

> When selecting a new cell, mobile station leaves the packet transfer mode, enters the packet idle mode where it switches to the new cell, read the system information and may then resume to packet transfer mode in the new cell.

Ex. 1005.10 [GPRS Standards, GSM 03.64 v. 6.1.0] at §6.2.2 Packet transfer mode.

h) Claims 19, 20, 41, and 42 are rendered obvious by Jawanda alone or in combination with GPRS and IEEE 802.11

234. It is my opinion that Jawanda alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 19, 20, 40, and 41. Claims 19 and 20 depend either directly or indirectly from Claim 1, and Claims 40 and 41 depend either directly or indirectly from Claim 23; therefore, all of the arguments of Claims 1 and 23 apply, and are incorporated by reference.

235. Claims 19, 20, 40, and 41 are all dependent claims reciting similar limitations that are generally directed towards automatically communicating with the cellular wireless network over an existing communication session when the IEEE 802.11 wireless LAN is unavailable.

Claim Number	Claim Language
19	The subscriber unit of claim 1, wherein the processor is further configured to automatically communicate with the cellular wireless network on a condition that the IEEE 802.11 wireless local area network is unavailable.
20	The subscriber unit of claim 19, wherein the processor is configured to automatically communicate with the cellular wireless network by utilizing the communication session with the cellular wireless network.
41	The method of claim 23, further comprising: automatically communicating with the cellular wireless network on a condition that the IEEE 802.11 wireless local area network is unavailable.
42	The method of claim 41, wherein automatically communicating with the cellular wireless network includes utilizing the communication session with the cellular wireless network.

236. As discussed earlier, Jawanda discloses a mobile terminal 14 that is capable of communication with both a cellular network and a wireless local area network. *See* Ex. 1003 [Jawanda Patent] at 3:66-4:19.

237. Jawanda further discloses a method of wireless data communication in which a data communication session can be seamlessly handed off from a wireless LAN (WLAN 12) to a cellular network (WWAN 10). This handoff takes place automatically when the WLAN becomes unavailable, for example, when the mobile terminal moves outside of service area of the wireless LAN.

> Referring now to FIG. 4, there is depicted a high level logical flowchart of a method of wireless data communication in which a data communication session is seamlessly handed off between wireless data communication networks. For illustrative purposes, the process will be described with respect to an exemplary processing scenario in which the service area of WWAN 10 includes a business premises or campus housing WLAN 12 and in which a user of mobile terminal 14 travels from a location distant from WLAN 12 into the service area of WLAN 12 and then returns to the remote location.

Ex. 1003 [Jawanda Patent] at 4:20-30.

> Next, as illustrated at block 126, network access arbitrator 92 determines whether or not the transfer of datagrams should be handed off to the connection with WWAN 10, for example, in response to mobile terminal 14 being moved out of range of WLAN 12 due to the user leaving the business premises housing WLAN 12. The determination made at block 126 can be based on one or more factors, including the number of transmission errors detected by WLAN interface 96 and the received signal strength (RSS) of signals received by wireless LAN adapter 64.

Ex. 1003 [Jawanda Patent] at 5:43-52.

> Returning to block 126, in response to a determination by network access arbitrator 92 that the transfer of datagrams should be handed off, the process passes to block 130. Block 130 illustrates network access arbitrator 92 causing a wireless data connection to be reestablished with WWAN 10 in the manner described above with respect to block 102, if such a connection is not already active. Thereafter, network access arbitrator 92 reroutes the flow of datagrams from WLAN interface 96 to CAI 94. As indicated at block 132, the data wireless connection with WLAN 12 can thereafter optionally be maintained, if possible, until such time as the condition that prompted the handoff is no longer present and datagram transfer can again be handed off to the high bandwidth connection with WLAN 12. The process illustrated in FIG. 4 then returns to block 104, which has been described.

Ex. 1003 [Jawanda Patent] at 5:62-6:10.

2. U.S. Patent No. 6,681,259 to Lemilainen and Haverinen

238. Because Lemiläinen was filed on May 10, 1999, I understand that Lemiläinen qualifies as prior art against the 244 Patent under at least 35 U.S.C. §§ 102(a) and 102(b).

a) Claims 1 and 23 are rendered obvious by Lemiläinen alone or in combination with GPRS and IEEE 802.11

(1) "a subscriber unit comprising" (Claim 1)

"a method for use in a dual mode subscriber unit, the method comprising" (Claim 23)

239. I understand that the respective preambles are not limiting, and as such they are not required to invalidate the claims. In the event that the Court determines that the respective preambles are limiting, it is my opinion that Lemiläinen discloses the preambles of Claims 1 and 23.

240. Lemiläinen discloses a portable or mobile terminal, as shown in Figure 1, that is the "subscriber unit" of the 244 Patent.

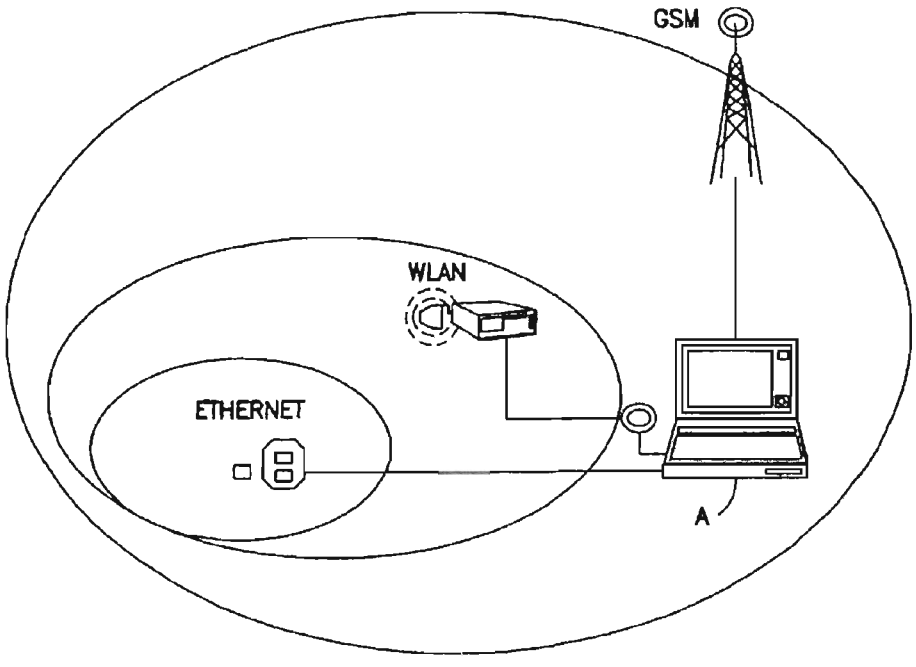


FIG. 1

Ex. 1004 [Lemiläinen] at Figure 1.

> It is a purpose of the present invention to provide a method for coupling a portable terminal in a flexible manner to a data transmission network, and for changing the data transmission connection used at a given time to another data transmission network, when necessary, as well as to a portable terminal according to the method.

Ex. 1004 [Lemiläinen] at 2:66-3:4.

> In the following, the invention will be described by using as an example of the mobile terminal a portable computer, which is presented in a reduced block diagram in Fig. 2. The operating system in the computer is the Windows® NT operating system developed by Microsoft Corporation, but it is obvious that the invention can be applied also in connection with other operating systems.

Ex. 1004 [Lemiläinen] at 4:14-19.

> Such terminal A is also called a multi-mode terminal.

Ex. 1004 [Lemiläinen] at 4:30.

241. Figure 2 and Figure 6 of Lemiläinen, as shown below, demonstrate a portable or mobile terminal capable of communicating with both a wireless local area network (WLAN) and a GSM cellular network.

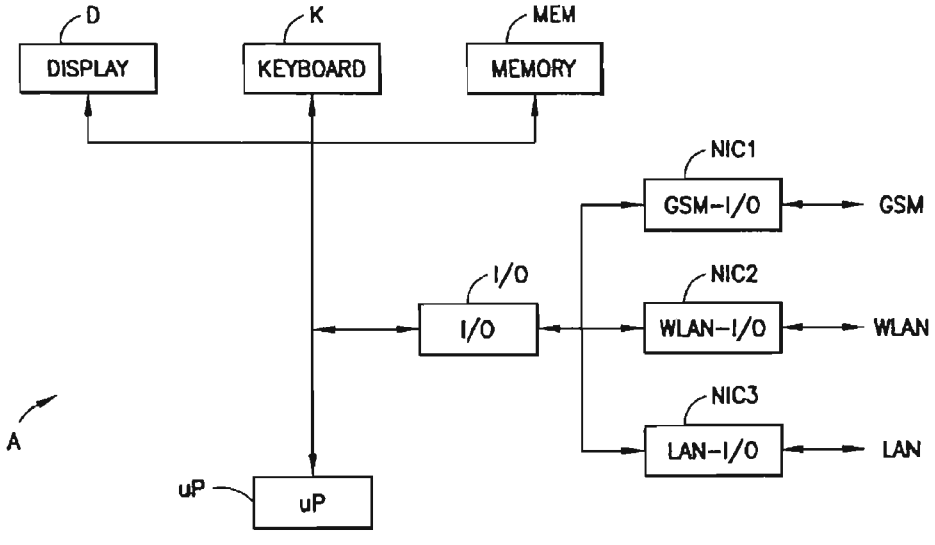


FIG.2

Ex. 1004 [Lemiläinen] at Figure 2.

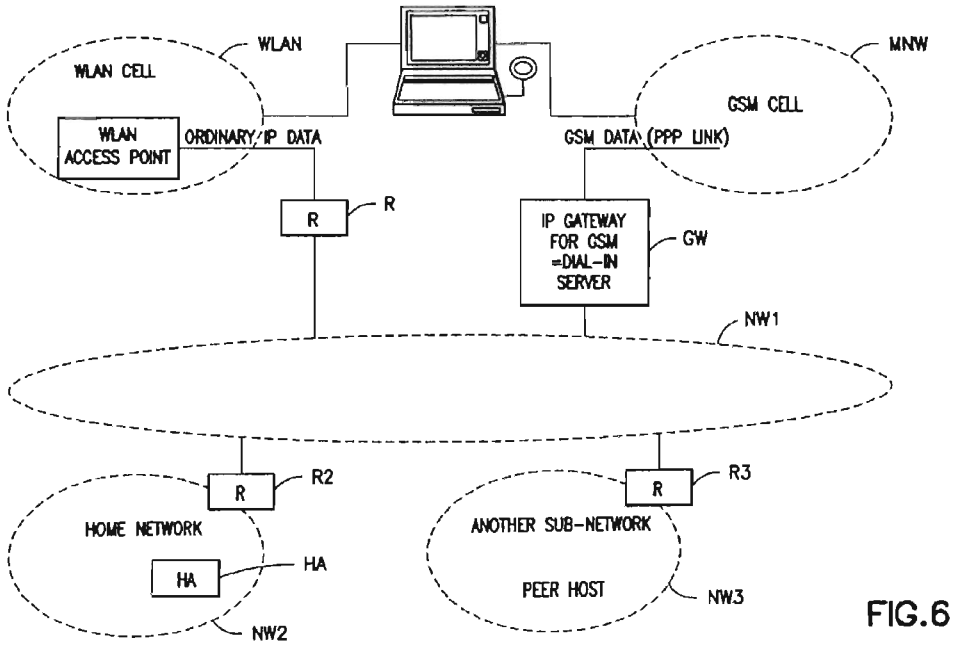


FIG.6

Ex. 1004 [Lemiläinen] at Figure 6.

(2) "a cellular transceiver configured to communicate with a cellular wireless network via a plurality of assigned physical channels" (Claim 1)

"establishing a communication session with a cellular wireless network" (Claim 23)

242. It is my opinion that both Lemiläinen and the GPRS Standards disclose these claim elements.

243. Lemiläinen discloses several network interface adapters that are available for coupling to a cellular network using a cellular layered communication protocol such as GSM or GPRS.

> Furthermore, in a terminal A there are several network interface adapters NIC1, NIC2, NIC3 available for coupling to data transmission networks of different types, of which an Ethernet type landline local area network, a wireless local area network WLAN according to the IEEE standard 802.11, and a GSM mobile communication network are mentioned as examples, but also other data transmission solutions, such as the packet switched data transmission system GPRS (General Packet Radio Service) of the GSM system and LPRF (Low Power RF) based on a low power radio signaling, can be applied in connection with the present invention. Such terminal A is also called a multi-mode terminal.

Ex. 1004 [Lemiläinen] at 4:20-32.

244. Lemiläinen also discloses communication with a cellular wireless network via a plurality of assigned physical channels.

> The network interface architecture comprises a network interface card NIC, by means of which the actual physical data transmission connection is established . . . Correspondingly, when connecting to the GSM mobile communication network, the network interface card comprises either a data interface to the mobile station (e.g. Nokia Cellular Data Suite), through which the data transmission connection is set up, or the network interface card can also comprise a mobile station transceiver for setting up a connection to the mobile communication network (e.g. Nokia Cellular Card Phone). Thus, the network interface card constitutes said physical layer and can also contain features of the link layer.

Ex. 1004 [Lemiläinen] at 4:61-5:14.

> The network interface card NIC1, NIC2, NIC3, and the network interface driver NCID constitute the layers of the lowermost level in the protocol stack.

Ex. 1004 [Lemiläinen] at 5:19-5:21.

245. Furthermore, Lemiläinen in combination with the GPRS Standards of the GSM protocol, explicitly identified in Lemiläinen, also disclose a plurality of physical channels available for assignment. GPRS provides for mobile terminals to aggregate packet data traffic channels so that multiple channels are provided for the mobile terminal to use when it has packet data to transmit.

> The access scheme is Time Division Multiple Access (TDMA) with eight basic physical channels per carrier. The carrier separation is 200 kHz. A physical channel is therefore defined as a sequence of TDMA frames, a time slot number (modulo 8) and a frequency hopping sequence.

Ex. 1005.09 [GPRS Standards, GSM 05.01 v. 6.1.1] at §5 Multiple access and timeslot structure.

> Multislot configurations for packet switched connections are defined as multiple (1 up to 8) PDTCH/Us and one PACCH for one mobile originated communication, or multiple (1 up to 8) PDTCH/Ds and one PACCH for one mobile terminated communication respectively, allocated to the same MS. In this context allocation refers to the list of PDCH that may dynamically carry the PDTCHs for that specific MS. The PACCH shall be mapped onto one PDCH carrying one PDTCH/U or PDTCH/D. That PDCH shall be indicated in the resource allocation message (see GSM 04.60).

Ex. 1005.09 [GPRS Standards, GSM 05.01 v. 6.1.1] at §2 Set of channels.

(3) "an IEEE 802.11 transceiver configured to communicate with an IEEE 802.11 wireless local area network" (Claim 1)

246. It is my opinion that both Lemiläinen and the IEEE 802.11 Standard disclose this claim element.

247. Lemiläinen discloses a network interface adapter configured to communicate with a wireless local area network (WLAN) according to the IEEE 802.11 Standard.

> Furthermore, in a terminal A there are several network interface adapters NIC1, NIC2, NIC3 available for coupling to data transmission networks of different types, of which an

> Ethernet type landline local area network, a wireless local area network WLAN according to the IEEE standard 802.11, and a GSM mobile communication network are mentioned as examples, but also other data transmission solutions, such as the packet switched data transmission system GPRS (General Packet Radio Service) of the GSM system and LPRF (Low Power RF) based on a low power radio signaling, can be applied in connection with the present invention. Such terminal A is also called a multi-mode terminal.

Ex. 1004 [Lemiläinen] at 4:20-32.

> The Institute of Electrical and Electronics Engineers IEEE has developed a standard 802.11 for wireless local area networks. In the connection of FIG. 4, data transmission according to this standard 802.11 is used between the host device A and the router R.

Ex. 1004 [Lemiläinen] at 6:15-28.

(4) "a processor configured to maintain a communication session with the cellular wireless network in an absence of the plurality of assigned physical channels while the IEEE 802.11 transceiver communicates packet data with the IEEE 802.11 wireless local area network" (Claim 1)

"maintaining the communication session in an absence of any physical channels associated with the cellular wireless network; and communicating packet data with an IEEE 802.11 wireless local area network while maintaining the communication session with the cellular wireless network" (Claim 23)

248. It is my opinion that both Lemiläinen and the GPRS Standards disclose these claim elements.

249. Lemiläinen discloses a portable or mobile terminal capable of shifting active data transmission from the cellular wireless network to the IEEE 802.11 wireless LAN, while using the upper layers for a logical connection that can be maintained, even without a physical connection to the cellular wireless network, because the "upper level layers do not have to know about the structure of the data network" and "the link layer attends to solutions required by different network technologies, wherein the upper level layers do not have to know how the data transmission network used at a given time is constructed."

> In the following, the meaning of these different protocol stack layers will be described briefly. The actual data transmission is conducted in the physical layer by using a data transmission means, such as a wireless radio network or landline cabling.
>
> The link layer attends to solutions required by different network technologies, wherein the upper level layers do not have to know how the data transmission network used at a given time is constructed. The link layer processes different addressing and frame modes and is responsible for the data transmission between two terminals in the same communication network.
>
> The task of the network layer is to route packets between terminals in the communication network. The network layer provides the coupling between different data networks, wherein the upper level layers do not have to know about the structure of the data network. On this network layer level, for instance protocols IP (Internet Protocol), ICMP (Internet Control Message Protocol) and IGMP (Internet Group Management Protocol) are used.

Ex. 1004 [Lemiläinen] at 6:29-49.

> Next, we shall discuss a situation where the terminal A shifts an active connection from one data network to another. The reason for the connection transition can be that the terminal A is transferred outside the service area of an active data network, or for another reason the connection quality in the active data network deteriorates at that moment to such an extent that the network interface selection driver NISD starts to change the connection to another data network. A reason for the connection change can also be that the terminal A enters the operation range of such a data network which the user has given a higher priority than the data network active at the moment. The terminal A is, for example, connected to a GSM mobile communication network and the user of the terminal arrives in an office where a wireless local area network is available. The appended FIG. 8c shows this data transmission network change in a reduced arrow diagram. It is presumed that the terminal A is connected to a second terminal B via a GSM mobile communication network. The connection is for example a TCP connection. The terminal A transmits IP packets to the second terminal B directly, without tunneling, via a server 728 located in the GSM mobile communication network.

Ex. 1004 [Lemiläinen] at 12:57-13:11.

> After receiving the registration reply message, the first terminal A terminates the connection to the GSM mobile communication network and starts to transmit packets by using the wireless local area network. In the above described method according to an advantageous embodiment of the invention, it is not necessary for the second terminal B and its applications to know the data network and address used by the first terminal A in this data network at a given time. The applications of the second terminal B can still transmit by using the same IP address of the first terminal.

Ex. 1004 [Lemiläinen] at 13:33-42.

250. Furthermore, I understand that InterDigital contends that a communication session is maintained so long as a logical connection with the cellular wireless network is maintained when no assigned physical channels are in use. Under InterDigital's contention, Lemiläinen explicitly discloses these claim elements as it expressly discloses higher layer logical connections. As quoted above, terminal A is able to retain the same logical connection information, *i.e.*, the same IP address. *See* Ex. 1004 [Lemiläinen] at 13:33-42.

251. Under this view, the mobile terminal can "still transmit by using the same IP address," the logical connection with the cellular network has been maintained, even after the physical cellular connection has been released. In other words, the logical connection with the cellular network remains because the NISD may shift the active data transmission back to the cellular wireless connection. In that case, the same logical connection (the same IP address used before the physical cellular connection was released) is still used when data transmission is shifted back to the cellular wireless network.

252. Lemiläinen also implicitly discloses these claims through the use of the specified Mobile IP protocol and GSM and GPRS network technologies.

> In the IP protocol used by the Internet data network, a so-called mobile IP protocol has been developed to allow the mobility of the terminal. This mobile IP protocol makes it possible for the terminal to move from one location to another in the Internet data network, maintaining, however, the same IP address. This mobility is implemented in the network layer level, wherein the change of location does not affect the applications and the applications can still function even though the location changes. This mobility is possible by using a so-called home agent, which is located in the home network of a mobile Internet terminal, and which conducts re-routing of the messages transmitted to the mobile terminal to the Internet data network in which the mobile terminal is located at a given time. When using solutions currently known, however, the mobility requires that the connection is maintained by means of a data network of a similar type, for example by using a GSM mobile communication network, if its undesirable to terminate the connection.

Ex. 1004 [Lemiläinen] at 8:62-9:13

> Furthermore, in a terminal A there are several network interface adapters NIC1, NIC2, NIC3 available for coupling to data transmission networks of different types, of which an Ethernet type landline local area network, a wireless local area network WLAN according to the IEEE standard 802.11, and a GSM mobile communication network are mentioned as examples, but also other data transmission solutions, such as the packet switched data transmission system GPRS (General Packet Radio Service) of the GSM system and LPRF (Low Power RF) based on a low power radio signalling, can be applied in connection with the present invention. Such terminal A is also called a multi-mode terminal.

Ex. 1004 [Lemiläinen] at 4:20-32

253. As discussed above, Mobile IP was a technology developed by the IETF to address problems associated with maintaining a communication session on a mobile device when the mobile device changes locations.

254. Similarly, the use of a GSM or GPRS network would necessarily and inherently disclose this element, as they maintain a communication session in the absence of a plurality of assigned physical channels through the use of a "PDP context."

255. The GPRS Standards, for example, disclose communication sessions on the Mobility Management layer.

> These procedures are used to establish, maintain and release a MM connection between the mobile station and the network, over which an entity of the upper CM layer can exchange information with its peer. A MM connection establishment can only be performed if no MM specific procedure is running. More than one MM connection may be active at the same time.

Ex. 1005.05 [GPRS Standards, GSM 04.08 v. 6.1.1] at §4.1.1 Type of MM procedures.

256. Subscriber units configured to communicate with GPRS Standard-based cellular wireless networks are configured to establish packet data communication sessions with the cellular network on the Session Management Layer. The Session Management Layer activates a PDP context in order to create a communication session.

> Session Management services are provided at the SMREG-SAP and the SNSM-SAP for anonymous and non-anonymous access. The non-anonymous and anonymous access

> procedures for PDP context activation and PDP context deactivation are available at the SMREG-SAP. In addition there exists a PDP context modification for non-anonymous PDP contexts.

Ex. 1005.04 [GPRS Standards, GSM 04.07 v. 6.1.0] at §6.5 Session Management Services for GPRS-Services.

257. The PDP context includes a number of session management parameters including, for example, PDP Type, PDP Address, and QoS Profile Negotiated parameters. *See* Ex. 1005.03 [GPRS Standards, GSM 03.60 v. 6.1.1] at §13.4 MS.

258. The GPRS Standards disclose a PDP context in an absence of physical channels, because when the radio link connection between the user device and the network has been released, one or more active PDP contexts may be preserved. Preserving the PDP context allows the mobile device to avoid the set-up time involved in establishing a data connection so the device can more quickly transmit data using the preserved PDP context.

> In the non-anonymous access case, the MM state relates only to GPRS MM activities of a subscriber. The MM state is independent of the number and state of PDP contexts for that subscriber.

Ex. 1005.03 [GPRS Standards, GSM 03.60 v. 6.1.1] at §6.1 Definition of Mobility Management States.

b) Claims 2, 3, 22, 24, 25, and 44 are rendered obvious by Lemiläinen alone or in combination with GPRS and IEEE 802.11

259. It is my opinion that Lemiläinen alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 2, 3, 22, 24, 25 and 44. Claims 2, 3 and 22 depend from Claim 1, and Claims 24, 25 and 44 depend from Claim 3; therefore, all of the arguments of Claims 1 and 23 apply, and are incorporated by reference.

260. Claims 2, 3, 22, 24, 25, and 44 are all dependent claims reciting similar limitations that are generally directed towards the use of a layered communication protocol, namely the TCP/IP protocol.

Claim Number	Claim Language
2	The subscriber unit of claim 1, wherein the packet data is transmission control protocol and Internet protocol (TCP/IP) packet data.
3	The subscriber unit of claim 1, wherein the communication session is a transmission control protocol (TCP) layer session, an Internet protocol (IP) layer session, or a network layer session.
22	The subscriber unit of claim 1, wherein the packet data is transmission control protocol and Internet protocol (TCP/IP) data
24	The method of claim 23, wherein the packet data is transmission control protocol and Internet protocol (TCP/IP) packet data.
25	The method of claim 23, wherein the communication session is a transmission control protocol (TCP) layer session, an Internet protocol (IP) layer session, or a network layer session.
44	The method of claim 23, wherein the packet data is transmission control protocol and Internet protocol (TCP/IP) data.

261. Lemiläinen discloses the use of a layered communication protocol to transmit packet data over an IEEE 802.11 WLAN, and to maintain a communication session with the cellular wireless network.

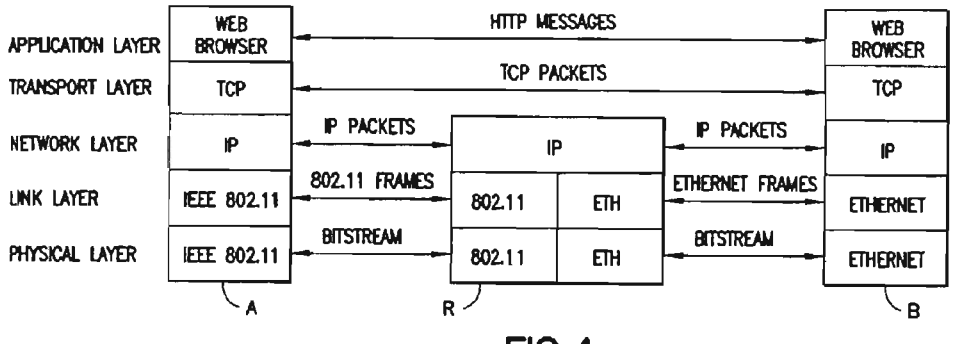


FIG.4

Ex. 1004 [Lemiläinen] at Figure 4.

> The TCP/IP protocols can be used in a variety of network solutions, such as the packet switched Ethernet and in the Token ring network, or in a switched network, such as ATM and ISDN. In a connection according to FIG. 4, the data transmission between the first

> host A and the router R is conducted in a wireless manner. Data transmission between the router R and the second host B is conducted by means of a landline Ethernet network, but it is obvious that these network solutions only act as examples here. The Institute of Electrical and Electronics Engineers IEEE has developed a standard 802.11 for wireless local area networks. In the connection of FIG. 4, data transmission according to this standard 802.11 is used between the host device A and the router R.

Ex. 1004 [Lemiläinen] at 6:15-28

262. Lemiläinen further discloses the use of Mobile IP, which, as described earlier discloses the use of a layered communication protocol to maintain a communication session with the cellular wireless network, as it was specifically intended to allow a terminal to move from one location to another while maintaining a fixed IP address.

> In the IP protocol used by the Internet data network, a so-called mobile IP protocol has been developed to allow the mobility of the terminal. This mobile IP protocol makes it possible for the terminal to move from one location to another in the Internet data network, maintaining, however, the same IP address. This mobility is implemented in the network layer level, wherein the change of location does not affect the applications and the applications can still function even though the location changes. This mobility is possible by using a so-called home agent, which is located in the home network of a mobile Internet terminal, and which conducts re-routing of the messages transmitted to the mobile terminal to the Internet data network in which the mobile terminal is located at a given time. When using solutions currently known, however, the mobility requires that the connection is maintained by means of a data network of a similar type, for example by using a GSM mobile communication network, if its undesirable to terminate the connection.

Ex. 1004 [Lemiläinen] at 8:62-9:13.

c) Claims 4, 6, 16, 26, 28, and 38 are rendered obvious by Lemiläinen alone or in combination with GPRS and IEEE 802.11

263. It is my opinion that Lemiläinen alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 4, 6, 16, 26, 28, and 38. Claims 4, 6 and 16 depend either directly or indirectly from Claim 1, and Claims 26, 28 and 38 depend either directly or indirectly from Claim 23; therefore, all of the arguments of Claims 1 and 23 apply, and are incorporated by reference.

264. Claims 4, 6, 16, 26, 28, and 38 are all dependent claims reciting similar limitations that are generally directed towards detecting the availability of and connecting to an IEEE 802.11 wireless LAN, as well as automatically communicating packet data over the IEEE 802.11 wireless LAN when available.

Claim Number	Claim Language
4	The subscriber unit of claim 1, further comprising: a detector configured to detect the IEEE 802.11 wireless local area network; a circuit configured to select the IEEE 802.11 transceiver in response to the detector detecting the IEEE 802.11 wireless local area network.
6	The subscriber unit of claim 4, wherein the detector is configured to detect a beacon frame or a probe response frame received by the IEEE 802.11 transceiver from the IEEE 802.11 wireless local area network.
16	The subscriber unit of claim 1, further comprising: a detector configured to detect whether the IEEE 802.11 wireless local area network is available, wherein packet data is automatically communicated to the IEEE 802.11 wireless local area network when the IEEE 802.11 wireless local area network is available.
26	The method of claim 23, further comprising: detecting the IEEE 802.11 wireless local area network; and communicating with the IEEE 802.11 wireless local area network in response to detecting the IEEE 802.11 wireless local area network.
28	The method of claim 26, wherein detecting the IEEE 802.11 wireless local area network comprises receiving a beacon frame or a probe response frame from the IEEE 802.11 wireless local area network.
38	The method of claim 23, further comprising: detecting whether the IEEE 802.11 wireless local area network is available; and automatically communicating packet data with the IEEE 802.11 wireless local area network upon detection of the IEEE 802.11 wireless local area network being available.

265. Lemiläinen discloses a network interface card (NIC) that is equivalent to a detector configured to detect a wireless LAN, since it is capable of receiving "an advertisement message" that is broadcast by the wireless LAN. Lemiläinen further discloses that the network interface selection driver (NISD) is directed to transmit a registration message to couple with wireless LAN, after which the NISD automatically transmits packet data over the wireless LAN.

> After it is started, the management application MA of the network interface selection driver examines which NIC drivers D1, D2, D3 are started in the terminal A and what is the quality of each active connection. It is also possible that a network interface card has received from the corresponding data network an advertisement message from an agent, such as an home agent or a foreign agent, by means of which the agent aims at defining the address information of the terminals A connected to the data network. On the basis of the defined information, the management application MA of the network interface selection driver directs the network interface selection driver NISD to transmit, when necessary, a registration message to that data network NW1, NW2, NW3, MNW, to which the network interface selection driver management application MA or the user of the terminal A desires to be connected at that moment. At this stage, the network interface selection driver NISD indicates to the protocol driver PD that the coupling to the data network is activated, wherein the network interface selection driver NISD can start transmitting packets.

Ex. 1004 [Lemiläinen] at 10:31-50.

> Next, we shall discuss a situation where the terminal A shifts an active connection from one data network to another. The reason for the connection transition can be that the terminal A is transferred outside the service area of an active data network, or for another reason the connection quality in the active data network deteriorates at that moment to such an extent that the network interface selection driver NISD starts to change the connection to another data network. A reason for the connection change can also be that the terminal A enters the operation range of such a data network which the user has given a higher priority than the data network active at the moment. The terminal A is, for example, connected to a GSM mobile communication network and the user of the terminal arrives in an office where a wireless local area network is available. The appended FIG. 8c shows this data transmission network change in a reduced arrow diagram. It is presumed that the terminal A is connected to a second terminal B via a GSM mobile communication network. The connection is for example a TCP connection. The terminal A transmits IP packets to the second terminal B directly, without tunneling, via a server 728 located in the GSM mobile communication network.

Ex. 1004 [Lemiläinen] at 12:57-13:11.

> In the first terminal A, the network interface selection driver NSID chooses to shift the connection to another data network, in this example to the wireless local area network WLAN (block 734) . . . After receiving the registration reply message, the first terminal A terminates the connection to the GSM mobile communication network and starts to transmit packets by using the wireless local area network.

Ex. 1004 [Lemiläinen] at 13:16-36.

266. Lemiläinen explicitly discloses communication with a wireless LAN using the IEEE 802.11 Standard, which itself defines the manner in which compliant wireless LANs are to be detected, namely through the use of a beacon frame or probe response frame mechanism.

> The Institute of Electrical and Electronics Engineers IEEE has developed a standard 802.11 for wireless local area networks. In the connection of FIG. 4, data transmission according to this standard 802.11 is used between the host device A and the router R.

Ex. 1004 [Lemiläinen] at 6:23-2.

> Beacon generation in an IBSS is distributed. The beacon period is included in Beacon and Probe Response frames, and STAs shall adopt that beacon period when joining the IBSS. All members of the IBSS participate in beacon generation.

Ex. 1019 [IEEE 802.11 Standard] at §11.1.2.2.

> To become a member of a particular ESS using passive scanning, a STA shall scan for Beacon frames containing that ESS's SSID, returning all Beacon frames matching the desired SSID in the BSSDescriptionSet parameter of the corresponding MLME-SCAN.confirm primitive with the appropriate bits in the Capabilities Information field indicating whether the beacon came from an Infrastructure BSS or IBSS. To actively scan, the STA shall transmit Probe frames containing the desired SSID. Upon completion of scanning, an MLME-SCAN.confirm is issued by the MLME indicating all of the BSS information received.

Ex. 1019 [IEEE 802.11 Standard] at §11.1.3.

> 11.1.3.2 Active scanning. Active scanning involves the generation of Probe frames and the subsequent processing of received Probe Response frames. The details of the active scanning procedures are as specified in the following subclauses.
>
> 11.1.3.2.1 Sending a probe response. STAs, subject to criteria below, receiving Probe Request frames shall respond with a probe response only if the SSID in the probe request is the broadcast SSID or matches the specific SSID of the STA. Probe Response frames shall be sent as directed frames to the address of the STA that generated the probe request. The probe response shall be sent using normal frame transmission rules.

Ex. 1019 [IEEE 802.11 Standard] at §11.1.3.2.

d) Claims 5, 21, 27, and 43 are rendered obvious by Lemiläinen alone or in combination with GPRS and IEEE 802.11

267. It is my opinion that Lemiläinen alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 5, 21, 27, and 43. Claims 5 and 21 depend directly from Claims 1 and 4, and Claims 27 and 43 depend indirectly from Claims 23 and 26; therefore, all of the arguments of Claims 1, 4, 23 and 26 apply, and are incorporated by reference.

268. Claims 5, 21, 27, and 43 are all dependent claims reciting similar limitations that are generally directed towards the release of physical channels.

Claim Number	Claim Language
5	The subscriber unit of claim 4, wherein the processor is further configured to release the plurality of assigned physical channels.
21	The subscriber unit of claim 1, wherein the processor is configured to release the plurality of assigned physical channels in response to a low utilization of the plurality of assigned physical channels or in response to a detection of the IEEE 802.11 wireless local area network.
27	The method of claim 26, further comprising: releasing all assigned physical channels associated with the first cellular wireless network.
43	The method of claim 23, further comprising: releasing all assigned physical channels in response to a low utilization of the assigned physical channels or in response to a detection of the IEEE 802.11 wireless local area network.

269. As discussed above with respect to Claims 1 and 23, Lemiläinen discloses a portable or mobile terminal capable of shifting active data transmission from the cellular wireless network to the IEEE 802.11 wireless LAN, while maintaining a connection with the cellular wireless network. Lemiläinen also discloses that the connection with the cellular network is terminated following the shift in data transmission, at which point the physical layer channels are released. But because the device can "still transmit by using the same IP address," the logical

connection with the cellular network has been maintained, even though the physical cellular connection has been released. In other words, the logical connection with the cellular network remains because the NISD may shift the active data transmission back to the cellular wireless connection. In that case, the same logical connection (same IP address) is still used after shifting back to the cellular wireless network.

> Next, we shall discuss a situation where the terminal A shifts an active connection from one data network to another. The reason for the connection transition can be that the terminal A is transferred outside the service area of an active data network, or for another reason the connection quality in the active data network deteriorates at that moment to such an extent that the network interface selection driver NISD starts to change the connection to another data network. A reason for the connection change can also be that the terminal A enters the operation range of such a data network which the user has given a higher priority than the data network active at the moment. The terminal A is, for example, connected to a GSM mobile communication network and the user of the terminal arrives in an office where a wireless local area network is available. The appended FIG. 8c shows this data transmission network change in a reduced arrow diagram. It is presumed that the terminal A is connected to a second terminal B via a GSM mobile communication network. The connection is for example a TCP connection. The terminal A transmits IP packets to the second terminal B directly, without tunneling, via a server 728 located in the GSM mobile communication network.

Ex. 1004 [Lemiläinen] at 12:57-13:11.

270. Lemiläinen also expressly teaches that the decision to shift data transmission can be in response to detecting an IEEE 802.11 wireless LAN, for example, when entering into the service area of the wireless LAN.

> In the first terminal A, the network interface selection driver NISD chooses to shift the connection to another data network, in this example to the wireless local area network WLAN (block 734). The first terminal A transmits a registration request message to the home agent HA via the wireless local area network WLAN (arrows 735 and 736) and at the same time continues to transmit IP packets via the GSM mobile communication network, if there are packets to be transmitted and the connection quality is adequate. The home agent HA receives the registration request, updates the new location address of the first terminal A in its own database and transmits a registration reply message via the wireless local area network WLAN to the first terminal A (arrows 737, 738). After this, the home agent HA transmits the packets addressed to the first terminal A to the wireless local area network WLAN, instead of the GSM mobile communication network. After

> receiving the registration reply message, the first terminal A terminates the connection to the GSM mobile communication network and starts to transmit packets by using the wireless local area network. In the above described method according to an advantageous embodiment of the invention, it is not necessary for the second terminal B and its applications to know the data network and address used by the first terminal A in this data network at a given time. The applications of the second terminal B can still transmit by using the same IP address of the first terminal.

Ex. 1004 [Lemiläinen] at 13:16-42.

e) Claims 7, 8, and 29 are rendered obvious by Lemiläinen alone or in combination with GPRS and IEEE 802.11

271. It is my opinion that Lemiläinen alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 7, 8, and 29. Claims 7 and 8 depend from Claim 1, and Claim 29 depends from Claim 23; therefore, all of the arguments of Claims 1 and 23 apply, and are incorporated by reference.

272. Claims 7, 8, and 29 are all dependent claims reciting similar limitations that are generally directed towards cellular systems and the physical channels being data channels.

Claim Number	Claim Language
7	The subscriber unit of claim 1, wherein at least one of the plurality of assigned physical channels is a data channel.
8	The subscriber unit of claim 1, wherein the cellular wireless network is a code division multiple access (CDMA) wireless network, and the cellular transceiver is a cellular code division multiple access (CDMA) transceiver.
29	The method of claim 23, wherein at least one of the physical channels is a data channel.

273. As discussed above with respect to Claims 1 and 23, Lemiläinen discloses several network interface adapters that are available for coupling to a cellular network using cellular technologies, such as GSM or GPRS, which provide for packet switched data transmission.

> Furthermore, in a terminal A there are several network interface adapters NIC1, NIC2, NIC3 available for coupling to data transmission networks of different types, of which an Ethernet type landline local area network, a wireless local area network WLAN according to the IEEE standard 802.11, and a GSM mobile communication network are mentioned as examples, but also other data transmission solutions, such as the packet

> switched data transmission system GPRS (General Packet Radio Service) of the GSM system and LPRF (Low Power RF) based on a low power radio signaling, can be applied in connection with the present invention. Such terminal A is also called a multi-mode terminal.

Ex. 1004 [Lemiläinen] at 4:19-32.

274. The GSM standards, explicitly identified in Lemiläinen, provide for packet switched data transmission over a plurality of physical channels, specifically the packet data traffic channels (PDTCH/Ds).

> The access scheme is Time Division Multiple Access (TDMA) with eight basic physical channels per carrier. The carrier separation is 200 kHz. A physical channel is therefore defined as a sequence of TDMA frames, a time slot number (modulo 8) and a frequency hopping sequence.

Ex. 1005.09 [GPRS Standards, GSM 05.01 v. 6.1.1] at §5 Multiple access and timeslot structure.

> Multislot configurations for packet switched connections are defined as multiple (1 up to 8) PDTCH/Us and one PACCH for one mobile originated communication, or multiple (1 up to 8) PDTCH/Ds and one PACCH for one mobile terminated communication respectively, allocated to the same MS. In this context allocation refers to the list of PDCH that may dynamically carry the PDTCHs for that specific MS. The PACCH shall be mapped onto one PDCH carrying one PDTCH/U or PDTCH/D. That PDCH shall be indicated in the resource allocation message (see GSM 04.60).

Ex. 1005.09 [GPRS Standards, GSM 05.01 v. 6.1.1] at §2 Set of channels.

275. While Lemiläinen does not explicitly identify the use of a CDMA air interface, it would have been obvious to a person having ordinary skill in the art that a mobile station in the 1999 timeframe to use code division multiple access (CDMA) as an alternative to GSM, which implements time division multiple access (TDMA). Selecting one well-known cellular standard over the other is a simple design choice that would not impact the teaching of Lemiläinen.

276. For example, given that Lemiläinen teaches the suggests using types of network cards to provide various communication paths, it would have been obvious to a person having ordinary skill in the art that a CDMA network interface card could have easily be substituted for

the GSM/GPRS wireless network card by selecting among the available cellular data networks known at the time. (*See*. Ex. 1004 (Lemiläinen), at 4:61-5:14).

f) Claims 14 and 36 are rendered obvious by Lemiläinen alone or in combination with GPRS and IEEE 802.11

277. It is my opinion that Lemiläinen alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 14 and 36. Claim 14 depends from Claim 1 and Claims 36 depends from Claim 23; therefore, all of the arguments of Claims 1 and 23 apply, and are incorporated by reference.

278. Claims 14 and 36 are both dependent claims reciting similar limitations that are generally directed towards communicating data to the Internet over a particular communication path, either a wireless LAN or cellular wireless network.

Claim Number	Claim Language
14	The subscriber unit of claim 1, wherein the packet data is communicated to the Internet via the IEEE 802.11 wireless local area network, and not via the cellular wireless network.
36	The method of claim 23, wherein the packet data is communicated to the Internet via the IEEE 802.11 wireless local area network, and not via the cellular wireless network.

279. As discussed above with respect to Claims 1 and 23, Lemiläinen discloses a portable or mobile terminal capable of shifting active data transmission from the cellular wireless network to the IEEE 802.11 wireless LAN.

280. More particularly, Lemiläinen discloses that following the shift in data transmission, the portable or mobile terminal "starts to transmit packets by using the wireless local area network" and "terminates the connection to the GSM mobile communication network." Thus, the packet data is communicated via the WLAN and not the cellular wireless network.

> In the first terminal A, the network interface selection driver NISD chooses to shift the connection to another data network, in this example to the wireless local area network WLAN (block 734). The first terminal A transmits a registration request message to the home agent HA via the wireless local area network WLAN (arrows 735 and 736) and at the same time continues to transmit IP packets via the GSM mobile communication network, if there are packets to be transmitted and the connection quality is adequate. The home agent HA receives the registration request, updates the new location address of the first terminal A in its own database and transmits a registration reply message via the wireless local area network WLAN to the first terminal A (arrows 737, 738). After this, the home agent HA transmits the packets addressed to the first terminal A to the wireless local area network WLAN, instead of the GSM mobile communication network. After receiving the registration reply message, the first terminal A terminates the connection to the GSM mobile communication network and starts to transmit packets by using the wireless local area network. In the above described method according to an advantageous embodiment of the invention, it is not necessary for the second terminal B and its applications to know the data network and address used by the first terminal A in this data network at a given time. The applications of the second terminal B can still transmit by using the same IP address of the first terminal.

Ex. 1004 [Lemiläinen] at 13:16-42.

281. Furthermore, Lemiläinen generally discloses that the packet data may be communicated to an IP data network, such as the Internet.

> The appended FIG. 6 presents the network architecture of a system in which it is advantageous to apply the invention. A terminal A according to the invention can be connected for example to a wireless local area network WLAN or to a GSM mobile communication network MNW. The wireless local area network WLAN can consist of one or more cells, wherein each cell contains a WLAN access point 3, via which the terminal A can communicate with the local area network WLAN. In the system of FIG. 6, the WLAN access point 3 is in data transmission connection via a router R to an IP data network NW1, such as the Internet data network. There are also other data networks NW2, NW3 connected to this IP data network NW1 via routers R2, R3. In the system of FIG. 6, a connection is set up also from the GSM mobile communication network MNW to the IP data network via a gateway GW, which is known as such. Thus, with the terminal A, a data transmission connection can be set up also via the GSM mobile communication network MNW to the IP data network NW1.

Ex. 1004 [Lemiläinen] at 9:14-32.

g) Claims 15 and 37 are rendered obvious by Lemiläinen alone or in combination with GPRS and IEEE 802.11

282. It is my opinion that Lemiläinen alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 15 and 37. Claim 15 depends from Claim 1 and Claims 37 depends from Claim 23; therefore, all of the arguments of Claims 1 and 23 apply, and are incorporated by reference.

283. Claims 15 and 37 are both dependent claims reciting similar limitations that are generally directed towards the subscriber unit selecting to use or selecting to stop using physical channels associated with the cellular wireless network.

Claim Number	Claim Language
15	The subscriber unit of claim 1, wherein the processor is further configured to allocate and deallocate at least one of the plurality of assigned physical channels.
37	The method of claim 23, further comprising: allocating and deallocating at least one physical channel associated with the cellular wireless network.

284. Lemiläinen teaches that a management application of the mobile terminal is able to determine when to begin using and when to stop using the various available physical layer resources, when necessary.

> "The management application MA of the network interface selection driver is also responsible for directing the connection set-up and cut off to the mobile communication network MNW when necessary."

(Ex. 1004 (Lemiläinen) at 14:2-5.

285. Further, Lemiläinen teaches that the user may provide a higher priority to one of the active data networks over the other. Thus, if the user has given the cellular network a higher priority, the network interface selection driver would select the cellular network and begin using the physical channels of the cellular network to transmit data. Likewise, if the mobile terminal is

transferred outside the service area of the cellular network, the network interface selection driver would elect to stop using the cellular network physical channels and shift to transmitting data on one of the other available networks.

> Next, we shall discuss a situation where the terminal A shifts an active connection from one data network to another. The reason for the connection transition can be that the terminal A is transferred outside the service area of an active data network, or for another reason the connection quality in the active data network deteriorates at that moment to such an extent that the network interface selection driver NISD starts to change the connection to another data network. A reason for the connection change can also be that the terminal A enters the operation range of such a data network which the user has given a higher priority than the data network active at the moment.

(Ex. 1004 (Lemiläinen) at 14:2-5.

286. To the extent that Lemiläinen does not explicitly disclose or teach these limitations, it would have been obvious in combination with the GPRS Standards, which as discussed above, disclose the ability of the subscriber unit to select to use or selecting to stop using assigned physical channels associated with the cellular wireless network.

287. Also as discussed above, the GPRS Standards do not require permanently allocated PDCHs. The allocation of capacity for GPRS can be based on the needs for actual packet transfers which is referred to as the "capacity on demand" principle. Accordingly, the mobile station is able select when to stop using and when to resume packet transfer on available channels.

> The GPRS does not require permanently allocated PDCHs. The allocation of capacity for GPRS can be based on the needs for actual packet transfers which is here referred to as the "capacity on demand" principle.

Ex. 1005.10 [GPRS Standards, GSM 03.64 v. 6.1.0] at §6.1.1.2 Capacity on demand concept.

> When selecting a new cell, mobile station leaves the packet transfer mode, enters the packet idle mode where it switches to the new cell, read the system information and may then resume to packet transfer mode in the new cell.

Ex. 1005.10 [GPRS Standards, GSM 03.64 v. 6.1.0] at §6.2.2 Packet transfer mode.

h) Claims 19, 20, 41, and 42 are rendered obvious by Lemiläinen alone or in combination with GPRS and IEEE 802.11

288. It is my opinion that Lemiläinen alone or in combination with the GPRS and IEEE 802.11 Standards renders obvious Claims 19, 20, 40, and 41. Claims 19 and 20 depend either directly or indirectly from Claim 1, and Claims 40 and 41 depend either directly or indirectly from Claim 23; therefore, all of the arguments of Claims 1 and 23 apply, and are incorporated by reference.

289. Claims 19, 20, 40, and 41 are all dependent claims reciting similar limitations that are generally directed towards automatically communicating with the cellular wireless network when the IEEE 802.11 wireless LAN is unavailable.

Claim Number	Claim Language
19	The subscriber unit of claim 1, wherein the processor is further configured to automatically communicate with the cellular wireless network on a condition that the IEEE 802.11 wireless local area network is unavailable.
20	The subscriber unit of claim 19, wherein the processor is configured to automatically communicate with the cellular wireless network by utilizing the communication session with the cellular wireless network.
41	The method of claim 23, further comprising: automatically communicating with the cellular wireless network on a condition that the IEEE 802.11 wireless local area network is unavailable.
42	The method of claim 41, wherein automatically communicating with the cellular wireless network includes utilizing the communication session with the cellular wireless network.

290. As discussed above with respect to Claims 1 and 23, Lemiläinen discloses a portable or mobile terminal capable of maintaining a communication session while shifting active data transmission from one data network to another.

291. Lemiläinen teaches that the decision to shift data transmission can be in response to the mobile terminal being "transferred outside the service area of an active data network" or when "the connection quality in the active data network deteriorates." Lemiläinen further

discloses that when shifting data transmission the existing communication session is transparently maintained.

> Next, we shall discuss a situation where the terminal A shifts an active connection from one data network to another. The reason for the connection transition can be that the terminal A is transferred outside the service area of an active data network, or for another reason the connection quality in the active data network deteriorates at that moment to such an extent that the network interface selection driver NISD starts to change the connection to another data network. . . . In the above described method according to an advantageous embodiment of the invention, it is not necessary for the second terminal B and its applications to know the data network and address used by the first terminal A in this data network at a given time. The applications of the second terminal B can still transmit by using the same IP address of the first terminal.

Ex. 1004 [Lemiläinen] at 12:57-13:42.

3. Draft UMTS Standards as of August 20, 1999

292. Because the Draft UMTS Standards were published and made available on or prior to August 20, 1999, I understand that the Draft UMTS Standards qualify as prior art against the 244 Patent under at least 35 U.S.C. § 102(e).

293. The Draft UMTS Standards disclose a mobile station (UE) that is capable of communication with either a cellular network, such as a UMTS Terrestrial Radio Access Network (UTRAN), or a WLAN, such as a BRAN or HIPERLAN/2 network. The Draft UMTS Standards discloses combining the UTRAN with the HIPERLAN/2 in a common network, the UMTS Radio Access Network (URAN), which provides support for roaming between different networks.

> Handovers between UTRAN and HIPERLAN/2, in case of dual mode terminals, should be supported via the core network.

Ex. 1006.04 [UMTS Standard, 3GPP TS 23.121] at §4.7.2.

294. Given that the Draft UMTS standards disclose a dual-mode device that supports seamless handoff of upper layer connections between a cellular connection and a WLAN

connection, a person having ordinary skill in the art would be motivated to combine the Draft UMTS references with other prior art that addressed the same problem. As discussed in above, Lemiläinen also sought to solve similar problems with data mobility. Further, as Draft UMTS was the next generation of cellular standards being built on GSM, it would have been obvious for a person having ordinary skill in the art to use the updated cellular standard in place of the older one. Accordingly, it is my opinion that it would have been obvious to one of skill in the art to combine these references.

295. As discussed above with respect to Lemiläinen, it discloses a dual-mode device that can connect to, among other networks, an IEEE 802.11 WLAN and a GSM network, but it does not explicitly disclose the use of a CDMA network as required by claim 8. In contrast the GPRS, the Draft UMTS Standards explicitly disclose a CDMA-based network. Thus, it is my opinion the combination of the Draft UMTS Standards and Lemiläinen renders each of the Challenged Claims obvious.

296. Because the limitations are similar to the analysis I have already provided with respect to Lemiläinen, I will not repeat that analysis here. Instead, it is my opinion that for the same reasons I identified showing each Challenged Claim disclosed by the combination of Lemilainen and GPRS, those same reasons would apply to the combination of Draft UMTS and Lemilainen, and I incorporate that analysis here. I only list below some of the additional support provided for the fact that the Draft UMTS Standards disclose the "plurality of assign physical channels" and "maintain a communication session" limitations below.

297. The UMTS Standards were developed from the prior GPRS Standards and eventually led to the WCDMA standard. As with the GPRS standards discussed earlier, the UMTS Standards also disclose the plurality of physical channels limitation. In UMTS standards-

compliant cellular networks, there are two different types of uplink channels: Dedicated Physical Data Channels (DPDCH) and Dedicated Physical Control Channels (DPCCH). The DPCCH is used to transmit Layer 1 control information associated with each DPDCH. Transmission of any DPDCH and the DPCCH is controlled such that one DPCCH is transmitted alone, neither channel type is transmitted, or the DPCCH and one or more DPDCH are transmitted.

> There are two types of uplink dedicated physical channels, the uplink Dedicated Physical Data Channel (uplink DPDCH) and the uplink Dedicated Physical Control Channel (uplink DPCCH) . . . The uplink DPDCH is used to carry dedicated data generated at Layer 2 and above, i.e. the dedicated transport channel (DCH). There may be zero, one, or several uplink DPDCHs on each Layer 1 connection. The uplink DPCCH is used to carry control information generated at Layer 1 . . . Multi-code operation is possible for the uplink dedicated physical channels. When multi-code transmission is used, several parallel DPDCH are transmitted using different channelization codes, see TS 25.213. However, there is one and only one uplink DPCCH per connection.

Ex. 1006.03 [Draft UMTS Standards, 3GPP TS 25.211 v. 2.1.0] at §5.2.1 Dedicated uplink physical channels.

298. On each Layer 1 connection, the DPCCH control channel and each transmitted data traffic channel (DPDCH) are transmitted with their own unique CDMA code.

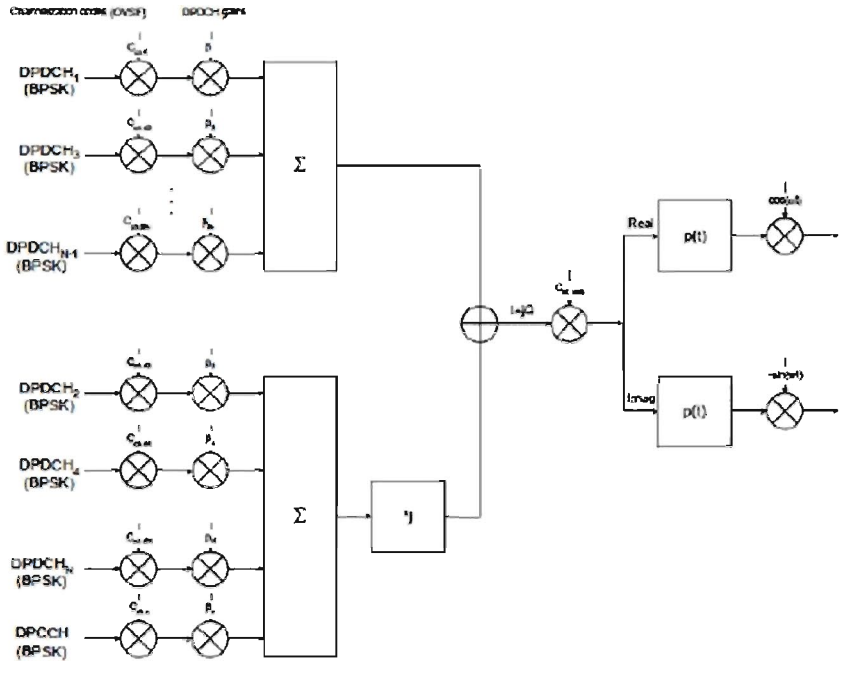


Figure 1 Spreading/modulation for uplink DPDCH/DPCCH for user services less than or equal to 1024kbps in the 5MHz band

Ex. 1006.08 [Draft UMTS Standards, 3GPP TS 25.213 v. 2.1.0] at Figure 1.

Figure 1 illustrates the spreading and modulation for the case of multiple uplink DPDCHs when total data rate is less than or equal to 1024kbps in the 5MHz band.

Ex. 1006.08 [Draft UMTS Standards, 3GPP TS 25.213 v. 2.1.0] at §4.2.1 Uplink Dedicated

Physical Channels (uplink DPDCH/DPCCH).

Ex. 1006.08 [Draft UMTS Standards, 3GPP TS 25.213 v. 2.1.0] at Figure 2.

Figure 2 illustrates the spreading and modulation for the case of multiple uplink DPDCHs when total data rate is less than or equal to 1024kbps in the 5MHz band.

Ex. 1006.08 [Draft UMTS Standards, 3GPP TS 25.213 v. 2.1.0] at §4.2.1 Uplink Dedicated

Physical Channels (uplink DPDCH/DPCCH).

DPDCH is spread by a predefined individual channelization codes

Ex. 1006.08 [Draft UMTS Standards, 3GPP TS 25.213 v. 2.1.0] at §4.2.1 Uplink Dedicated

Physical Channels (uplink DPDCH/DPCCH).

299. The UMTS Standards disclose assigned physical channels that can be selected for use by the UE. The UE is able to determine the number of DPDCHs (zero or more) assigned to a Layer 1 connection, based on the number of Transport Blocks in the Transport Block Set. This can be determined as the ratio of the Transport Block Set Size over the Transport Block Size for a given Transport Format.

> This is defined as a set of Transport Blocks which are exchanged between L1 and MAC at the same time instance using the same transport channel.

Ex. 1006.09 [Draft UMTS Standard, 3GPP TS 25.302 v. 2.3.0] at §7.1.2 Transport Block Set

> This is defined as a format offered by L1 to MAC (and vice versa) for the delivery of a Transport Block Set during a Transmission Time Interval on a Transport Channel. The Transport Format constitutes of two parts – one *dynamic* part and one *semi-static* part.

Ex. 1006.09 [Draft UMTS Standard, 3GPP TS 25.302 v. 2.3.0] at §7.1.6 Transport Format

> The layer 1 multiplexes one or several Transport Channels, and for each Transport Channel, there exists a list of transport formats (Transport Format Set) which are applicable. Nevertheless, at a given point of time, not all combinations may be submitted to layer 1 but only a subset, the Transport Format Combination. This is defined as an authorized combination of the combination of currently valid Transport Formats that can be submitted simultaneously to the layer 1 for transmission on a Coded Composite Transport Channel of a UE, i.e. containing one Transport Format form each Transport Channel.

Ex. 1006.09 [Draft UMTS Standard, 3GPP TS 25.302 v. 2.3.0] at §7.1.8 Transport Format Combination.

> The Transport Format Combination Set is what is given to MAC for control. However, the assignment of the Transport Format Combination Set is done by L3. When mapping data onto L1, MAC chooses between the different Transport Format Combinations given in the Transport Format Combination Set. Since it is only the dynamic part that differ between the Transport format Combinations, it is in fact only the dynamic part that MAC has any control over.

Ex. 1006.09 [Draft UMTS Standard, 3GPP TS 25.302 v. 2.3.0] at §7.1.9 Transport Format Combination Set.

> Note that a Transport Format Combination Set need not contain all possible Transport Format Combinations that can be formed by Transport Format Sets of the corresponding Transport Channels. It is only the allowed combinations that are included. Thereby a maximum total bit rate of all transport channels of a Code Composite Transport Channel can be set appropriately. That can be achieved by only allowing Transport Format Combinations for which the included Tranport Formats (one for each Tranport Channel) do not correspond to high bit rates simultaneously. The selection of Transport Format Combinations can be seen as a fast part of the radio resource control. The dedication of these fast parts of the radio resource control to MAC, close to L1, means that the flexible variable rate scheme provided by L1 can be fully utilized. These parts of the radio resource control should be distinguished from the slower parts, which are handled by L3. Thereby the bit rate can be changed very fast, without any need for L3 signalling.

Ex. 1006.09 [Draft UMTS Standard, 3GPP TS 25.302 v. 2.3.0] at §7.1.9 Transport Format Combination Set.

300. As with GPRS, the UMTS Standards also disclose a PDP context used for routing and session information for a packet data connection, and thus meet the "maintain a communication session" limitation. The Session Management Layer activates a PDP context in order to create "a communication session above the physical layer" as described by Claim 1 of the 244 Patent.

> The main function of the session management (SM) is to support PDP context handling of the user terminal. The SM comprises procedures for – identified PDP context activation, deactivation and modification; and – anonymous PDP context activation and deactivation. SM procedures for identified access can only be performed if a GMM context has been established between the MS and the network. If no GMM context has been established, the MM sublayer has to initiate the establishment of a GMM context by use of the GMM procedures as described in chapter 4. After GMM context establishment, SM uses services offered by GMM (see GSM 04.07 [20]). Ongoing SM procedures are suspended during GMM procedure execution.

Ex. 1006.06 [Draft UMTS Standards, 3GPP TS 24.008 v. 3.0.0] at §6.1.1.

> Session Management services are provided at the SMREG-SAP and the SNSM-SAP for anonymous and non-anonymous access. The non-anonymous and anonymous access procedures for PDP context activation and PDP context deactivation are available at the SMREG-SAP. In addition there exists a PDP context modification for non-anonymous PDP contexts.

Ex. 1005.04 [GPRS Standards, GSM 04.07 v. 6.1.0] at §6.5 Session Management Services for GPRS-Services.

301. The PDP context includes a number of session management parameters including, for example, external network protocol options, packet data protocol address, and Quality of Service (QoS) parameters.

> The purpose of the *protocol configuration options* information element is to transfer external network protocol options associated with a PDP context activation.

Ex. 1006.06 [Draft UMTS Standards, 3GPP TS 24.008 v. 3.0.0] at §10.5.6.3 Protocol configuration options.

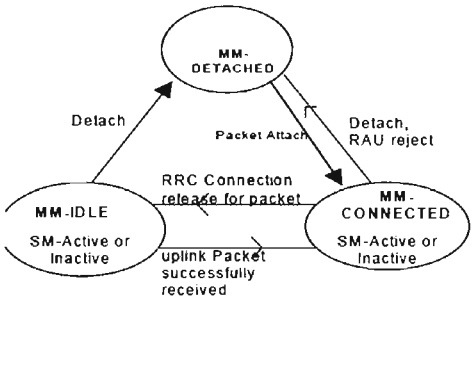
> The purpose of the *packet data protocol address* information element is to identify an address associated with a PDP.

Ex. 1006.06 [Draft UMTS Standards, 3GPP TS 24.008 v. 3.0.0] at §10.5.6.4 Packet data protocol address.

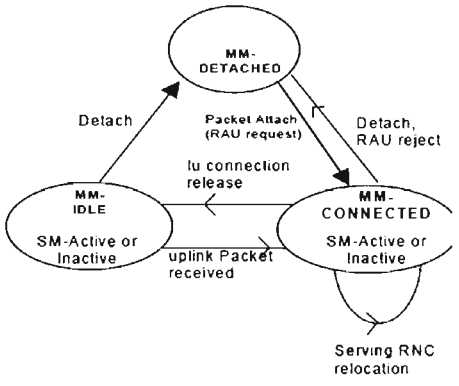
> The purpose of the *quality of service* information element is to specify the QoS parameters for a PDP context.

Ex. 1006.06 [Draft UMTS Standards, 3GPP TS 24.008 v. 3.0.0] at §10.5.6.5 Quality of Service.

302. The UMTS Standards disclose a PDP context that is "maintained when all assigned physical layer channels have been released" as described by Claim 1 of the 244 Patent. When the radio link connection between the user device and the network has been released, one or more active PDP contexts are preserved.



MM States in UE



MM States in 3G-SGSN

Ex. 1006.10 [Draft UMTS Standards, S2-99712] at §6.4.1 State Transitions and Functions for UMTS.

> In both MM-Idle and MM-connected, the Session Management may or may not have activated PDP context. The consequence is that in MM connected mode, a signaling connection might be established. In MM-Idle mode, PDP context may be established, but no corresponding connection over Iu and the radio are established.

Ex. 1006.10 [Draft UMTS Standards, S2-99712] at §6.4.1 State Transition and Functions for UMTS.

303. The UMTS Standards disclose a method of releasing all physical layer channels.

> In both MM-Idle and MM-connected, the Session Management may or may not have activated PDP context. The consequence is that in MM connected mode, a signaling connection might be established. In MM-Idle mode, PDP context may be established, but no corresponding connection over Iu and the radio are established.

Ex. 1006.10 [Draft UMTS Standards, S2-99712] at Iu release procedure.

J. Secondary Considerations of Obviousness/Non-Obviousness

304. I understand InterDigital contends that certain secondary considerations of non-obviousness support the validity of the 244 Patent claims. I understand the specific secondary considerations upon which InterDigital may rely include (1) skepticism in the industry and among experts as to the invention of the 244 Patent; (2) teaching away from the invention of the 244 Patent by the industry; (3) commercial success; (4) long-felt but unsolved needs; (5) the

failure of others; (6) unexpected results; (7) copying by infringers; and (8) licensing by others. Should InterDigital present such evidence, I reserve the right to rebut it.

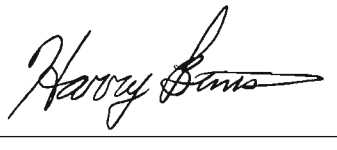
305. It is unlikely that InterDigital will be able to identify any secondary indicia evidence that would show a nexus to the claimed invention. However, to the extent that InterDigital is able to identify a nexus, it is my opinion that the simultaneous development of the relevant features by others supports the conclusion that the claimed invention was obvious to those of ordinary skill in the art.

306. In this report, I have presented my opinions regarding the invalidity of the 244 Patent claims, which are based on numerous prior art references. These references evidence the simultaneous or prior development by others of the subject matter claimed in the 244 Patent. In fact, much of this prior development occurred within a few years before Mr. Gorsuch filed his patent application. The fact that so many people in the industry would come up with the same ideas at the same time suggests that the ideas were obvious to those skilled in the art. It is my opinion that this simultaneous development by others supports my opinion that the claimed subject matter was obvious to a person having ordinary skill in the art in 1999.

V. REVISION OR SUPPLEMENTATION

307. My opinions are subject to change based on additional opinions that InterDigital and its expert may present and additional information I may receive. I reserve the right to supplement my opinions accordingly.

Executed March 21, 2014 at Menlo Park, California.



Dr. Harry Bims

Attachment A

Dr. Harry V. Bims
1314 Chilco Street
Menlo Park, CA 94025
harrybims@me.com
650-283-4174

PROFESSIONAL SUMMARY

Harry Bims, PhD, EE, provides expert witness support services for telecommunications-related intellectual property litigation. These services include deposition and court testimony, expert reports, and infringement research, for patent, copyright, and trade secret litigation matters. He has 17+ years of telecommunications industry experience, and holds eighteen US patents in network architecture and chip design for wireless communications.

EMPLOYMENT HISTORY

12/2001 - 05/2004 **AirFlow Networks, Inc. LLC • Sunnyvale, California**

Position: *CEO/CTO & Founder*

As the sole founder of the company, created the original business plan, raised venture capital, and hired the core engineering team. Grew the company to 32 people and shipped products for revenue in the US and overseas. Nine patents on the core technology have issued. These patents, which relate to wireless network infrastructure based on the 802.11 specification, have been sold to Broadcom.

03/2001 - 12/2001 **Bay Partners LLC • Cupertino, California**

Position: *Entrepreneur in Residence*

Reported to the partners of this VC firm as a technology expert on a range of wireless and networking subjects. Reviewed business plans and participated in due diligence activities related to several startups seeking funding. Developed a business plan for a startup that builds network infrastructure for 802.11 enterprise networks.

09/1999 - 03/2001 **Symmetry Communications Systems LLC • San Jose, California**

Position: *Director, Software Architecture*

Reporting to the CEO, responsible for the software architecture of their core

SGSN and GGSN products for the GPRS market. Formulated a software technology roadmap, showing the evolution from 2.5G to 3G SGSN and GGSN products. Management responsibility for Firmware, Hardware, Performance, and Systems Engineering Groups. Provided management support of early field trials of the system on a global basis.

07/1999 - 09/1999 **T-SPAN Systems Corporation LLC • Palo Alto, California**

Position: *Member of Technical Staff*

Designed a wireless home LAN protocol for the company. Also designed and built a PC-based platform to demonstrate their technology. Company is now publicly traded as Atheros Communications.

07/1992 - 12/1998 **Glenayre Technologies-Wireless Access Group • San Jose, California**

Position: *Member of Technical Staff; Sr. Member of Technical Staff; Manager of NOC Systems*

Employee #6 at the company, which was acquired by Glenayre Technologies, Nov 1997. Designed and built a 4-channel ReFLEX50 pager demonstration in 1 week. Participated in early field trials and feasibility studies, culminating in a Pioneer's Preference license award from the FCC to SkyTel Corporation for Narrowband PCS development.

Invented, designed, and built from concept through full implementation, a patented two-way pager test system for the ReFLEX50 and ReFLEX25 protocols. This system was used throughout company operations for performance testing of the ReFLEX pager designs from Wireless Access, and Motorola. Over 16 systems were deployed around the country for manufacturing tests, engineering protocol tests, antenna tests, and pager repair tests.

The project required technical skills in PC hardware design, C++, object-oriented programming, signal processing techniques, NT device driver development, Win32 user interface development, real-time, multi-threaded control, and proficiency with wireless communications lab equipment. Three patents have been issued based on technical inventions in this capacity.

Co-developed a wireless application protocol for sending and receiving encrypted email messages over the paging channel. Led the project team that deployed a software encryption module based on this protocol for government agencies.

Bims Laboratories, LLC Work History

6/2009 – 7/2009 **Eastman Kodak Company • Rochester, NY**

Position: *Technology Consultant*

Providing technology assessment on certain wireless communication patents.

10/2009 – Present **IEEE 802.16 Working Group**

Position: *Task Group Secretary, Task Group Vice-Chair, Task Group Chair, Working Group Vice-Chair & Secretary*

Served in several leadership capacities within this group that is working on improvements to the IEEE 802.16 standard, otherwise known as WiMAX.

Protocomm Systems, LLC Consulting History

04/1999–07/1999 **Gigabit Wireless, Inc. • San Jose, California**

Position: *Technical Leader*

Technical leader for the Wireless MAC design group. Responsible for comparative analysis of competing wireless MAC protocol standards. Responsible for the creation of a proprietary MAC protocol specification document, simulation of the protocol, and implementation in a prototype. Participated in early 802.16 protocol standards. This company was acquired by Intel Corporation.

3/2007 – 10/2009 **Apple, Inc. • Cupertino, CA**

Position: *Technology Consultant*

Participating in IEEE 802.16 standards meetings as an affiliate of the client.

7/2003 – Present **Various expert witness engagements (see below)**

Position: *Technical Expert Witness*

Testified as a wireless technology expert in patent infringement cases. For a list of such cases, see below.

Technical Expert Witness Experience

12/2013 – Present	**Client: Brinks Gilson & Lione LLP (representing ZTE Corp, and ZTE (USA), Inc.)**
Case:	Interdigital Communications, Inc. v ZTE Corporation and ZTE (USA) Inc.
	Case No. 1:13-cv-00009-RGA
Location:	UNITED STATES DISTRICT COURT FOR THE DISTRICT OF DELAWARE
	Testifying expert in this patent case involving cellular technology.
	Expert Reports:
	none
Attorneys:	For Plaintiff: Freitas Tseng & Kaufman LLP
	For Defendant: Kramer Levin LLP
Status:	Case ongoing

12/2013 – Present	**Client: Kramer Levin LLP (representing Sirius XM Radio Inc.)**
Case:	Catch a Wave Technologies, Inc. v. Sirius XM Radio Inc.
	Case No. 3:12-cv-05791-WHA
Location:	UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF CALIFORNIA SAN FRANCISCO DIVISION
	Testifying expert in this patent case involving satellite radio systems.
	Expert Reports:
	none
Attorneys:	For Plaintiff: Freitas Tseng & Kaufman LLP
	For Defendant: Kramer Levin LLP
Status:	Case ongoing

9/2013 – 1/2014	**Client: Reed & Scardino, LLP (representing Mobile Telecommunications Technologies, LLC)**

Case: Mobile Telecommunications Technologies, LLC v Clearwire Corporation

Case No. 2:12-CV-308

Location: UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF TEXAS MARSHALL DIVISION

Testifying expert in this patent case involving wireless networking signals.

Expert Reports:

11-11-13 Rebuttal report regarding validity

Videotaped Depositions:

12-5-13

Declarations:

1-23-14 Declaration before the Patent Trial and Appeal Board in Case IPR2013-00306

Attorneys: For Plaintiff: Reed & Scardino LLP

For Defendant: Shook, Hardy & Bacon, LLP

Status: Case settled

9/2013 – Present **Client: Foley & Lardner, LLP (representing Motorola Mobility, LLC)**

Case: University of Florida Research Foundation Inc., and Rapid Mobile Technologies, Inc. v Motorola Mobility, LLC.

Case No. 13-cv-61120-KMM-EGT

Location: UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF FLORIDA FORT LAUDERDALE DIVISION

Testifying expert in this patent case involving mobile device testing systems.

Expert Reports:

none

Declarations:

11-21-13 Declaration ISO Motorola's Responsive Claim Construction Brief

Attorneys: For Plaintiff: Meltzer & Meksraitis

For Defendant: Seyfarth Shaw LLP

Status: Case ongoing

7/2013 – Present **Client: WilmerHale (representing Broadcom)**

Case: Inter Partes Review of US Patent 6,424,625; 6,772,215; and 6,466,568 owned by Ericsson

Docket No. 0111168-0240

Location: UNITED STATES PATENT AND TRADEMARK OFFICE

Testifying expert in this Inter Partes Review regarding ARQ mechanisms.

Declarations:

9-19-13 Declaration regarding US Patent 6,772,215

9-19-13 Declaration regarding US Patent 6,466,568

9-29-13 Declaration regarding US Patent 6,424,625

Attorneys: For Plaintiff: Meltzer & Mathis

For Defendant: Seyfarth Shaw LLP

Status: Case ongoing

4/2013 – 8/2013 **Client: Seyfarth Shaw LLP (representing Motorola Mobility LLC)**

Case: Hernandez v Motorola Solutions, Inc.

Case No. 12-cv-60930-JIC

Location: UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF FLORIDA

Testifying expert in this employment law case involving mobile device testing systems.

Expert Reports:

3-1-13 Expert Report regarding Non-Infringement

Attorneys: For Plaintiff: Meltzer & Mathis

For Defendant: Seyfarth Shaw LLP

Status: Case settled

4/2013 – Present **Client: Kilpatrick Townsend & Stockton LLP (representing Google Inc. and Motorola Mobility LLC)**

Case: Fujifilm Corporation v. Motorola Mobility LLC

Case No. C12-03587 RS

Location: UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF CALIFORNIA

Testifying expert in this patent case involving mobile technology.

Attorneys: For Plaintiff: Morgan, Lewis & Bockius LLP

For Defendant: Kilpatrick Townsend & Stockton LLP

Status: Case ongoing

8/2012 – 4/2013 **Client: Paul Hastings LLP (representing Apple, Inc.)**

Case: SmartPhone Technologies, LLC v Research in Motion Corporation, et. al.

Case No. 6:10-cv-00074

Location: UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF TEXAS TYLER DIVISION

Testifying expert in this patent case involving 3GPP technology.

Expert Reports:

12-31-12 Appendix A to Rebuttal Expert Report of Dr. David Wilson

3-12-13 Appendix A to Supplemental Expert Report of Dr. David Wilson

Attorneys: For Plaintiff: Mintz Levin Cohn Ferris Glovsky and Popeo PC

For Defendant: Paul Hastings LLP

Status: Case settled

8/2012 – Present **Client: Reed & Scardino, LLP (representing EON Corp. IP Holdings, LLC)**

Case: EON Corp. IP Holdings, LLC v. Cantaloupe Systems, Inc., et. al.

Case No. 6:11-cv-00015

Location: UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF TEXAS TYLER DIVISION

Testifying expert in this patent case involving RF technology for WiFi networking.

Expert Reports:

2-15-13 Expert Report regarding Infringement

4-09-13 Videotaped deposition

Attorneys: For Plaintiff: Reed & Scardino, LLP

For Defendant: K&L GATES LLP

Status: Case settled

5/2012 – Present **Client: Reed & Scardino LLP (representing Eon Corp. IP Holdings)**

Case: Eon Corp. IP Holdings, LLC v. Landis+Gyr, Inc., et. al.

Case No. 6:09-cv-00317-LED-JDL

Location: UNITED STATES DISTRICT COURT EASTERN DISTRICT OF TEXAS TYLER DIVISION

Testifying expert in this patent case involving two-way wireless networks

Expert Report:

7-3-13 Expert Report regarding Infringement by Silver Spring Networks, Inc.

7-3-13 Expert Report regarding Infringement by Itron, Inc.

Attorneys: For Plaintiff: Reed & Scardino LLP

For Defendant: Dentons, LLP

Status: Case ongoing

3/2012 – Present **Client: Perkins Coie (representing Intel Corporation)**

Case: Stragent LLC, et. al. v. Intel Corp.,

Case No. 6:11-cv-421-LED (E.D. Tex.)

Location: UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF TEXAS TYLER DIVISION

Testifying expert in this patent case involving the use of error detection technology in computer networking.

Expert Reports:

08-23-13 Expert Report regarding Invalidity

09-23-13 Expert Report regarding Non-Infringement

Videotaped Deposition:

10-08-13, and 10-09-13

Attorneys: For Plaintiff: Nelson, Bumgardner & Casto

For Defendant: Perkins Coie

Status: Case ongoing

2/2012 – Present **Client: Dewey & LeBoeuf LLP (representing Harris Corporation)**

Case: Harris Corporation v. Ruckus Wireless, Inc.

Case No. 6:11-cv-618-CEH-KRS

Location: UNITED STATES DISTRICT COURT FOR THE MIDDLE DISTRICT OF FLORIDA ORLANDO DIVISION

Testifying expert in this patent case involving RF technology for WiFi networking.

Expert Reports:

3-5-12 Expert Report regarding Infringement

4-6-12 Expert Report regarding Validity

Declarations:

5-30-12 Declaration ISO Claim Construction

Videotaped Deposition:

4-30-12

Attorneys: For Plaintiff: Dewey & LeBeouf LLP

For Defendant: Lewis and Roca LLP

Status: Case ongoing

2/2012 – Present **Client: Common-Interest-Group (representing Nokia, Huawei, ZTE)**

Case: InterDigital Communications LLC, et. al. v. Huawei Tech Co., LTD., et. al.

Certain Wireless Devices With 3G Capabilities and Components Thereof

U.S. Int'l Trade Commission Inv. No. 337-TA-800

Location: UNITED STATES INTERNATIONAL TRADE COMMISSION

Testifying expert in this patent case involving 3G wireless, WiFi, and WCDMA technology.

Expert Reports:

11-30-12 Expert Report regarding Non-infringement

7-31-12 Expert Report regarding Invalidity

11-19-10 Rebuttal Expert Report regarding Validity

12-6-10 Supplemental Expert Report regarding Infringement

Videotaped Deposition:

12-14-12, 12-15-12

ITC Trial testimony:

2-15-12 Non-infringement and Invalidity witness statements, live testimony

Attorneys: For Plaintiff: Latham & Watkins, LLP

For Defendant: Alston & Bird, Covington & Burling, Brinks Hofer

Status: Case ended at ITC hearing

3/2011 – 8/2011 **Client: Fish & Richardson P.C. (representing LG)**

Case: Sony v. LG Electronics, Inc., et. al.

Certain Mobile Telephones and Modems

U.S. Int'l Trade Commission Inv. No. 337-TA-758

Location: UNITED STATES INTERNATIONAL TRADE COMMISSION

Testifying expert in this patent case

Attorneys: For Plaintiff: Kenyon & Kenyon LLP

For Defendant: Fish & Richardson P.C.

Status: Case settled

9/2010 – 4/2011 **Client: Reed & Scardino LLP (representing Eon Corp. IP Holdings)**

Case: Eon Corp. IP Holdings, LLC v. Sensus USA, Inc., et. al.

Case No. 6:09-cv-116-LED-JDL

Location: UNITED STATES DISTRICT COURT EASTERN DISTRICT OF TEXAS

TYLER DIVISION

Testifying expert in this patent case involving two-way wireless networks

Expert Report:

10-22-10 Expert Report regarding Infringement

11-7-10 Expert Report regarding Infringement

11-19-10 Rebuttal Expert Report regarding Validity

12-6-10 Supplemental Expert Report regarding Infringement

Declaration:

12-28-10, 1-18-11

Videotaped Deposition:

12-8-10, 2-3-11

Attorneys: For Plaintiff: Reed & Scardino LLP

For Defendant: Jones Day

Status: Case settled

8/2010 – Present **Client: Sidley Austin LLP (representing Research in Motion Limited)**

Case: SimpleAir, Inc. v. Research in Motion Limited and Research in Motion Corporation, et. al.

Case No. 2:09-cv-00289-CE

Location: UNITED STATES DISTRICT COURT EASTERN DISTRICT OF TEXAS TYLER DIVISION

Testifying expert in this patent case involving two-way wireless networks

Declaration:

11-5-13

Videotaped Deposition:

11-5-24

Attorneys: For Plaintiff: Dovel & Luner, LLP

For Defendant: Sidley Austin LLP

Status: Case ongoing

10/2009 – 2/2010 **Client: White & Case LLP (representing Marvell)**

Case: Marvell Semiconductor, Inc., et. al. v. Commonwealth Scientific Industrial Research Organisation

Case No. 6:07-CV-204 (LED)

Location: UNITED STATES DISTRICT COURT EASTERN DISTRICT OF TEXAS TYLER DIVISION

Testifying expert in this patent case involving wireless LAN protocols.

Expert Report:

11-24-09 Rebuttal Expert Report

Videotaped Deposition:

01-07-10

Attorneys: For Plaintiff: White & Case LLP

For Defendant: Townsend and Townsend and Crew LLP

Status: Case settled

9/2009 – 2/2010 **Client: Perkins Coie Brown & Bain PA (representing Intel)**

Case: Saxon Innovations, LLC v. Apple, Inc., et. al.

Case No. 6:08-cv-00265-LED

Location: UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF TEXAS TYLER DIVISION

Testifying expert in this patent case involving wireless technology.

Declarations:

12-04-09 Declaration Regarding Claim Construction

Videotaped Deposition:

01-19-10

Attorneys: For Plaintiff: Susman Godfrey LLP

For Defendant: Perkins Coie Brown & Bain LLP

Status: Case settled

8/2008 – 10/2009 **Client: Reed & Scardino LLP (representing Eon Corp. IP Holdings)**

Case: Eon Corp. IP Holdings, LLC v. Verizon Clinton Center Drive Corp., et. al.

Case No. 6:08-cv-00385

Location: UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF TEXAS TYLER DIVISION

Testifying expert in this patent case involving two-way wireless networks

Expert Report:

06-22-10 Expert Report
08-16-10 Supplemental Expert Report

Videotaped Depositions:
08-18-10, 08-26-10

Attorneys: For Plaintiff: Reed & Scardino LLP

For Defendant: Simpson Thacher & Bartlett LLP

Status: Case settled

4/2008 – 3/2009 **Client: McDermott, Will & Emery LLP (representing GE Licensing)**

Case: CIF Licensing, LLC d/b/a GE Licensing v. Agere Systems, Inc.

Case No. 07-170 (JJF)

Location: UNITED STATES DISTRICT COURT FOR THE DISTRICT OF DELAWARE

Testifying expert in this patent case involving modem technology.

Expert Report:

09-05-08 Rebuttal Expert Report

Non-videotaped Depositions:
9-24-08, 9-26-08

Jury trial testimony:

2-04-09

Attorneys: For Plaintiff: McDermott, Will & Emery LLP

For Defendant: Townsend and Townsend and Crew LLP

Status: Jury award

2/2008 – 5/2010, **Client: Simpson Thacher & Bartlett LLP (representing Cisco Systems, Inc.)**

2/2011 – 4/2011

Case: Commil USA, LLC v. Cisco Systems, Inc., et. al.

Case No. 2:07-CV-341-DF-CE

Location: UNITED STATES DISTRICT COURT EASTERN DISTRICT OF TEXAS MARSHALL DIVISION

Testifying expert on invalidity regarding short range communication protocols.

Opening Expert Report

12-23-09

Videotaped Depositions:

02-09-10

Attorneys: For Plaintiff: Sayles Werbner

For Defendant: Simpson Thacher & Bartlett LLP

Status: Jury award for original trial and retrial

6/2007 – 4/2009 **Client: Common Interest Group of Co-Defendants**
11/2010 – 4/2012 **Client: Common Interest Group of Co-Defendants**

Case: Commonwealth Scientific and Industrial Research Organisation v. Toshiba America Information Systems, Inc., et. al.

Case No. 6:06-cv-00550-LED

Location: UNITED STATES DISTRICT COURT EASTERN DISTRICT OF TEXAS TYLER DIVISION

Testifying expert in this patent case involving wireless LAN technology.

Declarations:

06-05-08 Regarding claim construction

12-17-08 Supporting opposition to summary judgment

04-05-09 Supporting motion for reconsideration

02-24-12 Supporting opposition to summary judgment

Expert Reports:

10-08-08 Rebuttal Expert Reports- Re: TI Chips, Re: Marvell Chips, Re: Airgo Chips, Re: Broadcom Chips, Re: Conexant Chips, Re: Ralink Chips, Re: Atheros Chips

01-27-12 Rebuttal Expert Reports- Re: TI Chips, Re: Broadcom Chips, Re:

Ralink Chips, Re: Atheros Chips

Videotaped Depositions:
11-1-08, 11-2-08, 02-14-12

Attorneys: For Plaintiff: Townsend & Townsend LLP

For Defendant: Keker & Van Nest, LLP

Status: Case settled

10/2006 – 8/2009 **Client: Keker & Van Nest (representing Comcast Corporation)**

Case: Rembrandt Technologies, Inc. v. Comcast Corporation

Case No. 2-05CV-000443 (TJW)

Location: UNITED STATES DISTRICT COURT EASTERN DISTRICT OF TEXAS MARSHALL DIVISION

Testifying expert in this patent case involving physical layer and data link layer communication protocols for cable networks.

Declaration:

01-10-07 Support of Claim Construction Brief

Videotaped Deposition:

12-22-06 Regarding claim construction opinions

Attorneys: For Plaintiff: McKool Smith

For Defendant: Keker & Van Nest

Status: Case settled

3/2007 – 5/2007 **Client: Niro, Scavone, Haller and Niro (representing MLR, LLC)**

Case: MLR, LLC v. Kyocera Wireless Corporation and Novatel Wireless, Inc.

Case No. 05-CV-0935 B (AJB)

Location: UNITED STATES DISTRICT COURT SOUTHERN DISTRICT OF CALIFORNIA

Testifying expert in this patent case involving cellular phone technology.

Expert Report:

04-20-07 Expert Report regarding infringement

Attorneys: For Plaintiff: Niro, Scavone, Haller, and Niro

For Defendant: Hogan & Hartson, LLP

Status: Case settled

6/2006 – 10/2006 **Client: Thompson & Knight (representing Ericsson, Inc.)**

Case: Fenner Investments, Ltd., v. Juniper Networks, Inc. et. al.
Case No. 2:05–CV–05 JDL

Location: UNITED STATES DISTRICT COURT EASTERN DISTRICT OF TEXAS MARSHALL DIVISION

Testifying expert in this patent case involving wireless communications services.

Expert report regarding infringement and invalidity

5-23-06 Rebuttal expert report regarding infringement and invalidity

Attorneys: For Plaintiff: Fulbright & Jaworski

For Defendant Ericsson: Thompson & Knight

Status: Case settled

12/2003 – 5/2006 **Client: Howrey LLP/ Winston & Strawn LLP (representing McKesson Information Solutions, Inc.)**

Case: McKesson Information Solutions, Inc. vs. Bridge Medical, Inc.
Case No. CIV S-02-2669 FCD KJM

Location: UNITED STATES DISTRICT COURT EASTERN DISTRICT OF CALIFORNIA

Testifying expert in this patent case involving a patient on a patient identification and verification system that incorporates wireless technology.

Inequitable Conduct Trial live testimony:
5-04-06

Markman Hearing live testimony:
6-29/30-05

Videotaped Depositions:
2-14-04, 6-3-05

Declarations:
12-1-03 Dec. in support of MISI's Opening/Opposition re Claim Construction
12-24-04 Dec. in support of MISI's Motion for Preliminary Injunction
3-1-04 Dec. in support of Claim Construction
6-29-04 Dec. re meaning of "Communication"
7/15/05 Dec. in support of MISI's Opposition to Bridge's Motion for Summary Judgment

Attorneys: For Defendant: Morrison & Foerster

For Plaintiff: Howrey Simon, Winston & Strawn, Morgan Lewis

Status: Case closed.

07/2003–02/2006 **Client: Heller Ehrman LLP (representing Texas Instruments, Inc.)**

Case: Texas Instruments, Inc. and Stanford University vs. GlobespanVirata, Inc.

Provided discovery of evidence used at trial, concerning the structure and operation of Globespan's ADSL products, and supported litigators in depositions of Globespan engineers.

Attorneys: For Plaintiff: Heller Ehrman

For Defendant: Covington & Burling, LLP

Status: Jury award.

Patents

Patent Number	Date Issued	Title
8,189,538	May 29, 2012	Reconfiguration of a communication system
8,144,640	March 27, 2012	Location tracking in a wireless communication system using power levels of packets received by repeaters
8,064,380	November 22, 2011	Reconfiguration of a communication system
8,027,637	September 27, 2011	Single frequency wireless communication system
7,957,741	June 7, 2011	Token-based receiver diversity
7,876,704	January 25, 2011	Tunneling protocols for wireless communications
7,689,210	March 30, 2010	Plug-n-playable wireless communication system

7,672,274	March 2, 2010	Mobility support via routing
7,668,542	February 23, 2010	Token-based receiver diversity
7,515,557	Apr 7, 2009	Reconfiguration of a communication system
7,236,470	Jun 26, 2007	Tracking multiple interface connections by mobile stations
7,149,196	Dec 12, 2006	Location tracking in a wireless communication system using power levels of packets received by repeater
6,965,769	Nov 15, 2005	Testing Center
6,862,448	Mar 1, 2005	Token-based receiver diversity
6,788,658	Sep 7, 2004	Wireless communication system architecture having split MAC layer
6,760,318	Jul 6, 2004	Receiver diversity in a communication system
6,557,134	Apr 29, 2003	ARQ method for wireless communication
6,259,911	Jul 10, 2001	Network operations center hardware and software design
8,468,426	June 18, 2013	Multimedia-aware quality-of-service and error correction provisioning

Education

Year	College/University	Degree
1993	Stanford University	PhD, Electrical Engineering Thesis: "Trellis Coding for Multi-Level, Partial-Response Continuous Phase Modulation with Precoding"
1988	Stanford University	MS, Electrical Engineering
1985	Rensselaer Polytechnic Institute	BS, Computer and Systems Engineering

Publications

Goldhamer, M., Grandblaise, D., Bims, H., Feng, S., Piggin, P., Sydor, J., and Wu, X. "Coexistence between 802.16 Systems Operating in Shared Bands", *Radio Resource Management in WiMAX,* John Wiley & Sons, 2009.

Bims, Harry. "Surveying the Wireless LANdscape. Or Why Large Wi-Fi Networks Require Good Planning." Xchange. [Online] Available http://www.xchangemag.com/articles/391supsys1.html, September 1, 2003.

Bims, Harry. "Building Voice-Ready Wireless LANs" Wireless Week. [Online] Available http://www.wirelessweek.com/article/CA319429.html?spacedesc=Departments, September 1, 2003.

Bims, Harry. "Enabling Voice over WLANs". White Paper. [Online] Available. **http://airflownetworks.com/solutions/pdf/vowlan_wp.pdf.** September 2003.

Bims, Harry. "Securing Enterprise WLANs". White Paper. [Online] Available. http://web.archive.org/web/20040303212529/airflownetworks.com/solutions/pdf/securing_wlans_wp.pdf. August 2003.

Bims, H. and Cioffi. J. "Trellis Coding for Full-Response CPM", *Third Generation Wireless Information Networks*, Kluwer Academic Publishers, 1992.

Bims, H. and Cioffi. J. "Trellis Coding for Full-Response CPM", *WINLAB WORKSHOP*, East Brunswick, NJ. October 18-19, 1990.

Bims, H. and Cioffi, J. "Trellis Coding for Partial-Response CPM", *1991 International Symposium on Information Theory*, Budapest, Hungary. June 24-28, 1991.

Bims, H. and Cioffi, J. "Trellis Coding with M-ary MSK Constraints", *GLOBECOM '89*, Dallas TX. Nov. 1989.

Professional Associations and Achievements

- Jan 2009 – Present Vice-Chair and Board of Directors, Menlo Park Chamber of Commerce
- Nov 2007 – Sep 2010 Vice-Chair and Secretary, IEEE 802.16h License Exempt Group
- Feb 2002 – Jan 2011 Member, City of Menlo Park Planning Commission (2006 Chairperson, 2005 Vice-Chairperson)
- Feb 2012 – Present Senior Member, IEEE
- Jan 2000 – Dec 2000 Chair, IEEE Engineering Management Society – Silicon Valley Chapter
- Jun 1985 - Jun 1991 AT&T Bell Laboratories Cooperative Research Fellow