UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROSOFT CORPORATION,
Petitioner,

v.

UNILOC 2017 LLC,
Patent Owner.

DECLARATION OF TAL LAVIAN, PH.D., REGARDING
U.S. PATENT NO. 8,724,622

MICROSOFT CORP.
EXHIBIT 1003

TABLE OF CONTENTS

Pages

TABLE OF CONTENTS
(continued)

Page

I, Tal Lavian, Ph.D., declare as follows:

I. INTRODUCTION AND ENGAGEMENT

1. I have been retained as an independent expert on behalf of Microsoft Corporation in connection with Inter Partes Reviews ("IPRs") of the above-identified patents and specifically in order to provide my analyses and opinions on certain technical issues related to U.S. Patent No. 8,724,622 (the "'622 Patent").

2. I am being compensated at my usual and customary rate for the time I spent in connection with this IPR. My compensation is not affected by the outcome of this IPR. I hold no interest in the Petitioner (Microsoft Corporation) or the Patent Owner (Uniloc 2017 LLC).

3. Specifically, I have been asked to provide my opinions regarding whether claims 1, 2, 5, 9, 36, and 37 of the '622 Patent (each a "Challenged Claim" and collectively the "Challenged Claims") would have been found in the prior art or obvious to a person having ordinary skill in the art ("POSITA")prior to December 2003. It is my opinion that each Challenged Claim would have been found in the cited prior art or at least obvious to a POSITA after reviewing the prior art discussed herein.

II. BACKGROUND AND QUALIFICATIONS

4. I have more than 25 years of experience in the networking, telecommunications, Internet, and software fields. I received a Ph.D. in Computer

Science, specializing in networking and communications, from the University of California at Berkeley in 2006 and obtained a Master's of Science ("M.Sc.") degree in Electrical Engineering from Tel Aviv University, Israel, in 1996. In 1987, I obtained a Bachelor of Science ("B.Sc.") in Mathematics and Computer Science, also from Tel Aviv University.

5. I had been employed by the University of California at Berkeley and was appointed as a lecturer and Industry Fellow in the Center of Entrepreneurship and Technology ("CET") as part of UC Berkeley College of Engineering. I had been with the University of California at Berkeley since 2000 to 2019, where I served as Berkeley Industry Fellow, Lecturer, SkyDeck researcher, Visiting Scientist, Ph.D. Candidate, and Nortel's Scientist Liaison. I had taught several classes in the areas of innovations, wireless devices and smartphones. Some positions and projects were held concurrently, while others were held sequentially.

6. I have more than 25 years of experience as a scientist, educator and technologist, and much of my experience relates to telecommunication, data communications, and computer networking technologies. For eleven years from 1996 to 2007, I worked for Bay Networks and Nortel Networks. Bay Networks was in the business of making and selling computer network hardware and software. Nortel Networks acquired Bay Networks in 1998, and I continued to work at Nortel after the acquisition. Throughout my tenure at Bay and Nortel, I held positions

including Principal Scientist, Principal Architect, Principal Engineer, Senior Software Engineer, and led the development and research involving a number of networking technologies. I led the efforts of Java technologies at Bay Networks and Nortel Networks. In addition, during 1999-2001, I served as the President of the Silicon Valley Java User Group with over 800 active members from many companies in the Silicon Valley.

7. Prior to that, from 1994 to 1995, I worked as a software engineer and team leader for Aptel Communications, designing and developing wireless technologies, mobile wireless devices and network software products.

8. From 1990 to 1993, I worked as a software engineer and team leader at Scitex Ltd., where I developed system and network communications tools (mostly in C and C++).

9. I have extensive experience in communications technologies including wireless technologies, routing and switching architectures and protocols, including Multi-Protocol Label Switching Networks, Layer 2 and Layer 3 Virtual Private Networks, and Pseudowire technologies. Much of my work for Nortel Networks (mentioned above) involved the research and development of these technologies. For example, I wrote software for Bay Networks and Nortel Networks switches and routers, developed network technologies for the Accelar 8600 family of switches and routers, the OPTera 3500 SONET switches, the OPTera 5000 DWDM family,

and the Alteon L4-7 switching product family. I wrote software for Java-based device management, including a software interface for device management and network management in the Accelar routing switch family's network management system. I have also worked on enterprise Wi-Fi solutions, wireless mobility management, and wireless infrastructure.

10. I am named as a co-inventor on more than 100 issued patents and I co-authored more than 25 scientific publications, journal articles, and peer-reviewed papers. Furthermore, I am a member of a number of professional affiliations, including the Association of Computing Machinery ("ACM") and the Institute of Electrical and Electronics Engineers ("IEEE") (senior member). I am also certified under the IEEE WCET (Wireless Communications Engineering Technologies) Program, which was specifically designed by the IEEE Communications Society (ComSoc) to address the worldwide wireless industry's growing and ever-evolving need for qualified communications professionals.

11. From 2007 to the present, I have served as a Principal Scientist at my company TelecommNet Consulting Inc., where I develop network communication technologies and provide research and consulting in advanced technologies, mainly in computer networking and Internet technologies. In addition, I have served as a Co-Founder and Chief Technology Officer (CTO) of VisuMenu, Inc. from 2010 to

the present, where I design and develop architecture of visual IVR technologies for smartphones and wireless mobile devices in the area of network communications.

12. I have worked on wireless and cellular systems using a variety of modulation technologies including time-division multiple-access (TDMA), code-division multiple-access (CDMA), and orthogonal frequency-division multiplexing (OFDM). I have additionally worked on various projects involving the transmission and streaming of digital media content.

13. The above outline of my experience with communications systems is not comprehensive of all of my experience over my years of technical experience. Additional details of my background are set forth in my curriculum vitae, attached as **Exhibit A** to this Declaration, which provides a more complete description of my educational background and work experience.

III. MATERIALS CONSIDERED AND INFORMATION RELIED UPON

14. The analysis that I provide in this Declaration is based on my education and experience in the telecommunications and information technology industries, as well as the documents I have considered, including U.S. Patent No. 8,724,622 ("'622" or "'622 Patent") Ex. 1001, which states on its face that it issued from an application filed on July 11, 2012, in turn claiming priority back to an earliest application filed on December 18, 2003. For purposes of this Declaration, I have assumed December 18, 2003 as the effective filing date for the '622 Patent.

15. In preparing this declaration, I have reviewed the following materials, each of which is the sort of material that experts in my field would rely upon when forming their opinions. I also considered other background materials that are referenced in this declaration.

No.	Description
1001	U.S. Patent No. 8,724,622 ("**the '622 Patent**")
1002	File History of U.S. Patent No. 8,724,622
1003	Reserved
1004	PCT Patent Application No. PCT/US00/21555 to Herbert Zydney et al. (filed August 7, 2000, published February 15, 2001 as WO 01/11824 A2) ("**Zydney**") (with line numbers added)
1005	Excerpts from DEBRA LITTLEJOHN SHINDER, COMPUTER NETWORKING ESSENTIALS (Cisco Press, January 2002) ("**Shinder**")
1006	U.K. Patent Application No. 0106915.2 to Andrew David Kirkwood (filed March 20, 2001, published February 20, 2002 as GB 2 365 664 A) ("**Kirkwood**")
1007	U.S. Patent Pub. No. 2002/0112167 ("**Boneh**")
1008	U.S. Patent No. 8,150,922 ("**Griffin**")
1009	R. Droms, *Dynamic Host Configuration Protocol*, Internet Engineering Task Force, Request for Comments 2131
1010	Harry Newton, *Newton's Telecom Dictionary* (16th. ed. 2000)
1011	John Rittinghouse, *IM Instant Messaging Security* (1st ed. 2005)
1012	Dreamtech Software Team, *Instant Messaging Systems: Cracking the Code* (2002)
1013	Upkar Varshney et al., *Voice over IP*, Communication of the ACM (2002, Vol. 45, No. 1)

1014	Iain Shigeoka, *Instant Messaging in Java: Jabber Protocols* (2002)
1015	Trushar Barot & Eytan Oren, *Guide to Chat Apps*, TOW Center for Digital Journalism, Columbia University (2005)
1016	Samir Chatterjee et al., *Instant Messaging and Presence Technologies for College Campuses*, IEEE Network (Nov. 9, 2005)
1017	Daniel Minoli & Emma Minoli, *Delivering Voice Over IP Networks* (2nd ed. 2002)
1018	Thomas Porter & Michael Gough, *How to Cheat at VoIP Security* (1st ed. 2007)
1019	Harry Newton, *Newton's Telecom Dictionary* (18th. ed. 2002)
1020	Justin Berg, *The IEEE 802.11 Standardization Its History, Specification, Implementations and Future*, George Mason University, Technical Report Series (2011)
1021	Wolter Lemstra & Vic Hayes, *Unlicensed Innovation: The Case of Wi-Fi*, Competition and Regulation in Network Industries (2008, Vol. 9, No. 2)
1022	U.S. Patent Application Publication No. 2003/0039340
1023	International Published Application No. WO 01/24036
1024	U.S. Patent No. 9,179,495
1025	U.S. Patent Application Publication No. 2005/0025080
1026	WO 02/17650A1
1027	Oxford (Online) Dictionaries, Definition of "Default" (cached 2000), https://en.oxforddictionaries.com/definition/default
1028	PCT Patent Application No. PCT/US00/21555 to Herbert Zydney et al. (filed August 7, 2000, published February 15, 2001 as WO 01/11824 A2) (as-published version without added line numbers)
1029	Excerpts from MICROSOFT COMPUTER DICTIONARY (Microsoft Press, 3d ed. 1997)

1030	Excerpts from MARGARET LEVINE YOUNG, INTERNET: THE COMPLETE REFERENCE (McGraw-Hill/Osborne, 2d ed. 2002)
1031	U.S. Patent No. 6,757,365 B1 to Travis A. Bogard (filed October 16, 2000, issued June 29, 2004)
1032	N. Borenstein et al., *Request for Comments (RFC) 1521: MIME (Multipurpose Internet Mail Extensions) Part One: Mechanisms for Specifying and Describing the Format of Internet Message Bodies*, September 1993 ("RFC 1521")

IV. PERSON OF ORDINARY SKILL IN THE ART

16. I understand that an assessment of claims of the '622 Patent should be undertaken from the perspective of a person of ordinary skill in the art as of the earliest claimed priority date, which I understand is December 18, 2003. I have also been advised that to determine the appropriate level of a person having ordinary skill in the art, the following factors may be considered: (1) the types of problems encountered by those working in the field and prior art solutions thereto; (2) the sophistication of the technology in question, and the rapidity with which innovations occur in the field; (3) the educational level of active workers in the field; and (4) the educational level of the inventor.

17. The '622 Patent states that the perceived problem and the purported solution are generally related to the field of Internet telephony (IP telephony). The patent states: "More particularly, the present invention is directed to a system and method for enabling local and global instant VoIP messaging over an IP network,

such as the Internet, with PSTN support." ('622, 1:18-22.) The '622 Patent purports to describe a "voice messaging system (and method) for delivering instant messages over a packet switched network." (*Id.*, Abstract). The '622 Patent purports to depict architectures of Internet and PSTN technologies, global and local IP networks, VoIP switches and gateways, and phone systems. The patent also purports to disclose local and global instant voice messaging servers communicating over an IP Network. In the Summary of the Invention, the applicant states: "The present invention is directed to a system and method for enabling local and global instant VoIP messaging over an IP network, such as the Internet." (*Id.*, 2:57-59.)

18. In my opinion, a person of ordinary skill in the art as of December 2003 would have possessed at least a bachelor's degree in computer science, computer engineering, or electrical engineering with at least two years of experience in development, programming, and operation of network communication systems (or equivalent degree or experience).

19. My opinions regarding the level of ordinary skill in the art are based on, among other things, my over 25 years of experience in computer science and network communications, my understanding of the basic qualifications that would be relevant to an engineer or scientist tasked with investigating methods and systems in the relevant area, and my familiarity with the backgrounds of colleagues, co-workers, and employees, both past and present.

20. Although my qualifications and experience exceed those of the hypothetical person having ordinary skill in the art defined above, my analysis and opinions regarding the '622 Patent have been based on the perspective of a person of ordinary skill in the art as of December 2003.

V. BASIS FOR MY OPINION AND STATEMENT OF LEGAL PRINCIPLES

21. My opinions and views set forth in this declaration are based on my education, training, and experience in the relevant field, as well as the materials I have reviewed for this matter, and the scientific knowledge regarding the subject matter that existed prior to December 2003.

A. Claim Construction

22. It is my understanding that, when construing a claim term, the claim term is given the plain and ordinary meaning that the term would have to a POSITA in view of the specification and the prosecution history.

B. Anticipation

23. It is my understanding that in order for a patent claim to be valid, the claimed invention must be novel. It is my understanding that if each and every element of a claim is disclosed in a single prior art reference, then the claimed invention is anticipated, and the invention is not patentable according to pre-AIA 35 U.S.C. § 102 effective before March 16, 2013. In order for the invention to be anticipated, each element of the claimed invention must be described or embodied,

either expressly or inherently, in the single prior art reference. In order for a reference to inherently disclose a claim limitation, that claim limitation must necessarily be present in the reference.

C. Obviousness

24. Counsel has advised me that obviousness under pre-AIA 35 U.S.C. § 103 effective before March 16, 2013 is the basis for invalidity in the Petitions. Counsel has advised me that a patent claim may be found invalid as obvious if, at the time when the invention was made, the subject matter of the claim, considered as a whole, would have been obvious to a person having ordinary skill in the field of the technology (the "art") to which the claimed subject matter belongs. I understand that the following factors should be considered in analyzing obviousness: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims; and (3) the level of ordinary skill in the pertinent art. I also understand that certain other factors known as "secondary considerations" such as commercial success, unexpected results, long felt but unsolved need, industry acclaim, simultaneous invention, copying by others, skepticism by experts in the field, and failure of others may be utilized as indicia of nonobviousness. I understand, however, that secondary considerations should be connected, or have a "nexus", with the invention claimed in the patent at issue. I understand that a person of ordinary skill in the art is assumed to have knowledge of all prior art. I understand that one

skilled in the art can combine various prior art references based on the teachings of those prior art references, the general knowledge present in the art, or common sense. I understand that a motivation to combine references may be implicit in the prior art, and there is no requirement that there be an actual or explicit teaching to combine two references. Thus, one may take into account the inferences and creative steps that a person of ordinary skill in the art would employ to combine the known elements in the prior art in the manner claimed by the patent at issue. I understand that one should avoid "hindsight bias" and ex post reasoning in performing an obviousness analysis. But this does not mean that a person of ordinary skill in the art for purposes of the obviousness inquiry does not have recourse to common sense. I understand that when determining whether a patent claim is obvious in light of the prior art, neither the particular motivation for the patent nor the stated purpose of the patentee is controlling. The primary inquiry has to do with the objective reach of the claims, and that if those claims extend to something that is obvious, then the entire patent claim is invalid. I understand one way that a patent can be found obvious is if there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims. I understand that a motivation to combine various prior art references to solve a particular problem may come from a variety of sources, including market demand or scientific literature. I understand that a need or problem known in the field at the time of the

invention can also provide a reason to combine prior art references and render a patent claim invalid for obviousness. I understand that familiar items may have obvious uses beyond their primary purpose, and that a person of ordinary skill in the art will be able to fit the teachings of multiple prior art references together "like the pieces of a puzzle." I understand that a person of ordinary skill is also a person of at least ordinary creativity. I understand when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If these finite number of predictable solutions lead to the anticipated success, I understand that the invention is likely the product of ordinary skill and common sense, and not of any sort of innovation. I understand that the fact that a combination was obvious to try might also show that it was obvious, and hence invalid, under the patent laws. I understand that if a patent claims a combination of familiar elements according to known methods, the combination is likely to be obvious when it does no more than yield predictable results. Thus, if a person of ordinary skill in the art can implement a predictable variation, an invention is likely obvious. I understand that combining embodiments disclosed near each other in a prior art reference would not ordinarily require a leap of inventiveness.

1. Motivation to Combine

25. I have been advised by counsel that obviousness may 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 also be shown by demonstrating that it would have been obvious to combine the teachings of more than one item of prior art. I have been advised by counsel 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. Counsel has also advised me that this suggestion or motivation may come from the knowledge of a person having ordinary skill in the art, or from sources such as explicit statements in the prior 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. Counsel has advised me 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 common sense and his skill to combine the known options in order to solve the problem. The following are examples of approaches and rationales that may be considered 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:

(1) Some teaching, motivation, or suggestion in the prior art that would have led a person of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention;

(2) Known work in one field of endeavor may prompt variations of it for use in the same field or a different field based on design incentives or other market forces if the variations would have been predictable to a person of ordinary skill in the art;

(3) Combining prior art elements according to known methods to yield predictable results;

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

(5) 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);

(6) Simple substitution of one known element for another to obtain predictable results; or

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

VI. RELEVANT TECHNOLOGY BACKGROUND

26. The '622 Patent, entitled "System and method for instant VoIP messaging," purports to disclose and claim a system and method for delivering

instant voice messages over a packet-switched network. (Ex. 1001, Abstract.) In this section, I provide a brief background discussion on technologies pertinent to the '622 Patent prior to December 2003.

A. The Internet and TCP/IP Protocol Suite

27. **The Internet** is the global packet-switched network based on a protocol suite known as Transmission Control Protocol/Internet Protocol (TCP/IP). The Internet originated in the late 1960s as a Department of Defense project known as ARPANET and, by the 1980s, was in use by a large number of universities and organizations. As the Internet advanced in size and speed over the years, a vast amount of research and development was invested to develop technologies and standards for enabling voice communications over IP networks (VoIP). These significant investments in research and development yielded approved standards and large-scale implementations based on these standards prior to the year 2003. Some of these key standards are discussed in the following sections.

28. The Internet is based on a globally unique address space based on the Internet Protocol (IP)[1] and is able to support communications using the TCP/IP suite or its subsequent extensions/follow-ons. In addition, the Internet provides, uses or makes accessible, either publicly or privately, high level services layered on the

[1] *See* IETF Network Working Group RFC 791 (Sept. 1981), RFC 1726 (Dec. 1994).

communications infrastructure. The TCP/IP protocol suite includes many different standard protocols including IP, TCP, UDP, VoIP, RTP, FTP, BGP, SMTP, DHCP, HTTP, and others. Internet standards are typically published in the form of documents known as "Requests for Comments" (RFCs), which are today maintained by the Internet Engineering Task Force (IETF).

B. Voice over IP (VoIP)

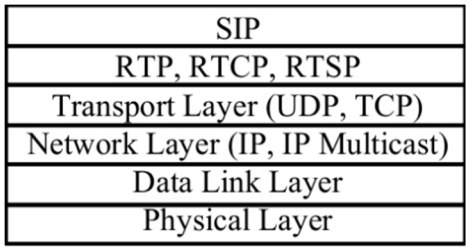
29. **Voice over IP (VoIP)** is a family of standard technologies which allows IP networks to be used for voice applications. VoIP generally involves the transmission of voice "data packets" from a device at one IP address over the Internet to a device at another IP address. The ability to transmit voice data packets from one IP address to another over the Internet is one of the background technologies relevant to the '622 Patent and the claims at issue, which recite communication over a "packet-switched network."

30. The technologies that enabled VoIP and implementation of applications based on these technologies were available long before the '622 Patent's filing date. For example, an early public domain VoIP application called NetFone (Speak Freely) was released in 1991 by Autodesk. A commercial internet VoIP application was released by VocalTec in February of 1995.[2]

[2] *See* William M. Bulkeley, *Hello World! Audible chats On the Internet*, WALL

31. The real-time transport protocol (RTP) is an Internet protocol for the transfer of real-time data including voice and video. Version 1.0 of RTP was published in the early 1990s, and it was approved as a standard with the publication of RFC 1889 in January 1996.

32. RTP runs on top of an IP transport (depicted in the figure below).



Some relevant points of the protocol design are quoted from the standard: [3]

This document defines RTP, consisting of two closely linked parts:

> The ***real-time transport protocol*** **(RTP)**, to carry data that has real-time properties.
> the ***RTP control protocol*** **(RTCP)**, to monitor the quality of service and to convey information about the participants in an on-going session. The latter aspect of RTCP may be sufficient for "loosely controlled" sessions, i.e., where there is no explicit membership control and set-up, but it

STREET JOURNAL, Feb. 10, 1995.

[3] All emphasis in quoted text in this Declaration has been added, unless otherwise noted.

is not necessarily intended to support all of an application's control communication requirements. This functionality may be fully or partially subsumed by a separate session control protocol, which is beyond the scope of this document.

Source: RFC 1889, § 1 (available at https://www.ietf.org/rfc/rfc1889.txt).

Definitions

RTP payload: The data transported by RTP in a packet, for example audio samples or compressed video data. The payload format and interpretation are beyond the scope of this document.

RTP packet: A data packet consisting of the fixed RTP header, a possibly empty list of contributing sources (see below), and the payload data. Some underlying protocols may require an encapsulation of the RTP packet to be defined. Typically, one packet of the underlying protocol contains a single RTP packet, but several RTP packets may be contained if permitted by the encapsulation method (see Section 10).

RTCP packet: A control packet consisting of a fixed header part similar to that of RTP data packets, followed by structured elements that vary depending upon the RTCP packet type. The formats are defined in Section 6. Typically, multiple RTCP packets are sent together as a compound RTCP packet in a single packet of the underlying protocol; this is enabled by the length field in

> the fixed header of each RTCP packet.
>
> ***Port***: The "abstraction that transport protocols use to distinguish among multiple destinations within a given host computer. TCP/IP protocols identify ports using small positive integers." [3] The transport selectors (TSEL) used by the OSI transport layer are equivalent to ports. RTP depends upon the lower-layer protocol to provide some mechanism such as ports to multiplex the RTP and RTCP packets of a session.
>
> ***Transport address***: The combination of a network address and port that identifies transport-level endpoint, for example an IP address and a UDP port. Packets are transmitted from a source transport address to a destination transport address.

Id., RFC 1889, § 3 ("Definitions").

33. The '622 Patent acknowledges the use of VoIP in the prior art. For example, the patent explains that voice messaging was known in voice over internet protocol ("VoIP") systems. (Ex. 1001, 2:22.) According to the patent, in a VoIP system, a user would access a terminal device, such as a VoIP phone or a personal computer running VoIP client software, to connect with other such VoIP devices over the Internet. (*Id.*, 1:35-45.) The user would use a microphone connected to the terminal device to record messages and speakers or headphones to listen to messages. (*Id.*, 1:45-48.) Those messages would be transmitted over the Internet in packets. (*Id.*, 1:37-43.)

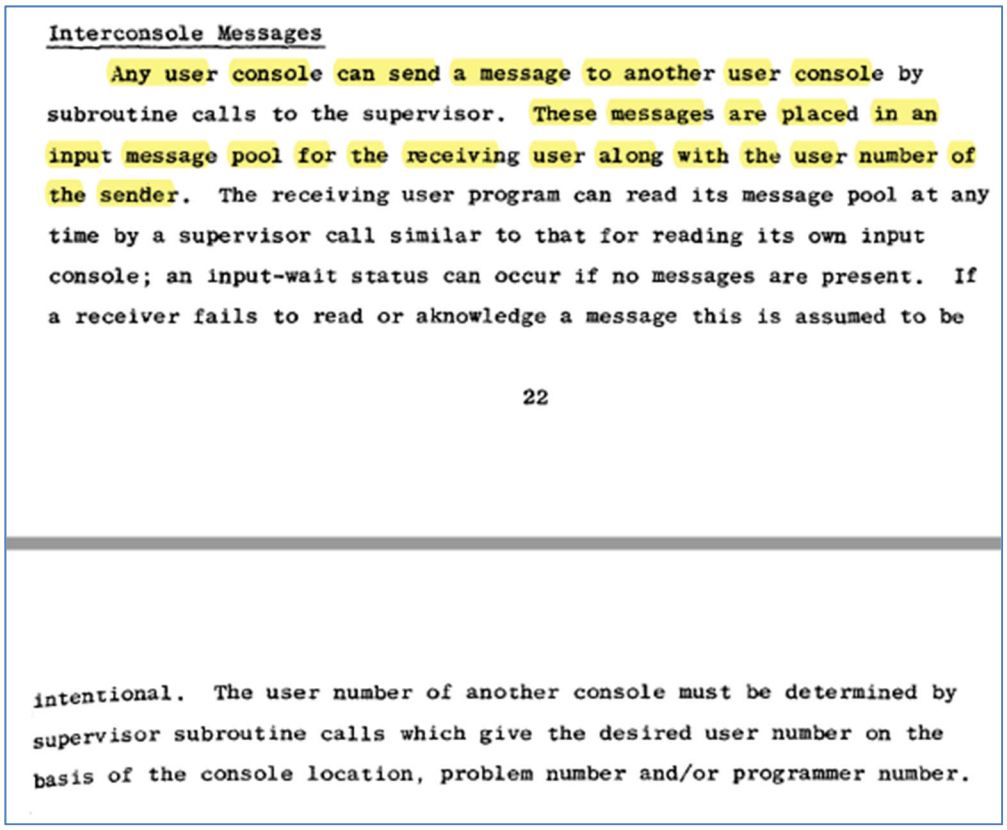
C. Instant messaging (IM)

34. Instant messaging (IM) was also well known before the '622 Patent's priority date. An IM solution generally includes software with a user interface that allows users to exchange information with other users, including text, voice data, and/or files. The user software typically allows a user to select one or more recipients from lists of registered users which are displayed in a window. IM clients typically communicate through a server which either forwards messages directly to recipients or stores them if the recipients are not currently available to receive messages.

35. Different clients may vary in terms of what types of information they can send, how they indicate availability, how they can group users, and whether and how they secure the communications. However, the most popular clients available before the '622 Patent filing date, provided the various functions proposed by the '622 Patent. I start with a brief history of IM solutions.

36. An early example of an instant messaging solution dates back to the 1960s, as is shown by the following except of an instruction manual for "Interconsole messages" from an MIT programming manual for the "compatible time sharing system" which was published in 1963[4] (highlight added):

[4] *The Compatible Time Sharing System*, The MIT Press, 1963.



Interconsole Messages

Any user console can send a message to another user console by subroutine calls to the supervisor. These messages are placed in an input message pool for the receiving user along with the user number of the sender. The receiving user program can read its message pool at any time by a supervisor call similar to that for reading its own input console; an input-wait status can occur if no messages are present. If a receiver fails to read or aknowledge a message this is assumed to be

22

intentional. The user number of another console must be determined by supervisor subroutine calls which give the desired user number on the basis of the console location, problem number and/or programmer number.

37. MIT and Digital Equipment later developed the "Zephyr Notification Service" in the 1980s. The service used Unix to locate and send messages to users:

> Zephyr is a notice transport and delivery system under development at Project Athena. Zephyr is for use by network-based services and applications with a need for immediate, reliable and rapid communication with their clients. Zephyr meets the high throughput, high fan-out communications requirements of large-scale workstation environments. It is designed as a suite of 'layered services' based on a reliable, authenticated notice protocol. Multiple, redundant Zephyr servers provide basic routing, queueing, and dispatching services to clients

> that communicate via the Zephyr Client Library. More advanced communication services are built upon this base.[5]

38. CompuServe's CB Simulator, released in 1980 to simulate citizens band radio through text-based messages and user handles, is considered by some to be the one of the first commercial services dedicated to online chat.

39. In 1982, Commodore International released the Commodore 64 computer. An Internet service known as Quantum Link (also known as Q-Link) was designed for use with Commodore computers. Q-Link, which later became known in the 1990s as America Online (AOL), allowed users to send text-based messages to another user via modem. The receiving user had the option of responding to or ignoring the messages.

40. One of the most popular IM applications was ICQ (I Seek You). The following is an excerpt from a press release: "Launched in November 1996, ICQ's instant communication and chat technology informs users when family, friends and business colleagues are online and enables them to exchange messages in real-time to help its users build their own communities. ICQ also gives its users the ability to

[5] DellaFera, C. Anthony, et al., *The Zephyr Notification Service*, USENIX, Winter 1988, at Abstract.

play games and exchange files and URLs."[6] AOL purchased ICQ in June 1998. AOL also had its own IM product called AOL Instant Messenger (AIM).

41. In the years before 2003, online instant messaging grew to include hundreds of millions of registered users. As explained by Young (Ex. 1030), published in 2002, ICQ and AIM each had more than 100 million registered users at the time. (Ex. 1030 at 331, 336.)

1. IETF in RFC 2778 – "A Model for Presence and Instant Messaging"

42. With the proliferation of IM systems, the IETF identified a need to generalize a model of IM services and protocols which would enable different IM systems to communicate. Instant messaging was addressed by the IETF in RFCs 2778 and 2779. An IM model was proposed by the IETF in RFC 2778 published in February 2000. RFC 2778 "defines the various entities involved, defines terminology, and outlines the services provided by the system." RFC 2778, Abstract. The motivation for defining the model is described: "A presence and instant messaging system allows users to subscribe to each other and be notified of changes in state, and for users to send each other short instant messages. To facilitate

[6] From http://www.timewarner.com/newsroom/press-releases/1998/06/08/america-online-inc-acquires-mirabilis-ltd-and-its-icq-instant.

development of a suite of protocols to provide this service, we believe that it is valuable to first develop a model for the system. The model consists of the various entities involved, descriptions of the basic functions they provide, and most importantly, definition of a vocabulary which can be used to facilitate discussion." *Id*., Introduction.

2. IETF RFC 2779 "Instant Messaging/Presence Protocol Requirements"

43. Using the RFC 2778 model, a basic architecture for instant messaging was proposed by the IETF RFC 2779 published in February 2000: "Applications of presence and instant messaging currently use independent, non-standard and non-interoperable protocols developed by various vendors. The goal of the Instant Messaging and Presence Protocol (IMPP) Working Group is to define a standard protocol so that independently developed applications of instant messaging and/or presence can interoperate across the Internet. This document defines a minimal set of requirements that IMPP must meet." RFC 2779, Abstract.

3. Prior Art Instant Messaging ("IM") Systems

44. The '622 Patent explains that known instant messaging ("IM") systems generally included client devices, IM software installed on those client devices, and IM servers. (Ex. 1001, 2:34-38.) IM systems communicated over a packet-switched network, such as the Internet. (Ex. 1001, 1:37-38, 2:34-38.) The IM server maintained a list of users that were currently "online" and able to receive messages

and presented this list to the users via the instant messaging software. (Ex. 1001, 2:38-41.) A user could select one or more recipients and send them a message. (Ex. 1001, 2:42-44.) The IM server would transmit the message to the recipients and the message would be displayed to the recipients by the IM software. (Ex. 1001, 2:44-46.)

45. Other elements of voice messaging systems were also well-known by December 2003. For example, **Bogard**, U.S. Patent No. 6,757,365, explains that visual interfaces, called **buddy lists**, could be used to identify available users and start voice messaging sessions. (Ex. 1031, 1:25-48.) Bogard describes the "**buddy list**" from AOL Instant Messenger's ("AIM") client software as "allow[ing] a user of AIM to see **which buddies** (other user**s** of interest to our particular user, e.g. friend**s**, co-worker**s**, family member**s**) **are signed on**." (*Id.*, 1:27-31.) Figure 1 of Bogard, reproduced below, shows an AIM client identifying both "**available**" buddies, i.e., Buddy1, Buddy2, Buddy3, and Buddy4, and **"offline" buddies**. (*Id.*, Fig. 1.)

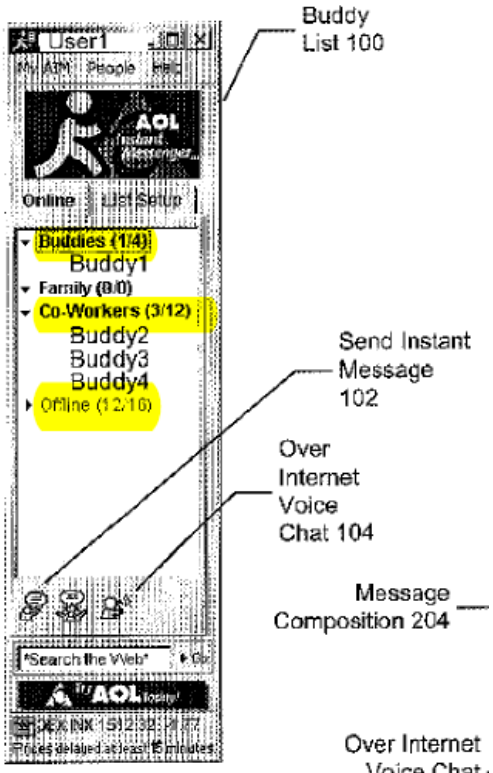


Figure 1
(Prior Art)

(*Id.*, Fig. 1.) Bogard also describes a method by which AIM users could start a voice communication session over the Internet through the buddy list by clicking a "Voice Chat" button. (Bogard, 1:40-48; *see also id.*, Fig. 1 (identifying the "Over Internet Voice Chat 104" button).)

46. **Young** likewise describes the AIM and ICQ instant message systems that were used by hundreds of millions of users prior to 2003, including their buddy list interfaces showing users' online and offline statuses, as shown in the figures reproduced below.

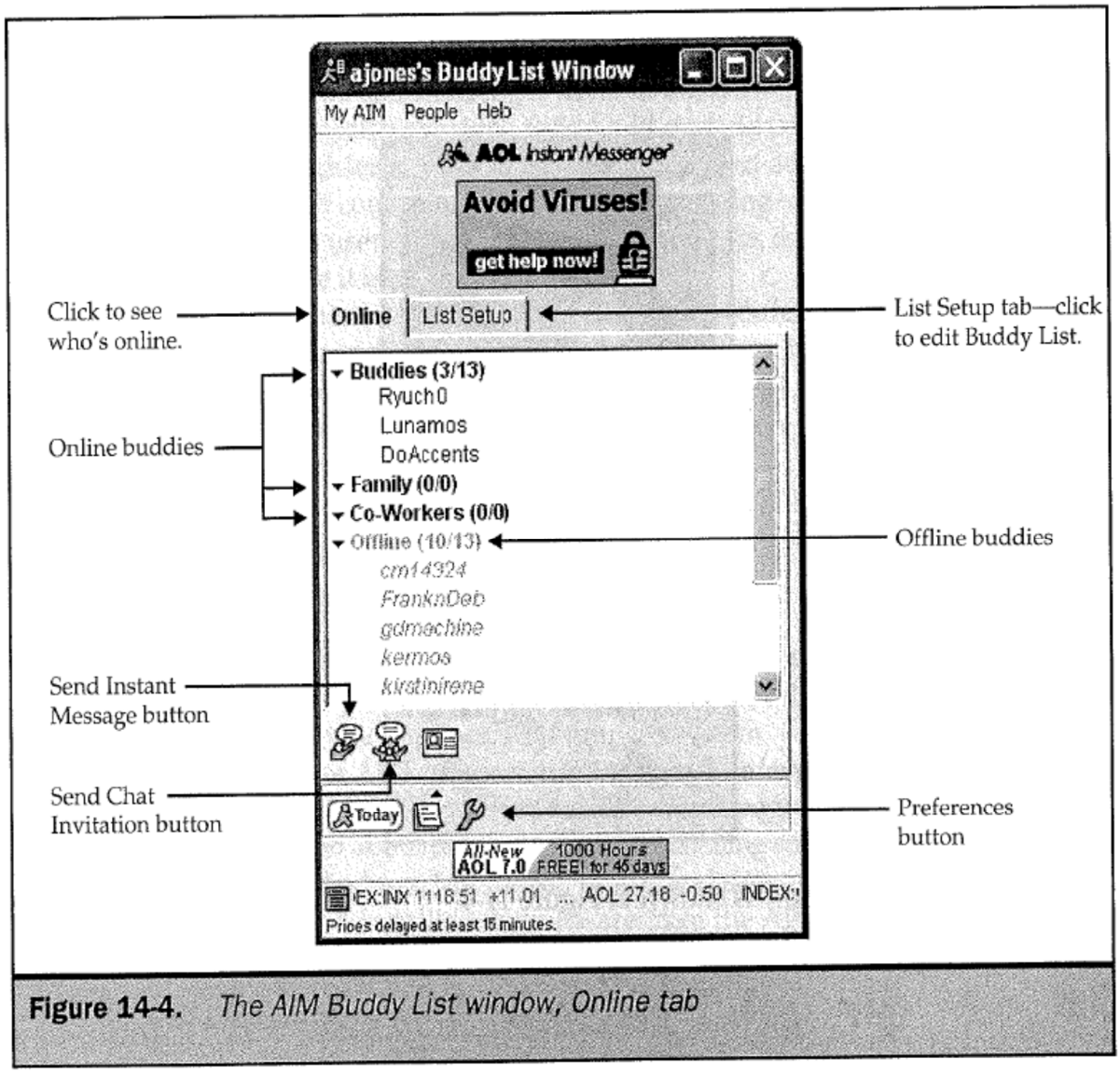


Figure 14-4. *The AIM Buddy List window, Online tab*

(Young at 338, Fig. 14-4.)

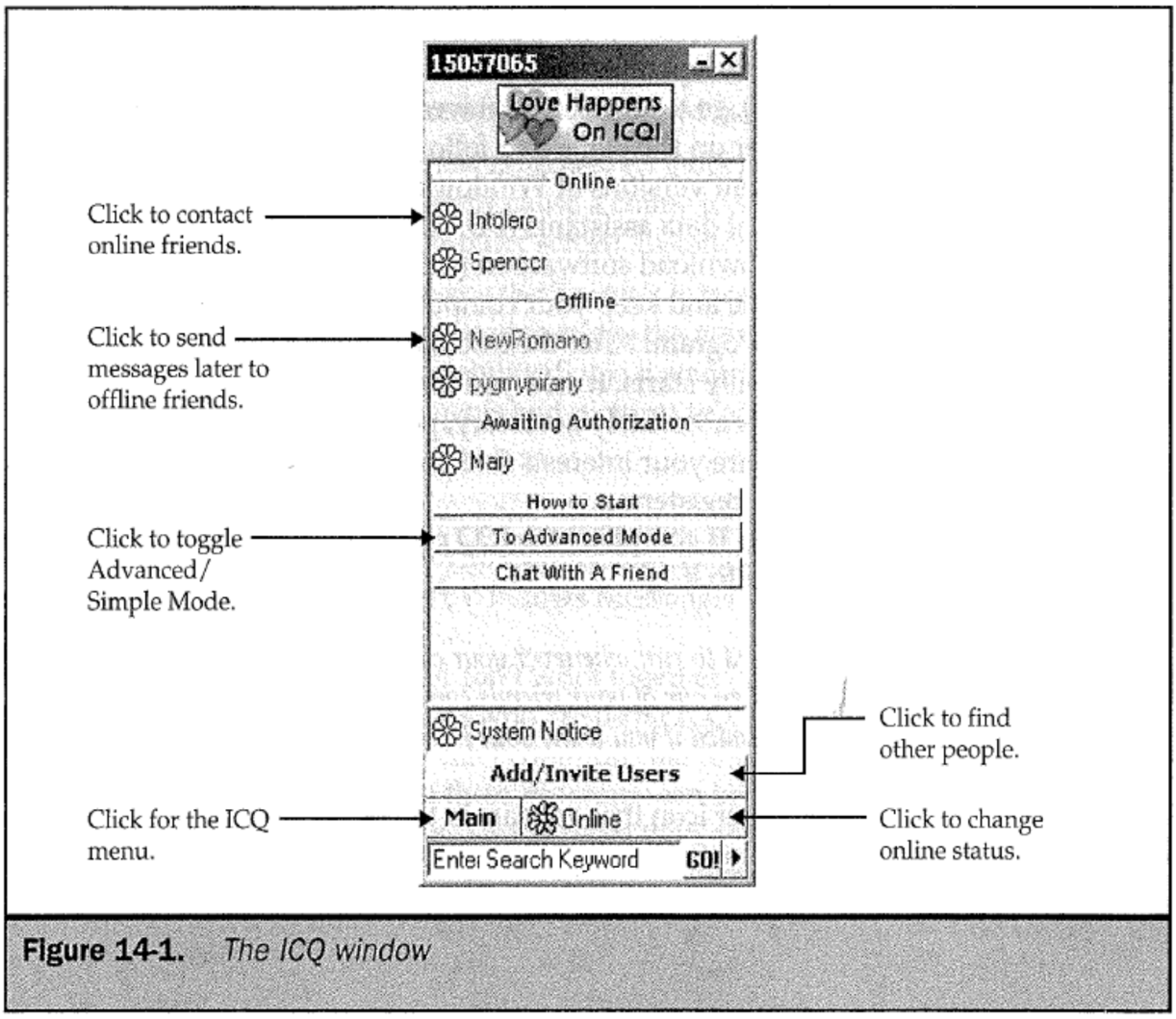


Figure 14-1. *The ICQ window*

(*Id.* at 332, Fig. 14-1.)

VII. THE '622 PATENT

A. The '622 Patent's Specification

47. The '622 Patent purports to describe a system and method for delivering instant voice messages over a packet-switched network. (Ex. 1001, Abstract.) In this system, a client such as a VoIP telephone or PC computer "enabled for IP telephony" is connected to a server and instant voice message ("IVM") recipients

through a network(s). (*Id.*, 1:43-50, 2:60-3:4, 6:65-7:2.) The '622 Patent admits that both voice messaging and instant text messaging were both previously known and were both previously used in conjunction with VoIP and PSTN. (Ex. 1001, 2:22-46.)

48. In one embodiment, when a user chooses to send an IVM, the IVM client displays a "list of one or more IVM recipients." (*Id.*, 7:65-8:4.) This recipient list is provided and stored by an IVM server. (*Id.*) Once recipients are selected, the user records a message, such as by using a microphone to record a digitized audio file. (*Id.*, 8:7-11.)

49. The patent states that one or more files may be attached to the instant voice message, such as by using a conventional "drag-and-drop" technique. (*Id.*, 12:26-38, 13:33-38.)

50. Once the voice message is generated, the client transmits the voice message to the server for delivery to one or more recipients. (*Id.*, 8:21-26.) After receiving the instant voice message, the server transmits the voice message to the one or more recipients. (*Id.*, 8:26-29.) Recipients that are "available" (currently connected to the IVM server) will receive the instant voice message. (*Id.*, 8:32-34.) If a recipient is unavailable (offline), the server temporarily saves the voice message and transmits it once the recipient becomes available. (*Id.*, 8:34-39.) The recipient is notified of the new voice message and can play the audio file aloud. (*Id.*, 8:29-

32.) If the voice message had attachments, the recipient can also access the attached files. (*Id.*, 13:3-10.)

51. With reference to Figure 2, the '622 Patent discloses a system having one or more instant voice message (IVM) clients 206, 208 and an IVM server 202 connected over a packet-switched network 204. (Id., 2:60-3:4.)

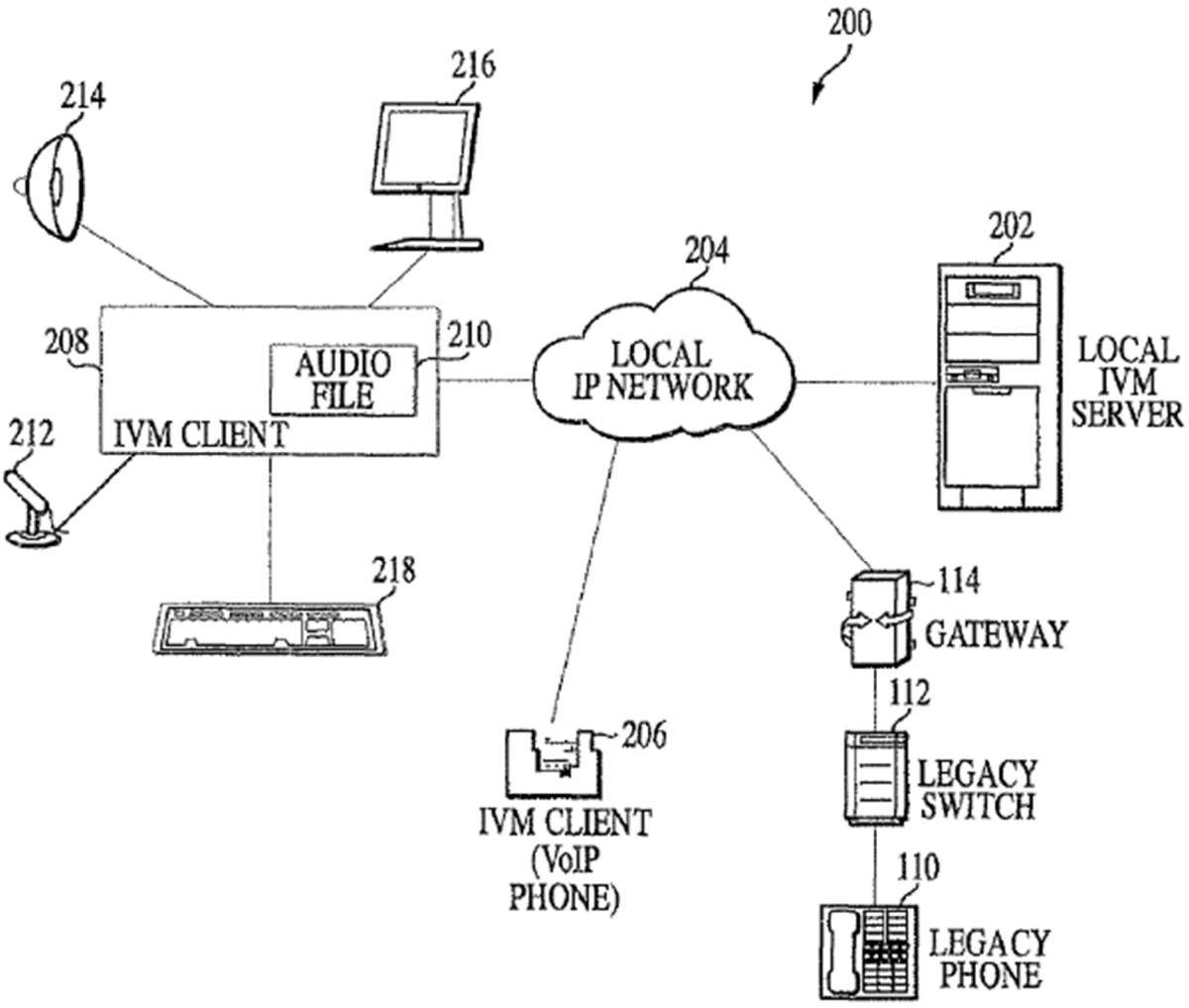


FIG. 2

(*Id*., Fig. 2.)

52. The IVM clients are connected to a local IVM server 202 via a packet-switched network (depicted in Fig. 2 as a "local IP network" 204). The local IVM server 202 enables instant voice messaging functionality over the network 204. (*Id*., 7:61-65.)

53. A user operates the IVM client to record a message for one or more selected recipients. (*Id*., 7:65-8:14.) The IVM client transmits the voice message to the IVM server for delivery to the recipients. (*Id*., 8:22-26.) If a recipient is "available," the server transmits the instant voice message to the recipient. (*Id*., 8:32-34.) If the recipient is "unavailable," the server temporarily saves the voice message and transmits it once the recipient becomes available. (Id., 8:34-39.) Upon receiving the voice message, the recipients can audibly play the message. (Id., 29-32.)

B. The Claims of the '622 Patent

54. This Declaration addresses claims 1, 2, 5, 9, 36, and 37. Claim 1 is an independent claim; claim 2 depends directly from claim 1; claims 5 and 9 depend indirectly from independent claim 3; and claims 36 and 37 depend indirectly from independent claim 27. I address the claims in my detailed analysis in Section XI below.

VIII. MEANING OF CERTAIN CLAIM TERMS

1. "instant voice message"

55. It is my opinion that "instant voice message should be construed as: "data that includes a representation of an audio message."

56. Claims 3 and 27 recite the term "instant voice message." Claim 3 recites that "the messaging system receives an instant voice message from one of a plurality of instant voice message client systems … wherein the instant voice message includes an object field including a digitized audio file." Claim 27 recites "a client platform system for generating an instant voice message and a messaging system for transmitting the instant voice message." Claim 27 further recites "a document handler system for attaching one or more files to the instant voice message."

57. The written description describes the "instant voice message" as data in three different embodiments. In one embodiment, the "instant voice message" is described as an audio file. (Ex. 1001, 8:7–11, 8:26–27, 9:64–65, 10:38–39, 10:45–46, 12:40–41, 16:22, 17:23–24, 18:6–7, 18:58, 18:64–65, 19:46–47, and 19:52.) In another embodiment, "successive portions of the instant voice message" are written to one or more buffers that are transmitted to the IVM server. (Ex. 1001, 11:35-58, 21:10-42 referring thusly to portions of the user's speech that are written to a buffer. *Id.* at 11:35−44.) Notably, the written description is clear that the one or more buffers are generated "*instead of creating an audio file*." (Ex. 1001, 11:35-37 (emphasis added).) Thus, using "[t]he one or more buffers … to automatically write successive portions of the instant voice message" is an alternative embodiment to storing the instant voice message as an audio file. In both embodiments, the "instant voice message" is data that includes a representation of an audio message.

58. Furthermore, in another embodiment, the written description describes a "message object" with an object field that contains "a block of data being carried by the message object, which may be, for example, a digitized instant voice message." (Ex. 1001, 14:37−40.) Thus, here the instant voice message is a block of data included in a "message object."

59. When each of these embodiments are considered, it is clear that the "instant voice message" refers to data that includes a representation of an audio message. The way in which data is organized may vary from embodiment to embodiment (such as an audio file, one or more buffers, or a data block in a "message object") but, in each case, the "instant voice message" refers to data that includes a representation, in one form or another, of the audio message.

60. Accordingly, a POSITA would have understood the plain and ordinary meaning of "instant voice message" to be "data that includes a representation of an audio message."

2. <u>"attaching one or more files to the instant voice message"</u>

61. It is my opinion that "attaching one or more files to the instant voice message" should be construed as: "indicating that the one or more files is associated with the instant voice message."

62. As noted above, claim 27 of the '622 patent recites that the "instant voice message application includes a document handler system for attaching one or

more files to the instant voice message." The written description describes "attachment" as *linking* a file to the instant voice message:

> The attachment of one or more files is enabled conventionally via a methodology such as "drag-and-drop" and the like, which invokes the document handler 306 to ***make the appropriate linkages to the one or more files*** and flags the messaging system 320 that the instant voice message also has the attached one or more files.

(Ex. 1001, 13:33−38 (emphasis added).) This passage also describes that, in addition to making linkages, the document handler *flags* the messaging system to *alert it* that the instant voice message has an attachment. (*See id*.) Thus, "attaching" the file creates *an association* between the one or more files and the instant voice message so that the system, once alerted, may transmit the instant voice message with the associated one or more files. The specification provides no other detailed description of how to attach a file to an "instant voice message."

63. Thus, the specification describes "attaching" broadly as the creation of an association between a file and the instant voice message. The specification's linkage and flagging cause the system to handle the one or more files *as attachments* of the "instant voice message." Thus, a file is "attached" to an instant voice message when the document handler associates the file with the instant voice message in a manner that enables effective transmission of the message and the attachment by the

client (e.g., by linking the file to the message and alerting the messaging system of the linkage). Thus, as long as the client has sufficient information that the instant voice message has an attachment, the recited "attachment" is performed. Whether links or flags, or other like information is used, is not relevant because such details are not recited expressly in claim 27.

64. Accordingly, a POSITA would have understood the plain and ordinary meaning of "attaching one or more files to the instant voice message" to be "indicating that the one or more files is associated with the instant voice message."

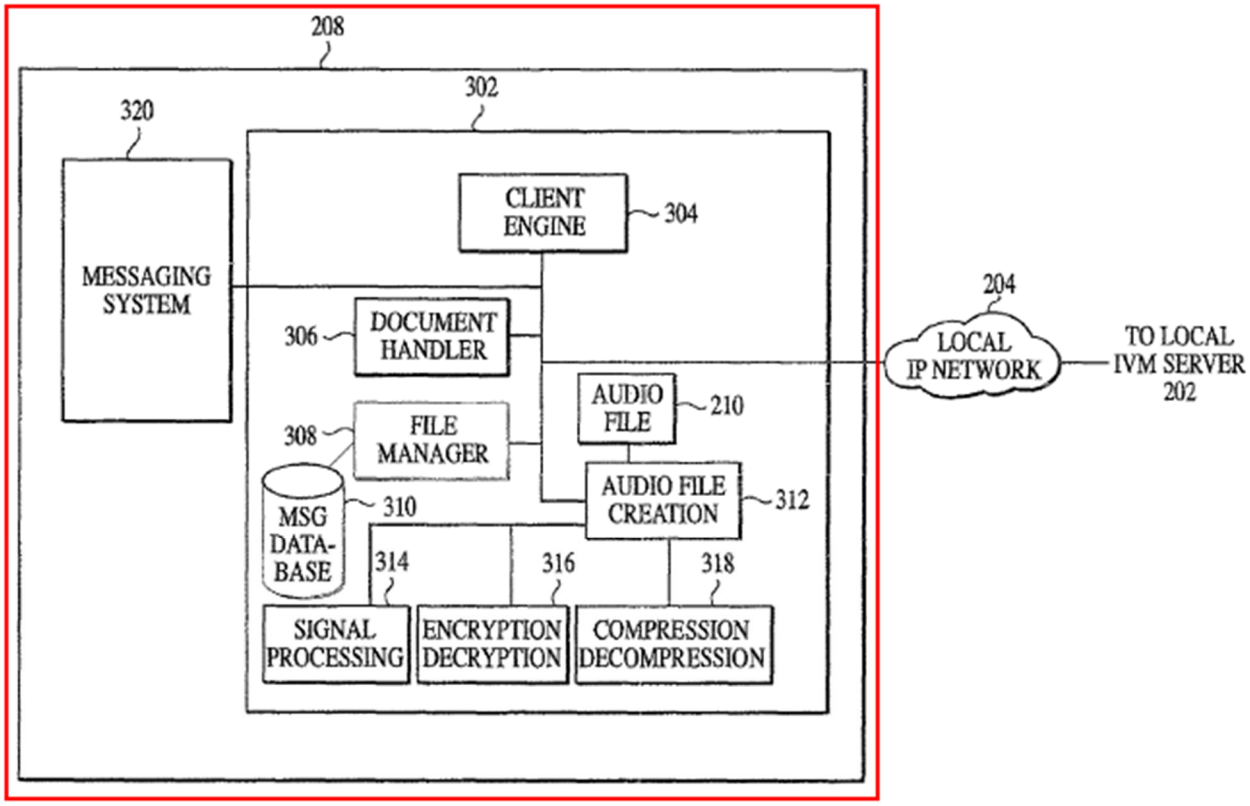
3. "an instant voice messaging application"

65. It is my opinion that "instant voice messaging application" should be construed as: "hardware and/or software used for instant voice messaging."

66. The written description does not use the word "application" in any way relevant to the alleged invention. The word "application" appears in the written description solely in reference to related patent applications. (Ex. 1001, 1:4-14.) The term "**application**" to a person of ordinary skill in the art typically refers to computer software for performing a particular function. But the written description of the '622 Patent indicates that the term "instant voice messaging application" should not be limited to software.

67. The written description does not identify any particular software program capable of performing all of the functions associated with the "instant voice

messaging application" recited in the claims. To the contrary, the patent describes these functions as being performed by an instant voice messaging ("IVM") client, IVM client **208**, which is a "general-purpose programmable computer." (Ex. 1001, 12:11-14.) Figure 3, which is reproduced below, shows these various boxes inside IVM client **208**:



(*Id.*, Fig. 3 (highlighting added).) IVM client **208** in Figure 3 above contains client platform **302** and messaging system **320**. (*Id.*, 12:17-21; 12:6-11.)

68. Claim 27 recites an "**instant voice messaging application**" that includes a "**client platform system**" and a "**messaging system**," which correspond to components 302 and 320, respectively, of the IVM client **208** depicted in Figure

3 above. This correspondence indicates that the '622 Patent equates the claimed "instant voice messaging application" with the IVM client **208** which, as noted above, is a general-purpose computer. (Ex. 1001, 12:11-14.) Accordingly, a POSITA would not understand the "instant voice messaging application" to be limited to software. Thus, a POSITA would have understood the plain and ordinary meaning of "**instant voice messaging application**" to be "**hardware and/or software used for instant voice messaging**."

4. "client platform system"

69. It is my opinion that "client platform system" should be construed as: "hardware and/or software on a client for generating an instant voice message."

70. As noted in the preceding section, one component of the claimed "instant voice messaging application" is a "**client platform system**." In particular, claim 27 states that the "instant voice messaging application" includes "a client platform system for generating an instant voice message."

71. The written description does not use the term "client platform system" but describes "client platform 302" whose purpose is "generating an instant voice message." (Ex. 1001, 12:7-8.) The written description further states that the client platform 302 "comprises a client engine 304, which controls other components" such as the document handler, file manager, and encryption/decryption. (*Id.*, 12:17-21.) The written description does not identify what "client engine 304" actually is, *e.g.*,

whether it is hardware and/or software. The written description instead provides a functional description of client engine 304 as performing at least two functions: (1) communicating with the server and (2) performing operations required to generate an instant voice message. (*Id.*, 12:24-25, 13:15-28.) Figure 3 similarly shows client engine 304 as a nondescript box within client platform 302. (*Id.*, Fig. 3.)

72. As explained above, the claimed "instant voice messaging application" is composed of hardware and/or software under its plain and ordinary meaning. Because the claimed "client platform system" is part of the "instant messaging application," the ordinary meaning of "client platform system" should similarly not be limited to software. Accordingly, the plain and ordinary meaning of "client platform system" to a POSITA is "hardware and/or software on a client for generating an instant voice message."

5. "communication platform system"

73. It is my opinion that "communication platform system" should be construed as: "a system of a server which relays communications and/or tracks client connection information."

74. Claims 1 and 3 recite "a communication platform system maintaining connection information for each of the plurality of instant voice message client systems indicating whether there is a current connection to each of the plurality of instant voice message client systems" (emphasis added). I note that the '622 Patent's

written description does not contain the term "communication platform system." The written description contains the following statements:

> The IVM server **202** comprises a server communication platform **402**, a messaging system **436** and a database **414**, thereby enabling instant voice messaging according to the present invention. The server communication platform **402** comprises a server engine **404**, client manager **406**, station manager **408**, gateway manager **410**, database manager **412** that accesses database **414**, supplemental servers **416** (including particular server subsystems **418-424**), as well as a control layer **426** (including non-proprietary server subsystems **428**, **430** and proprietary server subsystems **432**, **434**).

(Ex. 1001, 13:46-55.)

75. The "server communication platform" is shown labeled as item **402** in Figure 4, reproduced below.

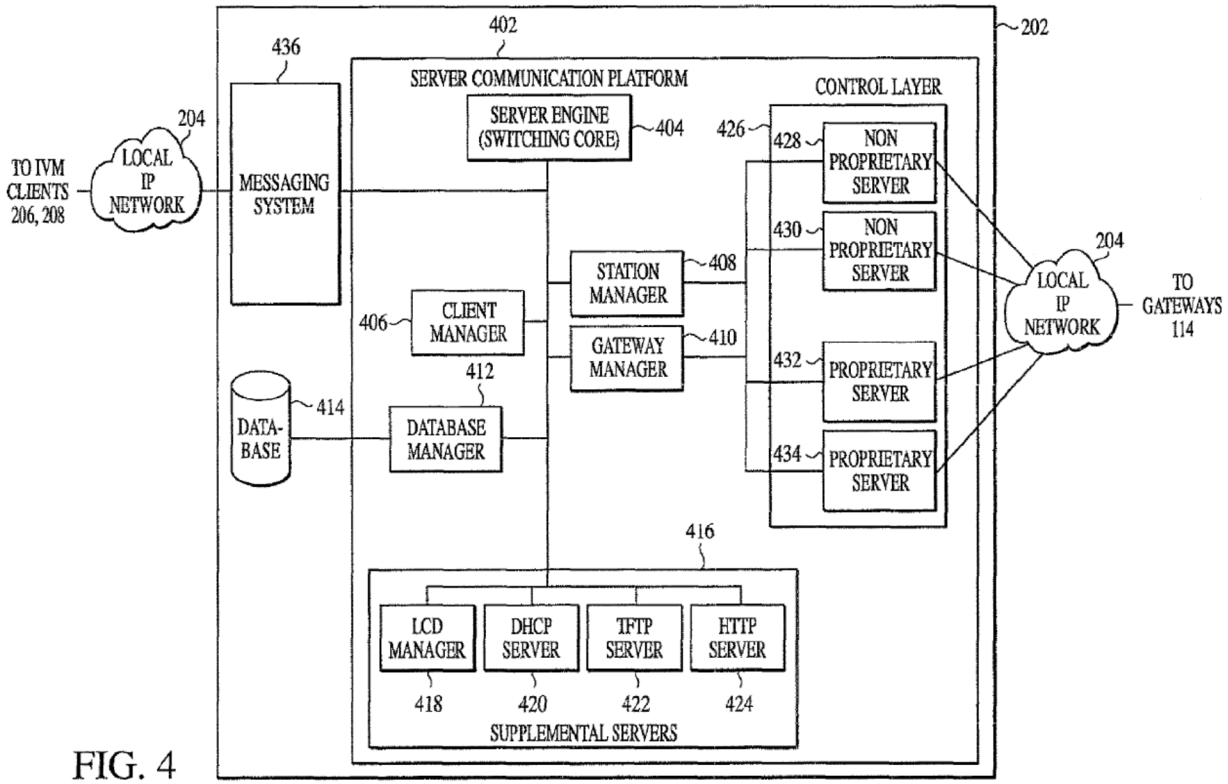


FIG. 4

(*Id*., Fig. 4.) Thus, the specification describes the "communication platform" as being a part of the IVM server 202. (*See also id*. at 13:46-55.)

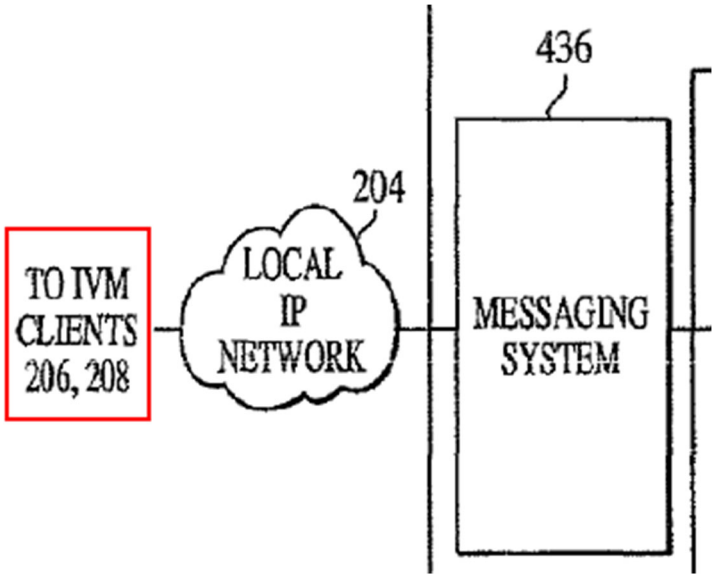
76. Accordingly, a POSITA would have understood the plain and ordinary meaning of "communication platform system" to be "a system of a server which relays communications and/or tracks client connection information."

6. "instant voice message client system"

77. It is my opinion that "instant voice message client system" should be construed as "hardware and/or software of a client used for instant voice messaging."

78. Claims 1 and 3 each recite "a plurality of instant voice message client systems." The written description does not use the phrase "instant voice message

client system." However, claims 1 and 3 each also recites "a messaging system communicating with [the] plurality of instant voice message client systems via a network interface" "connected to a packet-switched network." FIG. 4 (an excerpt of which is included below) depicts such a messaging system (436) communicating with "IVM clients 206, 208" via a packet-switched network (204):



(Ex. 1001, FIG. 4. (highlighting added); *see also id*. at 13:57-60.)

79. As discussed above in Section VIII.3, the IVM client 208 contains hardware and/or software used for instant voice messaging. IVM client 206 is described as a "VOIP telephone," which, in one embodiment, "is a standalone IVM client 206 enabled for instant voice messaging," and in another embodiment "operates synchronously with the IVM client 208 or IVM server 202 to enable instant voice messaging." (Ex. 1001, 8:40-48.) The written description explains that a "user operates the IVM client 206 by using a keypad on the VOIP telephone 206"

and "speaks into [a] handset … or speakerphone on the IVM client 206." (*Id*. at 8:56-64.) Thus, the IVM client 206 includes hardware (and in some embodiments software) used for instant voice messaging.

80. Based on this, a POSITA would have understood the plain and ordinary meaning of "instant voice message client system" to be "hardware and/or software of a client used for instant voice messaging."

IX. APPLICATION OF THE PRIOR ART TO THE CLAIMS

81. I have reviewed and analyzed the prior art references and materials listed in Part III above. In my opinion, the claims of the '622 Patent are obvious based on the following prior art.

References	Claims
Zydney, Shinder, and Kirkwood	1
Zydney, Shinder, Kirkwood, and Boneh	2
Zydney and Griffin	5
Zydney and Shinder	9, 36, & 37

82. In my opinion, as fully explained below, claim 1 is based on Zydney, Shinder, and Kirkwood. Claim 2 based on Zydney in view of Shinder, Kirkwood, and Boneh. Claim 5 is obvious based on Zydney in view of Griffin. Claims 9, 36, and 37 are obvious based on Zydney in view of Shinder. I understand that each of these references qualifies as prior art to the '622 Patent because it was filed or

published before December 18, 2003, the earliest claimed filing date for the '622 Patent.

X. SPECIFIC PRIOR ART DESCRIPTIONS AND TEACHINGS

83. This Section described specific aspects of the prior art, including in some instances how that prior art relates to certain claims of the '622 Patent.

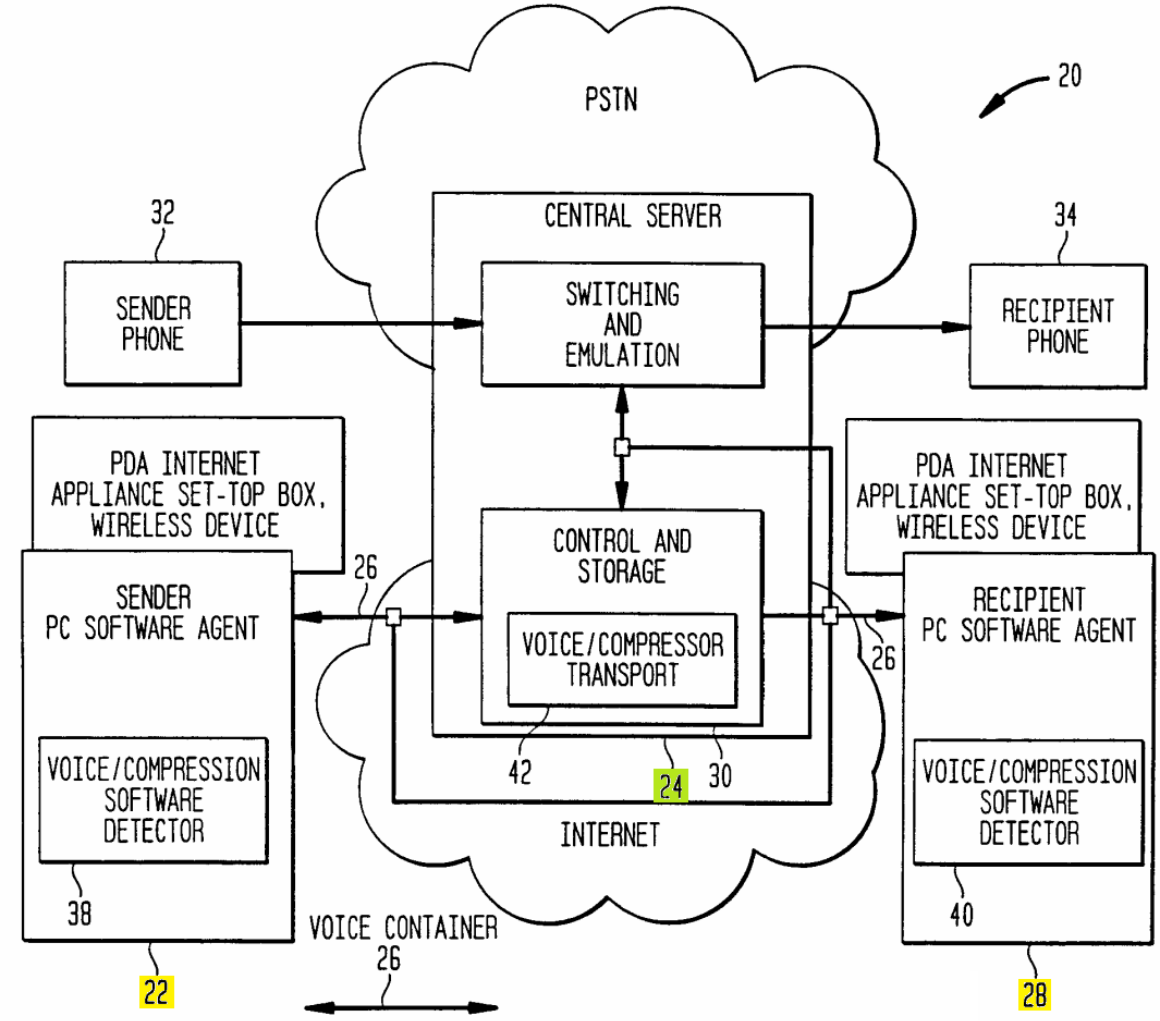
A. Zydney

84. Zydney describes a system for voice communication that enables a client to interact with a server in order to "send, receive and store messages using voice containers." (Zydney, 2:2-3.)[7] The system transmits the voice containers "instantaneously or stored for later delivery," depending on whether or not the recipient is currently online. (*Id*., 1:19-22, 15:8-21.)

85. Zydney describes that its method and system "is particularly well suited for use in connecting Internet users." (*Id*., 5:3-4.) The system is generally shown in Figure 1A, reproduced below.

[7] I am informed that the Zydney reference does not contain line numbers. Accordingly, Ex. 1004 contains a copy of Zydney in which line numbers were added to the left of each page (beginning on page 1), to facilitate precise citation to the passages of the reference that I discuss in this Declaration.

FIG. 1A



(*Id.*, Fig. 1A.)[8]

86. Three key components of the system include the "SENDER PC SOFTWARE AGENT" shown on the left (22), the "RECIPIENT PC SOFTWARE AGENT" shown on the right (28), and the "CENTRAL SERVER" shown in the

[8] Unless otherwise indicated, all underlining or boldface type in quotations and all highlighting in figures in this Declaration has been added for emphasis.

middle (24) of Figure 1A. (*Id.*, 10:19-11:1.) Zydney explains that the sender and recipient software agents may work on any suitable client device such as "a personal computer, wireless handheld computer such a personal data assistant (PDA), digital telephone, or beeper." (*Id.*, 11:14-20.) Central server (24) facilitates instant voice messaging between the sender and the recipient. (*Id.*, 10:20-11:1.) The sender, recipient, and central server communicate with each other using a communications network, as shown with the bottom cloud labeled "INTERNET" in Figure 1A. (*Id.*, Fig. 1A; *see also id.*, 5:4-5, 5:15-18, 10:11-14, 14:2-5.)[9]

87. Sending a voice instant message from a sender to a recipient in Zydney is straightforward. A message sender (originator) "selects one or more intended recipients from a list of names that have been previously entered into the software agent." (*Id.*, 14:17-19.) The sender also "digitally records messages for one or more recipients using a microphone-equipped device and the software agent. The software agent compresses the voice and stores the file temporarily on the PC if the voice will be delivered as an entire message." (*Id.*, 16:1-4; *see also id.*, 20:11-14,

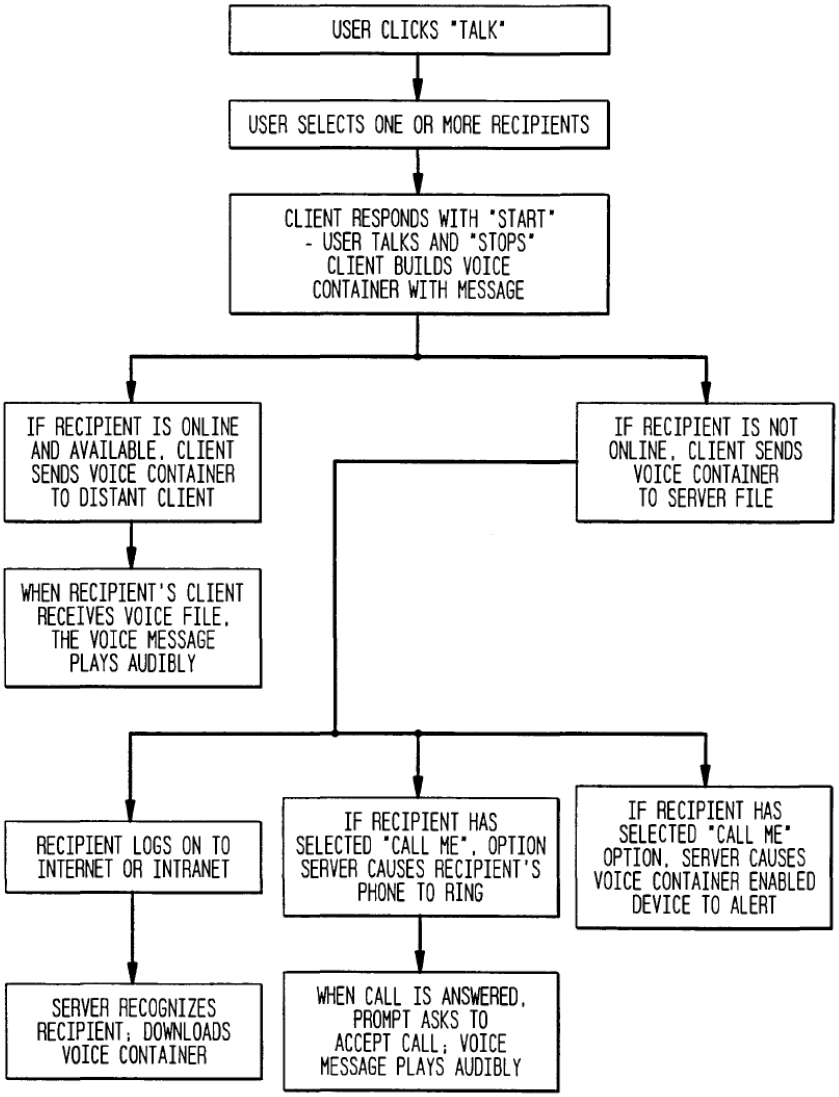
[9] Figure 1A also depicts an alternative embodiment in which a sender and recipient can communicate using phones (32, 34) connected over the Public Switched Telephone Network (PSTN). My Declaration will focus the Internet-connected embodiment described in the text.

21:11-16 (describing "the recording of one or more voice packet messages on a personal computer" as "voice files [that] can be played and recorded using voice container enabled devices.").) The voice message is placed into a "**voice container**," which can be transmitted to the destination. (*Id.*, 10:20-11:3.)

88. Zydney describes at least two modes in which voice messages can be transmitted. First, an instant voice message to an online recipient can be transmitted using "**pack and send**" mode. "A pack and send mode of operation is one in which the message is first acquired, compressed and then stored in a voice container 26 which is then sent to its destination(s)." (*Id.*, 11:1-3.) Second, Zydney discloses an "**intercom**" mode in which participants communicate in a real-time call or conversation. (*Id.*, 15:8-10.)

89. An exemplary process of transmitting an instant message is illustrated in Figure 4 of Zydney, reproduced below.

FIG. 4



(*Id.*, Fig. 4.)

90. As reflected in Figure 4, Zydney describes that, in order to send a voice instant message, a user selects one or more recipients from a list. (*Id.*, 14:17-19.) Once the delivery mode is determined, the sender records a message using a microphone. (*Id.*, 16:1-3.) In the "pack and send" mode, as noted, the software agent compresses and stores the voice message file, which Zydney refers to as a

"voice container," on the client device. (*Id.*, 16:3-4, 12:1-8, 10:20-11:3.) The sender also can include "multimedia attachments" with the voice message, as illustrated for example in Figure 6. (*Id.*, 19:2-8, 22:17-20, Fig. 6.)

91. The software agent then transmits the voice container (and any attachments) to either the central server for delivery to the recipient or, alternatively, directly to the recipient. (*Id.*, 12:1, 12:20-23, 16:7-10.)

92. If the recipient is **online**, it receives the voice container immediately. (*Id.*, 1:21-22 ("routed to the appropriate recipients instantaneously.").) If the recipient is **offline**, the server stores the voice container until the recipient is available, as shown in Figure 4. (*Id.*, 13:12-15, 14:9-11, Fig. 4 ("if recipient is not online, client sends voice container to server file").) More specifically, the central server will forward the stored voice container to the recipient once they log in. (*Id.*, claim 1, 14:14-16, Fig. 4 ("recipient logs on to internet or intranet," "server recognizes recipient, downloads voice container"), 16:10-12 ("If the intended recipient has a compatible active software agent on line after log on, the central server downloads the voice recording almost immediately to the recipient.").)

93. Upon receipt of a voice container, the recipient's software agent unpacks the voice container and any attachments and presents them to the recipient. (*Id.*, Fig. 18, 35:20-22.) The software agent can then audibly play the voice message

to the recipient through the speakers or headset attached to the device. (*Id.*, 13:19-22, 14:14-16, 16:10-14.)

B. Shinder

94. Shinder, entitled "Computer Networking Essentials," is a textbook published by Cisco Systems, a well-known supplier of networking equipment. The book was written to "help[] you understand the fundamentals of computer networking concepts and implementation and introduce[] you to the client and server operating systems that run on networked PCs." (Shinder, Introduction, p.xxii.)

95. I have cited Shinder in connection with limitations in the independent claims reciting a "**network interface**" that facilitates communication with a network. Zydney does not specifically describe the computing hardware used to connect the client or server devices to a network. But Shinder confirms that there was nothing inventive or non-obvious about providing a "**network interface**" in the manner recited in the claims. For example, one well-known example of a network interface was known as a network interface controller (NIC), which was widely available. (Shinder, p.195 ("The most basic piece of hardware required to network computers is the NIC, also called a network adapter or network card.").) Shinder further teaches:

> **Some sort of network interface is always required to communicate over a network**. . . . The NIC is the basic hardware component of network communications. It

> translates the parallel signal produced by the computer into the serial format that is sent over the network cable. The 1s and 0s of binary communications are turned into electrical impulses, pulses of light, radio waves, or whatever signaling scheme is used by the network media.

(*Id*., pp.195-196.) This passage confirms that a networked system, such as the instant messaging system of Zydney, cannot even function without a network interface for connecting the computing devices to the network. Shinder thus confirms the claimed "**network interface**" would have been apparent and obvious and provides no meaningful distinction over Zydney. At the time of the invention, when networking was so widely used and standardized, a POSITA would consider a network interface (such as a NIC) to be an integral part of a computer, just like a power supply, a storage device (disk), memory, or a CPU.

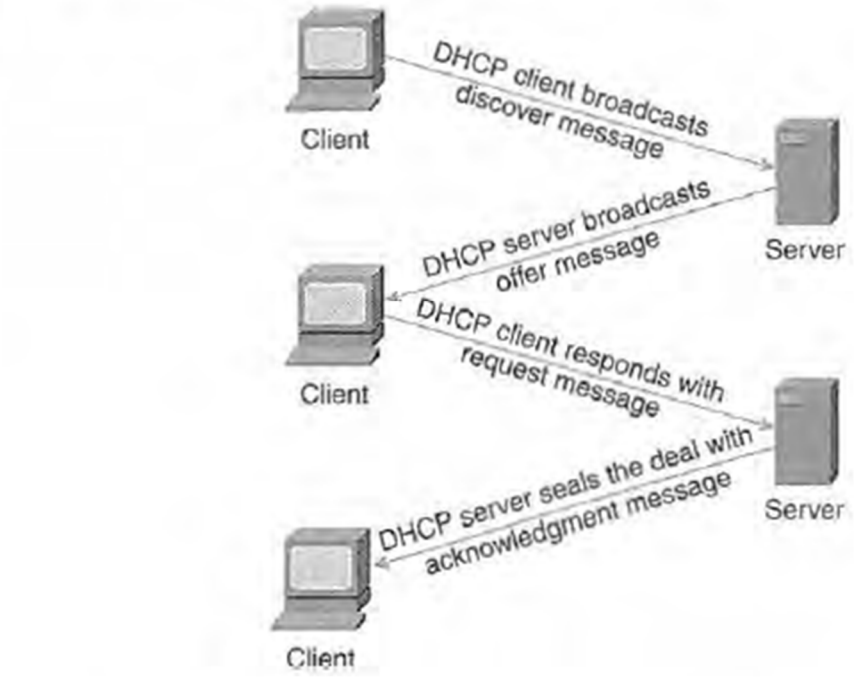
96. Shinder also confirms that assigning IP addresses to clients was a well-known practice and that using a server to assign IP addresses would have been apparent and obvious.

97. Shinder discloses that "[t]he TCP/IP stack is the foundation of Internet communications" and that "[t]o communicate using TCP/IP, a computer or other network device must have a unique IP address." (Shinder, pp. 78 and 86.) Shinder further teaches that it was well-known to automatically assign IP addresses to clients using a DHCP server:

> The [IP] address can be automatically assigned. Generally, this means a computer on the network is configured as a DHCP server to hand out IP addresses from a pool of valid addresses.

(*Id*., p. 86.) As shown in Fig. 8-3 below, Shinder discloses specific steps for assigning IP addresses to clients by a DHCP server.

Figure 8-3 *The DHCP server leases an address to the DHCP client.*



(*Id*., Fig. 8-3; *see also* pp. 87-88 (describing steps taken for a DHCP client to obtain an IP address from a DHCP server).)

98. Shinder also teaches that IP addresses can be manually assigned, but that using a DHCP server "has many advantages over manual IP addressing." (*Id*., p. 88.) Specifically, DHCP "saves time because the administrator does not have to enter the addresses into each computer's property settings" and it ensures greater

accuracy because the administrator does not have to keep up with which addresses have already been assigned and which are still free." (*Id*.)

99. Moreover, Shinder does not purport to disclose anything novel in its description of DHCP. Rather, Shinder is describing well-established practices for IP address assignment that would have been readily apparent to a POSITA. (*See* Ex. 1009 pp.12-17.)

C. Kirkwood

100. Kirkwood discloses a communication system that enables users to communicate via a telecommunications network. (Kirkwood, Abstract, 1:1-4.) In particular, Kirkwood discloses the storage of user records in a database that each contain a unique user identification code (i.e., a user id), a password, and a set of information determined by a user regarding other users with whom the user wished to communicate. (*Id*., Fig. 2, 5:20-6:2, 7:17-8:11.)

101. The fields assigned to each user are shown in Fig. 2a which shows a schematic database record:

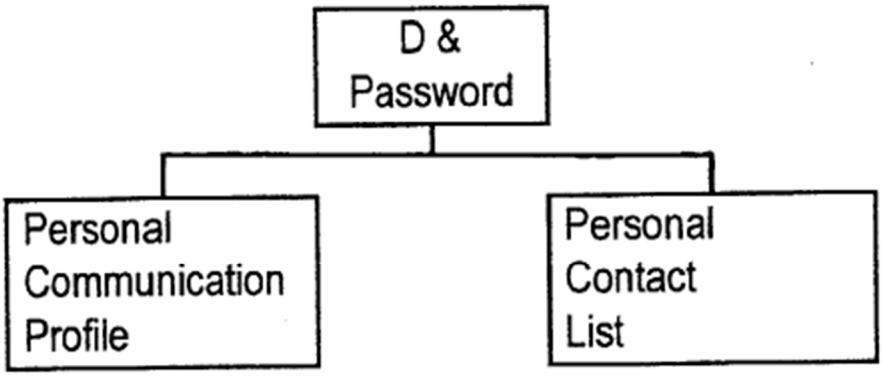


FIG. 2a

"Referring now to Fig. 2

In the database held on the remote server 19, each user of the system is assigned a unique user identification code which can identify that user uniquely on the telecommunications network 18. Each user of the system is also assigned a suitable password which is retained in the database associated with the unique user identification code."

(Id. page 5:20-22, 6:1-2)

102. According to Kirkwood, the database also contains a personal contacts list:

"Secondly, as shown in Fig. 2a, the database contains a second set of information determined by the user regarding other users with whom the user wishes to be able to communicate over the network 18. This information is contained within a personal contact list had in the database and each personal contact has information stored, for

example in the following fields, relating to that contact, as shown in Fig. 2d. The information stored can be, for example: …Contact Name, Unique user identification …, Voice activation name, …An access profile for that contact."

(*Id*., 6:3-7:22).

Name	String ID	VAN	Access Profile
Ian Jones	ijones21	✓	Friend
Gary Rodgers	garythefish	✓	Business Ass.
Tamara Maw	tamaram	✓	Family
Jane Fisher	janefisher2	✗	Barred

Personal Contact List

FIG. 2d

(*Id*. Fig. 2D.)

103. A sample access profile is described in Fig. 2C:

Business Ass.	Friends	Family	More
Access	Work	Mon-Fri	8am-8pm Work
	Mobile	Mon-Fri	8pm-8am Mobile
	Emergency	Sat	Work - Voice mail
		Sun	Work - Voice mail

Access Profiles

FIG. 2c

104. Kirkwood explains that the "String ID" in Fig. 2d is the unique user identification code for each selected contact.

> "So far as the user identification code for the contact is concerned, as previously explained, this field will contain the unique identification code which identifies the contact on the system"

(Id., 7:22-8:4; see also 8:9-11)

105. Kirkwood clearly teaches a database storing user records identifying users of a plurality of client systems, wherein each of the user records includes a unique user identification code, a password, an access profile, and a list of other users selected by a user (personal contact list).

106. A POSITA would recognize that these fields as typical information used to identify users who wish to contact each other. Moreover, a POSITA would agree that such information would be stored in a database accessible by the communication system.

D. Boneh

107. Boneh discloses a method and apparatus for protecting sensitive data stored in a database using various cryptographic operations. (*See* Boneh, Abstract, [0005-0006].):

> "A method and apparatus are provided for protecting sensitive information within server or other computing environments. Numerous electronic requests addressed to

> a server system are received over network couplings and evaluated. The evaluation scans for sensitive information including credit card information and private user information. Upon detecting sensitive data, cryptographic operations are applied to the sensitive data. When the sensitive data is being transferred to the server system, the cryptographic operations encrypt the sensitive data prior to transfer among components of the server system. When sensitive data is being transferred from the server system, the cryptographic operations decrypt the sensitive data prior to transfer among the network couplings. The cryptographic operations also include hash, and keyed hash operations."

108. The steps of the process are described in Fig. 3 (highlighting added).

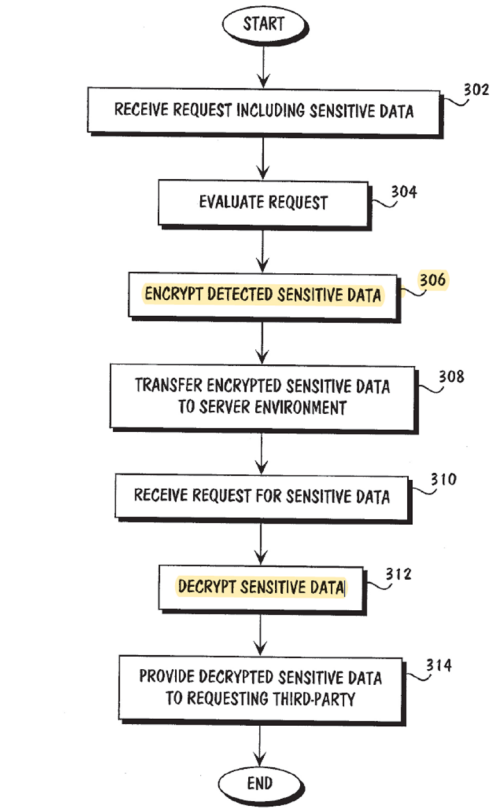


FIG. 3

109. Boneh discloses a transparent encryption appliance (TE) that "provides enhanced functionality of the form of transparent encryption to a security appliance" id, [0023]. According to Boneh, encryption can be applied to multiple fields (id. 0047):

> "…the user interface enables a user or administrator to specify the list of fields to be processed by the TE Appliance. This is a list of regular expressions that identify Transparent Encryption fields. For example, setting "A _ .*" as a delimiter implies that any field matching the regular expression "A __ .*" is a Transparent Encryption field. For example, " __ password" and " __ creditcard"

will be processed."

E. Griffin

110. Griffin discloses a system for real-time speech (i.e., voice) and text-based communication between mobile terminals:

> "The present invention provides techniques, principally applicable to wireless communication environments, for displaying and interacting with speech and text group chat threads. In particular, the present invention describes techniques to display a plurality of chat threads in a single chat history on a limited display area." (Id. 1:62-67).

111. The overall system architecture is described in FIG. 2.

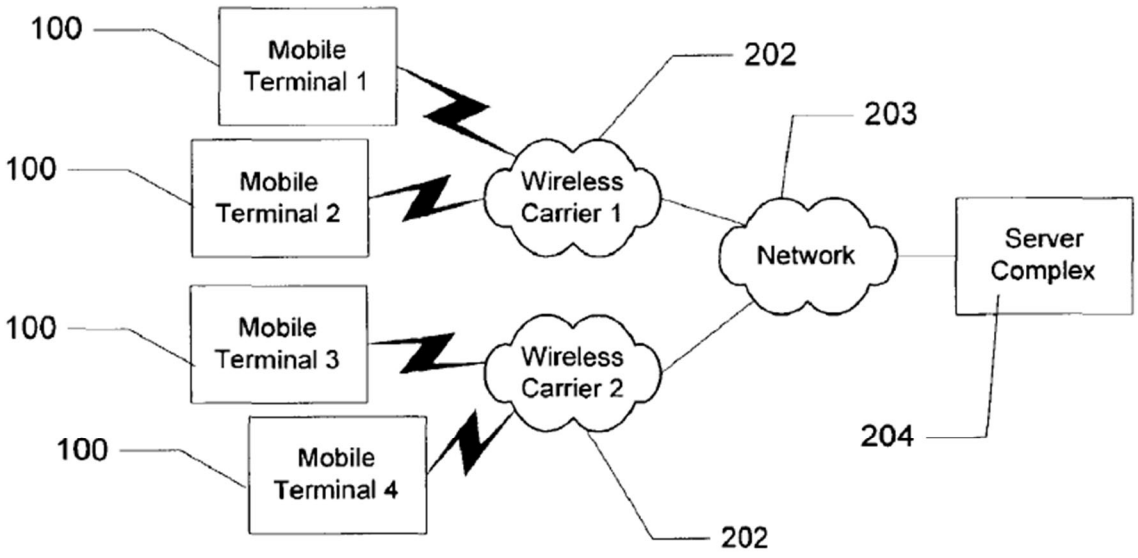


FIG. 2

FIG. 2. Shows multiple 'mobile terminals' which communicate 'with at least one chat server complex' by

> transmitting data 'wirelessly to a corresponding wireless carrier's infrastructure.' (Id. 3:47-54). The 'data packets are sent to a communication network that forwards them to onto the server complex.' (Id. 3:59-61). The packet-based network can be 'the Internet… a corporate intranet, or some combination of public and private network elements." (Id. 3:61:65). The server complex is comprised of 'networked server computers,' (id, 3:67).

112. FIG. 3 describes 'components found in both the terminals 100 and the server complex 204' (id, 4:27-28), specifically network interfaces:

> "Outbound chat messages sent to the server complex 204, as well as those inbound chat messages received from the server complex 204, pass through the network interface 306 that provides connectivity between the terminal and the data network. Where the terminal 100 comprises a wireless device, the network interface 306 comprises the entire physical interface necessary to communicate with the server complex 204, including a wireless transceiver." (Id. 4:44:52).

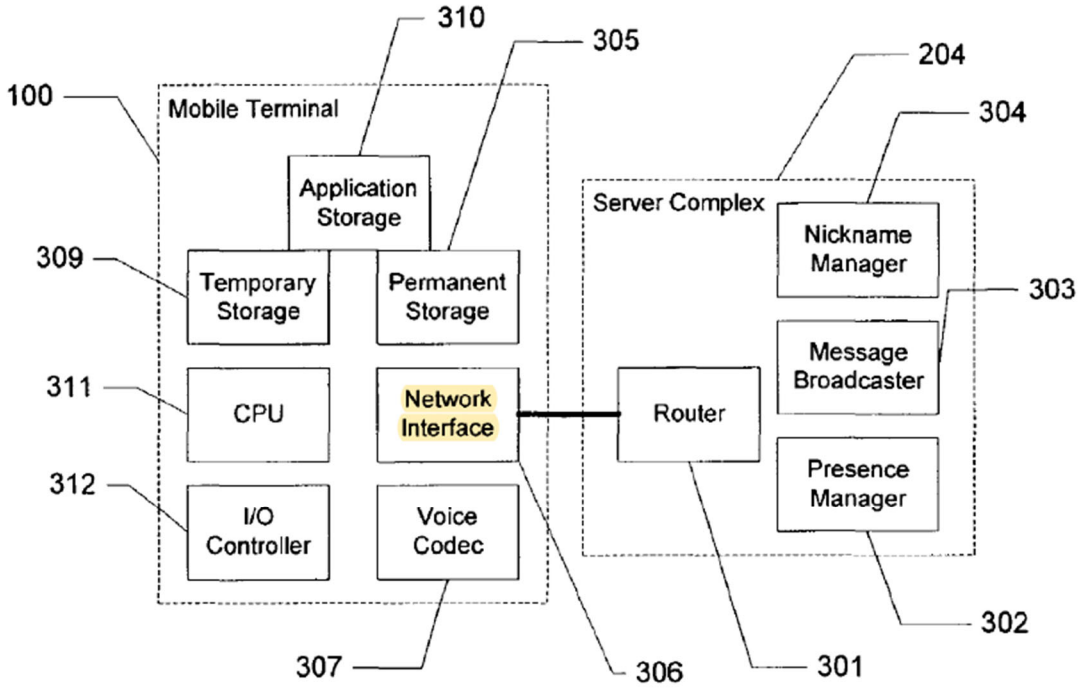


FIG. 3

Source: Id. FIG. 3 (highlighting added)

113. This passage of Griffin confirms that a networked system, such as the instant messaging system of Zydney, cannot even function without a network interface for connecting the computing devices to the network. Griffin thus confirms the claimed "**network interface**" would have been apparent and obvious and provides no meaningful distinction over Zydney. At the time of the invention, when networking was so widely used and standardized, a POSITA would consider a network interface (such as a NIC) to be an integral part of a computer, just like a power supply, a storage device (disk), memory, or a CPU.

114. Although Griffin describes "the network interface 306" as comprising "the entire physical interface necessary to communicate with the server complex 204," (Griffin at 4:49-51) and thus as being part of a terminal, a POSITA would recognize that the "server complex 204" must possess a network interface as well in order to receive the communications from the terminal. In particular, a POSITA would recognize the "router" of the "server complex 204" as having network interface with which it transmits and receives "the data traffic comprising encoded speech and text messages." (*See* Griffin at 4:61-5:9.) A POSITA would also know that most routers are operable to interface with packet-switched networks.

115. Thus, a POSITA would understand both the "terminal 100" and the "router 301" to have network interfaces connected to a packet-switched network.

116. Griffin describes a 'messaging system' which enables mobile users to exchange voice (speech) and text messages:

> "…when a plurality of users chat together (i.e., send chat messages from one terminal 100 to another), data comprising text, speech, and/or graphical messages (or some combination thereof) are sent to the server complex 204. The server complex 204 then sends copies of the message out to the targeted terminals 100…" id. 4:11-16.

117. The server complex of the messaging system includes a 'broadcaster' (FIG. 3. 303) that determines where incoming messages should be sent:

> "The message broadcaster 303 decomposes the incoming

message 400, and locates the list of recipient identifiers 402. It then queries a presence manager 302 to establish the recipients' current status 702 (i.e., an indicator of whether the recipient is ready to receive the particular type of message, speech and/or text messages only, etc.) and the terminal's address 703." Id. 5:3-15.

118. The presence manager maintains a table of presence records. The structure and content of the table is depicted in FIG. 7:

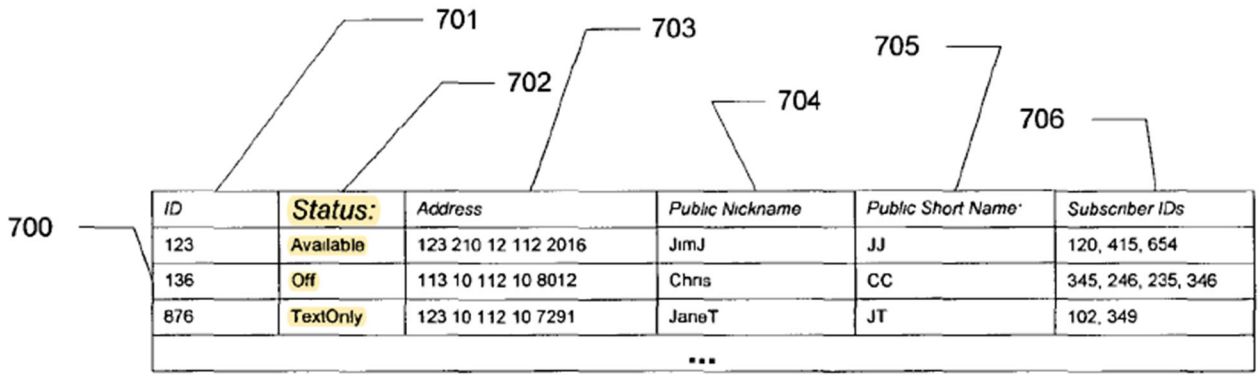


FIG. 7

Source: Id. FIG. 7 (highlighting added). The message broadcaster knows where to send outbound messages based on the recipient list shown in FIG. 4.

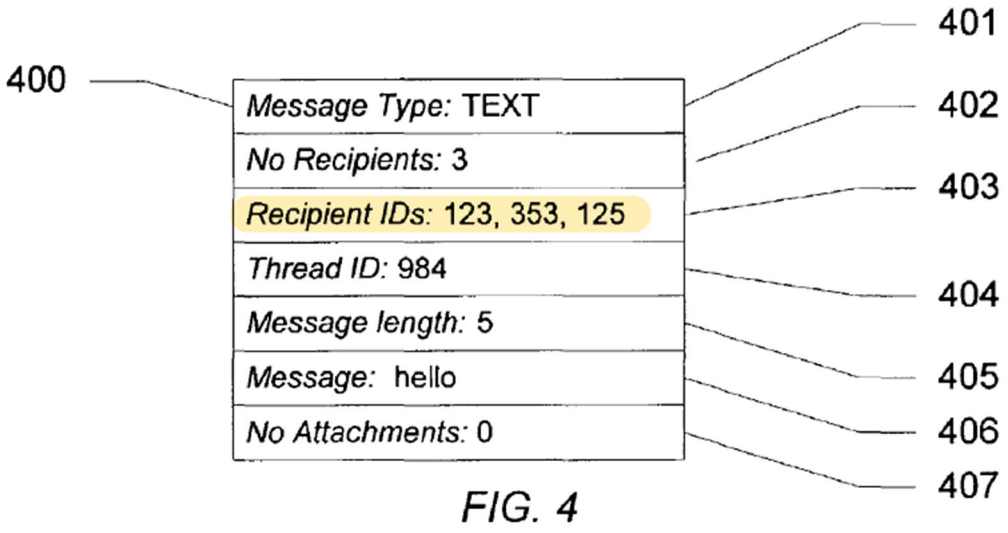


FIG. 4

Source: Id. FIG. 4

119. A POSITA would agree with Griffin's statement that the presence states and how they are handled could vary:

> "Those having ordinary skill in the art will recognize that presence records 700 may contain other information and attributes such as forwarding address, processing rules that describe what to do in various circumstances, graphical representation for various status, profiles (i.e., a plurality of a different value sets that could be used at various times or depending on the receiver, etc.) and so on." (*Id*. 5:31-37.)

120.

XI. THE PRIOR ART DISCLOSES OR SUGGESTS ALL THE FEATURES OF CLAIMS 1, 2, 5, 9, 36, AND 37 OF THE CHALLENGED PATENT

121. This declaration explains the conclusions that I have formed based on my analysis. In summary, based upon my knowledge and experience and my review of the prior art publications listed above, I believe that claims 1, 2, 5, 9, 36, and 37

of the ’622 Patent are rendered obvious by the prior art references. Specifically, I believe that:

122. Claim 1 is rendered obvious by the combination of Zydney, Shinder, and Kirkwood.

123. Claim 2 is rendered obvious by the combination of Zydney, Shinder, Kirkwood, and Boneh.

124. Claim 5 is rendered obvious by the combination of Zydney and Griffin.

125. Claims 9, 36, and 37 are rendered obvious by the combination of Zydney and Shinder.

A. CLAIM 1 IS OBVIOUS OVER ZYDNEY, SHINDER, AND KIRKWOOD

126. All of the elements of claim 1 are disclosed by the combination of Zydney, Shinder, and Kirkwood.

[1.1] A system comprising:

127. If the preamble is limiting, then it was at least obvious over Zydney and Shinder. Specifically, Zydney discloses an instant voice messaging system comprising the features discussed below.

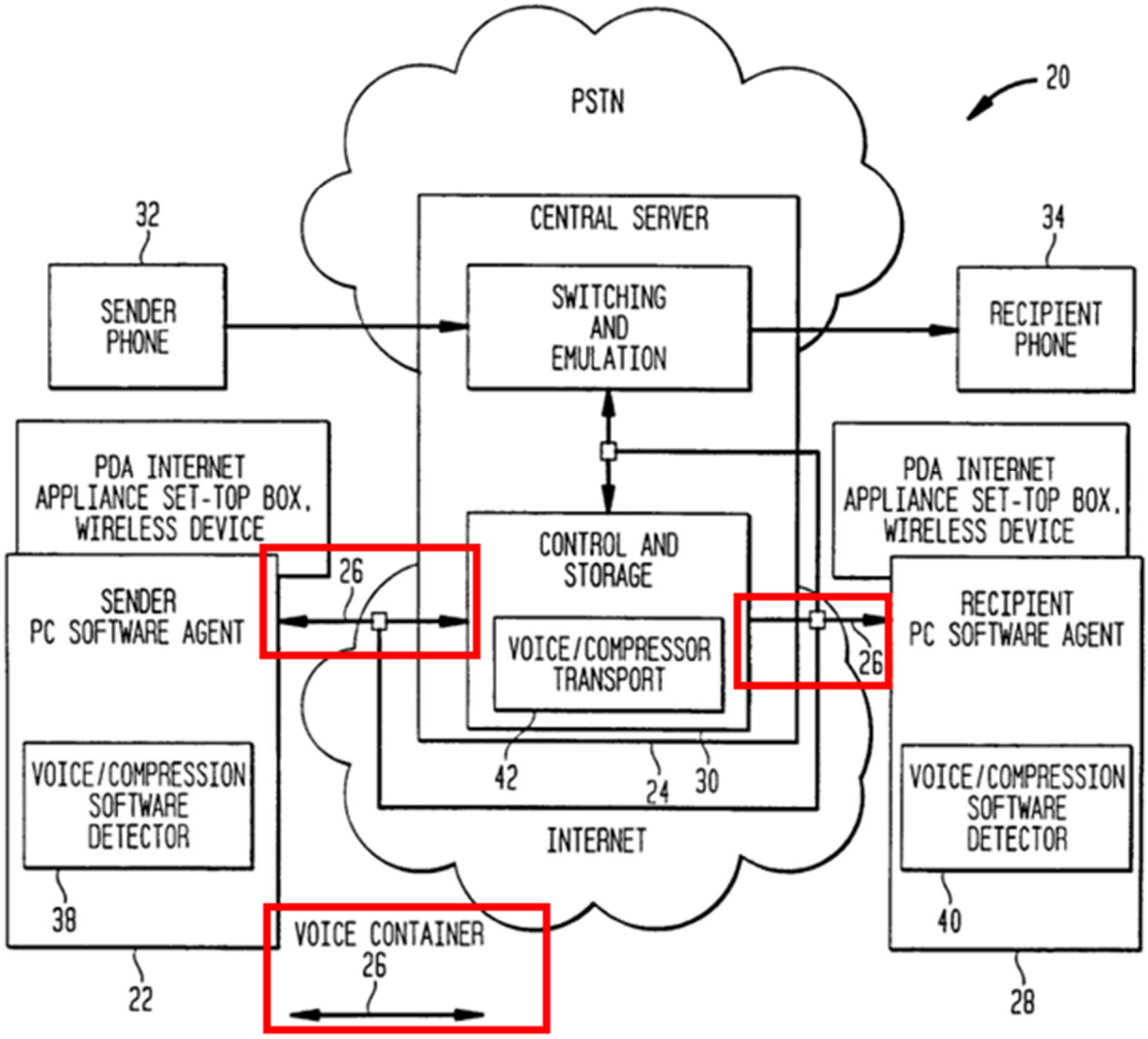
[1.2] a network interface connected to a packet-switched network;

128. The ’622 Patent does not provide much detail regarding the claimed “network interface” or much guidance on the meaning of this term. With respect to

the IVM server 202, the specification merely states: "The IVM server 202 is a general-purpose programmable computer equipped with a network interface, such as an Ethernet card, to provide connectivity to a network 204." (Ex. 1001, 13:41-44.) The exemplary "Ethernet card" mentioned in the '622 Patent was a well-known piece of hardware for providing an interface by which a computer could communicate on a network.

129. Zydney, alone and in combination with Shinder, discloses and renders obvious the claimed "network interface." Zydney describes a system in which clients create and transmit instant voice messages in the form of "voice containers." (Zydney, 12:1-8, 10:20-11:3, Fig. 1A.) A client system includes a software agent that can transmit the voice container over the Internet to a central server, which can then deliver the voice container to a recipient over the Internet. (*Id*., 13:1-6, 13:12-18, 14:6-13, Figs. 4, 8.) This is shown in Figure 1A, which depicts "transmission line 26" connecting the client systems to the central server through the Internet. (*Id.*, 10:21-23, Fig. 1A (line 26).)

FIG. 1A



(Zydney, Fig. 1A (highlighting added)).

130. Zydney does not specifically describe the computing hardware for connecting the clients and the central server to a network. However, it would have been obvious to a POSITA that Zydney included a "network interface" as claimed. This is because the central server would have needed such an interface in order to connect to the Internet as shown in Figure 1A. (*Id.*) The presence of a "network

interface" would thus have been obvious based on the disclosures of Zydney alone, when combined with the knowledge of a POSITA.

131. Furthermore, Shinder demonstrates that providing a "network interface," as recited in the claims, was well-known and obvious. For example, one well-known example of a network interface was a network interface controller ("NIC"), which was widely available. (Shinder, p.195.) Shinder further teaches:

> Some sort of network interface is always required to communicate over a network. . . . The NIC is the basic hardware component of network communications. It translates the parallel signal produced by the computer into the serial format that is sent over the network cable. The 1s and 0s of binary communications are turned into electrical impulses, pulses of light, radio waves, or whatever signaling scheme is used by the network media.

(*Id*., pp.195-196.) Shinder confirms that the claimed "network interface" is a well-known and off-the-shelf component that provides no meaningful distinction over Zydney. Shinder shows that the claimed "network interface" was a well-known and off-the-shelf component that would have been necessary for a networked system (such as Zydney's system) to function properly.

132. Shinder also explains that the network interface (such as a NIC) controls all incoming and outgoing data traffic to and from a networked computer: "Along with preparing the data to go onto the network media, the NIC is responsible

for controlling the flow of data between computers and media and for receiving incoming data." (Shinder, p.196.) Shinder thus discloses the claimed "network interface."

133. It would have been obvious to a POSITA to combine Zydney with Shinder, with no change in their respective functions, predictably resulting in the instant voice messaging system of Zydney in which the central server contained a "network interface," such as a network interface card (NIC), to connect the server to the Internet. Shinder itself provides a motivation to combine by explaining that "[s]ome sort of network interface is always required to communicate over a network." (Shinder, pp.195-196.) To the extent this requirement was not already known to a POSITA, Shinder would have clearly motivated a POSITA to provide a network interface to connect the central server of Zydney to the Internet. Indeed, Shinder would have confirmed that a "network interface" is not only desirable, but essential to allow the central server of Zydney to perform its communications functions within the instant messaging system. A POSITA would have thus found it obvious that the central server of Zydney would have been coupled to a network interface for communicating over the Internet, and the choice of which particular network interface to use would have been well within the grasp of a POSITA.

134. Providing a network interface was also within the basic knowledge of persons of ordinary skill in the art. The '622 Patent itself explains that the network

interface can include "an Ethernet card, to provide connectivity to a network 204." (Ex. 1001, 13:41-44.) An Ethernet card is an example of a NIC that was commonly installed in computers, including computers used as servers, connected to a network. A POSITA would thus have fully understood the need for a network interface to couple the central server of Zydney to the Internet. (*Id.*)

135. Zydney and Shinder also disclose that the network interface is connected to "a packet-switched network," as claimed. (Zydney, 10:21-23, Figs. 1, 1A.) The term "packet-switched network" generally refers to a communications network in which information is transferred through a series of data units called "packets." Zydney discloses transmission of voice containers over the Internet, which as shown below, is a "packet-switched network." (Zydney, Fig. 1A.)

136. It was well-known to persons of ordinary skill in the art that the Internet was a packet-switched network. The '622 Patent itself confirms as much. (Ex. 1001, 1:37-40 ("a VoIP terminal device is connected to a packet-switched network (e.g., Internet)"), 1:51-53.) Shinder also confirms this fact. (Shinder, p.170 ("An example of a packet-switched network is the Internet.").) It would thus have been obvious to a POSITA that the Internet as disclosed in Zydney would have been a packet-switched network.

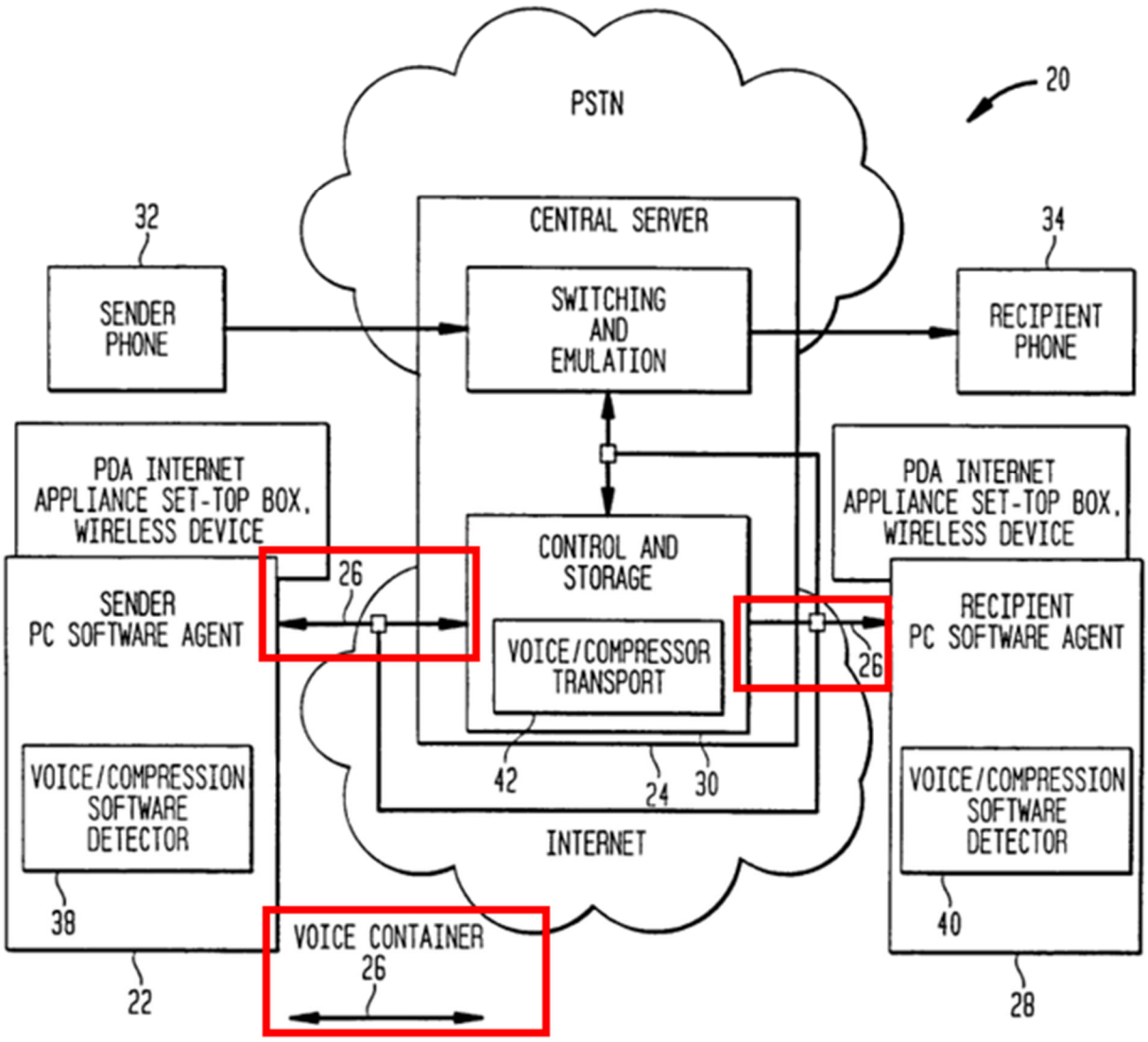
137. Finally, it would have been obvious to a POSITA that the network interface itself would be connected to the packet-switched network, as claimed.

Shinder explains that the network interface serves as the point of connection through which incoming and outgoing data flows to and from a networked computer. (Shinder, pp.195-196.) In particular, "[a]n important part of the network interface is the *transceiver*," which, "as its name indicates, sends and receives signals." (*Id*., p.196 (italics in original).) Therefore, when the central server in Zydney's system communicates data (including voice containers) over the Internet as Zydney describes, the network interface is connected to the packet-switched network.

[1.3] a messaging system communicating with a plurality of instant voice message client systems via the network interface;

138. The messaging system of Zydney is shown in Fig. 1A, which shows client systems connected to the central server through the Internet. (Zydney, 10:21-23, Fig. 1A (line 26).)

FIG. 1A

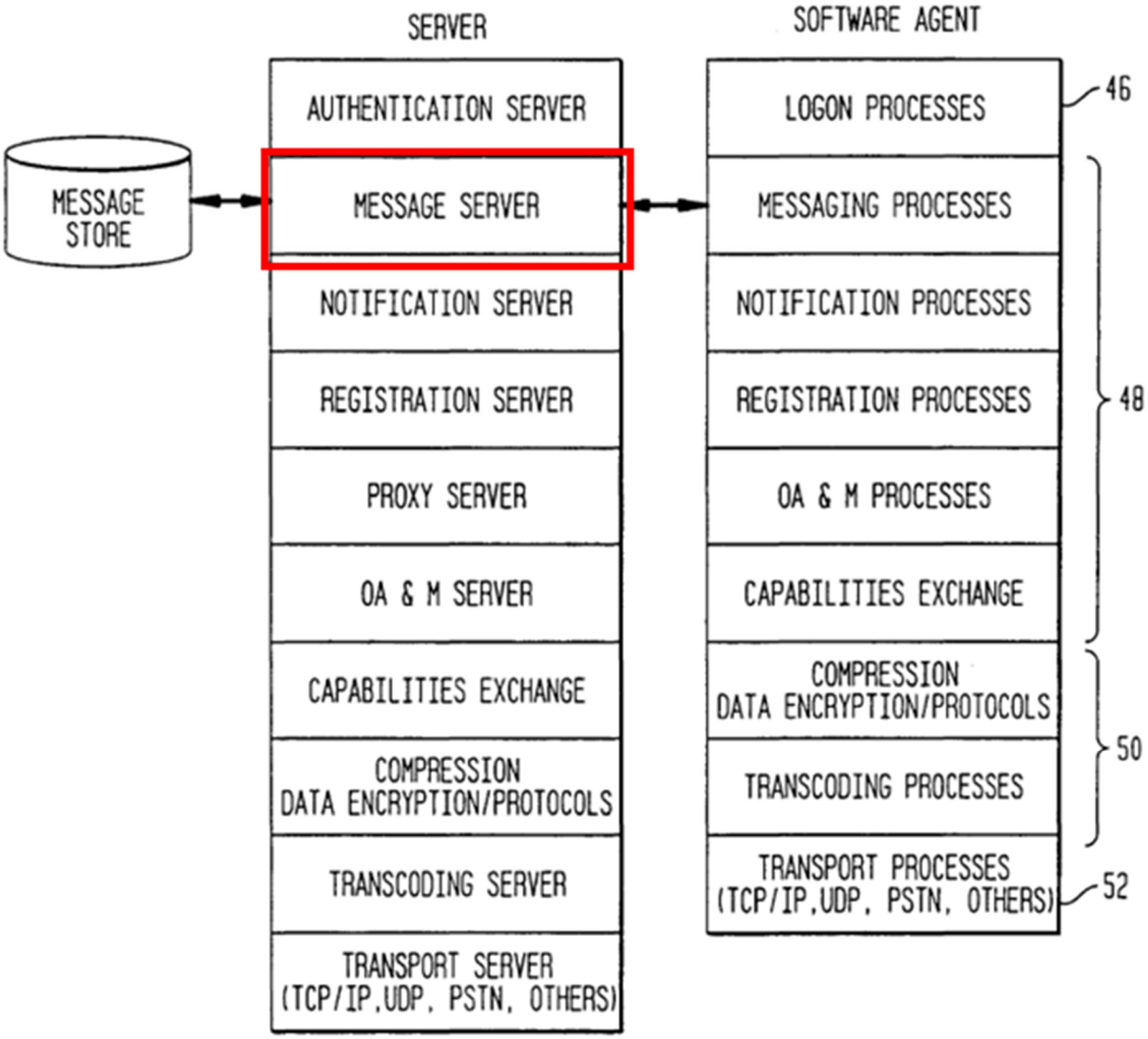


(Zydney, Fig. 1A).

139. The "messaging system" in Zydney sits within the central server (24) shown in the middle of Figure 1A above. Zydney explains that "[t]he central server in conjunction with the software agent controls, stores and switches the voice containers to the appropriate recipients." (*Id.*, 14:6-13; *see also id.*, 13:12-18.)

140. The central server of Zydney includes a number of subcomponents including a "message server" and a "transport server," shown in Figure 2:

FIG. 2



(*Id.*, Fig. 2 (highlighting added).)

141. When a client system sends a voice container to a recipient that is "[n]ot logged on," the "[m]essage will be sent to the message server." (*Id.*, 33:1-2.)

Similarly, "[t]he message server will download all messages to the software agent and/or retain copies of the messages based on administrative settings from the user." (*Id*., 27:15-16; *see also id*., 25:1-9, 30:6-7, 31:1-3.) The "transport server" in Figure 2 is responsible for receiving and sending voice containers over TCP/IP. (*Id.*, 23:11-12 ("The voice container will be sent using standard TCP/IP transport."), 29:1-2.)

142. The claim also calls for a "plurality of instant voice message client systems," which are shown in Figure 1 of Zydney as the device running the sender software agent (22) and the device running the recipient software agent (28). (Zydney, Fig. 1A.) Zydney explains that each of these devices may be "a personal computer, wireless handheld computer such a personal data assistant (PDA), digital telephone, or beeper." (*Id.*, 11:16-18.) Figure 1A above shows those client systems connected to the central server. (*Id.*, Fig. 1A.) Zydney thus discloses "a messaging system communicating with a plurality of instant voice message client systems."

143. The clients shown in Figure 1A above are "instant voice message client systems." The sender and recipient in Zydney can send and receive an instant voice message (voice container), which is depicted as numeral 26 in Figure 1A above. (*Id.*, 11:16-18, 14:2-3, Figs. 4, 6.) Each voice container discloses an instant voice message because a voice container "can be stored, transcoded and routed to the appropriate recipients instantaneously or stored for later delivery." (*Id*., 1:21-22.) A recipient of the voice message "can reply in a complementary way, allowing for near

real-time communication." (*Id*., 16:14-15.) Zydney describes this exchange of voice containers as "a voice instant messaging session," and an alternative to an "intercom" mode. (*Id*., 15:8-13, 10:19-11:3, 16:1-12.) Because the client systems in Zydney can send and receive instant voice messages, they qualify as "instant voice message client systems."

144. Finally, as explained previously for element [1.2], the central server in Zydney can include a "network interface" that provides the server's connection to the Internet. The central server's messaging system, therefore, communicates with the client systems using the network interface. Zydney and Shinder thus render obvious that the messaging system communicates with the client systems "via the network interface," as claimed.

[1.4] a communication platform system maintaining connection information for each of the plurality of instant voice message client systems indicating whether there is a current connection to each of the plurality of instant voice message client systems; and

145. As explained above for element [1.3], each of the "instant voice message client systems" in Zydney runs a software agent used for instant voice messaging. The central server in Zydney tracks the connectivity status of these software agents. (Zydney, 14:6-9 ("Central Server: … will track and maintain the status of all software agents."), 13:12-14 ("The Central Server provides the

following functionality: … maintain and provide the status of all software agents…").)

146. The claimed "communication platform system" in Zydney is the system within the central server that tracks and maintains this status. More specifically, the "communication platform system" in Zydney includes (a) the "notification server" of the central server (Figure 2), which notifies clients of the connection status of other clients, and (b) server storage for recording the actual client connection information. (*Id.*, 24:15-16 ("Software agents will gain access to the system through the log on process which interfaces with the notification server."), 31:13-15 ("The software agent will send a copy of the currently logged on Internet address to the notification server for purposes of notifying other software agents of its status and receiving messages."), 25:4-7, 32:12-15 ("The notification process will also query the server to find out the other registered software agents that are currently logged onto the system…").) Zydney thus discloses a "communication platform system" that maintains status information for each client.

147. This status information qualifies as "connection information for each of the plurality of instant voice message client systems," because the status information includes the "core state" of whether the client is online or offline:

> The status of all recipients entered into the software agent is frequently conveyed to the software agent by the central server. This includes the core states of whether the

> recipient is online or offline, but also offers related status information, for example whether the recipient does not want to be disturbed.

(*Id.*, 14:20-15:1; *see also id.*, 25:4-7 (a software agent is "on-line" when it "has been authenticated with the system and has notified other software agents via the notification server that they are on-line").) Zydney's teaching above that the central server maintains the "core states" of whether the software agent is currently "online" or "offline" also discloses connection information indicating whether there is "a current connection" between the central server and the client system containing the software agent. (*See id*., 32:12-15 ("The notification process will also query the server to find out the other registered software agents that are currently logged onto the system and send the Internet address of the other logged on software agents to the authenticated, newly logged on software agent.").)

[1.5] a user database storing user records identifying users of the plurality of instant message client systems, wherein each of the user records includes a user name, a password, and a list of other users selected by a user.

148. Zydney discloses storing a user name and password for each user of the instant voice message system. (Zydney, 23:18-24:6; *see also id*. 30:3-6, 31:1-6 and 10-13.) Zydney further discloses a list of users selected by a user: "the originator selects one or more intended recipients <u>from a list of names that have been previously entered into the software agent</u>." (*Id*., 14:17-19; *see also id*. 30:13-15 (referring to the "buddy list" of a user), 34:1-3). Although Zydney does not provide

specific examples of how the user names, passwords, and "buddy lists" for users are stored, it would have been obvious to a POSITA to store them as records in a database. Storing data as records in a database was a well-known technique for data persistence prior to the effect filing date of the '622 Patent. Furthermore, Zydney discloses that unique addresses assigned to software agents are maintained in a data store (e.g., a database). (Zydney 23:18-21.) It would have been obvious to a POSTIA to store other persistent data, such as user names, passwords, and buddylists, in the same data store.

149. Furthermore, even if such an implementation was not obvious to a POSITA in view of Zydney alone, it certainly would have been in view of the express teachings of Kirkwood. Kirkwood expressly teaches the storage of a user name (a user identification code) and password for a user, and list of users selected by the user (a personal contact list), in a record in a database:

> Referring now to Fig. 2
> In the database held on the remote server 19, each user of the system is assigned a unique user identification code which can identify that user uniquely on the telecommunications network 18. Each user of the system is also assigned a suitable password which is retained in the database associated with the unique user identification code.

(Kirkwood, 5:19-6:2.)

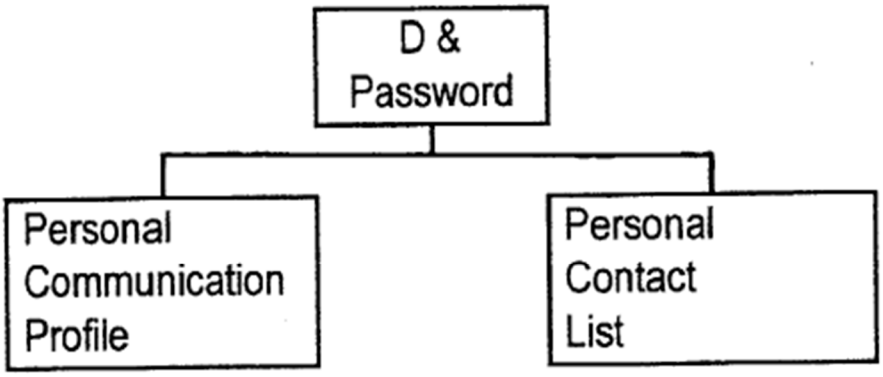


FIG. 2a

(Kirkwood, Fig. 2A (showing a schematic for a user database record).)

> Associated with each unique user identification code and password within the database are two further sets of information … Secondly, as shown in Fig. 2a, the database contains a second set of information determined by the user regarding other users with whom the user wishes to be able to communicate over the network 18. This information is contained within a personal contact list had in the database and each personal contact has information stored, for example in the following fields, relating to that contact, as shown in Fig. 2d.

(*Id*., 6:3-7:22 (omitting details describing the personal communication profile of the user).

Name	String ID	VAN	Access Profile
Ian Jones	ijones21	✓	Friend
Gary Rodgers	garythefish	✓	Business Ass.
Tamara Maw	tamaram	✓	Family
Jane Fisher	janefisher2	✗	Barred

Personal Contact List

FIG. 2d

(*Id*., Fig. 2D.)

150. Kirkwood explains that the "String ID" in Fig. 2d is the unique user identification code on the system for each selected contact. (*Id*., 7:22-8:4; *see also* 8:9-11 ("So far as the user identification code for the contact is concerned, as previously explained, this field will contain the unique identification code which identifies the contact on the system").) Thus, Kirkwood expressly teaches a database storing user records identifying users of a plurality of client systems, wherein each of the user records includes a user name (unique user identification code), a password, and a list of other users selected by a user (personal contact list).

151. Kirkwood is in a same field of endeavor as Zydney. Like Zydney, Kirkwood discloses a system for voice communication between users over a communication network. (Kirkwood 1:2-20.) A POSITA considering options for storing the user name, password, and buddy list in Zydney would naturally have consulted the teachings of Kirkwood. In light of the teachings of Kirkwood, a POSITA would have appreciated the advantages of storing the user name, password,

and buddy list in a database record. Furthermore, no modification of any other aspect of the system described in Zydney would have been required to store the usernames, passwords, and buddy lists in database records. Rather, such a modification would have been nothing more than a simple combination of known and commonly used technologies (a server system and a database) by known methods without changing their respective functions, to achieve predictable results.

152. Accordingly, a POSITA would have understood that Zydney in view of Kirkwood teaches user records for users that include a username, a password, and a list of other users selected by the user.

153. Thus, claim 1 would have been obvious to a POSITA in view of Zydney, Shinder, and Kirkwood.

B. CLAIM 2 IS OBVIOUS OVER ZYDNEY, SHINDER, KIRKWOOD, AND BONEH

154. All of the elements of claim 2 are disclosed by the combination of Zydney, Shinder, Kirkwood, and Boneh. Claim 2 depends from claim 1. For the reasons as discussed above, claim 1 would have been obvious to a POSITA in view of Zydney, Shinder, and Kirkwood. (*See* Section XI.A *supra*.)

[2.1] The system according to claim 1, wherein at least part of each of the user records is encrypted.

155. As discussed previously with respect to claim element [1.5], Kirkwood discloses user records stored in a database. (*See* Section XI.A *supra*.) Kirkwood does

not expressly describe encrypting part of the user record. However, it would have been obvious to a POSITA to encrypt at least part of each user record. It was well understood that sensitive data stored in a database (such as user names and passwords) should be encrypted in order to protect it from malicious users before the effective filing date of the '622 Patent. A POSITA would have appreciated that at least the password of the user record disclosed in Kirkwood is sensitive data and would have been motivated to encrypt at least this part of the user record in order to protect it.

156. The obviousness of such a combination is confirmed by Boneh, which expressly states that "web sites should ensure that sensitive data stored in their databases is always encrypted." (Boneh, [0006]). Boneh explains that "[h]ackers have broken into web server databases, thereby compromising … private user/customer information" and that this should be guarded against by ensuring that the private information is always encrypted. (*Id*., [0005-0006].)

157. Furthermore, Boneh expressly identifies "information related to user passwords" as an example of sensitive data and discloses "cryptographic operations [that] include hashing and keyed hashing of data received at the server system." (*Id*., [0016]; *see also id.*, Fig. 6 and [0013] ("FIG. 6 is a flow diagram of transparent encryption … that protects user passwords against dictionary attacks").)

158. Moreover, encrypting data in a database (in particular sensitive information like passwords, was a well-known practice. The '622 Patent uses the term "encryption" without providing any details about particular encryption techniques. Hashing techniques, like the one described in Boneh, were well-known forms of encryption that were commonly employed for encrypting passwords stored in databases.

159. Thus, a POSITA would have been motivated to encrypt at least the password in the user database record disclosed by Zydney and Kirkwood. Accordingly, a POSITA would have understood that Zydney in view of Shinder, Kirkwood, and Boneh teaches user records wherein at least part of each user record is encrypted.

C. CLAIM 5 IS OBVIOUS OVER ZYDNEY AND GRIFFIN

160. Claim 5 depends from claims 3 and 4. All of the elements of claims 3, 4, and 5 are disclosed by the combination of Zydney and Griffin.

[3.1] A system comprising:

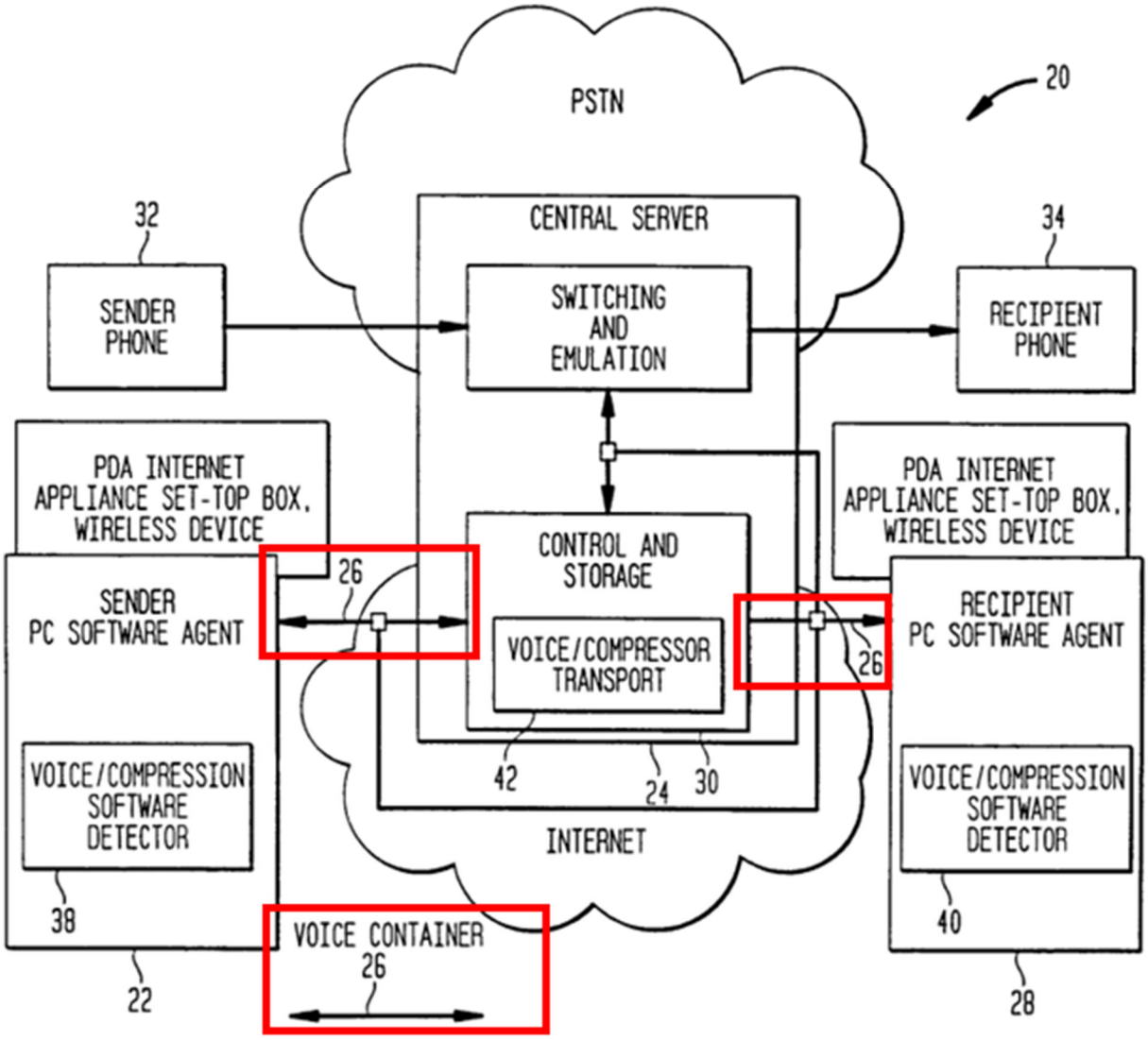
161. If the preamble is limiting, then it was at least obvious over Griffin and Zydney. Specifically, Griffin discloses an instant voice messaging system. *See* Griffin, Figs. 2 and 3, 1:6-12, 3:49-5:15; [3.2-3.6] *infra*.) Furthermore, Zydney also discloses an instant voice messaging system. (*See* Section XI.A *supra*; [3.2-3.6] *infra*.)

[3.2] a network interface connected to a packet-switched network;

162. The ’622 Patent does not provide much detail regarding the claimed “network interface” or much guidance on the meaning of this term. With respect to the IVM server 202, the specification merely states: “The IVM server 202 is a general-purpose programmable computer equipped with a network interface, such as an Ethernet card, to provide connectivity to a network 204.” (Ex. 1001, 13:41-44.) The exemplary “Ethernet card” mentioned in the ’622 Patent was a well-known piece of hardware for providing an interface by which a computer could communicate on a network.

163. Griffin, alone and in combination with Zydney, discloses and renders obvious the claimed “network interface.” Zydney describes a system in which clients create and transmit instant voice messages in the form of “voice containers.” (Zydney, 12:1-8, 10:20-11:3, Fig. 1A.) A client system includes a software agent that can transmit the voice container over the Internet to a central server, which can then deliver the voice container to a recipient over the Internet. (*Id*., 13:1-6, 13:12-18, 14:6-13, Figs. 4, 8.) This is shown in Figure 1A, which depicts “transmission line 26” connecting the client systems to the central server through the Internet. (*Id.*, 10:21-23, Fig. 1A (line 26).)

FIG. 1A



(Zydney, Fig. 1A (highlighting added)).

164. Zydney does not specifically describe the computing hardware for connecting the clients and the central server to a network. However, it would have been obvious to a POSITA that Zydney included a "network interface" as claimed. This is because the central server would have needed such an interface in order to connect to the Internet as shown in Figure 1A. (*Id.*) The presence of a "network

interface" would thus have been obvious based on the disclosures of Zydney alone, when combined with the knowledge of a POSITA.

165. Furthermore, Griffin discloses a network interface in two independent ways.

166. First, regarding Figure 3, Griffin explains that each terminal 100 contains a "network interface 306" ("network interface") for communicating with server 204. (Griffin, 4:44-51; *id*., 3:51-65, Fig. 3.) Network interface 306 "comprises the entire physical interface necessary" for terminal 100 "to communicate with the server 204, including a wireless transceiver." (*Id*., 4:44-51.)

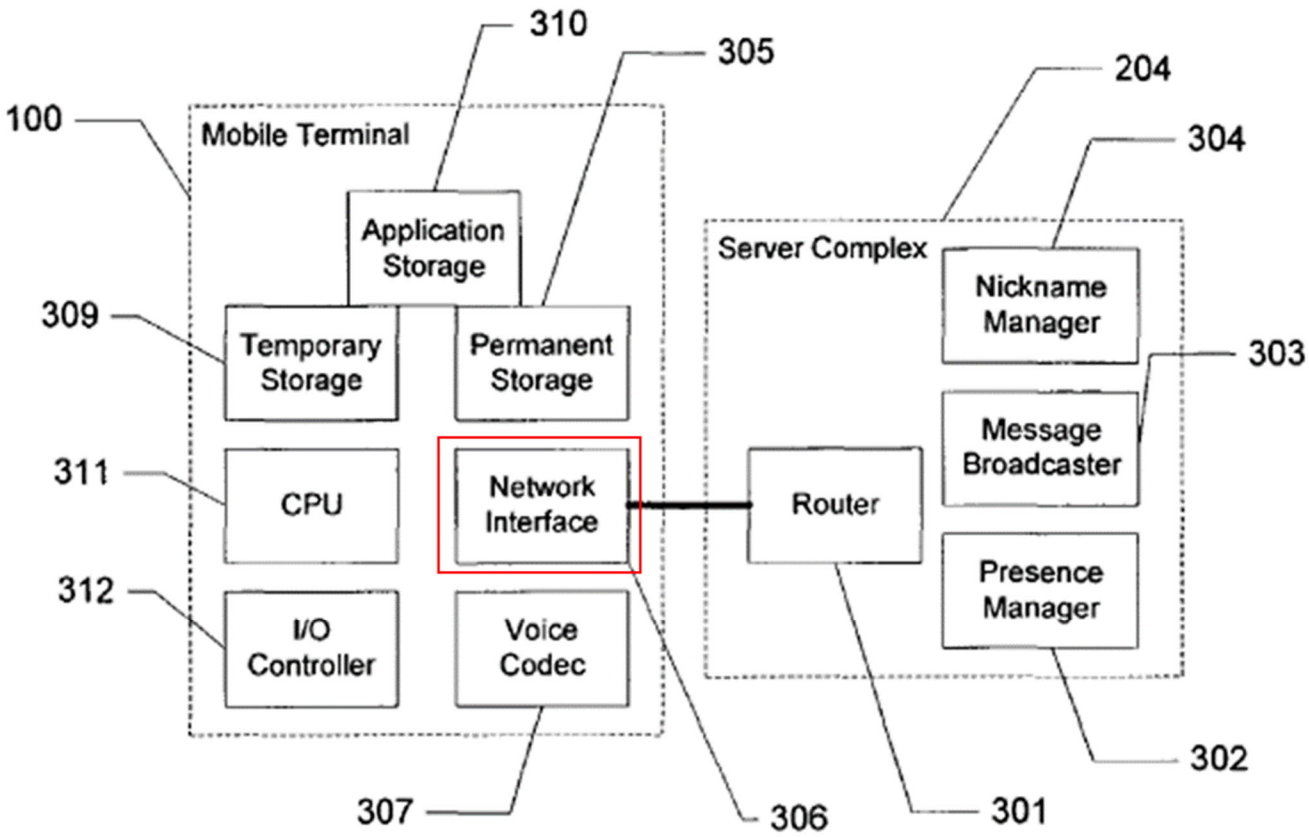


FIG. 3

(Griffin, Fig. 3 (highlighting added)).

167. Network interface 306 is connected to "a packet-switched network," as claimed. For example, as shown in Figure 2, Griffin explains that "data packets" communicated between terminals 100 are transmitted through network 203. (Griffin, 3:51-65; id., 4:44-51, Fig. 2.) Network 203 "is a packet-*based* network," such as "the *Internet*." (*Id*., 3:59-65 (emphasis added).) Additionally, as explained in the '622 Patent, and as was well known in the art, the *Internet* is a packet-*switched* network. (Ex. 1001, 1:37-43, 1:52-55, 7:2-4; Ex. 1010, 838-39, 894, 935-36; Ex. 1013, 89-93; Ex. 1017, 24-25, 157-58.)[10] Accordingly, network interface 306 is a component that provides connectivity to a packet-switched network.

168. Griffin also discloses a "network interface" in a second way. In particular, Griffin explains that server 204 is connected with network 203 for communicating with terminals 100 (Griffin, Figs. 2-3, 3:51-61, 4:61-5:15, 6:56-7:17) and that messages flow into server 204 "via the router 301" (id., 4:62-5:9; id., Fig. 3 (below), 7:8-11).

[10] Exhibits 1010, 1013, and 1017 are cited to demonstrate the state of the art.

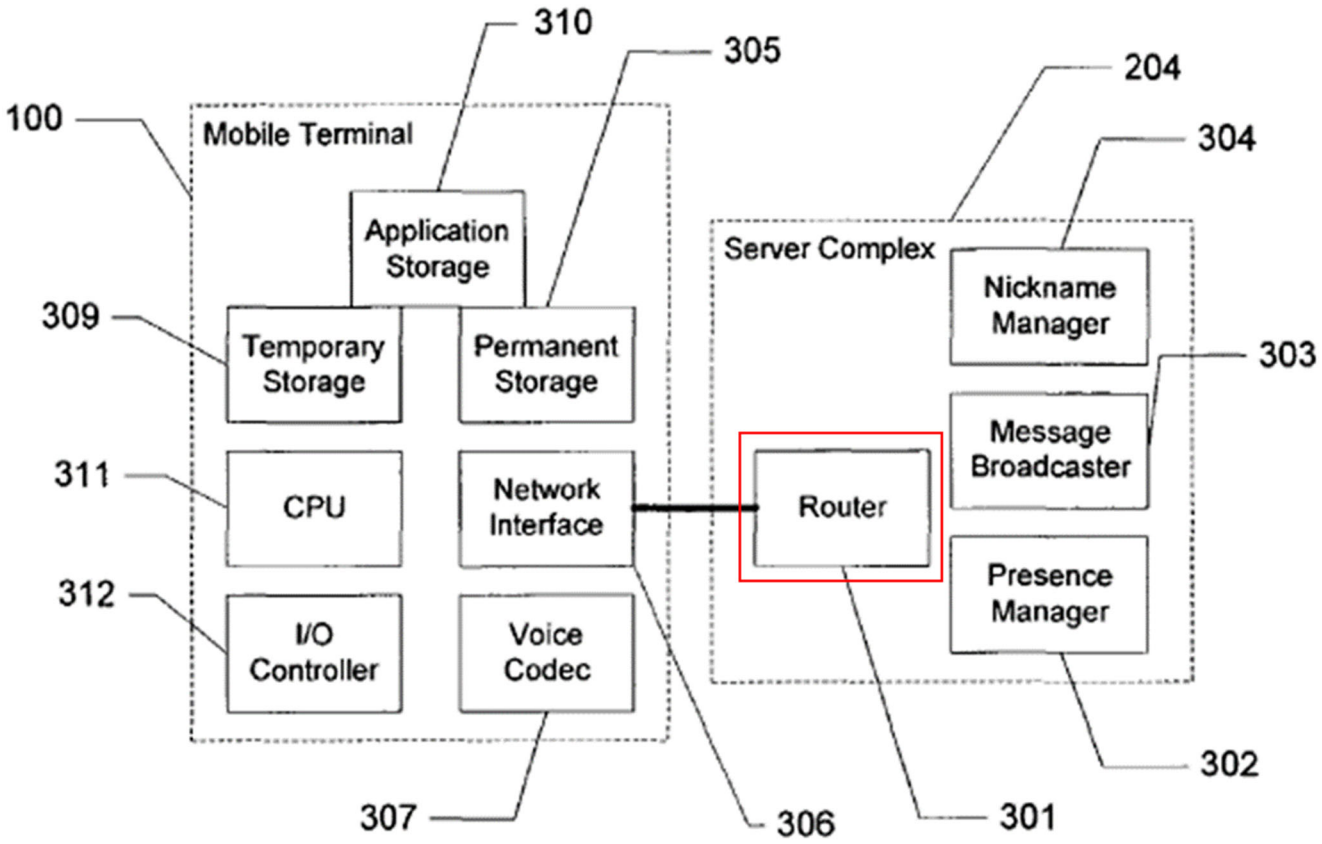


FIG. 3

(Griffin, Fig. 3 (highlighting added)).

169. FIG. 3 describes "components found in both the terminals 100 and the server complex 204" (*id.* at 4:27-28), specifically network interfaces:

> "Outbound chat messages sent to the server complex 204, as well as those inbound chat messages received from the server complex 204, pass through the network interface 306 that provides connectivity between the terminal and the data network. Where the terminal 100 comprises a wireless device, the network interface 306 comprises the entire physical interface necessary to communicate with the server complex 204, including a wireless transceiver."

(Id. 4:44:52).

170. This passage of Griffin confirms that a networked system, such as the instant messaging system of Zydney, cannot even function without a network interface for connecting the computing devices to the network. Griffin thus confirms the claimed "network interface" would have been an apparent and obvious component of any computing device connected to a network.

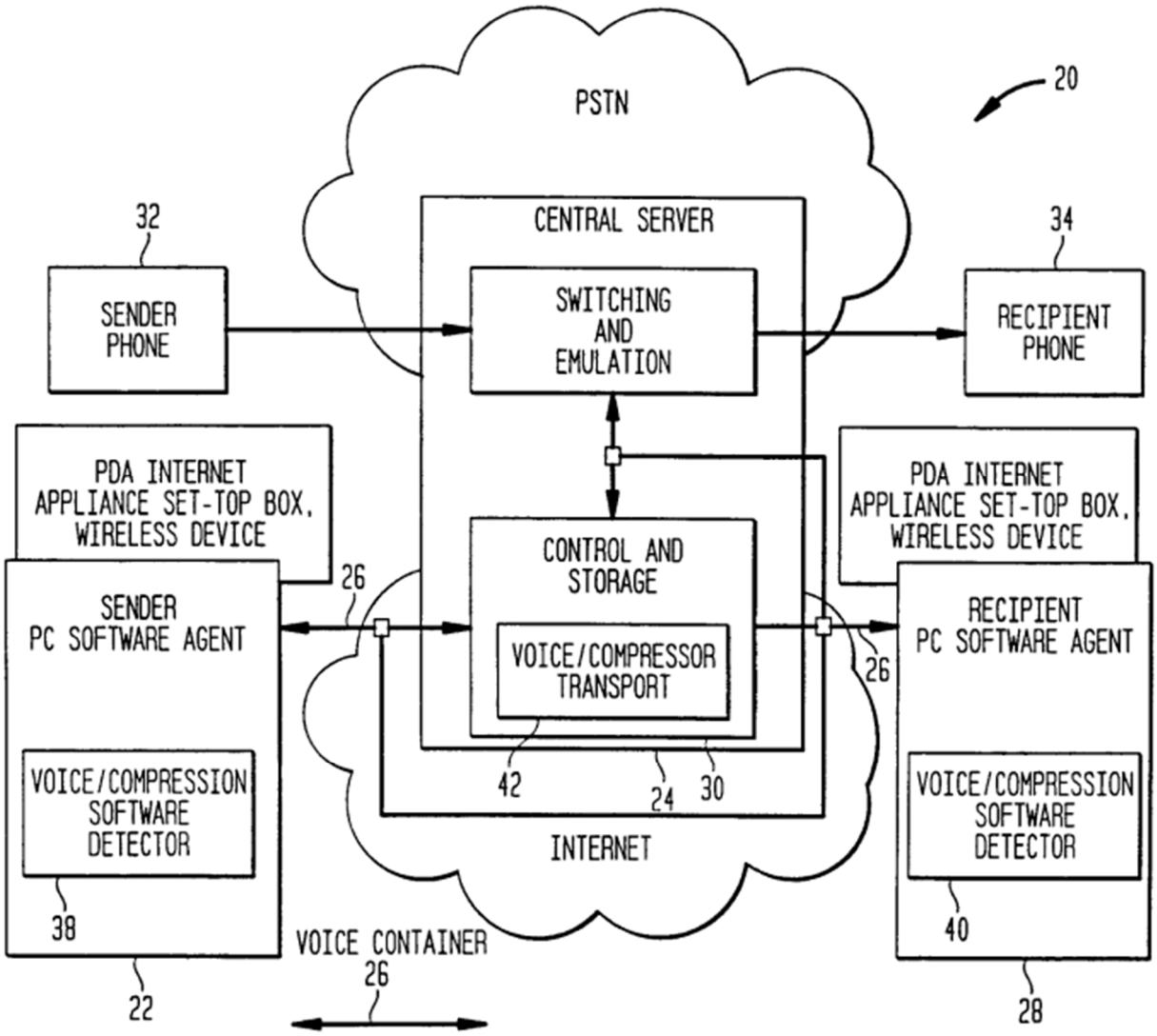
171. Although Griffin describes "the network interface 306" as comprising "the entire physical interface necessary to communicate with the server complex 204" (Griffin at 4:49-51), and thus as being part of a terminal, a POSITA would recognize that the "server complex 204" must possess a network interface as well in order to receive the communications from the terminal. In particular, a POSITA would recognize the "router" of the "server complex 204" as having network interface with which it transmits and receives "the data traffic comprising encoded speech and text messages." (*See* Griffin at 4:61-5:9.) A POSITA would also understand that the router 301 is operable to interface with a packet-switched network since, as explained above, network 203 "is a packet-based network," such as "the Internet" (*id*., 3:59-65 (emphasis added), which the '622 Patent identifies as an example of a "packet-switched network."

172. Thus, a POSITA would understand both the "terminal 100" and the "server complex" of Griffin to have network interfaces connected to a packet-switched network.

173. Zydney describes a system that includes agents 22, 28, and central server 24, which together facilitate instant voice messaging between agents. (Zydney, 10:19-11:6.) Zydney explains that agents 22, 28 may be implemented on any suitable client device (e.g., PDA). (*Id*., 11:14-20.) As shown in Figure 1 (below), agents 22, 28 communicate with one another and with server 24 via a connection to the Internet through transmission line 26. (*Id*., Figs. 1-2; id., 1:2-3, 2:6-10, 5:3-7,

5:15-18, 10:11-16, 14:2-5, 23:11-12.)

FIG. 1A



(Zydney, Fig. 1A.)

174. Accordingly, Zydney discloses that agents 22, 28 and server 24 are connected to a packet-switched network (e.g., Internet). And, as a POSITA would have known, the component and/or functionality that provides connectivity to the network is a network interface. This is confirmed by Zydney's explanation that

communication is "over a set of well-known ports" (Ex.1004, 26:1-2), and Zydney's discussion of well-known network interface components, such as a modem (id., 17:5-9; id., 28:16-18, 30:11-13.)

175. In view of these teachings, a POSITA would have understood that the common implementation of the connections of clients and server systems to a network is through network interfaces on both the server and the clients. Providing a network interface was also within the basic knowledge of a POSITA. The '622 Patent itself explains that the network interface can include "an Ethernet card, to provide connectivity to a network 204." (Ex. 1001, 13:41-44.) An Ethernet card is an example of a NIC that was commonly installed in computers, including computers used as servers, connected to a network. A POSITA would thus have fully understood the need for network interfaces to couple the central server and agents of Zydney to the Internet.

176. Therefore a POSITA would have viewed combining Griffin's and Zydney's teachings as simply a common and logical technical detail. Such a specification maintains the functionality of Griffin, without modifying the teachings of Zydney.

177. Moreover, because both Griffin and Zydney are in the same technical field of network communication systems, teach solutions to common problems in the field, and describe technologies that were well known, similar, and compatible,

a POSITA would have been encouraged to look to Zydney to complement the teachings of Griffin. (Griffin, 1:8-12, 3:59-65, 4:10-15; Zydney, Abstract, 5:1-5, 10:11-18.)

178. Therefore, Griffin, alone and in combination with Zydney, discloses and renders obvious the claimed "network interface."

[3.3] a messaging system communicating with a plurality of instant voice message client systems via the network interface; and

179. Both the claim and the specification of the '622 Patent describe the claimed "messaging system" only by its function, rather than its structure. (Ex. 1001, 13:46-60, 22:34-40.) For example, the claim describes the "messaging system" as some unspecified component and/or functionality that is "communicating with a plurality of instant voice message client systems via the network interface." Similarly, the specification describes "messaging system 436" as some unspecified component and/or functionality that is "able to communicate with the IVM clients 206, 208." (Ex. 1001, 13:57-60.) Griffin discloses a component and/or functionality that performs the same function as the claimed "messaging system."

180. For example, as shown in Figures 2 and 3 (below), Griffin explains that server 204 includes a message broadcaster 303 ("messaging system"), which communicates with terminals 100 ("a plurality of instant voice message client

systems") via router 301 ("network interface") and network interface 306 ("network interface").

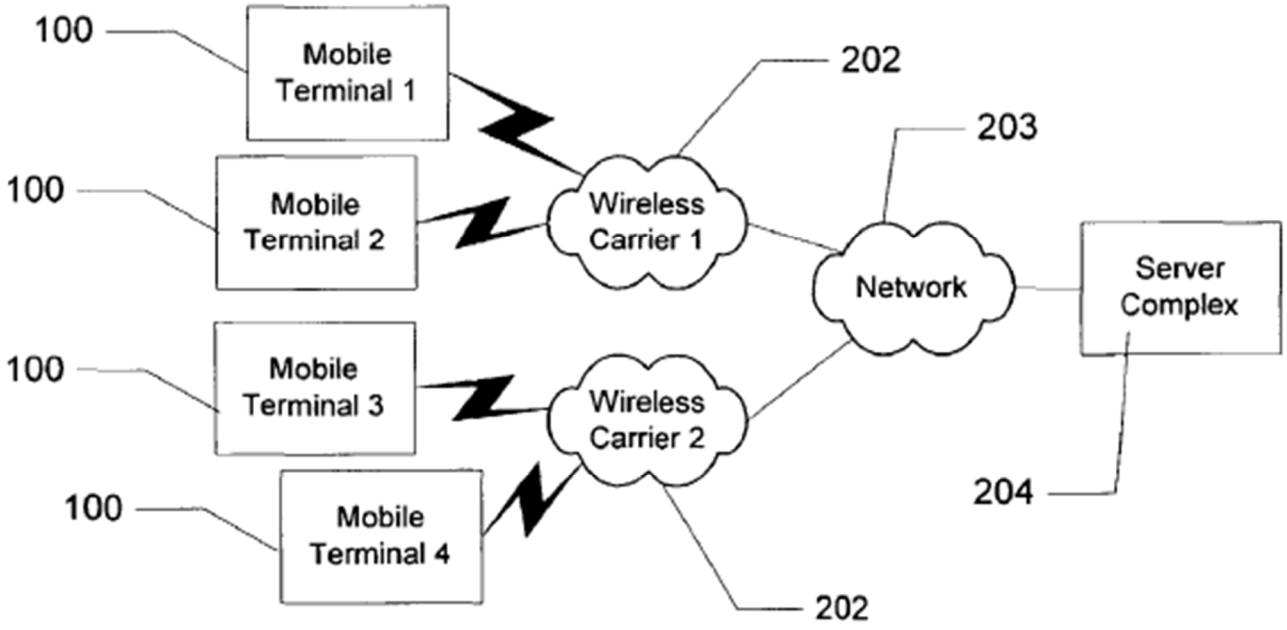


FIG. 2

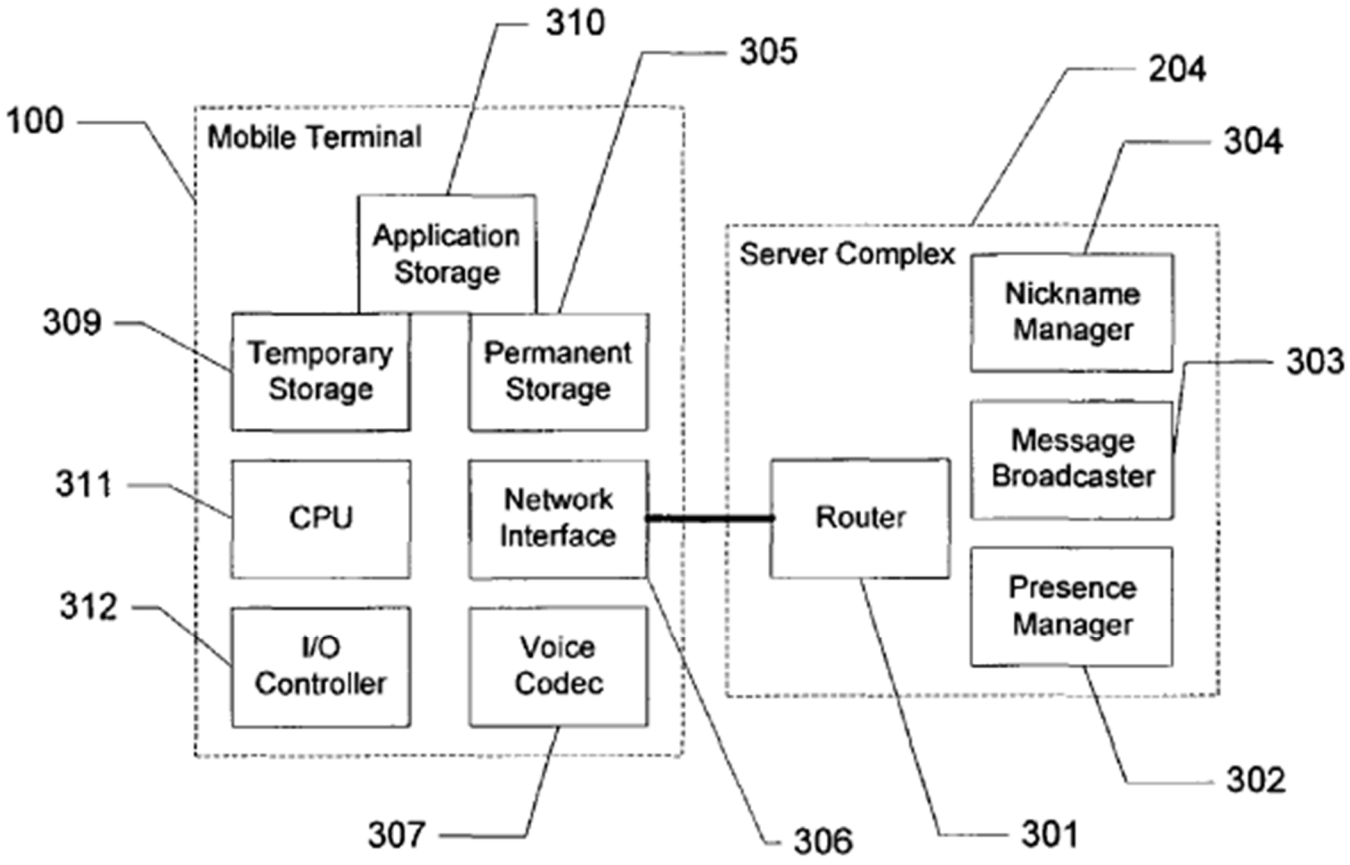


FIG. 3

(Griffin, Figs. 2 and 3).

181. Outbound messages from terminal 100 "pass through the network interface 306" (Griffin, 4:44-48) and into server 204 "via the router 301" (id., 4:62-65), which "directs the outbound chat message 400 towards a message broadcaster 303" (id., 5:2-5; id., 6:38-44.) Broadcaster 303 decomposes outbound messages to determine target terminal(s) 100 (id., 6:56-61), composes inbound messages for each available target terminal 100 (id., 6:61-7:1), and sends the inbound message to each available target terminal 100 over network 203 "via the router 301" (id., 7:8-11; id.,

5:2-15.) Inbound messages that are received by a target terminal 100 "pass through the network interface 306." (*Id*., 4:44-48.)

182. Accordingly, broadcaster 303 discloses the claimed "messaging system," as it is a component and/or functionality for communicating with client systems (i.e., terminals 100) via network interfaces (i.e., router 301, network interface 306).

183. Moreover, terminals 100 are "instant voice message client systems," as claimed. Indeed, Griffin explains that the messages transmitted between terminals 100 via server 204 may be speech (i.e., voice) messages. (Griffin, Title ("Voice and Text Group Chat"), 1:7-11, 3:20-22, 3:28-30, 4:11-18, 4:27-29, 4:40-44, 4:52-56 (encoding/decoding speech using a "voice codec"), 4:62-65, 5:9-15, 6:38-44, 8:47-52, 9:27-31, 10:36-43 ("speech content of an outbound voice message"), 10:53-58, 11:42-12:3, 12:24-28, 12:38-47.)

184. Additionally, each speech message is an "instant" voice message, as claimed, because it is a voice message transmitted in "real-time" to an available recipient terminal 100. (*Id*., 1:6-11; id., 4:11-18, 4:40-56, 4:62-65, 5:2-15, 6:38-44, 6:56-7:1, 7:8-17, 8:8-14, 8:47-52, 9:27-31, 10:36-52, 11:42-47, 12:1-17.) Griffin's description of real-time speech messaging is consistent with how instant messaging is described in the specification of the '622 Patent, and was understood in the art. (Ex. 1010, 435, 936; Ex. 1011, 3-4; Ex. 1012, 1; Ex. 1014, 4-6, 11-14, 18, 218, Fig.

1.2; Ex. 1015, 9-10; Ex. 1016, 3; Ex. 1018, 36; Ex. 1022, ¶¶3-9; Ex. 1023, 2:12-3:27, 3:9-27.)[11] For example, like the system/process described in the specification of the '622 Patent (Ex. 1001, 2:34-46, 8:1-39, 11:31-61), Griffin's system/process includes terminals 100 that are presented with information regarding the availability of other terminals 100 for messaging and facilitates the immediate transmission of speech messages between available terminals 100 via server 204 (Griffin, 1:6-11, 4:11-18, 6:56-7:1, 7:8-17, 8:47-52, 9:23-31).

[3.4] a communication platform system maintaining connection information for each of the plurality of instant voice message client systems indicating whether there is a current connection to each of the plurality of instant voice message client systems,

185. The claim describes the "communication platform system" only by its function, rather than its structure by reciting it as some unspecified component and/or functionality that is "maintaining connection information…." While the specification of the '622 Patent does not recite the term "communication platform system," similar to the claim language, it describes a "communication platform" as some unspecified component and/or functionality that is "providing contact presence (connection) information." (Ex. 1001, 14:64-15:3; id., 13:46-55, 14:64-67, 22:34-

[11] Exhibits 1010-1012, 1014-1016, 1022, and 1023 are cited to demonstrate the state of the art.

42, 22:67-23:6.) Griffin in view of Zydney discloses a component and/or functionality that performs the same function as the claimed "communication platform system."

186. Griffin explains that server 204 includes presence manager 302 ("communication platform system"), which maintains a plurality of "presence data records 700" for terminals 100 ("instant voice message client systems"). (Griffin, 4:62-5:2, 5:11-30.) As shown in Figure 7 (below), each record (i.e., row) indicates the status 702 of a terminal 100, which is "an indicator of whether the recipient is ready to receive the particular type of message." (*Id*., 5:11-30.)

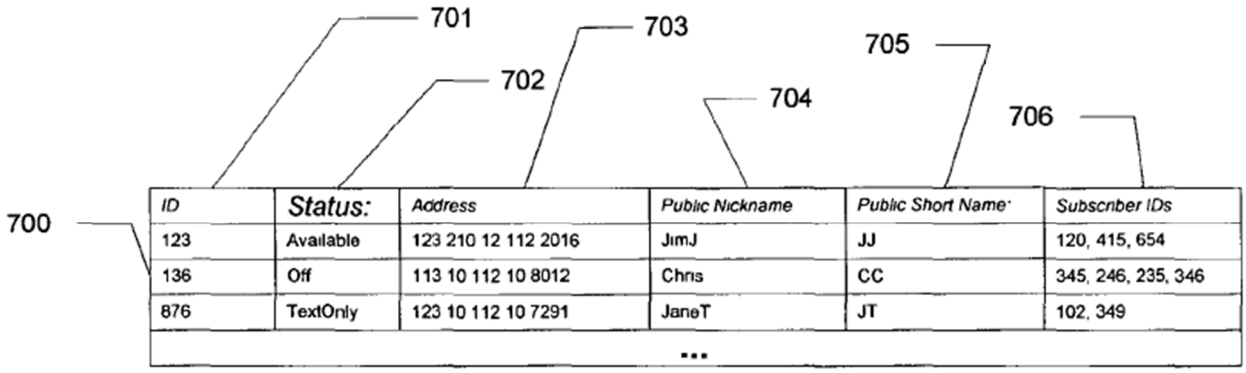


FIG. 7

(*Id*., Fig. 7.)

187. Griffin explains that broadcaster 303 "determines the status 702 of the target by locating the target's identifier in a presence record 700 with the matching identifier 701," and "for each available target (i.e., where the presence record indicates that the recipient can receive the message type 401), the broadcast manager 303 [sic], composes an inbound chat message 500," and then "sends the inbound

message 500 to the receiver's terminal 100 via the router 301." (*Id*., 6:61-7:11.) Presence manager 302 tracks changes to each terminal's current status 702 and informs other terminals of such changes. (*Id*., 5:15-22, 5:27-30, 7:39-42, 7:48-49, 8:1-8, Fig. 6.)

188. Accordingly, each data record 700 corresponds to one of the plurality of terminals 100 (e.g., identified by identifier 701). Moreover, status 702 indicates whether a corresponding terminal 100 is available to receive messages. (*Id*.) While Griffin does not provide additional details regarding what precisely status 702 indicates, it would have been obvious to a POSITA to configure the system such that status 702 to include connectivity information indicating whether client 100 is currently connected to server 204, based on the teachings of Zydney.

189. Zydney describes a system having a central server 24 that facilitates instant voice messaging between a sender agent 22 and a recipient agent 28 over a packet-switched network depending on the recipient agent's connectivity status. (Zydney, 1:2-3, 10:11-11:20, Figs. 1-2.) Central server 24 maintains and conveys the connectivity status of each agent in the network. (*Id*., 13:12-14, 14:6-9, 14:19-22, 30:13-15.) According to Zydney, an agent's connectivity status includes "the core states of whether the recipient is online or offline, but also offers related status information, for example whether the recipient does not want to be disturbed." (*Id*., 14:17-15:1, 32:9-33:2.) For instance, if an agent is "logged onto the system" and

available for messaging, the agent's connectivity status is "Available." (*Id*., 32:9-20.) If the agent is logged off of the system, the agent's connectivity status is "Not logged on." (*Id*., 33:1-2.) Accordingly, Zydney discloses maintaining connection information for each agent indicating whether there is a "current connection" to the system, as claimed.

190. It would have been obvious to a POSITA at the time of the alleged invention to combine these teachings of Griffin and Zydney by known methods without changing their respective functions. The combination would have predictably resulted in Griffin's presence manager 302 ("communication platform system") maintaining connection information for each terminal 100 in records 700, such that status 702 indicates whether each client 100 is currently connected to server 204. A POSITA would have been motivated to combine these teachings in such a way for several reasons.

191. First, Griffin discloses a system that maintains information regarding the availability of each terminal 100 to receive speech messages (Griffin, 5:15-30, 6:61-7:11), and it was well known and common in instant messaging systems at the time for such information to indicate whether there is a current connection (Ex. 1022, ¶7; Ex. 1023, 3:9-27; Ex. 1014, 4-6, Fig. 1.2.) Indeed, a POSITA knew that a network/server connection was imperative for instant messaging systems like that described in Griffin, and thus would have been driven by common sense to maintain

information regarding connectivity in implementing such a system. In fact, instant messaging systems at the time maintained and used such information to determine whether communication with a potential recipient was possible, and conveyed such information to interested users for the same purpose. (Ex. 1022, ¶7; Ex. 1023, 3:9-27; Ex. 1014, 4-6, Fig. 1.2.) Therefore, a POSITA would have readily ascertained that status 702 could have been configured to indicate whether terminal 100 is currently connected to server 204, and recognized the benefits of such an implementation.

192. Moreover, similar to the teachings of Griffin, Zydney explains that connectivity status can be maintained and conveyed to others so that the system and its users can conveniently determine which agents are currently able to exchange messages, and proceed accordingly. (Zydney, 14:20-15:1, 14:9-11, 16:7-17.) Zydney further explains that, by maintaining and conveying connectivity status, agents can better determine an appropriate mode of communication. (Zydney, 14:19-20, 15:3-21.) By implementing these teachings in Griffin's system/process, the same advantages would have been realized.

193. Furthermore, a POSITA would have been encouraged to look to Zydney to complement the features of Griffin for reasons similar to those discussed above. (*See supra* ¶¶162-178.)

[3.5] wherein the messaging system receives an instant voice message from one

of the plurality of instant voice message client systems, and

194. Griffin discloses these features. For example, as discussed above for element [3.4], Griffin discloses that broadcaster 303 ("messaging system") receives speech messages from terminals 100 ("instant voice message client systems"). For example, Griffin describes a terminal 100 transmitting an outbound message 400 to server 204 over network 203 via network interface 306 and router 301. (Griffin, 3:51-61, 4:44-54, 4:62-65.) The router "directs" the outbound message to broadcaster 303 ("messaging system"). (*Id*., 5:2-5.)

195. Additionally, as previously discussed, each speech message is an "instant voice message." (*See supra* ¶¶185-193.)

[3.6] wherein the instant voice message includes an object field including a digitized audio file.

196. Griffin in view of Zydney discloses these features. For example, Griffin describes an outbound message 400 received by broadcaster 303 from terminal 100. (Griffin, 2:51-52, 6:38-39; [3.5] *supra*.) As previously discussed, Griffin explains that message 400 can contain speech. (Griffin, 4:11-15; [3.3] *supra*.) As shown in Figure 4 (below), Griffin explains that message 400 can include a message type field 401, which indicates the type of content contained in the message, such as "text, speech, and so on." (Griffin, 6:39-44; id., 10:39-43.) Thus, while field 401 in Figure 4 recites "TEXT" to indicate a text chat message, a POSITA would

have understood that field 401 would recite "SPEECH" (or something similar) to indicate a speech message.

197. Griffin also explains that message 400 includes a message content field 406, as shown in Figure 4. (Griffin, 6:39-44.) Because Griffin discloses that message 400 may be a speech message, as discussed above ([3.3] *supra*), while message 400 illustrated in Figure 4 includes text data ("hello") in field 406 for a text chat message, a POSITA would have understood that field 406 would include speech data for a speech message. Accordingly, in the case of a speech message, field 406 discloses the claimed "object field," because it is speech data included in message 400.

198. Even if Griffin could be read such that the speech data is not contained in field 406, given message 400 carries speech data ([3.3] *supra*), the speech data would nevertheless disclose the claimed "object field." This is similar to how the "object field" is described in the '622 Patent, which explains that the "content of the object field is a block of data being carried by the message object." (Ex. 1001, 14:38-40.)

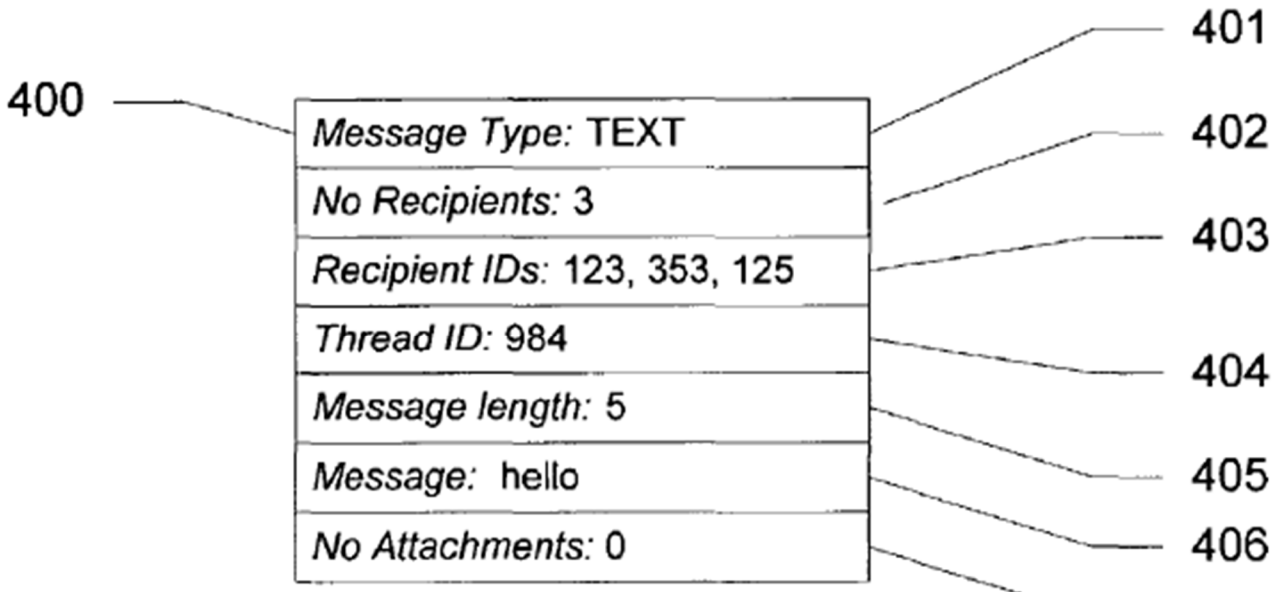


FIG. 4

(Griffin, Fig. 4.)

199. However, Griffin does not expressly disclose that the speech data contained in field 406 ("object field") is a "digitized audio file," as claimed. Nevertheless, it would have been obvious to a POSITA at the time of the alleged invention to modify Griffin's system/process to implement such features in view of the teachings of Zydney.

200. For example, Zydney explains that a client software agent in a sender device 22 generates a voice message by "digitally recording" the user's speech "using a microphone-equipped device." (Zydney, 16:1-3.) This digital voice recording is then compressed and stored as an audio file ("digitized audio file"). (*Id*., 16:3-4; id., 21:15-18, 39:16.) Zydney explains that the voice recording can be an MP3 audio file (id., 39:16), and played using a "MPEG Layer-3 (MP3) audio play-

back devices." (*Id*., 21:15-18.) The software agent in Zydney then packs the digital audio file into a voice container having "voice data or voice data and voice data properties." (*Id*., 12:6-8; id., 14:2-5, 23:1-11.) Zydney also explains that the voice container can be formatted using the Multipurpose Internet Mail Extension (MIME) standard, which "allows for non-textual messages and multipart message bodies attachments to be specified in the message headers." (*Id*., 19:7-10; id., 19:13-20:9.)

201. In view of these teachings and the knowledge of a POSITA, a POSITA would have been motivated to modify Griffin's system/process such that outbound message 400 ("instant voice message") includes an object field (similar to field 406) having a digital audio file of speech data, similar to as described in Zydney. A POSITA would have recognized that such a modification would have been nothing more than a simple substitution of one known and commonly-used technology for another (e.g., a digital audio file in place of other forms of data) to achieve the predictable result of a speech message having an object field including a digital audio file.

202. A POSITA would have been motivated to make such a modification given that Griffin already discloses that speech is "encoded" using a "voice codec" (Griffin, 4:52-53), which was a known way to output digital data. Similarly, Griffin discloses storing and communicating speech data in electronic form (e.g., field 406), as discussed above. (*Id*.) Additionally, digital audio files were well known and

commonly used in the art and had many well-known benefits. (*Id*.; Ex. 1027, 8:26-27.)[12] For example, digital audio files (i) can be easily and efficiently stored, manipulated (e.g., encrypted), and played on various types of devices, (ii) can be easily and efficiently transmitted over digital networks, like the Internet, and (iii) are less susceptible to errors. This, coupled with the teachings of Griffin and Zydney, would have motivated a POSITA to include a digital audio file in an object field of a speech message. (*Id*.)

203. Furthermore, a POSITA would have been encouraged to look to Zydney to complement the features of Griffin for reasons similar to those discussed above. (*See supra* ¶¶185-193.)

[4.1] The system according to claim 3, wherein the instant voice message includes an action field identifying one of a predetermined set of permitted actions requested by the user.

204. Griffin in view of Zydney discloses these features. Griffin explains that a user operating a terminal 100 may playback a received speech message ("instant voice message") (Griffin, 12:38-40), but Griffin does not explicitly disclose a message having an "action field," as claimed. However, it would have been obvious to a POSITA at the time of the alleged invention to modify Griffin's system/process

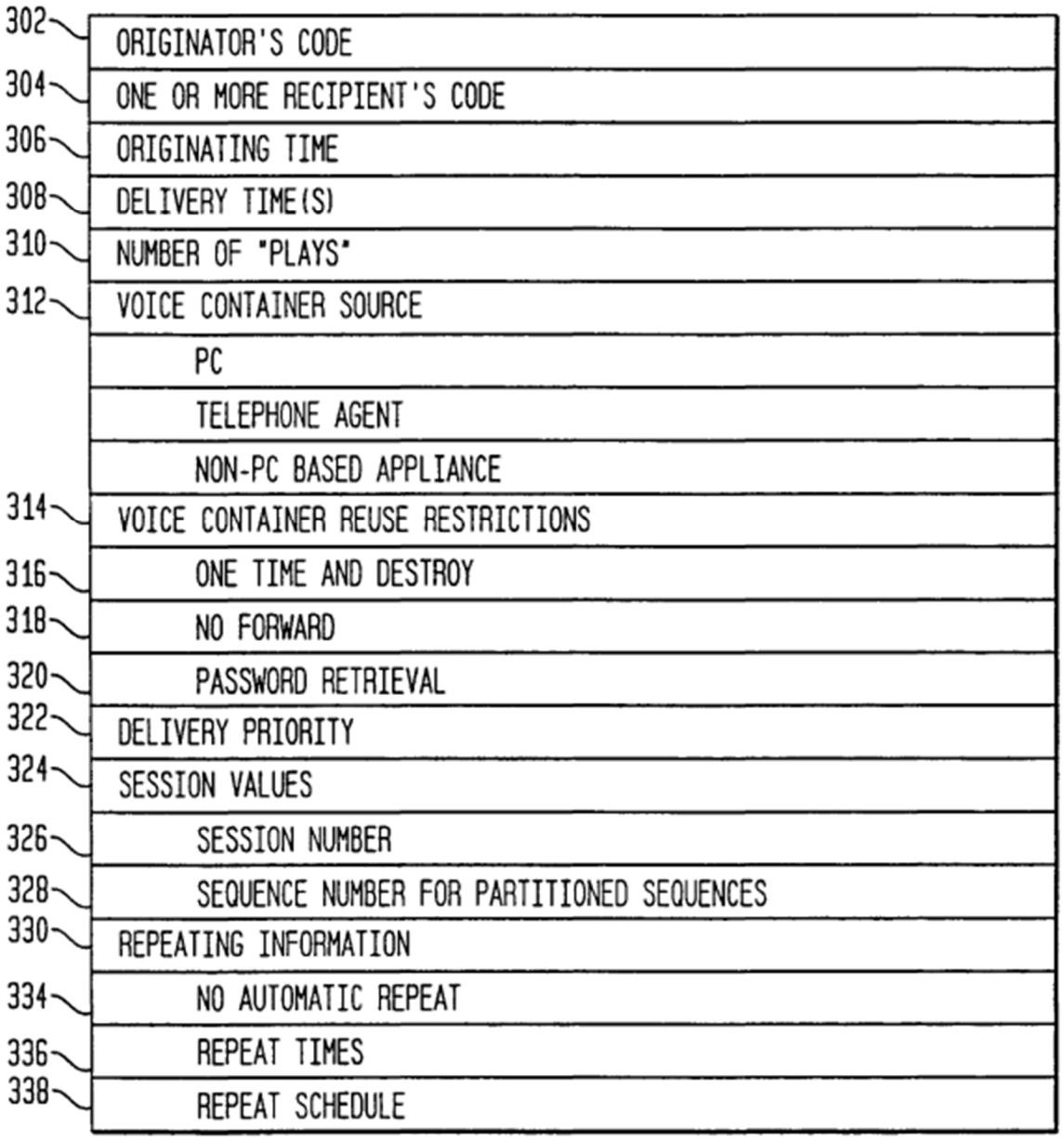
[12] Exhibit 1027 is cited to demonstrate the state of the art.

to implement such features in view of the teachings of Zydney and the knowledge of a POSITA.[13]

205. Zydney discloses a software agent that generates and sends a message in a voice container, like that illustrated in Figure 3 (below). (Zydney, 14:2-5; *see also* [3.6] *supra*.)

[13] Zydney does not explicitly recite the term "field." However, for reasons discussed herein, Zydney does disclose messages having fields that contain data identifying permitted actions. Thus, Zydney discloses the claimed "action field."

FIG. 3



(Zydney, Fig. 3.)

206. The voice container includes fields that contain data identifying permitted actions, including reuse restriction fields 314 that control how the voice message can be reused after it is transmitted, and repeating information fields 330

that specify whether a message is automatically repeated, and if so, how many times and on what schedule. (Zydney, 23:1-12.) Zydney explains that such fields are requested by the user. For example, Zydney explains that the fields of the voice container "may be tailored to the use desired by the user." (Zydney, 12:8-9.) Zydney further discloses that the software agent can set various "privacy features" related to forwarding messages from one agent to another or denying such forwarding, etc. (*Id*., 26:20-23.) Indeed, it would have been obvious to provide users with the ability to control messages in such a way for enhanced security. Accordingly, Zydney discloses or renders obvious including in an instant voice message action fields containing data identifying one of a predetermined set of permitted actions requested by the user.

207. In view of these teachings and the knowledge of a POSITA, a POSITA would have been motivated to modify Griffin's system/process such that speech messages ("instant voice messages") include an action field, similar to as described in Zydney. In particular, in view of the teachings of Zydney, a POSITA would have recognized that such a modification would have improved the utility and convenience of Griffin's system/process by enabling a user to request certain predetermined actions relating to speech messages. Such a modification would have enabled a user to restrict how many times a message can be repeated after transmission, similar to as described in Zydney.

208. Moreover, a POSITA would have recognized that such a modification would have been nothing more than a straightforward combination of known technologies by known methods without changing their respective functions to achieve a predictable result, and would have been well within the capabilities of such a person. Indeed, based on Griffin's disclosures of configuring a speech message with various fields (Griffin, 6:38-44, Fig. 4), a POSITA would have been encouraged to expand such features based on other teachings in the field. This is further supported by Griffin's disclosure that many different "arrangements and methods can be implemented by those skilled in the art" (Griffin, 13:10-13), and that such a skilled person "will appreciate that other elements can be added to the outbound chat message" (*Id*., 6:52-55). Thus, to improve message and system security, a POSITA would have been encouraged to adapt Griffin's speech messages based on the teachings of Zydney to include additional fields for the purpose of identifying user-specified permitted actions. Additionally, as modified, Griffin's system would perform the same function of transmitting/receiving speech messages in much the same way, with the added ability to control the use of such messages through predetermined user-specified permitted actions, similar to as described in Zydney.

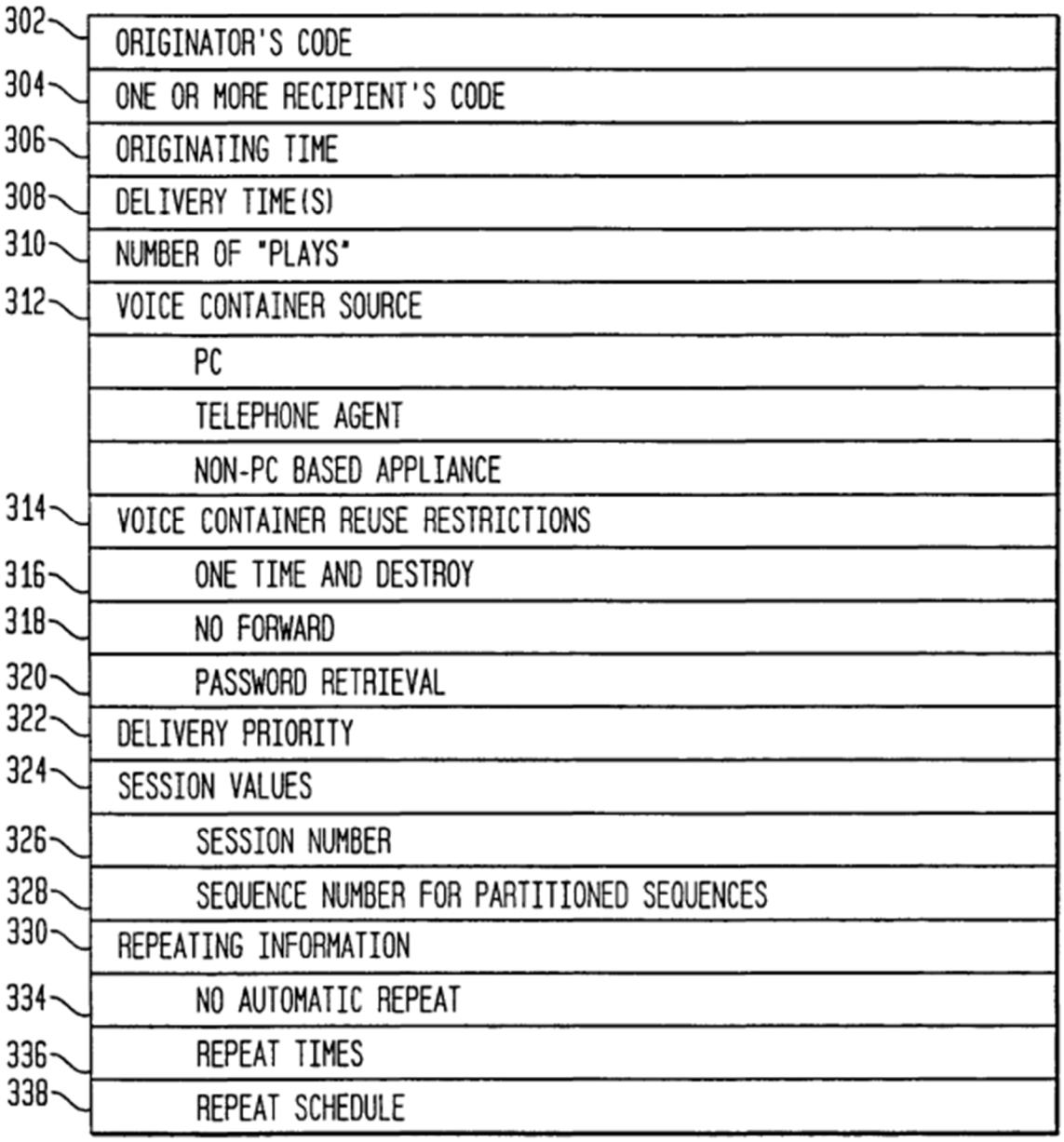
209. Furthermore, a POSITA would have been encouraged to look to Zydney to complement the features of Griffin for reasons similar to those discussed above. (*See supra* ¶¶185-193.)

[5.1] The system according to claim 4, wherein the predetermined set of permitted actions includes at least one of a connection request, a disconnection request, a subscription request, a message transmission request, and a set status request.

210. Griffin in view of Zydney discloses this limitation. As discussed above with respect to element [4.1], Zydney discloses or renders obvious an instant voice message action field containing data identifying one of a predetermined set of permitted actions requested by the user. (¶¶204-209 *supra*.) Zydney further discloses that at least one of the permitted actions is a **message transmission request**.

211. The voice container in Zydney includes fields that contain data identifying permitted actions including repeating information fields 330. (Zydney, Fig. 3, 23:1-12; *see also supra* ¶¶204-209.)

FIG. 3



(*Id*., Fig. 3.)

212. Zydney discloses that the permitted action fields include recipient codes that identify one or more recipients to whom the voice message should be transmitted, that the software agent can set various "privacy features" related to

forwarding messages from one agent to another, and that the fields of the voice container "may be tailored to the use desired by the user. (*Id*., Fig. 3, 12:8-9, 23:1-12.)

213. Furthermore, Zydney discloses an embodiment in which users are allowed to send and receive voice messages via conventional analog phones. (Zydney, 11:6-13). In this embodiment, a "user's agent 36 is located remote to the user and preferably proximate to or integrated with the server." (*Id*.) The remote agent "allows manual or pre-programmed control of the origination, distribution and listening to [the] messages, and also offers the options for ringing a pre-configured phone number at the recipient's request for the delivery of the message or forwarding the message to another Internet or voice container enabled device." (*Id*.)

214. Thus, Zydney discloses that actions permitted by users include requests for delivery (i.e., transmission) of messages by the remote agent to conventional analog phones and/or other Internet or voice container enabled devices." Accordingly, Zyndey teaches that a predetermined set of actions that includes a **message transmission request**.

215. A POSITA would have been motivated to combine Zydney's remote agent and message transmission request with Griffin's system since doing so would have enabled users to receive messages from Griffin's mobile terminals using

conventional analog telephones. Therefore, Griffin in view of Zydney teaches a predetermined set of actions that includes a message transmission request.

D. CLAIMS 9, 36, AND 37 ARE OBVIOUS OVER ZYDNEY AND SHINDER

1. Claim 9

216. Claim 9 depends from claim 3. As explained below, all elements of claims 3 and 9 are disclosed by the combination of Zydney and Shinder.

[3.1] A system comprising:

217. If the preamble is limiting, then it was at least obvious over Zydney and Shinder. Specifically, Zydney discloses an instant voice messaging system.

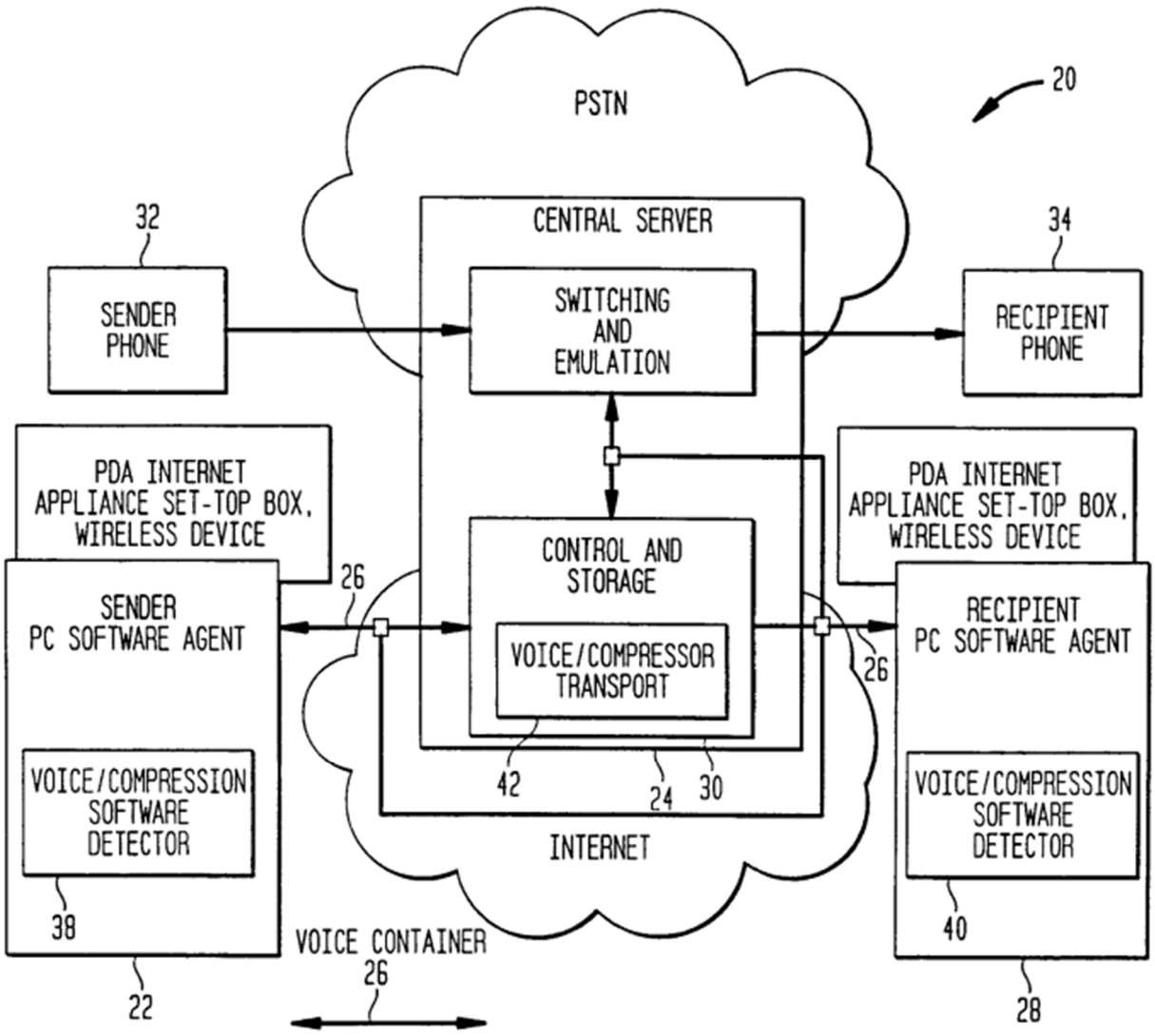
[3.2] a network interface connected to a packet-switched network;

218. The ’622 Patent does not provide much detail regarding the claimed “network interface” or much guidance on the meaning of this term. With respect to the IVM server 202, the specification merely states: “The IVM server 202 is a general-purpose programmable computer equipped with a network interface, such as an Ethernet card, to provide connectivity to a network 204.” (Ex. 1001, 13:41-44.) The exemplary “Ethernet card” mentioned in the ’622 Patent was a well-known piece of hardware for providing an interface by which a computer could communicate on a network. This indicates that the term “network interface” should

under its ordinary meaning refer to computing hardware that provides connectivity to a computer network. (*Id.*)

219. Zydney, alone and in combination with Shinder, discloses and renders obvious the claimed "network interface." Zydney describes a system in which clients create and transmit instant voice messages in the form of "voice containers." (Zydney, 12:1-8, 10:20-11:3, Fig. 1A.) A client system includes a software agent that can transmit the voice container over the Internet to a central server, which can then deliver the voice container to a recipient over the Internet. (*Id*., 13:1-6, 13:12-18, 14:6-13, Figs. 4, 8.) This is shown in Figure 1A, which depicts "transmission line 26" connecting the client systems to the central server through the Internet, as highlighted below. (*Id.*, 10:21-23, Fig. 1A (line 26).)

FIG. 1A



(Zydney, Fig. 1A).

220. Although Zydney does not describe the specific hardware used by the central server to connect the central server (24) to the Internet, it would have been obvious that it included a "network interface" as claimed. This is because the central server would have needed such an interface in order to connect to the Internet as

shown in Figure 1A. The presence of a "network interface" would thus have been obvious based on the disclosures of Zydney alone, when combined with the knowledge of a POSITA.

221. Nevertheless, in the event the Patent Owner were to argue that Zydney alone is insufficient to show the claimed "network interface," this limitation would have been obvious in view of Shinder, which describes network interface controllers (NICs) that were well-known in the prior art. (Shinder, pp.195-196.) Shinder explains that "[t]he most basic piece of hardware required to network computers is the NIC, also called a network adapter or network card." (*Id*., p.195.) Shinder further explains that "[s]ome sort of network interface is always required to communicate over a network." (*Id.*, pp.195-196.)

222. Shinder also explains that the network interface (such as a NIC) controls all incoming and outgoing data traffic to and from a networked computer: "Along with preparing the data to go onto the network media, the NIC is responsible for controlling the flow of data between computers and media and for receiving incoming data." (*Id*., p.196.) Shinder thus discloses the claimed "network interface."

223. It would have been obvious to a POSITA to combine Zydney with Shinder, with no change in their respective functions, predictably resulting in the instant voice messaging system of Zydney in which the central server contained a "network interface," such as a network interface card (NIC), to connect the server to

the Internet. Shinder itself provides a motivation to combine by explaining that "[s]ome sort of network interface is always required to communicate over a network." (Shinder, pp.195-196.) To the extent this requirement was not already known to a POSITA, Shinder would have clearly motivated a POSITA to provide a network interface to connect the central server of Zydney to the Internet. Indeed, Shinder would have confirmed that a "network interface" is not only desirable, but essential to allow the central server of Zydney to perform its communications functions within the instant messaging system. A POSITA would have thus found it obvious that the central server of Zydney would have been coupled to a network interface for communicating over the Internet, and the choice of which particular network interface to use would have been well within the grasp of a POSITA.

224. Providing a network interface was also within the basic knowledge of persons of ordinary skill in the art. The '622 Patent itself explains that the network interface can include "an Ethernet card, to provide connectivity to a network 204." (Ex. 1001, 13:41-44.) An Ethernet card is an example of a NIC that was commonly installed in computers, including computers used as servers, connected to a network. A POSITA would thus have fully understood the need for a network interface to couple the central server of Zydney to the Internet.

225. Zydney and Shinder also disclose that the network interface is connected to "a packet-switched network," as claimed. (Zydney, 10:21-23, Figs. 1,

1A.) The term "packet-switched network" generally refers to a communications network in which information is transferred through a series of data units called "packets." Zydney discloses transmission of voice containers over the Internet, which as shown below, is a "packet-switched network." (Zydney, Fig. 1A.)

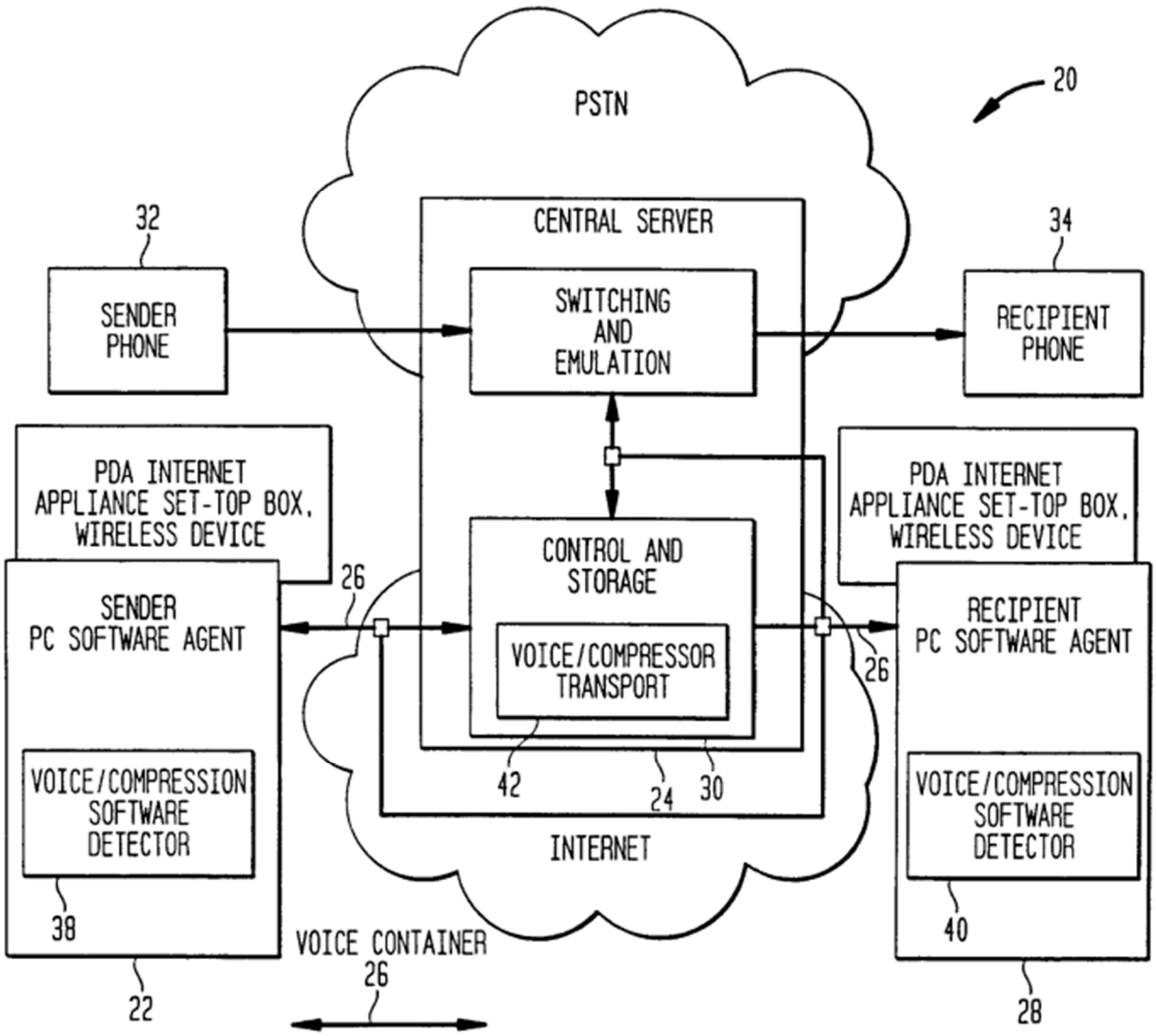
226. It was well-known to persons of ordinary skill in the art that the Internet was a packet-switched network. The '622 Patent itself confirms as much. (Ex. 1001, 1:37-40 ("a VoIP terminal device is connected to a packet-switched network (e.g., Internet)"), 1:51-53.) Shinder also confirms this fact. (Shinder, p.170 ("An example of a packet-switched network is the Internet.").) It would thus have been obvious to a POSITA that the Internet as disclosed in Zydney would have been a packet-switched network.

227. Finally, it would have been obvious to a POSITA that the network interface itself would be connected to the packet-switched network, as claimed. Shinder explains that the network interface serves as the point of connection through which incoming and outgoing data flows to and from a networked computer. (Shinder, pp.195-196.) In particular, "[a]n important part of the network interface is the *transceiver*," which, "as its name indicates, sends and receives signals." (*Id*., p.196 (italics in Shinder).) Therefore, when the central server in Zydney's system communicates data (including voice containers) over the Internet as Zydney describes, the network interface is connected to the packet-switched network.

[3.3] a messaging system communicating with a plurality of instant voice message client systems via the network interface; and

228. The messaging system of Zydney is shown, again, in Figure 1A, which shows client systems connected to the central server through the Internet, as highlighted below. (Zydney, 10:21-23, Fig. 1A (line 26).)

FIG. 1A

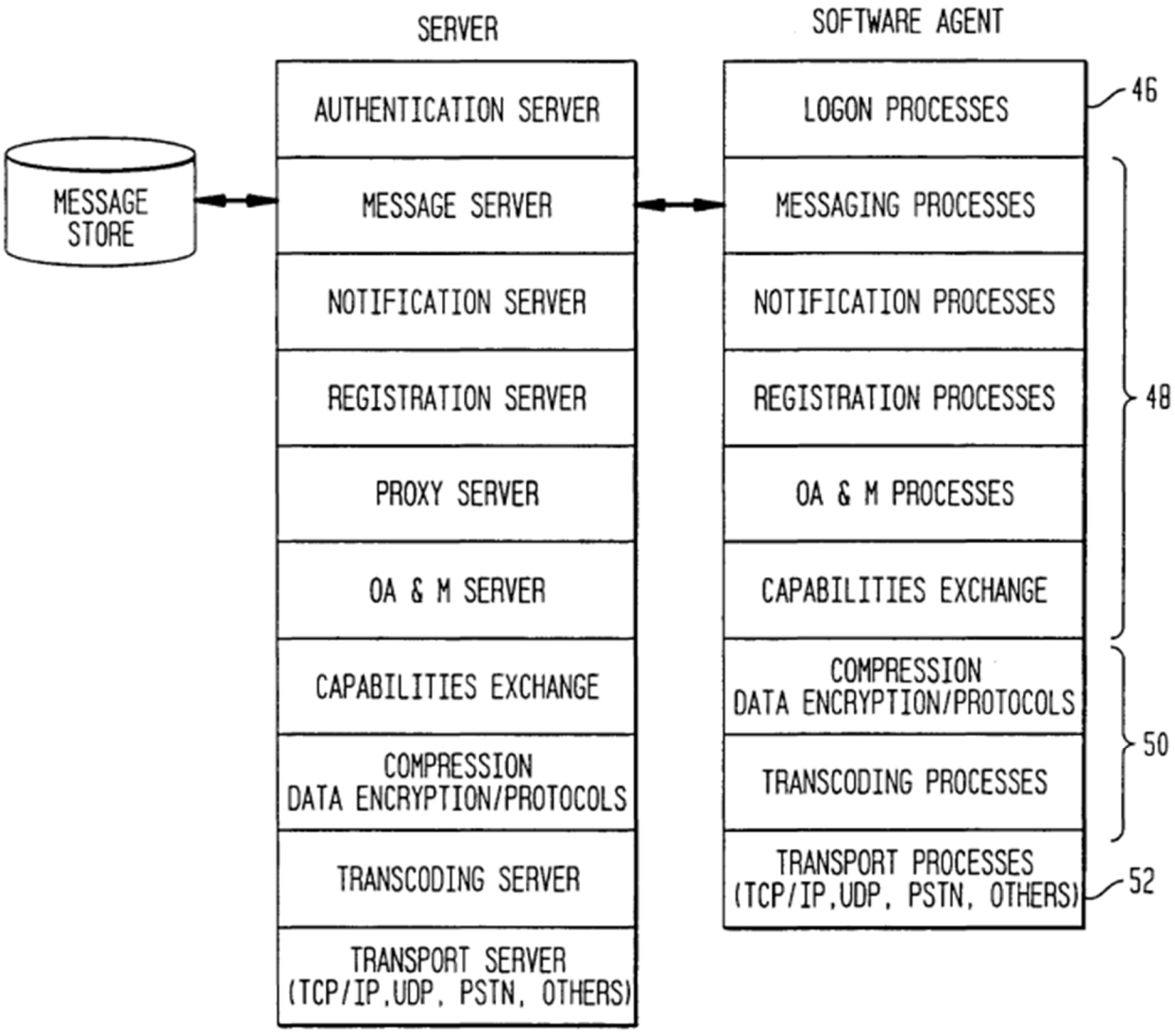


(Zydney, Fig. 1A).

229. The "messaging system" in Zydney sits within the central server (24) shown in the middle of Figure 1A above. Zydney explains that "[t]he central server in conjunction with the software agent controls, stores and switches the voice containers to the appropriate recipients." (*Id*., 14:6-13; *see also id.*, 13:12-18.)

230. The central server of Zydney includes a number of subcomponents including a "message server" shown in Figure 2:

FIG. 2



(*Id*., Fig. 2.)

231. As explained below, the claimed "messaging system" includes the "message server" and the "transport server" of Figure 2.

232. In particular, when a client system sends a voice container to a recipient that is "[n]ot logged on," the "[m]essage will be sent to the message server." (*Id*., 33:1-2.) Similarly, "[t]he message server will download all messages to the software agent and/or retain copies of the messages based on administrative settings from the user." (*Id*., 27:15-16; *see also id*., 25:1-9, 30:6-7, 31:1-3.) The "messaging system" of the claim also includes the "transport server" in Figure 2, which is responsible for receiving and sending voice containers over TCP/IP. (*Id.*, 23:11-12 ("The voice container will be sent using standard TCP/IP transport."), 29:1-2.)

233. The claim also calls for a "plurality of instant voice message client systems," which are shown in Figure 1 of Zydney as the device running the sender software agent (22) and the device running the recipient software agent (28). (Zydney, Fig. 1A.) Zydney explains that each of these devices may be "a personal computer, wireless handheld computer such a personal data assistant (PDA), digital telephone, or beeper." (*Id.*, 11:16-18.) Figure 1A above shows those client systems connected to the central server. (*Id.*, Fig. 1A.) Zydney thus discloses "a messaging system communicating with a plurality of instant voice message client systems."

234. The clients shown in Figure 1A above are "instant voice message client systems." The sender and recipient in Zydney can send and receive an instant voice message (voice container), which is depicted as numeral 26 in Figure 1A above. (*Id.*, 11:16-18, 14:2-3, Figs. 4, 6.) Each voice container discloses an instant voice message because a voice container "can be stored, transcoded and routed to the appropriate recipients instantaneously or stored for later delivery." (*Id*., 1:21-22.) A recipient of the voice message "can reply in a complementary way, allowing for near real-time communication." (*Id*., 16:14-15.) Zydney describes this exchange of voice containers as "a voice instant messaging session," and an alternative to an "intercom" mode. (*Id*., 15:8-13, 10:19-11:3, 16:1-12.) Because the client systems in Zydney can send and receive instant voice messages, they qualify as "instant voice message client systems."

235. Finally, as explained previously for element [3.1], the central server in Zydney can include a "network interface" that provides the server's connection to the Internet. The central server's messaging system, therefore, communicates with the client systems using the network interface. Zydney and Shinder thus render obvious that the messaging system communicates with the client systems "via the network interface," as claimed.

[3.4] a communication platform system maintaining connection information for each of the plurality of instant voice message client systems indicating whether there is a current connection to each of the plurality of instant voice message

client systems,

236. As explained for element [3.2], each of the "instant voice message client systems" in Zydney runs a software agent used for instant voice messaging. The central server in Zydney tracks the connectivity status of these software agents. (Zydney, 14:6-9 ("Central Server: … will track and maintain the status of all software agents."), 13:12-14 ("The Central Server provides the following functionality: … maintain and provide the status of all software agents…").)

237. The claimed "communication platform system" in Zydney is the system within the central server that tracks and maintains this status. More specifically, the "communication platform system" in Zydney includes (a) the "notification server" of the central server (Figure 2), which notifies clients of the connection status of other clients, and (b) server storage for recording the actual client connection information. (*Id.*, 24:15-16 ("Software agents will gain access to the system through the log on process which interfaces with the notification server."), 31:13-15 ("The software agent will send a copy of the currently logged on Internet address to the notification server for purposes of notifying other software agents of its status and receiving messages."), 25:4-7, 32:12-15 ("The notification process will also query the server to find out the other registered software agents that are currently logged onto the system…").) Zydney thus discloses a "communication platform system" that maintains status information for each client.

238. This status information qualifies as "connection information for each of the plurality of instant voice message client systems," because the status information includes the "core state" of whether the client is online or offline:

> The status of all recipients entered into the software agent is frequently conveyed to the software agent by the central server. This includes the core states of whether the recipient is online or offline, but also offers related status information, for example whether the recipient does not want to be disturbed.

(*Id.*, 14:20-15:1; *see also id.*, 25:4-7 (a software agent is "on-line" when it "has been authenticated with the system and has notified other software agents via the notification server that they are on-line").) Zydney's teaching above that the central server maintains the "core states" of whether the software agent is currently "online" or "offline" also discloses connection information indicating whether there is "a current connection" between the central server and the client system containing the software agent. (*See id.*, 32:12-15 ("The notification process will also query the server to find out the other registered software agents that are currently logged onto the system and send the Internet address of the other logged on software agents to the authenticated, newly logged on software agent.").)

[3.5] wherein the messaging system receives an instant voice message from one of the plurality of instant voice message client systems, and

239. Figure 1A of Zydney, reproduced above, expressly shows the central server (which contains the messaging system) receiving a "voice container" (instant voice message) from a sending client system. (Zydney, Fig. 1A, 16:7-12.) Zydney confirms that the "message server" component of the central server (part of the "messaging system") receives the voice container. For example, the "message server" in Zydney receives and stores the voice container if the recipient is not currently online. (*Id.*, 25:1-2 ("The message server will be the repository for messages sent to software agents."), 33:1-2 ("Not logged on – Message will be sent to the message server"), 27:15-16 ("The message server will download all messages to the software agent and/or retain copies of the messages based on administrative settings from the user.").) Zydney thus discloses that the "messaging system receives an instant voice message from one of the plurality of instant voice message client systems."

[3.6] wherein the instant voice message includes an object field including a digitized audio file.

240. Although the '622 Patent does not expressly define the term "object field," its meaning is reasonably clear from the specification, which explains that "[t]he content of the object field is a block of data being carried by the message object, which may be, for example, a digitized instant voice message." (Ex. 1001, 14:37-40.) The term "object field" would thus have been understood as a field

containing content that will accompany the instant voice message, with the term "field" simply referring to a block of data containing a particular type of data. The specification does not require that the claimed "object field" take any particular form or be implemented in any particular way.

241. Zydney discloses the claimed "object field" in at least two independent ways. First, Zydney expressly refers to a voice container as an "object" that contains voice data: "The term 'voice containers' as used throughout this application refers to a container object that contains no methods, but contains voice data or voice data and voice data properties." (Zydney, 12:6-8, Fig. 3.) Figure 3 of Zydney shows "an exemplary embodiment of the voice container having voice data and voice data properties components" including various information about the voice message. (*Id*., 23:1-11, Fig. 3.)

242. Although Zydney does not use the word "field" in relation to storage of voice data, the use of the term "field" in the claim adds nothing of patentable significance. The term "**field**" in the context of the '622 Patent simply refers to a block of data, or the location where a block of data is stored. This is consistent with a standard dictionary definition of "field" in this context. (*See*, *e.g.*, Ex. 1029 at p.210 (defining "field" as "[a] location in a record in which a particular type of data is stored.")). A POSITA would have understood that the voice data is contained in a field of the voice container and the term "**object field**" would thus have been

understood as simply referring to a field containing content that will accompany the instant voice message. This is consistent with the specification of the '622 Patent, which explains that: "A message object comprises an action field, an ID field, a source field, a destination field, and an object field." (Ex. 1001, 14:6-7.) "The content of the object field is a block of data being carried by the message object, which may be, for example, a digitized instant voice message." (Ex. 1001, 14:37-40.) I also note that the claim and specification do not require that the claimed "**object field**" take any particular form or be implemented in any particular way.

243. Accordingly, although Zydney does not use the word "field" in reference to the stored voice data, it clearly discloses such a field. Zydney describes a "voice container" as "a container object that… contains voice data or voice data and voice data properties." (Zydney, 12:6-8.) It would have been obvious to a person of ordinary skill in the art that the voice data inside the voice container object could have been stored in a field.[14]

[14] The term "field" as it relates to network-based data transmission does not refer to a physical "field," such as the field on a paper-based form. When an object is being transmitted over a network, the contents of the object (including any "fields" in the object) are generally transmitted as a series of signals over the communications medium. There are a number of known and trivially simple techniques for encoding

244. Thus, it would also have been obvious that the Zydney voice container would contain an "object field" because, without one, the recipient device could not

---

the data into a series of "fields," which the recipient device can use to locate and obtain the different pieces of data in the fields. For example, one common technique is to simply define a "field" as the data at a predetermined location in the object (*e.g.* field X starts at byte offset Y in the object), which does not require any additional information be sent to separate the fields. Another approach involves placing identifying "tags" around blocks of data in the object to separate and identify the different fields. In any case, and regardless of the implementation chosen, it would have been obvious that the voice container has an "**object field**" that contains the voice data because the recipient's software agent can receive the voice container, identify the voice data within the container, and decompress it for playback. (Zydney, 16:12-14 ("The voice is uncompressed and the recipient can hear the recording through the speakers or headset attached to their computer.").) Without some logically identified "field" in the voice container containing the voice data, in fact, the recipient device in Zydney could not separate the voice data from the other fields in the voice container (including the fields shown in Figure 3).

separate the voice data from the other fields of data in the voice container and play back the voice data for the user – a capability the recipient in Zydney has.

245. As a second and independent basis to find the claimed "object field" in Zydney, the voice container in Zydney can also be formatted using the industry-standard Multipurpose Internet Mail Extension ("MIME") format, which "allows non-textual messages and multipart message bodies attachments to be specified in the message headers." (Zydney, 19:7-10.) Zydney refers to Request for Comments ("RFC") 1521 from September 1993, one of the MIME standards that Zydney expressly incorporates by reference. (*Id.*, 19:13-20:9, 19:22-20:2 (RFC 1521)). That incorporated RFC (Ex. 1032) explains that a MIME message can contain audio or voice data in the "body," the field of the message containing the content being conveyed.

246. Because Zydney itself discloses that voice containers can be encoded using MIME and directly cites to RFC 1521, it would have been plainly obvious to a POSITA to provide the receiving software agent with the ability to format the voice container according to RFC 1521, thus encoding the voice data in the body (an "object field") of the message.

247. Zydney further discloses that the object field includes a "digitized audio file," as claimed. Zydney makes clear that, in creating the voice data for the voice container, the data is stored as a digital audio file: "the originator digitally records

messages for one or more recipients using a microphone-equipped device and the software agent. The software agent compresses the voice and stores the file temporarily on the PC if the voice will be delivered as an entire message." (Zydney, 16:1-4; *see also* 21:14-16 ("The voice recordings that are made via a microphone or converted by text-to-speech software can be used for many other purposes. These voice files can be played and recorded using voice container enabled devices."), 20:11-14 (describing "permitting the recording of one or more voice packet messages.").) As noted previously, each voice container can contain "voice data or voice data and voice data properties." (*Id.*, 12:6-8.) Thus the voice container includes the content of the recorded voice audio file and may also include properties of the voice data. (*Id*., 12:6-8, 23:1-11.) RFC 1521 similarly describes how the MIME message body would incorporate the audio file. (RFC 1521, pp.2-4, 66-67.)

248. Zydney thus discloses and renders obvious an object field including a digitized audio file.

[9.1] The system according to claim 3, wherein the communication platform system assigns an IP address to each of the instant voice message client systems when the communication platform receives a connection request from each of the instant voice message client systems.

249. Zydney in view of Shinder discloses this limitation.

250. As discussed above, Zydney and Shinder disclose a communication platform that enables communication via a packet-switched network, such as the

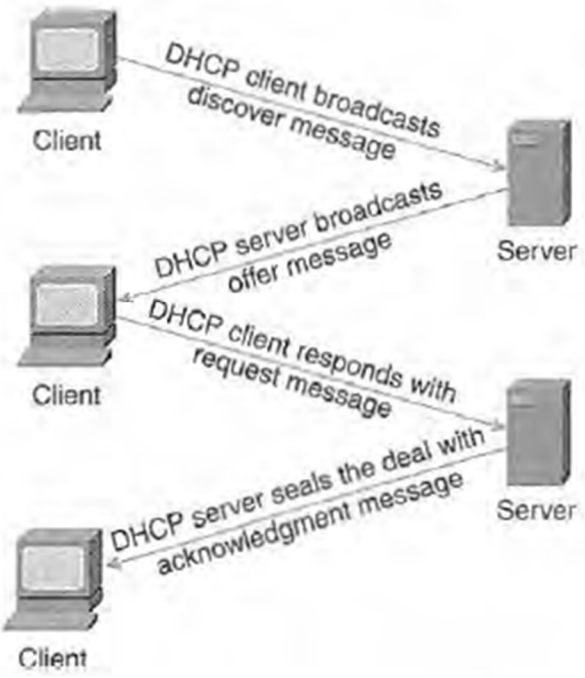
Internet. (*See supra* [3.2].) Zydney discloses that voice containers "will be sent using standard TCP/IP transport" (Zydney, 23:11-12) and that the software agents are associated with "Internet Protocol (IP) addresses" that are used to transport the voice containers. (*Id*. 15:1-2 and 13-14, and 16:7-10.)

251. Zydney teaches that the registration server assigns the software agent its unique address when the software agent connects to the registration server. (*Id*. 23:18-21.) Zydney does not explicitly describe how the IP addresses are assigned. However, Shinder discloses that "[t]he TCP/IP stack is the foundation of Internet communications" and that "[t]o communicate using TCP/IP, a computer or other network device must have a unique IP address." (Shinder, pp. 78 and 86.) Shinder further teaches that it was well-known to automatically assign IP addresses to clients using a DHCP server:

> The [IP] address can be automatically assigned. Generally, this means a computer on the network is configured as a DHCP server to hand out IP addresses from a pool of valid addresses.

(*Id*., p. 86.) As shown in Fig. 8-3 below, Shinder discloses specific steps for assigning IP addresses to clients by a DHCP server.

Figure 8-3 *The DHCP server leases an address to the DHCP client.*



(*Id*., Fig. 8-3; *see also* pp. 87-88 (describing steps taken for a DHCP client to obtain an IP address from a DHCP server).)

252. Shinder also teaches that IP addresses can be manually assigned, but that using a DHCP server "has many advantages over manual IP addressing." (*Id*., p. 88.) Specifically, DHCP "saves time because the administrator does not have to enter the addresses into each computer's property settings" and it ensures greater accuracy because the administrator does not have to keep up with which addresses have already been assigned and which are still free." (*Id*.) Moreover, Shinder does not purport to disclose anything novel in its description of DHCP. Rather, Shinder

is describing well-established practices for IP address assignment that would have been readily apparent to a POSITA. (*See also* Ex. 1009 pp.12-17[15].)

253. Based on this, a POSITA would have been motivated to modify registration server of Zydney to assign IP addresses stored in the software agents. Accordingly, a POSITA would have understood that Zydney in view of Shinder teaches a communication platform system that assigns an IP address to each of the instant voice message client systems when the communication platform receives a connection request from each of the instant voice message client systems.

2. Claim 36

254. Claim 36 depends from claim 27. As explained below, all elements of claims 27 and 36 are disclosed by the combination of Zydney and Shinder.

[27.1] A system comprising:

255. If the preamble is limiting, then it was at least obvious over Zydney and Shinder. Specifically, Zydney discloses an instant voice messaging system.

[27.2] a client device;

256. Zydney discloses "a client device" in the form of a personal computer or other device that contains a software agent and can send and receive instant voice messages, as discussed above for element [3.2]. (Zydney, 11:16-18, 14:2-3.)

[15] RFC 2131 (Ex. 1009) is cited to demonstrate the state of the art.

[27.3] a network interface coupled to the client device and connecting the client device to a packet-switched network; and

257. As explained in detail for element [3.2], Zydney discloses a client system and a server connected over the Internet, *i.e.*, a packet-switched network. A POSITA would have appreciated that, in order for the client in Zydney to connect to the Internet, it would have needed a "network interface" (such as a network interface controller (NIC)). As explained for element [3.2], Shinder confirms that "[s]ome sort of network interface is always required to communicate over a network." (Shinder, pp.195, 196.) This requirement of a network interface applies equally to the *client* in Zydney as it does to the *server*. The claimed "network interface" is therefore obvious for the same reasons as the "network interface" of element [3.2].

258. As a separate and independent basis for satisfying this limitation, Zydney describes a particular type of network interface – a cable modem – and motivates a POSITA to use it to connect clients to the network. (Zydney, 17:5-9 ("as bandwidth deployment increases via cable modems, high-speed subscriber lines, and other techniques, the conversational gaps are reduced and an even more natural sounding conversation results.").) A POSITA therefore would have understood and found it obvious that the client system would have contained a network interface, such as a cable modem to enable higher bandwidth and quality, to provide connectivity to the network.

[27.4] an instant voice messaging application installed on the client device, wherein the instant voice messaging application includes a client platform system for generating an instant voice message and,

259. The "instant voice messaging application" in Zydney is disclosed by the software (including a software agent) running on the computing device or hardware. (Zydney, 13:2-6; 14:2-12 (describing "Software Agent" utilized by the sender); *id.*, 13:19-22; 14:14-16 (describing "Software Agent" utilized by the recipient); 11:16-18 (noting that software agents may run on "a personal computer, wireless handheld computer such a personal data assistant (PDA), digital telephone, or beeper.").) Both the sending and receiving client systems in Zydney thus include "an instant voice messaging application," as recited in the claim.

260. As explained previously for claim 3, Zydney explains that the software agent running on the *sending* (originating) client system can generate and transmit instant voice messages in the form of voice containers. (*Id.*, 13:2-6 ("A Software Agent utilized by the sender of the voice container provides the following functionality… address the recipient(s) and pack message into a voice container or multiple voice containers 50; and, enable transport 52 of the voice container to the recipient or the central server.").) Similarly, the software agent on the *receiving* client system can receive and present received voice containers. (*Id.*, 13:19-22 ("A Software Agent utilized by the recipient provides the following functionality: log on

to the central server; authenticate to the central server; retrieve any undelivered voice containers; and, unpack the voice container and play the message.").)

261. The software agent in Zydney includes a client platform system for generating the instant voice message (voice container): "To create a message, the software agent will address, pack and send the message in a voice container." (Zydney, 14:2-5; 13:2-5 ("A Software Agent utilized by the sender of the voice container provides the following functionality: … address the recipient(s) and pack message into a voice container or multiple voice containers 50…"); *see also* Fig. 4 ("client builds voice container with message").) The client platform system in Zydney is thus disclosed by the portions of the software agent on the client of the sending (originating) user responsible for creating the instant voice message for the same reasons explained for claim 13. Zydney thus discloses an instant voice messaging application that includes a client platform system for "generating an instant voice message," as claimed.

[27.5] a messaging system for transmitting the instant voice message over the packet-switched network via the network interface,

262. This element of claim 27 requires that the claimed "messaging system" reside on the client, whereas the term "messaging system" in claim 3 refers to a system on a central system (*e.g.*, server) that communicates with the clients. The messaging system for purposes of claim 27 thus takes the form of the hardware

and/or software used to transmit an instant voice message over the packet-switched network. (Zydney, 13:2-6 ("A Software Agent utilized by the sender of the voice container provides the following functionality: … enable transport 52 of the voice container to the recipient or the central server.").) Figure 1A of Zydney illustrates that the communication between the central server and the software agent occurs over the Internet, which evidences that the messaging system transmits instant messages via the network interface as explained above. (Zydney, Fig. 1A.)

[27.6] wherein the instant voice messaging application includes a document handler system for attaching one or more files to the instant voice message.

263. The plain and ordinary meaning of the term "document handler system" to a POSITA is a software component that handles documents. In this case, the claim requires that it perform just one function – "attaching one or more files to the instant voice message."

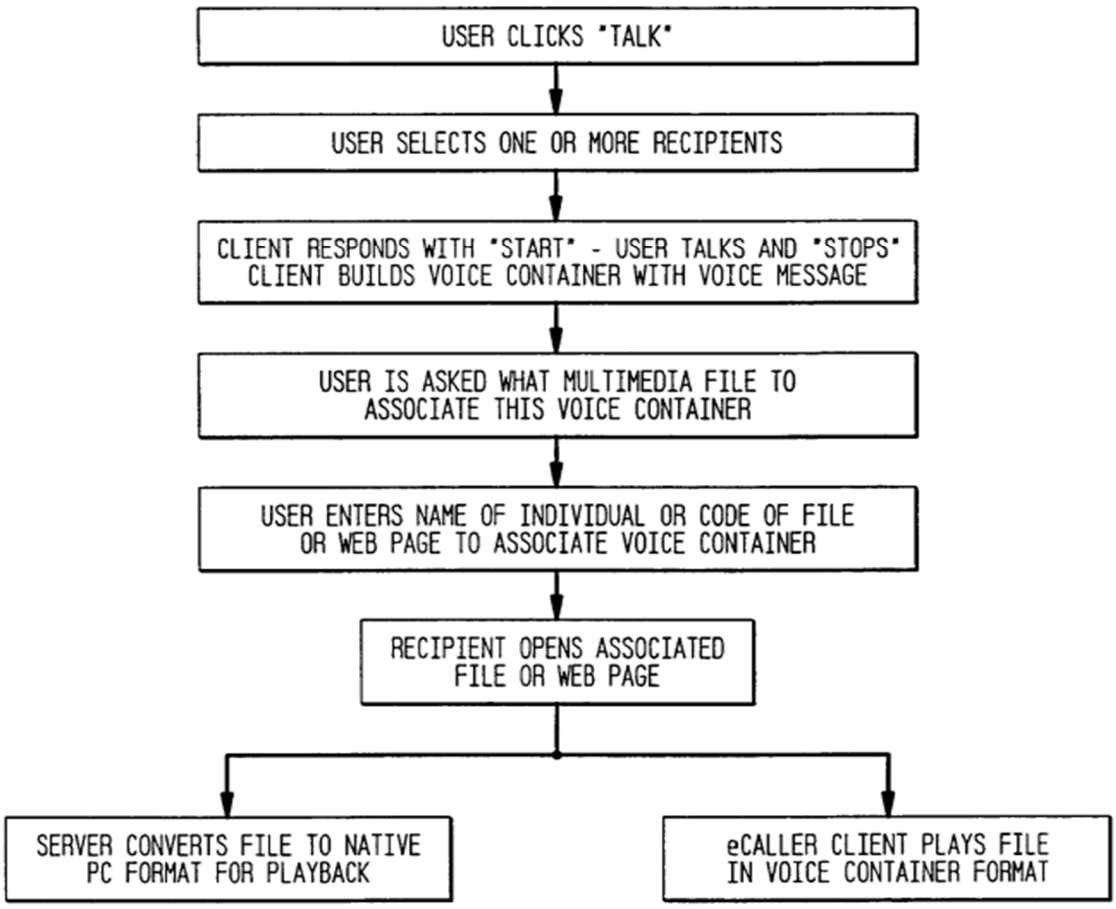
264. The document handler system in Zydney takes the form of software functionality for attaching files to the voice container (the "instant voice message"), such as a "digitized greeting card" or "other data types" to each instant voice message (voice container) to be "transported to the recipient":

> Example: Multimedia Attachments
> Another important application of the present invention system and method for voice exchange and voice distribution is attaching other media to the voice

> containers to provide a richer communications environment. For example, voice containers may have digitized greeting cards appended to them to present a personalized greeting. The voice container has the ability to have other data types attached to it and thus be transported to the recipient.

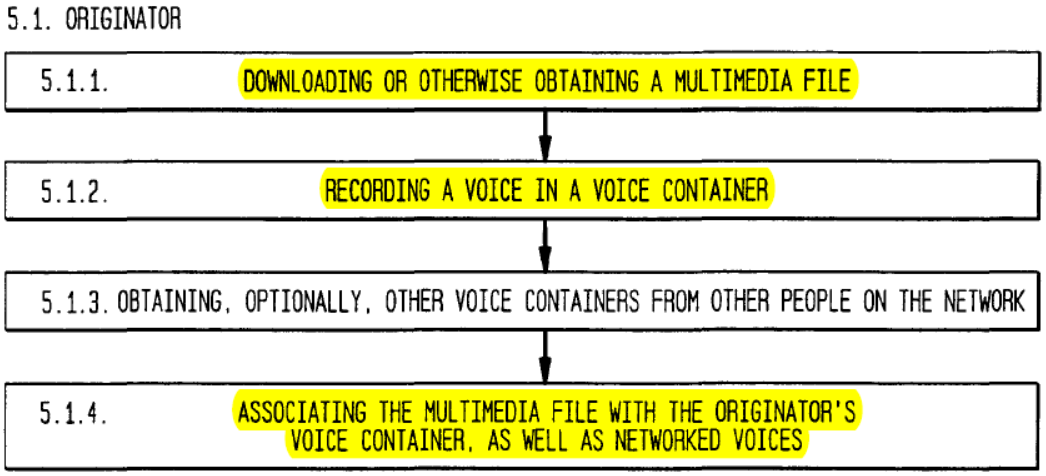
(Zydney, 19:1-7; 22:19-20.) Figure 6 below, depicts a process for generating an instant voice message that includes attaching a multimedia "file" to the voice container audio file:

FIG. 6



265. (*Id.*, Fig. 6.) Figures 16-18 similarly provide a three-part description of the generation and transmission of a voice container with multimedia attachments. (*Id.*, 35:15-22, Figs. 16-18.) As shown in Figure 16, reproduced below, the "originator" can obtain a "multimedia file," record a voice container, and "associate" (attach) the multimedia file to the voice container.

FIG. 16



(*Id.*, Fig. 16.) Figure 17 continues the description from Figure 16 ("5.1. Originator"), showing "5.2. Central Server" including a step of "receiving the voice container and associated media file." (*Id.*, Fig. 17.) These figures therefore confirm that the multimedia file is attached to the voice container on the originator's client system before the voice container and attachment are transmitted to the central server.

266. Zydney does not appear to explicitly describe which part of the software on the client system attaches files to voice containers. But this is a trivial omission, because the client system operated by the user to generate and transmit the voice

container (which discloses the claimed "instant voice messaging application") performs the attachment, as explained previously. (*Id.*, 19:1-7, 22:19-20, Figs. 16-17.) Moreover, a person of ordinary skill in the art would have found it obvious that the software agent that generates and transmits the voice container could also be responsible for the attachment of files to the voice container, given that the software agent performs the various other functions for generating and transmitting voice containers as shown in Figure 2. Zydney does not identify any other software on the client that performs this function.

267. In any event, it would have been obvious to implement the system of Zydney in which the software agent on the client performs the function of attaching files to the voice container prior to transmission. As explained in Zydney, "[t]o create a message, the software agent will address, pack and send the message in a voice container." (*Id.*, 14:4-5; *see also id.*, 13:2-5 ("A Software Agent utilized by the sender of the voice container provides the following functionality… pack message into a voice container or multiple voice containers 50…").) A person of ordinary skill in the art would have found it plainly obvious that attaching files to a voice container could have been included as part of the overall process of "pack[ing]" the message into a voice container, a process that Zydney confirms is performed by the software agent on the sending client device. (*Id.*)

268. As a separate basis for finding this claim limitation in Zydney, Zydney also describes attaching files to voice containers using the industry-standard MIME format, which allows attachments including "binary, audio, and video" files to be specified in message headers. (*Id.*, 19:6-12.) MIME refers to a well-known standard originally developed in the context of sending email messages containing file attachments. MIME specifies a technique for encoding a message into multiple parts (a "multipart message") with each part capable of containing a different type of data. (*Id.*) Different aspects of the MIME protocols were defined in IETF's RFC 2045, RFC 2046, RFC 2047, and RFC 2049 from November 1996. The MIME protocol was supported by almost every mail server and mail client application in the market. Zydney explains that MIME allows attachments including "binary, audio, and video" files to be specified in message headers. (Zydney, 19:6-12.) This provides a second and independent basis for showing performance of the function of the "document handler system" in Zydney.

[36.1] The system according to claim 27, wherein the instant voice message application communicates in an intercom mode when a recipient of the instant voice message is currently available to receive the instant voice message and communicates in a record mode when the recipient of the instant voice message is currently unavailable to receive the instant voice message.

269. Zydney in view of Shinder discloses this limitation.

270. Zydney teaches that the software agent, which corresponds to the instant voice message application, "permits a number of distinct modes of

communication based on the status of the recipient." (Zydney, 14:19-20.) Among these communication modes disclosed in Zydney are a "real-time 'intercom'" mode and a "pack and send" mode, which respectively correspond to the "intercom mode" and "record mode" recited in element [36.1] of the '622 Patent.

271. For example, Zydney teaches that if the intended recipient of a voice message is "online," the originating software agent "can … begin a real-time 'intercom' call which simulates a telephone call." (Zydney, 15:8-10; 16:4-7 ("If the real time 'intercom' mode has been invoked, a small portion of the digitized voice is stored to account for the requirements of the Internet protocols for retransmission and then transmitted before the entire conversation has been completed."); 10:14-18. Zydney's "real-time 'intercom' mode" corresponds to the claimed "intercom mode." In fact, Zydney's intercom mode not only has the same name as the intercom mode of the '622 Patent, but the descriptions of each show they are the same thing. (*Compare* '622 Patent, 11:31-61 (describing an "intercom mode" that enables "real-time" instant voice messaging via buffering) *with* Zydney, 15:8-14, 16:4-15 (describing a "real time 'intercom' mode implemented by buffering).)

272. If the recipient is "off line," Zydney discloses that the originating software agent can "begin a voice mail conversation that will be delivered the next time the recipient logs in." (Zydney, 15:15-16.) In this case, "the voice recording is stored in the central server until the recipient's software agent is active" and the

stored recording can be downloaded to the recipient's software agent. (*Id*., 16:15-17.) The communication mode that applies when the intended recipient is "off line," is referred to in Zydney as the "pack and send mode of operation." (*See id*., 10:23-11:3.) Zydney's "pack and send mode" corresponds to the claimed "record mode" because in the pack and send mode, "the [entire] message is first acquired, compressed and then stored in a voice container." (*Id*., 11:1-3.) Indeed, Zydney's disclosure regarding the "pack and send mode" is remarkably similar to the preferred embodiment of the '622 Patent's "record mode." (*Compare* '622 Patent, 7:56-8:26 (describing a "record mode") *with* Zydney, 10:19-11:6, 15:15-16:4 (describing a "pack-and-send mode").)

273. Accordingly, Zydney discloses the feature of element [36.1] of an instant voice message application (e.g., an originating software agent) that communicates in an intercom mode when a recipient of the instant voice message (e.g., voice container) is currently available to receive the instant voice message and communicates in a record mode (e.g., pack and send mode) when the recipient of the instant voice message is currently unavailable to receive the instant voice message.

3. Claim 37

274. Claim 37 depends from claim 36. As explained above, all elements of claims 27 and 36 are disclosed by the combination of Zydney and Shinder.

[37.1] The system according to claim 36, wherein the instant voice message application utilizes the intercom mode as a default communication mode.

275. Zydney in view of Shinder discloses this limitation.

276. The plain and ordinary meaning of the term "default" to a POSITA would have been "a preselected option adopted by a computer program or other mechanism when no alternative is specified by the user or programmer." (Ex. 1027[16].) Moreover, the '622 Patent is clear that the use of the intercom mode as a default communication mode can be contingent upon the recipient's online status: "The 'intercom mode' may be designated as a default mode when an IVM recipient is on-line, while the 'record mode' may be designated as a default if the IVM recipient is unavailable, i.e., not on-line." (Ex. 1001, 13:61-65, 21:48-52.) Thus, a POSITA would understand the element [37.1] to cover scenarios where the intercom mode is preselected when the recipient is online.

277. As discussed with respect to element [36.1], Zydney discloses a method where, based on the online/offline status of the recipient, either the "pack-and-send mode" (corresponding to the claimed "record mode") or the "real-time intercom mode" (corresponding to the claimed "intercom mode") is manually selected by the user or "automatically selected by the software agent, according to rules that are

[16] Exhibit 1027 is cited to demonstrate the state of the art.

stored." (Zydney, 15:4-7, 14:17:-15:4; *see also id*. 1:20-22, 10:14-18, 12:6-8 and 11-14, and 16:1-4.) In particular, Zydney teaches that the intercom mode can be executed when the recipient is online (e.g., available), while the pack and send mode can be executed when the recipient is either online or offline (e.g., unavailable). (*See id*., 14:17-16:21.)

278. Accordingly, Zydney discloses an instant voice messaging system that utilizes the intercom mode as a default communication mode.

XII. AVAILABILITY FOR CROSS-EXAMINATION

279. In signing this declaration, I recognize that the declaration may be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will cooperate to the best of my ability to appear for cross examination within the United States during the time allotted for cross examination.

A. Right To Supplement

280. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises and to take into account new information as it becomes available to me.

B. Signature

281. I, Tal Lavian, do hereby declare and state, that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: 8/29/2019

Respectfully submitted,

Tal Lavian

Tal Lavian, Ph.D.
Sunnyvale, California

EXHIBIT A

Dr. Tal Lavian

https://TelecommNet.com
tlavian@TelecommNet.com

1640 Mariani Dr.
Sunnyvale, CA 94087
(408)-209-9112

Telecommunications, Network Communications and Mobile Wireless Technologies Expert

Scientist, educator, and technologist with 30 years of experience. He has co-authored over 25 scientific publications, journal articles, and peer-reviewed papers. Dr. Lavian serves as an expert in network communications, telecommunications, Internet protocols, and mobile wireless technologies. He is the named inventor of over 120 issued and filed patents. He served as Principal Investigator (PI) for three US Department of Defense (DARPA) projects.

EDUCATION

- **Ph.D.**, Computer Science specializing in networking and communications, UC Berkeley
- **M.Sc.**, Electrical Engineering, Tel Aviv University
- **B.Sc.**, Mathematics and Computer Science, Tel Aviv University

EXPERTISE

Network communications, telecommunications, Internet protocols, and mobile wireless:

- **Communication networks:** Internet protocols; TCP/IP suite, TCP, UDP, IP, Ethernet, 802.3, network protocols, network software applications, data link, network, and transport layers (L2, L3, L4), packet switching, data center network architecture
- **Mobile wireless:** Wi-Fi, 802.11 (a/b/g/n/ac), MAC, PHY, OFDM, DSSS, Wireless LAN (WLAN). Cellular systems, GSM, LTE, CDMA, FDMA, TDMA, SMS, instant messaging (chat), mobile devices, smartphone
- **Internet/cloud:** Web applications, HTTP, e-mail, SMTP, POP, IMAP, Java, C/C++, file transfer FTP, client-server, cloud computing, distributed computing
- **Routing/switching:** LAN, WAN, VPN, routing protocols, RIP, BGP, MPLS, OSPF, multicast, DNS, QoS, network infrastructure, network communication architectures
- **Unified Communications:** PSTN, circuit switching, IP telephony, VoIP, SIP, RTP, SS7, optical networks, carrier Ethernet, SONET, SDH, WDM, TDM, video/audio conferencing, streaming media

ACCOMPLISHMENTS

- Served as Principal Investigator (PI) for three US Department of Defense (DARPA) projects
  - Directed networking computation project for the US Air Force Research Lab (AFRL)
  - PI of a wireless research project for an undisclosed US federal agency
- Led and developed the first network resource scheduling service for grid computing
- Managed and engineered the first demonstrated transatlantic dynamic allocation of 10Gbs Lambdas as a grid service
- Development and successful demonstration of the first wire-speed active network on commercial hardware

- Inventor of over 120 patents, over 60 prosecuted *pro se* in front of the USPTO
- Created and chaired Nortel Networks' EDN Patent Committee

PROFESSIONAL EXPERIENCE

University of California, Berkeley, Berkeley, California 2000-Present
UC Berkeley SkyDeck, Industry Fellow, Lecturer, Visiting Scientist, Ph.D. Candidate, Nortel's Scientist Liaison
Some positions and projects were concurrent, others sequential

- UC Berkeley SkyDeck startups - advanced technology research, development, business, and market
- Industry fellow and lecturer at the Sutardja Center for Entrepreneurship and Technology (SCET).
- Conducted research projects in data centers (RAD Labs), telecommunication infrastructure (SAHARA), and wireless systems (ICEBERG)
- Acted as scientific liaison between Nortel Research Lab and UC Berkeley, providing tangible value in advanced technologies
- Developed long-term technology for the enterprise market, integrating communication and computing technologies
- Studied network services, telecommunication systems and software, communications infrastructure, and data centers
- Earned a Ph.D. in Computer Science with a specialization in communications and networking

TelecommNet Consulting, Inc. Sunnyvale, California 2006-Present
Principal Scientist

- Consulting in the areas of network communications, telecommunications, Internet protocols, and smartphone mobile wireless devices
- Providing system architecture and technology analysis for computer networks, mobile wireless devices, and Internet web technologies projects
- Providing expert witness services in network communications patent infringement lawsuits

CRadar.Ai, UC Berkeley, California 2018-Present
Principal Investigator/CTO

- CRadar improves the Radar wireless RF signal phase noise purity by 100x
- Accurate Radars are paramount for self-driving car safety. Radars "see" where Cameras and LiDars are "blind" (fog, rain, snow, direct sunlight, and darkness)
- The superior wireless RF signal quality provides clean signal for high Radar accuracy
- Improving Radar accuracy and resolution enables true redundancy, sensory fusion and puts the Radar into the sensory spearhead

Aybell (VisuMenu Inc.), UC Berkeley, California 2016-Present
CEO/CTO

- Aybell transforms smartphones into visual menu systems, making the phone a frictionless point for user interactions with all features of customer service platforms. Empowers consumers to reach the right agents in call centers, overcoming customer service barriers. Aybell is a branding and marketing of VisuMenu advanced technologies.

- Architecture, design and implementation of a cloud data center for connecting any smartphone user, to any company and/or service, by digitizing interactive voice systems, and exposing through cloud-service APIs to other applications
- The system is deployed as a cloud networking and cloud computing service on Amazon Web Services (AWS) and Google Cloud Platform (GCP)
- Technologies include Data Science analytics, Machine Learning (ML), Artificial Intelligence (AI), and Statistical Learning (SL). Building an NLP Parser using Python, NLTK, SpaCy and other NLP libraries and modules

VisuMenu, Inc., Sunnyvale, California 2010-2016

Co- Founder and Chief Technology Officer (CTO)

- Led the software design and development of a visual IVR system for smartphones and mobile devices, based on an innovative use of wireless and network communications technologies
- Design of a search engine for IVR / PBX using Asterisk, SIP, and VoIP

Ixia, Santa Clara, California 2008 - 2008

Communications Consultant

- Researched and developed advanced network communications testing technologies:
- IxNetwork/IxN2X —IP routing and switching devices and broadband access equipment. Provided traffic generation and emulation for the full range of protocols: OSPF, RIP, EIGRP, BGP, IS-IS, MPLS, unicast, multicast, broadcast, layer 2/3 VPNs, IPSec, carrier Ethernet, broadband access, and data center bridging. Tested and validated IEEE, ITU and IETF RFC standards compatibility
- IxLoad — quickly and accurately modeled high-volume video, data, and voice subscribers and servers to test real-world performance of multiservice delivery and security platforms
- IxCatapult — emulated a broad range of wireless access and core protocols to test wireless components and systems that, when combined with IxLoad, provides an end-to-end solution for testing wireless service quality
- IxVeriWave — employed a client-centric model to test Wi-Fi and wireless LAN networks by generating repeatable large-scale, real-world test scenarios that are virtually impossible to create by any other means
- Test automation — provided simple, comprehensive lab automation to help test engineering teams create, organize, catalog, and schedule execution of tests

Nortel Networks, Santa Clara, California 1996 - 2007

Originally employed by Bay Networks, which was acquired by Nortel Networks

Principal Scientist, Principal Architect, Principal Engineer, Senior Software Engineer

Held scientific and research roles at Nortel Labs, Bay Architecture Labs, and in the office of the CTO

Principal Investigator for US Department of Defense (DARPA) Projects

- Conceived, proposed, and completed three research projects: active networks, DWDM-RAM, and a networking computation project for Air Force Research Lab (AFRL)
- Led a wireless research project for an undisclosed US federal agency

Academic and Industrial Researcher

- Analyzed new technologies to reduce risks associated with R&D investment

- Headed research collaboration with leading universities and professors at UC Berkeley, Northwestern University, University of Amsterdam, and University of Technology, Sydney
- Evaluated competitive products relative to Nortel's products and technology
- Proactively identified prospective business ideas, which led to new networking products
- Predicted technological trends through researching the technological horizon and academic sphere
- Designed software for switches, routers, and network communications devices
- Developed systems and architectures for switches, routers, and network management
- Researched and developed the following projects:
  - Data-Center Communications: network and server orchestration 2006-2007
  - DRAC: SOA-facilitated L1/L2/L3 network dynamic controller 2003-2007
  - Omega: classified wireless project for undisclosed US Federal Agency 2006-2006
  - Open platform: project for the US Air Force Research Laboratory (AFRL) 2005-2005
  - Network resource orchestration for Web services workflows 2004-2005
  - Proxy study between Web/grids services and network services 2004-2004
  - Streaming content replication: real-time A/V media multicast at edge 2003-2004
  - DWDM-RAM: US DARPA-funded program on agile optical transport 2003-2004
  - Packet capturing and forwarding service on IP and Ethernet traffic 2002-2003
  - CO2: content-aware agile networking 2001-2003
  - Active networks: US DARPA-funded research program 1999-2002
  - ORE: programmable network service platform 1998-2002
  - JVM platform: Java on network devices 1998-2001
  - Web-based device management: network device management 1996-1997

Technology Innovator and Patent Leader
- Created and chaired Nortel Networks' EDN Patent Committee
- Facilitated continuous stream of innovative ideas and their conversion into intellectual property rights
- Developed intellectual property assets through invention and analysis of existing technology portfolios

Aptel Communications, Netanya, Israel 1994-1995
Software Engineer, Team Leader
Start-up company focused on mobile wireless CDMA spread spectrum PCN/PCS
- Developed a mobile wireless device using an unlicensed band - Direct Sequence Spread Spectrum (DSSS); FCC part 15 - unlicensed transmitters
- Designed and managed a personal communication network (PCN) and personal communication system (PCS), which were the precursors of short text messages (SMS)
- Designed and developed network communications software products in C/C++
- Invented and implemented a two-way paging product

Scitex Ltd.,Herzeliya, Israel 1990-1993
Software Engineer, Team Leader
Software and hardware company acquired by Hewlett Packard (HP)
- Developed system and network communications in C/C++
- Invented Parallel SIMD Architecture
- Participated in the Technology Innovation group

Shalev, Ramat-HaSharon, Israel 1987-1990
Start-up company
Software Engineer
- Developed real-time software and algorithms in C/C++ and Pascal

PROFESSIONAL ASSOCIATIONS

- IEEE senior member
- IEEE CNSV co-chair, Intellectual Property SIG (2013)
- President Next Step Toastmasters (an advanced TM club in the Silicon Valley) (2013-2014)
- Technical co-chair, IEEE Hot Interconnects 2005 at Stanford University
- Member, IEEE Communications Society (COMMSOC)
- Member, IEEE Computer Society
- Member, IEEE Systems, Man, and Cybernetics Society
- Member, IEEE-USA Intellectual Property Committee (2012)
- Member, ACM, ACM Special Interest Group on Data Communication (SIGCOM)
- Member, ACM Special Interest Group on Hypertext, Hypermedia, and Web (SIGWEB)
- Member, IEEE Consultants' Network (CNSV)
- Global Member, Internet Society (ISOC)
- President Java Users Group – Silicon Valley Mountain View, CA,1999-2000
- Toastmasters International

FORMER ADVISORY BOARDS POSITIONS

- Quixey –search engine for wireless mobile apps
- Mytopia – mobile wireless social games
- iLeverage – Israeli Innovations

PROFESSIONAL AWARDS

- Top Talent Award – Nortel
- Top Inventors Award – Nortel EDN
- Certified IEEE-WCET - Wireless Communications Engineering Technologies
- Toastmasters International - Competent Communicator (twice)
- Toastmasters International - Advanced Communicator Bronze

PERSONAL

- USA FIT – San Jose Marathon running club (2017-2018)
- Hiking Bateva – hiking club
- A dancer for 45 years

Patents and Publications

(Not an exhaustive list)

Patents Issued

US 9,831,881	Radar target detection system for autonomous vehicles with ultra-low phase noise frequency synthesizer	Link
US 9,762,251	Ultra-low phase noise frequency synthesizer	Link
US 9,705,511	Ultra-low phase noise frequency synthesizer	Link
US 9,690,877	Systems and methods for electronic communications	Link
US 9,660,655	Ultra-low phase noise frequency synthesizer	Link
US 9,184,989	Grid proxy architecture for network resources	Link
US 9,521,255	Systems and methods for visual presentation and selection of IVR menu	Link
US 9,083,728	Systems and methods to support sharing and exchanging in a network	Link
US 9,021,130	Photonic line sharing for high-speed routers	Link
US 9,001,819	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,949,846	Time-value curves to provide dynamic QoS for time sensitive file transfers	Link
US 8,929,517	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,903,073	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,898,274	Grid proxy architecture for network resources	Link
US 8,880,120	Device and method for providing enhanced telephony	Link
US 8,879,703	System method and device for providing tailored services when call is on-hold	Link
US 8,879,698	Device and method for providing enhanced telephony	Link
US 8,867,708	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,787,536	Systems and methods for communicating with an interactive voice response system	Link
US 8,782,230	Method and apparatus for using a command design pattern to access and configure network elements	Link
US 8,762,963	Translation of programming code	Link
US 8,762,962	Methods and apparatus for automatic translation of a computer program language code	Link

US 8,745,573	Platform-independent application development framework	Link
US 8,731,148	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,688,796	Rating system for determining whether to accept or reject objection raised by user in social network	Link
US 8,619,793	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link
US 8,572,303	Portable universal communication device	Link
US 8,553,859	Device and method for providing enhanced telephony	Link
US 8,548,131	Systems and methods for communicating with an interactive voice response system	Link
US 8,537,989	Device and method for providing enhanced telephony	Link
US 8,341,257	Grid proxy architecture for network resources	Link
US 8,161,139	Method and apparatus for intelligent management of a network element	Link
US 8,146,090	Time-value curves to provide dynamic QoS for time sensitive file transfer	Link
US 8,078,708	Grid proxy architecture for network resources	Link
US 7,944,827	Content-aware dynamic network resource allocation	Link
US 7,860,999	Distributed computation in network devices	Link
US 7,734,748	Method and apparatus for intelligent management of a network element	Link
US 7,710,871	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link
US 7,580,349	Content-aware dynamic network resource allocation	Link
US 7,433,941	Method and apparatus for accessing network information on a network device	Link
US 7,359,993	Method and apparatus for interfacing external resources with a network element	Link
US 7,313,608	Method and apparatus for using documents written in a markup language to access and configure network elements	Link
US 7,260,621	Object-oriented network management interface	Link
US 7,237,012	Method and apparatus for classifying Java remote method invocation transport traffic	Link
US 7,127,526	Method and apparatus for dynamically loading and managing software services on a network device	Link

US 7,047,536	Method and apparatus for classifying remote procedure call transport traffic	Link
US 7,039,724	Programmable command-line interface API for managing operation of a network device	Link
US 6,976,054	Method and system for accessing low-level resources in a network device	Link
US 6,970,943	Routing architecture including a compute plane configured for high-speed processing of packets to provide application layer support	Link
US 6,950,932	Security association mediator for Java-enabled devices	Link
US 6,850,989	Method and apparatus for automatically configuring a network switch	Link
US 6,845,397	Interface method and system for accessing inner layers of a network protocol	Link
US 6,842,781	Download and processing of a network management application on a network device	Link
US 6,772,205	Executing applications on a target network device using a proxy network device	Link
US 6,564,325	Method of and apparatus for providing multi-level security access to system	Link
US 6,175,868	Method and apparatus for automatically configuring a network switch	Link
US 6,170,015	Network apparatus with Java co-processor	Link
US 8,687,777	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,681,951	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,625,756	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,594,280	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,548,135	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,406,388	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,345,835	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,223,931	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,160,215	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,155,280	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,054,952	Systems and methods for visual presentation and selection of IVR menu	Link
US 8,000,454	Systems and methods for visual presentation and selection of IVR menu	Link
EP 1,905,211	Technique for authenticating network users	Link

EP 1,142,213	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link
EP 1,671,460	Method and apparatus for scheduling resources on a switched underlay network	Link
CA 2,358,525	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link
CA 2,989,752	Ultra-low Phase Noise Frequency Synthesizer	Link

Patent Applications Published and Pending
(Not an exhaustive list)

US 20150058490	Grid Proxy Architecture for Network Resources	Link
US 20150010136	Systems and Methods for Visual Presentation and Selection of IVR Menu	Link
US 20140379784	Method and Apparatus for Using a Command Design Pattern to Access and Configure Network Elements	Link
US 20140105025	Dynamic Assignment of Traffic Classes to a Priority Queue in a Packet Forwarding Device	Link
US 20140105012	Dynamic Assignment of Traffic Classes to a Priority Queue in a Packet Forwarding Device	Link
US 20140012991	Grid Proxy Architecture for Network Resources	Link
US 20130080898	Systems and Methods for Electronic Communications	Link
US 20130022191	Systems and Methods for Visual Presentation and Selection of IVR Menu	Link
US 20130022183	Systems and Methods for Visual Presentation and Selection of IVR Menu	Link
US 20130022181	Systems and Methods for Visual Presentation and Selection of IVR Menu	Link
US 20120180059	Time-Value Curves to Provide Dynamic QOS for Time Sensitive File Transfers	Link
US 20120063574	Systems and Methods for Visual Presentation and Selection of IVR Menu	Link
US 20110225330	Portable Universal Communication Device	Link
US 20100220616	Optimizing Network Connections	Link
US 20100217854	Method and Apparatus for Intelligent Management of a Network Element	Link
US 20100146492	Translation of Programming Code	Link
US 20100146112	Efficient Communication Techniques	Link
US 20100146111	Efficient Communication in a Network	Link
US 20090313613	Methods and Apparatus for Automatic Translation of a Computer Program Language Code	Link
US 20090313004	Platform-Independent Application Development Framework	Link
US 20090279562	Content-aware dynamic network resource allocation	Link
US 20080040630	Time-Value Curves to Provide Dynamic QoS for Time Sensitive File	Link

	Transfers	
US 20070169171	Technique for authenticating network users	Link
US 20060123481	Method and apparatus for network immunization	Link
US 20060075042	Extensible Resource Messaging Between User Applications and Network Elements in a Communication Network	Link
US 20050083960	Method and Apparatus for Transporting Parcels of Data Using Network Elements with Network Element Storage	Link
US 20050076339	Method and Apparatus for Automated Negotiation for Resources on a Switched Underlay Network	Link
US 20050076336	Method and Apparatus for Scheduling Resources on a Switched Underlay Network	Link
US 20050076173	Method And Apparatus for Preconditioning Data to Be Transferred on a Switched Underlay Network	Link
US 20050076099	Method and Apparatus for Live Streaming Media Replication in a Communication Network	Link
US 20050074529	Method and apparatus for transporting visualization information on a switched underlay network	Link
US 20040076161	Dynamic Assignment of Traffic Classes to a Priority Queue in a Packet Forwarding Device	Link
US 20020021701	Dynamic Assignment of Traffic Classes to a Priority Queue in a Packet Forwarding Device	Link
WO 2006/063052	Method and apparatus for network immunization	Link
WO 2007/008976	Technique for authenticating network users	Link
WO2000/0054460	Method and apparatus for accessing network information on a network device	Link
WO/2016/203460	Ultra-low phase noise frequency synthesizer	Link
WO/2005/033899	Method and apparatus for scheduling resources on a switched underlay network	Link
WO/2000/041368	Dynamic assignment of traffic classes to a priority queue in a packet forwarding device	Link
US 20140156556	Time-variant rating system and method thereof	Link

US 20140156758	Reliable rating system and method thereof	Link
US 20170085708	Systems and methods for visual presentation and selection of ivr menu	Link
US 20160373117	Ultra-low phase noise frequency synthesizer	Link
US 20170322687	Systems and methods for electronic communications	Link
US 20170302282	Radar target detection system for autonomous vehicles with ultra-low phase noise frequency synthesizer	Link
US 20180019755	Radar target detection system for autonomous vehicles with ultra-low phase noise frequency synthesizer	Link
US 20170289332	Systems and methods for visual presentation and selection of ivr menu	Link
US 20170269797	Systems and methods for electronic communication	Link
US 20170099058	Ultra-low phase noise frequency synthesizer	Link
US 20170099057	Ultra-low phase noise frequency synthesizer	Link

Publications

(Not an exhaustive list)

- Dangerous Liaisons - Software Combinations as Derivative Works? Determann L.; Berkeley Technology Law Journal. Volume 21, Issue 4, Fall 2006.
- "R&D Models for Advanced Development & Corporate Research" Understanding Six Models of Advanced R&D - Ikhlaq Sidhu, Tal Lavian, Victoria Howell - University of California, Berkeley. Accepted paper for 2015 ASEE Annual Conference and Exposition- June 2015
- "Communications Architecture in Support of Grid Computing",TalLavian, Scholar's Press 2013ISBN 978-3-639-51098-0.
- "Applications Drive Secure Light-path Creation across Heterogeneous Domains, Feature Topic Optical Control Planes for Grid Networks: Opportunities, Challenges and the Vision." Gommans L.; Van Oudenaarde B.; Dijkstra F.; De Laat C.; Lavian T.; Monga I.; Taal A.; Travostino F.; Wan A.; IEEE Communications Magazine, vol. 44, no. 3, March 2006, pp. 100-106.
- *Lambda Data Grid: Communications Architecture in Support of Grid Computing*. Tal I. Lavian, Randy H. Katz; Doctoral Thesis, University of California at Berkeley. January 2006.
- "Information Switching Networks." Hoang D.B.; T. Lavian; The 4th Workshop on the Internet, *Telecommunications and Signal Processing, WITSP2005*, December 19-21, 2005, Sunshine Coast, Australia.
- "Impact of Grid Computing on Network Operators and HW Vendors." Allcock B.; Arnaud B.; Lavian T.; Papadopoulos P.B.; Hasan M.Z.; Kaplow W.; *IEEE Hot Interconnects at Stanford University 2005*, pp.89-90.
- *DWDM-RAM: A Data Intensive Grid Service Architecture Enabled by Dynamic Optical Networks*. Lavian T.; Mambretti J.; Cutrell D.; Cohen H.J; Merrill S.; Durairaj R.; Daspit P.; Monga I.; Naiksatam S.; Figueira S.; Gutierrez D.; Hoang D.B., Travostino F.; *CCGRID 2004*, pp. 762-764.
- *DWDM-RAM: An Architecture for Data Intensive Service Enabled by Next Generation Dynamic Optical Networks*. Hoang D.B.; Cohen H.; Cutrell D.; Figueira S.; Lavian T.; Mambretti J.; Monga I.; Naiksatam S.; Travostino F.; Proceedings IEEE Globecom 2004, Workshop on High-Performance Global Grid Networks, Houston, 29 Nov. to 3 Dec. 2004, pp.400-409.
- *Implementation of a Quality of Service Feedback Control Loop on Programmable Routers*. Nguyen C.; Hoang D.B.; Zhao, I.L.; Lavian, T.; Proceedings, 12th IEEE International Conference on Networks 2004. (ICON 2004) Singapore, Volume 2, 16-19 Nov. 2004, pp.578-582.
- *A Platform for Large-Scale Grid Data Service on Dynamic High-Performance Networks*. Lavian T.; Hoang D.B.; Mambretti J.; Figueira S.; Naiksatam S.; Kaushil N.; Monga I.; Durairaj R.; Cutrell D.; Merrill S.; Cohen H.; Daspit P.; Travostino F; GridNets 2004, San Jose, CA., October 2004.
- *DWDM-RAM: Enabling Grid Services with Dynamic Optical Networks*. Figueira S.; Naiksatam S.; Cohen H.; Cutrell D.; Daspit, P.; Gutierrez D.; Hoang D. B.; Lavian T.; Mambretti J.; Merrill S.; Travostino F; Proceedings, 4th IEEE/ACM International Symposium on Cluster Computing and the Grid, Chicago, USA, April 2004, pp. 707-714.
- *DWDM-RAM: Enabling Grid Services with Dynamic Optical Networks*. Figueira S.; Naiksatam S.; Cohen H.; Cutrell D.; Gutierrez D.; Hoang D.B.; Lavian T.; Mambretti J.; Merrill S.;

Travostino F.; 4th IEEE/ACM International Symposium on Cluster Computing and the Grid, Chicago, USA, April 2004.

- *An Extensible, Programmable, Commercial-Grade Platform for Internet Service Architecture*. Lavian T.; Hoang D.B.; Travostino F.; Wang P.Y.; Subramanian S.; Monga I.; IEEE Transactions on Systems, Man, and Cybernetics on Technologies Promoting Computational Intelligence, Openness and Programmability in Networks and Internet Services Volume 34, Issue 1, Feb. 2004, pp.58-68.
- *DWDM-RAM: An Architecture for Data Intensive Service Enabled by Next Generation Dynamic Optical Networks*. Lavian T.; Cutrell D.; Mambretti J.; Weinberger J.; Gutierrez D.; Naiksatam S.; Figueira S.; Hoang D. B.; Supercomputing Conference, SC2003 Igniting Innovation, Phoenix, November 2003.
- *Edge Device Multi-Unicasting for Video Streaming*. Lavian T.; Wang P.; Durairaj R.; Hoang D.; Travostino F.; Telecommunications, 2003. ICT 2003. 10th International Conference on Telecommunications, Tahiti, Volume 2, 23 Feb.-1 March, 2003 pp. 1441-1447.
- The SAHARA Model for Service Composition Across Multiple Providers. Raman B.; Agarwal S.; Chen Y.; Caesar M.; Cui W.; Lai K.; Lavian T.; Machiraju S.; Mao Z. M.; Porter G.; Roscoe T.; Subramanian L.; Suzuki T.; Zhuang S.; Joseph A. D.; Katz Y.H.; Stoica I.; Proceedings of the First International Conference on Pervasive Computing. ACM Pervasive 2002, pp. 1-14.
- *Enabling Active Flow Manipulation in Silicon-Based Network Forwarding Engines*. Lavian T.; Wang P.; Travostino F.; Subramanian S.; Duraraj R.; Hoang D.B.; Sethaput V.; Culler D.; Proceeding of the Active Networks Conference and Exposition, 2002.(DANCE) 29-30 May 2002, pp. 65-76.
- *Practical Active Network Services within Content-Aware Gateways*. Subramanian S.; Wang P.; Durairaj R.; Rasimas J.; Travostino F.; Lavian T.; Hoang D.B.; Proceeding of the DARPA Active Networks Conference and Exposition, 2002.(DANCE) 29-30 May 2002, pp. 344-354.
- *Active Networking on a Programmable Network Platform*. Wang P.Y.; Lavian T.; Duncan R.; Jaeger R.; Fourth IEEE Conference on Open Architectures and Network Programming (OPENARCH), Anchorage, April 2002.
- *Intelligent Network Services through Active Flow Manipulation*. Lavian T.; Wang P.; Travostino F.; Subramanian S.; Hoang D.B.; Sethaput V.; IEEE Intelligent Networks 2001 Workshop (IN2001), Boston, May 2001.
- *Intelligent Network Services through Active Flow Manipulation*. Lavian T.; Wang P.; Travostino F.; Subramanian S.; Hoang D.B.; Sethaput V.; Intelligent Network Workshop, 2001 IEEE 6-9 May 2001, pp.73 -82.
- *Enabling Active Flow Manipulation in Silicon-based Network Forwarding Engine*. Lavian, T.; Wang, P.; Travostino, F.; Subramanian S.; Hoang D.B.; Sethaput V.; Culler D.; Journal of Communications and Networks, March 2001, pp.78-87.
- *Active Networking on a Programmable Networking Platform*. Lavian T.; Wang P.Y.; IEEE Open Architectures and Network Programming, 2001, pp. 95-103.
- *Enabling Active Networks Services on a Gigabit Routing Switch*. Wang P.; Jaeger R.; Duncan R.; Lavian T.; Travostino F.; 2nd Workshop on Active Middleware Services, 2000.
- *Dynamic Classification in Silicon-Based Forwarding Engine Environments*. Jaeger R.; Duncan R.; Travostino F.; Lavian T.; Hollingsworth J.; Selected Papers. 10th IEEE Workshop on Metropolitan Area and Local Networks, 1999. 21-24 Nov. 1999, pp.103-109.
- *Open Programmable Architecture for Java-Enabled Network Devices*. Lavian, T.; Jaeger, R. F.; Hollingsworth, J. K.; IEEE Hot Interconnects Stanford University, August 1999, pp. 265-277.

- *Open Java SNMP MIB API*. Rob Duncan, Tal Lavian, Roy Lee, Jason Zhou, Bay Architecture Lab Technical Report TR98-038, December 1998.
- *Java-Based Open Service Interface Architecture*. Lavian T.; Lau S.; BAL TR98-010 Bay Architecture Lab Technical Report, March 1998.
- *Parallel SIMD Architecture for Color Image Processing*. Lavian T. Tel – Aviv University, Tel – Aviv, Israel, November 1995.
- *Grid Network Services, Draft-ggf-ghpn-netservices-1.0*. George Clapp, Tiziana Ferrari, Doan B. Hoang, Gigi Karmous-Edwards, Tal Lavian, Mark J. Leese, Paul Mealor, InderMonga, Volker Sander, Franco Travostino, Global Grid Forum(GGF).
- *Project DRAC: Creating an applications-aware network*. Travostino F.; Keates R.; Lavian T.; Monga I.; Schofield B.; Nortel Technical Journal, February 2005, pp. 23-26.
- *Optical Network Infrastructure for Grid, Draft-ggf-ghpn-opticalnets-1*. Dimitra Simeonidou, Reza Nejabati, Bill St. Arnaud, Micah Beck, Peter Clarke, Doan B. Hoang, David Hutchison, Gigi Karmous-Edwards, Tal Lavian, Jason Leigh, Joe Mambretti, Volker Sander, John Strand, Franco Travostino, Global Grid Forum(GGF) GHPN Standard GFD-I.036 August 2004.
- *Popeye - Using Fine-grained Network Access Control to Support Mobile Users and Protect Intranet Hosts*. Mike Chen, Barbara Hohlt, Tal Lavian, December 2000.
- Open Networking - Better Networking through Programmability, Open Networking - Better Networking through Programmability

Presentations and Talks

(Not an exhaustive list)

- Lambda Data Grid
- A Platform for Large-Scale Grid Data Service on Dynamic High-Performance Networks
- Lambda Data Grid: An Agile Optical Platform for Grid Computing and Data-intensive Applications.
- Workflow Integrated Network Resource Orchestration
- DWDM-RAM: DARPA-Sponsored Research for Data Intensive Service-on-Demand Advanced Optical Networks
- Impact of Grid Computing on Network Operators and HW Vendors
- Web Services and OGSA
- WINER Workflow Integrated Network Resource Orchestration.
- A Grid Proxy Architecture for Network Resources
- Technology & Society
- Abundant Bandwidth and how it affects us?
- Active Content Networking (ACN)
- DWDM-RAM: Enabling Grid Services with Dynamic Optical Networks
- Application-engaged Dynamic Orchestration of Optical Network Resources
- DWDM-RAM: DARPA-Sponsored Research for Data Intensive Service-on-Demand Advanced Optical Networks
- An Architecture for Data Intensive Service Enabled by Next Generation Optical Networks
- A Platform for Data Intensive Services Enabled by Next Generation Dynamic Optical Networks
- A Platform for Data Intensive Services Enabled by Next Generation Dynamic Optical Networks
- Optical Networks
- Grid Optical Network Service Architecture for Data Intensive Applications
- Optical Networking & DWDM

- OptiCal Inc.
- OptiCal & LUMOS Networks
- Optical Networking Services
- Optical Networks
- Business Models for Dynamically Provisioned Optical Networks
- Business Model Concepts for Dynamically Provisioned Optical Networks
- Optical Networks Infrastructure
- Research Challenges in agile optical networks
- Services and Applications' infrastructure for agile optical networks
- Impact on Society
- Technology & Society
- TeraGrid Communication and Computation
- Unified Device Management via Java-enabled Network Devices
- Active Network Node in Silicon-Based L3 Gigabit Routing Switch
- Enabling Active Flow Manipulation (AFM) in Silicon-based Network Forwarding Engines
- Enabling Active Flow Manipulation (AFM) in Silicon-based Network Forwarding Engines
- Active Nets Technology Transfer through High-Performance Network Devices
- Enabling Active Networks Services on A Gigabit Routing Switch
- Programmable Network Node: Applications
- Open Innovation via Java-enabled Network Devices
- Practical Considerations for Deploying a Java Active Networking Platform
- Open Programmable Architecture for Java-enabled Network Devices
- Enabling Active Flow Manipulation In Silicon-based Network Forwarding Engines
- Enabling Active Flow Manipulation In Silicon-based Network Forwarding Engines
- Enabling Active Flow Manipulation In Silicon-based Network Forwarding Engines
- DWDM-RAM: DARPA-Sponsored Research for Data Intensive Service-on-Demand Advanced Optical Networks
- DWDM-RAM: DARPA-Sponsored Research for Data Intensive Service-on-Demand Advanced Optical Networks
- Open Programmable Architecture for Java-enabled Network Devices
- Open Java-Based Intelligent Agent Architecture for Adaptive Networking Devices
- Edge Device Multi-unicasting for Video Streaming
- Intelligent Network Services through Active Flow Manipulation
- Java SNMP Oplet
- Unified Device Management via Java-enabled Network Devices
- Dynamic Classification in a Silicon-Based Forwarding Engine
- Integrating Active Networking and Commercial-Grade Routing Platforms
- Enabling Active Flow Manipulation In Silicon-based Network Forwarding Engines
- Open Distributed Networking Intelligence: A New Java Paradigm
- Open Networking Better Networking Through Programmability
- Open Networking
- Open Programmability
- Active Networking On A Programmable Networking Platform
- Open Networking through Programmability
- Open Programmable Architecture for Java-enabled Network Devices
- Popeye – Fine-grained Network Access Control for Mobile Users

- Integrating Active Networking and Commercial-Grade Routing Platforms
- Active Networking
- Programmable Network Devices
- Open Programmable Architecture for Java-enabled Network Devices
- To be smart or not to be?