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(54) Title: SERVER FOR COMMUNICATING A DISPLAY MESSAGE TO A USER DEVICE AND SYSTEM FOR SELECTING A PATH FOR ROUTING A COMMUNICATION CALL

(57) Abstract: There is provided a communication management server for serving a number of users via a number of user communication devices. The communication management server is operable to communicate at least one display message or at least one link to a display message to a user communication device being in communicative connection with the server, whereby the display message can be displayed at the connected user communication device. The communication management server is further operable to update one or more databases based at least partly on the number of times a display message has been communicated to a user communication device and/or based at least partly on the length of time a communicated display message has been displayed at a user communication device. The communication management server may be operable to update said one or more databases based on message display information received from a user communication device having one or more display messages displayed. The one or more databases may comprise a number of user accounts of registered users, and the communication management server may be operable to update a user account of a registered user based at least partly on the number of times a display message has been communicated to a user communication device used by said registered user and/or based at least partly on the length of time a communicated display message has been displayed at a user communication device used by said registered user. There is further provided a data communication system comprising a communication management server for selecting a communication path for routing a communication call from a user communication device.

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SERVER FOR COMMUNICATING A DISPLAY MESSAGE TO A USER DEVICE
AND SYSTEM FOR SELECTING A PATH FOR ROUTING A COMMUNICATION
CALL

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FIELD OF THE INVENTION

The present invention relates to a communication management server for communicating a display message for display on a user communication device, with
10 the communication management server being operable to update one or more databases based on displayed messages. Furthermore, the present invention relates to a data communication system comprising a communication management server for selecting a communication path for routing a communication call from a user communication device.

15

BACKGROUND OF THE INVENTION

The Internet is a data communication network of interconnected computers and computer networks around the world and has evolved to the point where it combines elements of telecommunications, computing, broadcasting, publishing,
20 commerce, and information services into a model for global communications. Unlike a circuit-switched network, the Internet is a packet-switched network; communication on the Internet is accomplished by sending small packets of "data" back and forth. In addition to the data itself, each packet contains an address to ensure that it is routed to the correct destination. The exact format of
25 these packets is defined by the Internet Protocol (IP). The "data" can be just about anything, including digitized and encoded "voice". Thus, "Voice Over IP" or VoIP is exactly what it means, voice delivered using the Internet Protocol, for managing the delivery of voice information using the Internet Protocol and sent
30 over the Internet to facilitate telephone-like communications.

Voice, fax and other forms of information have traditionally been carried over dedicated circuit-switched connections of the public switched telephone network (PSTN) that is typically controlled by one or more service carriers. The use of the

PSTN is measured in terms of seconds or minutes and times as well as the distance that collectively determine the overall cost of the use.

5 Using the Internet, calls travel as packets of data on shared lines, avoiding the tolls of the PSTN. This has created an opportunity for non-phone businesses to get into the phone service market in direct competition against the traditional phone companies. For example, Microsoft Corporation offers windows-based technologies that enable PC-to-phone and phone-to-phone services.

10 The use of the Internet also presents the possibility of communicating display messages, such as advertising messages, to an IP phone connected to the Internet and having a display. In US Patent No. 6,937,699 is disclosed a system for providing advertising and advertising services using a telephone system. A data network telephony system includes a commercial message server that communi-
15 cates with a telephony connection server to communicate commercial messages to display devices on data network telephones. A caller uses the data network telephone to make a telephone call to a callee. The commercial message server receives information about the connection and retrieves commercial messages, or advertisements to communicate to either the caller, the callee or both.

20 The telephony services over the Internet are more cost-effective than the same services over PSTN. With the advent of new technologies for the Internet, the quality of service (QoS) of the telephony service is catching up quickly. The idea of voice and data over a single network has now become a reality. Nevertheless,
25 many of the IP telephony service providers carry on the traditional service plans, namely the overall cost of the telephony services is determined by the usage of the network except the charging rate is now significantly lower. Recently, the company Skype Ltd. has been offering a program for providing free calls over the Internet. However, when having a call from an IP phone or PC phone to a phone
30 connected to the PSTN, the tolls from the use of the PSTN still has to be paid by the users.

Thus, there is a need for a system, which allows a user of an IP phone or IP communication device to earn or save communication or talk time, which may be

used for paying when the user is performing a communication call to a callee via a non toll free service carrier.

SUMMARY OF THE INVENTION

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According to a first aspect of the present invention, there is provided a communication management server for serving a number of users via a number of user communication devices, said user communication devices being operable to be in communicative connection with the communication management server, and
10 said user communication devices forming at least part of a number of network communication devices connected to a communication network and being operable to communicate with each other by use of one or more communications paths provided by said communication network, wherein

the communication management server is operable to communicate at
15 least one display message or at least one link to a display message to a user communication device being in communicative connection with the server, whereby the display message can be displayed at the connected user communication device; and

the communication management server is operable to update one or more
20 databases based at least partly on the number of times a display message has been communicated to a user communication device and/or based at least partly on the length of time a communicated display message has been displayed at a user communication device.

25 It is preferred that the communication management server is operable to update said one or more databases based on message display information received from a user communication device having one or more display messages displayed. It is also preferred that the communication management server is operable to communicate at least one display message or at least one link to a display message to the user communication device upon a communicative connection being
30 established between the server and the user communication device.

It is within an embodiment of the first aspect of the invention that said one or more databases comprises a number of user accounts of registered users, and
35 that the communication management server is operable to update a user account

of a registered user based at least partly on the number of times a display message has been communicated to a user communication device used by said registered user and/or based at least partly on the length of time a communicated display message has been displayed at a user communication device used by
5 said registered user.

It is also within an embodiment of the first aspect of the invention that the communication management server, upon receiving a request for a communication call from a calling user via a calling user communication device to a receiving
10 network communication device, is operable to communicate at least one display message or at least one link to a display message to the calling user communication device.

For embodiments of the first aspect of the invention, wherein said one or more
15 databases comprises a number of user accounts, it is preferred that the communication management server is operable to update the user account of a registered user based on message display information received from a user communication device used by said registered user. It is also preferred that the user account corresponding to a registered user holds information of available communication time or talk time for the registered user. Here, the communication management server may be operable to increase the available communication time or
20 talk time of said registered user based at least partly on received display message information holding information on the number of times a display message has been communicated to a user communication device used by said registered user and/or the length of time a communicated display message has been displayed at a user communication device used by said registered user.
25

For embodiments of the first aspect of the invention, wherein said one or more databases comprises a number of user accounts, it is preferred that the communication management server is further operable to update the user account of a
30 registered user based on information of communication time or talk time paid by the registered user or to be paid by the registered user. It is also preferred that the communication management server is operable to update the user account of a registered user based on information of communication time or talk time used
35 by the registered user during a communication call from a user communication

device used by the registered user to a receiving network communication device. Here, the communication management server may be operable to update said user account based on used communication time or talk time from communication time or talk time information received from the user communication device
5 used by said registered user during said communication call.

It is also within an embodiment of the first aspect of the invention that a user account holds information identifying the corresponding registered user.

10 According to an embodiment of the first aspect of the present invention it is preferred that the communication management server, upon receiving a request for a communication call from a user using a user communication device to a receiving network communication device, is operable to determine if the calling user is a registered user.

15

It is within an embodiment of the first aspect of the present invention that said one or more databases further store communication path data corresponding to the communication paths provided by the communication network, and that the communication management server, upon receiving a request for a communication call from a calling user via a calling user communication device to a receiving
20 network communication device, is operable to select a communication path for routing the communication call from the calling communication device to the receiving network communication device within said communication network. Here, the communication management server may further be operable to forward data
25 comprising information of the selected communication path to the calling user communication device. It is preferred that the communication path data holds information of communication costs for use of said communication paths. It is also preferred that the communication path data holds information of providers of the communication paths. Here, the communication path data may hold IP (Inter-
30 net Protocol) account information for the providers of the communication paths

According to a second aspect of the present invention, there is provided a data communication system comprising:

35 a communication network to provide connectivity for one or more communication paths;

a number of network communication devices being operable to communicate with each other by use of one or more of the communication paths;

a communication management server for serving a number of users via a number of user communication devices forming at least part of the network communication devices, said user communication devices being operable to be in
5 communicate connection with the communication management server;

one or more databases for storing user data and for storing communication path data corresponding to at least part of said one or more communication paths; wherein

10 the communication management server, upon receiving a request for a communication call from a calling user via a calling user communication device to a receiving network communication device, is operable to select a communication path for routing the communication call from the calling user communication device to the receiving network communication device; and

15 the communication management server is further operable to forward data comprising information of the selected communication path to the calling user communication device.

For the second aspect of the invention it is preferred that the communication
20 management server is operable to select said communication path based at least partly on the stored communication path data. It is also preferred that the communication management server is operable to determine if the calling user is a registered user based at least partly on the stored used data.

25 It is within an embodiment of the second aspect of the invention that the calling user communication device upon receiving information of the selected communication path from the communication management server is operable to establish a connection for the communication call to the receiving network communication device via said selected communication path. Here, the calling user communication
30 device upon termination of the communication call to the receiving network communication device may be operable to forward call information corresponding to the terminated call to the communication management server.

According to an embodiment of the second aspect of the invention, the communication
35 management server may be operable to forward data comprising informa-

tion of a selected communication path to the calling user communication device only when the calling user is a registered user.

5 It is preferred that the communication management server is operable to communicate with the user communication devices by use of a TCP/IP connection.

10 It is within an embodiment of the second aspect of the invention that the communication path data holds information of communication costs for use of said communication paths. It is also within an embodiment of the second aspect of the invention that the communication path data holds information of providers of the communication paths. Here, the communication path data may hold IP (Internet Protocol) account information for the providers of the communication paths.

15 According to an embodiment of the second aspect of the invention at least part of the one or more communication paths may use a data transport protocol selected from the group consisting of: the Session Initiation Protocol (SIP) and the Skype protocol.

20 The second aspect of the invention also covers an embodiment wherein the communication management server is operable to communicate at least one display message or at least one link to a display message to a user communication device being in communicative connection with the server, whereby the display message can be displayed at the connected user communication device. Here, the communication management server may be operable to update said user data based at least partly on the number of times a display message has been communicated to a user communication device and/or based at least partly on the length of time a communicated display message has been displayed at a user communication device. It is preferred that the communication management server is operable to update said user data based on message display information received from a user communication device having one or more display messages displayed.

35 According to an embodiment of the second aspect of the invention the communication management server is operable to communicate at least one display message or at least one link to a display message to the user communication device

upon a communicative connection being established between the server and the user communication device.

5 It is within an embodiment of the second aspect of the invention that said user data comprises a number of user accounts of registered users, and wherein the communication management server is operable to update a user account of a registered user based at least partly on the number of times a display message has been communicated to a user communication device used by said registered user and/or based at least partly on the length of time a communicated display
10 message has been displayed at a user communication device used by said registered user.

The second aspect of the invention also covers an embodiment wherein the communication management server, upon receiving a request for a communication call from the calling user via the calling user communication device to the
15 receiving network communication device, is operable to communicate at least one display message or at least one link to a display message to the calling user communication device.

20 It is also within an embodiment of the second aspect of the invention that the communication management server is operable to update the user account of a registered user based on message display information received from a user communication device used by said registered user.

25 The second aspect of the invention also covers an embodiment wherein the user account corresponding to a registered user holds information of available communication time or talk time for the registered user. Here, the communication management server may be operable to increase the available communication time or talk time of said registered user based at least partly on received display
30 message information holding information on the number of times a display message has been communicated to a user communication device used by said registered user and/or the length of time a communicated display message has been displayed at a user communication device used by said registered user.

For embodiments of the second aspect of the invention wherein the user data comprises a number of user accounts, it is preferred that the communication management server is further operable to update the user account of a registered user based on information of communication time or talk time paid by the registered user or to be paid by the registered user. It is also preferred that the communication management server is operable to update the user account of a registered user based on information of communication time or talk time used by the registered user during a communication call from a user communication device used by the registered user to a receiving network communication device. Here, the communication management server may be operable to update said user account based on used communication time or talk time from communication time or talk time information received from the user communication device used by said registered user during said communication call. It is also within a preferred embodiment of the second aspect of the invention that a user account holds information identifying the corresponding registered user.

It should be understood that when using the terms "communication time" or "talk time" in connection with the present invention, these terms are meant in a broad sense and also covers the financial balance of a user account. The costs of a communication call will depend on the selected communication path, and therefore the available communication time or talk time of a user account will depend on the financial balance of the user account and the selected communication path or route.

Further features and advantages of the present invention will become more apparent with reference to the following drawings and description of preferred embodiments.

DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing the interaction between components in a data communication system including a communication management server according to a first embodiment of the present invention,

Fig. 2 is a block diagram showing the interaction between components in a data communication system including a communication management server according to a second embodiment of the present invention,

5 Fig. 3 is a block diagram showing the interaction between components in a data communication system including a communication management server according to a third embodiment of the present invention,

10 Fig. 4 is a block diagram showing the interaction between components in a data communication system including a communication management server according to a fourth embodiment of the present invention,

15 Fig. 5 is a block diagram showing the interaction between components in a data communication system including a communication management server according to a fifth embodiment of the present invention,

20 Fig. 6 is a flowchart illustrating the basic processing corresponding to an embodiment of the present invention, wherein a user via a calling communication device requests a communication management server for a call to a receiving communication device,

25 Fig. 7 is a flowchart illustrating the basic processing corresponding to an embodiment of the present invention wherein a message display service is provided, and wherein a user via a calling communication device requests a communication management server for a call to a receiving communication device,

30 Fig. 8 is a flowchart illustrating a subroutine of the processing illustrated in Figs. 6 and 7, wherein the communication management server selects an available communication path for a requested call from a user, and

35 Fig. 9 is a flowchart illustrating a subroutine of the interaction between a user communication device and the communication management server as illustrated in Figs. 1 and 2, wherein call information of a terminated communication call is forwarded to the communication management server.

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to a "Communication Management System" including a "Communication Management Server" (CMS), and the system or server may provide a wide variety of communication possibilities for connected users. The communication can occur on different technical platforms, and may have a central billing system independent of platform. The Communication Management System may also contain display messages, which can be advertisements or advertisements in many different forms (web banner advertisements, sound files etc), along with questionnaires intended for registered users. Messages, advertisements and/or questionnaires may be exposed to users while they communicate through a "Communication Device"(CD) being adapted for displaying a message and connected to the CMS. CD may be any kind of communication device (soft-phone, IP phone, PDA, Handheld PC etc.).

The CMS may contain two accounts for each registered user. One account may be for money that is deposited by the user, called the YOM account. The other account may be for earned communication time or minutes, called the CIM account. CIM's can be earned in many different ways.

The CMS may ensure that any initiated communication session (voice, video, chat, SMS etc) may be financed by combining 3 different financing steps:

Step 1 is called the Free Talk Time, at no charge for the user.

Step 2 is called the CIM Talk Time, financed by the earned CIM's.

Step 3 is called the YOM Talk Time, financed by the real money deposited by the user.

The CMS according to embodiments of the present invention may be a database system with appropriate Internet Protocol (IP) services and handling communication with connected users. CMS cannot handle a true communication session, the way we know it from the Session Initiation Protocol, SIP. CMS may be completely separated from communication session services (such as PBX's), and CMS may handle user management, message or advertisement distribution, earning system, billing and questionnaires.

The CMS database may contain information regarding:

Sponsors:

- 5 - Standard Advertisements
- Unused CIM tickets

Merchants Advertisements:

- Including add intention (views per user etc)
- Price per view
- 10 - Price per click

Telephone costs (for the provider of CMS):

- Of any call destination

Information regarding IP communication providers:

- IP account information for provider around the world.

15 User Information:

- Login, password and other non human identity information
- Balance on users CIM or YOM accounts
- Add view history

Billing:

- 20 - Debit and Credit of CIMs, YOMs, communication costs etc

Referring now to Fig. 1, which is a block diagram showing the interaction between components in a data communication system including a communication management server according to a first embodiment of the present invention. For
25 the embodiment illustrated in Fig. 1, a user A uses an IP communication device, CD, which is connected to the communication management server, CMS, and User A requests a call to a User B, who is using an IP communication device, which is not connected to the CMS.

30 The interaction between the components of the communication system according to Fig. 1 is described in the following:

1.1. User A's CD has a TCP/IP connection to CMS. Communication is based on the CMS protocol

35 1.2. User A requests the CMS to communicate with User B.

1.3. CMS sends a few advertisements to the CD of User A, intended for display for User A while waiting for the CMS to send a Call Execution Plan.

1.4. CMS calculates the Call Execution Plan (CEP). CEP contains information regarding how User A's CD must perform the communication with User B, how
5 much Free talk time, CIM and YOM talk time available for the call. Furthermore CEP has information of call rates, the specific advertisements, which may be exposed to the user during the communication.

1.5. Based on the CEP, User A' CD performs the call to User B, while the CD of User A displays advertisements for User A. The CD of User A uses the commu-
10 nication technology provided by CEP. The technology could be anyone of the known IP communication technologies like SIP, H3.23, Skype Protokol, ICQ, AOL, Messenger etc.

1.6. During communication, advertisements are exposed or displayed to User A. Communication proceeds as long as communication is financed (combined by
15 free talk time, CIM and YOM talk time), or until User A or B disconnects the call. If the provider of the CMS has no cost on the communication, User A will earn CIM's during communication.

1.7. The CD of User A sends Call Detail Information (CDI) to the CMS. CDI may contain communication duration, use of CIM's and YOM's, which advertisements
20 where exposed, which advertisements where clicked, along with answers from questionnaires.

1.8. CMS logs all info from CDI, and performs debit and credit on relevant user accounts.

25 Referring now to Fig. 2, which is a block diagram showing the interaction between components in a data communication system including a communication management server according to a second embodiment of the present invention. For the embodiment illustrated in Fig. 2, a user A uses an IP communication device, CD, which is connected to the communication management server, CMS,
30 and User A requests a call to a User B, who is using a public PSTN communication device, which is not connected to the CMS.

The interaction between the components of the communication system according to Fig. 2 is described in the following:

- 2.1. User A's CD has a TCP/IP connection to CMS. Communication is based on the CMS protocol.
- 2.2. User A requests the CMS to communicate with User B.
- 2.3. CMS sends a few advertisements to the CD of User A, intended for display
5 for User A while waiting for CMS to send a Call Execution Plan. Advertisements are shown on User A's CD.
- 2.4. CMS calculates the Call Execution Plan (CEP). CEP contains information regarding how User A's CD must perform the communication with User B, how much Free talk time, CIM and YOM talk time available for the call. Furthermore
10 CEP has info of call rates, the specific advertisements, which should be exposed to User A during communication, in what frequency they are shown to the user and whether or not questionnaires are to be shown to the user. Finally it may contain information about server, username and password etc. to make the call.
- 2.5. Based on the CEP, User A's CD performs the call to User B, while the User
15 A's CD displays advertisements for the user. The communication is going through the SIP provider given by the CEP.
- 2.6. During communication, advertisements are exposed to User A. Communication proceeds as long as communication is financed (combined by free talk time, CIM and YOM talk time), or until User A or B disconnects the call
- 20 2.7. User A's CD sends Call Detail Information (CDI) to CMS. CDI may contain communication duration, use of CIMs and YOMs, which advertisements were exposed, which advertisements were clicked along with answers from questionnaires.
- 2.8. CMS logs all info from CDI, and performs debit and credit on relevant accounts.
25

Referring now to Fig. 3, which is a block diagram showing the interaction between components in a data communication system including a communication management server according to a third embodiment of the present invention.

30 For the embodiment illustrated in Fig. 3, a user A uses an IP communication device, CD, which is connected to the communication management server, CMS, and User A requests a call to a User B, who is using an IP communication device, CD, which is also connected to the CMS.

The interaction between the components of the communication system according to Fig. 3 is described in the following:

- 3.1. User B's CD has a TCP/IP connection to the CMS. Communication between User B and the CMS is based on the CMS protocol
- 3.2. User A's CD has a TCP/IP connection to the CMS. Communication between User A and the CMS is based on the CMS protocol
- 3.3. User A requests the CMS to communicate with User B.
- 3.4. CMS sends a few advertisements to the CD of User A, intended for User A while waiting for the CMS to send a Call Execution Plan. The advertisements are shown to User A.
- 3.5. CMS calculates a Call Execution Plan (CEP). It only contains information regarding the specific advertisements, which should be exposed to User A during communication, in what frequency they should be shown to the user and whether or not questionnaires are to be shown to the user
- 3.6. CMS notify User B' CD that User A wants to communicate.
- 3.7. CMS sends the same CEP to User B's CD.
- 3.8. CMS sends SIP server, login and password to User A's CD.
- 3.9. User A registers on the given SIP server and are ready to receive calls.
- 3.10. User A notifies the CMS that he is ready to receive calls.
- 3.11. CMS sends SIP server, login and password to User B's CD. At the same time information about the SIP address of User A's CD is send.
- 3.12. User B registers on the given SIP server.
- 3.13. User B performs a SIP call to User A's SIP login.
- 3.14. User A's SIP interface answer the call automatic, and communication is established.
- 3.15. During communication the same advertisements are displayed on User A's CD and User B's CD. The possible communication time is unlimited and User A and B are both earning CIM's during their conversation. The actual number of CIM's earned may depend on how many advertisements are being displayed.
- 3.16. An UnRegister is performed on the SIP server so that neither User A' CD or User B' CD are connected to the SIP server.
- 3.17. User A's CD and User B's CD send Call Detail Information (CDI) to the CMS. The CDI may contain communication duration, which advertisements

where exposed, which advertisements where clicked along with answers from possible questionnaires.

3.18. CMS logs all info from CDI, and performs debit and credit on relevant accounts.

5

Referring now to Fig. 4, which is a block diagram showing the interaction between components in a data communication system including a communication management server according to a fourth embodiment of the present invention. For the embodiment illustrated in Fig. 4, a user A uses an IP communication device, CD, which is connected to the communication management server, CMS, and User A receives a call from a User B, who is using a public PSTN communication device, which is not connected to the CMS.

10

The interaction between the components of the communication system according to Fig. 4 is described in the following:

15

4.1. User A's CD has a TCP/IP connection to CMS. Communication is based on the CMS protocol

4.2. When User A's CD starts and connects to the CMS, then the CMS sends a few advertisements that are to be displayed during an incoming call.

20

4.3. User A registers at a SIP VoIP provider by own choice.

4.4. When a PSTN call is received from the SIP provider, the SIP provider sends an invitation to User A, which is captured by User A's CD.

4.5. User A's CD accepts the call via "user interaction" and through the SIP interface a SIP OK is send to the SIP provider and communication is established.

25

4.6. During communication advertisements are displayed to User A. As there are no cost in connection with an incoming call, User A earns CIM's during the call. The number of CIM's earned is depending on the type and the number of advertisements displayed during the call.

4.7. User A's CD and User B's CD send Call Detail Information (CDI) to the CMS. The CDI may contain communication duration, which advertisements where exposed, which advertisements where clicked along with answers from questionnaires.

30

4.8. The CMS logs all info from CDI, and performs debit and credit on relevant accounts.

35

Referring now to Fig. 5, which is a block diagram showing the interaction between components in a data communication system including a communication management server according to a fifth embodiment of the present invention. The embodiment of Fig. 5 illustrates an example of a Multi user Instant Messaging Session based on several IP communication technologies, and for the embodiment of Fig. 5, user A uses an IP communication device, CD, which is connected to the communication management server, CMS, and User A requests a call to User B, who is also using an IP communication device, CD, being connected to the CMS.

5.1. User B's CD has a TCP/IP connection to CMS. Communication is based on the CMS protocol.

5.2. User A's CD has a TCP/IP connection to CMS. Communication is based on the CMS protocol.

5.3. User A requests the CMS to initialise an Instant Messaging (IM) session with User B's CD.

5.4. CMS establishes a SIP IM session through a known SIP Server (Could be a 3rd party).

5.5. User A requests, through relevant API (e.g. SKYPE, ICQ, AOL, Messenger, IRC etc.), User C's CD to engage in an IM Session.

5.6. IM Session between API and User C's CD is established.

5.7. User A requests, through relevant API (e.g. SKYPE, ICQ, AOL, Messenger, IRC etc.), User D's CD to engage in an IM Session.

5.8. IM Session between API and User D's CD is established.

5.9. User C sends an IM message to User A. User A's CD captures the message and displays it to User A.

5.10. User A sends User C's message to User B through the established SIP session.

5.11. User A sends User C's message to User D through the established IM session.

5.12. In this way four different users, using three different IM technologies, have communicated with User A's CD as "host".

Referring now to Fig. 6, which is a flowchart illustrating the basic processing corresponding to an embodiment of the present invention, wherein a user A via a calling communication device, User A's CM Client, requests a communication management server, CMS, for a call to a User B, who is using a receiving communication device, which is not connected to the CMS. For the embodiment of the invention illustrated in Fig. 6, there are no forwarding of advertisements or messages from the CMS to the calling user communication device, User A's CM Client.

10 The processing steps according to Fig. 6 are described in the following:

- 1: User A initiates a call to User B from User A's CM Client
- 2: User A's CM client has a TCP/IP Connection to the CMS. Through that connection User A's request is sent to the CMS.
- 15 3: CMS is handling incoming requests by listening on relevant PORT's. CMS receives User A's request.
- 4: CMS is checking to see if User A is sponsored by a merchant.
- 5: If not sponsored, CMS finds a default ring tone.
- 6: If sponsored, CMS finds the latest ring tone provided by the sponsor.
- 20 7: CMS sends information about ring tone to User A's CM Client. User A's CM Client is responsible for playback of the ring tone. (7A)
- 8: CMS Find the Call Pattern. Call Pattern is an identification (ID) of the exact call destination. CMS has details of country- and area codes available in PSTN. Call Pattern is therefore an ID of a PSTN destination or ID of an IP destination. If the
- 25 call destination does not match a call pattern, call pattern will be marked as invalid.
- 9: CMS is checking if Call Pattern is valid
- 10: On invalid call pattern, CMS send an error to User A's CM Client, and User A's CM Client will not perform a Call
- 30 11: Based on the call pattern, CMS identifies the Call Category.
- 12: For each call category, free talk time (FTT) and call interface (CIF) are defined. These are fetched and stored for later use.
- 13: User A's CIM and YOM balanced are also fetched, and when combined with FTT, the total possible talk time is calculated.
- 35 14: CMS checks to see if there is any available talk time.

15: If no available talk time, CMS send an error to User A's CM Client, and User A's CM client will not perform a Call

19: One of the essential roles for the CMS is to provide login information of an available PBX, so User A's CM Client can connect to the PBX and perform the

5 call. CMS finds the relevant PBX (PBI)

20: CMS combines TTT, PBI, CIF and FTT as the total execution plan, and sends it to User A's CM Client.

20a: User A's CM Client receives the execution plan.

20b: User A's CM Client performs the call.

10

Referring now to Fig. 7, which is a flowchart illustrating the basic processing corresponding to an embodiment of the present invention wherein a message display service is provided, and wherein a user A via a calling communication device, User A's CM Client, requests a communication management server, CMS,

15 for a call to a user B, who is using a receiving communication device, which is not connected to the CMS.

The processing steps according to Fig. 7 are described in the following:

20 1: User A initiates a call to User B from User A's CM Client.

2: User A's CM Client has a TCP/IP Connection to the CMS. Through that connection User A's request is sent to the CMS.

3: CMS is handling incoming requests by listening on relevant PORT,s. CMS receives User A's request.

25 4: CMS is checking to see if User A is sponsored by a merchant.

5: If not sponsored, CMS finds a default banner advertisement and a sponsor sound (could be a simple ring tone).

6: If sponsored, CMS finds the latest banner advertisement and sponsor sound provided by the sponsor.

30 7: CMS sends information about banner advertisement and sponsor sound to User A's CM Client. User A's CM Client is responsible for displaying the banner advertisement and to playback the sponsor sound. (7A)

8: CMS Find the Call Pattern. Call Pattern is an identification (ID) of the exact call destination. CMS has details of country- and area codes available in PSTN. Call

35 Pattern is therefore an ID of a PSTN destination or ID of an IP destination. If the

call destination does not match a call pattern, call pattern will be marked as invalid.

9: CMS is checking if Call Pattern is valid

10: On invalid call pattern, CMS send an error to User A's CM Client, and User

5 A's CM Client will not perform a Call

11: Based on the call pattern, CMS must identify the Call Category.

12: For each call category, banner advertisement per minute (BPM), free talk time (FTT), banner html template (BHT), and call interface (CIF), are defined.

These are fetched and stored for later use.

10 13: User A's CIM and YOM balanced are also fetched, and when combined with FTT, the total possible talk time is calculated.

14: CMS checks to see if there is any available talk time.

15: If no available talk time, CMS send an error to User A's CM Client, and User A's CM Client will not perform a Call.

15 16: Based on BPM and TTT the total banner advertisement requirements (BAR) are calculated.

17: CMS is retrieving historic information regarding previously viewed advertisements for User A. User A's hobby profile (areas of interest, like cars, art, sports etc) may also be fetched.

20 18: Based on BAR, historic add views and hobby profile, CMS selects the most suitable banner advertisements for this particular call (BAC).

19: One of the essential roles for the CMS is to provide login information of an available PBX, so that User A's CM Client can connect to the PBX and perform the call. CMS finds the relevant PBX (PBI)

25 20: CMS combines TTT, BAC, PBI, CIF, FTT and BHT in the total execution plan, and sends it to User A's CM Client.

20a: User A's CM Client receives the execution plan.

20b: User A's CM Client performs the call while displaying relevant advertisements.

30

Referring now to Fig. 8, which is a flowchart illustrating a subroutine corresponding to step 19 of the processing illustrated in Figs. 6 and 7, wherein the communication management server, CMS, selects an available communication path for a requested call from user A to user B, wherein user A is using a calling communication device, User A's CM Client, which is connected to the CMS, and wherein

35

user B is using a receiving communication device, which is not connected to the CMS.

The processing steps according to Fig. 8 are described in the following:

5

a: CMS find a list of prioritized PBX's for this particular Call Category. The prioritized list is manually set by the CMS administrator, and has no technical reference to the call cost for the call destination. The CMS administrator sets the prioritized list based on a combination of information like price, quality, scalability etc.

10

b: Checking if there was a list for this Call Category

c: If no list was available for this call category, CMS's default list is loaded (PLS). PLS is an arrayed list with index from 1 to XX, where XX is the number of PBX's in PLS.

15

d: CMS prepares for running an internal iteration loop. The iteration is initialized by marking PBX selected as NO, and setting the current PBX list number (CLI) in the array to 0.

e: The loop exists when PBX selected is set to YES (on CLI is larger than the number of PBX's in PLS).

20

f: Each loop start by selecting the next PBX (CLN=CLN+1).

g: CMS contains info about Max simultaneous connections for the PBX (MAX) and all possible logins for the PBX.

h: CMS also has information of any active connections to the PBX. These are retrieved and compared to the MAX connections possible for the PBX.

25

i: If there are available connections to the PBX, CMS selects the next available login, marks it as having an active connection, and set the Loop flag (PBX selected = YES), otherwise the loop iterates with the next PBX in PLS.

j: PBX info is stored as PBI. PBI is sent along with other information to User A's CM Client as the Execution Plan.

30

Referring now to Fig. 9, which is a flowchart illustrating a subroutine of the interaction between a user communication device and the communication management server as illustrated in Figs. 1 and 2, wherein call information of a terminated communication call is forwarded to the communication management

35

server. The subroutine illustrated in Fig. 9 may correspond to steps 1.7 and 1.8 in

Fig. 1 and steps 2.7 and 2.8 in Fig. 2. In Fig. 9, user A is using a communication device, User A's CM Client, which is connected to the CMS.

The processing steps according to Fig. 9 are described in the following:

- 5 1: User A has had a communication with User B. User A's CM Client gathers information regarding the call, Call Detail Information (CDI).
- 2: User A's CM Client has a TCP/IP Connection to the CMS. Through that connection User A's request is sent to the CMS.
- 3: CMS is handling incoming requests by listening on relevant PORT,s. CMS
- 10 receives User A's request.
- 4: CMS is logging all information in CDI in the call history database.
- 5: CMS is storing banner advertisements viewed (BAV) and banner advertisements clicked (BAC) in User A's advertisement history.
- 6: CMS is updating all relevant user-, system and financial accounts. This is done
- 15 with traditional debit/credit transactions. New account balances are stored for later use.
- 7: CMS is releasing the PBX connection information stored during Calculate Execution Plan (Step 19 in Fig. 7), so used PBX and login info can be used by others.
- 20 8: CMS is sending updated balances, or (if user A does not have balanced accounts) a simple OK message.

Other embodiments will be evident to those skilled in the art. It should be understood that the foregoing detailed description is provided for clarity only and is

25 merely exemplary. The spirit and scope of the present invention are not limited to the above examples, but are encompassed by the following claims.

CLAIMS

1. A communication management server for serving a number of users via a number of user communication devices, said user communication devices being
5 operable to be in communicative connection with the communication management server, and said user communication devices forming at least part of a number of network communication devices connected to a communication network and being operable to communicate with each other by use of one or more communications paths provided by said communication network, wherein

10 the communication management server is operable to communicate at least one display message or at least one link to a display message to a user communication device being in communicative connection with the server, whereby the display message can be displayed at the connected user communication device; and

15 the communication management server is operable to update one or more databases based at least partly on the number of times a display message has been communicated to a user communication device and/or based at least partly on the length of time a communicated display message has been displayed at a user communication device.

20 2. A communication management server according to claim 1, wherein the communication management server is operable to update said one or more databases based on message display information received from a user communication device having one or more display messages displayed.

25 3. A communication management server according to claim 1 or 2, wherein the communication management server is operable to communicate at least one display message or at least one link to a display message to the user communication device upon a communicative connection being established between the
30 server and the user communication device.

4. A communication management server according to any one of the claims 1-3, wherein said one or more databases comprises a number of user accounts of registered users, and wherein the communication management server is oper-
35 able to update a user account of a registered user based at least partly on the

number of times a display message has been communicated to a user communication device used by said registered user and/or based at least partly on the length of time a communicated display message has been displayed at a user communication device used by said registered user.

5

5. A communication management server according to any one of the claims 1-4, wherein the communication management server, upon receiving a request for a communication call from a calling user via a calling user communication device to a receiving network communication device, is operable to communicate at least one display message or at least one link to a display message to the calling user communication device.

10

6. A communication management server according to claim 4 or 5, wherein the communication management server is operable to update the user account of a registered user based on message display information received from a user communication device used by said registered user.

15

7. A communication management server according to any one of the claims 4-6, wherein the user account corresponding to a registered user holds information of available communication time or talk time for the registered user.

20

8. A communication management server according to claims 4 and 7, wherein the communication management server is operable to increase the available communication time or talk time of said registered user based at least partly on received display message information holding information on the number of times a display message has been communicated to a user communication device used by said registered user and/or the length of time a communicated display message has been displayed at a user communication device used by said registered user.

25
30

9. A communication management server according to any one of the claims 4-8, wherein the communication management server is further operable to update the user account of a registered user based on information of communication time or talk time paid by the registered user or to be paid by the registered user.

35

10. A communication management server according to any one of the claims 4-9, wherein the communication management server is operable to update the user account of a registered user based on information of communication time or talk time used by the registered user during a communication call from a user communication device used by the registered user to a receiving network communication device.

11. A communication management server according to claim 10, wherein the communication management server is operable to update said user account based on used communication time or talk time from communication time or talk time information received from the user communication device used by said registered user during said communication call.

12. A communication management server according to any one of the claims 4-11, wherein a user account holds information identifying the corresponding registered user.

13. A communication management server according to any one of the claims 4-12, wherein the communication management server, upon receiving a request for a communication call from a user using a user communication device to a receiving network communication device, is operable to determine if the calling user is a registered user.

14. A communication management server according to any one of the claims 1-13, wherein said one or more databases further store communication path data corresponding to the communication paths provided by the communication network, and wherein

the communication management server, upon receiving a request for a communication call from a calling user via a calling user communication device to a receiving network communication device, is operable to select a communication path for routing the communication call from the calling communication device to the receiving network communication device within said communication network.

15. A communication management server according to claim 14, wherein the communication management server is further operable to forward data compris-

ing information of the selected communication path to the calling user communication device.

16. A communication management server according to claim 14 or 15, wherein
5 the communication path data holds information of communication costs for use of said communication paths.

17. A communication management server according to any one of the claims
14-16, wherein the communication path data holds information of providers of the
10 communication paths.

18. A communication management server according to claim 17, wherein the
communication path data holds IP (Internet Protocol) account information for the
providers of the communication paths.

15

19. A data communication system comprising:

a communication network to provide connectivity for one or more communication paths;

a number of network communication devices being operable to communicate with each other by use of one or more of the communication paths;

20

a communication management server for serving a number of users via a number of user communication devices forming at least part of the network communication devices, said user communication devices being operable to be in communicate connection with the communication management server;

25

one or more databases for storing user data and for storing communication path data corresponding to at least part of said one or more communication paths; wherein

the communication management server, upon receiving a request for a communication call from a calling user via a calling user communication device to a receiving network communication device, is operable to select a communication path for routing the communication call from the calling user communication device to the receiving network communication device; and

30

the communication management server is further operable to forward data comprising information of the selected communication path to the calling user

35

communication device.

20. A data communication system according to claim 19, wherein the communication management server is operable to select said communication path based at least partly on the stored communication path data.

5

21. A data communication system according to claim 19 or 20, wherein the communication management server is operable to determine if the calling user is a registered user based at least partly on the stored used data.

10

22. A data communication system according to any one of the claims 19-21, wherein the calling user communication device upon receiving information of the selected communication path from the communication management server is operable to establish a connection for the communication call to the receiving network communication device via said selected communication path.

15

23. A data communication system according to claim 22, wherein the calling user communication device upon termination of the communication call to the receiving network communication device is operable to forward call information corresponding to the terminated call to the communication management server.

20

24. A data communication system according to any one of the claims 19-23, wherein the communication management server is operable to forward data comprising information of a selected communication path to the calling user communication device only when the calling user is a registered user.

25

25. A data communication system according to any one of the claims 19-24, wherein the communication management server is operable to communicate with the user communication devices by use of a TCP/IP connection.

30

26. A data communication system according to any one of the claims 19-25, wherein the communication path data holds information of communication costs for use of said communication paths.

27. A data communication system according to any one of the claims 19-26, wherein the communication path data holds information of providers of the communication paths.

5 28. A data communication system according to claim 27, wherein the communication path data holds IP (Internet Protocol) account information for the providers of the communication paths.

29. A data communication system according to any one of the claims 19-28,
10 wherein at least part of the one or more communication paths uses a data transport protocol selected from the group consisting of: the Session Initiation Protocol (SIP) and the Skype protocol.

30. A data communication system according to any one of the claims 19-29,
15 wherein the communication management server is operable to communicate at least one display message or at least one link to a display message to a user communication device being in communicative connection with the server, whereby the display message can be displayed at the connected user communication device.

20 31. A data communication system according to claim 30, wherein the communication management server is operable to update said user data based at least partly on the number of times a display message has been communicated to a user communication device and/or based at least partly on the length of time a
25 communicated display message has been displayed at a user communication device.

32. A data communication system according to claim 31, wherein the communication management server is operable to update said user data based on message display information received from a user communication device having one
30 or more display messages displayed.

33. A data communication system according to any one of the claims 30-32, wherein the communication management server is operable to communicate at
35 least one display message or at least one link to a display message to the user

communication device upon a communicative connection being established between the server and the user communication device.

34. A data communication system according to any one of the claims 30-33,
5 wherein said user data comprises a number of user accounts of registered users, and wherein the communication management server is operable to update a user account of a registered user based at least partly on the number of times a display message has been communicated to a user communication device used by
10 said registered user and/or based at least partly on the length of time a communicated display message has been displayed at a user communication device used by said registered user.

35. A data communication system according to any one of the claims 30-34,
15 wherein the communication management server, upon receiving said request for a communication call from the calling user via the calling user communication device to the receiving network communication device, is operable to communicate at least one display message or at least one link to a display message to the calling user communication device.

20 36. A data communication system according to claim 34 or 35, wherein the communication management server is operable to update the user account of a registered user based on message display information received from a user communication device used by said registered user.

25 37. A data communication system according to any one of the claims 34-36, wherein the user account corresponding to a registered user holds information of available communication time or talk time for the registered user.

30 38. A data communication system according to claims 34 and 37, wherein the communication management server is operable to increase the available communication time or talk time of said registered user based at least partly on received display message information holding information on the number of times a display message has been communicated to a user communication device used by said registered user and/or the length of time a communicated display mes-

sage has been displayed at a user communication device used by said registered user.

5 39. A data communication system according to any one of the claims 34-38, wherein the communication management server is further operable to update the user account of a registered user based on information of communication time or talk time paid by the registered user or to be paid by the registered user.

10 40. A data communication system according to any one of the claims 34-39, wherein the communication management server is operable to update the user account of a registered user based on information of communication time or talk time used by the registered user during a communication call from a user communication device used by the registered user to a receiving network communication device.

15 41. A data communication system according to claim 40, wherein the communication management server is operable to update said user account based on used communication time or talk time from communication time or talk time information received from the user communication device used by said registered user during said communication call.

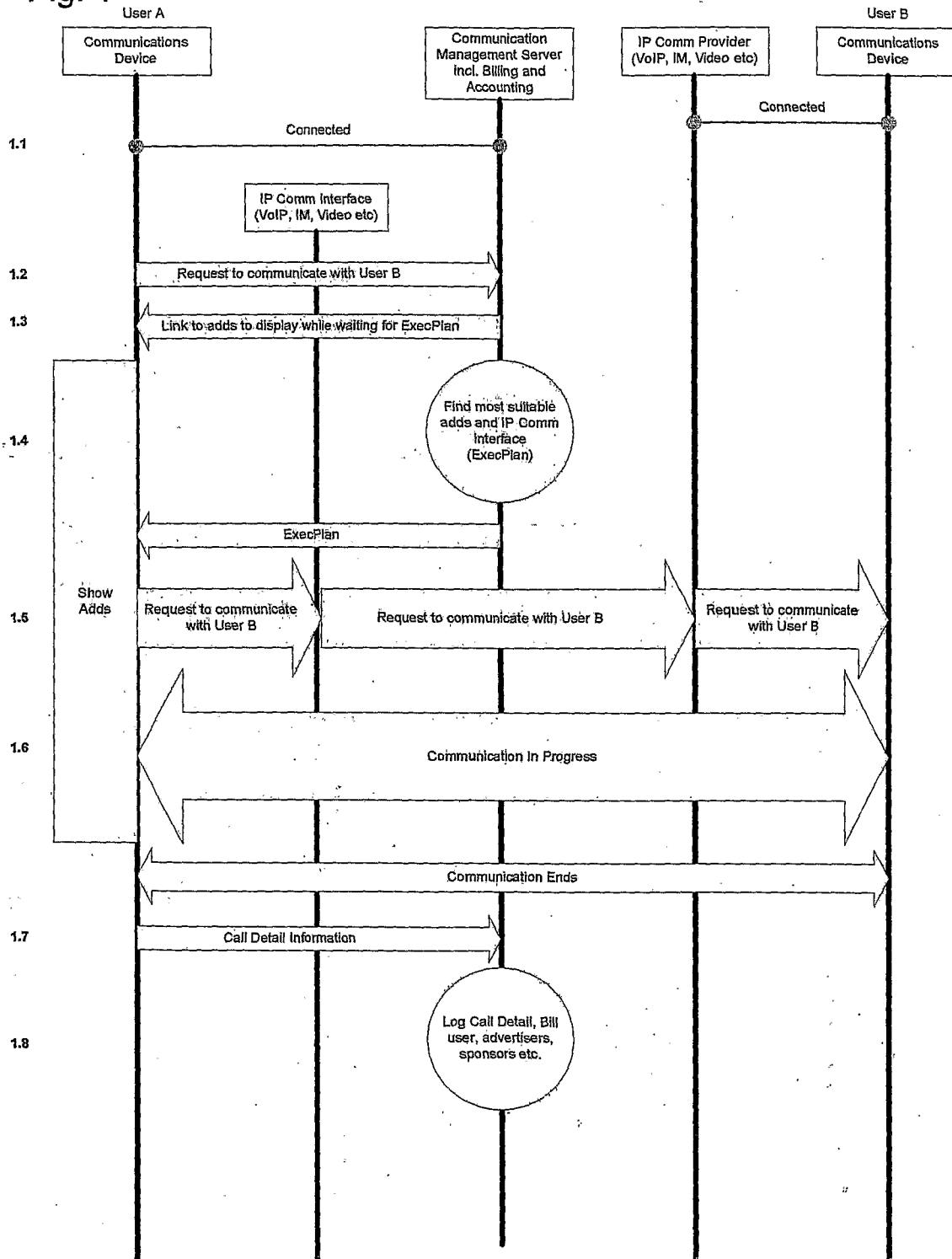
20

42. A data communication system according to any one of the claims 34-41, wherein a user account holds information identifying the corresponding registered user.

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Drawing 1: User A (connected to CMS), Calls User B who is connected to other IP Comm interface (3rd party VoIP, AOL, Yahoo Messenger, SKYPE etc)

Fig. 1



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Fig. 2

Drawing 2: User A (connected to CMS), Calls User B who has a public PSTN number anywhere in the world

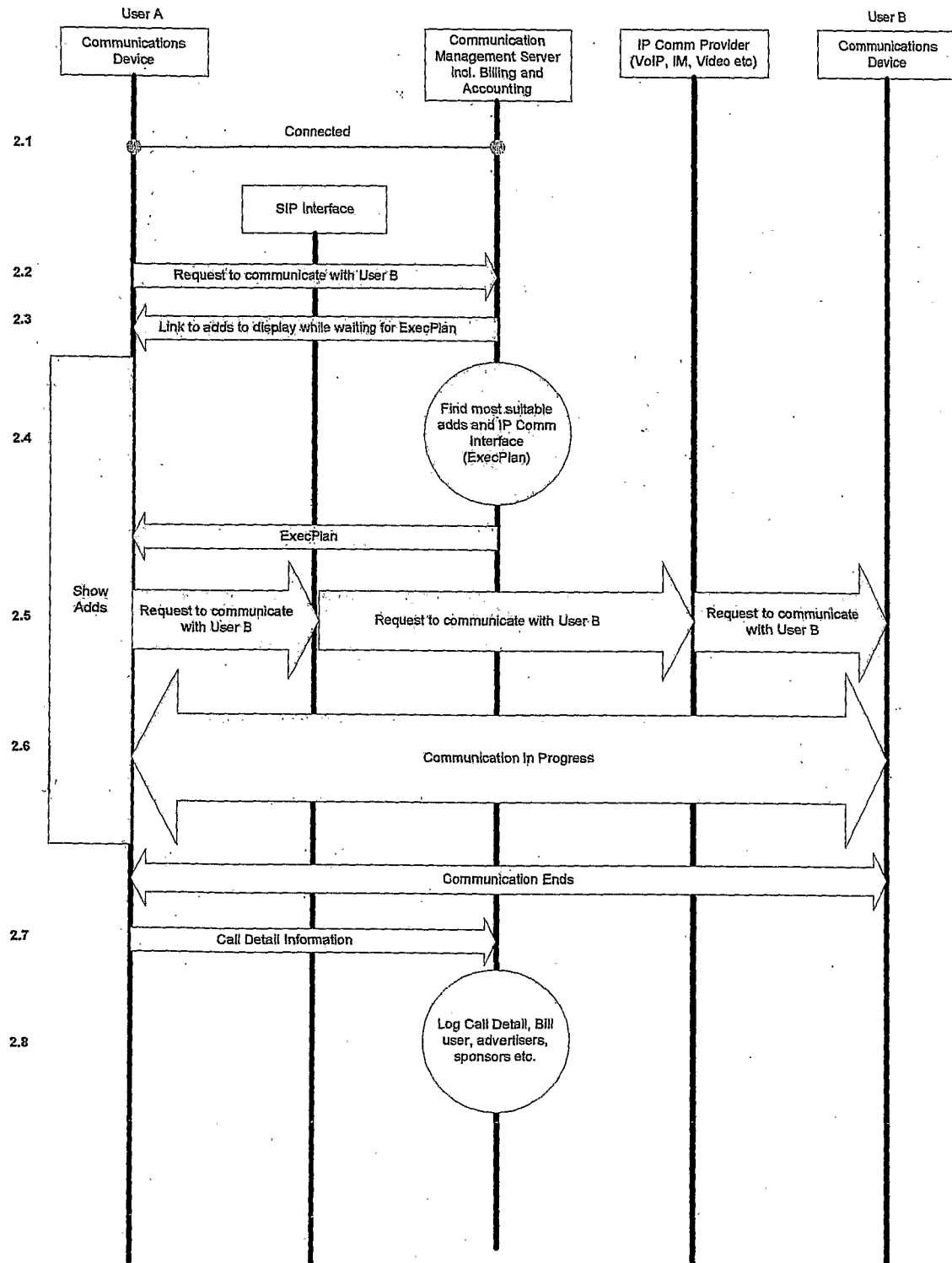
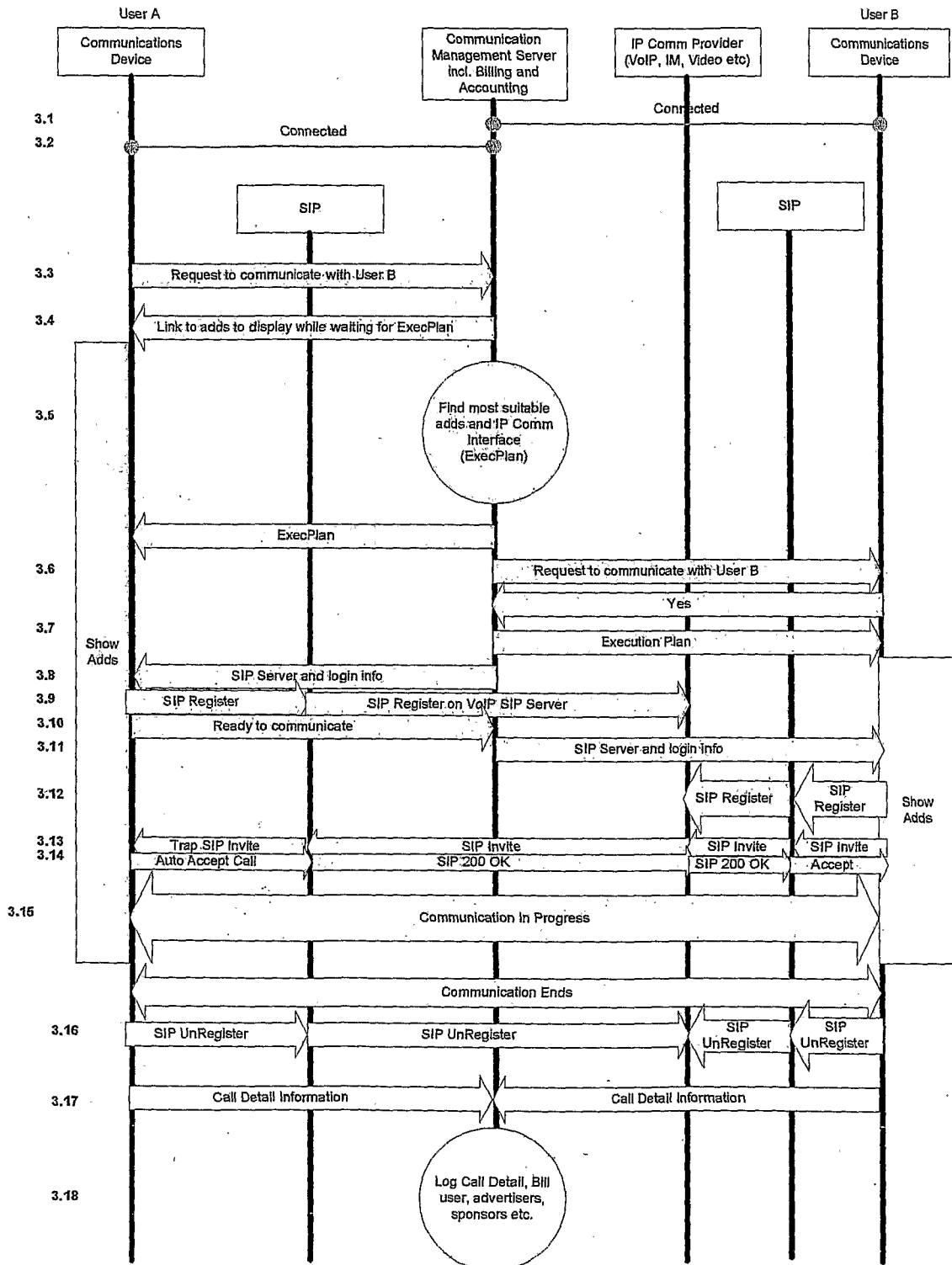


Fig. 3

Drawing 3 : User A (connected to CMS), Calls User B who is also connected to CMS



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Fig. 4

Drawing 4: User A (connected to CMS) is receives incoming PSTN Call

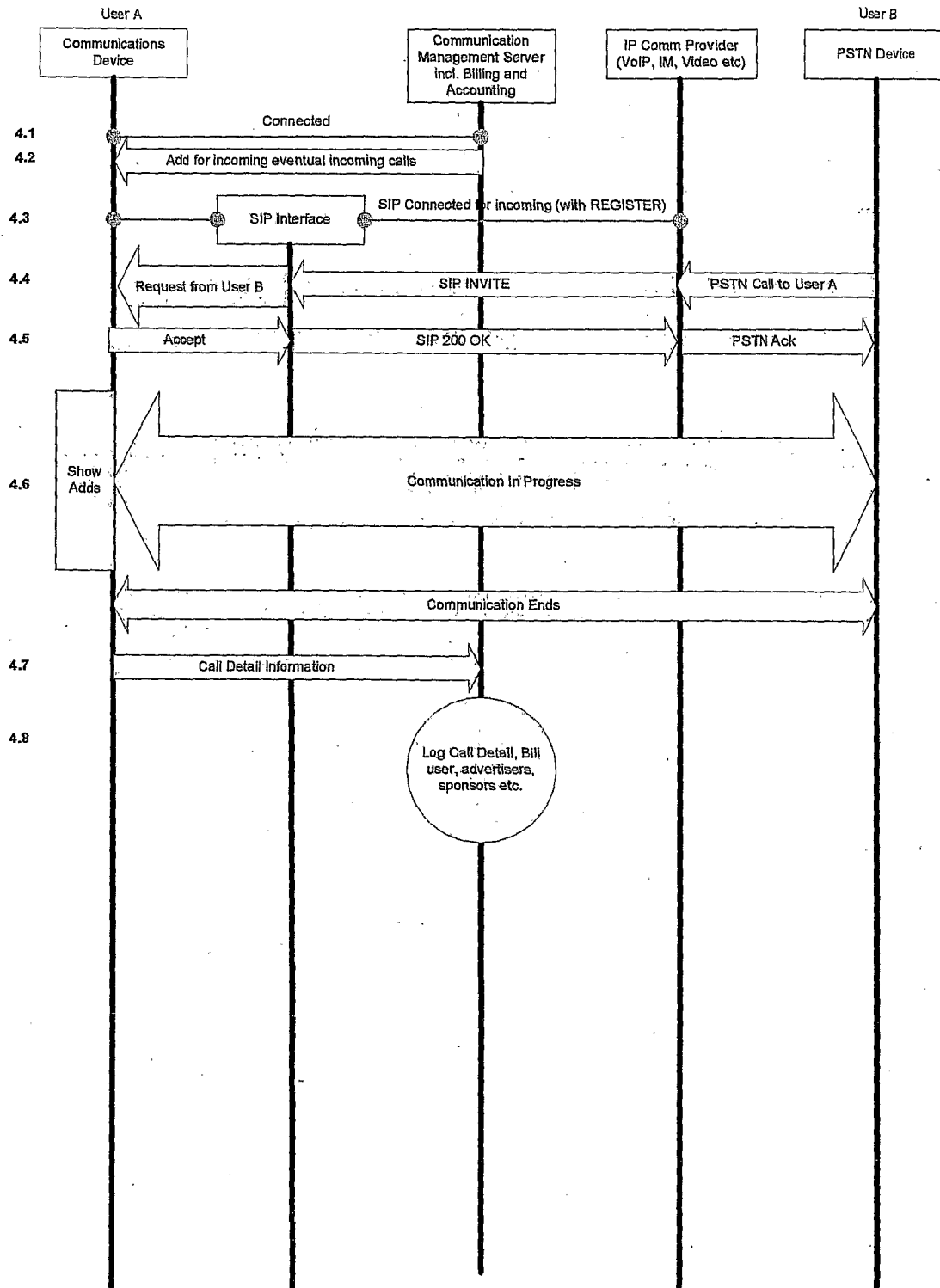
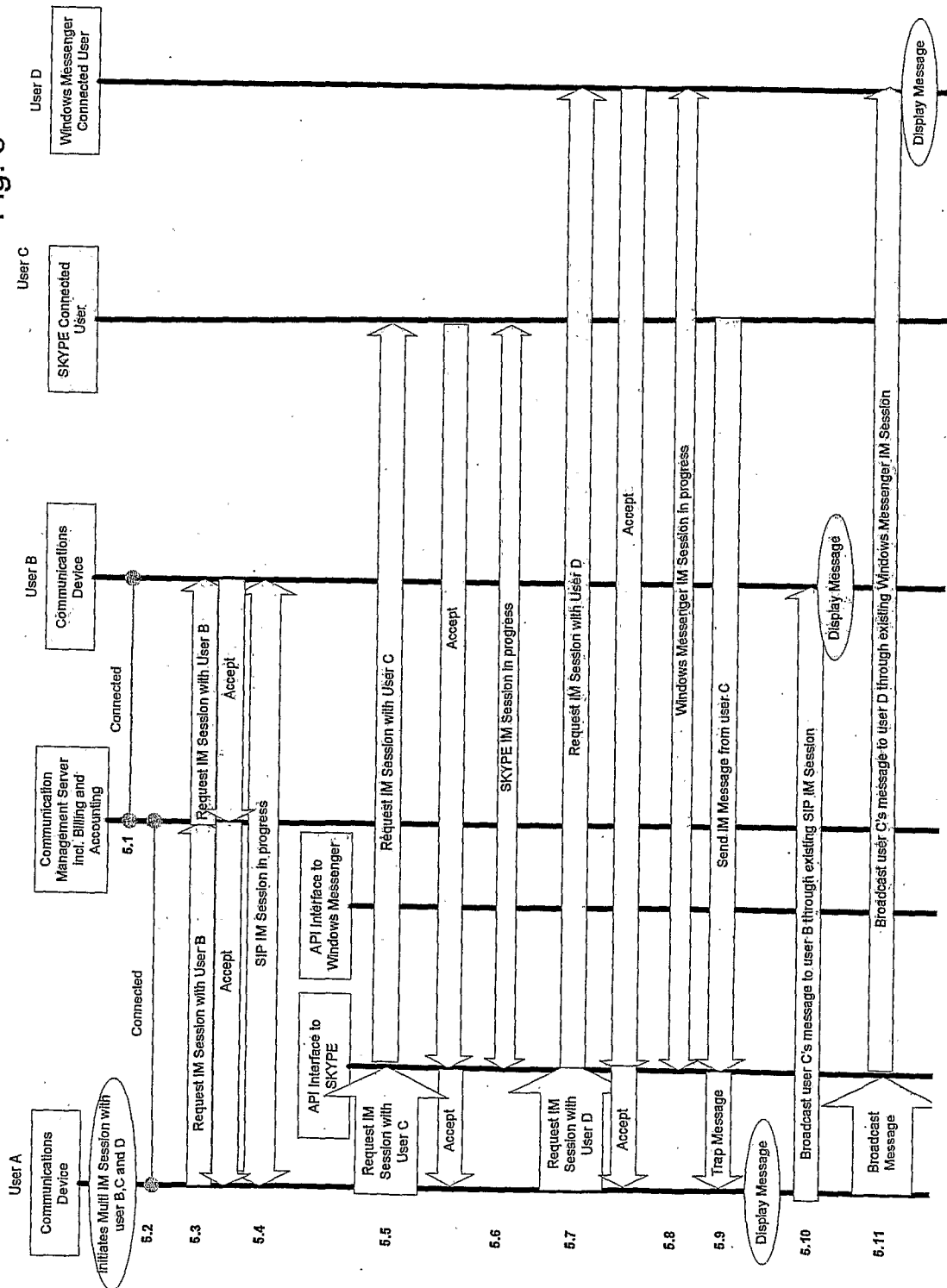


Fig. 5

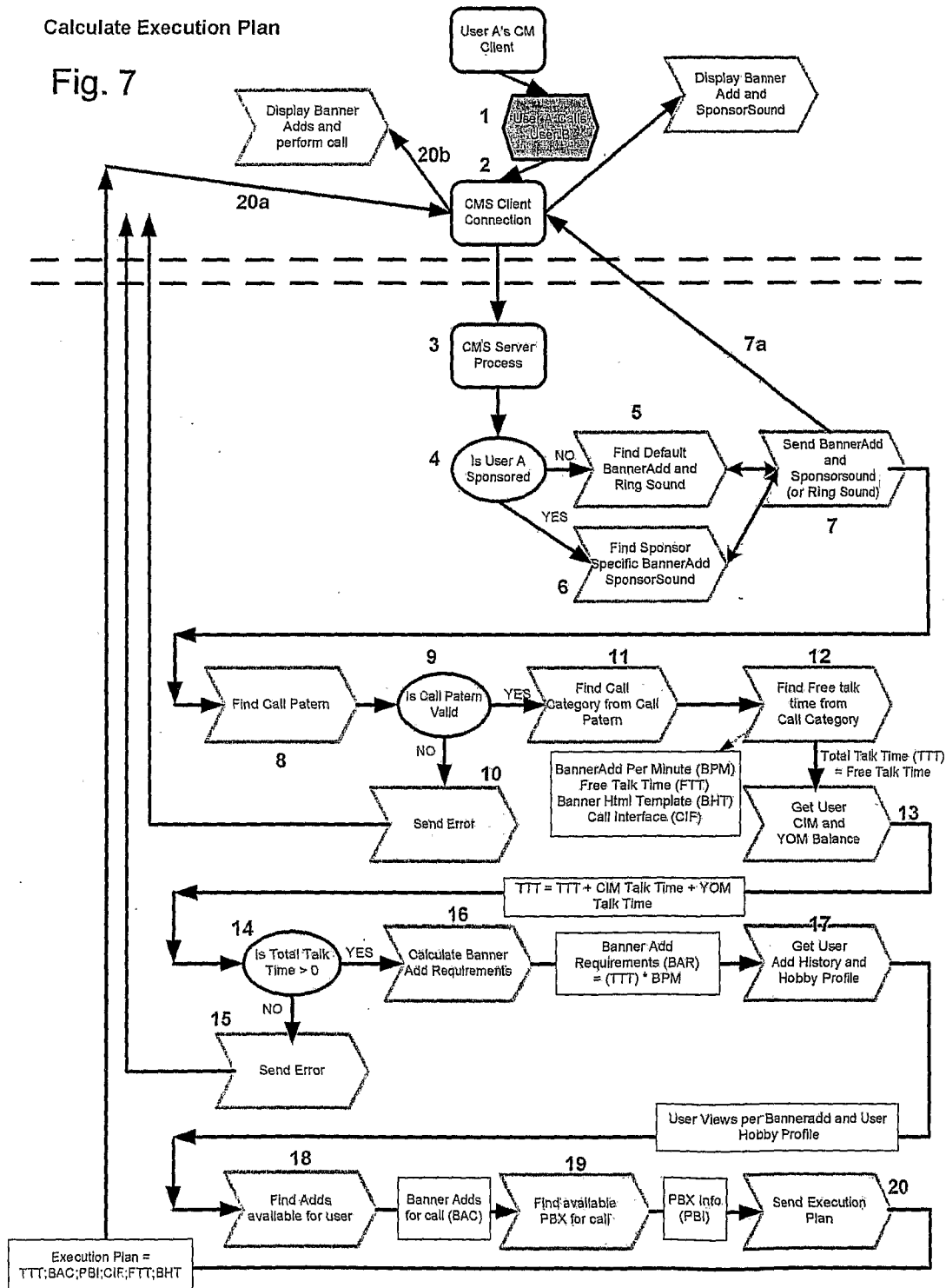
Drawing 5: User A hosts a multi Instant Messaging session with User B, User C and User D, based on 3 different IM technologies



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Calculate Execution Plan

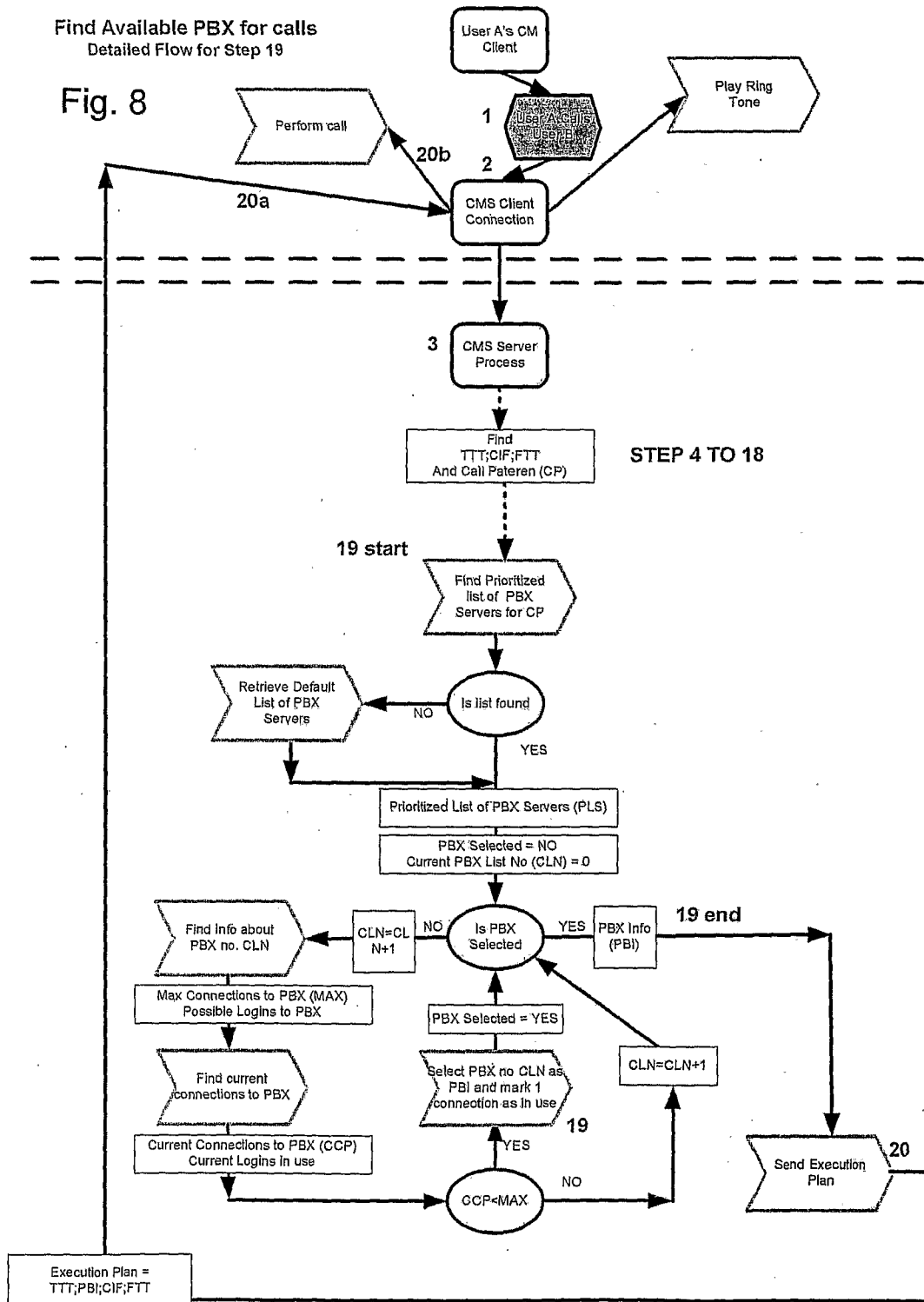
Fig. 7



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Find Available PBX for calls
Detailed Flow for Step 19

Fig. 8



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