

[0018] FIG. 6 illustrates a call-based conversation between five users according to certain embodiments of the present invention.

#### DETAILED DESCRIPTION

[0019] The Media Messaging Services (MMS) system described herein defines a system architecture and technical specification for a communications platform, including the exchange and distribution of different forms of media and information through the interconnection of mobile and stationary users on anywhere from a local to a global scale. A “communications platform” as used herein includes any mechanism used to connect two or more users to exchange media or information. “Media” as used herein includes any binary or textual data, including text, images, audio, video, full- or half-duplex streaming media, and so forth. Mobile users can include any person, entity, or program using a mobile device such as a personal digital assistant (PDA), handheld computer, cellular phone, smart phone, barcode scanner, etc. “Barcode scanner” can include a one-dimensional barcode scanner, two-dimensional barcode scanner, or any other type of barcode scanner. Stationary users can include any person, entity, or program using a device that has network access but is either not mobile or is mobile but does not regularly move, including but not limited to traditional personal computers, dumb terminals, and mainframes. Users and services are not bound by geographic boundaries.

[0020] The Media Messaging Services described herein are not specific to any particular hardware or software platforms. For example, an MMS handheld client 316 or mobile device can be based on any type of hardware or software platform, including but not limited to Pocket PC, Windows CE, and Symbian. Likewise, an MMS desktop client 314 or stationary device can be based on any type of hardware or software platform, including but not limited to Windows 95/98/2000/XP, Mac OS, or Unix/Linux operating systems.

[0021] FIG. 3 illustrates the system components of an extensible architecture for an MMS Server 300, in accordance with certain embodiments. A particular MMS Server 300 implementation can include some or all of the components illustrated, further subdivide these components, or add other components.

[0022] MMS Server 300 comprises a Media Distribution Center (MDC) 302 to facilitate the exchange of media and information between users. MDC 302 can be configured to distribute data to and between MMS client applications. MDC 302 is an abstract component that can be implemented in a number of different ways. For example, MDC 302 is protocol independent, such that its data transfer functions can be implemented using any data transfer protocol such as FTP, HTTP, or a custom protocol, provided the data transfer components of corresponding MMS client applications have compatible implementations.

[0023] MMS Server 300 can further comprise a System Database 318 configured to store MMS application data. For example, System Database 318 can store information regarding the media capabilities of the devices 316 connected to the MMS Server 300, such as if a particular device has text capabilities but no voice capabilities. For another example, System Database 318 can store session data such as presence information for the users or devices connected

to the MMS Server 300. For another example, System Database 318 can store call data such as the participants, devices, and media type of a call between two users, which can be used to route data packets corresponding to that call. System Database 318 can be implemented in a number of ways, including but not limited to a relational database management system (RDBMS) or an object-oriented database (OODB).

[0024] MMS Server 300 can further comprise a Media Store 310, which can store all media that passes through MMS Server 300. Media Store 310 can be configured to supply the required storage in the event MMS Server 300 is configured to maintain a persistent record of all messages and/or all calls between users, as further described below. MDC 302 can be configured to retrieve media stored in Media Store 310 and deliver it to a recipient.

[0025] Media Store 310 is an abstract component that can be implemented in a number of different ways. While System Database 318 stores application data such as session data, Media Store 310 stores information and media exchanges between clients such as email messages. Therefore, Media Store 310 can be similar to or integrated with System Database 318, depending on the embodiment.

[0026] MMS Server 300 can further comprise a Streaming Media Engine 312 configured to stream live media to MMS client devices 314, 316. While media in the form of (static) messages can be stored in Media Store 310 prior to delivery by MMS Server 300, media in the form of (dynamic) real-time calls must be streamed from the sender to the recipient because the real-time nature of calls requires delivery in increments as the media is created by the sender. For example, a prerecorded voice message can be stored in Media Store 310 and then delivered to a recipient, but a live voice call must be streamed between the sender and recipient by Streaming Media Engine 312. Streaming Media Engine 312 can facilitate the streaming of real-time media between a sender and one or more recipients in different ways. According to certain embodiments of the present invention, real-time media data is sent directly between MMS client devices 314, 316 without going through the MMS server 300, in which case the Streaming Media Engine 312 facilitates the initial connection between the MMS client devices 314, 316. According to other embodiments of the present invention, real-time media data is sent through the MMS server 300, in which case the Streaming Media Engine 312 receives and routes the real-time media packets to their destination MMS client device 314, 316. For example, Streaming Media Engine 312 can be configured to coordinate call routing between MMS users 314, 316.

[0027] MMS Server 300 can further comprise a Session Manager 306 configured to maintain session data such as presence information and the hardware capabilities of various MMS client devices 314, 316. For example, Session Manager 306 can be configured to implement authentication of client applications or client devices 314, 316 in the MMS Server 300. For another example, Session Manager 306 can be configured to enforce data bandwidth restrictions for MMS users, such as how much data is allowed to be pushed and/or pulled in a certain period of time. For another example, Session Manager 306 can be configured to automatically terminate an authenticated MMS client session after a timeout period.