

DESCRIPTION

Title of Invention

A system and method for sending and receiving instant messages using mobile phone devices irrespective of whether internet connection is available or not, called Cooee Messenger.

The Technical Field

The technical field involving the invention is the sending and receiving of messages over mobile telecommunication devices.

The Prior Art

The current state of the art in instant messaging is that when there is a need to send short messages, documents, pictures or images, we use messaging applications. There are a number of messaging applications in the market today, examples of which are WhatsApp, Telegram etc.

Technical Problem and Solution

However these messaging applications work only when there is internet connection between the two parties. Where internet connection is not available, messaging is done using telecommunication native SMS, which can be expensive. Cooee Messenger (CM) overcomes this limitation by allowing sending and receiving of message even in the absence of an internet connection.

This is achieved through the Smart Message Routing Engine (SMRE). It automatically selects the most cost effective and fastest means of sending messages, taking into account the following:

- Balance of free SMS from the Telephone Company (Telco)
- CM credits available

Figure 1 illustrates the flow and logic of the SMRE.

In the diagram two terminologies are used:

- “Online” meaning Internet access is available.
- “Offline” meaning Internet access is NOT available.

The CM System

The CM System comprises the following components:

- CM client - mobile/web application
- CM XMPP Server
- CM HTTP Server
- CM Database Server
- CM SMS gateway or Third Party SMS provider.

The diagram in Figure 2 illustrates the components of the system

The XMPP Server:-

The XMPP server provides basic messaging, presence, and XML routing features. XMPP stands for **Extensible Messaging and Presence Protocol**. XMPP is a communications protocol for message-oriented middleware based on XML (Extensible Markup Language). XMPP is defined as an open standard and uses an open systems approach of development and application. The XMPP server offers the following services:

Authentication: This service is another part of the foundation for secure application development. In this case, the authentication service ensures that entities attempting to communicate over the network are first authenticated by a server, which acts as a kind of gatekeeper for network access.

Presence: This service enables one to find out about the network availability of other entities. At the most basic level, a presence service answers the question, “Is the entity online and available for communication, or offline and not available?” Presence data can also include more detailed information (such as whether a person is in a meeting). Typically, the sharing of presence information is based on an explicit presence subscription between two entities in order to protect the privacy of user information.

Contact lists: This service enables one to store a contact list or roster, on an XMPP server. The most common use for this service is an instant messaging “friend list,” but any entity that has an account on a server can use the service to maintain a list of known or trusted entities.

One-to-one messaging: This service enables one to send messages to another entity. The classic use of one-to-one messaging is personal IM (Instant Messaging), but messages can be arbitrary XML, and any two entities on a network can exchange messages—they could be bots, servers, components, devices, XMPP-enabled web services, or any other XMPP entity.

Group messaging: This service enables one to join a virtual chat room for the exchange of messages between multiple participants, similar to Internet Relay Chat (IRC). The messages can be plain text, or can contain XML extensions for more advanced functionality, such as room configuration, in-room voting, and various session control messages.

Notifications: This service enables one to generate a notification and have it delivered to multiple subscribers. This service is similar to multi-party messaging, but it is optimized for one-to-many delivery with explicit subscriptions to specific channels or topics (called “nodes”).

Peer-to-peer media sessions: This service enables one to negotiate and manage a media session with another entity. Such a session can be used for the purpose of voice chat, video chat, file transfer, and other real-time interactions.

The XMPP network has many servers and clients, and the servers are interconnected in a single-hop network

The HTTP Server

In our application we use HTTP (Hyper Text Transport Protocol) for file transfer and getting contacts list whereas XMPP is used for messaging and presence information transfer.

HTTP sits at the top layer of the network model. HTTP uses non-persistent connection. That is, if a client wants to get or send the data from or to the server, connection is established between two entities and data is transferred through a network connection. Connection is closed automatically. Using HTTP, connection is available for specific request and response only. That is, unlike TCP (Transmission Control Protocol), HTTP does not use the keep-alive connection.

As HTTP creates and destroys the connection for each request-response, it is not suitable for real-time applications which need instant data passing. XMPP is good for use in the applications that need continuous data flow from one entity to another.

The Database Server

Database server is used to store data about the following entities

- Users
- Archive Messages
- Offline Messages
- Short Images
- Sessions
- Payments
- Groups
- Group Members
- Group Admins
- Group Properties
- Mobile Tokens
- Contacts
- Verification Codes

The data is stored permanently on the server. Data can also be retrieved

The SMS Gateway

The SMS gateway allows a computer to send or receive Short Message Service (SMS) transmissions to or from a telecommunications network. Most messages are eventually routed into the mobile phone networks. We make use of this gateway for sending offline messages.

Flow of the CM System

The diagram in Figure 3 shows the flow of data between the components of the CM system and is highlighted below:

- 1) Sender sends message to receiver through any CM Client Application (iOS, Android, Blackberry, Windows Mobile or Mac, Linux , Windows Desktop or CM web application)
- 2) If Sender is ONLINE and Receiver is also ONLINE then Text Messages (Individual and group chats) are sent through CM XMPP Server
- 3) All Text message sent to the CM XMPP server is stored in the CM database server for storage purpose
- 4) If Sender is ONLINE and Receiver is also ONLINE then Images equal to or smaller than 64 kb are directly sent through the CM XMPP server
- 5) If Sender is ONLINE and Receiver is also ONLINE then Images greater than 64 kb (size after image compression), e.g. audio files, video files, any other files sent through CM Web (HTTP) server and these files are stored on the Web Server itself.
- 6) if Sender is ONLINE and Receiver is also ONLINE but Receiver's CM Client Application is in the background mode, then CM XMPP Server sends Message Notification to APNS (if Client Application is on iOS) or to GCM (if Client Application is on Android). APNS notifies iOS Clients And GCM notifies Android Clients
- 7) if Sender is ONLINE and Receiver is also ONLINE but CM Client Application is NOT running in Foreground and Background, then, if device is iOS then CM XMPP Server sends Message through the CM SMS Gateway
- 8) if Sender is ONLINE and Receiver is also ONLINE but CM Client Application is NOT running in the Foreground or Background and if Receiver is on Android device then CM XMPP Server sends Message notification to GCM and GCM Notifies Receiver
- 9) if Sender is ONLINE and Receiver is OFFLINE but if Sender has free telco SMS then CM Client Application sends message through Telco SMS
- 10) if Sender is ONLINE and Receiver is OFFLINE and Sender does not have any free Telco SMS then Client Application sends message through the CM XMPP Server but because receiver is OFFLINE , server sends message to receiver through the CM SMS Gateway
- 11) if sender is OFFLINE then CM Client Application can send message through the Telco SMS
- 12) When Receiver comes ONLINE again, then CM XMPP server Retrieves all OFFLINE messages related to Receiver from CM Database Server and sends to Receiver