



ISSN: 2319-5967

ISO 9001:2008 Certified

International Journal of Engineering Science and Innovative Technology (IJESIT)

Volume 3, Issue 2, March 2014

Integrated Quick Messaging System for Mobile Phones

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Abstract - With the rapid advancement of wireless network technologies, Mobile Instant Messaging (IM) has become a major application in the telecommunications industry. The Internet-based instant messaging services (e.g. MSN messenger, GTalk) have become the most popular communication choice among millions of people worldwide. Due to the huge number of mobile subscribers, there is a real demand to provide such a service to mobile clients. Despite technology's significant advantages, the primary disadvantage is that only users who are on the same network can chat with each other on that particular network. For instance, a Yahoo! user can only chat with another Yahoo! user but not with the AOL user. Thus, we propose a mobile instant messaging system, IIMS is a multi-protocol instant messaging system which will integrate all popular networks like Jabber, GTalk and AOL which can be deployed on mobile phone. IIMS, which integrates all popular networks like AOL, GTalk and Jabber designed for mobile environments. This instant messaging system is expected to provide to its members an improved, single contact point, efficient, portable, easy-to-use, inter-network connectivity within a single application.

Keywords – Instant Messaging, Presence Service, XMPP Protocol.

I. INTRODUCTION

The already existing applications are dedicated to particular network and allow users of that network to communicate with the users of the same network. Thus there exists no interoperability among various chat networks. For instance, a Gmail user can only chat with another Gmail user but not with the AOL user. These applications if deployed on mobile phones, requires the subscriber to open multiple applications to chat on different networks, thus consuming the memory and battery power of the mobile phone. This project delivers a single, easy-to-use, portable and efficient instant messaging system to be used on mobile phones. The system provides a single application with inter-network connectivity allowing the users log into multiple accounts to chat with their buddies regardless of which network they belong. It allows the users to view and manage their contacts (buddies). Also, the application allows the user to insert smiley's portraying their personality, thoughts and emotions and manage user groups.

II. RELATED WORK

Ever since it became evident that users of the proprietary solutions would not be able to communicate with each other, IETF has been striving to produce a standardized solution for instant messaging. This section presents the results of the standardization efforts.

A. IMPP

IETF originally chartered IMPP (Instant Messaging and Presence Protocol) in order to define protocols and data formats necessary to build an internet-scaled instant messaging system. The working group managed to produce a model for presence and instant messaging in RFC 2778 [4] and requirements for an instant messaging protocol in RFC 2779 [3]. However, as stated in Section 2.2, the working group failed to achieve a common consensus for an instant messaging protocol. This resulted in the launch of several new working groups specifying protocols based on IMPP. It was decided that although the IMPP working group was not to specify any instant messaging protocol, it would carry on with its work. It would focus on producing standards for enabling interoperability between instant messaging systems. The working group has since created RFCs containing:

- a) a common extensible instant message format (message/cpim)
- b) a common extensible presence information format (application/pidf+xml)
- c) a common profile for instant messaging (CPIM)
- d) a common profile for presence (CPP)



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CPIM [5] and CPP [6] specify semantics and data formats for common instant messaging and presence services. The goal of the profiles is to facilitate the creation of gateways between instant messaging systems for interoperability. CPIM uses the message/cpim MIME (Multipurpose Internet Mail Extension) type [7] as data format for instant messages while PIDF (Presence Information Data Format) [8] is used for formatting presence information in CPP. In order for an instant messaging system to be IMPP compliant, it must conform to the CPIM and CPP profiles and their data formats as well as meet the requirements of RFC 2778 and RFC 2779.

B. SIMPLE

The IETF SIMPLE (SIP for Instant Messaging and Presence Leveraging Extensions) working group was one of the three working groups formed in 2000 when the IMPP working group failed to agree on a common protocol for instant messaging. Of the three, the SIMPLE solution is the only one still going strong; the other two have more or less failed. As the name indicates, SIMPLE is based on SIP (Session Initiation Protocol) [12]. The primary work of the SIMPLE working group is to generate an IMPP-compliant proposed standard SIP extension for instant messaging. SIMPLE defines the presence protocol as an instantiation of the general event notification framework for SIP [11]. For sending instant messaging SIMPLE provides two modes: a pager mode [10] and a session mode [9]. When using the pager mode instant messages are sent as SIP messages. In session mode SIP is used to initiate a session, in which the instant messages then are sent. The progress of the SIMPLE working group has been quite slow, mostly due to the complexity of the SIP protocol. Overall, the SIMPLE specifications currently consist of close to 20 Internet Drafts. Only a few Requests for Comments has been produced so far, including pager mode messaging specified in RFC 3428. Despite the slow-moving standardization process, the SIMPLE standard has gained support from several major companies including Microsoft, IBM and Yahoo.

III. PROPOSED SOLUTION

A. JABBER

Jabber is the most widespread open source platform, using an XML encoded protocol, especially tailored to provide instant messaging (IM) and presence services over the Internet; however, Jabber is not designed just for this purpose, but several are the applications that may benefit and use the Jabber protocol suite. The protocol is totally free from legacy rights; both on the server and on the client side, which means that anyone can design its own Jabber client and even that any organization can freely implement an internal jabber server. Many are the advantages that come out from this approach:

1. The fact that the protocol is open lead to a better understanding of it, as everyone can learn from the work previously done and make available its code to other developers for the same purposes.
2. XML allows easy extensibility to the main features of the protocol. The Jabber Software Foundation accounts for the common extensions.
3. Decentralized approach. Since any organization can have its Jabber server, the resulting architecture is more scalable as lighter load is posed on the single servers, compared to a centralized approach.

Although the protocol itself does not provide means to achieve interoperability with other IM protocols, this is possible by means of server-side gateways, which take care of the communication between users in the Jabber space and users in the space of other (possibly) proprietary protocols. Jabber-related activities are ongoing in the Extensible Messaging and Presence Protocol (XMPP) IETF working group [XMPP]; the working group has been chartered to discuss extensions to the XMPP protocol, which is the core of the Jabber platform, especially to be compliant to the requirements posed by [RFC2779], RFC from the IETF Instant Messaging and Presence Protocol (IMPP) working group, chartered to define a standard protocol for providing instant messaging and presence services. A good document describing Jabber main features is [SA01].

B. XMPP

The Extensible Messaging and Presence Protocol (XMPP) is beyond doubt the strongest challenger to the SIMPLE standard in the Internet. Like SIMPLE, XMPP is also administered by an IETF working group, i.e. the XMPP working group. XMPP has been formed from the basis of the Jabber protocol. The Jabber protocol is the result of a project started by Jeremie Miller in 1998 [13]. The goal of the project was to produce an interoperable and open instant messaging protocol, an alternative to the proprietary solutions. The first public release of the protocol took



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place in May 2000. In June 2000 project members sent an Internet Draft of the Jabber protocol to the IMPP working group (see Section 2.5.1) as an instant messaging protocol proposal. However, the organization of the Jabber project was not mature enough at the time and the Internet Draft was left to expire. In 2001 the Jabber Software Foundation was formed to organize the projects and commercial bodies involved in the Jabber community. Following the reorganization, a new Internet Draft was submitted to the IETF in February 2002, eventually leading to the birth of the XMPP working group in October 2002. XMPP is in essence the core of the XML (Extensible Markup Language) based Jabber protocol. XMPP has been made IMPP compliant by the working group. The Jabber Software Foundation will continue to work on the parts of the Jabber protocol that are not part of XMPP or IMPP, exploring features such as: multi-user chat, calendaring and white boarding.

Compared to SIMPLE, the XMPP solution is more mature. Recently, three of four Internet Drafts have been approved as Proposed Standards and the protocol has already been widely deployed with tens of thousands of active servers and millions of users. Although it has not acquired the support of as many major companies as SIMPLE, XMPP is also embraced by big enterprises, including Hewlett-Packard and Intel. An in-depth comparison of SIMPLE and XMPP from the viewpoint of XMPP can be found in [14].

C. Comparison Chart with Existing System

	Existing System	Existing System	Proposed System
Features	JimmyIM	GTMobile	IIMS
Language	Java	Java	Java
Requires support of	MIDP 2.0	MIDP 2.0	MIDP 2.1
Protocols And Networks Supported	MSN, GTalk/Jabber, ICQ	GTalk	MSN, Yahoo!, AOL, GTalk/Jabber and Facebook
Support for Social Networks	No	No	Yes(Facebook)
Email	No	No	No
Group Chat	No	No	No
Video Chat/Call	No	No	No
File Transfers	No	No	Yes
Location Based Services	No	No	Yes
Secure Communication	Yes	Yes	Yes
User Interface	Not user friendly	User friendly	Rich and User Friendly
Multitasking	Yes	No	Yes
Scalable	No	Yes	Yes
Customizable	No	No	Yes(Use of smileys)
Portable	Yes	Yes	Yes

Comparison Chart with Existing System

D. General Architecture

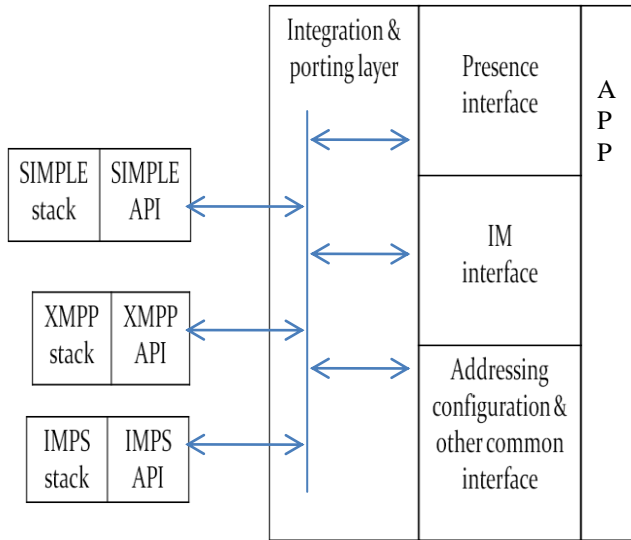


Fig 1: General Architecture

The above architecture is a general architecture of the proposed system. It shows that various chat protocols stacks and their API's are integrated to provide a single application. The proposed application provides us with presence interface to find out whether a particular user is available or not (i.e. online or offline). It also provides the Instant Messaging system interface for chatting and addressing configuration interface for login or logoff operations.

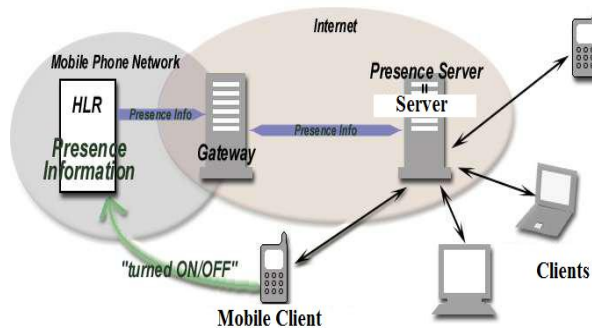


Fig 2 Client Server Processing

Steps of Processing:-

1. Mobile Client connects to the server to initiate a communication with other mobile devices.
2. Home Location Register provides the presence information to the above Mobile Client (1).
3. The presence information in the Home Location Register is shared with the Server via a Gateway.
4. Once the connection is setup, the mobile device can use the network to share the data among other mobile clients.

IV. DESIGN CONSIDERATIONS

- a. Device Limitations (e.g. memory, battery, etc.)
- b. Network Limitations (e.g. delay bandwidth, etc.)
- c. Mobility (e.g. Roaming & Coverage)
- d. Other (e.g. Charging)

V. CONCLUSION & FUTURE WORK

The project delivered allows the users of Jabber/Gmail/AOL to interoperate and communicate with each other without any barriers. The users can log on to any network and chat with other users belonging to other network. Also the system allows the users to reflect their personality, thoughts, and emotions with the use of emoticons in



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their messages. The system allows the user to maintain multiple accounts and buddy list. However, due to advancements made in the technology, various new features can be added to the existing system which will enhance the functionality of the system. Features like online file sharing, email, voice over IP, conferencing, location tracker to track the location of the available user via GPS, etc can be incorporated into the project to make the system more useful and widely acceptable in corporate and non-corporate areas.

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