The World of Instant Messaging

Samer Fahmy 9906252
Software Engineering 4C03

April 6, 2004
The World of Instant Messaging

Introduction

Instant messaging is a very recent technology which has gained much popularity. Prior to instant messaging, the telephone was the primary way in which to contact someone instantly and to conduct a conversation. When email was introduced, it quickly became a very popular means for communicating with people around the world. However, email lacked being instant, meaning that a reply was not guaranteed instantly since no presence information is given with email. The introduction of instant messaging quickly changed this fact. Instant messaging allows for communication between two or more members in real time and also for presence information to be known. It replaced the phone in the internet world and has become one of the most popular applications on the internet today.

Many companies have since jumped on the instant message technology and have created their own networks and protocols. Some of these companies include ICQ, Microsoft, AOL and Yahoo! Instant messaging works by having a client/sever system. Each user is a client which connects to a central server. The central sever serves as the link between all the users and allows them to communicate. Communication between the client and the server is done through the internet and with a protocol which allows the client and server to understand each other. Each of the above mentioned companies have created their own proprietary protocols which means that an AOL client cannot talk to a Microsoft server. There have also been a few attempts being started to create a standard protocol which all instant messaging client/servers should adhere to so that any client could talk to any server. Examples of these are SIP and Wireless Village as well as Jabber.

MSN Messenger

MSN Messenger is an instant messaging network created by Microsoft. It went online in July of 1999. Since then there have been many modifications and revisions to their client as well as server and many versions of their protocol. The protocol used to communicate between client and server on the MSN Messenger network is a proprietary protocol and is not interoperable with other systems. Since it’s creation in 1999, the protocol has undergone many changes and currently the client supports version 8, 9, and 10 of their protocol. [2]

The MSN Messenger system is a client/server based system. To begin the session, a client first connects to a central server. The central server serves the purpose of directing the user to a Notification Server which is not congested and also based on the user’s location. At this stage, the client is told which Notification Server to connect to based on different factors such as number of users, location, etc. All notification servers
are interconnected to each other. The client then closes connection to the central server and opens a new connection to the specified notification server. All notifications are done through this connection. For example, if a contact goes offline or online or changes their status, notification is done through this server connection using messages that are passed between the server and the client. To conduct a conversation with another client, both clients spawn a separate connection to what is known as a Switchboard Server which acts as the link between the clients and allows for them to communicate. [2]

The underlying network connections between client and servers are all TCP/IP connections. The MSN Messenger protocol is all based on strings which are passed between client and server. Each message has a code which is interpreted by the client and/or the server and then acted upon. For example, “NLN AWY example@passport.com Mike 0\r\n” is a message which is sent from the server to the client. This message tells the client that the contact named Mike has now set his presence to Away. [2]

As mentioned, all messages are transmitted in plain text as strings. There is no encryption that is done between client and server to secure the connection. This means that an eavesdropper could listen in on the conversation and view all messages. However, when sending the personal information such as the password in the initial connection, the messages are encrypted to ensure security of the message. Many people have criticized this protocol for the fact that everything is sent in plain text from point to point. On the other hand, this protocol is simple to implement in clients and is easy to understand and to extend to new functionality. And for most users, it offers a good solution provided that users never transmit important information such as credit card numbers or passwords. [2]

**Other Proprietary Protocols**

The discussion above has given a detailed explanation of the MSN Messenger network and protocol and served as an example of how instant messaging works. As mentioned, it is one of many which are in use today. Other proprietary protocols differ from it in many ways. This section will give a few key differences between the MSN Messenger protocol and other popular protocols.

One of the other most popular instant message applications is ICQ. It is also one of the earlier instant messaging applications. Unlike the MSN Messenger protocol, the ICQ protocol is not based on strings and plain text which are passed from client to server. Instead it is comprised of encoded bytes in packets which are decoded and interpreted on either side. ICQ puts a higher stress on message security and thus messages in the ICQ protocol are encrypted and decrypted on either end. However, again unlike MSN Messenger, ICQ does not use TCP/IP to create connections. Rather, it uses UDP for all connections which are less reliable than TCP/IP. [5]

The most popular instant messaging application on the internet today is AOL’s instant messaging application known AIM. AIM is similar to ICQ in that it does not use
plain text to transmit messages. It also uses encoded bytes. Like MSN Messenger, AIM uses TCP/IP for all connections. AIM does differ from both other protocols in one aspect however. In both the ICQ and MSN protocols, only one message is transmitted at a time per packet. AIM’s protocol however supports multiple messages per packet frame and calls these packets Flaps. Each message has a sequence number with it so that the client and server can reorganize the messages that are spanned over multiple packets. [1]

**Standard Protocols**

The above discussions have introduced many of the popular instant message applications. Each of these services mentioned above uses their own proprietary protocol implementation as described above. None of them are interoperable which means that clients of ICQ cannot communicate with clients on MSN Messenger for example. To solve this problem there have been many proposed standards in hopes that all instant messaging could be interoperable. One of the standards that is gaining popularity is Session Initiation Protocol (SIP). The SIP standard addresses many issues common to instant messaging and presence applications including internet conferencing, telephony, presence, events notifications, and instant messaging. SIP is independent of the packet layer and only requires an unreliable datagram service, as it provides its own reliability mechanism and works on both UDP and TCP connections. [4]

Another initiative to standardize the instant messaging/presence world is WirelessVillage. The main focus of WirelessVillage is to bridge the gap between the mobile world and the pc world. Since now there are a great number of new wireless devices which support presence information and can support instant messaging, this initiative aims to bridge these gaps so that all devices and hardware can communicate seamlessly. [3]

**Conclusion**

Instant messaging is still in its infant stages. It has been around since at least 1996 however in the past years it has grown and changed tremendously. There are always new innovations and new technology which shape the way it advances into the future. MSN Messenger, ICQ and AIM are three of the most popular instant messaging applications at the moment. However each uses its own proprietary protocol and system which keeps their clients separated from the other services. Initiatives such as SIP and WirelessVillage are aiming to change this and create a common instant messaging standard. Whether or not these standards are adopted by these major companies is still unknown. For the moment, there is a race to attracting as many users as possible and creating the most versatile protocol.
References

   Retrieved: March 28, 2004
   From: http://aimdoc.sourceforge.net/OSCARdoc/

   Retrieved: March 28, 2004
   From: http://www.hypothetic.org/docs/msn/index.php

   Retrieved: March 29, 2004
   From: http://www.openmobilealliance.org/tech/affiliates/wv/wvindex.html

   Retrieved: March 28, 2004
   From: http://www.cs.columbia.edu/sip/

   Retrieved: March 28, 2004
   From: http://www.megasecurity.org/Info/ICQ.html