

AN INTERNET MESSENGER SYSTEM FOR LOCAL AREA NETWORK

W.R.A.S.N. Bandara, A.A.M.M.E. Karunaratne, R.M.S.D. Rajapaksha and R.G. Ragel

Department of Computer Engineering, University of Peradeniya

Introduction and Related Work

There exist a number of freely accessible messenger systems in the Internet. Most of them are developed for typical instance messaging (IM) usage. When we use them for communication among users of a LAN (Local Area Network) like a company network or a departmental network they fail to make use of all the resources available in that network. In addition, these companies are not comfortable with allowing their employees to use such public messenger systems due to concerns on both productivity of employees and privacy of the company. To overcome these limitations, we have developed a

resources and gives the expected privacy.

Typical free *IMs* are *Google talk* (Google, 2009), *Yahoo messenger* (Yahoo, 2009), and *Windows Live Messenger* (MSN, 2009) (see Table 01 for comparison). These messengers typically have the following features: (a) Text Chatting, (b) Video Chatting, (c) Audio Chatting and (d) File Transfer. When we use them as a messenger for a specific LAN like a company there are some limitations, such as:

- The file transfers are going to be slow in messengers like *Google talk*,
- The company will be paying up/down traffic for internal communication between its employees,
- Since the data go through a third party server (servers of Google, Yahoo, etc) we cannot guaranty the privacy of such data, and
- No means of stopping employees wasting time chatting with outsiders (friends, family, etc.).

The aim of our project is to overcome such limitations and to learn how a state of the art *Internet* messenger (both web-based and desktop) is built with the latest technologies.

This abstract gives overall details of the project "*CE IM*", the messenger system we developed.

Table 1. Comparison between IMs

Options	G Talk	MSN	Y! IM	CE IM
Private chat	✓	✓	✓	✓
Chat rooms	X	X	✓	✓
Conference	X	✓	✓	✓
Audio	✓	✓	✓	X
Video	X	✓	✓	✓
Emoticons	X	✓	✓	✓
Games	X	X	X	✓
File transfer	Slow	Mediun	Slow	Fast
Saving Conversation	Server	PC	PC	PC
Chat in web	✓	X	✓	✓

messenger system that can be used in a LAN that exploits all available

Requirement Analysis

The functional requirements for *CE IM*:

- Using a username and a password, users should be able to login.
- Once logged in to the system, all the online users are displayed to the user.
- When a user login to the system, he is redirected to the main chat room where every online users can chat.
- In the public chat room, a user can whisper to one or more online users by selecting whisper option.
- User will be able to privately chat with any online user.
- By selecting several users, a conference can be started.
- User will be able to view webcam of any selected user.
- File transferring is enabled in private chat.
- In text chat, smiles can be used.
- Different font sizes, font colours, bold, italic, underline options are available in the text chat.
- Different sounds are used as alerts when, user becoming online, receiving a message, selecting users for private chat and conference and whispering.
- User can change settings to disable and enable these sounds.
- User can save text and smiles of private chats, main chat and conference chats.
- User can play a deck card game with any other three online users.
- User registration, profile management can be performed via the web application. The same application also accommodates public chat rooms.

There are few non functional requirements of the product and they are:

- Attractive user interfaces implemented using Widows Presentation Foundation (WPF, 2009),
- Both web and desktop applications developed with attractive and user friendly user interfaces.

System Design

Figure 1 depicts the system architecture of our messenger system. The system consists of a server application and a client application. Desktop clients communicate between them using *Windows Communication Foundation* (WCF, 2009) services in the server. All the functionality necessary are implemented in the server as WCF methods.

The application layer is used for communication between the application and the database. It consists of methods that are needed to insert, update and delete records in the database.

Web application has three common chat rooms, profile management and administrative task pages. In web chat, clients always check the server after a specific time period and if there are chat updates, the clients updates the chat rooms (using Ajax). Each chat room is separated by room id while the same server application is used for each chat room. Web application communicates with the database by using the application layer. When a message is sent from a desktop client it goes to the server and server updates all the target clients to which the message should delivered.

User passwords are hashed using MD5 before stored in the data base. There are 3 types of user roles in the web application as follows: (1) general users with the following duties: manage a user profile, view others user profiles, view who is online, chat in three public chat rooms, and view member list; (2) administrative users with the following options: provide all options that are given to the general users, enable, disable and edit other user profiles and set a general user as an administrator; and (3) guests users with the following capabilities: view the *home page*, *help page* and *registration page* they can register as a general user, once a user is registered administrator have to enable his user profile.

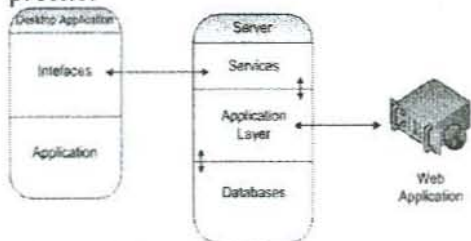


Figure 1. System Architecture

Implementation of CE IM

The system consists of a desktop application and a web application. The following modules are implemented for the desktop application: (i) a login page with authentication; (ii) chat room, private chat, conference, video chat; (iii) file transfer (see Figure 02) and (iv) a deck card game, and the following for the web application: (i) a login page with authentication; (ii) chat rooms; (iii) profile management; and (iv) administrative tasks.

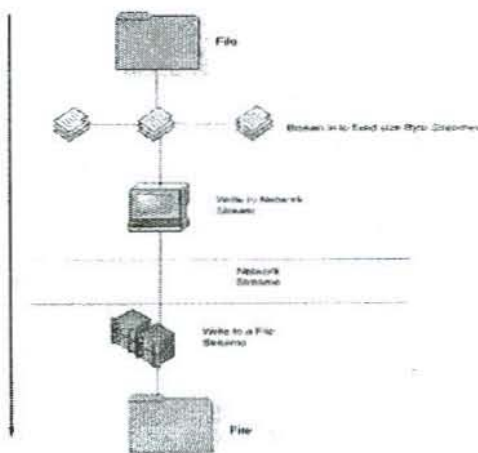


Figure 2. File transfer process

The tools and technologies used for the implementation are *Visual Studio 2008 (ASP.NET, C#)*, *WPF, WCF, SQL Server 2005, Ajax* and *JavaScript*.

In video chat implementation, we were unable to develop the video chat in such a way that video images are transferred directly as streams. We achieved video transfer via sending JPG image strings in high frequency to simulate images.

Testing and Quality Assurance

In the desktop application, first, the text chatting was implemented and was tested in the local host. Then it is tested in two computers using peer to peer network connection. After that it is tested in the network of department of computer engineering.

File transfer and video transfer are implemented separately. They are also tested separately using the above procedure. Then we integrate them in to the application and tested again.

The web application is tested for its functionality using several web browsers such as *Mozilla Firefox*,

Google Chrome and Microsoft Internet Explorer.

Conclusion

The main idea in our project was to build a smart, user friendly messenger application with much functionality so that it can be used in a LAN with high performance and privacy concerns. A web and desktop based messenger is developed to satisfy this requirement. We implemented this system with all the features identified under functional and non functional requirements and we believe that we achieved our target.

References

- WCF (2009). Windows Communication Foundation. Available at <http://msdn.microsoft.com/en-us/library/aa480210.aspx>, accessed on 20-08-09.
- WPF (2009). Windows Presentation Foundation. Available at <http://msdn.microsoft.com/en-us/library/ms750441.aspx>, accessed on 20-08-09.
- Google (2009). Google Talk. Available at <http://www.google.com/talk/>, accessed on 20-08-09.
- Yahoo (2009). Yahoo Online Messenger. Available at <http://messenger.yahoo.com>, accessed on 20-08-09.
- MSN (2009). Microsoft Live Messenger. Available at <http://home.live.com>, accessed on 20-08-09.