**LAN Chat Application**

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**Abstract: -** LAN chat application is one of easiest way to chat with your friends through LAN. No internet connection is needed. The only thing which requires is server IP address and you will be able to connect to others members through LAN. It can help you to talk to your friends even you both do not have internet connection. As it is based on LAN. LAN i.e. Local area network which connect different client to each other and also client to main server. So we have used the same concept here we are connecting two or more client to the server with each other and by providing the IP address we can talk with each other. On the other hand file sharing application is also implemented where a user can upload a file on a server. We are providing the path to the directory where we have stored our file to the user who wants to access particular file.

# Introduction

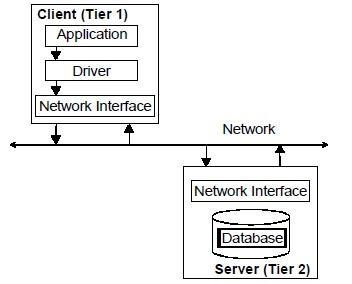
LAN Chat Server (LCS) is a chat system via local area network. The functions of the system include chat room & files uploading. The bulk of people who used local area networks nowadays put in force security procedures at their limits. The procedures are generally designed to succeed at least two aims. First, they attempt to limit the harm to the network that valid clients may cause, for example, by mistakably downloading virus infected emails or by permeable secret business information to the outdoor world. Second, network edge security strategies can limit or sometimes eradicate difficulties produced by worms and other types of malware.

Object oriented programming (OOP) was used in the development of the system. The OOP used is JAVA programming. Java is one of the most popular object-oriented programming languages. Currently, Java is commonly used in network applications and mobile devices because of its advantages like security, strength and platform independence. First of all, the reason is Java is an object-oriented programming language and the Java computer-generated machine is a stack-based machine, but the conformist computer architecture does not support object-oriented programming in hardware directly. Finally Java is a dynamic binding language, and during execution, many data type and security checking are performed to maintain the system’s robustness. Therefore, an exact object-oriented processor targeting Java is a good choice to improve the execution speed.

# Two-Tier Architecture

The LCM (LAN Chat Messenger) uses two-tier client server architecture as shown in figure 1. The application handling is completed separately for user interface presentation. Generally, the networks bind the back-end of an application to the front-end, though all tiers can be present on the same hardware. The architecture of any client/server situation is by classification at least a two-tier system, the client is the first tier and the server is the second.

The two-tier design generally encompasses client demanding services undeviating from server i.e. client communicates alongside the server without the help of another server or server process.



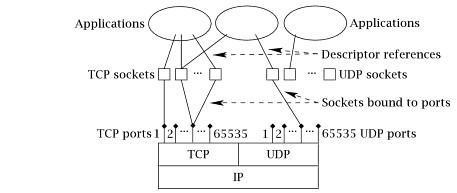
**Figure 1:** Two Tier Client/Server Architecture Model

## *Socket*

In order to implement LCM, it needs socket which is an object that represents a low-level access point to the IP stack. A socket is a simulated medium that allows sending and receiving of data in an application. The socket enables an application to connect to a network and communicates with other applications connected to that same network. A socket basically constitutes the combination of an IP address and a port number. (Socket = IP address + Port Number).

### Types of Sockets

There are many types of sockets that fit into dissimilar protocols and dissimilar stacks of protocols in a suite. However, this paper is focused on the TCP/IP protocol because the TCP/IP is the standard and mostly used protocols in instant messengers. The primary or fundamental sockets in the TC/IP are the stream socket and the datagram socket . Figure 2 below shows sockets and ports.



**Figure 2:** socket and ports

### Chosen Socket

Having known the types of TCP/IP sockets and how they work, in this system, we will employ the stream socket because it uses the TCP protocol which allows limitless messages to be sent over a network unlike the datagram socket that is limited to 65,000 bytes. Besides, it is very secure and more reliable as compared to the datagram socket. Also, it ensures reliable delivery of messages and files.

## How Chat Communications Work

Two sockets are created at the client side and the server side. The client connects to the server through its IP address and port number. They must share the same port number for them to communicate. The client and the server both communicate through a stream of bytes written to the socket. The client and the server must agree on a protocol (TCP, UDP or RAW) and agree on the language of the information transferred back and forth through the socket. This study used socket concept to collect message. Basically, the message sent by one client into a socket and passes it to another client on the receiving side. If it is group chatting, a central socket will be used to collect the message and then it will be broadcast to all clients that are active.

## Network

Client/server network was used to implement the LCS because of the central administration, scalability- any component or client can be upgraded when required, flexibility – new technology can be integrated into the network should the client increase. Table 1 below shows the comparison between peer to peer network and client/server network.

**Table 1:** Comparison between the peer to peer network & the Client/Server network architecture

|  |  |  |
| --- | --- | --- |
|  | **Peer to Peer Network** | **Client/Server network** |
| **Hardware Cost** | It needs no high-end server as the resources are distributed over all clients which reduce cost. | A dedicated computer server (hardware) that distributes resources is needed. |
| **Easy Setup** | It is easy to setup mainly if the computers are less than fifty (50). | It is difficult to setup. |
| **Network Operating system** | There is no required network operating. | Network operating system is required. |
| **Failure** | It can accommodate failure i.e. if one or more Computers  (Clients) fail the others can still be up. | It cannot accommodate failure if the server fails. |
| **Security** | It has security deficiency as clients’ administration is not guaranteed. | Very secure because server administration is guaranteed. |
| **Performance** | It performs less | Performs very good |
| **Backup** | It has decentralized backup that is difficult to access. | It has a centralized data backup with ease of access. |

# System Implementation

The system was implemented using JAVA programming.

# Conclusions and Discussion

The LCM is established as a solution to some communication problems and reduces the use of resources including time factor of an organization’s internal communication. The proposed system enables users to communicate on networks outside internet boundaries. LCM can be integrated in other application areas such as in school, university and public libraries for communication between library patrons and librarian, in business offices, scientific organizations, and the academe, to mention a few. The proposed system can be a future replacement for many internet chat applications and will cost the organization lesser resources to implement. The strengths of the system identified are: more communication opportunities within an organization without using an internet subscription; it can work on all Windows platforms provided that the client and server are using the same type of operating system; it enables connected clients to chat with each other & upload files; it supports peer-to-peer and server-based modes; user interface is common and familiar; and users may create chat rooms for specific topics or users so if there is any urgent management announcement is easy to broadcast to everyone at once and to specific persons only. There are other advantages of the system especially when future enhancements would be analysed and implemented.

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