LAB 3: THE CLIENT SERVER ARCHITECTURE

In this lab, you will learn how to develop a client-server application using a command line broadcasting application as an example. Download the source code from Moodle and import it into your Eclipse IDE. There are altogether three projects:

- edu.rosehulman.broadcast.protocol – Represents the protocol for the clients and server
- edu.rosehulman.broadcast.client – The command line chat application client
- edu.rosehulman.broadcast.server – The server that broadcasts chat messages to the connected clients

Follow your instructor's demo to understand how it works.

Request for Comments (RFC) – The RHBCAST1.0 Protocol

The RHBCAST1.0 protocol (Rose-Hulman Broadcast Protocol) is used for broadcasting messages to remote clients connected to a broadcast server using TCP sockets at port 9000. Two types of messages are supported in version 1.0 of the protocol: echo and control (discussed shortly). Here is the general format of the message/protocol packet (excluding the surrounding lines):

<Protocol-Version> <Space> <Command> <Space> <Payload-Size> <CRLF>
<Username> < CRLF>
<Data> < CRLF>

Here is the explanation of the fields:

Protocol-Version: RHBCAST1.0, for version 1.0 of the protocol
Space: Regular space character
Command: One of "echo" or "quit"
Payload-Size: Size of the next two lines including escape characters
CRLF: Carriage return and line feed together, i.e., the "\r\n" string
Username: The name of the user sending messages
Data: The payload data to be broadcasted

Echo Message

Echo message are sent from a client to the server to be broadcasted to all of the connected clients including the sender. Here is a sample format of the message:

RHBCAST1.0 echo 27
rupakhet
Hello CSSE 477!

Quit Message

A Quit message is sent from a client to the server for disconnecting from the broadcast service. The server will delete the client from its broadcast list and close the socket connection upon receiving this message. Here is a sample format of the message:

BCAST1.0 quit 10
rupakhet

Lab Assignment

You will extend RHBCAST1.0 protocol to support the following new feature (change the version number to 1.1):

Implement a "LIST" control message that a client sends to the server. When server gets this message, a list of all usernames connected to the server are returned to the requesting client (only). Use best design and coding practices to implement your solution.

Deliverables (Two Files)

1. A short documentation that includes the following (**pdf only**):
    - An architecture diagram (Module, C&C, and Allocation)
    - A UML class diagram that include protocol, client, and server interfaces/classes. Only show important methods where necessary.
    - Snapshots of the application working on Eclipse Console

2. Bundle all three projects into one zip file and turn it in on Moodle.