COMP 6231: Distributed Systems Design

Lab Instructions

Java Sockets

May 7, 2022

1 General Information

Lab Date: Tuesday, May 10th, 2022.

Your lab instructor will provide you with instructions on how to do this lab activity.

2 Overview

The purpose of this lab is to get a hands-on experience on multi-threaded socket programming using java sockets. In this lab you develop a simple TCP listener that serves multiple clients, by implementing a text-based L7 protocol[1], as specified in 3.2:

3 Instructions

You may start from scratch or use the provided kick-start project that implements a sample "greeting server". For your convenience, a simple socket library is provided.

[1] See SMTP (4) as an example of a text-based L7 protocol

3.1 Project Setup

Clone the template from the first tutorial on Github:

`https://github.com/COMP6231/T01`

See `GreeterServerProtocol`, `GreeterServerExample`, and `socklib.ServerListener` for details. You may alternatively use `java.nio`.

3.2 The Greeting Server

A multi-threaded TCP lisenter is to be created and listen on port 6231 for incoming connections. The greeting protocol is outlined in the following:

```
SERVER: OK Greeter server ready to greet you.
CLIENT: HELO
SERVER: HELO <<client's ip address>>; pleased to meet you!
CLIENT: ALO
SERVER: ALOHA
CLIENT: BONJOUR
SERVER: HI
CLIENT: BYE
SERVER: CIAO Arrivederci!
```

3.3 Running the Project

Compile and Run the project. Use *telnet* or *netcat* to connect to the server and test the protocol.

4 After the Lab

Think of a discovery protocol to discover greeting servers on the local network. How would you develop such a system?

References

1. Java Concurrency:

   https://docs.oracle.com/javase/tutorial/essential/concurrency/runthread.html

2. Java Sockets:

   https://www.baeldung.com/a-guide-to-java-sockets

3. Java NIO Sockets:

   https://www.tutorialspoint.com/java_nio/java_nio_socket_channel.htm

4. SMTP @Wiki:

   https://en.wikipedia.org/wiki/Simple_Mail_Transfer_Protocol#SMTP_transport_example