Programming Assignment 7: The Data Server Moved Out!

Due 12/6/18 at 11:59pm, Total 100 pts

Introduction

In this Programming Assignment, we add another RequestChannel subclass, called NetworkReqquestChannel to provide communication across the network. Specifically, we allow the client-side end of a request channel to reside on one machine, and the server-side end of the channel on another machine. The communication over a request channel is to be provided by TCP connection(s). In order to establish request channels over the network, the interface of the request channel must be modified somewhat and you are allowed to do so.

You are to modify the data server program from PA6 to handle incoming requests over network request channels instead of request channels. The data server must be able to handle multiple request channels, either from the same client or from different clients, possibly on different machines. You also have to modify the client from PA6 to send requests over network request channels.

The Assignment

You are to write a program (call it client.cpp) that consist of a number of request threads, one for each person, a number of worker threads, and a number of statistics threads, one for each person.

Design your dataserver so that multiple instances of the client program, either from the same or from different client machines, can connect to the dataserver simultaneously. The client program is to be called in the following form:

```
./client -n <#reqs> -w <# workers> -b <bb size> -i <f|q|m|n> -h <host name> -p <port no>
```

The data server is to be called in the following form:

```
./dataserve -i <f|q|m|n> -p <port no>
```

Note that you the dataserver no longer runs using exec() function from the client. Rather, it is run in the terminal in a different machine, or the same machine as well (i.e., TCP/IP also works as an IPC method). The dataserver executable does not need host name argument because it runs the service in local host.

What to Hand In

You are to hand in a .zip file that comprises the following files:

- Your implementation of the Network Request Channel, to be submitted in two files: `NetworkRequestChannel.h` and `NetworkRequestChannel.cpp`
- The updated `client.cpp, dataserver.cpp,` `makefile etc to compile`
- Measure the performance of the system with varying numbers clients and write a report with the runtime numbers presented in a graph (like the previous PAs).