CS 39006: Assignment 4

Concurrent Server Implementation

Assignment Date: 30-Jan-2020

Deadline: 06-Feb-2020 2:00 PM

Objective:

The objective of this assignment is to implement a concurrent server where multiple clients can request for same or different services and the server serves them concurrently. The implementation will also help you to understand the functionality of the `select()` system call used for servicing multiple requests over different sockets.

Problem Statement:

Your task is to implement a server and two clients with two different service requests. The server can receive two different service requests from the clients as follows.

1. *Request for a bag of images*, where the server will forward a set of images one after another **over a stream socket**. The server contains a directory called `/images` which contains multiple subdirectories called `/images/im1`, `/images/im2`, etc. each having a set of images. The client requests for the images of a specific subdirectory by forwarding the subdirectory name to the server. Once the server receives a request for the images under a subdirectory, it reads the images from that subdirectory and forwards them one after another. The end of service is marked with an **"**`END`**"** message from the server to the client. Once the client receives that **"**`END`**"** message, it prints the number of images received and exits. Note that the server does not inform the client about the number of images. It just sends all the images followed by an **"**`END`**"** message to the client. A sample `/image` directory along with the subdirectories and images are also given with this assignment.
2. *Request for the IP address corresponding to a domain name*, where the client requests for the IP address of a domain, say `www.iitkgp.ac.in`, over a datagram socket. The server looks up for the IP address by using the system call `gethostbyname()`. The server returns this IP address to the client. The client prints the IP address and exits.

You have to implement two clients, one corresponding to each of the services as mentioned above. Note that the client requesting the bag of images works over a stream socket, whereas the client requesting for the IP address works on a datagram socket.

The server can receive multiple service requests simultaneously from different clients, and it needs to respond to each client with the corresponding response.

Submission Instruction:

You should write three C programs - `selectserver.c` (contains the server program), `imageclient.c` (for image requests) and `dnsclient.c` (for IP address requests). Keep these three files in a single compressed folder (zip) having the name <roll number1>_<roll number2>_Assignment3.zip. DO NOT submit any additional files. Check that you DO NOT have any hidden file in your submission. Follow the file and directory naming convention as mentioned in the assignment.

Upload this compressed folder at Moodle course page by the deadline (6th February 2020 2:00 PM).