#### COEN 146: Computer Networks – Fall 2018

**Lab assignment 4: Concurrent TCP server**

**Objectives**

##### To build a concurrent server using TCP/IP socket to accept connections from multiple clients at the same time

##### **Multiple Clients – Concurrent Server with TCP/IP**

In Lab 3, you have developed a TCP/IP client/server to transfer file. Imagine you want to transfer a large size file (e.g. Giga bytes of data), then the client will need to iteratively read blocks of the file and send to the server.

For a faster file transfer, the large file may be divided into n smaller files, then the transfer of each smaller file can be handled by a separate client. In this case the server will need to concurrently accept connections for transfer from multiple clients and save incoming content to the destination file.

In this lab, you will develop a concurrent TCP server that accepts file transfer from n clients.

1. Write a concurrent TCP server that accepts and responds to multiple client connection requests for file transfer. You may modify your TCP server in Lab3 so that when the server accepts a connection from a client it spawns a separate thread to handle this specific client connection for file transfer.
2. Duplicate several TCP clients, each reading from a separate src.dat file, then connecting to the TCP server for file transfer.
3. Demonstrate multiple client/server communication to the TA and upload your source code to Camino.

Note: You will have a number of threads (at the same time) running on the server transferring separate files and copying to the main destination file – dst.dat.

1. [Bonus] You may observe that the smaller files coming from separate clients are not sequentially written to the destination file. In this case, you main need to synchronize the operation of the server threads so that the content of the dst file is in order. Synchronization can be implemented by specific API (e.g. locks, semaphores, etc.).

**Requirements to complete the lab**

Show the TA correct execution of the programs you wrote and upload source code to Camino.

Be sure to retain copies (machine and/or printed) of your source code. You will want these for study purposes and to resolve any grading questions (should they arise)

Please start each program with a descriptive block that includes minimally the following information:

/\*

\* Name: <your name>

\* Date:

\* Title: Lab4 - ….

\* Description: This program … <you should

\* complete an appropriate description here.>

\*/