CS550 Advanced Operating System

Programming Assignment 4

Meng Tang A20455416

Output Files & Performance Evaluation Results

Overview

Make file setup file datas for transferring. It also runs download time tests with 2, 4, 8, 16 available downloading clients. Then it organizes all the test output log files into a folder named test-logs.

Tests Description

The test measures the average time to download 10 files from different numbers of peers. The peer numbers vary from 2, 4, 8, and 16. In every test, the corresponding number of peers will be set up to behave like a server waiting for incoming request to download files. One more thread is started at the last and it is the requestor and connects to the different number of peers. This one peer has an empty directory, and it downloads all 10 files from other peers. The time measurement is taken from this one peer. Time record starts before threads starts and go off to download the chunk of files with a new socket connection. Then it ends when all threads are joined. The average request time is calculated at exit and write to the log file.

The chunk size is coded to be 2MB and the 10 files are 32MB in size. Therefore when there are 16 peers active in the index server, all peers will get a chance to accept requests from the downloading peer. Another hard coded component that is specifically set up for this chunk size and my machine is the socket timeout. It is set to 15 seconds.

Output and Graphs:

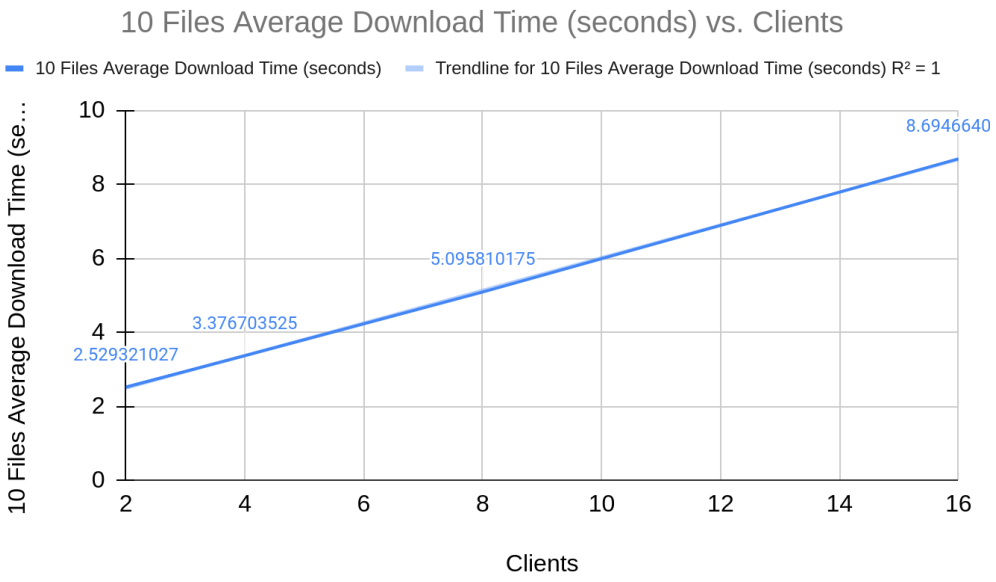

Figure 1. 10 files average download time for 2, 4, 8, 16 clients.

With increasing clients, it takes more time to download the 10 files. The fitted linear formula has R2 value of 1, which means the line is almost perfectly linear and. This result is due to the benchmark

being testing on the same computer. When starting each client, it is equivalent to starting a process in the machine. Therefore it runs slower when there are more processes using the limited resource. Theoretically downloading from more different peers should reduce the time it takes to download everything, since each peer node is actually dealing with less file read and less socket connection with more peers.

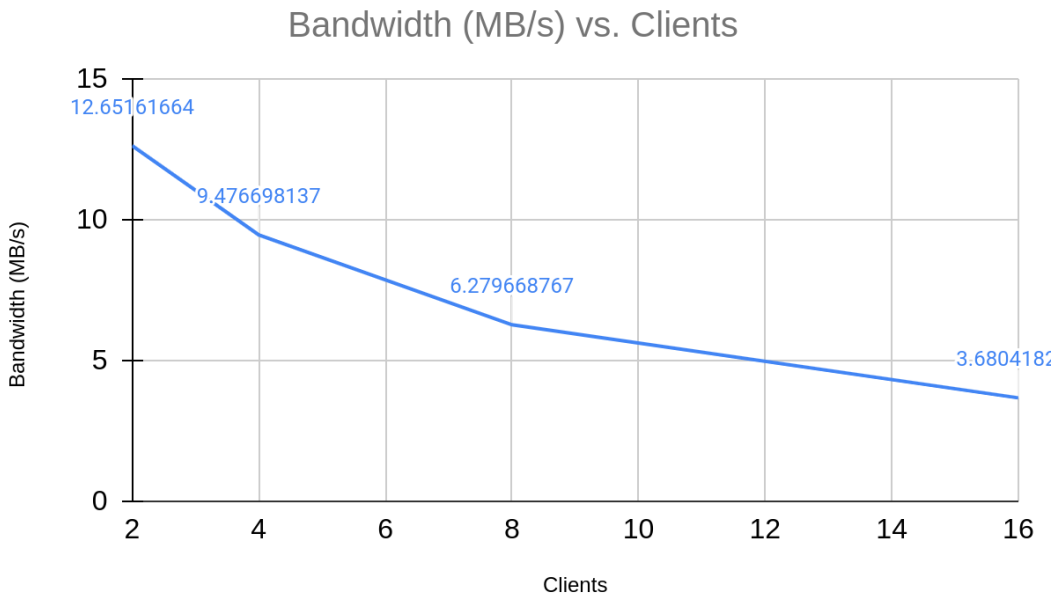

Figure 2. File transfer bandwidth with increasing clients.

This is an additional graph calculated with 32MB file size divided by the time. When there are 16 peers running within the machine, the file transfer can only reach about 3.7MB/s bandwidth with the sockets.