CS 550 Programming Assignment – 1

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Performance Evaluation on Peer to Peer Network

The system configuration that was used to run the code:

CPUs	8
Threads(s) per core	2
Core(s) per socket	4
Socket(s)	1
CPU Frequency (MHz)	2300
Memory (RAM):	1 GB

With the above system, following performance measurements are made for the "search" requests from the client:

1) Average response time per client
2) Concurrent requests made my multiple clients

1) Average response time per client:

Steps:

- Start the Central Indexing Server
- Start a peer binary that has a client and a server. Here, the client code is modified so that it has a list (1000) of filenames to look up at the Indexing server. For example:
    - Peer1 searches for filenames file1.txt, file2.txt upto file file999.txt
- Some files (around 20) are registered at the servers by other peers. In the run, as expected, many of the requests will return as no source seeds for the requesting client.

Following is the observation, with each iteration performing sequential requests for 1000 files:

Iterations	Average Time taken for the search (in Milliseconds)
1st	0.141539
2nd	0.139949
3rd	0.145786
4th	0.144572
5th	0.145376

2) Concurrent requests made my multiple clients

Steps:

- Start the Central Indexing Server
- Modify the client code of 3 peers in such a way that each one sends a set of 1000s search requests to the CI server. For example,
    - Peer1 searches for filenames file1.txt, file2.txt upto file file999.txt
    - Peer2 searches for filenames file500.txt, file501.txt upto file file1499.txt
    - Peer3 searches for filenames file1000.txt, file1001.txt upto file file1999.txt

- Execute all the 3 peer binaries be at the same time in the command line

Following are the observations of average response time faced by the respective peer nodes for each iteration:

Iterations	Peer1 (50006) (ms)	Peer2 (50007) (ms)	Peer3 (50007) (ms)
1	0.133853	0.090924	0.067816
2	0.135745	0.092419	0.068116
3	0.131279	0.088321	0.066890
4	0.131490	0.086961	0.066609
5	0.132116	0.087655	0.064568

- As evident, Peer1's search takes a longer time than others because Peer1's search includes the files (filenames file1.txt, file2.txt,…, file30.txt) which are already indexed at the CI server when the peers get registered. So, it takes a while to identify their peers and return them back.