

Term Assignment 1

Lessons Learned

- How a P2P works.
- How a CHORD protocol works. (Didn't implement it well though)
- Debugging network issues. (Wireshark on windows, tcpdump on linux)
- Synchronization of file system
- input/output streams, ports, sockets, etc.
- Need to manage time better and not get tunnel vision on one problem

Overview of the Program:

- Search for IP addresses with an open port using an IP scanner object
- Create a Node object with a string, the port, and a list of IP's in the network.
- Creates a socket for the node object and one node connects with another node.
- Place socket IP into a DHT as a key and places a list of files as the value.
- A DHT contains the nodes in the network and the files that they contain.
- Begin the file synchronization.
 - The DHT are continuously updated. For instance, Node A sends DHT to Node B. Node B then receives DHT from Node A and sends the updated DHT to Node A. Then, Node A receives DHT from Node B and sends the updated to Node B.
 - Node B will begin to synchronize Node B's files with the other node's files by comparing what files they are missing from each node and requesting the appropriate file from the other Node.
 - Once Node B has finished updating their set of files. It will send out the DHT to other nodes for other nodes to check and update.
 - When a node receives a DHT, it will update their own DHT as stated earlier and find files that they are missing from other nodes and request them from the nodes that have the missing files.
 - Continues until all nodes in the DHT have the same list of files.
- Able to sync while the program is running: you can add new files and the files will sync with other nodes.

Challenges/Problems/Possible solutions:

- Currently don't have a way to synchronize two files that are the same name
 - SOLN: send over the timestamps of the last modified time for the files somewhere in the syncing method
 - SOLN: send the copies of the same file into another folder and let the user decide whether or not they would want to keep them.

- SOLN: Merge the files with the same name and the user will edit the merged file to their liking.
- Program may be inefficient with a large amount of nodes since it iterates over all nodes in the DHT.
 - Do better threading and/or implement the CHORD protocol exactly how CHORD should be implemented

Personal Issues:

- Needed to spend a lot of time learning about how exactly a peer to peer would work
- Needed to spend a lot of time understanding sockets and stream and connection in the network
- Class conflicts and time conflicts to work with a partner
- Issue of having only two computer to test the program
- COVID vaccine symptoms were harsh