Lei Huang; huan1397; 5330737
Yihan Zhou; zhou1298; 5547186

Design document

For this project, we build a distributed hash table based on “Chord” protocol. The system can support concurrent operations for multiple clients. The client can store and fetch key-value pairs into the system. The system can also support file reading and store all pairs within the file. We build the system on a completely decentralized manner with a SuperNode knowing only a small part of information.

SuperNode:

SuperNode will maintain the node list of the system knowing all the information of the nodes in the system. The address of super node is well known for all the clients and new nodes. Each new node needs to contact the super node first to get a random node information of the system. Each client will also talk to the super node first to a random node information and do the following information.

Super node will guarantee that there will be no concurrent node join and only return node information to clients when the system is ready (the number of nodes equals the configured node number)

Node:

Each node will maintain a part of the DHT and maintains a finger table storing partial information of the other nodes in the system to provide “shortcut” to other nodes.

We use [ip]:[port] as the string to generate hash code.

When a node first joins the system, it will talk to the super node first to get a random node existing in the system. Then the new node will use the existing information to build its own finger table and join the system. Updating the finger tables of other nodes is also the job of the new node. Each node provides multiple services for other nodes and clients to get its own information (finger entries and real data pairs).

Client:

Client is used to provide user interfaces to talk to the system. Client knows the super node information and will use a random node of the system as an enter point to get access to the whole system.

There are 4 options a user can do:

1) To set a single pair into the system: book title and genre . Call setPair() with book title and genre.
2) To set book title and genre with an input file. Get each line of pairs and store them into the system.
3) To get book title, call getPair().
4) Exit the system

For each operation here, user can choose whether or not to print the tracking information.