Project 3 Report

Sanjay Nair

Preethu Thomas

After implementing and testing a version of the Chord distributed hash table in Scala using the Akka Actor framework, we were interested in testing if our implementation matched the logarithmic performance present in the full implementation. When testing our program, we were interested in increasing the number of nodes in the system linearly or exponentially and see if the number of hops required to lookup a value maintained a log(n) relationship with n nodes in the system.

We began with a simple test, increasing the number of nodes from 10 to 1000 by steps of 10 and having each node complete when they sent 10 messages (for the interest of time). Of course, the average number of hops computed at the end of execution could be considered to be more accurate if a larger number of messages were sent by each node. However, with each node sending one message a second and the time required to build the Chord ring, we decided that 10 messages was sufficient to observe the trend of increasing number of hops with increasing number of nodes. Figure 1 shows the results of this experiment.

Figure

As we hoped, the number of hops required to lookup a value seemed to be increasing logarithmically with respect to the number of nodes.

We continued the experiment by running the system with 10 to 10000 nodes increasing the number by 1000 on each run to monitor performance in a more quickly growing system.