DISTRIBUTED OPERATING SYSTEMS PROJECT REPORT

CHORD ALGORITHM

GROUP MEMBERS

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IMPLEMENTATION DETAILS

We have spawned each node. Then, each node uses GenServer to communicate with other nodes and send their requests. We have implemented two kinds of node failures- temporary and permanent. In case a node fails temporarily, node alerts it's predecessor and successor of this event. The node's successor changes it's successor and the node's successor changes it's predecessor. When the node rejoins, the node with just greater identifier than the rejoining node, is made it's successor. Then, the successor makes the rejoined node, it's predecessor. And the node's predecessor becomes rejoined node's predecessor and it makes the rejoined node it's successor. The keys are arranged in network accordingly.
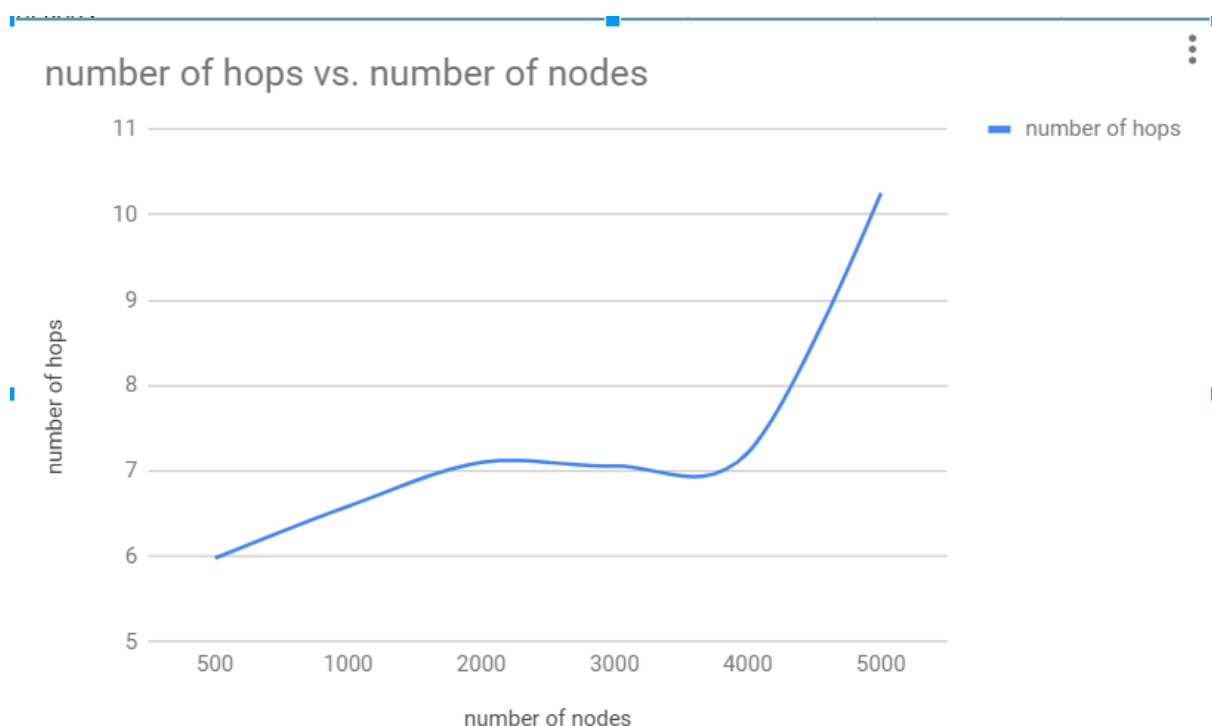
In case of permanent failure, the node does the same thing. But it returns 0 hops value and it deletes itself from registry.
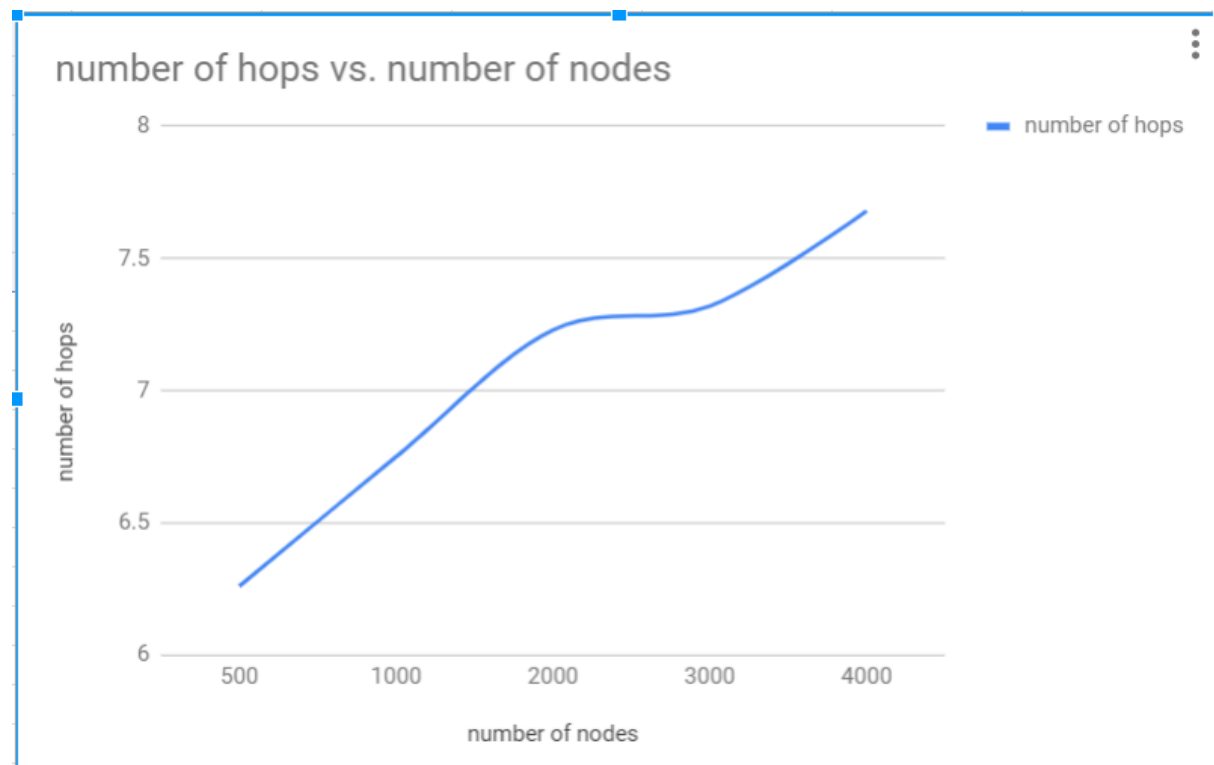
GRAPHS

Non – failure model

X -axis-> Number of nodes   Y-axis-> Average number of hops

Case 1: Each node makes 5 requests.
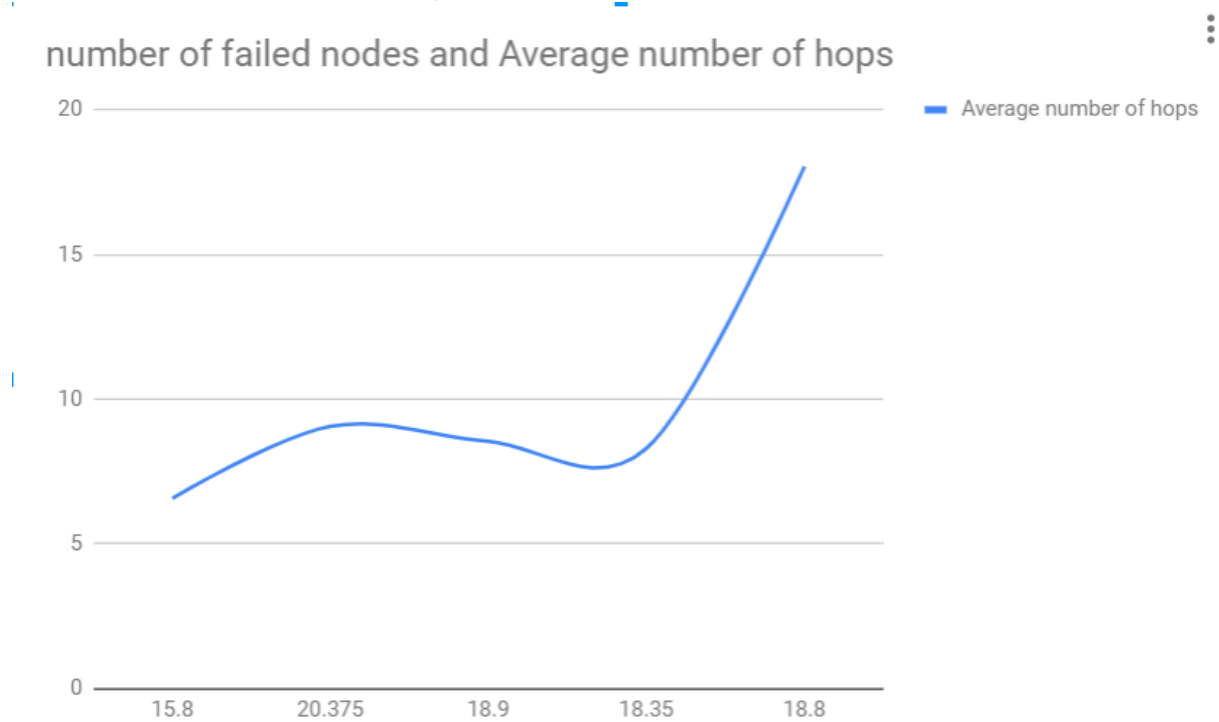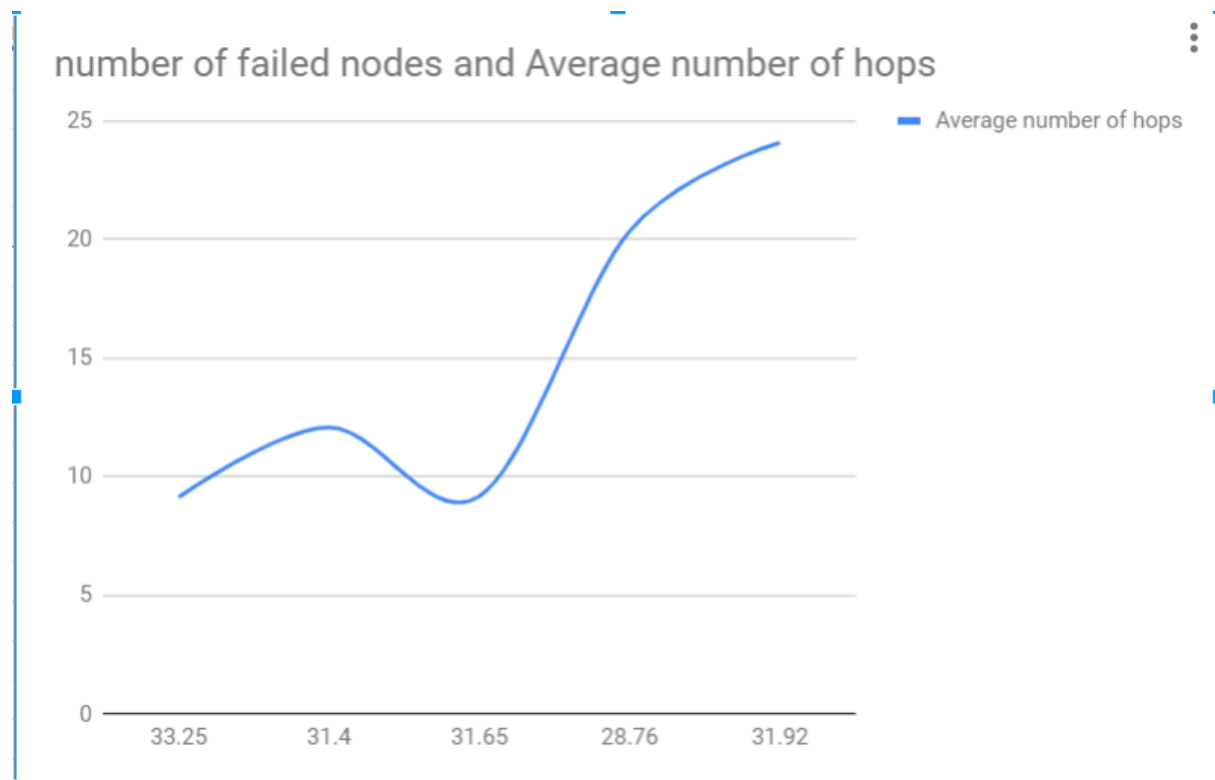
Case 2: Each node makes 10 requests.

number of hops vs. number of nodes

Failure Model

X -axis-> Number of failed nodes %   Y-axis-> Average number of hops

Case 1 : Each node makes 5 requests

number of failed nodes and Average number of hops

Case 2: Each node makes 10 requests.

number of failed nodes and Average number of hops

INTERESTING FINDINGS

1. Latency grows slowly as number of nodes grows
2. Chord is robust in case of node failures. Number of hops are slightly increased due to some extra hops which are made because some nodes became dead or unresponsive. But due to chord algorithm, time for given number of nodes and number of requests is approximately same in case of failure and non-failure models. This means failures have less impact on output.
3. Maximum number of hops that a node has to make is (number of nodes – 1)in case correct finger table entry dies not exist.
4. We can see from the graph that as number of failed nodes increases, the number of hops increases slowly.
   (Time to run each input is shown in ReadMe file)