

DOSP Project Report 3

Chord Protocol

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What is working?

The chord protocol has been implemented in accordance with the paper titled : **Chord: A Scalable Peer-to-peer Lookup Protocol for Internet Applications** Actors are being spun up and they are able to assemble themselves into the chord formation, furthermore, they are able to lookup random keys from a given range.

The figure 4 in the paper is an accurate representation for our protocol, with front links and backlinks always active. We have implemented dynamic indexing so that it is easier to transition in and out of failure of nodes. Additionally, we have made a recording of how our erlang code behaves over an M1 Macbook Pro with 16 GB of RAM, here are the findings:

Number of Nodes	Average Hop Count
100	1.33
500	1.38
1000	1.43
2000	1.442
4000	1.48

What is the Largest Network You Managed to Deal with?

Largest Network we managed to deal with consisted of 4000 nodes.

Found key in 8 hops and 201694 / 136070 = 1.4822811788050267 average.
Found key in 5 hops and 201699 / 136071 = 1.4823070308882862 average.
Found key in 8 hops and 201707 / 136072 = 1.4823549297430771 average.
Found key in 5 hops and 201712 / 136073 = 1.4823807809043674 average.
Found key in 8 hops and 201720 / 136074 = 1.482428678513162 average.
Found key in 5 hops and 201725 / 136075 = 1.4824545287525261 average.
Found key in 5 hops and 201730 / 136076 = 1.4824803786119523 average.
Found key in 8 hops and 201738 / 136077 = 1.4825282744328578 average.
Found key in 8 hops and 201746 / 136078 = 1.482576169549817 average.
Found key in 5 hops and 201751 / 136079 = 1.4826020179454582 average.
Found key in 8 hops and 201759 / 136080 = 1.4826499118165786 average.
Found key in 8 hops and 201767 / 136081 = 1.4826978049837964 average.