README

Team Members

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Steps to Run

dotnet add package Akka –version 1.4.25
dotnet add package Akka.FSharp –version 1.4.25
dotnet fsi project3.fsx <numNodes> <numRequests>

- numNodes - An integer which specifies the number of peers in the Chord network.
- numRequests - The number of requests each peer handles.

Introduction

Our algorithm uses Actor Model in F# to implement the Chord protocol. Each peer can create a request per second. The program terminates when all the peers have found all the requests. The peers try to look up for the data via a finger table to reduce the number of hops required to find a specific data key.

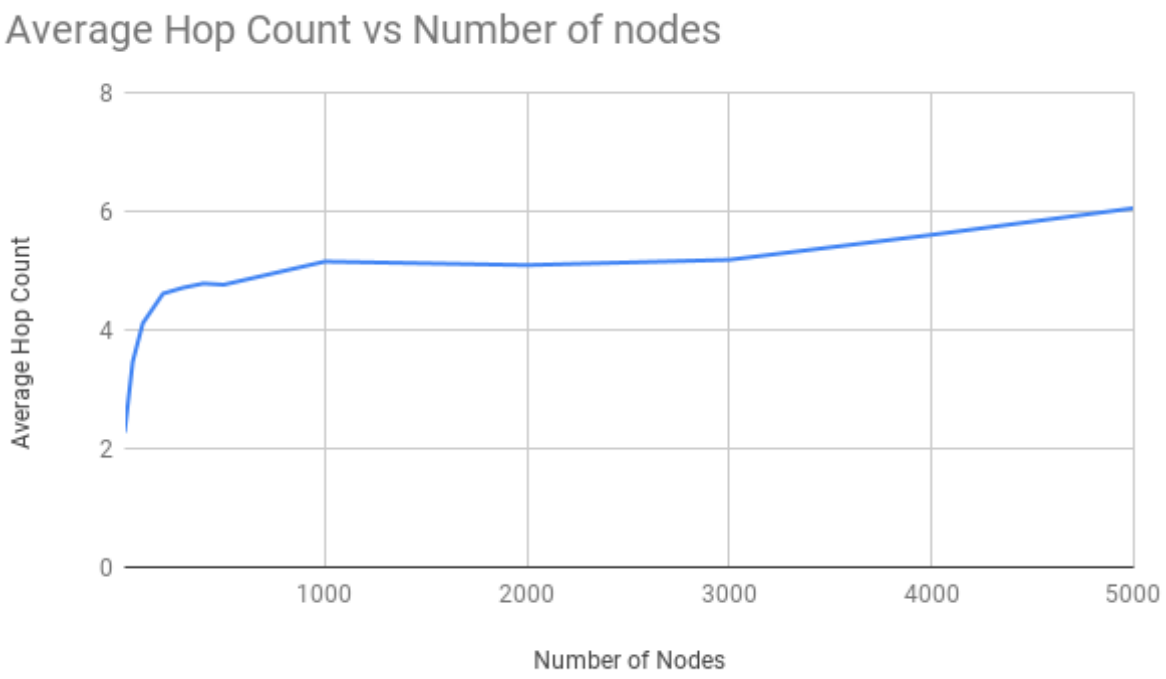
Observations

- We have implemented the Chord protocol where new nodes join the network and are arranged according to their identifiers(generated randomly) in the chord ring.
- The stabilize function is called periodically to update the successors according to the changing chord network.
- The notify function updates the predecessor according to the changing chord network.
- The finger table is also updated periodically to handle the changing network. In our code the finger table is of size 20. Our address space is of size 2^{20}.
- We have tested the network for nodes ranging from 10 to 5000 and have calculated the average hops required to find the keys.
- We have tested the network for 10 requests per node. Each node is made to search 10 keys per second and the number of hops are calculated to find the average.
- We have built the graph for our outputs which shows a logarithmic trend. Thus we can conclude that the Chord Protocol indeed finds peers in logarithmic time.

Largest Network

We have tested Chord with 5000 nodes and 10 requests each. The average hops for 5000 nodes as found by our code is **6.05**.

Graphs and Outputs




```
PROBLEMS 7   OUTPUT   TERMINAL   DEBUG CONSOLE

DELL@MacBook-Pro Chord_P3 % dotnet fsi project3.fsx 50 10


/Users/DELL/Documents/VS Code folders/F#/Chord_P3/project3.fsx(246,11
ions. The type variable 'a has been constrained to be type 'MasterMes

Sum = 1850 Average = 3.700000
DELL@MacBook-Pro Chord_P3 %
```