

Report 5: Chordy: a distributed hash table

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1 Introduction

This task investigates about distributed hash table with the Chordy algorithm, and can be generally divided into three parts. The first part, `node1.erl`, will realize a ring structure. After that simple ring structure, store is introduced in the `node2.erl`.

2 Main problems and solutions

2.1 Ring structure in `node1`

ID ranks the position of the circle in the clockwise direction. As a result, although A and C has connections prior to B, B is still inserted between A and C.

2.2 storing function in `node2`

In this part, 4000 information was initially stored in one node A, and then the operation time is 19 ms. However, when there are three extra points added to the circle, the operation time becomes smaller, which is 13 ms. Theoretically, if there will be one node against one piece of information, we may reach the minimum operation time. However, I failed in very simply 100 nodes.

3 Evaluation

```
OK
28> A = node1:start(0).
<0. 233. 0>
29> C = node1:start(2, A).
<0. 235. 0>
30> B = node1:start(1, A).
<0. 237. 0>
31> D = node1:start(3, A).
<0. 239. 0>
32> A ! state.
Id: 0
Predecessor: {3, <0. 239. 0>}, Successor: {1, <0. 237. 0>}
state
33> A!probe.
Nodes: [3, 2, 1, 0]
probe
Time: 0 micro seconds
34>
```

Figure 1: Ring structure construction

```
18> f().
ok
19> A=test:start(node2).
<0. 120. 0>
20> B=test:keys(4000).
[311326755, 597447525, 915656207, 666957294, 477121057,
 596510082, 142108218, 209448557, 697140785, 159811421, 558255809,
 214973049, 457924030, 421398761, 5922673, 562119769, 475772460,
 400961457, 309692304, 58649424, 578813091, 989293906, 330249246,
 183675908, 202756797, 33598462, 889026248, 836913029, 828875759]...
21> C=test:add(B, A).
ok
22> test:check(B, A).
4000 lookup operations in 19 ms
0 lookups failed, 0 caused a timeout
ok
23> test:start(node2, 3, A).
ok
24> test:check(B, A).
4000 lookup operations in 13 ms
0 lookups failed, 0 caused a timeout
ok
25> test:start(node2, 100, A).
ok
26> test:check(B, A).
4000 lookup operations in 126 ms
2623 lookups failed, 0 caused a timeout
ok
27>
```

Figure 2: Ring structure with store

4 Conclusions

Finally, DHT was implemented successfully under the Chord scheme, which contributes to the ring structure, and store and find message.