Distributed System I
Wintersemester2020/21
Assignment 1

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Team 19

December 7, 2020

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Assignment 2

1 Parameter Passing and RMI

a)

i. Call-By-Value:[0,2,8,4,8]
ii.Call-By-Reference:[0,2,16,12,32]
iii.Call-By-Copy: 1. No Aliasing:[0,2,16,12,32], 2.Aliasing:[0,2,8,4,8]

b)

1. Listing 1: we can't add element to a list like in line 5,

```
4         public Vector(int x, int y, int z){
5             this.values.add(x);
6             this.values.add(y);
7             this.values.add(z);
8         }
```

2. we should extend Java RMI:

```
1         public interface RemoteVector extends java.rmi.Remote{
2             ...
3         }
```

3.there is no methode connect in java.rmi.connect(line 29):

```
26      public static void main ( String [] args ) throws Exception {
27          Server serverVector1 = new Server (4 ,5 ,6);
28          Server serverVector2 = new Server (1 ,2 ,3);
29          java . rmi . Naming . rebind (" rmi :// localhost /v1",
                serverVector1 );
30          java . rmi . Naming . rebind (" rmi :// localhost /v2",
                serverVector2 );
31       }
32  }
```

4. in line 5,6 we need force type convertion:

```
5         RemoteVector rb1 = (RemoteVector) java . rmi . Naming .
              lookup (" rmi :// localhost /v1");
6         RemoteVector rb2 = (RemoteVector) java . rmi . Naming .
              lookup (" rmi :// localhost /v2");
```

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c)

1.: 4,5,6
2.: 1,2,3
3.: 5,7,9

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2 Chord System

a)

FT1:	
1	4
2	4
3	8
4	14
5	22

FT4:	
1	8
2	8
3	8
4	14
5	22

FT8:	
1	14
2	14
3	14
4	22
5	28

FT14:	
1	22
2	22
3	22
4	22
5	1

FT22:	
1	28
2	28
3	28
4	1
5	8

FT28:	
1	1
2	1
3	1
4	4
5	14

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b)

At first 31 > 22 so go Node 22.
then 31>28 and 31<33(1) so go Node 28
Then return 1

c)

FT24:	
1	28
2	28
3	28
4	1
5	8

FT22.1 and 2 change to 24, FT8.5 change to 24.

d)

The modified Chord system reduced storge but increase the lookup operation. Because each fingertable have less numbers. Thats mean we have less chance got p=e situation. So in average we need to find more times.

e)

No, For example, $m = 3$ and $ID_1(N) = 4$. Then $ID_2 = 4$ is equal to ID_1.

3 Name Services

a)

1. 8 messages for Iter and 8 messages for Recursive.
2. 6 messages for Iter and 6 messages for Recursive.
3. 8 messages for Iter and 8 messages for Recursive.

b

1. 8 messages and 320ms for Iterative. 8 messages and 200ms for Recursive
2. 4 messages and 160ms for Iterative. 4 message and 120ms for Recursive
3. 8 messages and 320ms for Iterative. 8 messages and 200ms for Recursive

c

i. They are not replicated.
ii. the under figure

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```
; <<>> DiG 9.11.4-P2-RedHat-9.11.4-26.P2.el7_9.2 <<>> @8.8.8.8 +trace www.uni-stuttgart.de
; (1 server found)
;; global options: +cmd
.                       80226   IN      NS      e.root-servers.net.
.                       80226   IN      NS      h.root-servers.net.
.                       80226   IN      NS      l.root-servers.net.
.                       80226   IN      NS      i.root-servers.net.
.                       80226   IN      NS      a.root-servers.net.
.                       80226   IN      NS      d.root-servers.net.
.                       80226   IN      NS      c.root-servers.net.
.                       80226   IN      NS      b.root-servers.net.
.                       80226   IN      NS      j.root-servers.net.
.                       80226   IN      NS      k.root-servers.net.
.                       80226   IN      NS      g.root-servers.net.
.                       80226   IN      NS      m.root-servers.net.
.                       80226   IN      NS      f.root-servers.net.
.                       80226   IN      RRSIG   NS 8 0 518400 20201219170000 20201206160000 26116 . dJuD
21YgzDZiNZaYXASassJtJ5vBYSsvL9dSNX3uHmhl0mU AVdfZrSMfH6CzQzKMoffA2AsN5pTvRukNbiirTiI5daTZDzgeW9GrOMi 1xi
;; Received 525 bytes from 8.8.8.8#53(8.8.8.8) in 0 ms

de.                     172800  IN      NS      n.de.net.
de.                     172800  IN      NS      a.nic.de.
de.                     172800  IN      NS      s.de.net.
de.                     172800  IN      NS      l.de.net.
de.                     172800  IN      NS      z.nic.de.
de.                     172800  IN      NS      f.nic.de.
de.                     86400   IN      DS      45580 8 2 918C32E2F12211766BE6226674F447458F2259B9A0D87B
de.                     86400   IN      RRSIG   DS 8 1 86400 20201219170000 20201206160000 26116 . afFwB
fsRji2sKtYq2Zrd9N9kseFgIMtFWovHNtOGO6wjGw4 43aLz4eyhHKPZoZJJEXGT9qMsBiJi7hxdOq+jigkUItnV5ZFXujyJzba 2w+w
;; Received 754 bytes from 192.112.36.4#53(g.root-servers.net) in 35 ms

uni-stuttgart.de.       86400   IN      NS      dns3.belwue.de.
uni-stuttgart.de.       86400   IN      NS      dns1.uni-stuttgart.edu.
uni-stuttgart.de.       86400   IN      NS      minnehaha.rhrk.uni-kl.de.
uni-stuttgart.de.       86400   IN      NS      dns1.belwue.de.
uni-stuttgart.de.       86400   IN      NS      dns0.uni-stuttgart.de.
uni-stuttgart.de.       86400   IN      DS      53428 10 2 46A9DE33B8F5A3C45AC5DF78B8325F612147F989A4FEC
uni-stuttgart.de.       86400   IN      DS      5796 10 2 80448384B6557435DECB49C393B7314A922327551A8F24
uni-stuttgart.de.       86400   IN      RRSIG   DS 8 2 86400 20201217104338 20201203091338 60906 de. ksW
;; Received 619 bytes from 194.0.0.53#53(a.nic.de) in 1 ms

www.uni-stuttgart.de.   3600    IN      A       129.69.8.19
www.uni-stuttgart.de.   3600    IN      RRSIG   A 10 3 3600 20201216000051 20201205235551 36245 uni-stut
 3mxcAyzDSl7FfVPJAMILFs+bLnRXrQ86Kn3hZybdPpNvdzdUmKRC7M10 kXwyutS/M6XKYdLQ5vJa43h9gD/2XH+VTBotFdTg7K0wbL
N tEN6MXkO5eDgC6TYoN31/0rIYfS0q6NHyg48kmaVOkbPjjPIfM8dhxOp 3WtkVAPqTh+zhGiu7EbYRkNQYc0Lwga/hxhSZkRPKJe6L
uni-stuttgart.de.       3600    IN      NS      dns3.belwue.de.
uni-stuttgart.de.       3600    IN      NS      dns1.belwue.de.
uni-stuttgart.de.       3600    IN      NS      dns0.uni-stuttgart.de.
uni-stuttgart.de.       3600    IN      NS      dns1.uni-stuttgart.edu.
uni-stuttgart.de.       3600    IN      NS      minnehaha.rhrk.uni-kl.de.
uni-stuttgart.de.       3600    IN      RRSIG   NS 10 2 3600 20201216000051 20201205235551 36245 uni-stu
X 3ozgGXbamkzQHDHXfVOJNaS/JZZjmMgnBKThnofY9YrsCSECVlt9+qWA oH1sCmBSMkCzR5NsKOTif4NQfbrSLN6kfICQ89F7iyykt
BP hnwbukOV+68rwTXG5vb6P5n31OF3N/e71DT076mFaLayVxRUlmjObig2 AZv1d0qpfubw4qmk3WA+kJtKKU3peLOvEkCsg3GPnPus
;; Received 2485 bytes from 129.143.253.133#53(dns3.belwue.de) in 152 ms
```