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Negative cases:

1. **The Client submit a job, when the number of nodes in the dtc table is less than the required nodes assigned in the SuperNode.**

   The client will receive the"dht not Ready,please contact later" when trying to get assigned node information from Supernode.

   ```
   zhou1298@csel-kh4250-08:/home/zhou1298/Downloads/5105PA2/gen-java $ java -cp ".:
   /usr/local/Thrift/*" Client localhost 4001
   SLF4J: The requested version 1.5.8 by your slf4j binding is not compatible with
   [1.6, 1.7]
   SLF4J: See http://www.slf4j.org/codes.html#version_mismatch for further details.
   ================================================
     DHT Not ready, Please Connect Later
   ```

2. **The Client submit a job to get the genre of a book which is not stored in the distributed hash table.**

   Reply with not such title

   ```
   3:Get a single pair! Type in the title:
   birds
   Type in 'yes' if you want node tracking.Anything else means no:
   yes
   There is no such title in the DHT
   ```

3. **The Client submit a job to set things in a file not exits.**

   FileNot found exception.

   ```
   2:Set by a file! Type in the file name:
   shake.txt
   Type in 'yes' if you want node tracking.Anything else means no:
   yes
   File not exist. Check your parameter
   ```

4. **The SuperNode receives the request from node to join the system while another node is in the joining process.**

   This node can not join the distributed hashtable table with information"Super Node is busy right now, Please try later"

   ```
   [^Czhou1298@csel-kh4250-08:/home/zhou1298/Downloads/5105PA2/gen-java $ java -
   S ".:/usr/local/Thrift/*" Node 3001 localhost 4001
   I================================================
   NThis node: 0896e22c0eb7e25753b0844f3271fe34
   ================================================
   2SLF4J: The requested version 1.5.8 by your slf4j binding is not compatible w
   3ith [1.6, 1.7]
   4SLF4J: See http://www.slf4j.org/codes.html#version_mismatch for further deta
   5ils.
   ^SuperNode is busy right now. Please try later
   ```

5. **The number of node in the superNode already reach to max and a new node want to join.**

   The super node will reject this join and the node will abort the system.

```
zhou1298@csel-kh4250-08:/home/zhou1298/Downloads/5105PA2/gen-java $ java -cp ".:
/usr/local/Thrift/*" Node 8005 localhost 4001
=====================================================
This node: bcd376736ae646d6906c1b83f90f6bc5
=====================================================
SLF4J: The requested version 1.5.8 by your slf4j binding is not compatible with
[1.6, 1.7]
SLF4J: See http://www.slf4j.org/codes.html#version_mismatch for further details.
System already reaches the max node
Node Server is running on port: 8005
zhou1298@csel-kh4250-08:/home/zhou1298/Downloads/5105PA2/gen-java $ ls
```

6. **The SuperNode receives the request from node to join the system with an ip and port same with one Node already in the joined the system.**

   The superNode will reject this request.

```
^Czhou1298@csel-kh4250-08:/home/zhou1298/Downloads/5105PA2/gen-java $ java -cp "
/usr/local/Thrift/*" SuperNode 4001 5
SLF4J: The requested version 1.5.8 by your slf4j binding is not compatible with
[1.6, 1.7]
SLF4J: See http://www.slf4j.org/codes.html#version_mismatch for further details.
SuperNode is running on port: 4001
New Node 128.101.37.8:4005 has joined the system
1: 128.101.37.8:4005 id:dc92b89e792555b25316e2f1e42e52e6
Duplicate node join request. Do nothing
```

```
SLF4J: See http://www.slf4j.org/codes.html#version_mismatch for further details.
Duplicate port!! check your parameters!
```

Positive Cases:

1. **All the Node successfully connected to the distributed hash table.**

```
SLF4J: See http://www.slf4j.org/codes.html#version_mismatch for further details.
SuperNode is running on port: 4001
New Node 128.101.37.8:4005 has joined the system
1: 128.101.37.8:4005 id:dc92b89e792555b25316e2f1e42e52e6
Duplicate node join request. Do nothing
New Node 128.101.37.8:4008 has joined the system
1: 128.101.37.8:4005 id:dc92b89e792555b25316e2f1e42e52e6
2: 128.101.37.8:4008 id:9c6fa554b809c707c90930b3cd11688d
New Node 128.101.37.8:5005 has joined the system
1: 128.101.37.8:4005 id:dc92b89e792555b25316e2f1e42e52e6
2: 128.101.37.8:4008 id:9c6fa554b809c707c90930b3cd11688d
3: 128.101.37.8:5005 id:57b2193cec574aeafbc69190504fa813
New Node 128.101.37.8:6005 has joined the system
1: 128.101.37.8:4005 id:dc92b89e792555b25316e2f1e42e52e6
2: 128.101.37.8:4008 id:9c6fa554b809c707c90930b3cd11688d
3: 128.101.37.8:5005 id:57b2193cec574aeafbc69190504fa813
4: 128.101.37.8:6005 id:89da80e4b95bce7c07d3b3325bdeba8f
New Node 128.101.37.8:7005 has joined the system
1: 128.101.37.8:4005 id:dc92b89e792555b25316e2f1e42e52e6
2: 128.101.37.8:4008 id:9c6fa554b809c707c90930b3cd11688d
3: 128.101.37.8:5005 id:57b2193cec574aeafbc69190504fa813
4: 128.101.37.8:6005 id:89da80e4b95bce7c07d3b3325bdeba8f
5: 128.101.37.8:7005 id:8e79b562a2b695bf9a6385075e94445d
```

2. **The client request to set things through a file name and choose to track node and done successfully.**

   Each node will print the pair it stored and client will print the tack node and Successful.

```
SLF4J: The requested version 1.5.8 by your slf4j binding is not compatible with
[1.6, 1.7]
SLF4J: See http://www.slf4j.org/codes.html#version_mismatch for further details.
Get random node: dc92b89e792555b25316e2f1e42e52e6
Initiate finger table done
Update other nodes done
Node Server is running on port: 6005
Add new pair: <7d00ebbca467346696a55bb2e76980c8,Comedies>
Add new pair: <7914f2974d484d84276bde553ba39cf9,Histories>
Add new pair: <5f10e1767f9bd93d8cf6917d84d1ffb5,Tragedies>
Add new pair: <7f6f15a92a7c09fe3853042ca52d6019,Poems>
Add new pair: <7d00ebbca467346696a55bb2e76980c8,Comedies>
```

```
2:Set by a file! Type in the file name:
shakespeares.txt
Type in 'yes' if you want node tracking.Anything else means no:
yes
Pair <All's Well That Ends Well,Comedies>
Node Track Info:
 1: dc92b89e792555b25316e2f1e42e52e6
 2: 57b2193cec574aeafbc69190504fa813
Pair <As You Like It,Comedies>
Node Track Info:
 1: dc92b89e792555b25316e2f1e42e52e6
 2: 89da80e4b95bce7c07d3b3325bdeba8f
 3: 9c6fa554b809c707c90930b3cd11688d
 4: dc92b89e792555b25316e2f1e42e52e6
Pair <The Comedy of Errors,Comedies>
Node Track Info:
 1: dc92b89e792555b25316e2f1e42e52e6
 2: 57b2193cec574aeafbc69190504fa813
 3: 89da80e4b95bce7c07d3b3325bdeba8f
Pair <Love's Labor's Lost,Comedies>
Node Track Info:
 1: dc92b89e792555b25316e2f1e42e52e6
 2: 57b2193cec574aeafbc69190504fa813
Pair <Measure for Measure,Comedies>
Node Track Info:
 1: dc92b89e792555b25316e2f1e42e52e6
 2: 57b2193cec574aeafbc69190504fa813
Pair <The Merchant of Venice,Comedies>
Node Track Info:
 1: dc92b89e792555b25316e2f1e42e52e6
 2: 89da80e4b95bce7c07d3b3325bdeba8f
 3: 9c6fa554b809c707c90930b3cd11688d
 4: dc92b89e792555b25316e2f1e42e52e6
```

3. **The client request to set things through book title and genre and done successfully.**
   Node who stores the information will print the pair and client will print the tracked node successfully.

```
1:Set a single pair! Type in the title:
fly in the wind
Type in the genre:
Comedies
Type in 'yes' if you want node tracking.Anything else means no:
yes
Pair set success!
Node Track Info:
 1: ab4e37b7842af42bdd7414df90a44e33
 2: dc92b89e792555b25316e2f1e42e52e6
========================================================
```

4. **The client successfully get the genre of the book with the given book title and track the node it has gone through**

```
3:Get a single pair! Type in the title:
fly in the wind
Type in 'yes' if you want node tracking.Anything else means no:
yes
The genre is: Comedies
Node Track Info:
 1: 0896e22c0eb7e25753b0844f3271fe34
 2: 89da80e4b95bce7c07d3b3325bdeba8f
 3: ab4e37b7842af42bdd7414df90a44e33
 4: dc92b89e792555b25316e2f1e42e52e6
========================================================
```

5. **The client successfully change the genre of the book already stored in the table.**

Relative node will update its information

```
1:Set a single pair! Type in the title:
fly in the wind
Type in the genre:
Romances
```

```
Add new pair: <ccb30a877b1bf22232bf6570fb0fd32a,Comedies>
Add new pair: <ccb30a877b1bf22232bf6570fb0fd32a,Romances>
```