

Test design and report

Join and build DHT test:

Using 5 nodes with max node number equals to 1024, the finger tables are:

```
=====
Node ID: 363
Range of keys: (965, 363]
Data size: 0
Finger Table:
index:0, nodeID: 598, address:128.101.37.49:6033
index:1, nodeID: 598, address:128.101.37.49:6033
index:2, nodeID: 598, address:128.101.37.49:6033
index:3, nodeID: 598, address:128.101.37.49:6033
index:4, nodeID: 598, address:128.101.37.49:6033
index:5, nodeID: 598, address:128.101.37.49:6033
index:6, nodeID: 598, address:128.101.37.49:6033
index:7, nodeID: 598, address:128.101.37.49:6033
index:8, nodeID: 965, address:128.101.37.49:6032
index:9, nodeID: 965, address:128.101.37.49:6032
=====
Node ID: 965
Range of keys: (598, 965]
Data size: 0
Finger Table:
index:0, nodeID: 125, address:128.101.37.48:6034
index:1, nodeID: 125, address:128.101.37.48:6034
index:2, nodeID: 125, address:128.101.37.48:6034
index:3, nodeID: 125, address:128.101.37.48:6034
index:4, nodeID: 125, address:128.101.37.48:6034
index:5, nodeID: 125, address:128.101.37.48:6034
index:6, nodeID: 125, address:128.101.37.48:6034
index:7, nodeID: 125, address:128.101.37.48:6034
index:8, nodeID: 359, address:128.101.37.48:6035
index:9, nodeID: 598, address:128.101.37.49:6033
=====
Node ID: 598
Range of keys: (363, 598]
Data size: 0
Finger Table:
index:0, nodeID: 965, address:128.101.37.49:6032
index:1, nodeID: 965, address:128.101.37.49:6032
index:2, nodeID: 965, address:128.101.37.49:6032
index:3, nodeID: 965, address:128.101.37.49:6032
index:4, nodeID: 965, address:128.101.37.49:6032
index:5, nodeID: 965, address:128.101.37.49:6032
index:6, nodeID: 965, address:128.101.37.49:6032
index:7, nodeID: 965, address:128.101.37.49:6032
index:8, nodeID: 965, address:128.101.37.49:6032
index:9, nodeID: 125, address:128.101.37.48:6034
=====
Node ID: 125
Range of keys: (965, 125]
Data size: 0
Finger Table:
index:0, nodeID: 359, address:128.101.37.48:6035
index:1, nodeID: 359, address:128.101.37.48:6035
index:2, nodeID: 359, address:128.101.37.48:6035
index:3, nodeID: 359, address:128.101.37.48:6035
index:4, nodeID: 359, address:128.101.37.48:6035
index:5, nodeID: 359, address:128.101.37.48:6035
index:6, nodeID: 359, address:128.101.37.48:6035
index:7, nodeID: 359, address:128.101.37.48:6035
index:8, nodeID: 598, address:128.101.37.49:6033
index:9, nodeID: 965, address:128.101.37.49:6032
=====
Node ID: 359
Range of keys: (125, 359]
Data size: 0
```

Finger Table:

```
index:0, nodeID: 363, address:128.101.37.49:6031
index:1, nodeID: 363, address:128.101.37.49:6031
index:2, nodeID: 363, address:128.101.37.49:6031
index:3, nodeID: 598, address:128.101.37.49:6033
index:4, nodeID: 598, address:128.101.37.49:6033
index:5, nodeID: 598, address:128.101.37.49:6033
index:6, nodeID: 598, address:128.101.37.49:6033
index:7, nodeID: 598, address:128.101.37.49:6033
index:8, nodeID: 965, address:128.101.37.49:6032
index:9, nodeID: 965, address:128.101.37.49:6032
=====
```

SuperNode shows:

SuperNode running on: 128.101.37.49:6060

```
joining..
post join..
joining..
post join..
joining..
post join..
joining..
post join..
joining..
post join..
```

which means all join and postjoin is correctly sent.

Get test:

get:harry potter

```
=====
Genre of 'harry potter' is error: cannot find harry potter
=====
```

get:jane:-withlogs

```
=====
Genre of 'jane' is error: cannot find jane
=====
```

With “-withlogs” option, it will track all the node process get command and print logs on those nodes, e.g:

```
Forward getgenre to node 849
Getgenre done on node 849
```

Set test:

```
set:t1:g1:-withlogs
setting: t1 : g1
set: t1 : g1
get t1
```

```
=====
Genre of 't1' is g1
=====
```

With “-withlogs” option, it will track all the node process set command and print logs on those nodes, e.g:

```
Forward setgenre to node 363
Set genre done on node 363
```

Set from file test:

```
set:./data/shakespeares.txt:-withlogs
setting: All's Well That Ends Well : Comedies
set: All's Well That Ends Well : Comedies
setting: As You Like It : Comedies
set: As You Like It : Comedies
setting: The Comedy of Errors : Comedies
set: The Comedy of Errors : Comedies
setting: Love's Labor's Lost : Comedies
set: Love's Labor's Lost : Comedies
setting: Measure for Measure : Comedies
set: Measure for Measure : Comedies
setting: The Merchant of Venice : Comedies
set: The Merchant of Venice : Comedies
setting: The Merry Wives of Windsor : Comedies
```

set: The Merry Wives of Windsor : Comedies
setting: A Midsummer Night's Dream : Comedies
set: A Midsummer Night's Dream : Comedies
setting: Much Ado About Nothing : Comedies
set: Much Ado About Nothing : Comedies
setting: The Taming of the Shrew : Comedies
set: The Taming of the Shrew : Comedies
setting: Twelfth Night : Comedies
set: Twelfth Night : Comedies
setting: The Two Gentlemen of Verona : Comedies
set: The Two Gentlemen of Verona : Comedies
setting: The Two Noble Kinsmen : Comedies
set: The Two Noble Kinsmen : Comedies
setting: Henry IV, Part 1 : Histories
set: Henry IV, Part 1 : Histories
setting: Henry IV, Part 2 : Histories
set: Henry IV, Part 2 : Histories
setting: Henry V : Histories
set: Henry V : Histories
setting: Henry VI, Part 1 : Histories
set: Henry VI, Part 1 : Histories
setting: Henry VI, Part 2 : Histories
set: Henry VI, Part 2 : Histories
setting: Henry VI, Part 3 : Histories
set: Henry VI, Part 3 : Histories
setting: Henry VIII : Histories
set: Henry VIII : Histories
setting: King John : Histories
set: King John : Histories
setting: Richard II : Histories
set: Richard II : Histories
setting: Richard III : Histories
set: Richard III : Histories
setting: Antony and Cleopatra : Tragedies
set: Antony and Cleopatra : Tragedies
setting: Coriolanus : Tragedies
set: Coriolanus : Tragedies
setting: Hamlet : Tragedies
set: Hamlet : Tragedies
setting: Julius Caesar : Tragedies
set: Julius Caesar : Tragedies
setting: King Lear : Tragedies
set: King Lear : Tragedies
setting: Macbeth : Tragedies
set: Macbeth : Tragedies
setting: Othello : Tragedies
set: Othello : Tragedies
setting: Romeo and Juliet : Tragedies
set: Romeo and Juliet : Tragedies
setting: Timon of Athens : Tragedies
set: Timon of Athens : Tragedies
setting: Titus Andronicus : Tragedies
set: Titus Andronicus : Tragedies
setting: Troilus and Cressida : Tragedies
set: Troilus and Cressida : Tragedies
setting: Cymbeline : Romances
set: Cymbeline : Romances
setting: Pericles : Romances
set: Pericles : Romances
setting: The Tempest : Romances
set: The Tempest : Romances
setting: The Winter's Tale : Romances
set: The Winter's Tale : Romances
setting: Lucrece : Poems
set: Lucrece : Poems
setting: The Phoenix and Turtle : Poems
set: The Phoenix and Turtle : Poems
setting: Sonnets : Poems
set: Sonnets : Poems
setting: Venus and Adonis : Poems
set: Venus and Adonis : Poems
Then we can check the result by:
get:Venus and Adonis:-withlogs
=====

Genre of 'Venus and Adonis' is Poems

=====

With “-withlogs” option, it will track all the node process set command and print logs on those nodes, e.g:

Set genre done on node 359

Data transfer test:

set:./data/shakespeares.txt:-withlogs when there are 3 nodes running.

Then run a new node and the final result is:

Node ID: 363

Range of keys: (965, 363]

Data size: 0

Node ID: 598

Range of keys: (363, 598]

Data size: 4

Node ID: 965

Range of keys: (598, 965]

Data size: 18

Node ID: 125

Range of keys: (965, 125]

Data size: 20

New node 125 is correctly given 20 data moved from node 363 and the sum number of data is 42 witch is equal to the data in the file.

ID collision test:

If there are node ID collison, super node console shows:

node id collided, retry..

and is correctly handled.

If there are no ID slot left, this happens when max node number is small, the console of super node shows:

No ID slot left for new node!

Multi-client test:

Running two client at the same time, it turns out they both work normally.

Standalone and distributed test:

It shows that Node, SuperNode, Client can run on both the same computer and different ones.

NACK test:

When a node is joining, and another node wants to join before the previous one is finished, there is a message printed out at the latter node console:

SuperNode is busy in join process of another node! Join failed!

This shows a NACK is correctly returned.