TAPESTRY

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Aim of the project is to implement Tapestry protocol and to check the maximum number of hops taken by source node to reach a random destination.

Implementation Details:

In tapestry project, we are establishing X nodes and R requests as input. From these X nodes, we construct 80% nodes initially to build the routing table, and then later for 20% nodes we add them to the existing 80% node network using dynamic join. Every node is represented by hash value, which we are restricting to 8 digit hexadecimal figure. Number of columns in the table will be 16, which denote number of hexadecimal values, ranging from 0-F.

For routing, we take each node and trigger R requests by choosing random destination each time. We find the maximum hops encounter each time. The max number of hops is initialized to zero initially. The program prints and updates the maximum hop value whenever it encounters a request whose no of hops is greater than the previous existing maximum hop. The last value printed is the max number of hops encountered by the program for X nodes and R requests.

```
Raghus-MacBook-Pro:tapestry raghuchowdary$ mix escript.build
Generated escript tapestry with MIX_ENV=dev
Raghus-MacBook-Pro:tapestry raghuchowdary$ ./tapestry 1000 10
Main process started
Number Of Nodes: 1000
Number Of Request Per Node: 10
Nodes Creation Started
Nodes creation completed
Routing table building for 80% Nodes
Routing table completed for 80% Nodes
Dynamic Join started for 20% Nodes
Dynamic Join Completed for 20% Nodes
Invoke Routing for Nodes
Initial Maxhops: 0
Maxhops updated to : 2
Maxhops updated to : 3
Maxhops updated to : 4
Maxhops updated to : 5 <-- Max-Hops
Raghus-MacBook-Pro:tapestry raghuchowdary$ mix escript.build
```

From the above screen shot the Maxhops encountered the program for **1000 Nodes and 10 requests** for each node is **5**.

Instructions to Run program

1. Unzip the folder GhodkariChowdaryMaroke.zip,
2. From terminal Goto folder tapestry
3. Run the following commands to trigger the program
   mix escript.build
   ./tapestry noofNodes noofReq
   Eg: ./tapestry 1000 5

What is working:

1. Initially routing table is built for 80% of the nodes
2. For the remaining 20% of the nodes join operation is performed.
3. Routing is performed for each node which invokes requests by selecting random destination. The maximum hop is printed on the console.
4. The last maximum hop value is the final no of max hops calculated by the program.

Largest Network

```
Raghus-MacBook-Pro:tapestry raghuchowdary$ mix escript.build
Generated escript tapestry with MIX_ENV=dev
Raghus-MacBook-Pro:tapestry raghuchowdary$ ./tapestry 10000 10
Main process started
Number Of Nodes: 10000
Number Of Request Per Node: 10
Nodes Creation Started
Nodes creation completed
Routing table building for 80% Nodes
Routing table completed for 80% Nodes
Dynamic Join started for 20% Nodes
Dynamic Join Completed for 20% Nodes
Invoke Routing for Nodes
Initial Maxhops: 0
Maxhops updated to : 3
Maxhops updated to : 4
Maxhops updated to : 5
Raghus-MacBook-Pro:tapestry raghuchowdary$
```

Largest Network dealt with the program is **10,000 Nodes 10 requests**, Its taking around **15 min** to run. For larger networks, the program will take a lot of time.