COP5615 – Fall 2014

Project 3 – Report

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Observation:

We obtained the average hops for the pastry algorithm under two scenarios:

1. Number of nodes is constant and the number of requests is different

Number of Nodes	Number of Requests	Average Hops
1000	5	2.50
1000	10	2.88
1000	25	3.83
1000	50	4.19
1000	75	4.28
1000	100	4.34

2. Number of nodes is different and the number of requests is constant

Number of Nodes	Number of Requests	Average Hops
1000	10	2.9
5000	10	3.25
10000	10	3.36
20000	10	3.5
30000	10	3.57
40000	10	3.63
50000	10	3.68
60000	10	3.7

It can be observed that the Average number of hops increases with the number of messages sent (Number of nodes * Number of Requests) in both the cases, but it is within the $\log_{2^b}N$ steps as prescribed by the pastry algorithm.

For Example, in this project we are having b=2.

For N=1000 (and Number of Requests =100), $\log_{2^b}N = 4.9828921423$ and Average number of hops = 4.34

Therefore, we can say that it doesn't matter if we keep number of nodes or number of requests as constant, the average hop count will increase based on the number of messages sent (Number of nodes * Number of Requests). But, the average hops will be less than $\log_{2^b}N$ as per pastry algorithm.