Performance Result

Firstly we should start all the 10 peers, and set their loop into 200. We choose “i.txt” to do the Evaluation.

Test query evaluation: (Linear topology)

1. One Peer Evaluation

Test	1	2	3	4	Avg. Time	Total Avg.
Peer 1(ms)	2.734	2.856	2.693	2.710	2.74825	2.74825

2. Two Peers Evaluation

Test	1	2	3	4	Avg. Time	Total Avg.
Peer 1(ms)	4.232	3.716	4.109	3.891	3.987	3.65875
Peer 2(ms)	3.559	3.090	3.398	3.275	3.3305	

3. Three Peers Evaluation

Test	1	2	3	4	Avg. Time	Total Avg.
Peer 1(ms)	5.383	5.443	5.359	5.536	5.43025	4.826
Peer 2(ms)	4.405	4.396	4.300	4.566	4.41675	
Peer 3(ms)	4.663	4.563	4.467	4.831	4.631	

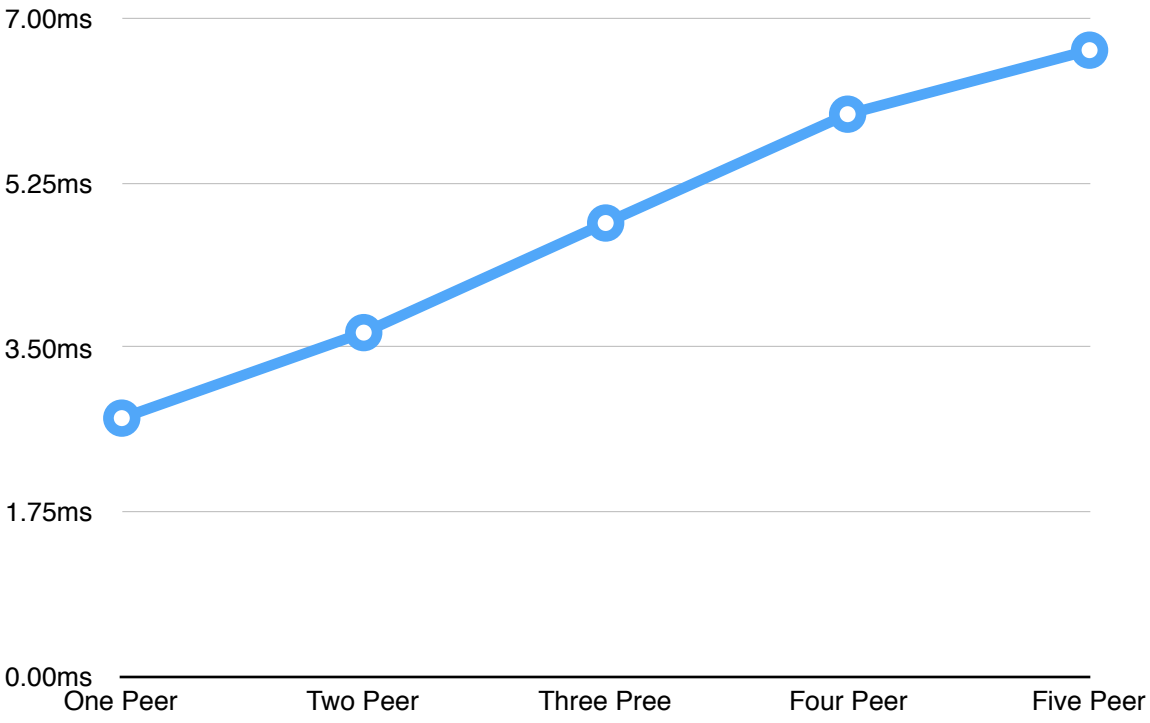
4. Four Peers Evaluation

Test	1	2	3	4	Avg. Time	Total Avg.
Peer 1(ms)	7.280	6.049	6.170	6.502	6.50025	5.9849375
Peer 2(ms)	6.041	5.254	5.046	5.399	5.435	
Peer 3(ms)	6.435	5.408	5.469	5.712	5.756	
Peer 4(ms)	6.831	6.020	5.982	6.161	6.2485	

5. Five Peers Evaluation

Test	1	2	3	4	Avg. Time	Total Avg.
Peer 1(ms)	6.611	7.168	6.527	7.280	6.8965	6.6666
Peer 2(ms)	6.405	6.286	6.538	6.192	6.35525	
Peer 3(ms)	6.154	6.749	6.285	6.486	6.4185	
Peer 4(ms)	6.664	7.061	6.361	7.017	6.77575	
Peer 5(ms)	6.663	7.347	6.362	7.176	6.887	

6. Performance Plot



So we can see from the chat, the Avg. response time is linearly increase along with the increase number of Peers who call the query function simultaneously.

Test query evaluation: (Star topology)

1. One Peer Evaluation

Test	1	2	3	4	Avg. Time	Total Avg.
Peer 1(ms)	2.238	2.195	2.192	2.283	2.227	2.227

2. Two Peers Evaluation

Test	1	2	3	4	Avg. Time	Total Avg.
Peer 1(ms)	3.390	3.204	3.277	2.668	3.13475	3.44925
Peer 2(ms)	4.090	4.000	3.734	3.231	3.76375	

3. Three Peers Evaluation

Test	1	2	3	4	Avg. Time	Total Avg.
Peer 1(ms)	3.829	4.176	3.738	4.498	4.06025	4.40242
Peer 2(ms)	4.341	4.649	4.154	4.991	4.53375	
Peer 3(ms)	4.395	4.820	4.293	4.945	4.61325	

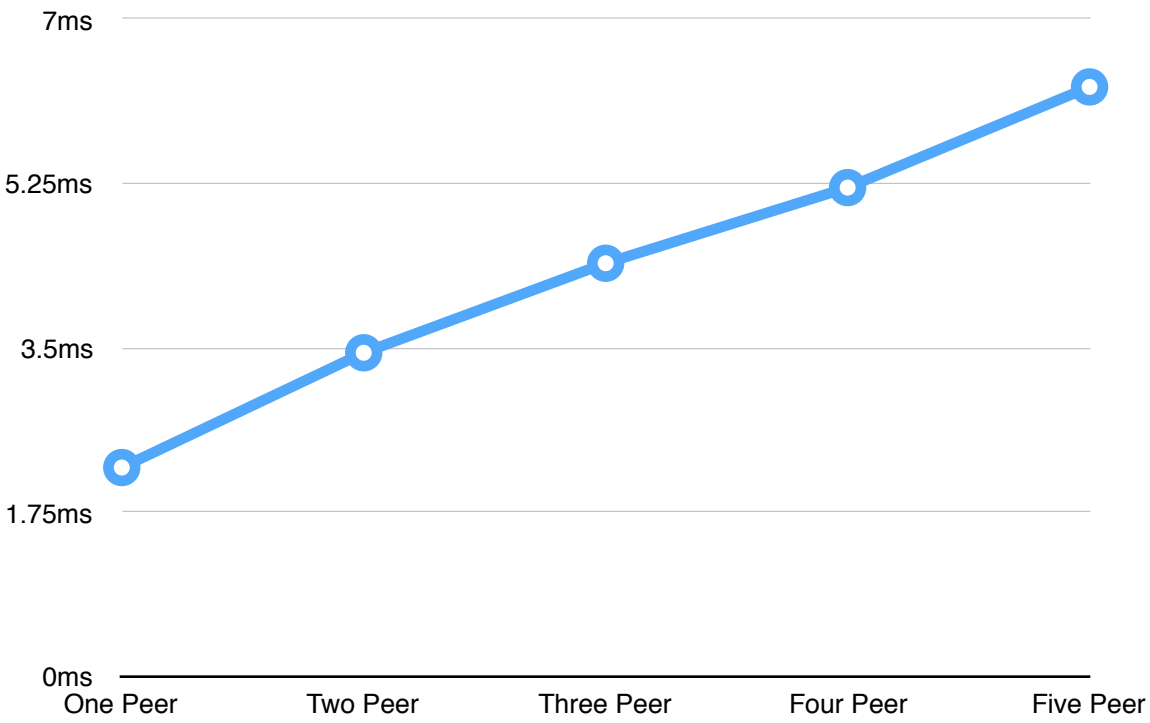
4. Four Peers Evaluation

Test	1	2	3	4	Avg. Time	Total Avg.
Peer 1(ms)	5.623	4.961	4.926	4.776	5.0715	5.2081875
Peer 2(ms)	5.785	5.099	5.081	5.107	5.268	
Peer 3(ms)	5.526	5.247	5.022	5.012	5.20175	
Peer 4(ms)	5.744	5.018	5.368	5.036	5.2915	

5. Five Peers Evaluation

Test	1	2	3	4	Avg. Time	Total Avg.
Peer 1(ms)	6.358	6.290	6.008	5.878	6.1335	
Peer 2(ms)	5.841	6.221	6.505	6.011	6.1445	
Peer 3(ms)	6.563	6.383	6.083	6.081	6.2775	6.28025
Peer 4(ms)	6.477	6.499	6.195	6.440	6.40275	
Peer 5(ms)	6.758	6.509	6.218	6.287	6.443	

6. Performance Plot



So we can see from the chat, the Avg. response time is linearly increase along with the increase number of Peers who call the query function simultaneously. Whereas to compare the result of linear and star topology, we can find star topology is faster than linear topology.

Download evaluation

Loop: 200
Download 20KB file “i.txt”.

Test	1	2	3	4	Avg. Time
Mb/s	38.194	45.664	31.695	49.981	41.3835

To compare with the first assignment

Compare to the first programming assignment 1, this Gnutella network need more time to spread the message and get the hit back. But the same thing is that their average response time is increasing along with the addition of busy peers, because more query/lookup need occupy more resources. Whereas star topology has a better speed performance than linear.

Comparison between Linear and Star topology

Linear topology:

- Advantage:
  1. Long transmission distance, because linear structure connect each other one by one, so it can reach far peers.
  2. Easy to monitor, since each peer only have one upstream peer.
- Disadvantage:
  1. Low transmission speed, because the distance between peers might be too long.
  2. Low Scalability, new peers only can be added into the end point of the topology, otherwise we should disconnect the whole system to add one into the medium position.
  3. Low fault toleration, the failure of one peer could cause the whole system down.
- Applicability:
  1. Applicate to the long distance transmission.
  2. Applicate to stable system, which do not require modification.

Star topology

- Advantage:
  1. High transmission speed, because the distance between peers are short.
  2. High stability, because the peer in the system is individually connect to the central point, so a failure on one peer will not influent the whole system, besides the central peer.
- Disadvantage:
  1. Highly rely on central point, if central peer is failure, the whole system will down.
  2. Speed limited on central point, the whole system transmission speed is rely on the ability of central peer.
  3. Low transmission distance.
- Applicability:
  1. Applicate to data collection and analysis, the central peer can easily collection other peers information.
  2. Applicate to local area network, it is convenient for the users to exchange data within the local area network.