ECE 573 -PROJECT 1

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Application message format -

The general format for a request message between RS-Peer or Peer-Peer is given by -

method <sp> message <sp> version <cr> <lf>
header field name <sp> value <cr> <lf>
header field name <sp> value <cr> <lf>

The general format for a response message between RS-Peer or Peer-Peer is given by -

message <sp> status code <sp> version <cr> <lf>
header field name <sp> value <cr> <lf>
header field name <sp> value <cr> <lf>

Specific format of messages exchanged between RS and peer -

- Register request message -
  GET <sp> Register <sp>P2P-DI/0.1 <cr> <lf>
  RFCServerPort: <sp> port_number<cr> <lf>
  Host: <sp> host_name <cr> <lf>
  OS: <sp> OS type<cr> <lf>

- Register response message -
  REGISTER <sp> OK <cr> <lf>
  Cookie: <sp> cookie_number <cr> <lf>

- Pquery request message -
  PQUERY <sp> PQuery <sp>P2P-DI/0.1 <cr> <lf>
  Cookie: <sp> cookie_number <cr> <lf>
  Host: <sp> host_name <cr> <lf>
  OS: <sp> OS type<cr> <lf>

- Pquery response message -
  REGISTER <sp> OK <cr> <lf>

- Keepalive request message -
  GET <sp> keepAlive <sp>P2P-DI/0.1 <cr> <lf>
  Cookie: <sp> cookie_number <cr> <lf>
  Host: <sp> host_name <cr> <lf>
  OS: <sp> OS type<cr> <lf>

- Keepalive response message -
  KEEPALIVE <sp> OK <cr> <lf>

- Leave request message -
  GET <sp> Leave <sp>P2P-DI/0.1 <cr> <lf>
  Cookie: <sp> cookie_number <cr> <lf>

Host: <sp> host_name <cr> <lf>
OS: <sp> OS type<cr> <lf>

- Leave response message -
  LEAVE <sp> OK <cr> <lf>

Specific format of messages excganged between peers -

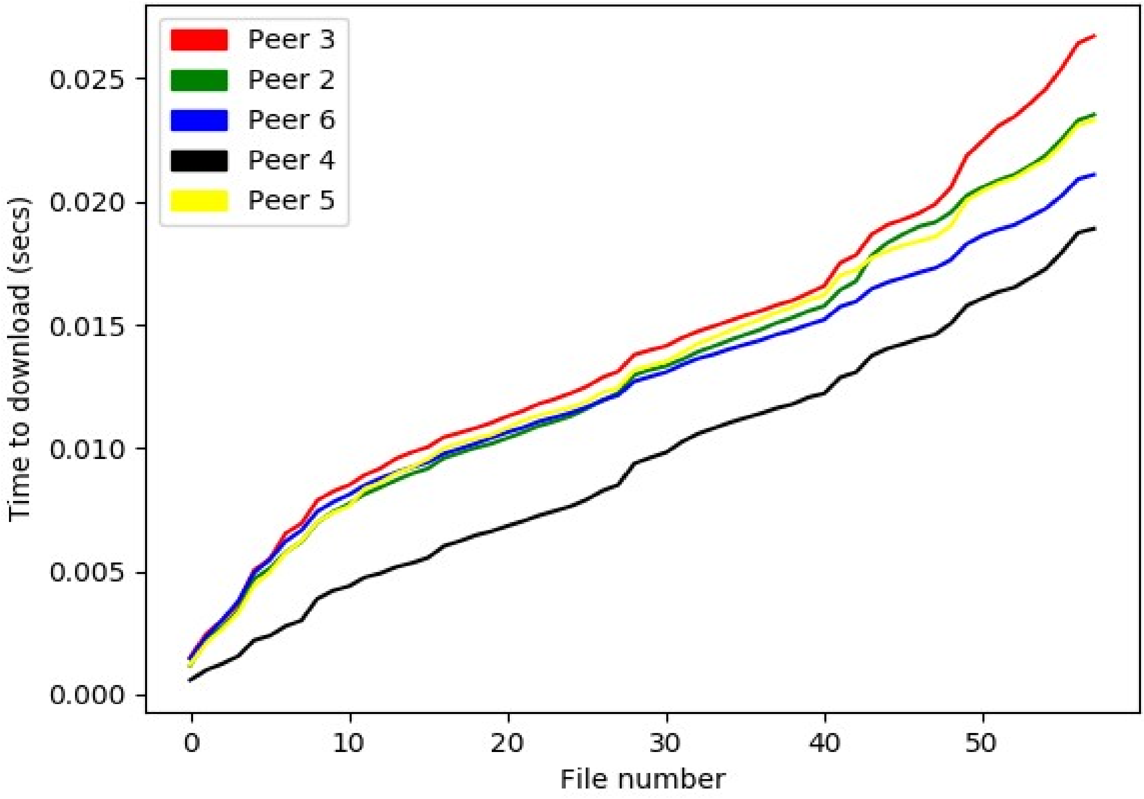
- RFC query request message -
  GET <sp> RFC_Index -<sp>Index number <cr> <lf>
  RFCQUERY <cr> <lf>
  Host: <sp> host_name <cr> <lf>
  OS: <sp> OS type<cr> <lf>

- Get RFC request message -
  GET <sp> RFC<cr> <lf>
  GETRFC <cr> <lf>
  Host: <sp> host_name <cr> <lf>
  OS: <sp> OS type<cr> <lf>

Task 1 – Centralized File Distribution

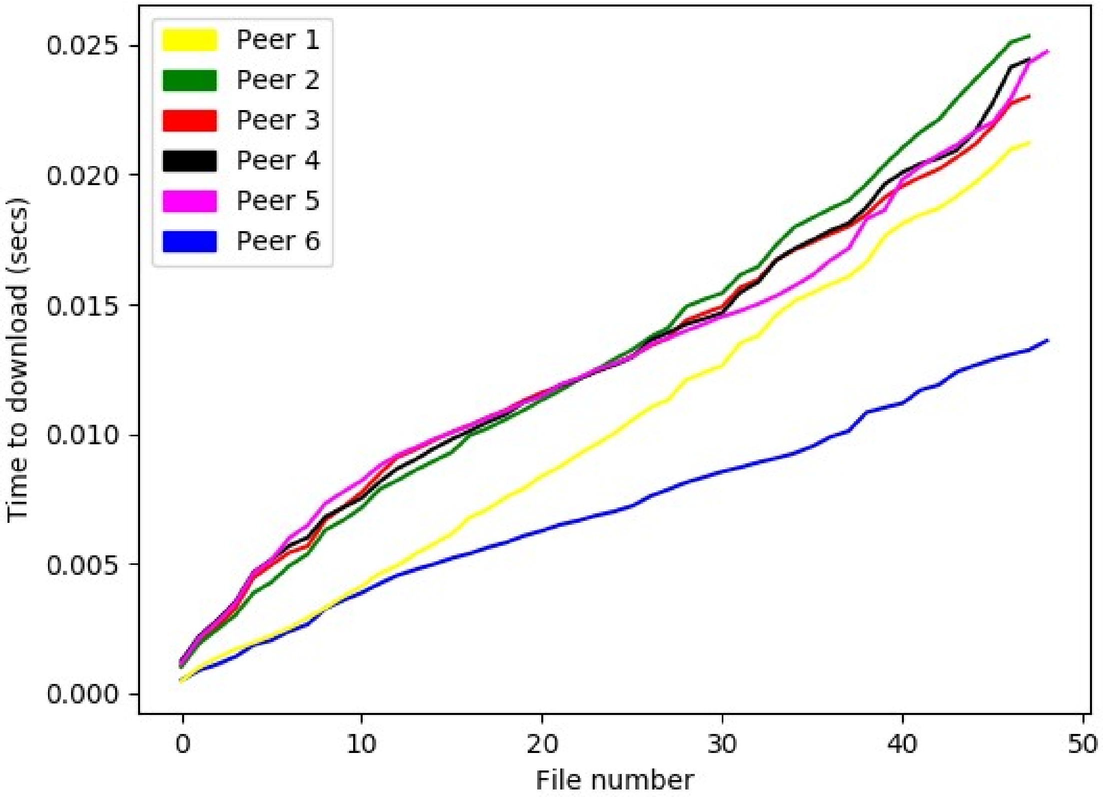
Peer 1 acts as a centralized server, as it contains all 60 RFCs. It also maintains and serves all other peers with a response to all the requests simultaneously.

Here, peers 2 – 6 query peer 1 that has all the 60 RFCs.



Task 2: Peer-to-Peer File Distribution

In this task, each of the 6 peers have differnet 10 RFCs each, they register to RS and get active peer list of the network and starts querying each other to get RFC index for remaining RFCs, peers then download all other 50 RFCs from one another and the cumulative download time is plotted against file number.



Differences observed in the above download time curves:

- The cumulative download time for task 1 varies from 28ms to 19ms for all 5 peers. As it has centralized file distribution setup, it has the worst cumulative download time compare to task 2, as only peer 1 acts a server and should serve all other 5 servers.
- The cumulative download time for task 2 varies from 25ms to 13ms between all 6 peers. Even though there are 6 peers participating in the network to download files, the download time is lesser when comparitived to task 1. This is because all six peers involve in seeding service capacity to the system, even though they add load to system.
- The minimum cumulative download time in task 1is 19ms which is higher when compared to minimum download time in task 2 which is 13ms.

Conclusions on scalability of P2P versus Centralized file distribution:

- Peer-to-Peer file distribution system is self-scalable. No much changes in download time when peers are getting added into the network. This is because, even though they generate load on the network, but they also contribute to the service capacity of the system by distributing files to other peers in the network, subsequently nullfying the its own load.
- There will be less reliance on stand-alone server in P2P file distribution system.
- On the other hand, with respect to centralized file distribution, we can expect increasing in file downloading time when clients starts getting added into the network and starts requesting RFCs . This is because, there will be only one server which will be serving the requests (in this case, Downloading RFCs), so as we go on adding clients in this setup, load on central server goes on increasing, so does cululative download time.
- Therefore, from these two tasks performed in this project, we can conclude that P2P file distribution system is more scalable than centralized file distribution.