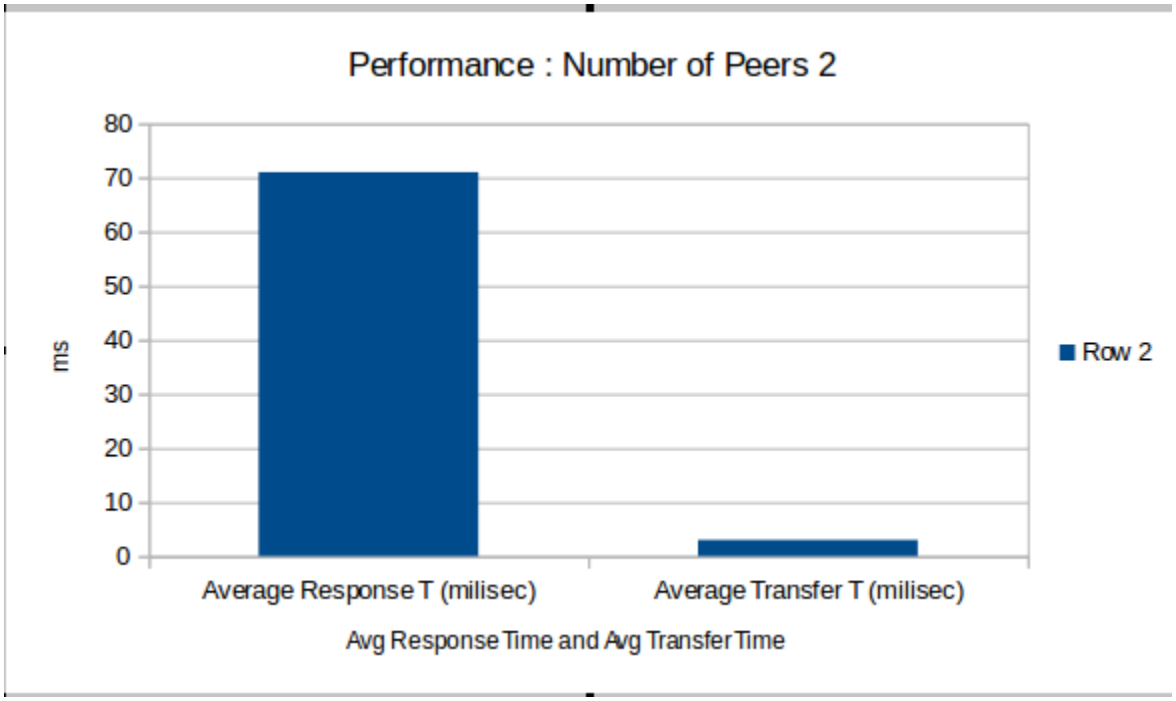
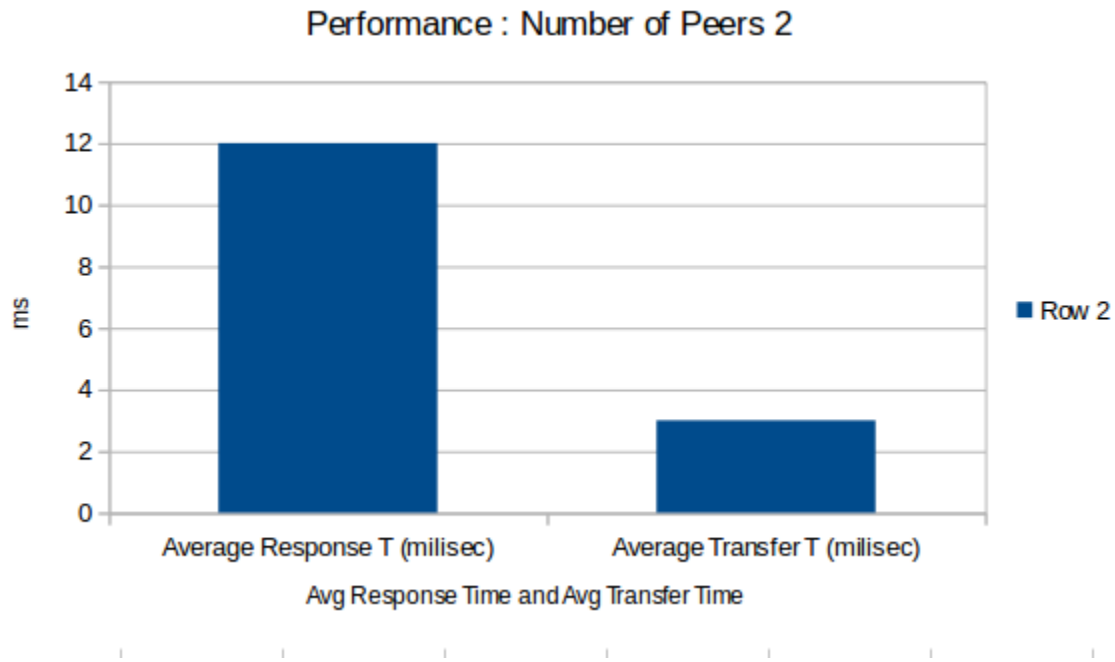
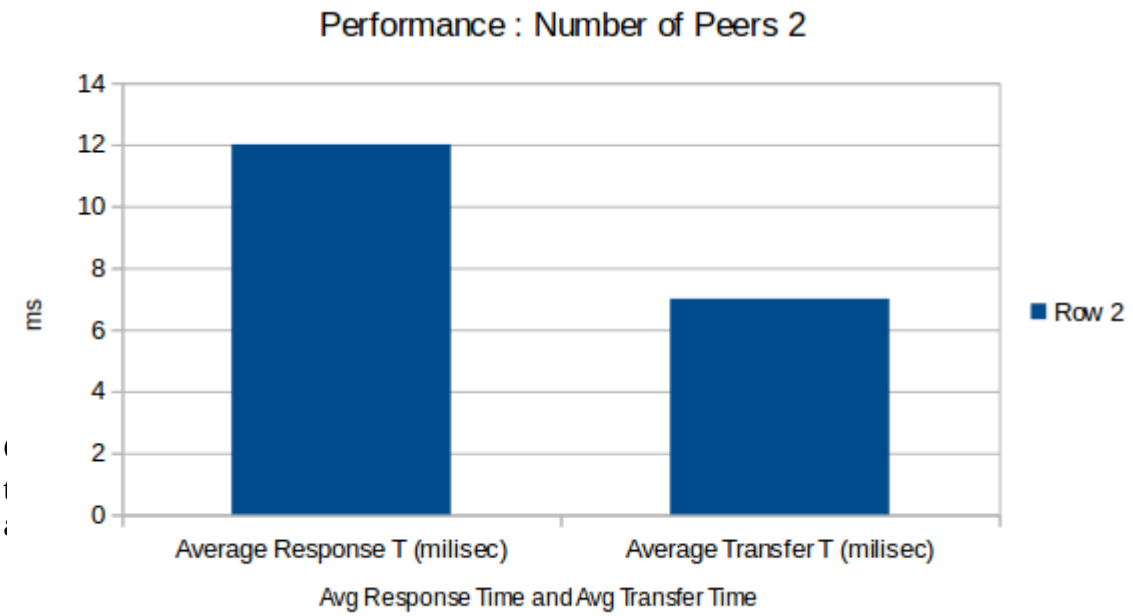
➔ Compute the average response time per client query request by measuring the average response time seen by a client where there's only 1 client issuing queries, then 2 clients, 3 clients, and so on.(BUS TOPOLOGY).



Number of peers :2 File:1KB

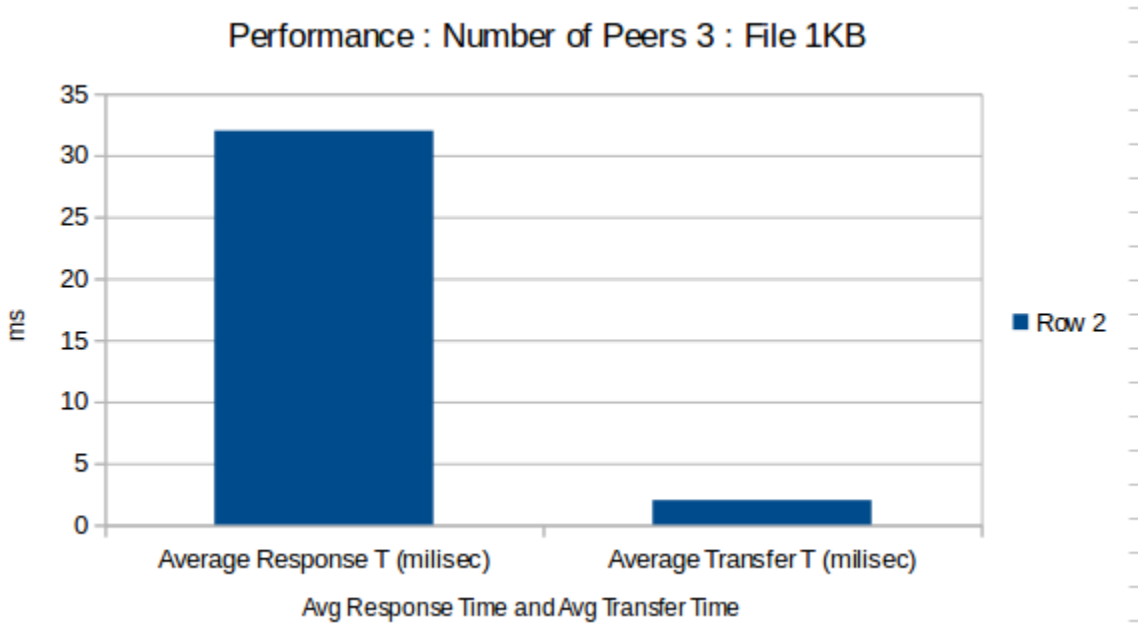


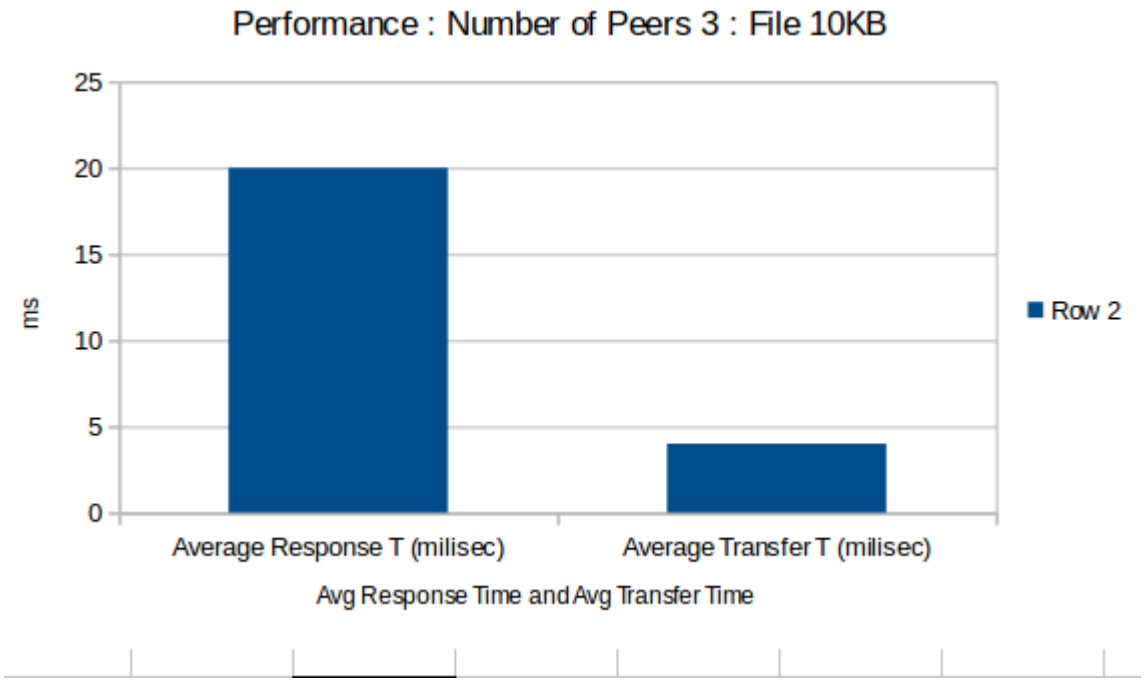
Number of peers : 2 File:10KB

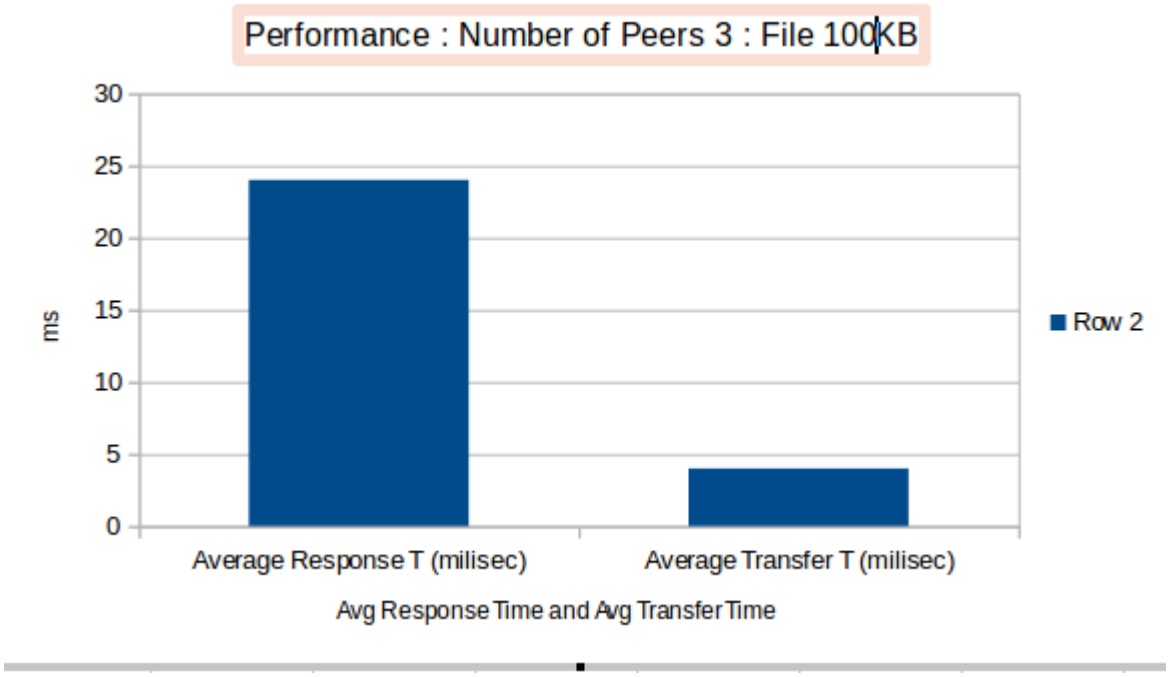


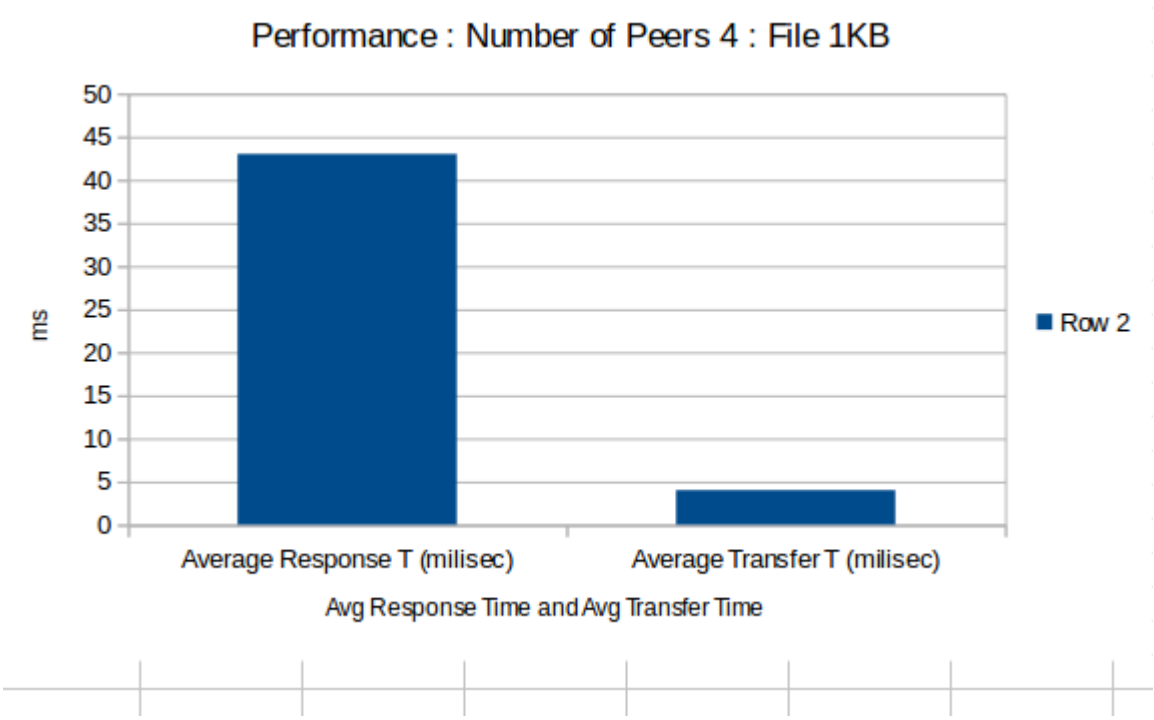
➔ esponse
average

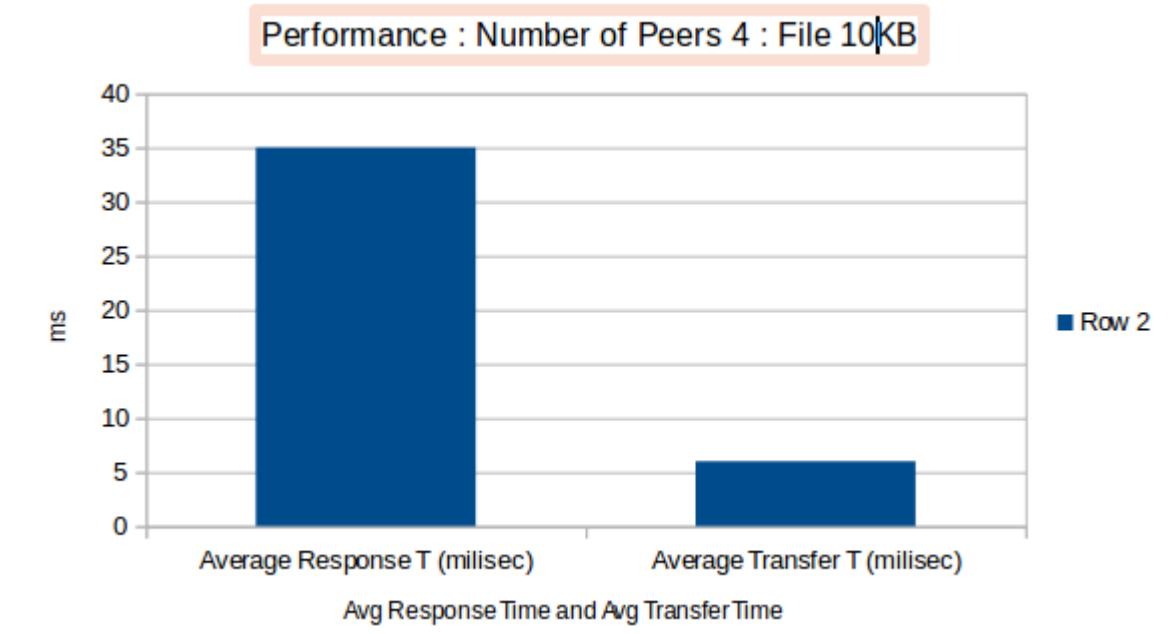
Number of Peers 2 : File :100kb1.

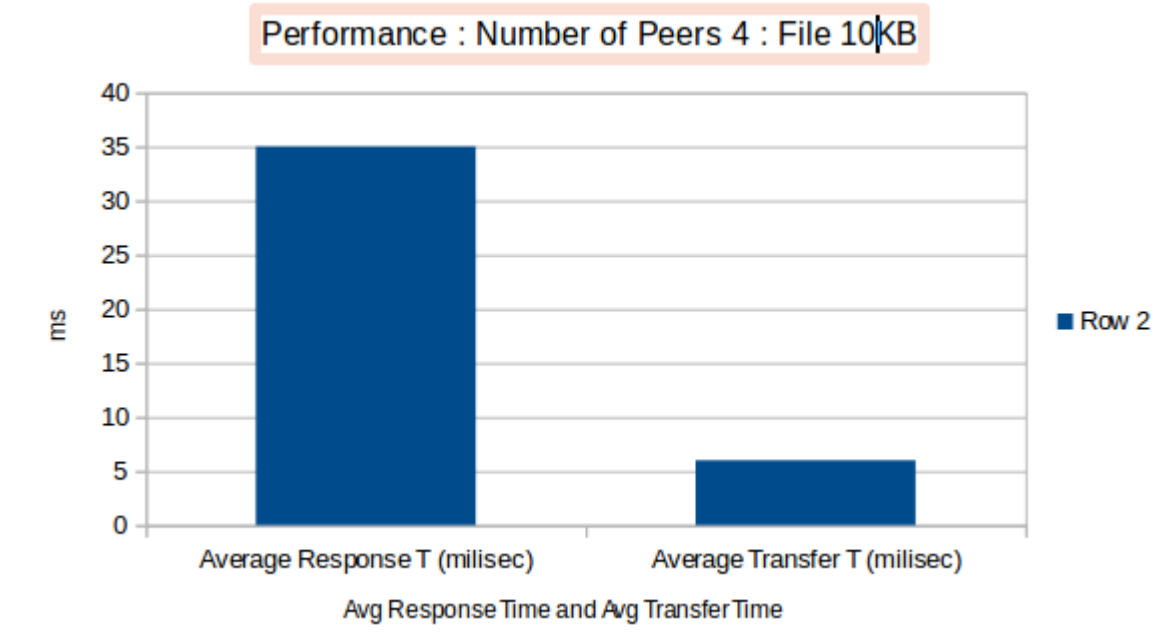


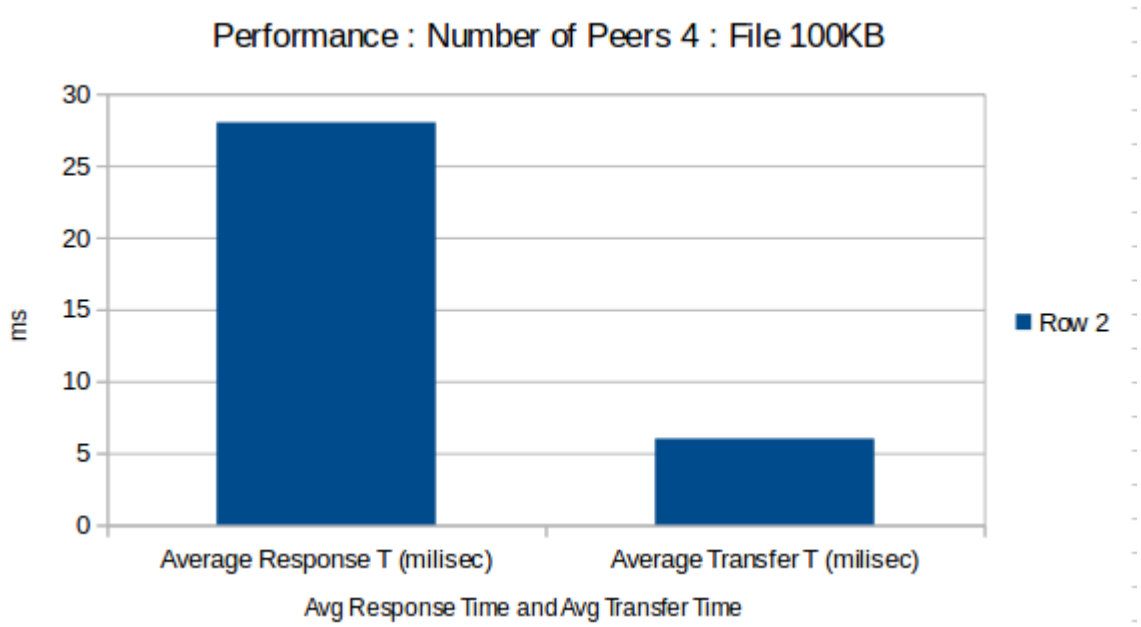

Performance : Number of Peers 3 : File 10KB
25
20
15
10
5
0
ms
Row 2
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time

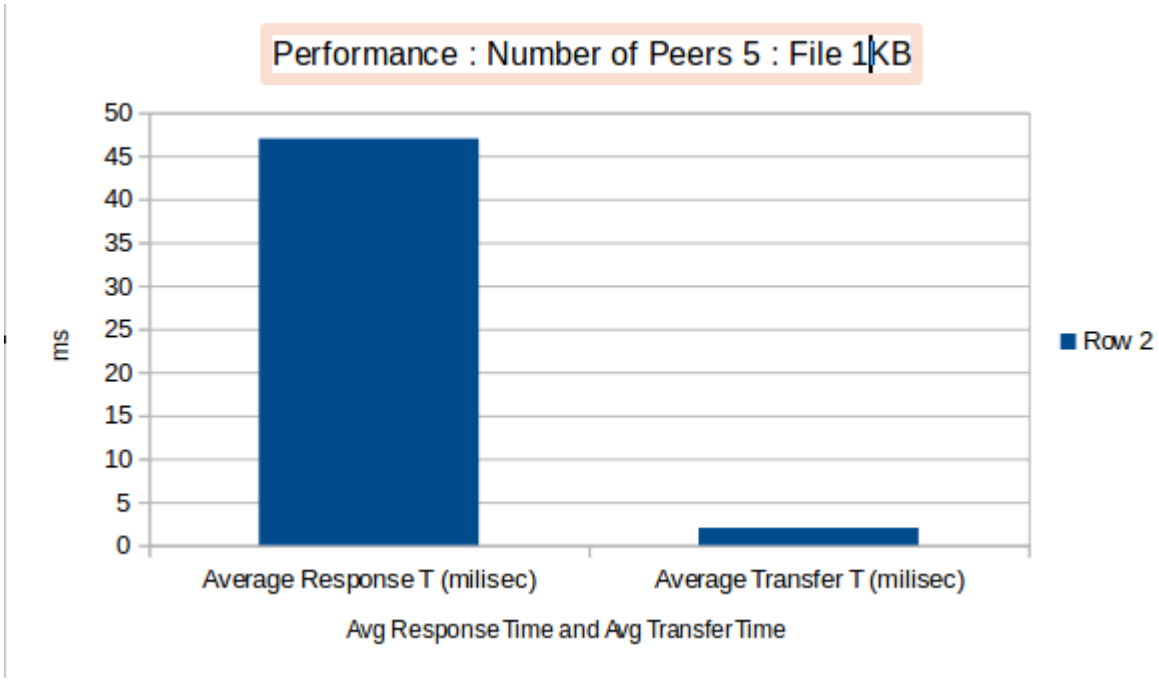

Performance : Number of Peers 3 : File 100KB
30
25
20
15
10
5
0
ms
Row 2
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time

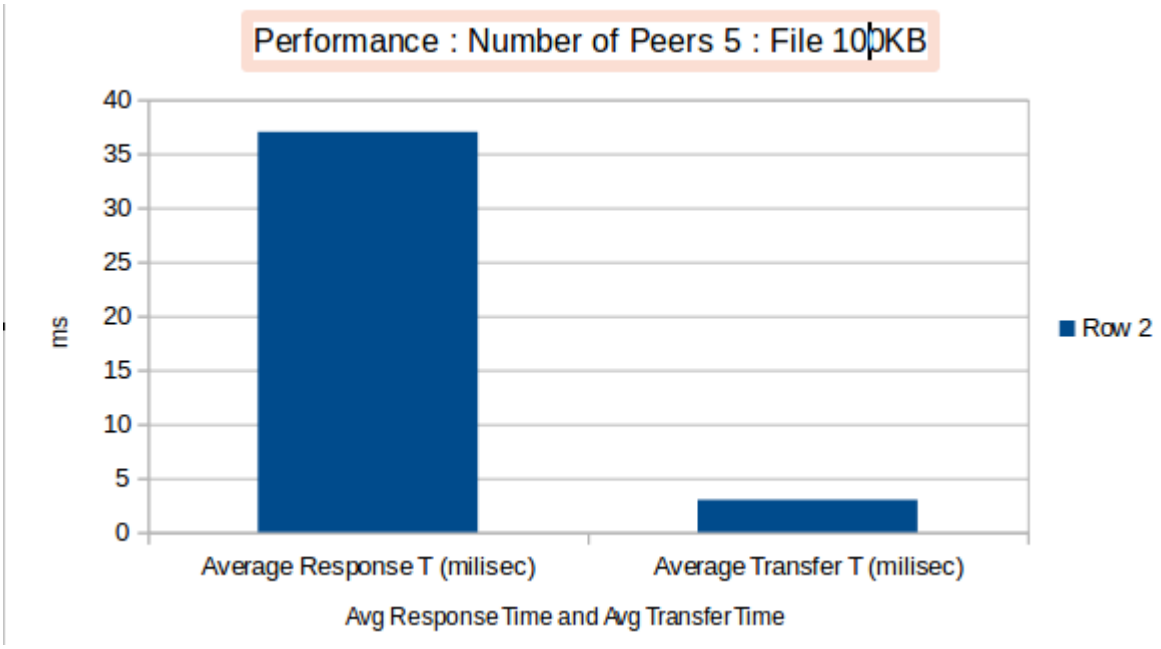

Performance : Number of Peers 4 : File 1KB
50
45
40
35
30
25
20
15
10
5
0
ms
Row 2
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time


Performance : Number of Peers 4 : File 10KB
40
35
30
25
20
15
10
5
0
ms
Row 2
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time


Performance : Number of Peers 4 : File 10KB
40
35
30
25
20
15
10
5
0
ms
Row 2
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time


Performance : Number of Peers 4 : File 100KB
30
25
20
15
10
5
0
ms
Row 2
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time


Performance : Number of Peers 5 : File 1KB
50
45
40
35
30
25
20
15
10
5
0
ms
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time
Row 2


Performance : Number of Peers 5 : File 10KB
40
35
30
25
20
15
10
5
0
ms
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time
Row 2

➔ Compare the result to the first programming assignment 1 and justify your conclusion.(BUS TOPOLOGY)

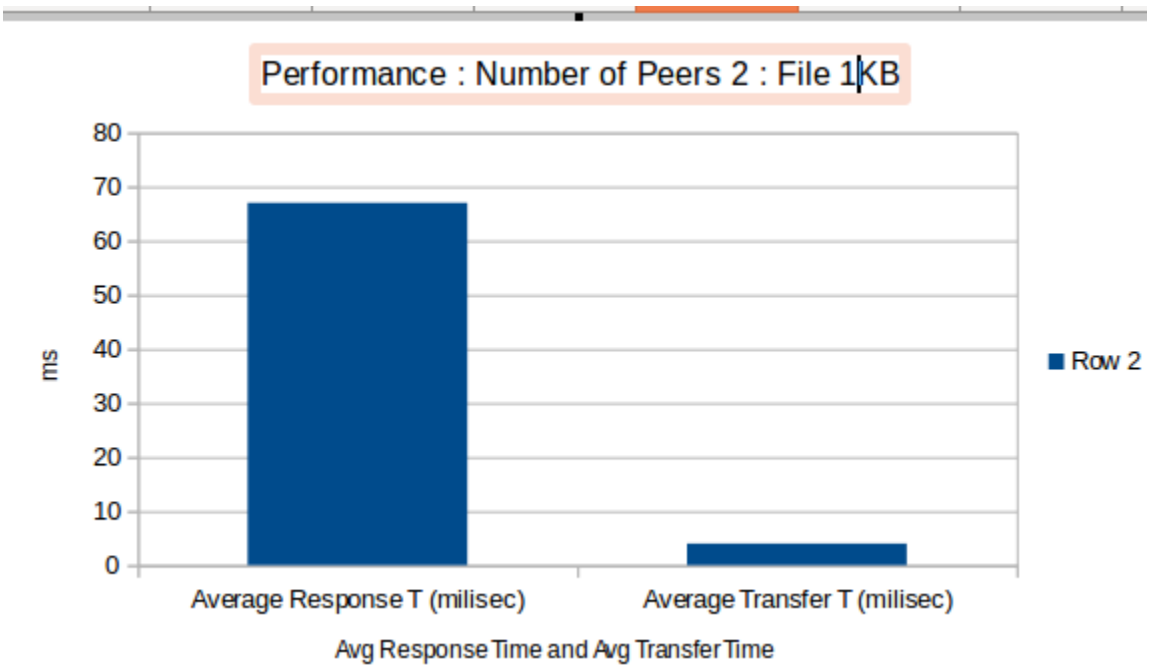
1) **For 1 KB file : Avg** Transfer time =4 ms Assignment 1
Avg Transfer time = 3 ms Assignment 2 Bus Topology for 2 Peers network
Avg Transfer time = 2 ms Assignment 2 Bus Topology for 3 Peers network
Hence we can conclude that in a Bus topology transfer time is lesser compared to Assignment 1 using Central Indexing Server.

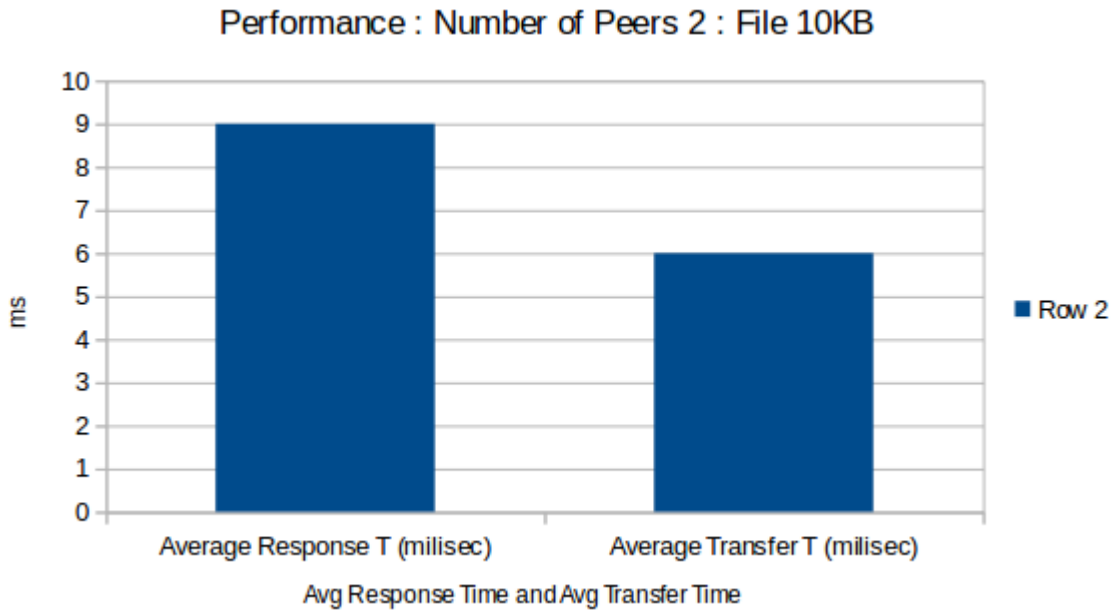
2) **For 10 KB file : Avg** Transfer time =6 ms Assignment 1
Avg Transfer time = 4 ms Assignment 2 Bus Topology for 2 Peers network
Avg Transfer time = 6 ms Assignment 2 Bus Topology for 3 Peers network
Hence we can conclude that in a Bus topology transfer time is lesser compared to Assignment 1 using Central Indexing Server.

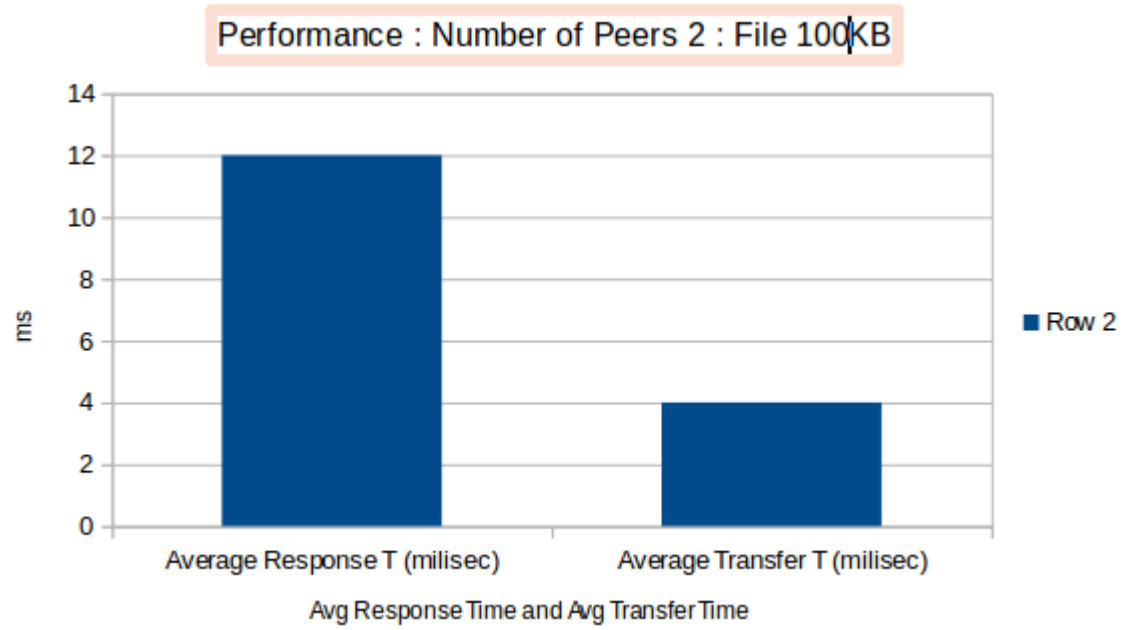
3) **For 100 KB file : Avg** Transfer time =7 ms Assignment 1
Avg Transfer time = 4 ms Assignment 2 Bus Topology for 2 Peers network
Avg Transfer time = 4 ms Assignment 2 Bus Topology for 3 Peers network
Hence we can conclude that in a Bus topology transfer time is lesser compared to Assignment 1 using Central Indexing Server.

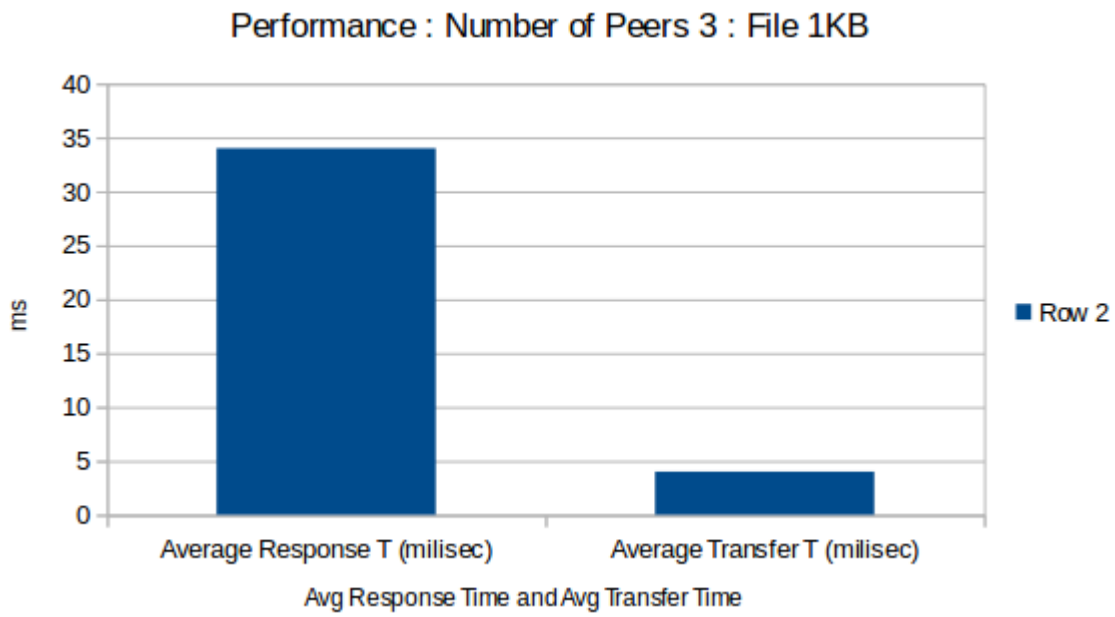
With the above data we can say that in Assignment 1's Central indexing server Transfer time increase with the size of file while in a bus topology transfer time is much faster comparatively and there is no proper relation between the transfer times in a bus topology. It highly depends on the bus traffic.

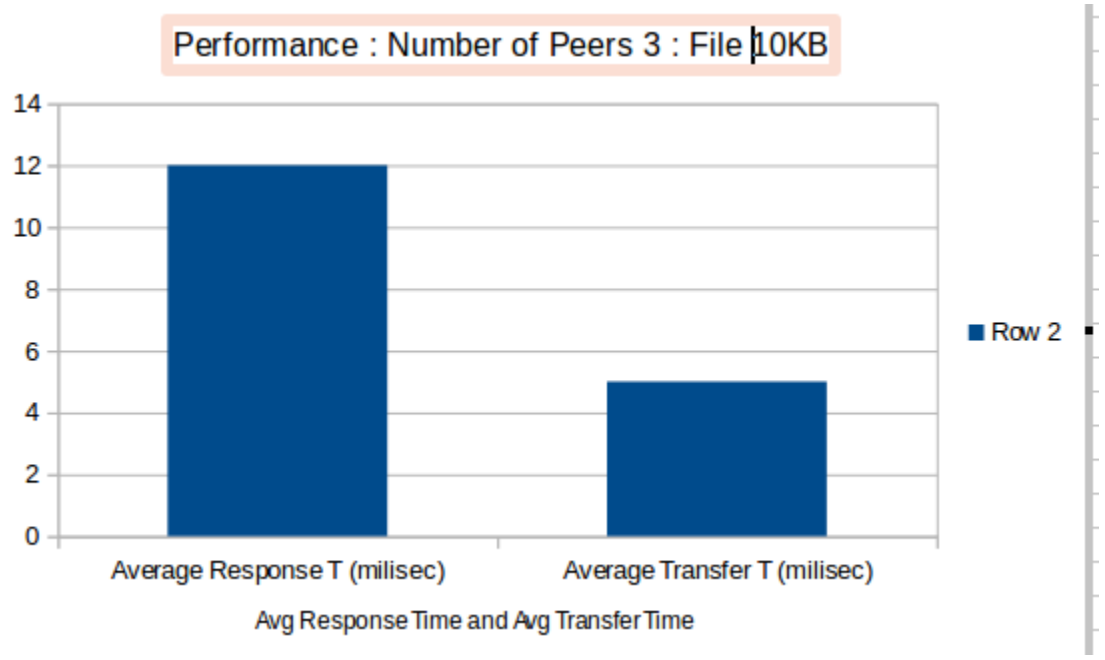
➔ Compute the average response time per client query request by measuring the average response time seen by a client where there's only 1 client issuing queries, then 2 clients, 3 clients, and so on.(STAR TOPOLOGY)

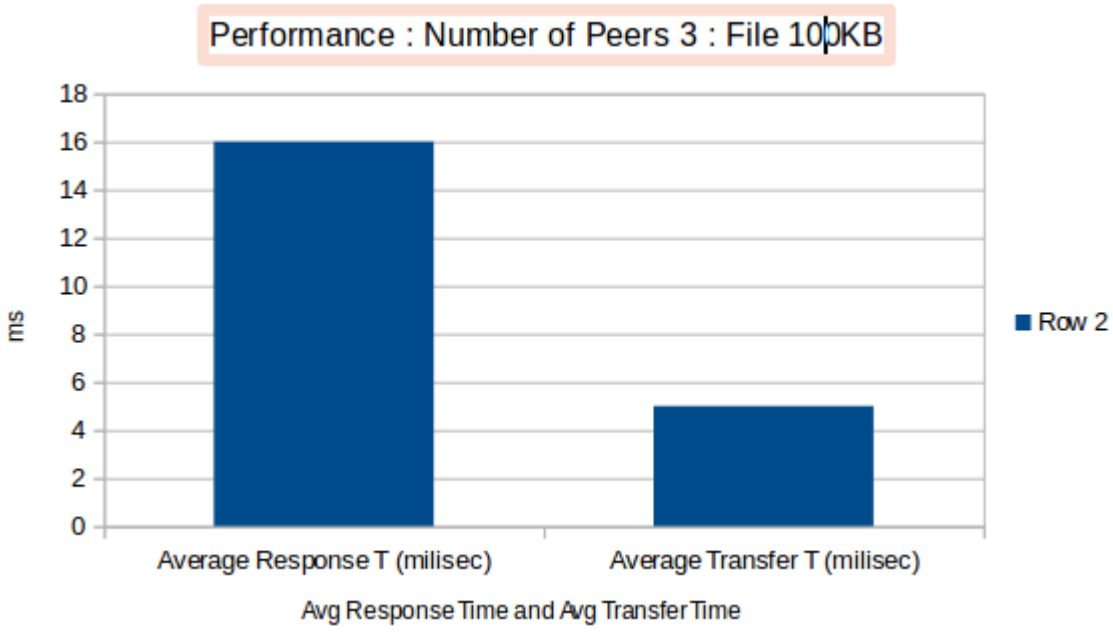


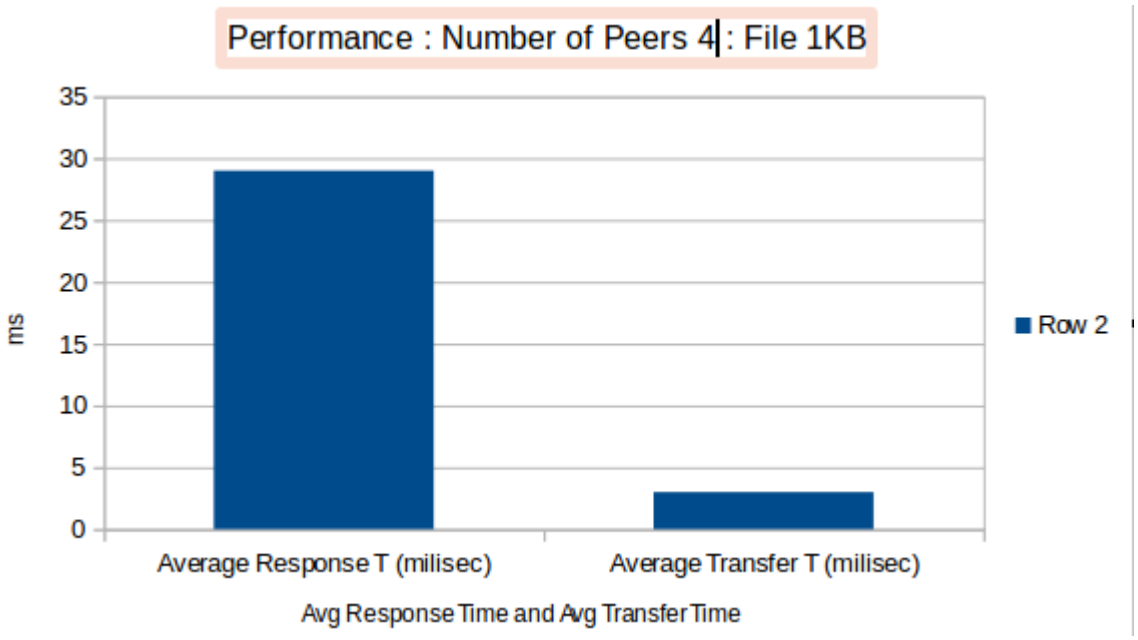


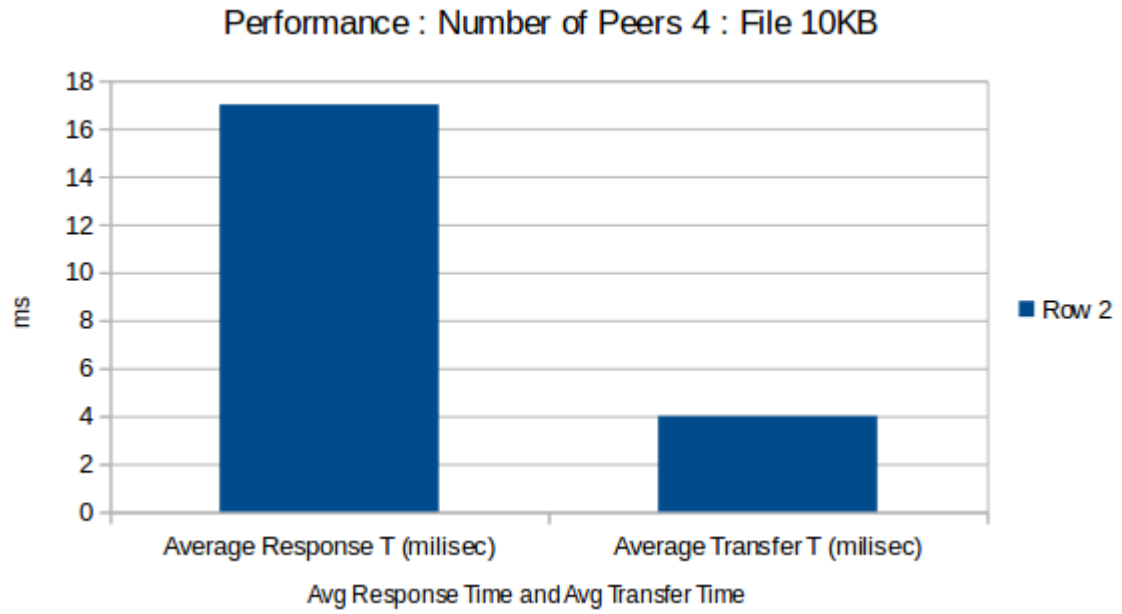

Performance : Number of Peers 2 : File 100KB
14
12
10
8
6
4
2
0
ms
Row 2
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time

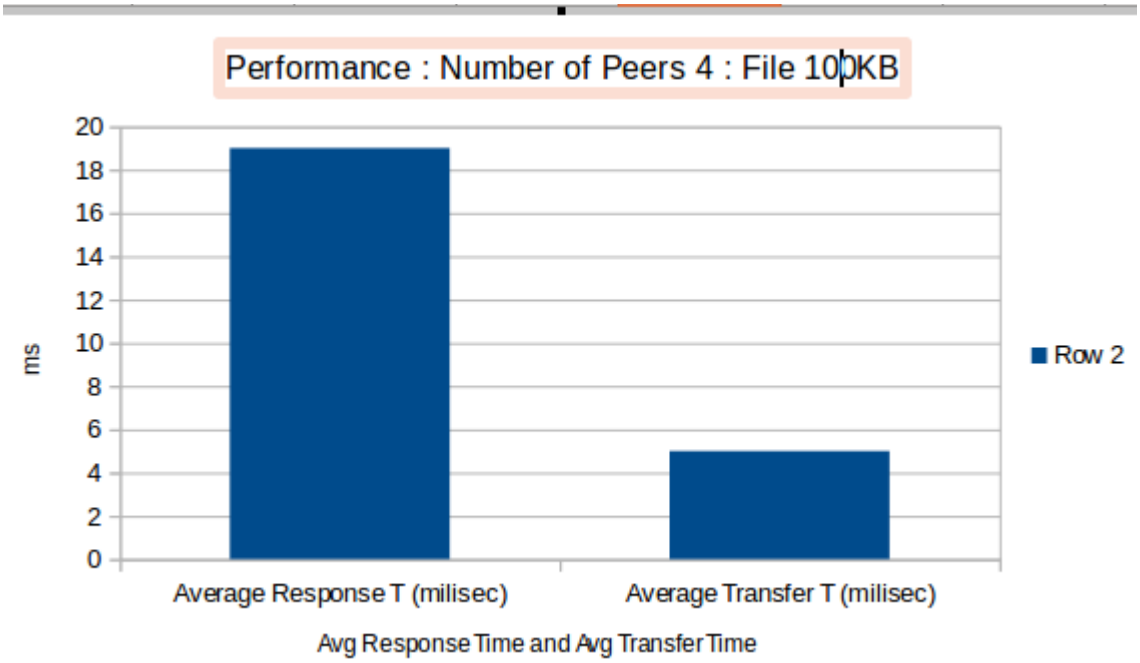

Performance : Number of Peers 3 : File 1KB
40
35
30
25
20
15
10
5
0
ms
Row 2
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time

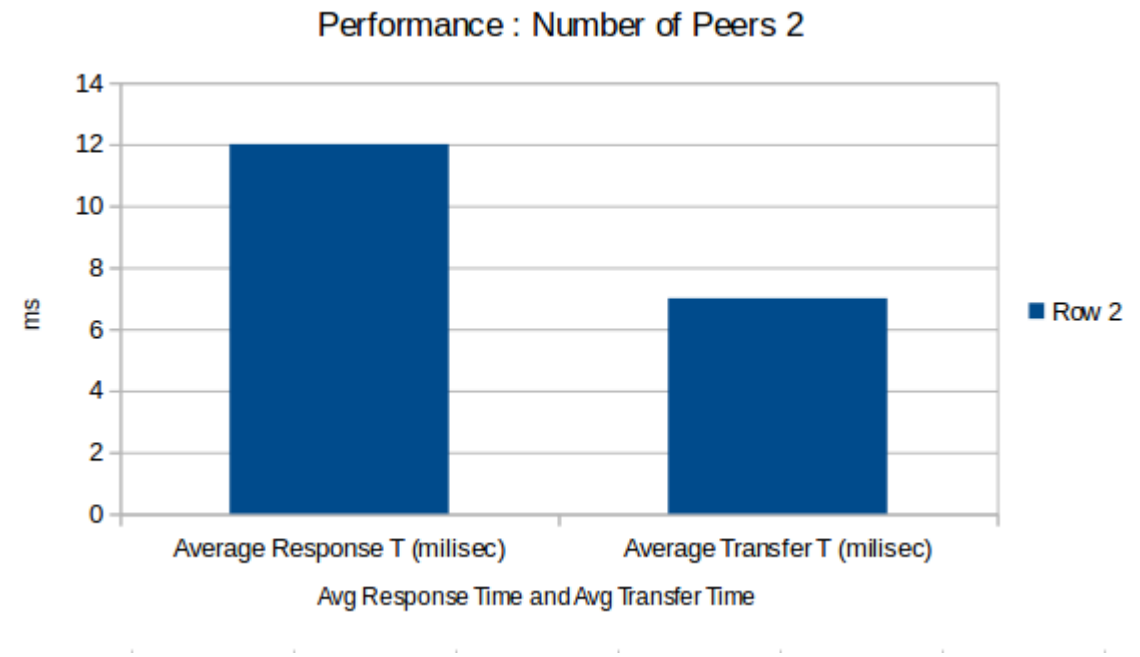

Performance : Number of Peers 3 : File 10KB
14
12
10
8
6
4
2
0
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time
Row 2


Performance : Number of Peers 3 : File 100KB
ms
18
16
14
12
10
8
6
4
2
0
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time
Row 2


Performance : Number of Peers 4 : File 1KB
35
30
25
20
15
10
5
0
ms
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time
Row 2


Performance : Number of Peers 4 : File 10KB
18
16
14
12
10
8
6
4
2
0
ms
Average Response T (milisec)
Average Transfer T (milisec)
Avg Response Time and Avg Transfer Time
Row 2





➔ Compute the average response time per client query request by measuring the average response time seen by a client, since there may be multiple results for each query, measure the average among them.(STAR TOPOLOGY)

Refer STARoutputfile.txt for test cases and comparision.

➔ Compare the result to the first programming assignment 1 and justify your conclusion.(STAR TOPOLOGY)

1) **For 1 KB file :** Transfer time =4 ms Assignment 1
Transfer time = 4 ms Assignment 2 Bus Topology for 2 Peers network
Transfer time = 3 ms Assignment 2 Bus Topology for 3 Peers network
Hence we can conclude that in a Star topology transfer time is lesser compared to Assignment 1 using Central Indexing Server.

2) **For 10 KB file :** Transfer time =6 ms Assignment 1
Transfer time = 6 ms Assignment 2 Bus Topology for 2 Peers network
Transfer time = 5 ms Assignment 2 Bus Topology for 3 Peers network
Hence we can conclude that in a Star topology transfer time is lesser compared to Assignment 1 using Central Indexing Server.

3) **For 100 KB file :** Transfer time =7 ms Assignment 1
Transfer time = 4 ms Assignment 2 Bus Topology for 2 Peers network
Transfer time = 5 ms Assignment 2 Bus Topology for 3 Peers network
Hence we can conclude that in a Star topology transfer time is lesser compared to Assignment 1 using Central Indexing Server.

From the above reading we can conclude that Assignment 1's Central indexing server Transfer time increase with the size of file while in a Star topology transfer time is faster and there is an slight increase in the transfer time with the size of the file related.

➔ You should compare the system performance between a star topology and linear topology under the same system size. List their advantages, disadvantages and applicability.

STAR TOPOLOGY:

ADVANTAGE :

- Good performance.
- Scalable, Easy to set up and to expand.
- Any non-centralised failure will have very little effect on the network, whereas on a ring network it would all fail with one fault.
- Easy to detect faults
- Data Packets are sent quickly as they do not have to travel through any unnecessary nodes.
- It is used for centralised control.

DISADVANTAGE :

- Expensive to install
- Extra hardware required
- If the hub/switch fails the entire system is affected.

LINEAR OR BUS TOPOLOGY:

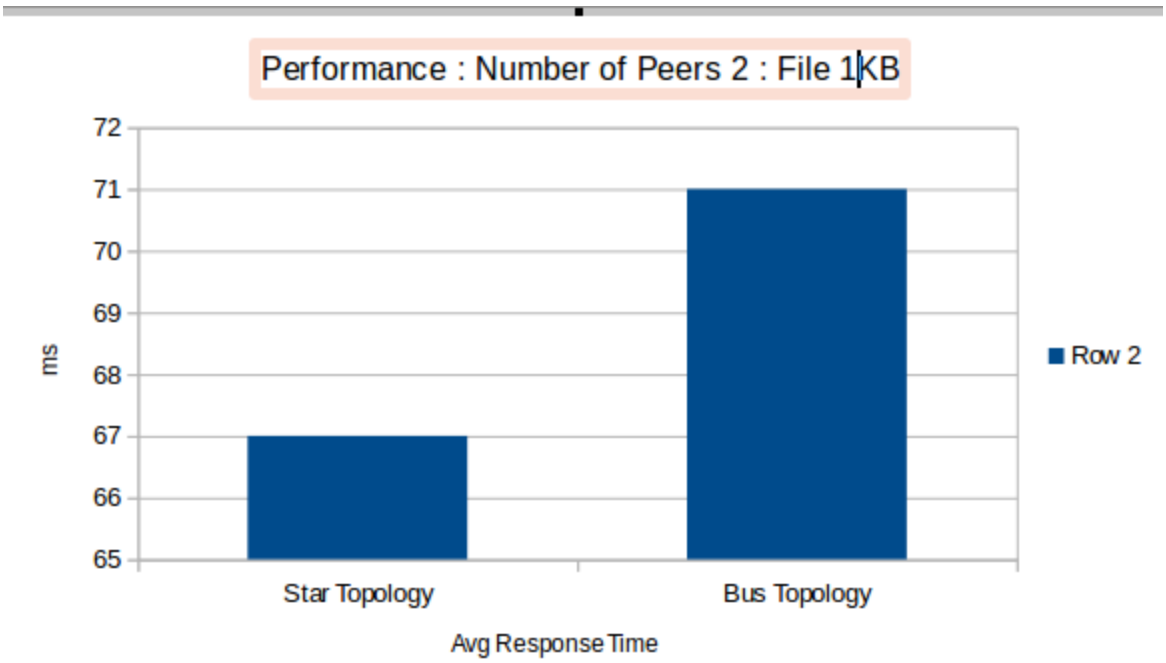
ADVANTAGE :

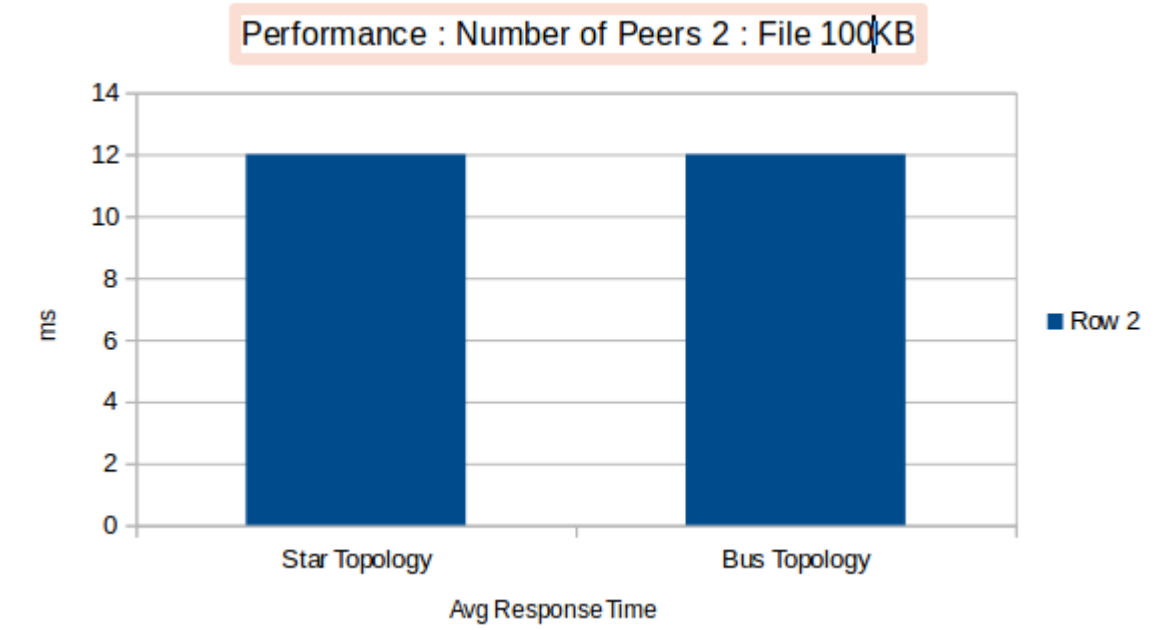
- Easy to implement and extend
- Requires less cable length than a star topology
- Well suited for temporary or small networks not requiring high speeds(quick setup)
- Cheaper than other topologies.

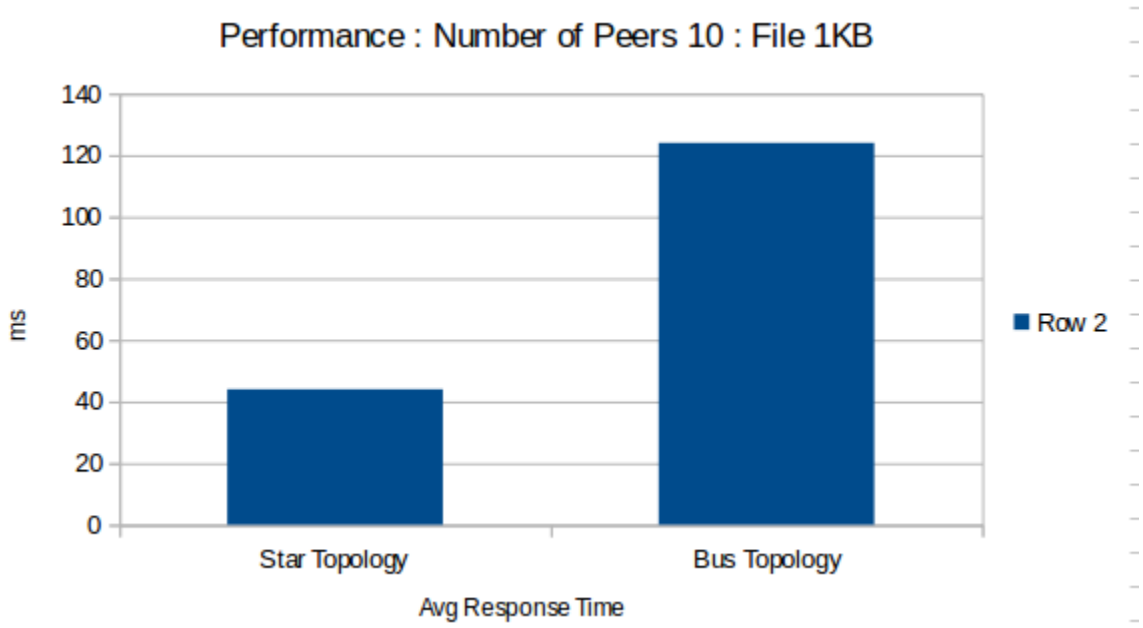
DISADVANTAGE :

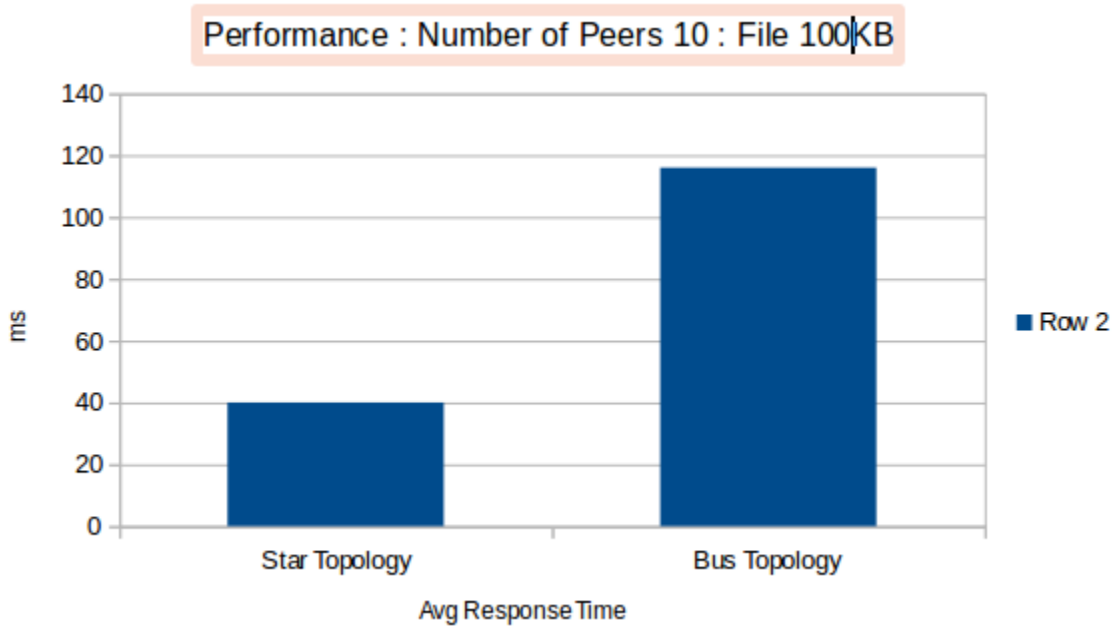
- Limited cable length and number of stations.
- If there is a problem with the cable, the entire network goes down.
- Maintenance costs may be higher in the long run.
- Performance degrades as additional computers are added or on heavy traffic.
- Proper termination is required.(loop must be in closed path).
- If many computers are attached, the amount of data flowing causes the network to slow down.
- Significant Capacitive Load (each bus transaction must be able to stretch to most distant link)
- It works best with limited number of nodes.

System performance between a star topology and linear topology.






Performance : Number of Peers 10 : File 1KB
140
120
100
80
60
40
20
0
ms
Star Topology
Bus Topology
Avg Response Time
Row 2


Performance : Number of Peers 10 : File 100KB
140
120
100
80
60
40
20
0
ms
Star Topology
Bus Topology
Avg Response Time
Row 2