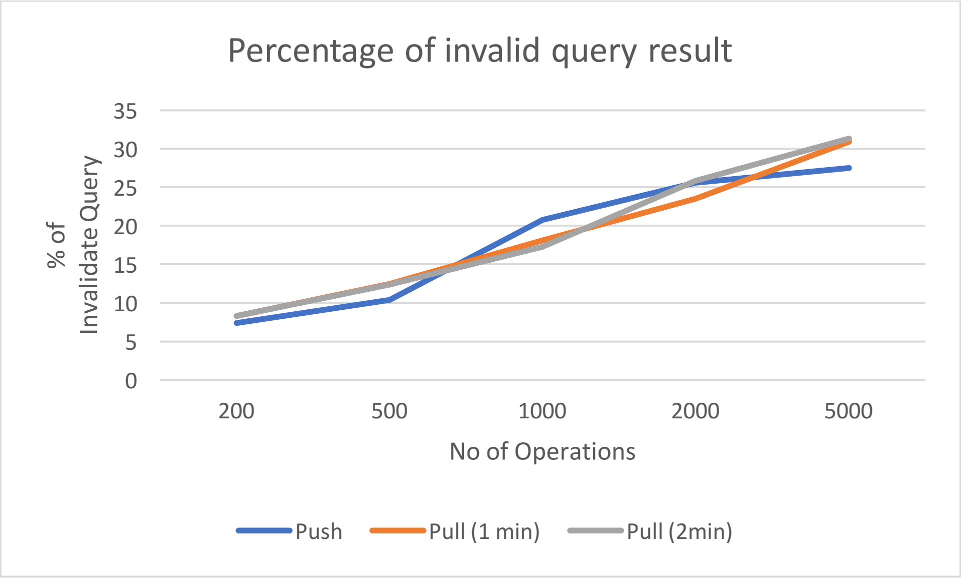
Performance Evaluation

Total number of peers : 10
Approaches implemented : Push and Pull
Files with data size : varying from 1kb to 10kb

1 Peer searching and downloading and remaining modifying files:

No of Operations	% of invalid query result		
	Push	Pull	
		1 min	2 min
200	7.4	8.3	8.3
500	10.4	12.5	12.4
1000	20.8	18.1	17.3
2000	25.6	23.5	25.8
5000	27.5	30.9	31.3

A line graph is plotted using the above observations



X-axis: Number of operations:
Y-axis: Percentage of Invalid Query Result

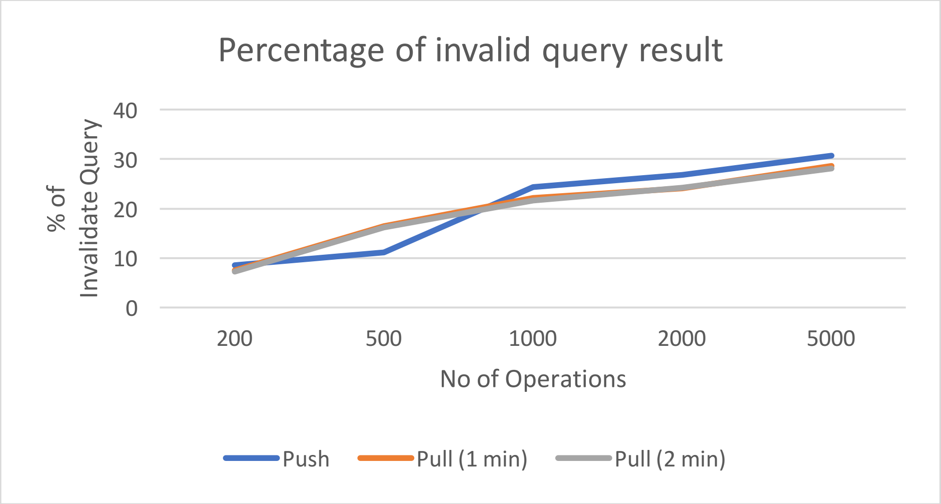
Observation -

- As number of request increases, % of invalid query also increases.

2 Peer searching and downloading and remaining modifying files:

No of Operations	% of invalid query result		
	Push	Pull	
		1 min	2 min
200	8.5	7.5	7.3
500	11.2	16.4	16.2
1000	24.3	22.2	21.6
2000	26.8	24.1	24.2
5000	30.7	28.6	28.1

A line graph is plotted using the above observations



X-axis: Number of operations:
Y-axis: Percentage of Invalid Query Result

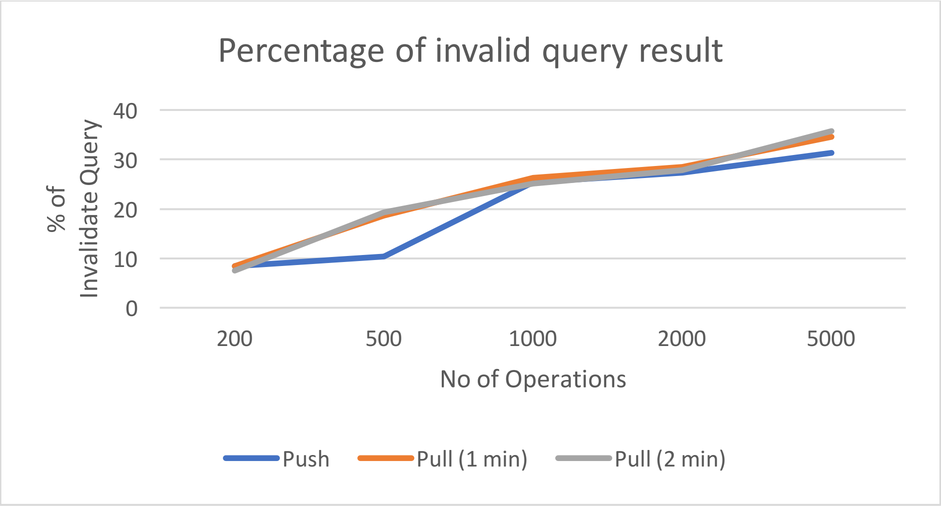
Observation -

- As number of request increases, % of invalid query also increases.

3 Peer searching and downloading and remaining modifying files:

No of Operations	% of invalid query result		
	Push	Pull	
		1 min	2 min
200	8.4	8.4	7.5
500	10.4	18.7	19.3
1000	25.33	26.3	25.1
2000	27.4	28.5	27.8
5000	31.4	34.6	35.7

A line graph is plotted using the above observations



X-axis: Number of operations:
Y-axis: Percentage of Invalid Query Result

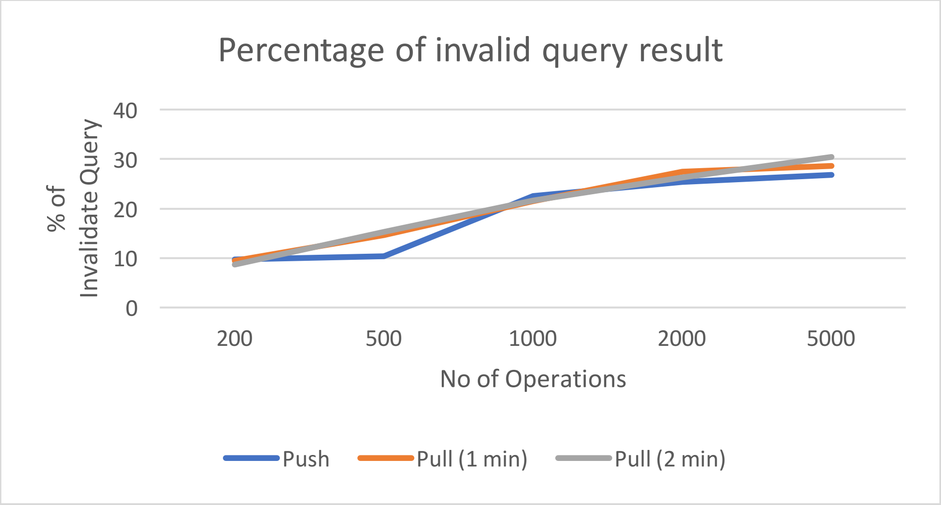
Observation -

- As number of request increases, % of invalid query also increases.

4 Peer searching and downloading and remaining modifying files:

No of Operations	% of invalid query result		
	Push	Pull	
		1 min	2 min
200	9.7	9.4	8.7
500	10.4	14.6	15.3
1000	22.5	21.5	21.6
2000	25.4	27.5	26.3
5000	26.8	28.6	30.5

A line graph is plotted using the above observations



X-axis: Number of operations:
Y-axis: Percentage of Invalid Query Result

Observation -

- As number of request increases, % of invalid query also increases.

PUSH:

- Modified objects are passed down from origin server to nodes.
- The origin server doesn’t ask the nodes which object to push, so multiple objects can reach the same node and some others never arrive which is not a sign of efficiency.
- The technique is also inefficient in terms of network bandwidth usage.

Applications-

- Automatic downloading of software upgrades

Advantages of the Push approach

- it's simple, stateless, and takes advantage of the underlying message routing framework.
- technique provides strong consistency guarantees in the absence of failures.
- Pushing new modified versions of objects improves the reliability.

PULL:

- A node asks for a new object to origin server without knowing whether the origin server has the newer version or not.
- here starvation may occur because a node can take time to find origin server which has the object it is looking for.

Applications:

- The bitmap of a video playout buffer: 0 for a missing chunk, 1 for an available one.

Advantages of the Pull approach

- The node asks for new object to the origin server which is a sign of efficiency.
- No multiple objects can reach the same node.
- New object is requested only when it is needed which provides consistency to system.

Conclusion:

- We can say that percentage of invalid query results are increasing with the number of operations.

- From above charts we can state that PUSH approach is giving little less number of invalid queries. But, this the difference is negligible.

- By implementing PUSH and PULL approach, file consistency is maintained over number of peers in Gnutella-style P2P system.