

Quiz 3: Distributed File Systems

Due Jun 8 at 11:59pm **Points** 100 **Questions** 5 **Available** Jun 2 at 8am - Jun 8 at 11:59pm 7 days
Time Limit 60 Minutes

This quiz was locked Jun 8 at 11:59pm.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	48 minutes	74.2 out of 100

Score for this quiz: **74.2** out of 100

Submitted Jun 8 at 12:45pm

This attempt took 48 minutes.

Question 1

5 / 20 pts

1. What is close-to-open in NFS?
2. How may close-to-open potentially violate AFS' session semantics?

Your Answer:

1. Close-to-open NFS ensures that the data that was written to a file does not get lost when a cached version is being modified. It locks a file to only be opened in one instance so to open it in another, it needs to be closed in the former.
2. AFS fetches a copy of the file for opening on the client-side (instead of the server-side of NFS). Based on my understanding of the question, AFS would not be able to fetch the close-to-open file if the instance is open on another computer since the server will try to poll the clients for the state.

1. Close-to-open: When a file is closed on the client, any updates are flushed to the server, and will be received (by a cache refresh) by any client that later opens that file. 2. AFS session semantics: No updates are seen by other clients until the file is closed, whereas with NFS intermediate updates may be sent asynchronously to the server (before the file is closed).

Question 2

15 / 20 pts

1. How do NFS clients learn that their cached version of a file has become "stale"?
2. Answer the same question for AFS clients.

Your Answer:

1. NFS clients have to check the state of the file compared to the server copy. The client implements close-to-open so that the data does not go missing.
2. AFS has the server polling the clients to inform them of the updated files.

1. NFS: Clients poll the server periodically. They also check the server when they open a file, in case they already have it cached.

Question 3**20 / 20 pts**

1. What does consistency mean for replicated data in GFS?
2. How does GFS ensure that all replicas of a data chunk are consistent?

Your Answer:

1. Consistency means that the replicated data in GFS has the same value.
2. GFS ensures all replicas of a data chunk are consistent by having a single master that is coordinating and keeping the metadata organized through an operation log. The changes are ordered by a primary.

Question 4**15 / 20 pts**

1. What does "defined" mean for updates in GFS?
2. How does GFS ensure that record appends are atomic?
3. How does GFS ensure that metadata updates are atomic?

Your Answer:

1. In GFS, "defined" means that the replicas of the consistent reflect the mutations.
2. GFS ensures that the record appends are atomic by having a single master append it to a file at least once.
3. GFS ensures that the metadata updates are atomic by having a single master make the changes and define the master order in a log.

2. GFS picks the offset at which a record append will be done, ensuring there are no other updates that might interfere with it.

Question 5**19.2 / 20 pts**

Assume Node 50 has Node 75 as its successor. Show the network after each of the following Chord network operations:

1. Node 55 inserts itself by making itself the predecessor of Node 75
2. Node 60 makes itself the predecessor of Node 75
3. Node 50 runs stabilize
4. Node 55 runs stabilize
5. Node 50 runs stabilize

	Initially	After (1)	After (2)	After (3)	After (4)	After (5)
PRED(50)						
SUCC(50)	Node 75	Node 75	Node 75	Node 55	Node 60	Node 55

PRED(55)						Node 50
SUCC(55)		Node 75	Node 75	Node 75	Node 60	Node 60
PRED(60)				Node 50	Node 55	Node 55
SUCC(60)			Node 75	Node 75	Node 75	Node 75
PRED(75)	Nod 50	Node 55	Node 60	Node 60	Node 60	Node 60
SUCC(75)						

Answer 1:

You Answered

Node 75

Correct Answer

75

Answer 2:

You Answered

Node 75

Correct Answer

75

Answer 3:

You Answered

Node 75

Correct Answer

75

Answer 4:

You Answered

Node 55

Correct Answer

60

Answer 5:

You Answered

Node 60

Correct Answer

60

Answer 6:

You Answered

Node 55

Correct Answer

55

Answer 7:

You Answered

Node 50

Correct Answer

50

Answer 8:

You Answered

Node 75

Correct Answer 75

Answer 9:

You Answered Node 75

Correct Answer 75

Answer 10:

You Answered Node 75

Correct Answer 75

Answer 11:

You Answered Node 60

Correct Answer 60

Answer 12:

You Answered Node 60

Correct Answer 60

Answer 13:

You Answered Node 50

Correct Answer 50

Answer 14:

You Answered Node 55

Correct Answer 55

Answer 15:

You Answered Node 55

Correct Answer 55

Answer 16:

You Answered Node 75

Correct Answer 75

Answer 17:

You Answered Node 75

Correct Answer 75

Answer 18:

You Answered Node 75

Correct Answer 75

Answer 19:

You Answered Node 75

Correct Answer 75

Answer 20:

You Answered Nod 50

Correct Answer 50

Answer 21:

You Answered Node 55

Correct Answer 55

Answer 22:

You Answered Node 60

Correct Answer 60

Answer 23:

You Answered Node 60

Correct Answer 60

Answer 24:

You Answered Node 60

Correct Answer 60

Answer 25:

You Answered Node 60

Correct Answer 60

Quiz Score: **74.2** out of 100