0/8 Questions Answered

Vitamin 12

STUDENT NAME

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Q1 2 Phase Commit

4 Points

Q1.1 Part 1

2 Points

Q1.1.1

Suppose that you are a Coordinator node, and you're participating in a transaction with 7 Participants. How many YES votes do you need to COMMIT?

Enter your answer here

Q1.1.2

You wake up. You have no memory of what happened. You're a Participant node, and you realize that you've just crashed. You look at your logs and see that the last record that appeared on transaction T1 is a PREPARE record. What do you do?

- ○ Commit
- ○ Abort
- ○ Ask the Coordinator for its status and wait
- ○ Ack

Save Answer

Q1.2 Part 2

1 Point

Q1.2.1

Suppose we have a Coordinator and **7** Participants. Under what conditions is it **NEVER** possible for the coordinator to ABORT a transaction?

- [ ] The Coordinator has written ABORT in its logs
- [ ] The Coordinator sent PREPARE to all Participants and received 6 YES votes but hasn't yet heard from the seventh node
- [ ] The Coordinator sent COMMIT to all Participants and received 6 ACKs but hasn't yet heard from the seventh node
- [ ] A Participant has written ABORT in its log
- [ ] A Participant has written COMMIT in its log
- [ ] A Participant has voted YES

Save Answer

Q1.3 Part 3

1 Point

Q1.3.1

Suppose we have a Coordinator and **7** Participants. Under what conditions is it **NEVER** possible for the coordinator to COMMIT a transaction?

- [ ] The Coordinator has written ABORT in its logs
- [ ] The Coordinator sent PREPARE to all Participants and received 6 YES votes but hasn't yet heard from the seventh node
- [ ] The Coordinator sent COMMIT to all Participants and received 6 ACKs but hasn't yet heard from the seventh node
- [ ] A Participant has written ABORT in its log
- [ ] A Participant has written COMMIT in its log
- [ ] A Participant has voted YES

Save Answer

Q2 Distributed 2 Phase Locking

2 Points

Q2.1

1 Point

Since each node

- [ ] shares its data with other nodes,
- [ ] contains data independent of the data from other nodes,

we can apply 2 phase locking with

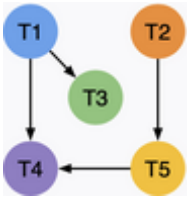
- [ ] a single shared lock table.
- [ ] a local lock table for each node.

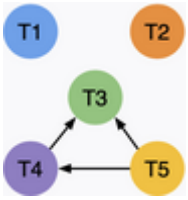
Save Answer

Q2.2 Deadlock

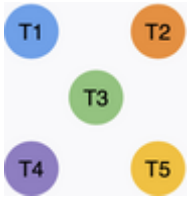
1 Point

We run 5 transactions on 4 different machines. Below are the 4 waits-for graphs from the machines. Is there a deadlock? If so, choose the transactions that are deadlocked; if not, select "No deadlock."

M1: 

M2: 

M3: 

M4: 

- [ ] T1
- [ ] T2
- [ ] T3
- [ ] T4
- [ ] T5
- [ ] No deadlock

Save Answer

Q3 Timing

6 Points

Suppose there are three participant nodes P1, P2, and P3, and there's one coordinator node C. We have the following information about the network:

- C takes 40 seconds to send a message to P1, P2, and P3. C can broadcast a message to them simultaneously.
- P1 takes 6 seconds to send a message to C.
- P2 takes 12 seconds to send a message to C.
- P3 takes 15 seconds to send a message to C.
- Each node takes 6 seconds to flush a message.

Q3.1

2 Points

What is the best case time it takes for the machines to commit a transaction and complete (assuming every node wants to commit)? Consider a transaction to be complete when **every** log record is written and flushed.

Enter your answer here

Save Answer

Q3.2

2 Points

How long would it take in the best case if we added the presumed abort optimization? Assume every participant still wants to commit and that a transaction is considered complete when **every** log record is written and flushed

Here's the same network info copied for convenience:

- C takes 40 seconds to send a message to P1, P2, and P3. C can broadcast a message to them simultaneously.
- P1 takes 6 seconds to send a message to C.
- P2 takes 12 seconds to send a message to C.
- P3 takes 15 seconds to send a message to C.
- Each node takes 6 seconds to flush a message.

Enter your answer here

Save Answer

Q3.3

2 Points

Now, suppose P2 wants to commit, but P1 and P3 don't. How long will the overall abort take? We are using the presumed abort optimization.

In this case, ignore the time it takes to flush records that don't need to be immediately flushed (e.g. records like the end record from 3.1). Also, assume that the actual abort and rollback is instantaneous.

Here's the same network info copied for convenience:

- C takes 40 seconds to send a message to P1, P2, and P3. C can broadcast a message to them simultaneously.
- P1 takes 6 seconds to send a message to C.
- P2 takes 12 seconds to send a message to C.
- P3 takes 15 seconds to send a message to C.
- Each node takes 6 seconds to flush a message.

Enter your answer here

Save Answer

Save All Answers

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