

# IN5020 - Distributed Systems Group Session

## Topic 10 – Paxos and Distributed Transactions

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Question 1 -

Describe the two phases in paxos

# Two phases in Paxos

## Phase 1:

1. Prepare – **Proposer** sends **prepare** message to quorum of **Acceptors**
2. Promise – **Acceptors** reply **promise** to Proposers

## Phase 2:

1. Accept Request – **Proposers** send **accept** request to **Acceptors**
2. Accepted – **Acceptors** accept the request and perform it

## Question 2-

Why do Paxos use promise message in phase 1b instead of directly accepting the request?

# Why promise

- Instead of sending **Promise** message to the Proposers, if the **Acceptors** directly confirm the request, then it will wait for the **Proposers** to send the **Accept** message.
- If the Proposers **failed** then it will **block** the protocol
- So the Paxos uses Promise message to ensure the protocol will be running even if the proposers failed

## Question 3-

Distributed Transactions - How does the two-phase commit protocol ensure atomicity?

# Two-phase commit protocol : Atomicity

## Atomicity:

- Transaction consists of set of operations - Either **all the operations are committed** or **none** of them are committed

In Distributed Systems, the transaction might update more than one server.

The Two-phase commit protocol uses **coordinator**. The Coordinator queries the servers whether they can commit the transaction or not in the first phase. In Second phase, it sends commit message only if all the servers agreed to commit otherwise it will send abort message.



Thank You