Transactions

Definition

A transaction is an individual, indivisible operation that provides the ACID properties.

ACID

ACID stands for Atomicity, Consistency, Isolation and Durability

- Atomicity: all or nothing
- Consistency: never leave system in inconsistent state
- Isolation: don't affect the "outside world", be visible only when you're done
- Durability: don't change until the next transaction

ACID properties are partially implemented by the two-phase-commit algorithm.

Two-phase-commit

1. A co-ordinator node requests a transaction and sends a request to all participants.
2. All participants respond if they're willing + able to execute the request and send VOTE_COMMIT or VOTE_ABORT
3. The participants log their current state and perform the transaction.
4. All participants log their vote.
5. The coordinator looks at the votes. If all participants have voted to commit the coordinator sends a GLOBAL_COMMIT to everyone. Otherwise he sends a GLOBAL_ABORT.
6. Participants receive the decision from the coordinator and record it locally. If it was an ABORT, participants roll back to their previous state. (which they logged in step 3)