



How does 2PC work?

10.0 Two Phase Commit Protocol

The 2-PC protocol ensures that all resource managers either all commit to completing the transaction or they all abort the transaction, thus leaving the state of their resources unchanged from the pre-transactional state.

10.1 Elements of a Two-Phase Commit System

10.1.1 Resource Manager (RM)

The resource manager is usually a database management system, such as Oracle, DB2, or SQL Server. A resource manager is responsible for maintaining and recovering its own resources. From the perspective of the application, the resource manager is a single attachment to the resource (e.g., a database). Note that resource managers are not limited to databases. Any software program that manages persistent data is a resource manager.

10.1.2 Transaction Manager (TM)

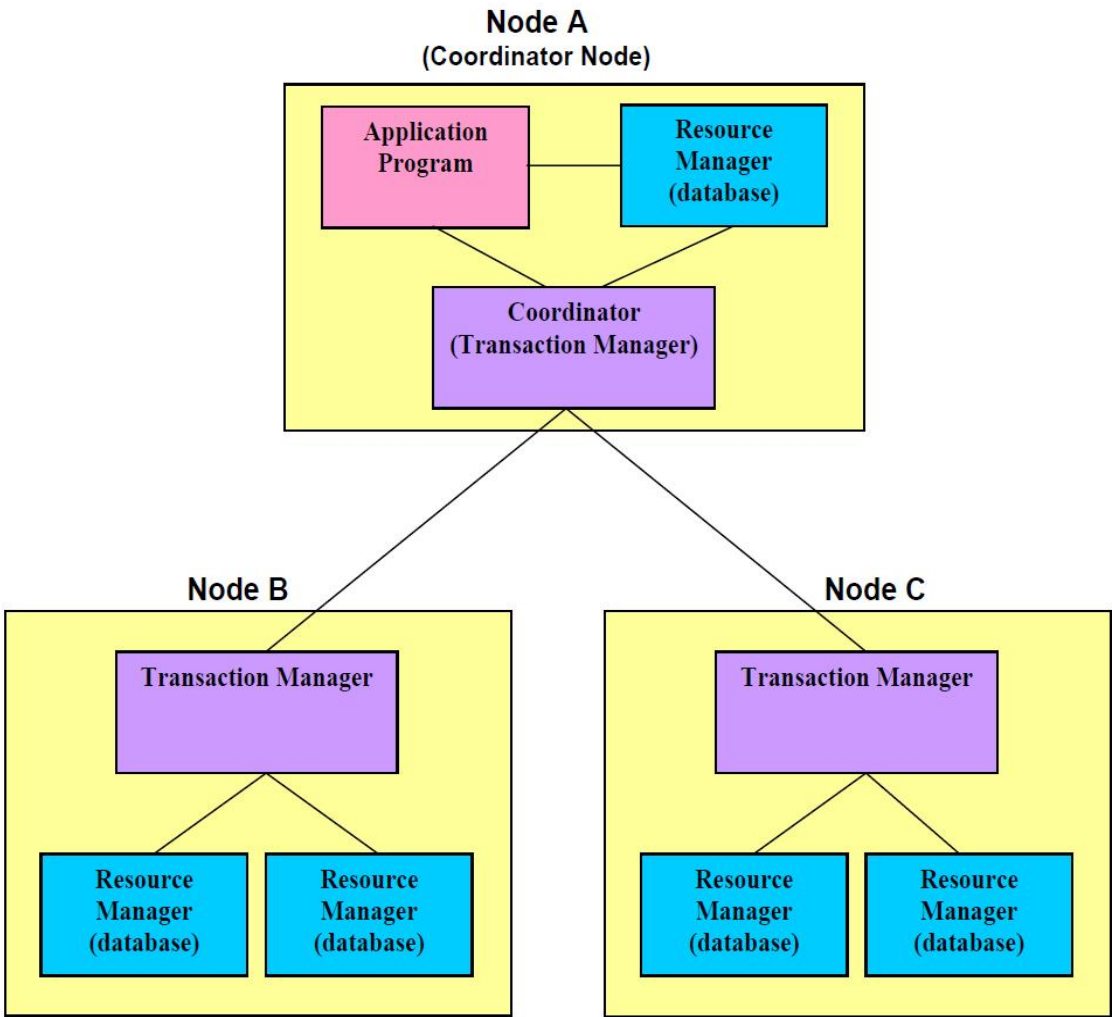
The transaction manager coordinates the actions of the resource managers that are located on the same node (local resource managers) as the transaction manager. (A transaction manager may also act as the coordinator under specific circumstances.)

10.1.3 Transaction Coordinator (TC)

The transaction coordinator is the transaction manager on the node where the application started the transaction. The coordinator orchestrates the distributed transaction by communicating with transaction managers on other nodes (remote transaction managers) and with resource managers on the same node (local resource managers).

10.1.4 Transaction Processing Monitor (TPM)

The transaction processing monitor consists of the transaction coordinator and all the transaction managers composing the distributed 2-PC system.



10.2 The Two-Phase Commit Process

- When the application starts a distributed transaction, the TM on the same node becomes the TC.
- Following are the steps that involved in consummating the distributed transaction.
- The TC first checks that the TM software is running on all the nodes participating in the transaction. If the TM software is not running, the TC returns an error and does not start the distributed transaction.
 - If all the TMs are available, the TC generates a distributed transaction identifier and associates the identifier with all the participants in that particular transaction.
 - When the application is ready to commit all the changes to the RMs involved in the distributed transaction, all the nodes in the transaction must execute both phases of the two-phase commit protocol, the prepare phase and the commit phase.
 - During the prepare phase, the TC asks each RM participating in the transaction whether or not it is prepared to commit the transaction. If the TC receives a „yes“ response from all the RMs, the TC instructs the participants in the transaction to enter the commit phase.
 - During the commit phase, the TC instructs the RM to make permanent changes to its data, i.e. to commit the changes. The RM then commits the changes and the transaction is completed.

The table below describes the circumstances under which distributed transactions are committed or rolled back under the 2-PC protocol.

When This Happens	This is the Result
Application instructs the transaction to roll back.	Transaction rolls back



http://www.enotes.com/topic/Two-phase_commit_protocol

<http://www.hypergurl.com/blog/databases/transaction-processing.html>