



CS544 EA

Applications

Transactions: Global Transactions

Local Transactions

- So far we've only considered local transactions
 - Transactions that use a single transactional resource (database, message bus)

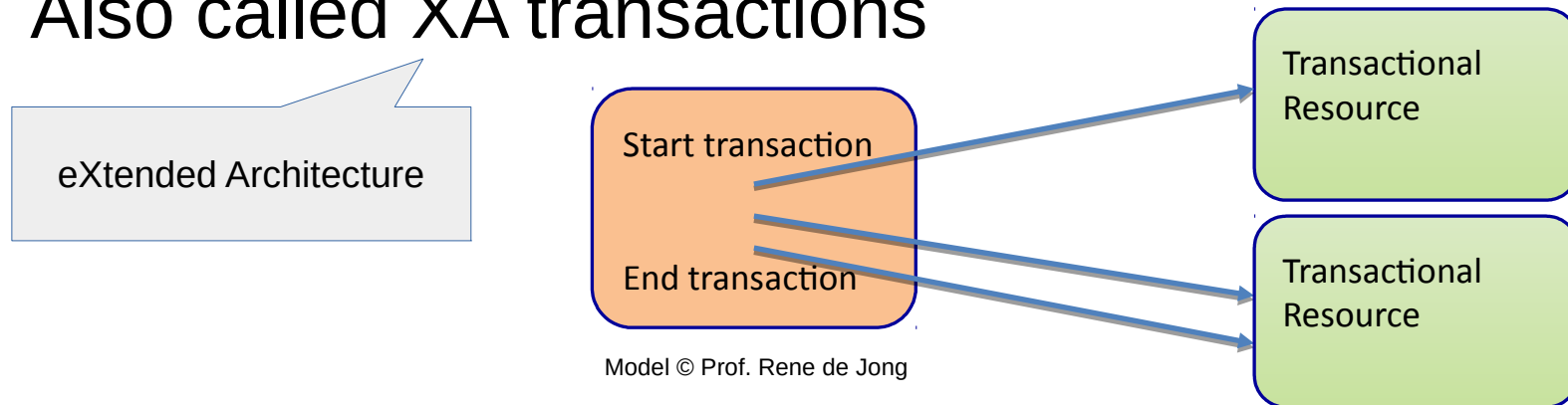


- These transactions are **managed by the DB**
 - Simple and Fast



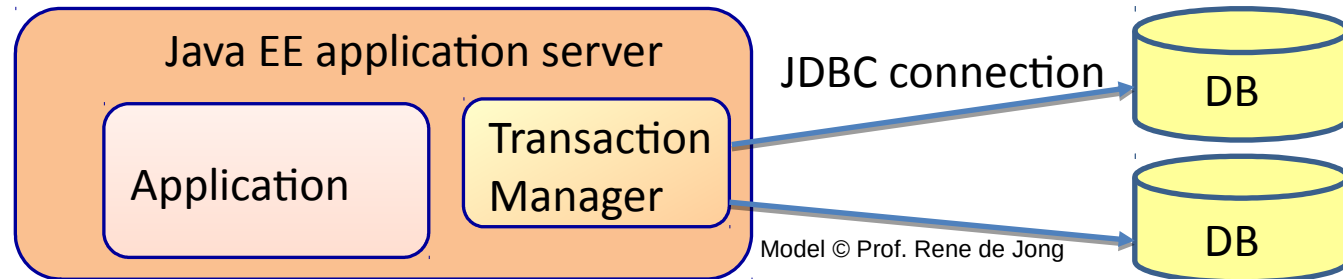
Global Transactions

- Global Transactions are transactions that span **multiple transactional resources**
 - Such as databases or message busses
 - More common in enterprise applications
 - Also called XA transactions



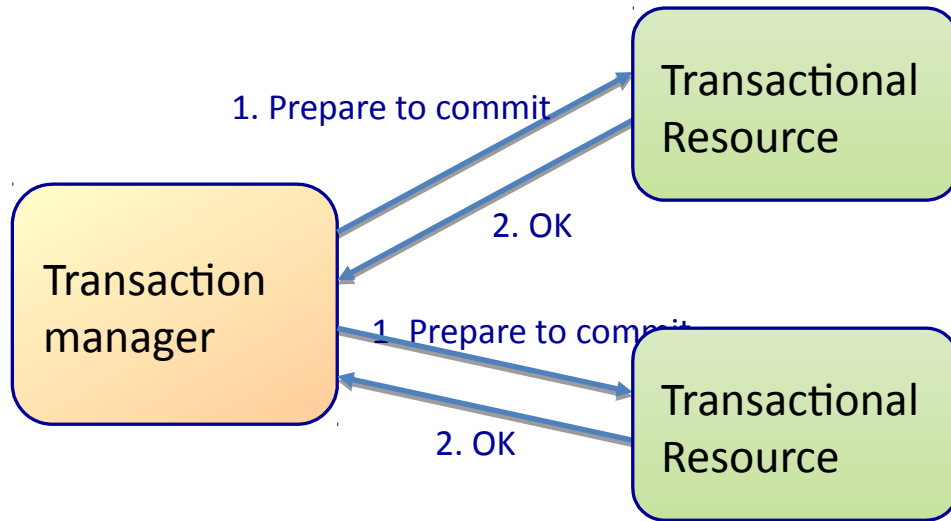
Transaction Manager

- Global Transactions have to be managed on the application side (to coordinate resources)
 - Generally done by a **Transaction Manager**
 - Standard Java Transaction API (JTA) interface
 - Required part of Java EE application servers
 - Stand Alone JTA implementations also exist

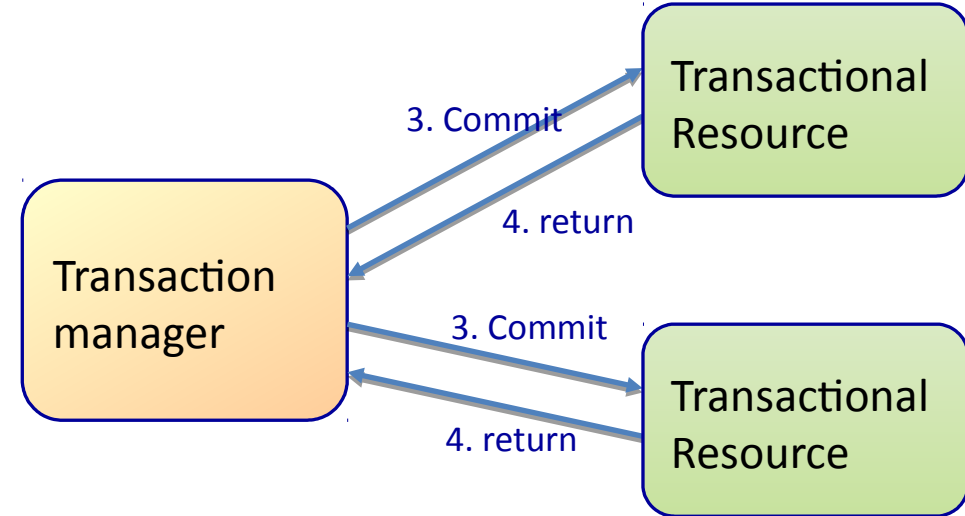


2 Phase Commit (success)

- Phase 1

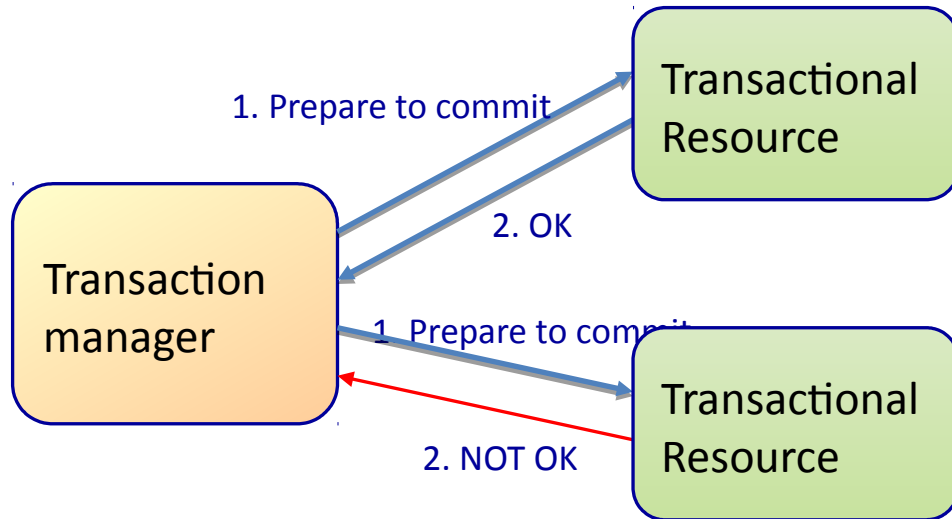


- Phase 2

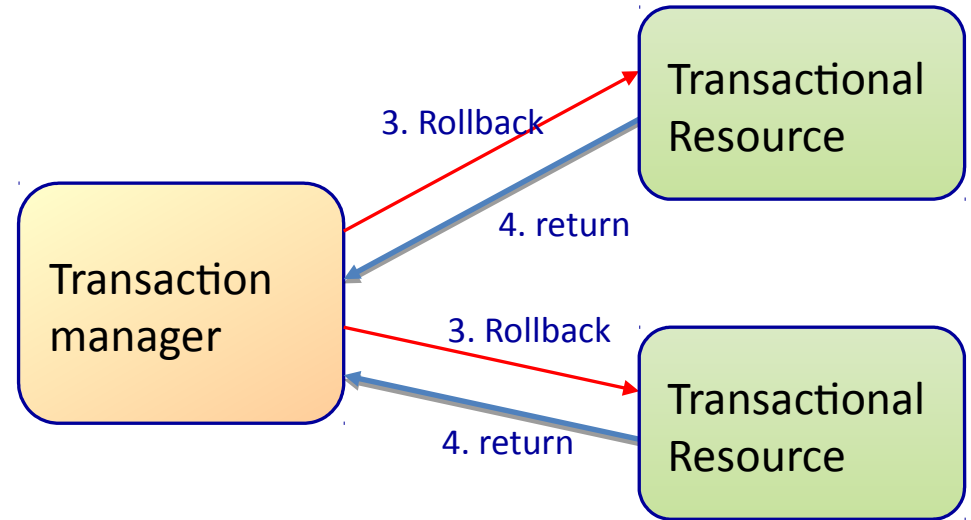


2 Phase Commit (Failure)

- Phase 1



- Phase 2



Characteristics of XA TX

- 2 Phase Commit
 - Does not guarantee that nothing will go wrong
 - Is slow – multiple remote connections
- TX resources become dependent on each other
 - Need to keep locks until ALL resources finished
 - Again making things slower
- **The price you pay for coordinating!**