Exercise 11 - Transaction Management 2
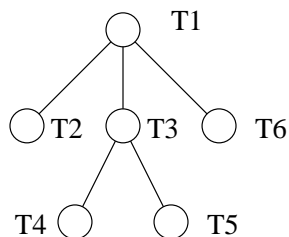
1   Transactional Integrity II

The example is given as previously on exercise sheet 10: the company Miller Real Estates transfers the monthly salary of its employee Henry Robertson from their bank account at bank A to his bank account at bank B on December 25th. On the following day the company also transfers the outstanding travel expenses to Henry Robertsons account. At bank A a transfer requires 6 days, i.e. debit on day one, 4 days processing time, and credit entry on day 6. On December 27th Henry Robertson transfers the monthly rent for his house to his landlord, which has a bank account at bank C. At bank B a transfer only requires 4 days.

Assuming that the three banks A, B, and C commonly use a Distributed DBMS:

1. What would be the processing order, if the synchronization would be based on

   a) S2PL,

   b) CS2PL, or

   c) Timestamp Ordering?

2. How would that change, if Mr. Robertson would lend his house from the company, where he is employed?

2   Distributed Commit Protocols

1. What are Commit Protocols such as 2PC and 3PC used for?

2. The following execution structure of a distributed TXN running on six different nodes is given:

   How many messages are required to perform the 2-Phase-Commit Protocol for this TXN in case of a successful processing? How would that change, if T_6 fails?

3. What possible problems can be solved by applying the 3-Phase Commit Protocol?