4. Miscellaneous Project Issues

CSEP 545 Transaction Processing for E-Commerce
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Lock Conversions

• This is step 3 of the course project
• Lock conversion - upgrading an r-lock to a w-lock
  – e.g., \( T_i = \text{read}(x) \ldots \text{write}(x) \)
• The main purpose of step 3 is to ensure you understand the lock manager code we supply.
• Deadlocks are an issue
  – if two txns convert a lock concurrently, they’ll deadlock (both get an r-lock on x before either gets a w-lock)
  – To avoid the deadlock, a caller can get a w-lock first and down-grade to an r-lock if it doesn’t need to write.
Lecture Dependencies

• Step 5 involves implementing a workflow controller.
  It depends on
  – Transaction bracketing
  – Partitioning work between WC and transaction servers
  – Propagating transaction context in RM calls
  – Parameter-based routing (e.g. choose an RM based on flight number)
[4/9/07]

• Steps 6 – 10 involve two-phase commit.
  I’ll cover this on April 26. See Chapters 2 & 3 of text.

  – I’ll cover it by April 30. See also Chapter 8.
Process Structure

• For architectural reasons, RM and WC should be processes.

• Ordinarily, there’s a TM per network node.
  – To simulate this, a TM should be a process