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Assignment 6 (ARIES Recovery Algorithm)

SAARLAND UNIVERSITY
COMPUTER SCIENCE

1 ARIES Recovery Algorithm

Briefly answer the following questions:

1. How does the recovery manager ensure atomicity of transactions? How does it ensure durability?
2. What is the difference between stable storage and disk?
3. Explain the WAL protocol.
4. Describe the steal and no-force policies.

2 ARIES Analysis, Redo, and Undo Phases

Briefly answer the following questions:

1. What are the roles of the Analysis, Redo, and Undo phases in ARIES?
2. Consider the execution shown in Figure 1.
   - **(a)** What is done during Analysis? (Be precise about the points at which Analysis begins and ends and describe the contents of any tables constructed in this phase.)
   - **(b)** What is done during Redo? (Be precise about the points at which Redo begins and ends.)
   - **(c)** What is done during Undo? (Be precise about the points at which Undo begins and ends.)

3 ARIES Crash During Recovery

Consider the execution shown in Figure 2. In addition, the system crashes during recovery after writing two log records to stable storage and again after writing another two log records.

1. What is done during Analysis?
2. What is done during Redo?
3. What is done during Undo?
4. Show the log when recovery is complete, including all non-null prevLSN and undonextLSN values in log records.

4 Project

Implement a first version of your project implementing the contest specification. You should use the code used for the first milestone of this lecture (main-memory index). Make sure your project passes all tests. Deadline: January 27^{th}, midnight. More info at: http://infosys.cs.uni-saarland.de/teaching/dbs0809/exercises/project.html

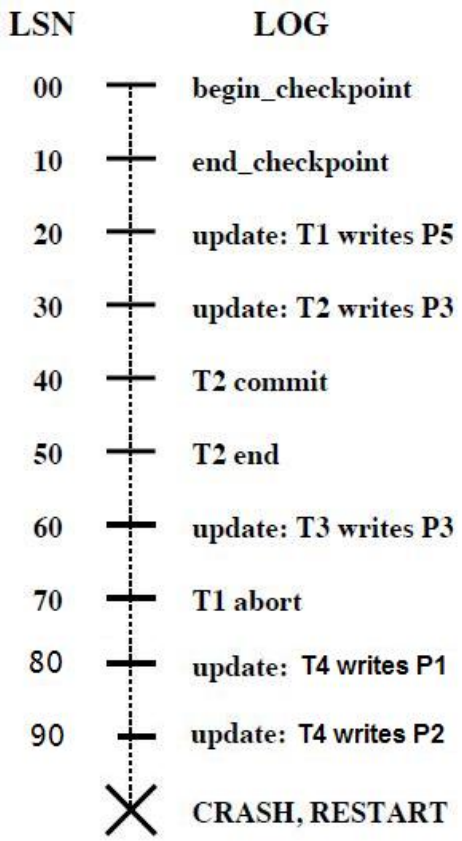

Figure 1: Execution with a Crash.

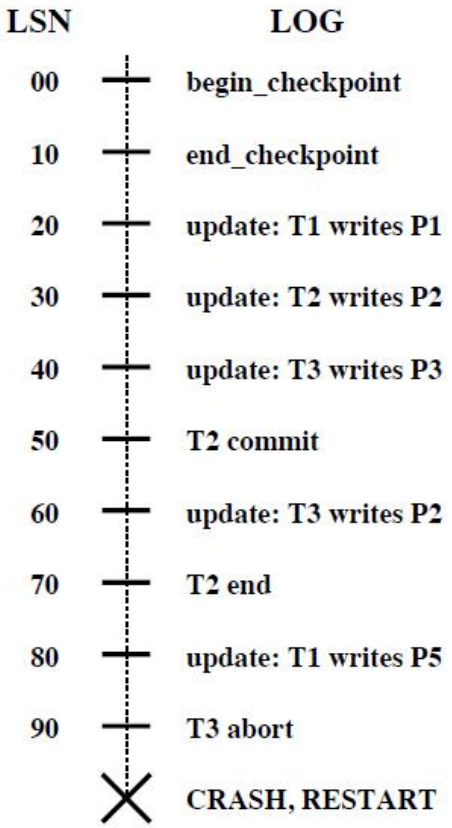

Figure 2: Execution with Multiple Crashes.