Homework submissions: by email to the instructor.

Homework 2

Write a review of the TM implementation allotted to you in class. Your review should address the following points: (i) characterize the access granularity, update mechanism, and conflict detection technique of the STM, (ii) describe the procedures of read, write, validate, and commit separately, and (iii) briefly describe the novel features of the STM over earlier implementations (you might want to read some of the papers cited in the related work for this).

Homework 3

Based on the description of the DSTM and TL2 implementations presented in class, answer the following questions:

- Consider an optimization of the DSTM algorithm that slightly modifies the behavior of the openForRead operation. If the TMObject is opened by another transaction with status ACTIVE, the reading transaction simply reads the old version of the TMObject. However, the validation before the commit is unchanged. Does this optimization still satisfy serializability? Opacity? Give an informal argument in case you think the property is still satisfied. If you think the property is violated, give a counterexample.

- Consider an optimization of the TL2 algorithm where it is not checked whether the lock is held during the read and the validation phase. Argue about the safety property violations in this case.

- Consider a version of the TL2 algorithm where the version number and lock bit reside in different words. Argue about the safety properties in this case.