

Assignment 0

Download *chapter 7* from the book “Concurrency Control and Recovery in Database Systems” by Phil Bernstein et al. from the following URL:

<ftp://ftp.research.microsoft.com/users/ccontrol/>

Assignment 1

Read section 7.5 (3PC protocol).

Assignment 2

Solve exercises 7.14 and 7.17 (pp. 262–263) .

Assignment 3

- (a) Assume a replicated system using a Read One–Write all (ROWA) strategy. Each write has to be done by all sites. Design a distributed protocol that will still ensure consistency but where an update does not need to be written to all sites (and, thus, where reads will have to be performed at more than one site). A hint can be found in chapter 8 of the Bernstein book.
- (b) In the ROWA protocol, the cost of executing transactions is $R + N \times W$, where R is the read load, N the number of sites in the system, and W is the write load. The loads are normalized such that $R + W = 1$. That is, when the load is only reads, the costs is 1; when the load consists is only writes, the cost is N . For the protocol you have designed in 3 (a), can you characterize the write and read load for the system to be better than ROWA?
- (c) In terms of the cost formula given above, can you explain why asynchronous replication has a lower cost than synchronous replication.