

Livelock and Domino Effects

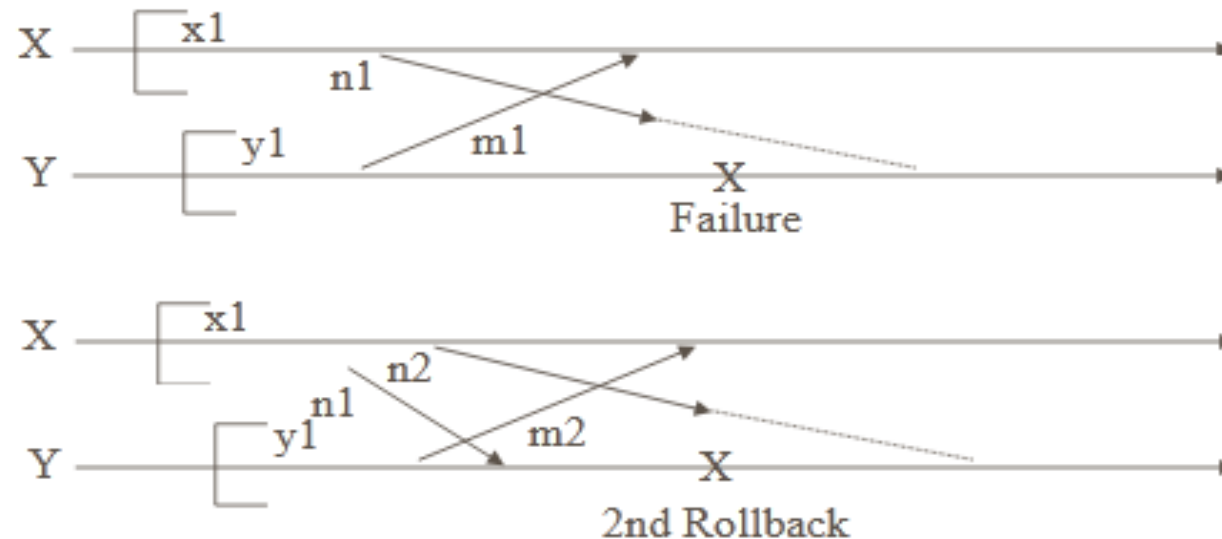
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Livelocks due to delayed messages

Livelocks



- Y crashes before receiving `n1`. Y rolls back to `y1` -> X to `x1`.
- Y recovers, receives `n1` and sends `m2`.
- X recovers, sends `n2` but has no record of sending `n1`.
- Hence, Y is forced to rollback second time. X also rolls back as it has received `m2` but Y has no record of `m2`.
- Above sequence can repeat indefinitely, causing a livelock.

Domino Effect due to Orphan Messages

- Orphan messages & the Domino effect: Assume Y fails after sending m.
 - X has record of m at x3 but Y has no record. m -> orphan message.
 - Y rolls back to y2 -> X should go to x2.
 - If Z rolls back, X and Y has to go to x1 and y1 -> Domino effect, roll back of one process causes one or more processes to roll back.

