Livelock and Domino Effects
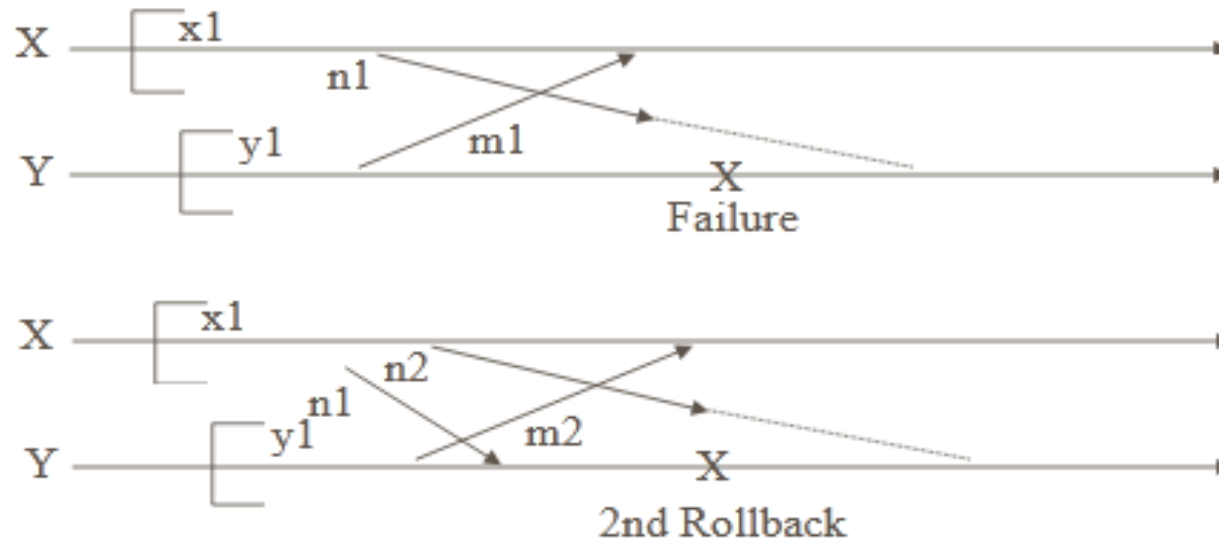
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Livelocks due to delayed messages

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.