Algorithm For Asynchronous checkpoint and Recovery:

Checkpoint: It is the process of creating a snapshot for current state of a system or process at a particular time. In case the system get failure means we can restore the system back to a consistent state.

Asynchronous checkpointing: Each process in the system takes checkpoints independently, without coordinating with other process.

uncoordinate checkpoint:

* Each process has autonomy in deciding when to take checkpoints.
* Domino effect may occur during recovery.
* Since no coordination is taking checkpoints, some process may take useless checkpoints.

Data structures used :

i) sent $i \rightarrow j$ (ci) : the no. of msg sent by process Pi to Pj, until the checkpoint

ii) Receive $j \leftarrow i$ (ci) the no. of msg send by process Pi to Pj, until the checkpoint.

Types of log storage :

i) volatile log - short time to access, but lost if processor crash.

ii) stable log - longes. time to access but remains stable

Juan - Venkatesan Algorithm :

* The Algorithm is based on asynchronous checkpointing.

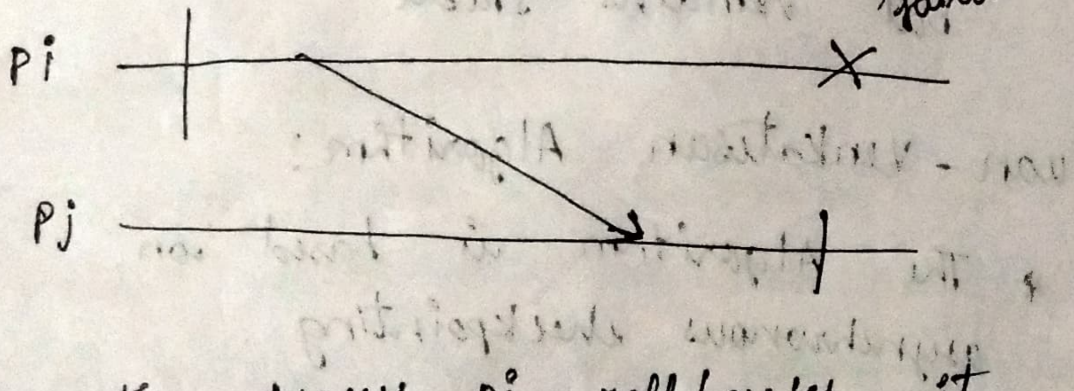
* During the recovery, we need to find the consistent set of checkpoints to which the system can be restored.

* In this recovery Algorithm, each process keeps track of both the no. of msg send and received from other processes.

* This Algorithm avoids the existence of orphan msg.

* Several iterations of rollbacks by processes are involved in this recovery.

Eg :



* The process pi rollbacks, it is necessary for all the process to find the msg send by the Rollback process has become an orphan msg.

* orphan msg,

$P_i \rightarrow P_j$; $P_i < P_j$

* then process P_j must roll back to a state where no. of msg received are equal to no. of msg send. (ie),

$P_i = P_j$.

Recovery protocol : If a failure occurs, the system uses the checkpoint from all processes to restore a consistent global state.

Eg :

P1 => A = 100 (Inital state)

P2 => B = 200

checkpoint :

At t1, P1 takes checkpoint (A = 100)

At t2, P2 takes checkpoint (B=200)

Msg Exchange :

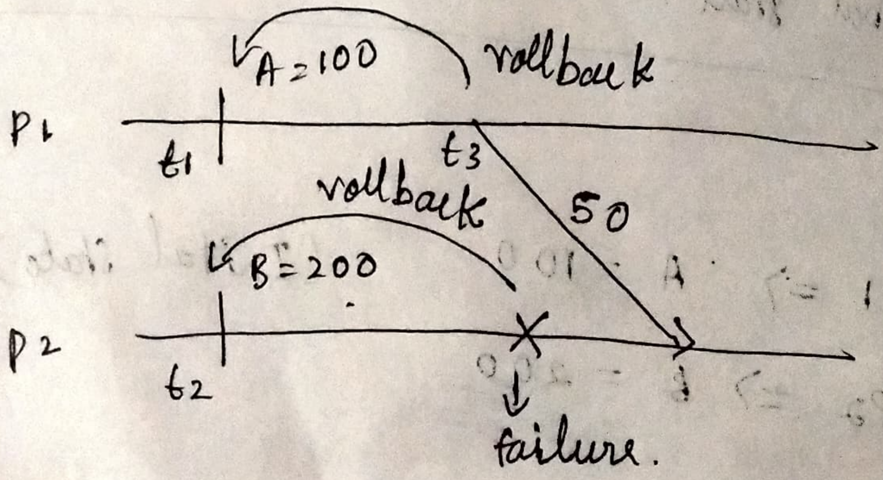
P1 → P2 (50 to ~~A~~ Account B)

Failure :

P2 crashes before receiving P1 msg.

Recovery ;

both process roll back to their initall state to reflect the correct transaction flow.



Adv :

- * Fault tolerance
- * Scalability
- * Efficiency.