**40. How instance recovery happens in oracle RAC?**

When any one of the instance is crashed in RAC, then this node failure is detected by the surviving instances. Now the GRD resouces will be distributed across the existing instances. The instance which first detects the crash, will the start the online redo log thread of the crashed instance.  The SMON of that instance, will read the redo to do rollforward ( i.e to apply both committed and noncommited data). Once rollforward is done, it will rollback the uncommited transactions using UNDO tablespace of the failed instance.

**Sequence**

1. Normal RAC operation, all nodes are available.
2. One or more RAC instances fail.
3. Node failure is detected.
4. Global Cache Service (GCS) reconfigures to distribute resource management to the surviving instances.
5. The SMON process in the instance that first discovers the failed instance(s) reads the failed instance(s) redo logs to determine which blocks have to be recovered.
6. SMON issues requests for all of the blocks it needs to recover.  Once all blocks are made available to the SMON process doing the recovery, all other database blocks are available for normal processing.
7. Oracle performs roll forward recovery against the blocks, applying all redo log recorded transactions.
8. Once redo transactions are applied, all undo records are applied, which eliminates non-committed transactions.
9. Database is now fully available to surviving nodes.