RAC

How do you list nodes of a cluster?

```
$ olsnodes
```

How do you do a health check of Oracle clusterware?

```
$ crsctl check crs
```

```
$ crs_stat -t
```

What does a voting disk contain?

```
* Node membership
* Heartbeats
```

How do you find the voting disk location?

```
crsctl query css votedisk
```

How do you check what instances are running?

```
$ srvctl status database -d <db>
```

How do you check which listeners are running?

```
$ srvctl status nodeapps -n <node>
```

```
$ crs_stat -t
```

```
$ lsnrctl status        (you need to run this on every node)
```

What IP addresses do you have in a 10g RAC system?

* Public IP (physical IP address)
* Private IP (for interconnect)
* Virtual IP
> New in 10g. This is for connections. The virtual IP addresses are used to avoid timeouts when a node is down. The virtual IP is marked as "down" and connections move on to the next node immediately (no waits for timeouts).

What are Virtual IP addresses (VIPs) used by in RAC?

VIPs are related to a NIC card for failover and automatically managed by CRS .

When installing 10g RAC, at least 2 network interfaces are required for each node:
One for public and and one for private Interface.

How do you identify the interface name and associated IP address for every network adapter?

```
$ ifconfig -a
```


What is the past image of a block?

RAC cache fusion:
Past images are older copies of a buffer that have not yet been written to disk.

If a lock is acquired and already has dirty buffers on a remote instance then it takes on a global lock role and any remote instances that contain these dirty buffers will have what is called a 'past image' of the buffer.

What files are shared (or not shared) in a RAC system?

Common/shared files (shared)
      data files
      control files

Instance specific files (not shared)
      redo log files
          Put on shared storage to help recovery operations.
      archive log files
          Put on shared or local storage (better on shared).
      undo tablespace
      alert.log and trace files

Special cases
      spfile
      RAC systems can have a single shared spfile when using a symbolic link in
      $ORACLE_HOME/dbs pointing to the shared file.

What is Cache Fusion?

Cache Fusion provides cache-to-cache transfer of data blocks between instances in a cluster.

What happens if you create a datafile on a file system that is only visible to one node (ocfs)?

Most things will still work (e.g. transactions that don't need to access the invisible data file).
You will get an error for transactions that try to access the invisible data file.

What are the CRS components?

* Voting disk to record node membership information and heartbeats.
* Oracle Cluster Registry (OCR) to record cluster configuration information

How to you list the private interconnect?

```
olsnodes -p -i        # shows private interconnect and virtual host name
```

How do you check if the CRS processes are running?

```
$ ps -ef |grep crsd        # cluster ready services
$ ps -ef |grep cssd        # cluster syncronysation service
$ ps -ef |grep evmd        # event manager
```

How to you export, import, backup and restore OCR?

```
ocrconfig -showbackup
```

How to you start/stop an Oracle RAC system?

Starting the Oracle RAC 10g Environment

1. Start the Oracle clusterware as root
2. Start the node applications (Virtual IP, GSD, TNS Listener, and ONS).
3. Bring up the ASM instance.
4. Start up the Oracle instance (and related services).
5. Start the Enterprise Manager Database console.

```
$ crsctl start crs                        # as root
$ srvctl start nodeapps -n node
$ srvctl start asm -n node
$ srvctl start instance -d db_name -i instance
$ emctl start dbconsole
```

Stopping the Oracle RAC 10g Environment

Run the stop commands in reverse order of the start commands.

How do you add/remove a database or instance to CRS?

```
srvctl add database -d <db> -o <oracle_home>
srvctl remove database -d <db> -f

srvctl add instance -d <db> -i <sid> -n <node>
srvctl remove instance -d <db> -i <sid>
```

How do you start/stop listener and database in a RAC system?

```
srvctl start listener -n <node>
srvctl stop listener -n <node>

srvctl start database -d <db>
srvctl stop database -d <db>
```

What are RAC specific tuning issues?

- Block pinning between instances.
- Single threaded batch job runs only on one instance.
- You need to know on which instance a problem SQL is running in order to tune it.
- Check log and trace files on all nodes.

What are RAC specific administration issues?

- Need to check alert.log file for each instance.
- Use srvctl instead of sqlplus to start/stop the instance/database
- Parameters can be set globally (*.param) or instance specific (instance.param)
- Cluster related issues, e.g. node eviction
- Scan listener

How do you upgrade a RAC database?

1. Upgrade Clusterware
2. Ungrade ASM
3. Upgrade the database
   Startup the database in single instance mode for the upgrade.
   Do a rolling upgrade of the databases.

What are the CRS background Processes?

oprocd
   Process monitor for the cluster.
evmd
   Event manager daemon that starts the racgevt process to manage callouts.
ocssd
   Manages cluster node membership and runs as oracle user; failure of this process results in
   cluster restart.
crsd
   Performs high availability recovery and management operations such as maintaining the OCR.
   Also manages application resources and runs as root user and restarts automatically upon
   failure.

Table of Contents