Practice 13

Creating a RAC One Node Database

Practice Overview

In this practice, you will perform the following:

- Create a RAC One Node database
- Relocate online the RAC One Node instance
- Convert the RAC One Node database to a RAC database

Note: I understand that the folder that contains all the virtual machines is enormous now (it was about 268 GB in my case). Still, if your hardisk free space allows it, I recommend taking backup of the folder because you will drop the current database in this practice.

Practice Assumptions

- The practice assumes that you have the Oracle RAC database up and running in the virtual machines `srv1` and `srv2`.

Handling Zero Free Space in FRA

I have come across a weird issue during implementing this practice. You may or may not face it and its root cause is unknown yet.

The issue is, although you can read and write into the FRA disk group when you retrieve information about it, it reports that it does not have any free space.

Here is the symptom. If you login as `grid` user, issue the `asmcmd` utility, and issue "`lsdg fra`" command, the output looks like the following (output truncated):

```
State    Block AU       Total_MB  Free_MB  Req_mir_free_MB  Usable_file_MB  Offline_disks  Name
MOUNTED  4096  1048576     15358        0                0               0              0  FRA/
```

The "Free_MB" is zero. Although this does not cause any issue during the database operation, it prevents the Oracle RAC One Node from being created.

If you do not have the same issue, go to the next section.

If you do have the same issue, try performing the following procedure to remedy the issue:

1. Shutdown the database
2. Login as `grid`
3. Run `asmcmd`
4. Issue the following commands:
   a. `umount fra`
   b. `mount fra`
   c. `chkdg --repair fra`
   d. `lsdg`
5. Startup the database

Creating a RAC One Node database

In this section of the practice, you will create a new Oracle RAC One Node database.

1. Start Putty and login to `srv1` as `oracle` user. In the rest of this practice, this window will be referred to as **admin window**.

2. Start RMAN and delete the archivelog files and the backupset files.

```
rman target /
DELETE ARCHIVELOG ALL;
DELETE BACKUPSET ;
```

3. Make sure that `rac` database is running on all its nodes.

```
srvctl status database -d rac
```

4. Login to the VirtualBox window of `srv1` as `oracle` user and start dbca utility.

5. Use the dbca utility to drop the `rac` database.

6. Start the dbca utility again and use it to create a RAC One Node database. Respond to the utility windows as follows:

Utility Window	Response
Database Operations	Select **Create Database**
Creation Mode	Select **Advanced Mode**
Deployment Type	Select **Oracle RAC One Node** database as the Database Type Select **Admin Managed** as the Configuration Type. Select the **General Purpose or Transaction Processing** template
Nodes Selection	Make sure all nodes are selected
Database Identification	Global Database Name: `oradb.localdomain` SID: `oradb` Service Name: `oradbsrv` **Unmark** "**Create as Container Database**"
Storage Options	In the Database files storage type: select **Automatic Storage Management (ASM)** as the Storage Type. Enter **+DATA/{DB_UNIQUE_NAME}** in the Database File Locations field (can be selected by clicking on the **Browse** button). Select **Oracle-Managed Files**

Fast Recovery Option	Select **Specify Fast Recovery Area** and enter +FRA in the Fast Recovery Area field. Storage Type: **Automatic Storage Management (ASM)** Fast Recovery Area: **+FRA** Fast Recovery Area Size: **10240** **Unmark Enable Archiving** (needless to say this is not recommended in real life scenario)
Oracle Vault Option	click on **Next** button
Configuration Options	SGA Size: **1000** PGA Size: **334**
Management Options	**Unmark** "Run Cluster Verification Utility..." **Unmark** "Configure Enterprise Manager (EM) Database Express"
User Credentials	Select "Use the same Administrative password." Enter `oracle` as the password.
Creation Options	Select **Create Database** and click **Next**
Pre-requisites Checks	Select **Ignore All**
Summary	Finish
Dialog box Upon database completion	A dialog box is displayed. Click **Exit**
Progress Page	Click on **Close** button

7. In the Putty session, using the `srvctl` oracle utility, check the database configuration and its status, and the service status.

Observe the instance name running in `srv1`.

```
srvctl status database -db oradb
srvctl config database -db oradb
srvctl status service -d oradb -s oradbsrv
```

Relocating a RAC One Node database

In this section of the practice, you will relocate the RAC One Node database from srv1 to srv2.

8. Issue the following command to view the command usage of relocating a database.

```
srvctl relocate database -help
```

9. Start a new Putty session and use it to connect to srv1 as oracle. This window will be referred to in this practice as the **monitoring window**.

10. In the **admin window**, issue the following command to perform an online database relocation from srv1 to srv2. Do not wait for the command to finish. Go to next step.

```
srvctl relocate database -db oradb -node srv2 -w 15 -v
```

11. In the **monitoring window**, issue the following command several times to monitor the progress of the migration process.

```
srvctl status database -db oradb
```

12. Continue monitoring the migration process till it is completely finished.

13. Observe the instance name running in srv2.

14. Relocate oradb database back to srv1.

```
srvctl relocate database -db oradb -node srv1 -w 10 -v
srvctl status database -db oradb
```

Converting the RAC One Node database to a RAC database

In this section of the practice, you will convert the RAC One Node database to RAC database.

15. Shut down the RAC One Node database.

```
srvctl stop database -db oradb
```

16. Issue the following command to convert the database to RAC then start the database.

Note: Remember, in real life scenario, RAC license is different from RAC One Node license.

```
srvctl convert database -db oradb -dbtype RAC
srvctl start database -db oradb
```

17. Check the status and configuration of oradb database.

Observe that the converted database is a RAC database that consists of one node.

```
srvctl status database -db oradb
srvctl config database -db oradb
```

18. Add the second instance (oradb_2) in the node srv2 to the RAC database then start it.

Observe that you can add the second node online.

```
srvctl add instance -d oradb -i oradb_2 -n srv2
srvctl start instance -d oradb -i oradb_2
```

19. Check the status and configuration of the RAC database.

```
srvctl status database -db oradb
srvctl config database -db oradb
```

20. In the VirtualBox window of srv1, issue dbca utility and remove the database.

21. Exit from the Putty sessions.

Summary

- Creating an Oracle RAC One Node database is similar to creating a full RAC database.
- It is easy to relocate a RAC One Node instance from one node to another node in the cluster.
- You can easily convert a RAC One Node database to a RAC database.