

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 archive log 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: <code>oradb.localdomain</code> SID: <code>oradb</code> Service Name: <code>oradbsrv</code> 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 <code>oracle</code> 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.

