**Practices for Lesson 11: Overview**

**Practices Overview**

In this practice, you will configure ARCHIVELOG mode for your RAC database, configure instance-specific connect strings for

RMAN, and configure persistent RMAN settings.

Practices for Lesson 11: Managing Backup and Recovery for RAC

Lab 11 - Page 2

# Practice 11-1: Configuring ARCHIVELOG Mode

### Overview

In this practice, you adjust initialization parameters in the SPFILE, and stop and start the ASM instances on local and remote nodes.

1. Open a terminal session to ol7-122-rac1 as the oracle user and set up the environment variables using the oraenv script for the database instance. Determine the instance running on ol7-122-rac1 (the local machine). Change the value of the ORACLE\_SID variable to allow local system authenticated connections.

|  |
| --- |
| [vncuser@classroom\_pc ~] **ssh oracle@ol7-122-rac1**  Password:  [oracle@ol7-122-rac1 ~]$ **. oraenv**  ORACLE\_SID = [oracle] ? **cdbrac**  The Oracle base has been set to /u01/app/oracle  [oracle@ol7-122-rac1 ~]$ **srvctl status database -db cdbrac**  Instance cdbrac1 is running on node ol7-122-rac2 Instance cdbrac2 is running on node host03 Instance cdbrac3 is running on node ol7-122-rac1  [oracle@ol7-122-rac1 ~]$ **export ORACLE\_SID=cdbrac3**  [oracle@ol7-122-rac1 ~]$ |

1. Make a local connection using operating system authentication to the database instance, and then use the archive log list SQL command to determine whether the database is in ARCHIVELOG mode. Exit SQL\*Plus when done.

|  |
| --- |
| [oracle@ol7-122-rac1 ~]$ **sqlplus / as sysdba**  SQL\*Plus: Release 12.1.0.2.0 Production on Mon Jan 13 17:24:39  2014  Copyright (c) 1982, 2014, Oracle. All rights reserved. Connected to:  Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production  With the Partitioning, Real Application Clusters, Automatic Storage Management, OLAP,  Advanced Analytics and Real Application Testing options  SQL> **archive log list**  Database log mode No Archive Mode |

Practices for Lesson 11: Managing Backup and Recovery for RAC

Lab 11 - Page 3

|  |
| --- |
| Automatic archival Disabled  Archive destination USE\_DB\_RECOVERY\_FILE\_DEST Oldest online log sequence 80  Current log sequence 81  SQL> **exit**  Disconnected from Oracle Database 12c Enterprise Edition Release  12.1.0.2.0 - 64bit Production  With the Partitioning, Real Application Clusters, Automatic Storage Management, OLAP,  Advanced Analytics and Real Application Testing options [oracle@ol7-122-rac1 ~]$ |

1. Stop the cdbrac database on each node of the cluster by using the srvctl stop database command.

|  |
| --- |
| [oracle@ol7-122-rac1 ~]$ **srvctl stop database -d cdbrac**  [oracle@ol7-122-rac1 ~]$ |

1. Verify that the cdbrac database is not running on any node of the cluster by using the

srvctl status database command.

|  |
| --- |
| [oracle@ol7-122-rac1 ~]$ **srvctl status database -d cdbrac**  [oracle@ol7-122-rac1 ~]$ |

1. Make a local connection using operating system authentication to the local database instance, and then start up the database on only the first node with the mount option.

|  |
| --- |
| [oracle@ol7-122-rac1 ~]$ **sqlplus / as sysdba**  SQL\*Plus: Release 12.1.0.2.0 Production on Thu Sep 12 06:52:26  2014  Copyright (c) 1982, 2014, Oracle. All rights reserved. Connected to an idle instance.  SQL> **startup mount**  ORACLE instance started.  Total System Global Area 1018830848 bytes Fixed Size 2295992 bytes Variable Size 427820872 bytes |

Practices for Lesson 11: Managing Backup and Recovery for RAC

Lab 11 - Page 4

|  |
| --- |
| Database Buffers 583008256 bytes Redo Buffers 5705728 bytes Database mounted.  SQL> |

1. Issue the alter database archivelog SQL command to change the archive mode of the database, and then verify the results by using the archive log list SQL command.

|  |
| --- |
| SQL> **alter database archivelog;**  Database altered. SQL> **archive log list**  Database log mode Archive Mode  Automatic archival Enabled  Archive destination USE\_DB\_RECOVERY\_FILE\_DEST Oldest online log sequence 80  Next log sequence to archive 81  Current log sequence 81  SQL> |

1. Shut down the database instance with the immediate option and exit SQL\*Plus. Use the

srvctl utility to restart the database instances on all nodes of the cluster.

|  |
| --- |
| SQL> **shutdown immediate**  ORA-01109: database not open  Database dismounted. ORACLE instance shut down. SQL> **exit**  Disconnected from Oracle Database 12c Enterprise Edition Release  12.1.0.2.0 - 64bit Production  With the Partitioning, Real Application Clusters, Automatic Storage Management, OLAP,  Advanced Analytics and Real Application Testing options  [oracle@ol7-122-rac1 ~]$ **srvctl start database -d cdbrac**  [oracle@ol7-122-rac1 ~]$ |

1. Verify that the cdbrac database is running on all the nodes of your cluster by using the

srvctl status database command.

|  |
| --- |
| [oracle@ol7-122-rac1 ~]$ **srvctl status database -d cdbrac** |

Practices for Lesson 11: Managing Backup and Recovery for RAC

Lab 11 - Page 5

# Practice 11-2: Configuring RMAN and Performing Parallel Backups

### Overview

In this practice, you will designate all instances (cdbrac1, cdbrac2) of your policy-managed database responsible for performing parallel backups of the database. The database will be backed up to the +FRA ASM disk group by default.

1. Using the recovery manager utility (RMAN), connect to the cdbrac database as the target database.

|  |
| --- |
| [oracle@ol7-122-rac1 ~]$ **rman target /**  Recovery Manager: Release 12.1.0.2.0 - Production on Thu Sep 12 09:03:24 2014  Copyright (c) 1982, 2014, Oracle and/or its affiliates. All rights reserved.  connected to target database: CDBRAC (DBID=1352492209) RMAN> |

1. Display all of the current RMAN settings.

|  |
| --- |
| RMAN> **show all;**  using target database control file instead of recovery catalog  RMAN configuration parameters for database with db\_unique\_name CDBRAC are:  CONFIGURE RETENTION POLICY TO REDUNDANCY 1; # default CONFIGURE BACKUP OPTIMIZATION OFF; # default CONFIGURE DEFAULT DEVICE TYPE TO DISK; # default CONFIGURE CONTROLFILE AUTOBACKUP OFF; # default  CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK TO  '%F'; # default  CONFIGURE DEVICE TYPE DISK PARALLELISM 1 BACKUP TYPE TO  BACKUPSET; # default  CONFIGURE DATAFILE BACKUP COPIES FOR DEVICE TYPE DISK TO 1; #  default  CONFIGURE ARCHIVELOG BACKUP COPIES FOR DEVICE TYPE DISK TO 1; #  default  CONFIGURE MAXSETSIZE TO UNLIMITED; # default CONFIGURE ENCRYPTION FOR DATABASE OFF; # default CONFIGURE ENCRYPTION ALGORITHM 'AES128'; # default  CONFIGURE COMPRESSION ALGORITHM 'BASIC' AS OF RELEASE 'DEFAULT'  OPTIMIZE FOR LOAD TRUE ; # default |

Practices for Lesson 11: Managing Backup and Recovery for RAC

Lab 11 - Page 7

|  |
| --- |
| CONFIGURE RMAN OUTPUT TO KEEP FOR 7 DAYS; # default CONFIGURE ARCHIVELOG DELETION POLICY TO NONE; # default  CONFIGURE SNAPSHOT CONTROLFILE NAME TO  '/u01/app/oracle/product/12.1.0/dbhome\_1/dbs/snapcf\_cdbrac3.f'; # default  RMAN> |

1. Configure RMAN to automatically back up the control file and server parameter file each time any backup operation is performed.

|  |
| --- |
| RMAN> **configure controlfile autobackup on;**  new RMAN configuration parameters:  CONFIGURE CONTROLFILE AUTOBACKUP ON;  new RMAN configuration parameters are successfully stored  RMAN> |

1. Configure channels to use automatic load balancing. Set parallelism to 3, and then configure the connect string.

|  |
| --- |
| RMAN> **CONFIGURE DEVICE TYPE disk PARALLELISM 3;**  new RMAN configuration parameters:  CONFIGURE DEVICE TYPE DISK PARALLELISM 3 BACKUP TYPE TO BACKUPSET;  new RMAN configuration parameters are successfully stored  RMAN> **configure channel device type disk connect = 'sys/*sys*\_*password*@cdbrac';**  new RMAN configuration parameters:  CONFIGURE CHANNEL DEVICE TYPE DISK CONNECT '\*';  new RMAN configuration parameters are successfully stored  RMAN> |

1. Open a second terminal session as the oracle user and set up the environment variables for the cdbrac database. Invoke SQL\*plus as the system user, and run the

/stage/RAC/labs/lab\_11/monitor\_rman.sql script. Do not exit the first session with the RMAN prompt or this second session with the SQL prompt.

|  |
| --- |
| [oracle@ol7-122-rac1 ~]$ **. oraenv**  ORACLE\_SID = [oracle] ? **cdbrac**  The Oracle base has been set to /u01/app/oracle |

Practices for Lesson 11: Managing Backup and Recovery for RAC

Lab 11 - Page 8

|  |
| --- |
| [oracle@ol7-122-rac1 ~]$ **export ORACLE\_SID=cdbrac3**  [oracle@ol7-122-rac1 ~]$ sqlplus / as sysdba  SQL\*Plus: Release 12.1.0.2.0 Production on Thu Sep 12 09:16:51  2014  Copyright (c) 1982, 2014, Oracle. All rights reserved.  Connected to:  Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production  With the Partitioning, Real Application Clusters, Automatic Storage Management, OLAP,  Advanced Analytics and Real Application Testing options SQL> **@/stage/RAC/labs/lab\_11/monitor\_rman.sql**  no rows selected  SQL> |

1. In the first session with the RMAN prompt, perform a full database backup with archive logs. The backup should happen only on the designated nodes (your first and second nodes) as the backup nodes. **Do not wait for this step to finish before proceeding to the next step.**

|  |
| --- |
| RMAN> **backup database plus archivelog;** |

Practices for Lesson 11: Managing Backup and Recovery for RAC

Lab 11 – Page 9

1. While the backup is in progress, rerun the query in the second terminal window to monitor the RMAN backup session progress within the cluster. The backup should be done in parallel, with work distributed to all three nodes of the cluster. Enter the slash (/) symbol and press the Enter key to rerun the query. It may be necessary to do this multiple times until the output appears. When the backup finishes, exit SQL\*Plus.

|  |
| --- |
| SQL> **/**  no rows selected SQL> /  INST\_ID SID SERIAL# CONTEXT SOFAR TOTALWORK %\_COMPLETE    1 237 45393 1 106494 139004 76.61  2 38 11464 1 53233 53369 99.75  SQL> **/**  INST\_ID SID SERIAL# CONTEXT SOFAR TOTALWORK %\_COMPLETE 3 95 42956 1 126 135040 .09 |

|  |
| --- |
| 2 38 11464 1 634 169440 .37  1 237 45393 1 25086 256000 9.8  SQL> **/**  INST\_ID SID SERIAL# CONTEXT SOFAR TOTALWORK %\_COMPLETE 3 95 42956 1 25458 135040 18.85  2 38 11464 1 14584 169440 8.61  1 237 45393 1 32638 256000 12.75  SQL> **exit**  [oracle@ol7-122-rac1 ~]$ |

1. Shut down the database using srvctl so ARCHIVELOG mode can be disabled for your RAC database.

|  |
| --- |
| [oracle@ol7-122-rac1 ~]$ **srvctl stop database -d cdbrac**  [oracle@ol7-122-rac1 ~]$ |

1. Make a local connection using operating system authentication to the local database instance, and then start up the database on only the first node with the mount option. Disable ARCHIVELOG mode with the alter database noarchivelog statement. Confirm this operation with the archive log list statement. Shut down the database and exit SQL\*Plus when finished.

|  |
| --- |
| [oracle@ol7-122-rac1 ~]$ **sqlplus / as sysdba**  SQL\*Plus: Release 12.1.0.2.0 Production on Thu Sep 12 12:30:00  2014  Copyright (c) 1982, 2014, Oracle. All rights reserved. Connected to an idle instance.  SQL> **startup mount**  ORACLE instance started.  Total System Global Area 1018830848 bytes Fixed Size 2295992 bytes Variable Size 427820872 bytes  Database Buffers 583008256 bytes  Redo Buffers 5705728 bytes Database mounted. |

Lesson 11: Managing Backup and Recovery for RAC

Lab 11 - Page 11

|  |
| --- |
| SQL> **alter database noarchivelog;**  Database altered. SQL> **archive log list**  Database log mode No Archive Mode  Automatic archival Disabled  Archive destination USE\_DB\_RECOVERY\_FILE\_DEST Oldest online log sequence 87  Current log sequence 88  SQL> **shutdown immediate;**  ORA-01109: database not open  Database dismounted. ORACLE instance shut down. SQL> **exit**  Disconnected from Oracle Database 12c Enterprise Edition Release  12.1.0.2.0 - 64bit Production  With the Partitioning, Real Application Clusters, Automatic Storage Management, OLAP,  Advanced Analytics and Real Application Testing options [oracle@ol7-122-rac1 ~]$ |

1. Use srvctl to restart your database. Ensure that all instances are up, and then exit all terminal windows.

|  |
| --- |
| [oracle@ol7-122-rac1 ~]$ **srvctl start database -d cdbrac**  [oracle@ol7-122-rac1 ~]$ **srvctl status database -d cdbrac**  [oracle@ol7-122-rac1 ~]$ |

1. Close all terminal windows opened for this practice.

Lab 11 - Page 12