Abstract

This document provides a guide for configuring backup processes and procedures specific to Oracle® Database 10g Standard Edition Real Application Clusters. The following backup process takes advantage of the new Oracle Database 10g feature; the Flash Recovery Area. The Flash Recovery Area is designed to simplify the management of Oracle Database and to improve the speed of backup and recovery processes. For a detailed understanding of Oracle Database 10g backups and Flash Recovery Area, please refer to Oracle Database 10g documentation set.

To take maximum advantage of Oracle's features for automatic managing backup and recovery, configure your database as follows:

- Use a Flash Recovery Area, to automate storage management for most backup-related files
- Run your database in ARCHIVELOG mode, so that you can perform online backups and have data recovery options such as complete and point-in-time media recovery
- Use the Flash Recovery Area as an archive log destination for your database

You must also set a number of policies governing which files are backed up, what format is used to store backups on disk, and when files become eligible for deletion from the flash recovery area.
Local Security Policy Setting Requirements

In order to successfully complete the backup process you will need to update the Local Security Policy to allow the local administrator user to log on as a batch job. To enable this option, follow the steps listed below.

1. Launch the **Local Security Settings** applet from **Start > Programs > Administrative Tools > Local Security Policy**.

2. Expand the **Local Policies** listing and select the **User Rights Assignments** listing.
3. Double click the **Log on as batch job** listing to open the **Log on as a batch job Properties** window.

![Log on as a batch job Properties window]

4. Click the **Add User or Group** button to open the Select Users or Groups window.
5. Click the **Advanced** button.
6. Click the **Find Now** button.

7. Double click on **Administrator** in the **Search Results** section.
8. Click **OK** in the **Select Users or Groups** window.

9. Click **OK** on the **Log on as a batch job Properties** window.

10. Repeat this process on each node in your cluster.
Confirming ARCHIVELOG mode

If you have followed the Dell Deployment guide documentation, your database should already be running in ARCHIVELOG mode. To confirm that your database is currently running in ARCHIVELOG mode follow these steps.

1. Launch the Enterprise Manager Database Console via a web browser.

   **URL:**  http://localhost:5500/em

2. Log in to the Enterprise Manager Database Console by specifying the SYS username and password as SYSDBA. Click Login.

   ![Login to Database](image-url)
3. If **ARCHIVELOG** mode was enabled during your initial database configuration, Archiving will be set to **Enabled** under the **High Availability** section of the **Cluster Database** home page.
Enabling **ARCHIVELOG** mode

If your database is not configured for **ARCHIVELOG** mode you must enable it before proceeding any further. Follow these steps to enable **ARCHIVELOG** mode.

1. Connect to your database with **SYSDBA** privileges.

   C:\> sqlplus sys/oracle@racdb2 as sysdba

2. Put the database in **ARCHIVELOG** mode.

   SQL> ALTER SYSTEM SET log_archive_start=TRUE SCOPE=spfile;
   SQL> ALTER SYSTEM SET log_archive_format='arch_%t_%s.arc' SCOPE=spfile;

3. Set the database for exclusive mode.

   SQL> ALTER SYSTEM SET cluster_database=FALSE SCOPE=spfile;
4. Stop the cluster database

```
C:\> srvctl stop database -d <Global_DB_SID>
```

5. Enable **ARCHIVELOG** mode.

```
C:\> set ORACLE_SID=<local_instance_id>
C:\> sqlplus / as sysdba
SQL> STARTUP MOUNT;
SQL> ARCHIVE LOG START;
SQL> ALTER DATABASE ARCHIVELOG;
SQL> ALTER DATABASE SET cluster_database=TRUE SCOPE=spfile;
SQL> SHUTDOWN IMMEDIATE;
```

6. Start the cluster database.

```
C:\> srvctl start database -d <Global_DB_SID>
```
Configuring the Flash Recovery Area

1. Launch the Enterprise Manager Database Console via a web browser.

   **URL:**  http://localhost:5500/em

2. Log in to the Enterprise Manager Database Console by specifying the **SYS** username and password as **SYSDBA**. Click **Login**.
3. In order to properly set up the database to use the Flash Recovery Area click Administration on your Cluster Database home page.

NOTE: Archiving will be set to Enabled under the High Availability section of the Oracle Cluster Database Home page if it was configured initially with ARCHIVELOG mode on.
4. Click **Initialization Parameters**.
5. Scroll down to `log_archive_dest_1`, confirm that there is no entry in this text box. If there is an entry, delete it and click **Apply**. Repeat this process on the **SPFile** listing as well.
6. Click **Cluster Database: <global_db_name>** to take you back to the **Administration** page. From here scroll down and click on one of the instances listed under the **Instances** table at the bottom of the page.
7. In order to determine the amount of physical space available for the **Flash Recovery Area**, click `<instance_name>_+ASMn` on your **Cluster Database Instance** home page.
8. Click Administration and login specifying the SYS username and password and select SYSDBA for the Connect As option. The click Login.
9. Click **FLASH**. The value for **FLASH** in the **Size (MB)** column is the total size of the **Flash Recovery Area**.

NOTE: It is recommended to use the following formula to compute the amount of space to be used for the Flash Recovery Area.

\[
\text{Flash Recovery Area} = \text{FLASH} - 5M
\]
10. Return to the **Cluster Database** home page by clicking the **Database** tab at the top right of the page. On the **Cluster Database** home page click on the **Administration** link.
11. Scroll down and enter **+FLASH** for the `db_recovery_file_dest` parameter and the amount of space you determined for the **Flash Recovery Area** in Step 9 for the `db_recovery_file_dest_size` parameter.

**NOTE:** Be sure to enter the value for the `db_recovery_file_dest_size` parameter in **megabytes**.
12. Scroll up and click **Apply** in the upper right hand corner of the page. An **Update Message** page will appear if the update is successful. Click on the **SPFile** link and repeat this process.
13. These settings can be confirmed on the **Configure Recovery Settings** page of an instance.

Click the **Cluster Database** link to return to the **Administration** page and scroll to the bottom to select an instance.
14. Click on a database instance to be taken to the **Cluster Database Instance** home page.
15. Click **Maintenance**.
16. Click **Configure Recovery Settings** link and scroll to the **Flash Recovery Area** section to confirm your settings were accepted.
Configuring Backup Settings and Policies

You can configure a number of settings and policies that determine how backups are stored, which data is backed up, how backups perform, and how long backups are retained before being purged from the recovery area. You can also configure features to improve backup performance.

1. Click on **Maintenance** on the **Cluster Database** home page.
2. Click on **Configure Backup Settings** under the **Backup/Recovery** heading.
3. Scroll to the **Host Credentials** section on the **Configure Backup Settings** page. Enter the operating system username and password. Scroll up to the **Disk Settings** section.
4. The **Disk Backup Location** is NULL so that the **Flash Recovery Area** will be used for backups. Select **Image Copy** for **Disk Backup Type**. Click **Test Disk Backup**.
5. A message will be displayed indicating the **Disk Settings** backup test was successful. Now you will configure the backup policy settings. Click the **Policy** link to access the **Policy** page.
6. Select Automatically backup the control file and server parameter file (SPFILE) with every backup and database structural change. Select Optimize the whole database backup by skipping unchanged files such as read-only and offline datafiles that have been backed up. The scroll down to the Retention Policy section.
7. Select **Retain backups that are necessary for a recovery to any time within the specified number of days (point-in-time recovery)** and accept the default of **31 days**. Click OK. You are then returned to the **Maintenance** page.
Performing a Whole Database Backup

You can back up the entire contents of your database by performing a whole database backup. Full backups of all datafiles are created. The results may be stored as image copies or as backup sets, but in either case the complete contents of all datafiles of the database are represented in the backup, as well as the control file, archived redo log and server parameter file. The database can be recovered completely with this set of files.

1. Click on the Schedule Backup link under the Backup/Recovery section of the Cluster Database Maintenance page.
2. The Schedule Backup: Strategy page appears. Select Customized from the Backup Strategy drop-down menu. Select Whole Database and enter the username and password in the Host Credentials (if they are not already entered).
Cluster Database: racdb2

Schedule Backup: Strategy

Based on your disk and/or tape configuration, Oracle provides an automated backup strategy, or you can develop your own backup strategy with customized options.

Backup Strategy: Customized

Object Type: Whole Database
- Tablespace
- Datafile
- Archivelog
- All Recovery Files on Disk

These files include all archivelog and disk backups that are not already backed up to tape.

Host Credentials
To perform a backup, supply operating system login credentials.
- Username: Administrator
- Password: **********
- Save as Preferred Credential

Backup Strategies

Oracle-suggested:
- Provides an out-of-the-box backup strategy based on the backup destination. Options may vary based on the database version.
- Sets up recovery window for backup management
- Automates backup management
- Schedules recurring backups

Customized:
- Specify the objects to be backed up
- Choose a disk or tape backup destination
- Override the default backup settings
- Schedule the backup
3. The Schedule Backup: Options page appears. Select Full Backup in the Backup Type section. Select Online Backup in the Backup Mode section. Select Also backup all archived logs on disk under the Advanced selection. Click Next.
4. The **Schedule Backup: Settings** page appears. Select **Disk** or **Tape** (whichever is appropriate for your environment). Click **Next**.
5. The **Schedule Backup: Schedule** page appears. Accept the default **Job Name**. Select **Immediately** to execute the job immediately or enter a time to execute the backup job at a later time. Click **Next**.
7. The **Status** page appears and will contain the message: **The job has been successfully submitted.** Click **OK**.
Backing Up Your Database Using the Oracle-Suggested Backup Strategy

The Oracle-suggested backup strategy is based on creating an image copy of your database which is rolled forward using RMAN incremental backups. Oracle Enterprise Manager schedules RMAN backup jobs. Follow the steps below to set up your backup schedule:

1. Click on the **Schedule Backup** link under the **Backup/Recovery** section of the **Cluster Database Maintenance** page
2. The **Schedule Backup: Strategy** page appears. Select **Oracle-suggested** from the **Backup Strategy** drop-down menu. Enter the username and password in the **Host Credentials** (if they are not already entered).
3. The **Schedule Backup: Setup** page appears. Review the information and click **Next**.
4. The **Schedule Backup: Schedule** page appears. Review the information and adjust the start date and time as needed. Click **Next**.
5. The **Schedule Backup: Review** page appears. Click **Submit Job**.
6. The **Status** page appears and will contain the message: **The job has been successfully submitted.** Click **OK**.