



Explorer Controller Suite 3.0 Backup and Restore User Guide

Overview

Purpose

This user guide provides backup and restore procedures for the Oracle RMAN (Recovery Manager) in a Cisco Explorer Controller Suite (ECS) 3.0 environment. These procedures describe how to configure and execute a backup or restore of the Oracle Real Application Clusters (Oracle RAC) database.

Audience

This document is written for system operators. Our engineers may also find this document to be useful.

Document Version

This is the first formal release of this document.

In This Document

■ Configure the Database Environment for Backup and Recovery	2
■ Create Oracle RAC Database Backups	8
■ Restore Oracle RAC Database Backups.....	10

Configure the Database Environment for Backup and Recovery

This section provides the details to configure RMAN and includes procedures for the following tasks.

- Verifying Oracle database archive mode
- Configuring Oracle database to archive mode
- Modifying the RMAN configuration file for database backups
- Creating cron jobs to automate database backups

Verifying the Oracle RAC Database Archive Mode

- 1 From a terminal window, log into the *primary* RAC VM as **root** user.
- 2 Enter the following command to switch to the **oracle** user.
`[root@ecs4rac4a ~]# su - oracle`
- 3 Enter the following command to source the **CABHE.env** environment file.
`[oracle@ecs4rac4a ~]$. /opt/oracle/CABHE.env`
- 4 Type the following command to connect to the CABHE database as **sysdba**.
`[oracle@ecs4rac4a ~]$ sqlplus / as sysdba`
- 5 Type the following command and press **Enter** to check if Oracle is in archive mode.

```
SQL> archive log list;
```

Example: Sample output when database is set to archive mode

```
Database log mode           Archive Mode
Automatic archival         Enabled
Archive destination        /oraback/CABHE/archive/
Oldest online log sequence 98
Next log sequence to archive 103
Current log sequence        103
```

Example: Sample output when database is NOT set to archive mode

```
Database log mode           No Archive Mode
Automatic archival         Disabled
Archive destination        USE_DB_RECOVERY_FILE_DEST
Oldest online log sequence 137
Current log sequence        140
Next log sequence to archive 140
```

- 6 Type **exit** and press **Enter** to exit the database.
- 7 Is the database in archive mode?
 - If **yes**, type `exit` to log out of the oracle user session and then go to *Modifying the RAC RMAN Configuration File* (on page 5).
 - If **no**, go to *Changing the Oracle RAC Database to Archive Mode* (on page 3).

Changing the Oracle RAC Database to Archive Mode

Complete the following procedure only if the database is not in archive mode.

Important: If you are working on a production database, obtain permission from your database administrator (DBA) before following this procedure.

- 1 Type the following command and press **Enter** to verify that the `/oraback` file system is mounted.

```
[oracle@ecs4rac4a ~]$ df -h
```

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/mapper/vgoh-lv_root	77G	49G	24G	62%	/
tmpfs	48G	31G	18G	64%	/dev/shm
/dev/sda1	457M	40M	394M	10%	/boot
/dev/asm/oraback_vol-244	1.0T	68G	957G	7%	/oraback

- 2 Enter the following command to verify that the resulting directory structure exists.

Command Syntax:

```
ls -l /oraback/[DataBaseName]
```

Command Example:

```
[oracle@ecs4rac4a ~]$ ls -l /oraback/CABHE
```

Permissions	Owner	Group	Size	Time	File
drwxr-xr-x. 2	oracle	dba	8192	Oct 10 2016	export
drwxr-xr-x. 6	oracle	dba	8192	Apr 13 18:04	rman
drwxr-xr-x. 2	oracle	dba	24576	Apr 20 14:27	archive

Note: The CABHE and archive directories must have oracle:dba ownership.

- 3 Type the following command and press **Enter** to source the Cluster Ready Services (CRS) environment for the Oracle server.

```
[oracle@ecs4rac4a ~]$ source /opt/oracle/CRS.env
```

- 4 Type the following command and press **Enter** to shut down the database instances.

```
[oracle@ecs4rac4a ~]$ srvctl stop database -d CABHE
```

- 5 Type the following command and press **Enter** to verify that the instances are down.

```
[oracle@ecs4rac4a ~]$ srvctl status database -d CABHE
```

Note: You should see output similar to the following.

```
Instance CABHE01 is not running on node ecs4rac4a
Instance CABHE02 is not running on node ecs4rac4b
```

- 6 Type the following command and press **Enter** to source the Oracle database environment.

Command Syntax:

```
source /opt/oracle/<SID>.env
```

Command Example:

```
[oracle@ecs4rac4a ~]$ source /opt/oracle/CABHE.env
```

- 7 Type the following command and press **Enter** to access the database as `sysdba` user.

```
[oracle@ecs4rac4a ~]$ sqlplus / as sysdba
```

Configure the Database Environment for Backup and Recovery

- 8 Type the following command and press **Enter** to start a single instance of the database.

```
SQL> startup mount;
```
- 9 Type the following command and press **Enter** to change the database to Archive mode.

```
SQL> alter database archivelog;
```
- 10 Type the following command and press **Enter** to change the configuration of the database to point to the directory location for all archives.

```
SQL> alter system set  
log_archive_dest_1='LOCATION=/oraback/CABHE/archive/';
```

Notes:

 - This procedure will establish the archive location. You should take into consideration the amount of space you might need in the future to hold all archive logs.
 - This command may fail the first time you execute it. If it does, execute the command again.
- 11 Enter the following command to start the Oracle server.

```
SQL> alter database open;
```
- 12 Type **exit** and press **Enter** to exit the database.
- 13 Type the following command and press **Enter** to restart all database instances.

```
[oracle@ecs4rac4a ~]$ srvctl start database -d CABHE
```
- 14 Type the following command and press **Enter** to check the database status. An instance should be running on both servers.

```
[oracle@ecs4rac4a ~]$ srvctl status database -d CABHE
```

Note: You should see output similar to the following.

```
Instance CABHE01 is running on node ecs4rac4a  
Instance CABHE02 is running on node ecs4rac4b
```
- 15 Type the following command and press **Enter** to verify that the database is in Archive mode.

```
[oracle@ecs4rac4a ~]$ sqlplus / as sysdba  
SQL> archive log list;
```
- 16 Does the output show that the database log mode is set to Archive mode?
 - If **yes**, go to Step 17.
 - If **no**, repeat this procedure. If the database still does not set the database log mode to Archive mode, contact Cisco Services for assistance.
- 17 Type **exit** and press **Enter** to exit the database.
- 18 Type **exit** and press **Enter** to log out as the oracle user. You are returned to the root user session.

Modifying the RAC RMAN Configuration File

Before running RMAN backups, you must copy and edit the CABHE.rman.config file.

Important: You must complete this procedure on both Oracle RAC nodes.

- 1 On the *primary* RAC node, enter the following command to see if the **CABHE.rman.config** file exists in the **/opt/nds/ora_rman/etc** directory.


```
[root@ecs4rac4a ~]# ls -ltr /opt/nds/ora_rman/etc | grep CABHE.*
```
- 2 Was the **CABHE.rman.config** file present?
 - If **no**, go to the next step.
 - If **yes**, go to Step 4.
- 3 On the *primary* RAC node, type the following command and press **Enter** to copy the **CABHE.rman.config** file to the **/opt/nds/ora_rman/etc** directory.


```
[root@ecs4rac4a ~]# cp /opt/nds/ora_rman/docs/sample/CABHE.rman.config /opt/nds/ora_rman/etc
```
- 4 Edit the **/opt/nds/ora_rman/etc/CABHE.rman.config** file in a text editor and set the following fields to the values shown below.

Notes:

- If you have backed up a previous version of the CABHE.rman.config file, use it as a reference for the values shown below.
- Keep the double quotes.

```
SID_NAME= "CABHE01"
BACKUP_VERSIONS="3"
TRANSFER_TO_STANDBY="N"
DIRECTORY_LOC_BACKUP="/oraback/CABHE/rman"
DIRECTORY_LOC_LOG==" /opt/nds/ora_rman/log"
```

- 5 Save and close the file.
- 6 From a terminal window, log into the *secondary* RAC node as **root** user.
- 7 Repeat Steps 1 through 5, however, define the fields in the **/opt/nds/ora_rman/etc/CABHE.rman.config** file with the following values.

Note: Although Step 1 states the primary RAC node, you will execute the step on the *secondary* RAC node.

```
SID_NAME= "CABHE02"
BACKUP_VERSIONS="3"
TRANSFER_TO_STANDBY="N"
DIRECTORY_LOC_BACKUP="/oraback/CABHE/rman"
DIRECTORY_LOC_LOG==" /opt/nds/ora_rman/log"
```

Deleting the Oracle Database Export cron Entries on Each RAC Node

Note: RMAN scripts replace the Oracle database export utility.

Complete this procedure to check for the presence of the database export cron entries. If cron entries are present, follow the steps in the procedure to remove them.

- 1 As **root** user on the *primary* RAC node, type the following command and press **Enter** to verify that the database export cron entries are present.

```
[root@ecs4rac4a ~]# ls -l /etc/cron.daily/
```

Example output:

```
total 32
lrwxrwxrwx. 1 root root 58 Dec 17 18:24 29-ora_cron_bkCABHE01.sh -> /opt/nds/mgdb_cabhe_cabhe01/ut
ils/29-ora_cron_bkCABHE01.sh
lrwxrwxrwx. 1 root root 54 Dec 17 18:16 29-ora_cron_bkCABHE.sh -> /opt/nds/mgdb_cabhe_cabhe/utills/
29-ora_cron_bkCABHE.sh
lrwxrwxrwx. 1 root root 46 Dec 17 17:38 90-Oracle-clean.sh -> /opt/nds/custom_tools/utills/90-Oracl
e-clean.sh
-rwxr-xr-x. 1 root root 118 Aug 7 2013 cups
-rwxr-xr-x. 1 root root 196 May 28 2013 logrotate
-rwxr-xr-x. 1 root root 905 Nov 16 2012 makewhatis.cron
-rwxr-xr-x. 1 root root 174 Sep 24 2012 mlocate.cron
-rwxr-xr-x. 1 root root 2126 Jul 19 2013 prelink
-rwxr-xr-x. 1 root root 563 Oct 21 2013 readahead.cron
-rwx----- 1 root root 256 Oct 16 2013 rhsm
-rwxr-xr-x. 1 root root 365 Oct 16 2009 tmpwatch
```

- 2 Does the output show any **29-ora_cron** entries (i.e. the first two entries)?
 - If **yes**, remove the entries using the following command.

```
[root@ecs4rac4a ~]# rm -f /etc/cron.daily/29-ora_cron*
```
 - If **no**, go to the next step.
- 3 Have you completed this procedure on both RAC nodes?
 - If **yes**, go to the next procedure in this document.

If **no**, repeat Steps 1 through 2 in a terminal window on the secondary RAC node.

Note: Although Step 1 states the primary RAC node, you will execute this step on the *secondary* RAC node.

Creating RMAN cron Entries on Each RAC Node

Note: RMAN scripts replace the Oracle database export utility.

Complete the following procedure on each RAC node to create the rman cron jobs.

Important: You must execute this procedure on both RAC nodes.

- 1 As **root** user on the *primary* RAC node, type the following command and press **Enter** to edit the root crontab file.

```
[root@ecs4rac4a ~]# crontab -e
```

Configure the Database Environment for Backup and Recovery

2 Add the following two cron jobs to the file.

```
# Perform full database backup at 2 AM every Sunday
0 2 * * 0 /opt/nds/ora_rman/utils/ora_rman_wrapper.sh - f
CABHE > /opt/nds/ora_rman/log/full_database_backup_cron.out
2>&1

# Perform differential database backup at 2AM every other
day of week
0 2 * * 1-6 /opt/nds/ora_rman/utils/ora_rman_wrapper.sh -d
CABHE > /opt/nds/ora_rman/log/diff_database_backup_cron.out
2>&1
```

3 Save and close the file.

4 Have you completed this procedure on both RAC nodes?

- If **yes**, go to the next procedure in this document.
- If **no**, repeat Steps 1 through 3 on the *secondary* RAC node.

Note: Although Step 1 states the primary RAC node, you will execute this step on the *secondary* RAC node.

Create Oracle RAC Database Backups

Oracle RAC Full Database Backup

This section describes how to perform a full backup of the Oracle RAC database.

Important: You should have completed all of the procedures in this document to this point. If you have not, go back and complete the steps in each section before continuing with this procedure.

- 1 As **root** user on the *primary* Oracle RAC VM, type the following command and press **Enter** to manually create a full database backup.

```
[root@ecs4rac4a ~]#
/opt/nds/ora_rman/utlils/ora_rman_wrapper.sh -f CABHE >
/opt/nds/ora_rman/log/full_database_backup.out
```

- 2 When the backup completes, type the following command and press **Enter** to review the backup log.

```
[root@ecs4rac4a ~]# less
/opt/nds/ora_rman/log/full_database_backup.out
```

Example: Output from the log after a successful backup

```
Starting Full Backup
Thu Apr 20 14:18:36 Full Backup has started on <HOSTNAME>
-----
You can monitor progress on Log file /opt/nds/ora_rman/log/CABHE_backup_Full_20-Apr-2017.log
-----
Thu Apr 20 14:19:55 Backup has completed successfully.
```

- 3 Enter the following command to list the contents of the `/oraback/CABHE/rman/full_backup` directory and verify that the full backup is present.

```
[root@ecs4rac4a ~]# ls -l /oraback/CABHE/rman/full_backup
```

```
-rw-r----- 1 oracle dba 1114963968 Apr 20 18:47 data_20170420_CABHE_s72941827622_p1_Full
-rw-r----- 1 oracle dba 779517952 Apr 20 18:47 data_20170420_CABHE_s73941827630_p1_Full
-rw-r----- 1 oracle dba 1089536 Apr 20 18:47 data_20170420_CABHE_s74941827637_p1_Full
-rw-r----- 1 oracle dba 1089536 Apr 20 18:47 data_20170420_CABHE_s75941827638_p1_Full
-rw-r----- 1 oracle dba 1089536 Apr 20 18:47 data_20170420_CABHE_s76941827639_p1_Full
-rw-r----- 1 oracle dba 1089536 Apr 20 18:47 data_20170420_CABHE_s77941827640_p1_Full
-rw-r----- 1 oracle dba 1089536 Apr 20 18:47 data_20170420_CABHE_s78941827641_p1_Full
-rw-r----- 1 oracle dba 1089536 Apr 20 18:47 data_20170420_CABHE_s79941827642_p1_Full
-rw-r----- 1 oracle dba 1089536 Apr 20 18:47 data_20170420_CABHE_s80941827644_p1_Full
-rw-r----- 1 oracle dba 423297024 Apr 20 18:47 data_20170420_CABHE_s81941827645_p1_Full
-rw-r----- 1 oracle dba 129449984 Apr 20 18:47 data_20170420_CABHE_s82941827648_p1_Full
-rw-r----- 1 oracle dba 7208960 Apr 20 18:47 data_20170420_CABHE_s83941827649_p1_Full
-rw-r----- 1 oracle dba 270745600 Apr 20 18:47 data_20170420_CABHE_s84941827650_p1_Full
-rw-r----- 1 oracle dba 2195456 Apr 20 18:47 data_20170420_CABHE_s85941827653_p1_Full
-rw-r----- 1 oracle dba 10452992 Apr 20 18:47 data_20170420_CABHE_s86941827655_p1_Full
```

Oracle RAC Until Time Database Backup

This section describes how to perform an until time (differential) backup of the Oracle RAC database.

Important: You should have completed all of the procedures in this document to this point. If you have not, go back and complete the steps in each section before continuing with this procedure.

- 1 As **root** user on the *primary* RAC node, type the following command and press **Enter** to manually create an until time database backup.

```
[root@ecs4rac4a ~]#
/opt/nds/ora_rman/utills/ora_rman_wrapper.sh -d CABHE >
/opt/nds/ora_rman/log/diff_database_backup.out
```

- 2 Type the following command and press **Enter** to check for errors in the backup log.

```
[root@ecs4rac4a ~]# less
/opt/nds/ora_rman/log/diff_database_backup.out
```

Example Output on Success:

```
Starting Diff Backup
Thu Apr 20 18:54:00 Differential Backup has started on <HOSTNAME>
=====
You can monitor progress on Log file /opt/nds/ora_rman/log/CABHE_backup_Diff_20-Apr-2017.log
=====
Thu Apr 20 18:54:53 Differential Backup has completed successfully
```

- 3 Enter the following command to list the contents of the `/oraback/CABHE/rman/diff_backup` directory and to verify that the "until time" backup file is present.

```
[root@ecs4rac4a ~]# ls -ltr /oraback/CABHE/rman/diff_backup
-rw-r----- 1 oracle dba 737280 Apr 20 18:54 data_20170420_CABHE_s89941828057_p1_Diff
-rw-r----- 1 oracle dba 221184 Apr 20 18:54 data_20170420_CABHE_s90941828064_p1_Diff
-rw-r----- 1 oracle dba 40960 Apr 20 18:54 data_20170420_CABHE_s91941828068_p1_Diff
-rw-r----- 1 oracle dba 40960 Apr 20 18:54 data_20170420_CABHE_s92941828069_p1_Diff
-rw-r----- 1 oracle dba 40960 Apr 20 18:54 data_20170420_CABHE_s93941828070_p1_Diff
-rw-r----- 1 oracle dba 40960 Apr 20 18:54 data_20170420_CABHE_s94941828071_p1_Diff
-rw-r----- 1 oracle dba 40960 Apr 20 18:54 data_20170420_CABHE_s95941828072_p1_Diff
-rw-r----- 1 oracle dba 40960 Apr 20 18:54 data_20170420_CABHE_s96941828073_p1_Diff
-rw-r----- 1 oracle dba 40960 Apr 20 18:54 data_20170420_CABHE_s97941828074_p1_Diff
-rw-r----- 1 oracle dba 630784 Apr 20 18:54 data_20170420_CABHE_s98941828076_p1_Diff
-rw-r----- 1 oracle dba 393216 Apr 20 18:54 data_20170420_CABHE_s99941828079_p1_Diff
```

Restore Oracle RAC Database Backups

Oracle RAC Full Restore

This section describes how to restore a database archive to your Oracle RAC node.

Important: This section assumes that all ECS processes have been shut down. No applications should be accessing the database at the time of the restore.

- 1 Log into each each of the following VMs and shut them down in the the order shown below.

- ECS 1
- ECS 2
- VCS Console 1
- VCS Console 2

- 2 Log into the *primary* Oracle RAC server as **root** user.

- 3 Enter the following command to switch to **oracle** user.

```
[root@ecs4rac4a ~]# su - oracle
```

- 4 Enter the following command to source the CRS environment for the Oracle server.

```
[oracle@ecs4rac4a ~]$ source /opt/oracle/CRS.env
```

- 5 Enter the following command to check the status of the database. Both instances should be running.

```
[oracle@ecs4rac4a ~]$ srvctl status database -d CABHE
```

Expected output:

```
Instance CABHE01 is running on node ecs4rac4a
Instance CABHE02 is running on node ecs4rac4b
```

- 6 Enter the following command and press **Enter** to shut down the database instances.

```
[oracle@ecs4rac4a ~]$ srvctl stop database -d CABHE
```

- 7 Enter the following command to check that the instances are not running.

```
[oracle@ecs4rac4a ~]$ srvctl status database -d CABHE
```

Expected output:

```
Instance CABHE01 is not running on node ecs4rac4a
Instance CABHE02 is not running on node ecs4rac4b
```

- 8 Type **exit** and press **Enter** to log out of the oracle user session.

- 9 Run the following script to execute a full restore of the database.

```
[root@ecs4rac4a ~]#
/opt/nds/rac_ora_rman/utils/full_restore.sh -f CABHE | tee
/opt/nds/rac_ora_rman/log/restore_full_database_backup.out
```

- 10 If you receive the following message, press **Enter** to continue.

Important: This procedure overwrites any database on the system with same name.

```

=====
WARNING: Be Careful! This script will override all existing Database files that may exist.
If the database is an Oracle RAC database, then first verify that all of its instances on its nodes
are DOWN.
+++++
Note:   Press Control C to exit
        Press ENTER   to continue
=====

```

- 11 Was the database restore successful?

- If **yes** and the following message displayed, go to *Successful Oracle RAC Full Restore* (on page 11).

```

=====
The Database Restoration has completed successfully!
""
Important:
-----
Run FULL BACKUP before start working with Database.
-----
For Oracle RAC databases it is now necessary to startup all
additional Instances.
=====

```

- If **no** and the following message displayed, go to *Failed Oracle RAC Full Restore* (on page 12).

```

=====
ERROR: The Database Restoration procedure has FAILED!
Action: Contact your Oracle DBA Oracle
=====

```

Successful Oracle RAC Full Restore

Complete the following procedure to restart the database for all instances.

- 1 Enter the following command to switch to the **oracle** user.


```
[root@ecs4rac4a ~]# su - oracle
```
- 2 Enter the following command to source the CRS environment for the Oracle server.


```
[oracle@ecs4rac4a ~]$ source /opt/oracle/CRS.env
```
- 3 Type the following command and press **Enter** to restart the Oracle instances.


```
[oracle@ecs4rac4a ~]$ srvctl start database -d CABHE
```
- 4 Verify that the expected data has been restored.
- 5 Power on the following VMs in the order shown below.
 - VCS Console 1
 - VCS Console 2
 - ECS 1
 - ECS 2

Restore Oracle RAC Database Backups

Failed Oracle RAC Full Restore

If the database restoration failed, contact the following resources for assistance.

- Database administrator (DBA)
- Cisco support

Note: Do not start the Oracle server service until the database has been properly restored.

Oracle RAC Until Time Restore

This section describes how to perform an until time restoration of the Oracle RAC database.

Important:

- This section assumes that all ECS processes have been shut down. No applications should be accessing the database at the time of restore.
 - After performing a successful until time restore, you must perform a full database backup.
- 1 Log into each the following VMs and shut them down in the order shown below.
 - ECS 1
 - ECS 2
 - VCS Console 1
 - VCS Console 2

- 2 Log into the *primary* Oracle RAC server as **root** user.

- 3 Enter the following command to switch to the **oracle** user.

```
[root@ecs4rac4a ~]# su - oracle
```

- 4 Execute the following command to source the CRS environment for the Oracle server.

```
[oracle@ecs4rac4a ~]$ source /opt/oracle/CRS.env
```

- 5 Check the status of the database instances. Both instances should be running.

```
[oracle@ecs4rac4a ~]$ srvctl status database -d CABHE
```

```
Instance CABHE01 is running on node ecs4rac4a  
Instance CABHE02 is running on node ecs4rac4b
```

- 6 Enter the following command to shut down the database instances.

```
[oracle@ecs4rac4a ~]$ srvctl stop database -d CABHE
```

- 7 Enter the following command to verify that the instances are down.

```
[oracle@ecs4rac4a ~]$ srvctl status database -d CABHE
```

Expected output:

```
Instance CABHE01 is not running on node ecs4rac4a  
Instance CABHE02 is not running on node ecs4rac4b
```

- 8 Type **exit** and press **Enter** to log out of the oracle user session.
- 9 Type the following command to execute the restore script.

```
[root@ecs4rac4a ~]# /opt/nds/ora_rman/utils/run_full_restore.sh -t CABHE | tee /opt/nds/ora_rman/log/diff_database_restore.out
```

- 10 If you receive the following message, press **Enter** to continue.
Important: This procedure overwrites any database on the system with same name.

```
=====
WARNING: Be Careful! This script will override all existing Database files that may exist.
If the database is an Oracle RAC database, then first verify that all of its instances on its nodes
are DOWN.
+++++
Note:   Press Control C to exit
        Press ENTER   to continue
=====
```

- 11 When you receive the second message, press **Enter** again to continue. You will be prompted to enter the date and time for the database restoration.

```
=====
Important:
-----
When inputting a Date and Time for Database Restoration always specify exactly
4 digits for the year
2 digits for the month
2 digits for the day
2 digits for the hour, based upon a 24 hour clock
2 digits for the minute
2 digits for the second

Use leading zeros as required
=====
Please enter the year for the restoration (YYYY):
```

- 12 Respond to the following prompts and press **Enter** after typing each response.
 - a **Restoration year** – enter the year in the YYYY format
 - b **Month for the restoration** – enter the month in the MM format
 - c **Day for the restoration** – enter the day in the DD format
 - d **Until what hour for the restoration** – enter the hour in a two-digit 24-hour format
 - e **Until what minute for the restoration** – enter the minutes in a two-digit format
 - f **Until what second for the restoration** – enter the seconds in a two-digit format

Example output:

```
=====
Verification:
-----
The restoration process will start restoring the database UPC until
20/03/2012 22:10:10
DD/MM/YYYY HH:MI:SS

In order to EXIT from this script, press Control C
In order to continue with the restoration, press ENTER
=====
```

Restore Oracle RAC Database Backups

13 If everything is correct, press **Enter** to continue.

14 Was the until time restoration successful?

- If **yes** and the following output displayed, go to *Successful Until Time Restore* (on page 14).

```
=====
The Database Restoration has completed successfully!
""
Important:
-----
Run FULL BACKUP before start working with Database.
-----
For Oracle RAC databases it is now necessary to startup all additional Instances.
=====
```

- If **no** and the following output displayed, go to *Failed Until Time Restore* (on page 14).

```
=====
ERROR: The restoration process has failed
CAUSE: No backup files prior to DD/MM/YYYY HH:MI:SS have been found
ACTION: Specify a date which is covered by the existing backup files or Plape the appropriate
backup files in the location specified by the parameter DIRECTORY_LOC_BACKUP which is found in
the configuration file
$ETC_DIR/$DATABASE_NAME.rman.config
=====
```

Successful Until Time Restore

Complete the following procedure to restart your database for all instances.

- 1 Enter the following command to switch to the **oracle** user.
[root@ecs4rac4a ~]# su - oracle
- 2 Enter the following command to source the CRS environment for the Oracle server.
[oracle@ecs4rac4a ~]\$ source /opt/oracle/CRS.env
- 3 Type the following command and press **Enter** to restart the Oracle instances.
[oracle@ecs4rac4a ~]\$ srvctl start database -d CABHE
- 4 Verify the expected data has been restored.
- 5 Power on the following VMs in the order shown below.
 - VCS Console 1
 - VCS Console 2
 - ECS 1
 - ECS 2
- 6 Go to *Oracle RAC Full Database Backup* (on page 8) to execute a full database backup.

Failed Until Time Restore

If the database restoration failed, contact the following resources for assistance.

- Database administrator (DBA)
- Cisco support

Note: Do not start the Oracle server service until the database has been properly restored.

For Information

If You Have Questions

If you have technical questions, contact Cisco Services for assistance. Follow the menu options to speak with a service engineer.



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