# Practices for Lesson 18: Performing Additional Recovery Operations

Practices for Lesson 18: Overview

Overview

In these practices, you will recover from a number of different database failures. It is highly recommended to complete those that you start, because earlier ones affect practices that follow.

Practice 18-1: Recovering from the Loss of a Parameter File

Overview

In this practice, you will create an issue by deleting the initorclcdb.ora parameter file. After creating the issue, you must restore the parameter file.

Assumptions

A full backup of the database exists. Autobackup of the control file and SPFILE is assumed to be configured in the fast recovery area.

You have two terminal windows open in which you are logged in as the oracle OS user,

$HOME/labs/DBMod\_Recovery is the current directory, and environment variables point to the orclcdb database instance.

Tasks

Prepare for this practice by executing the setup\_06\_01.sh script from the

$HOME/labs/DBMod\_Recovery directory. This script:

Creates a new tablespace and user

As the new user creates a table and populates it

Performs a backup of the tablespace and then updates the table

Saves its output in the /tmp/setup.log file

Cause a failure in the database by executing the break\_06\_01.sh script from the

$HOME/labs/DBMod\_Recovery directory. The script saves its output in the

/tmp/break.log file.

Attempt to start the database instance. Notice the error messages. Exit from SQL\*Plus.

Start the database by using RMAN.

$ rman target "'/ as sysbackup'"

…

connected to target database (not started)

RMAN> **startup;**

startup failed: ORA-01078: failure in processing system parameters

LRM-00109: could not open parameter file '/u01/app/oracle/product/19.3.0/dbhome\_1/dbs/initorclcdb.ora'

starting Oracle instance without parameter file for retrieval of spfile

Oracle instance started RMAN-00571:

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RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS

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RMAN-00571:

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RMAN-03002: failure of startup command at 07/01/2019 16:25:01

ORA-00205: error in identifying control file, check alert log for more info

RMAN>

**Note:** The database has been started with a dummy parameter file to allow the SPFILE to be restored.

Restore the SPFILE. Because the database has been started with a dummy parameter file, the location of the autobackup must be specified. In this case, you are using the recovery area and DB\_NAME options to specify where the autobackups can be found.

Shut down the database instance and restart it with the restored SPFILE.

In your second terminal window, execute the cleanup\_06\_01.sh script to clean up from this practice. The script saves its output in the /tmp/cleanup.log file.

Return to the RMAN terminal session. In preparation for the next practice, back up your orclcdb database, remove obsolete backups, and ensure that no failures are listed. Then exit from RMAN.

**Note:** Expect substantial output from the backup and delete commands.

Practice 18-2: Restoring the Control File

Overview

In this practice, you first create an issue for recovery by deleting the control02.ctl control file. After creating the issue, you *must* restore this single "lost" control file.

Assumptions

A full backup of the database is available. Autobackup of the control file and SPFILE to the fast recovery area is configured.

You have two terminal windows open in which you are logged in as the oracle OS user,

$HOME/labs/DBMod\_Recovery is the current directory, and environment variables point to the orclcdb database instance.

Tasks

Prepare for this practice by executing the setup\_06\_02.sh script from the

$HOME/labs/DBMod\_Recovery directory. This script creates a new tablespace and user. As the new user, the script creates a table and populates it. The script creates a backup of the tablespace, and then updates the table.

The script saves its output in the /tmp/setup.log file. You can view this log file while the script executes.

Cause a failure in the database by executing the break\_06\_02.sh script from the

$HOME/labs/DBMod\_Recovery directory. The script saves its output in the

/tmp/break.log file.

Attempt to start the database. Review the error messages. Then exit SQL\*Plus.

Use adrci to view the orclcdb/orclcdb alert log. Scroll to the most recent entries to see the errors from this practice. The list of diagnostic homes may vary. Select the home for orclcdb/orclcdb (*option 2* in this example). Your option number may be different.

$ **adrci**

…

adrci> **set editor gedit**

adrci> **show alert**

Choose the home from which to view the alert log:

1: diag/rdbms/dummy/orclcdb

2: diag/rdbms/**orclcdb**/**orclcdb**

3: diag/rdbms/ubff\_pitr\_orclpdb1\_orclcdb/uBFF

4: diag/rdbms/rcatcdb/rcatcdb

5: diag/tnslsnr/edvmr1p0/listener Q: to quit

Please select option: **2**

/\* Scroll to bottom of the file in gedit to see the following \*/

…

ALTER DATABASE MOUNT

ORA-00210: cannot open the specified control file ORA-00202: control file:

'/u01/app/oracle/fast\_recovery\_area/ORCLCDB/control02.ctl' ORA-27037: unable to obtain file status

Linux-x86\_64 Error: 2: No such file or directory Additional information: 7

ORA-205 signalled during: ALTER DATABASE MOUNT...

Errors in file

/u01/app/oracle/diag/rdbms/orclcdb/orclcdb/trace/orclcdb\_mz00\_76 15.trc:

ORA-00202: control file: '/u01/app/oracle/fast\_recovery\_area/ORCLCDB/control02.ctl'

ORA-27037: unable to obtain file status

Linux-x86\_64 Error: 2: No such file or directory Additional information: 7

2019-07-01 17:28:25.169000 +00:00

Checker run found 1 new persistent data failures 2018-07-25 19:52:00.135000 +00:00

Close the gedit window by clicking the close window icon (x) and then exit adrci.

Check the Data Recovery Advisor for a solution. Preview the suggested solution before executing it.

Log in to RMAN and run the LIST FAILURE command.

Run the ADVISE FAILURE command.

Run the REPAIR FAILURE PREVIEW command.

Restore the control file. You can either execute the commands via the RMAN command line, or use the REPAIR FAILURE command to perform the task for you.

**Note:** Any existing copy of the control file can be used to restore the missing copy. Enter Y or YES when prompted to execute the repair and to open the database.

Use the LIST FAILURE command to verify that the failure has been repaired.

In your second terminal window, clean up the practice environment by running the

cleanup\_06\_02.sh script. The script saves its output in the /tmp/cleanup.log file.

Return to the RMAN terminal session. In preparation for the next practice, back up your

orclcdb database, remove obsolete backups, and ensure that no failures are listed.

Practice 18-3: Recovering from the Loss of All Control Files

Overview

In this practice, you create an issue by removing control files. After creating the issue, you must restore the control files.

Assumptions

A full backup of the database is available. Autobackup of the control file and SPFILE is configured.

You have two terminal windows open in which you are logged in as the oracle OS user,

$HOME/labs/DBMod\_Recovery is the current directory, and environment variables point to the orclcdb database instance.

Tasks

Prepare for this practice by executing the setup\_06\_03.sh script from the

$HOME/labs/DBMod\_Recovery directory. This script creates a new tablespace and user. As the new user, the script creates a table and populates it. The script creates a backup of the tablespace, and then updates the table.

The script saves its output in the /tmp/setup.log file. You can view this log file while the script executes.

Cause a failure in the database by executing the break\_06\_03.sh script from the

$HOME/labs/DBMod\_Recovery directory. The script saves its output in the

/tmp/break.log file.

Log in to SQL\*Plus and attempt to start the database. Notice the error message. Exit from SQL\*Plus.

View the alert log (*option* 2 in this example). Your option number may be different. Scroll to the most recent entries to see the errors from this practice.

$ **adrci**

…

ADR base = "/u01/app/oracle" adrci> **set editor gedit** adrci> **show alert**

Choose the home from which to view the alert log:

1: diag/rdbms/dummy/orclcdb

2: diag/rdbms/**orclcdb**/**orclcdb**

3: diag/rdbms/ubff\_pitr\_orclpdb1\_orclcdb/uBFF

4: diag/rdbms/rcatcdb/rcatcdb

5: diag/tnslsnr/edvmr1p0/listener Q: to quit

Please select option: **2**

/\* Scroll to bottom of the file in gedit to see the following \*/

…

ORA-00202: control file: '/u01/app/oracle/controlfiles\_dir/ORCLCDB/control03.ctl'

ORA-27037: unable to obtain file status

Linux-x86\_64 Error: 2: No such file or directory Additional information: 7

ORA-00210: cannot open the specified control file

ORA-00202: control file: '/u01/app/oracle/fast\_recovery\_area/ORCLCDB/control02.ctl'

ORA-27037: unable to obtain file status

Linux-x86\_64 Error: 2: No such file or directory Additional information: 7

ORA-00210: cannot open the specified control file

ORA-00202: control file: '/u01/app/oracle/oradata/ORCLCDB/control01.ctl'

ORA-27037: unable to obtain file status

Linux-x86\_64 Error: 2: No such file or directory Additional information: 7

Checker run found 3 new persistent data failures

**Note:** There are three failures, all control files are missing.

Exit from viewing the alert log by clicking the "x" icon to close the gedit window. Exit

adrci by entering Q, and then exit.

Use the RMAN LIST FAILURE and ADVISE FAILURE commands to determine the failures and proposed solutions.

$ rman target "'/ as sysbackup'"

…

connected to target database: ORCLCDB (not mounted)

RMAN> **list failure;**

using target database control file instead of recovery catalog List of Database Failures

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Failure ID Priority Status Time Detected Summary

4030 CRITICAL OPEN 02-JUL-19 Control file

/u01/app/oracle/controlfiles\_dir/ORCLCDB/control03.ctl is missing

4035 CRITICAL OPEN 02-JUL-19 Control file

/u01/app/oracle/fast\_recovery\_area/ORCLCDB/control02.ctl is missing

4032 CRITICAL OPEN 02-JUL-19 Control file

/u01/app/oracle/oradata/ORCLCDB/control01.ctl is missing

RMAN> **advise failure;**

List of Database Failures

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Failure ID Priority Status Time Detected Summary

4030 CRITICAL OPEN 02-JUL-19 Control file

/u01/app/oracle/controlfiles\_dir/ORCLCDB/control03.ctl is missing

4035 CRITICAL OPEN 02-JUL-19 Control file

/u01/app/oracle/fast\_recovery\_area/ORCLCDB/control02.ctl is missing

4032 CRITICAL OPEN 02-JUL-19 Control file

/u01/app/oracle/oradata/ORCLCDB/control01.ctl is missing

analyzing automatic repair options; this may take some time allocated channel: ORA\_DISK\_1

channel ORA\_DISK\_1: SID=237 device type=DISK analyzing automatic repair options complete

Mandatory Manual Actions

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no manual actions available

Optional Manual Actions

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If file

/u01/app/oracle/controlfiles\_dir/ORCLCDB/control03.ctl was unintentionally renamed or moved, restore it

If file

/u01/app/oracle/fast\_recovery\_area/ORCLCDB/control02.ctl was unintentionally renamed or moved, restore it

If file /u01/app/oracle/oradata/ORCLCDB/control01.ctl was unintentionally renamed or moved, restore it

If this is a standby database, restore the controlfile for a standby database using RESTORE STANDBY CONTROLFILE FROM AUTOBACKUP command

If this is a primary database and a standby database is available, then perform a Data Guard failover initiated from the standby

Automated Repair Options

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Option Repair Description

1 Restore a backup control file

Strategy: The repair includes complete media recovery with no data loss

Repair script:

/u01/app/oracle/diag/rdbms/orclcdb/orclcdb/hm/reco\_1494177699.hm

RMAN>

Review the commands generated by the REPAIR FAILURE PREVIEW command.

One option now would be to use the automated recovery command REPAIR FAILURE. However, doing so introduces new failures, such that you would subsequently need to run these RMAN commands in a series, repeated as needed to correct the failures:

LIST FAILURE;

ADVISE FAILURE;

REPAIR FAILURE PREVIEW; REPAIR FAILURE;

So to avoid going through the above steps repeatedly with the Data Recovery Advisor, follow steps 8 through 11 of this practice exactly as described.

Use the RMAN command line to restore the control files and mount the database.

Attempt to open the database.

**Question:** Why is RESETLOGS necessary?

**Answer:** RESETLOGS is required because the SCN in the restored control file does not match the SCN recorded in the data files.

Attempt to open the database with the RESETLOGS option.

**Question:** Why did the database open still fail with the RESETLOGS option?

**Answer:** The SCN in the control file is older than the SCN in the data files and the data files have not been restored with the UNTIL cause. The database needs to be recovered so that the control file can be synchronized with the data files.

Recover the database.

RMAN> **recover database;**

Starting recover at 02-JUL-19

Starting implicit crosscheck backup at 02-JUL-19 allocated channel: ORA\_DISK\_1

channel ORA\_DISK\_1: SID=258 device type=DISK Crosschecked 12 objects

Finished implicit crosscheck backup at 02-JUL-19

Starting implicit crosscheck copy at 02-JUL-19 using channel ORA\_DISK\_1

Finished implicit crosscheck copy at 02-JUL-19

searching for all files in the recovery area cataloging files...

cataloging done

List of Cataloged Files

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File Name:

/u01/app/oracle/fast\_recovery\_area/ORCLCDB/autobackup/2019\_07\_01

/o1\_mf\_s\_1012509894\_gknw675v\_.bkp File Name:

/u01/app/oracle/fast\_recovery\_area/ORCLCDB/archivelog/2019\_07\_02

/o1\_mf\_1\_6\_gkp095or\_.arc File Name:

/u01/app/oracle/fast\_recovery\_area/ORCLCDB/8C28E6F854EB7DBBE0536

210ED0AFDD9/datafile/o1\_mf\_bartbs\_gkpv2ngh\_.dbf

using channel ORA\_DISK\_1

starting media recovery

archived log for thread 1 with sequence 6 is already on disk as file

/u01/app/oracle/fast\_recovery\_area/ORCLCDB/archivelog/2019\_07\_02

/o1\_mf\_1\_6\_gkp095or\_.arc

archived log for thread 1 with sequence 7 is already on disk as file

/u01/app/oracle/fast\_recovery\_area/ORCLCDB/onlinelog/redo1a.log archived log file name=/u01/app/oracle/fast\_recovery\_area/ORCLCDB/archivelog/2019\_

07\_02/o1\_mf\_1\_6\_gkp095or\_.arc thread=1 sequence=6

archived log file name=/u01/app/oracle/fast\_recovery\_area/ORCLCDB/onlinelog/redo1a

.log thread=1 sequence=7

Open the database with RESETLOGS.

Use the LIST FAILURE command to verify that the failure has been repaired.

In your second terminal window, optionally log in to SQL\*Plus and query V$DATABASE to view the values of DBID and CURRENT\_SCN of both orclcdb and orclpdb1. Exit SQL\*Plus when finished.

Clean up the practice environment by using the cleanup\_06\_03.sh script from the

$HOME/labs/DBMod\_Recovery directory. The script saves its output in the

/tmp/cleanup.log file.

Return to the RMAN terminal session. In preparation for the next practice, back up your orclcdb database, remove obsolete backups, and ensure that no failures are listed. Then exit from RMAN.

Practice 18-4: Restoring the Password File

Overview

In this practice, you recover from the loss of the database password file. The database password is required for remote access to the database by SYSDBA privileged users.

Assumptions

A full backup of the database is available.

You have two terminal windows open in which you are logged in as the oracle OS user,

$HOME/labs/DBMod\_Recovery is the current directory, and environment variables point to the orclcdb database instance.

Tasks

Cause a failure in the database by executing the break\_06\_04.sh script from the

$HOME/labs/DBMod\_Recovery directory. The script saves its output in the

/tmp/break.log file. You can view this file while and after the script executes.

Attempt to connect to the database using a remote connection. Notice the error messages. Refer to the “*Course Practice Environment: Security Credentials*” document for the correct password. Use <Ctrl-C> <Return> to exit your login attempt.

**Note:** The remote connection requires the use of a password file.

Check if the password file exists. The name of the orclcdb database password file for Linux and UNIX systems is $ORACLE\_HOME/dbs/orapworclcdb.

The orapworclcdb.ora should not be listed because it was deleted by the

break\_06\_04.sh script.

**Note:** It is critically important to the security of your system that you protect your password file and the environment variables that identify the location of the password file. Any user with access to these could potentially compromise the security of the connection.

Optionally, view the description of the orapwd parameters. Invoke orapwd in a terminal window.

$ **orapwd**

Usage: orapwd file=<fname> force=<y/n> asm=<y/n> dbuniquename=<dbname> format=<12/12.2> delete=<y/n> input\_file=<input-fname> sys=<y/password/external(<sys-external-name>)>

sysbackup=<y/password/external(<sysbackup-external-name>)> sysdg=<y/password/external(<sysdg-external-name>)> syskm=<y/password/external(<syskm-external-name>)>

Usage: orapwd describe file=<fname>

where

file - name of password file (required), password - password for SYS will be prompted

if not specified at command line. Ignored, if input\_file is specified,

force - whether to overwrite existing file (optional), asm - indicates that the password to be stored in

Automatic Storage Management (ASM) disk group is an ASM password. (optional),

dbuniquename - unique database name used to identify database password files residing in ASM diskgroup only. Ignored when asm option is specified (optional),

format - use format=12 for new 12c features like SYSBACKUP, SYSDG

and

SYSKM support, longer identifiers, SHA2 Verifiers etc. use format=12.2 for 12.2 features like enforcing user profile (password limits and password complexity) and account status for administrative users.

If not specified, format=12.2 is default (optional), delete - drops a password file. Must specify 'asm',

'dbuniquename' or 'file'. If 'file' is specified,

the file must be located on an ASM diskgroup (optional), input\_file - name of input password file, from where old user

entries will be migrated (optional),

sys - specifies if SYS user is password or externally

authenticated.

For external SYS, also specifies external name. SYS={y/password} specifies if SYS user password needs to be changed when used with input\_file,

sysbackup - creates SYSBACKUP entry (optional).

Specifies if SYSBACKUP user is password or externally authenticated. For external SYSBACKUP, also specifies

Create a new password file by using the orapwd utility. Use the password specified for this step in the “*Course Practice Environment: Security Credentials*” document. Replace

*<password>* with the correct password.

**Note:** When you exceed the allocated number of password entries, you must create a new password file. To avoid this necessity, allocate more entries than you think you will ever need.

Test the remote SYSDBA login. Now it should be successful. Use the password specified for this step in the “*Course Practice Environment: Security Credentials*” document. Replace

*<password>* with the correct password.

Optionally, review the V$PWFILE\_USERS view.

Exit SQL\*Plus.

Close all terminal windows open.