Practice 21

Duplicating a Database using RMAN

Practice Target

In this practice you will perform multiple techniques to duplicate the database ORADB in srv1 to another database in the same host.

Practice Overview

In this practice, you will perform the following database duplication techniques:

- Active database duplication
- Database duplication from backup files with a target connection
- Database duplication from backup files with a connection to recovery catalog
- Database duplication from backup files without connection to the target nor to a recovery catalog

Assumptions

This practice assumes the following are true:

- srv1 appliance is up and running and its database ORADB is running in OPEN state.
- winsrv2 appliance is up and running and its database ORAWIN is running in OPEN state.

A. Practice Preparation Steps

Perform the following steps to prepare the environment for this practice.

1. Take snapshot of `srv1` and `winsrv2`. Give it the snapshot the name "**Practice 21 Start**".
2. Start Putty and connect to `srv1` as `oracle`.
3. Start RMAN and connect to `ORADB` as target

```
rman target "'/ as SYSBACKUP'" catalog rc_owner/oracle@orawin
```

4. Take full backup of the target database

```
BACKUP
FORMAT '/media/sf_extdisk/backup/ORADB.bck'
DATABASE TAG 'ORADB_DB'
CURRENT CONTROLFILE TAG 'ORADB_CTL' FORMAT '/media/sf_extdisk/backup/ORADBCTL.bck'
SPFILE TAG 'ORADB_SPFILE' FORMAT '/media/sf_extdisk/backup/ORADBSPFILE.bck'
PLUS ARCHIVELOG TAG 'ORADB_ARC' FORMAT '/media/sf_extdisk/backup/ORADBARC%U.bck';
```

B. Preparing the Auxiliary Database

In this section of the practice you will perform the actions required to prepare the auxiliary database (ORADB2).

5. Create the directories where the database files will be saved for ORADB2.

Database file locations should be different from the source database.

```
mkdir -p /u01/app/oracle/oradata/ORADB2/datafile
mkdir -p /u01/app/oracle/fra/ORADB2
mkdir ~/temp
```

6. Create an initialization parameter file for the auxiliary instance and add just the DB_NAME parameter in it.

```
vi $ORACLE_HOME/dbs/initORADB2.ora
```

```
DB_NAME='ORADB2'
```

7. Establish Oracle net connectivity between the databases in tnsnames.ora file by adding the following entry to it. Do not copy the code from the PDF file. Copy it from the attached tnsnames.ora file.

```
vi $TNS_ADMIN/tnsnames.ora
```

```
ORADB2 =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = srv1.localdomain)(PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SID = ORADB2)
    )
  )
```

8. Create a static entry of the auxiliary instance in the listener. Do not copy the code from the PDF file. Copy it from the attached listener.ora file.

```
vi $TNS_ADMIN/listener.ora
```

```
# add the following to the file:
SID_LIST_LISTENER =
  (SID_LIST =
    (SID_DESC =
      (GLOBAL_DBNAME = DB11G.WORLD)
      (ORACLE_HOME = /u01/app/oracle/product/12.2.0/db_1)
      (SID_NAME = ORADB2)
    )
  )
```

9. Restart the listener

```
lsnrctl reload
```

10. Create password file for the auxiliary database.

Instead of creating a password file from scratch, you can make a copy of the existing one.

```
cp $ORACLE_HOME/dbs/orapwORADB $ORACLE_HOME/dbs/orapwORADB2
```

11. Startup the auxiliary instance.

The auxiliary database will automatically read from the PFILE created earlier because its name is set to the default name and it is saved in the default location.

```
export ORACLE_SID=ORADB2
sqlplus / as sysdba
STARTUP NOMOUNT
```

Note: If TDE is configured, you need to make sure the Keystore file is available in its default location and open.

12. Take snapshot of srv1. Give the snapshot the name "**Auxiliary Database Prepared**".

Do not delete the snapshot that you created in the beginning of the practice. Keep it.

C. Performing Active Database Duplication

In this section of the practice you will duplicate ORADB using active database duplication method.

13. Invoke RMAN with connecting to the source database (ORADB) and the auxiliary database (ORADB2).

```
rman TARGET sys/oracle@ORADB AUXILIARY sys/oracle@ORADB2
```

14. Perform the active database duplication.

Less memory is granted to the duplicate database in our case to reduce the burden on the server resources by having two database instances running at the same time in the same machine.

```
run
{
 DUPLICATE DATABASE TO ORADB2
  FROM ACTIVE DATABASE
  SPFILE
 SET CONTROL_FILES
'/u01/app/oracle/oradata/ORADB2/datafile/control1.ctl','/u01/app/oracle/fra/ORADB2/contro
l2.ctl'
 SET DB_CREATE_FILE_DEST '/u01/app/oracle/oradata'
 SET DB_RECOVERY_FILE_DEST '/u01/app/oracle/fra/ORADB2'
 SET DB_RECOVERY_FILE_DEST_SIZE '42949672960'
 SET AUDIT_FILE_DEST '/u01/app/oracle/audit'
 SET PGA_AGGREGATE_TARGET '210m'
 SET SGA_TARGET '900m';
}
```

15. Verify that the databases are up and running.

```
ps -ef | grep pmon

sqlplus system/oracle@ORADB
SELECT COUNT(*) FROM SOE.ORDERS;

conn system/oracle@ORADB2
SELECT COUNT(*) FROM SOE.ORDERS;
```

Clean Up

16. Shutdown the appliance srv1.

17. Restore srv1 from the snapshot "**Auxiliary Database Prepared**".

D. Performing Database Duplication from Backup Files with a Target Connection

In this section of the practice you will duplicate ORADB from backup files with connection to the target database.

18. Start Putty and connect to srv1 as oracle.

19. Invoke RMAN with connecting to the source database (ORADB) and the auxiliary database (ORADB2).

```
rman TARGET sys/oracle@ORADB AUXILIARY sys/oracle@ORADB2
```

20. Perform the database duplication from the backup files.

The only difference between this command and the command that you used in the previous section is that the clause "FROM ACTIVE DATABASE" is omitted.

RMAN uses the backup files to restore the auxiliary database and it obtains their names and locations from the control file of the source database.

```
run {
DUPLICATE DATABASE TO ORADB2
  SPFILE
SET CONTROL_FILES
'/u01/app/oracle/oradata/ORADB2/datafile/control1.ctl','/u01/app/oracle/fra/ORADB2/contro
l2.ctl'
 SET DB_CREATE_FILE_DEST '/u01/app/oracle/oradata'
 SET DB_RECOVERY_FILE_DEST '/u01/app/oracle/fra/ORADB2'
 SET DB_RECOVERY_FILE_DEST_SIZE '42949672960'
 SET AUDIT_FILE_DEST '/u01/app/oracle/audit'
 SET PGA_AGGREGATE_TARGET '210m'
 SET SGA_TARGET '900m';
}
```

21. Verify that the databases are up and running.

```
ps -ef | grep pmon

export ORACLE_SID=ORADB2
sqlplus system/oracle
SELECT COUNT(*) FROM SOE.ORDERS;
```

Clean Up

22. Shutdown the appliance srv1.

23. Restore srv1 from the snapshot "**Auxiliary Database Prepared**".

E. Performing Database Duplication from Backup Files with a Connection to Recovery Catalog

In this section of the practice you will duplicate ORADB from backup files with connection to the recovery catalog database but without connecting to the target database.

24. Start Putty and connect to srv1 as oracle.

25. Invoke RMAN with connecting to the auxiliary database (ORADB2) and the recovery catalog database (ORAWIN).

No connection is made to the target database.

```
rman AUXILIARY sys/oracle@ORADB2 CATALOG rc_owner/oracle@orawin
```

26. Perform the database duplication from the backup files.

Observe the source database name must be stated in the DUPLICATE command. This is a must in this scenario.

```
run {
DUPLICATE DATABASE ORADB TO ORADB2
  SPFILE
SET CONTROL_FILES
'/u01/app/oracle/oradata/ORADB2/datafile/control1.ctl','/u01/app/oracle/fra/ORADB2/contro
l2.ctl'
 SET DB_CREATE_FILE_DEST '/u01/app/oracle/oradata'
 SET DB_RECOVERY_FILE_DEST '/u01/app/oracle/fra/ORADB2'
 SET DB_RECOVERY_FILE_DEST_SIZE '42949672960'
 SET AUDIT_FILE_DEST '/u01/app/oracle/audit'
 SET PGA_AGGREGATE_TARGET '210m'
 SET SGA_TARGET '900m';
}
```

27. Verify that the databases are up and running.

```
ps -ef | grep pmon

set ORACLE_SID=ORADB2
sqlplus system/oracle
SELECT COUNT(*) FROM SOE.ORDERS;
```

Clean Up

28. Shutdown the appliance srv1.

29. Restore srv1 from the snapshot "**Auxiliary Database Prepared**".

F. Performing Database Duplication from Backup Files without Connection to the Target nor to a Recovery Catalog

In this section of the practice you will duplicate ORADB from backup files without connecting to the target database and without connecting to a recovery catalog database.

30. Invoke RMAN with connecting only to the auxiliary database (ORADB2).

```
rman AUXILIARY sys/oracle@ORADB2
```

31. Perform the database duplication from the backup files.

Because RMAN is not connected to the target database nor to the recovery catalog, you have to specify the backup files location, using the clause BACKUP LOCATION. It should come after the SET commands.

```
run
{
DUPLICATE DATABASE TO ORADB2
  SPFILE
SET CONTROL_FILES
'/u01/app/oracle/oradata/ORADB2/datafile/control1.ctl','/u01/app/oracle/fra/ORADB2/contro
l2.ctl'
 SET DB_CREATE_FILE_DEST '/u01/app/oracle/oradata'
 SET DB_RECOVERY_FILE_DEST '/u01/app/oracle/fra/ORADB2'
 SET DB_RECOVERY_FILE_DEST_SIZE '42949672960'
 SET AUDIT_FILE_DEST '/u01/app/oracle/audit'
 SET PGA_AGGREGATE_TARGET '210m'
 SET SGA_TARGET '900m'
BACKUP LOCATION '/media/sf_extdisk/backup';
}
```

32. Verify that the databases are up and running.

```
ps -ef | grep pmon

set ORACLE_SID=ORADB2
sqlplus system/oracle
SELECT COUNT(*) FROM SOE.ORDERS;
```

Clean Up

33. Shutdown the appliances srv1 and winsrv2

34. Delete the snapshot “Auxiliary Database Prepared”.

35. Restore srv1 and winsrv2 from the snapshot “**Practice 21 Start**”.

36. Delete the snapshots “Practice 21 Start”.

37. Delete the files in the shared folder.

Summary

In this practice, you performed the following database duplication techniques:

- Active database duplication
- Database duplication from backup files with a target connection
- Database duplication from backup files with a connection to recovery catalog
- Database duplication from backup files without connection to the target nor to a recovery catalog