Oracle Backup Management

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Abstract -- Backup is the activity of copying files or databases so that they will be preserved in case of equipment failure or other catastrophe. Backup is the mechanism to make or to create the background. In this Paper the mechanism which contain integrated and reasonable backup methods are presented and implemented. Basically there are many Backup mechanisms like Cold backup, hot backup provided by the Oracle but according to requirements of large Enterprises the new Backup Mechanism RMAN (Recovery Manager) based Backup Mechanism is used which is introduced in 10G and 11G versions of Oracle. By using RMAN for backing up and to recover the Database We can overcome with the problem of losing data and this will not require any downtime for the Backup and Recovery. So basically here we use data Files, Control Files, Redo Logs, Archive Logs to Backup and to recover Back the Database.

Indexed Terms -- Database Cold Backup, Database Hot Backup, and Database Backup with RMAN Utility, Data Files, and Control Files.

I. INTRODUCTION

Data is very important to all enterprises in modern business society. Even with adequate precautions, critical database records can be destroyed sometimes as a result of user error or hardware or software failure. The only way to prevent this potentially disastrous situation is to perform regular backup operations.

Oracle provides several backup methods and each has its own special feature, which enables DBAs to adopt different methods based on their working environments. Backup mechanism can be divided into cold backup and hot backup. Cold backup can backup data in consistent state but database cannot be used during the backup operation, which cannot be endured by some 24*7 running enterprise, so this mechanism is not widely used and was only used in some test system and small scale database. So users can rely on hot backup, where database can be made available during backup period and user transaction can be activated smoothly by using hot backup. This mechanism is flexible and popular in many enterprises.

There is another backup mechanism (Backup with RMAN utility) is available which was introduced in oracle 9i but frequently used in 10g and 11g versions of oracle. RMAN is the backup tool which is provided by oracle. In oracle 9i there was some issues regarding RMAN backup utility and it is not easy to use so to overcome the problem of complexity of RMAN commands oracle again rebuild it in oracle 10g and from that version this is one of the efficient tool for the backup of databases.

II. DATABASE COLD BACKUP

A cold backup of the database is an image copy of the database at a point in time. The database is consistent and restorable. This image copy can be used to move the database to another computer provided the same operating system is being used. If the database is in ARCHIVELOG mode, the cold backup would be the starting point for a point-in-time recovery. All archive log files necessary would be applied to the database once it is restored from the cold backup. Cold backups are useful if your business requirements allow for a shut-down window to backup the database. If your database is very large or you have 24x7 processing, cold backups are not an option, and you must use online (hot) backups.

a) Cold Backup Mechanism:
STEP 1:
In cold backup if database is in archive mode or is in no archive mode we don"t have any problem so there is no any need to check it.

STEP 2:
Now we have to create a directory where we can store the backup so using command $Mkdir –p /u01/app/bkp

A directory bkp is created in app directory. Here u01 is the root directory.

STEP 3:
Now we have to move in the directory where we want to store the backup. So we use the command.
$cd /u01/app/bkp

STEP 4:
Now we store the backup of our database here using the Command.
$cp /u01/app/oracle/oradata/db_name/*.

b) Recovery Using Cold Backup:

In case of failure or we can say in case of instant crashes we need to recover the database using the stored backup. So to recover it first we have to open the database till mount using the command „startup mount". Now here it will show the error message regarding the file which is crashed or deleted. Now to overcome with this problem we have to in the database directory at os level using the command.

$cd /u01/app/oracle/oradata/db_name

Now here we have to replace the file from backup directory which is generating the error

To do this we use the command $cp /u01/app/bkp/filename Now we will fire the command
Alter database open;
After this the database will run successfully.

III. DATABASE HOT BACKUP

When databases must remain operational 24 hours a day, 7 days a week, or have become so large that a cold backup would take too long, Oracle provides for online (hot) backups to be made while the database is open and being used. To perform a hot backup, the database must be in ARCHIVELOG mode. Unlike a cold backup, in which the whole database is usually backed up at the same time, table spaces in a hot backup scenario can be backed up on different schedules. The other major difference between hot and cold backups is that before a table space can be backed

up, the database must be informed when a backup is starting and when it is complete.

1.   Database should be configured in archive log mode. To check that the configuration mode we use the command:
Archive log list;

If database is configured in no archive log mode we have to configure it in archive log mode using the command:
Alter database archivelog;

2.   Hot backup and recovery is also known as online backup and recovery. So here there is no any facility to shut down the database

We have to do all the operations when database is in up and running mode

a) Backup Using Hot Backup:
We already have the backup of whole database in bkp directory as we done in cold backup method. Now here we can take the backup online for a particular file like for control file using the command: Alter database backup control file to trace;

By this command all the data which stores in control file will also stores in trace of database.

And at the time of recovery we can restore the data from trace.

b) Recovery Using Hot Backup:
Suppose at the time of starting up of database due to some reason any data file or control file

Is corrupted and by this error database is not opened.

In this case it will show the error of respective file at mount.

STEP: 1
Now first task of DBA is to open the database first so that other users can access the database. So to do this we will set offline the corrupted file. By using command:
Alter database file_name file_no offline;

Now the corrupted file is offline and we can open the database using the command: Alter database open;
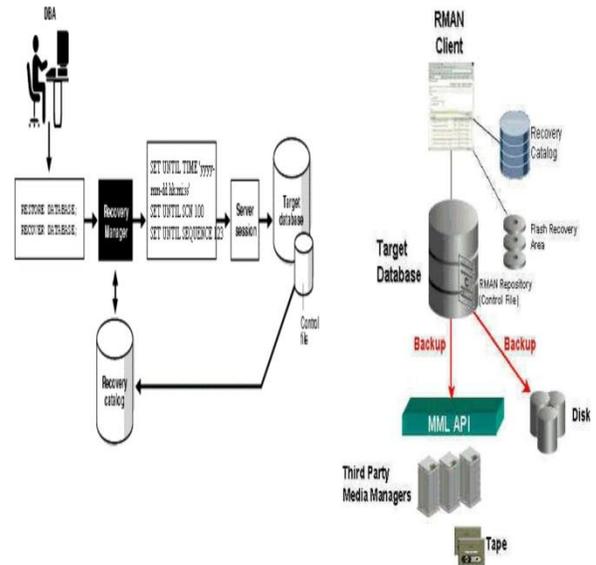
STEP: 2

Now the users whose data is in that corrupted file are not accessing the data. So here we have to recover that file and then we also have to online that file. To recover that file we use command:
Recover database using backup file_name until cancel;

Now here we have to apply all the archives because some data will also in archive log files. To do this we use the command:
Apply all archive;
Auto;

Now the file is recovered and we can set it online using command:
Alter database file_name file_no online:

IV. DATABASE BACKUP WITH RMAN UTILITY

RMAN (Recovery Manager) is a backup and recovery manager supplied for Oracle databases created by the Oracle Corporation. It provides database backup, restore, and recovery capabilities addressing high availability and disaster recovery concerns. Oracle Corporation recommends RMAN as its preferred method for backup and recovery and has written command-line and graphical (via Oracle Enterprise Manager) interfaces for the product.

a) Backup Mechanism Using RMAN:

First we have connected with RMAN tool using command:
RMAN target db_name;

After connecting with RMAN we can do all the backup processes here but the main backup process is to take backup of a particular file using command:
Backup datafile datafile_no;

From RMAN tool we can store the backup at a particular location and we can also delete the backup, create a duplicate copy of the backup and we can also store the backup in compressed form like in .zip format or in .rar format.

Here to take the backup we have write a script:

```
Run
{
Allocate Channel c1 device type disk;
Allocate Channel c2 device type disk;
Allocate Channel c3 device type disk;
Backup database;
}
```

Now by running this script backup is stored in the form of channels.

Using RMAN we can also overcome with the problem of block corruption.

ACKNOWLEDGMENT

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