

FireTower Tech, LLP

“We put fires out before they start!”

Getting The Most Out of RMAN

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Agenda



- Introduction
- Create a Catalog & Configure Key Parameters
- Backup and Validate with RMAN Scripts
- Recover a DB with RMAN
- Duplicate a DB with RMAN
- Wrap Up

Getting The Most Out of RMAN



Introduction

Who Is This Guy?



- **Technology Consultant for various customers**
World-Wide
 - Leverage the advantages of Remote Support to offer customers Senior-level expertise at affordable prices
 - Customers on six continents
- **Specialties Include**
 - Oracle DBA
 - Complete System Performance Diagnostics and Tuning

Who Is In The Audience?



- Oracle DBA
- Database Manager
- Responsible for Disaster Recovery
- Anybody else?

What Is He Talking About?



- Recovery MANager
 - Configure it
 - Use it
 - Backup Databases
 - Recover Databases
 - Duplicate Databases
 - Monitor it
 - Reports
 - Validation

Why Do I Care?



- RMAN simplifies backup and restore
 - Central Catalog for all backup metadata
 - Reusable backup scripts in the Catalog
- RMAN simplifies DB cloning
 - Use the Catalog metadata to move a DB
- RMAN provides backup reporting
 - Great for Managers and Auditors

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Create a Catalog &
Configure Key Parameters

Can I Use RMAN?

RMAN Compatibility Matrix

Target DB	Executable	Catalog
8.1.7.4	8.1.7.4	8.1.7.4 / 9.0.1.4+
9.0.1	9.0.1	9.0.1+
<i>9.2.0+</i>	<i>9.0.1.3 – Target DB</i>	<i>Executable+</i>

Executable <= target DB

Catalog => Executable

Pro and Con of a Catalog



- **Pro**
 - Keep metadata for all DBs in one place
 - Keep more historical metadata
 - Store backup scripts
- **Con**
 - Maintain and Backup an additional DB
 - Must be online for restores (standard RMAN backup)

Create the Catalog

- Conn sys@fttrman as sysdba
- Create user rman
identified by rman
default tablespace rman
temporary tablespace temp;
- Grant recovery_catalog_owner to rman;
- Grant connect, resource to rman;

Create the Catalog (continued)

- C:\Rman target sys@fttprod catalog \
rman@fttrman
- RMAN> create catalog;
- RMAN> register database;

Configure RMAN Parameters

- RMAN> configure retention policy to none;
- RMAN> configure channel device type disk
format 'c:\orabackup\fttprod\backup\%U'
maxpiecesize 2000M;
- RMAN> configure exclude for tablespace
nolog;

Configure RMAN Parameters (continued)

- RMAN> configure controlfile autobackup on;
- RMAN> configure controlfile autobackup format for device type disk to
‘c:\orabackup\fttprod\backup\%F’;
- RMAN> configure snapshot controlfile name to
‘c:\orabackup\fttprod\backup\sncffttprod.ora’;
- RMAN> show all;

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Backup and Validate
with RMAN Scripts

Create a FULL Backup Script

- RMAN> create script fullbu {
Crosscheck backup;
Crosscheck archivelog all;
Backup database;
Sql 'alter system archive log current';
Backup archivelog all not backed up 2 times delete input;
Backup current controlfile;
Report unrecoverable;
Report obsolete orphan;
}

Create an ARCHIVELOG Backup Script

- RMAN> create script archbu {
Crosscheck backup;
Crosscheck archivelog all;
Sql 'alter system archive log current';
Backup archivelog all not backed up 2 times delete input;
Backup current controlfile;
Report unrecoverable;
Report obsolete orphan;
}

Consider 10g New Feature: “Backup as Copy”

- Can restore files without the Catalog
 - Great for total disaster
 - Great if the catalog is corrupt
- Still have the catalog for metadata
 - Simplifies hot backup
 - Stores metadata for hot backup
- Simple command changes
 - Backup as copy database;
 - Backup as copy archivelog all not backed up 2 times delete input;

Run a Full Backup

- RMAN> configure controlfile autobackup off;
- RMAN> spool log to
c:\orabackup\fttprod\backup\fullbu.log
- RMAN> run {execute script fullbu;}
- RMAN> list backup summary;
- RMAN> spool log off;
- RMAN> configure controlfile autobackup on;

Run an Archivelog Backup

- RMAN> configure controlfile autobackup off;
- RMAN> spool log to
c:\orabackup\fttprod\backup\archbu.log
- RMAN> run {execute script archbu;}
- RMAN> list backup summary;
- RMAN> spool log off;
- RMAN> configure controlfile autobackup on;

Backup Automation

- Create shell/batch scripts to run backups
- Use rman <<EOF
- Make connections inside of the shell scripts
 - Rman command shows up in process list
 - Connect target sys/fttprod@fttprod
 - Connect catalog rman/rman@fttrman
 - See sample script
- Guard permissions for the scripts

Do I Have a Good Backup?



- Review the Log
 - Look for “validation failed”
 - Look for “ORA-” errors
 - Look at the reports
 - Report unrecoverable
 - Report obsolete orphan
 - List backup summary
- Restore database validate;

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Recover a DB with RMAN

Create a Disaster



- Shutdown abort
- Remove all datafiles
- Keep controlfiles and online redo logs
 - They should not be lost in most cases because they should be multiplexed!

Perform RMAN Recovery

- Mount the DB
- RMAN> restore database;
- RMAN> recover database skip tablespace nolog;
- SQL> Alter database datafile
‘c:\oradata\fttprod\nolog01.dbf’ offline;
- Open the DB
- Drop and recreate nolog tablespace

Total Disaster



- If your controlfiles are lost
 - Recover them from the RMAN backup
 - Open resetlogs
 - Add a tempfile
 - nid
- If your online redo logs are lost
 - Recover until SCN or until time
 - Open resetlogs
 - Add a tempfile
 - nid

Example Recovery for Total Disaster

- `SQL> Startup nomount`
- `RMAN> restore controlfile;`
- `SQL> Alter database mount`
- Review `v$log_history` to identify your recovery time/SCN

Example Recovery for Total Disaster (continued)

- RMAN> run {
Set until time 'Feb 24 2007 15:00:00';
or set until sequence 400;
Restore database;
Recover database;
}

Example Recovery for Total Disaster (continued)

- SQL> Alter database open resetlogs;
- SQL> Alter tablespace temp
 - > add tempfile 'c:\oradata\fttprod\temp01.dbf'
 - > size 26214400 reuse
 - > autoextend on
 - > next 5242880 maxsize unlimited;

Example Recovery for Total Disaster (continued)

- Use nid to set a new DBID
 - Necessary before you can backup the new incarnation of the DB
 - Shutdown and mount the DB
 - Host Nid target=sys/<password>@<DB>
 - Shutdown the DB
 - Create a new password file for the DB
 - Open the DB with resetlogs

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Duplicate a DB with RMAN

Create the new Instance



- Configure Ora*Net
- Create oradata and dump folders
- Create an init file
- Create the service and/or password file
- Create an spfile, if desired
- Start (force nomount) the new instance

Duplicate the DB

- Rman target sys@fttprod catalog rman@ftrman auxiliary sys@fttdev

- Run {

Set newname for datafile 1

to 'c:\oradata\fttdev\system01.dbf';

Set newname for datafile 2

to 'c:\oradata\fttdev\undotbs01.dbf';

Set newname for datafile 3

to 'c:\oradata\fttdev\sysaux01.dbf';

Set newname for datafile 4

to 'c:\oradata\fttdev\users01.dbf';

Duplicate the DB (continued)

Set newname for tempfile 1

to 'c:\oradata\fttdev\temp01.dbf';

Duplicate target database

to fttdev

skip tablespace nolog

logfile

group 1 ('c:\oradata\fttdev\redo01.log') size 10M,

group 2 ('c:\oradata\fttdev\redo02.log') size 10M;

}

Other Duplication Scenarios

- You can duplicate to a time or SCN
- You can resynchronize a duplicate DB with the master
- You can duplicate to an auxiliary DB on another host
- You can duplicate to test your backups
- You must use `nid` if you want to register a cloned DB with the same catalog as the master DB

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Wrap Up

Summary



- Use RMAN to simplify and centralize DB backup and cloning procedures
- Use stored scripts for backups
- Be careful of password usage
- Consider backup as copy for 10g DBs
- Use RMAN reports and validation procedures to ensure that your backups are good
- Guard your controlfiles and online redo logs

Summary (continued)

- All of your traditional recovery options are still available
- Use `nid` to reset the DBID after you use 'open resetlogs'
- Use RMAN duplication procedures as a method to test backups or to create new DBs
- Don't forget to backup the catalog!
 - Export or Cold Backup during business hours is usually OK

This Presentation

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Are We Done Yet?



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