ORACLE RMAN QUICK GUIDE
FOR THE BEGINNING USER

LANGUAGE FUNDAMENTALS

Oracle Recovery Manager (RMAN) is Oracle's preferred method by which we are able to take backups and restore and recover our database. The following list gives an overview of the commands and their uses in RMAN.

BASIC SYNTAX AND EXAMPLES

Commands that are used to backup our Oracle databases. The database must be in archivelog mode for RMAN to take open database backups. You can however use RMAN to take a cold backup if needed.

LOGGING INTO RMAN

```
export ORACLE_SID=<database sid>
```

```
c:\>rman target /

Recovery Manager: Release 11.1.0.7.0 - Production
on Fri Aug 28 13:59:11 2009

Copyright (c) 1982, 2007, Oracle.  All rights
reserved.

connected to target database: ORADB
(DBID=2448644975)

RMAN>
```

RMAN PARAMETERS

RMAN parameters can be set to a specified value and remain persistent. This information is stored in the target database's controlfile. By default, if you have a flash recovery area set up then RMAN will use this location for backups to be stored.

SHOW	Show current values for set parameters
CONFIGURE	Command to set new value for parameter

```
RMAN> show all;
using target database control file instead of
recovery catalog
RMAN configuration parameters for database with
db_unique_name ORADB are:
CONFIGURE RETENTION POLICY TO REDUNDANCY 1; #
default
CONFIGURE BACKUP OPTIMIZATION OFF; # default
CONFIGURE DEFAULT DEVICE TYPE TO DISK; # default
CONFIGURE CONTROLFILE AUTOBACKUP ON;
```

```
RMAN> CONFIGURE CONTROLFILE AUTOBACKUP ON;
old RMAN configuration parameters:
CONFIGURE CONTROLFILE AUTOBACKUP OFF;
new RMAN configuration parameters:
CONFIGURE CONTROLFILE AUTOBACKUP ON;
new RMAN configuration parameters are successfully
stored
RMAN>
```

TAKING A DATABASE BACKUP WITH RMAN

Backing up the database can be done with just a few commands or can be made with numerous options. You can set many parameters by configuring them first and making them persistent or you can override them by specifying them explicitly in your RMAN backup command.

```
RMAN> backup database;
Starting backup at 28-AUG-09
using target database control file instead of
recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=121 device type=DISK
channel ORA_DISK_1: starting full datafile backup
set
channel ORA_DISK_1: specifying datafile(s) in backup
set
input datafile file number=00001 name=C:\APP\MPYLE\
ORADATA\ORADB\SYSTEM01.DBF
input datafile file number=00002 name=C:\APP\MPYLE\
ORADATA\ORADB\SYSAUX01.DBF
input datafile file number=00003 name=C:\APP\MPYLE\
ORADATA\ORADB\UNDOTBS01.DBF
input datafile file number=00004 name=C:\APP\MPYLE\
ORADATA\ORADB\USERS01.DBF
channel ORA_DISK_1: starting piece 1 at 28-AUG-09
channel ORA_DISK_1: finished piece 1 at 28-AUG-09
piece handle=C:\TEMP\0IKNQQGK_1_1
tag=TAG20090828T125652 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed
time: 00:02:05
Finished backup at 28-AUG-09

Starting Control File and SPFILE Autobackup at
28-AUG-09
piece handle=C:\APP\MPYLE\FLASH_RECOVERY_AREA\
ORADB\AUTOBACKUP\2009_08_28\O1_MF_S_696085138_
59J36MDF_.BKP comment=NONE
Finished Control File and SPFILE Autobackup at
28-AUG-09

RMAN>
```

Alternatively you can take a cold backup with RMAN as well. First close and then mount your database.

```
RMAN> shutdown immediate;
using target database control file instead of
recovery catalog
database closed
database dismounted
Oracle instance shut down
```

```
RMAN> startup mount;

connected to target database (not started)
Oracle instance started
database mounted

Total System Global Area     313860096 bytes
Fixed Size                     1347020 bytes
Variable Size                243270196 bytes
Database Buffers              62914560 bytes
Redo Buffers                   6328320 bytes
```

```
RMAN> backup as compressed backupset database;

Starting backup at 02-NOV-09
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=155 device type=DISK
channel ORA_DISK_1: starting compressed full
datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup
set
input datafile file number=00001 name=C:\APP\MPYLE\
ORADATA\ORADB\SYSTEM01.DBF
input datafile file number=00002 name=C:\APP\MPYLE\
ORADATA\ORADB\SYSAUX01.DBF
input datafile file number=00003 name=C:\APP\MPYLE\
ORADATA\ORADB\UNDOTBS01.DBF
input datafile file number=00004 name=C:\APP\MPYLE\
ORADATA\ORADB\USERS01.DBF
channel ORA_DISK_1: starting piece 1 at 02-NOV-09
channel ORA_DISK_1: finished piece 1 at 02-NOV-09
piece handle=C:\TEMP\1GKTBGGA_1_1
tag=TAG20091102T131138 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed
time: 00:01:15
Finished backup at 02-NOV-09

Starting Control File and SPFILE Autobackup at
02-NOV-09
piece handle=C:\APP\MPYLE\FLASH_RECOVERY_AREA\
ORADB\AUTOBACKUP\2009_11_02\O1_MF_S_701874632_
5GY898N5_.BKP comment=NONE
Finished Control File and SPFILE Autobackup at
02-NOV-09

RMAN>
```

OPTIONS	
COMPRESSED	Compresses the backup as it is taken
INCREMENTAL	Selecting incremental allows to backup only changes since last full backup
FORMAT	Allows you to specify an alternate location
TAG	You can name your backup
MAXSETSIZE	Limits backup piece size
TABLESPACE	Allows you to backup only a tablespace

```
RMAN> backup as compressed backupset database;
RMAN> Backup INCREMENTAL level=0 database;
RMAN> Backup database TAG=db01;
RMAN> Backup database MAXSETSIZE=2g;
RMAN> backup TABLESPACE users;
```

You may also combine options together in a single backup.

```
RMAN> Backup INCREMENTAL level=1 as COMPRESSED
backupset database FORMAT 'C:\TEMP\%U.BAK'
maxsetsize 2G;
```

VIEWING YOUR RMAN BACKUPS

You can review your RMAN backups using the LIST command. You can use LIST with options to customize what you want RMAN to return to you.

```
RMAN> LIST backup;
```

OPTIONS	
SUMMARY	Returns just a summary of your backups
ARCHIVELOG ALL	You can see your archivelog backups
COMPLETED <after, between, before>	Used to filter your backup selection
TAG	Allows you to search for a tagged backup

```
RMAN> list backup SUMMARY;
RMAN> list ARCHIVELOG ALL;
RMAN> list backup COMPLETED before '28-AUG-09';
RMAN> list backup of database TAG db01;
```

RESTORING YOUR BACKUPS

Performing a restore of your database can be done very easily with RMAN. You can also duplicate and validate your backups of your database. In the following examples we have our channel format and type set in our configuration parameters

First we restore the datafiles. Database must be started and not mounted.

```
RMAN> RESTORE database;
Starting restore at 01-SEP-09
using target database control file instead of
recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=154 device type=DISK

channel ORA_DISK_1: starting datafile backup set
restore
channel ORA_DISK_1: specifying datafile(s) to
restore from backup set
channel ORA_DISK_1: specifying datafile(s) to re-
store from backup set
channel ORA_DISK_1: restoring datafile 00001 to C:\
APP\MPYLE\ORADATA\ORADB\SYSTEM01.DBF
channel ORA_DISK_1: restoring datafile 00002 to C:\
APP\MPYLE\ORADATA\ORADB\SYSAUX01.DBF
channel ORA_DISK_1: restoring datafile 00003 to C:\
APP\MPYLE\ORADATA\ORADB\UNDOTBS01.DBF
channel ORA_DISK_1: reading from backup piece
C:\TEMP\16KNR3I3_1_1.BAK
channel ORA_DISK_1: piece handle=C:\TEMP\16KNR3I3_
1_1.BAK tag=TAG20090828T153115
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time:
00:04:55
channel ORA_DISK_1: starting datafile backup set
restore
channel ORA_DISK_1: specifying datafile(s) to
restore from backup set
channel ORA_DISK_1: restoring datafile 00004 to C:\
APP\MPYLE\ORADATA\ORADB\USERS01.DBF
channel ORA_DISK_1: reading from backup piece C:\
TEMP\18KNR3NH_1_1
channel ORA_DISK_1: piece handle=C:\TEMP\18KNR3NH_
```

```
1_1 tag=TAG20090828T153409
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time:
00:00:01
Finished restore at 01-SEP-09
```

Then we recover the database.

```
RMAN> RECOVER database;

Starting recover at 01-SEP-09
using channel ORA_DISK_1

starting media recovery
media recovery complete, elapsed time: 00:00:15

Finished recover at 01-SEP-09
```

RESTORE OPTIONS	
DATAFILE <filename>	Restores specified datafile
CONTROLFILE	Restores controlfile from backup. Database must be started nomount. After restore, you must recover the database and open resetlogs.
ARCHIVELOG <logseq=sequence number> or from <logseq sequence_number> until <logseq sequence_number>	Restores archivelogs to location they were backed up from unless otherwise specified
TABLESPACE <tbls_name>	Restores all the datafiles associated with specified tablespace and can be done with database open.

Restoring a datafile.

```
RMAN> restore DATAFILE 'C:\APP\MPYLE\ORADATA\ORADB\
SYSTEM01.DBF';
```

Restoring the controlfile. The database must not be mounted.

```
RMAN> restore CONTROLFILE from autobackup;
RMAN> alter database mount;
RMAN> restore database;
RMAN> alter database open resetlogs;
```

Restoring an archivelog. You can list the archivelogs already backed up to find the log sequence number.

```
RMAN> restore archivelog logseq 1;

Starting restore at 02-NOV-09
using channel ORA_DISK_1

channel ORA_DISK_1: starting archived log restore
to default destination
channel ORA_DISK_1: restoring archived log
archived log thread=1 sequence=1
channel ORA_DISK_1: reading from backup piece C:\
TEMP\1EKO59HC_1_1
channel ORA_DISK_1: piece handle=C:\TEMP\1EKO59HC_
1_1 tag=TAG20090901T121428
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time:
00:00:01
Finished restore at 02-NOV-09

RMAN>
```

You can also restore a tablespace. This will restore any datafiles associated with the tablespace.

```
RMAN> restore tablespace mpyle;

Starting restore at 02-NOV-09
using target database control file instead of recov-
ery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=151 device type=DISK

channel ORA_DISK_1: starting datafile backup set
restore
channel ORA_DISK_1: specifying datafile(s) to re-
store from backup set
channel ORA_DISK_1: restoring datafile 00005 to C:\
APP\MPYLE\ORADATA\ORADB\MPYLE.DBF
channel ORA_DISK_1: reading from backup piece C:\
TEMP\1PKTBIPB_1_1
channel ORA_DISK_1: piece handle=C:\TEMP\1PKTBIPB_
1_1 tag=TAG20091102T135035
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time:
00:00:01
Finished restore at 02-NOV-09

RMAN> recover tablespace mpyle;

Starting recover at 02-NOV-09
using channel ORA_DISK_1

starting media recovery
media recovery complete, elapsed time: 00:00:01
Finished recover at 02-NOV-09

RMAN> SQL 'ALTER TABLESPACE users ONLINE';

sql statement: ALTER TABLESPACE users ONLINE

RMAN>
```

TESTING YOUR BACKUPS

You can test your backups using the validate command.

```
RMAN> restore database validate;

Starting restore at 10-NOV-09
using target database control file instead of
recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=170 device type=DISK

channel ORA_DISK_1: starting validation of datafile
backup set
channel ORA_DISK_1: reading from backup piece C:\
TEMP\1PKTBIPB_1_1
channel ORA_DISK_1: piece handle=C:\TEMP\1PKTBIPB_
1_1 tag=TAG20091102T135035
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: validation complete, elapsed
time: 00:00:45
Finished restore at 10-NOV-09

RMAN>
```

CONCLUSION

As we can see RMAN is a powerful utility that can be used in many ways. For additional information please reference the documentation on RMAN at http://tahiti.oracle.com.

Perpetual Technologies, Inc. (PTI) provides mission-critical database and information systems support to commercial and government enterprises worldwide. Focused on improving performance and lowering costs, our subject-matter experts plan, design, develop, deploy, and manage Oracle database environments running on UNIX and Windows platforms. Perpetual Technologies strives to create tailored, flexible IT solutions in the areas of Oracle database 8i, 9i, 10g, 11g, Oracle RAC, capacity planning, disaster recovery planning, performance tuning, Oracle Application Server , Oracle content manager, Oracle database design, complete or supplemental remote Oracle database administration, after-hours DBA coverage, and Oracle database vacation support.

PERPETUAL TECHNOLOGIES, INC.

5649 Lee Road
Indianapolis, IN 46216
800-538-0453
www.PTI.net

ORACLE RMAN Quick Reference Guide

FOR THE BEGINNING USER

ADVANCING THE DATA-DRIVEN WORLD