

# Freeing Space in the 10g Flash Recovery Area When Using ASM

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When using Oracle 10g's Automated Storage Management feature and performing RMAN flash recovery area backups, it is possible to fill the "Recovery File Destination" area if periodic backups of the flash recovery area are not being made (e.g. BACKUP RECOVERY AREA) and/or the flash recovery area has not been sized appropriately for the retention policy specified. If the flash recovery area does fill then messages like the following will be output to the alert.log file:

```
Tue Aug 23 14:10:33 2005
Errors in file /oracle/admin/DBSID/bdump/DBSID_arc1_5005.trc:
ORA-19815: WARNING: db_recovery_file_dest_size of 429496729600 bytes is 99.82% used, and
has 781680640 remaining bytes available.
*****
You have following choices to free up space from flash recovery area:
1. Consider changing RMAN RETENTION POLICY. If you are using Data Guard,
then consider changing RMAN ARCHIVELOG DELETION POLICY.
2. Back up files to tertiary device such as tape using RMAN
BACKUP RECOVERY AREA command.
3. Add disk space and increase db_recovery_file_dest_size parameter to
reflect the new space.
4. Delete unnecessary files using RMAN DELETE command. If an operating
system command was used to delete files, then use RMAN CROSSCHECK and
DELETE EXPIRED commands.
*****
Tue Aug 23 14:10:33 2005
Errors in file /oracle/admin/DBSID/bdump/DBSID_arc1_5005.trc:
ORA-19809: limit exceeded for recovery files
ORA-19804: cannot reclaim 1046327296 bytes disk space from 429496729600 limit
ARC1: Error 19809 Creating archive log file to '+ORADATA01'
ARC1: All standby destinations failed; successful archival assumed
ARC1: Failed to archive thread 1 sequence 517 (19809)
ARCH: Archival stopped, error occurred. Will continue retrying
Tue Aug 23 14:10:33 2005
ORACLE Instance DBSID - Archival Error
ARCH: Connecting to console port...
```

If there is no additional space to allocate to the flash recovery area then your only other practical choice is probably to delete files from the flash recovery area. If you've followed the RMAN 10g backup examples, then you probably have your retention policy set to "REDUNDANCY 1". If this is your situation then you won't have "obsolete" files because they're already being deleted by RMAN, and if you're doing just disk based backups you won't be able to run a "BACKUP RECOVERY AREA" command. In this case you must delete existing files. Note that this may compromise your recovery abilities, but that can be addressed once the database is back running.

The problem now is, how to delete flash recovery area files when the flash recovery area is located on ASM storage. The following examples will step through a process of identifying the files in the ASM flash recovery area, deleting them, and then updating the RMAN controlfile/repository to reflect that they have been deleted.

The following command will list all ASM files. Since the path is included this output can be compared to the "db\_recovery\_file\_dest" parameter to help in deterring which files make up the flash recovery area.

```

COLUMN name Heading "Name"          FORMAT A30 WORD_WRAPPED;
COLUMN path Heading "Path"          FORMAT A60 WORD_WRAPPED;
COLUMN typ  Heading "File Type"     FORMAT A20;

BREAK ON typ SKIP 1 DUPLICATES;

SELECT al.name,
       NVL(fi.type,'Directory') typ,
       SYS_CONNECT_BY_PATH(al.name,'/') path
FROM   v$asm_alias al,
       v$asm_file fi
WHERE  al.file_number = fi.file_number(+)
START WITH alias_index = 0
CONNECT BY PRIOR al.reference_index = al.parent_index
ORDER BY path, typ
/

```

In order to delete RMAN backup files, which will have a type of "ARCHIVELOG" and "BACKUPSET" the following two commands can be run and their output spooled to separate files:

```

SELECT 'alter diskgroup '||dg.name||' drop file
''+'||dg.name||''||SYS_CONNECT_BY_PATH(al.name,'/')||''';'
FROM   v$asm_alias al, v$asm_file fi, v$asm_diskgroup dg
WHERE  al.file_number = fi.file_number(+)
       AND al.group_number = dg.group_number
       AND fi.type = 'ARCHIVELOG'
START WITH alias_index = 0
CONNECT BY PRIOR al.reference_index = al.parent_index

```

```

SELECT 'alter diskgroup '||dg.name||' drop file
''+'||dg.name||''||SYS_CONNECT_BY_PATH(al.name,'/')||''';'
FROM   v$asm_alias al, v$asm_file fi, v$asm_diskgroup dg
WHERE  al.file_number = fi.file_number(+)
       AND al.group_number = dg.group_number
       AND fi.type = 'BACKUPSET'
START WITH alias_index = 0
CONNECT BY PRIOR al.reference_index = al.parent_index

```

These files can then be edited and run, and the desired files will be deleted from ASM. The following is a sample taken from this output to delete one file:

```

/oracle$ sqlplus / as sysdba

SQL*Plus: Release 10.1.0.3.0 - Production on Wed Jan 26 14:24:12 2005

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Connected to:
Oracle Database 10g Enterprise Edition Release 10.1.0.3.0 - Production
With the Partitioning and Data Mining options

SQL> alter diskgroup ORADATA01 drop file '+ORADATA01/DBSID/1_12_542025636.arc';

Diskgroup altered.

SQL>

```

Once this is accomplished a "crosscheck archivelog all;" RMAN command should be run. RMAN will note the discrepancy between the missing file(s) on disk and the RMAN controlfile/repository, and mark the files as expired:

```
RMAN> crosscheck archivelog all;1
```

```
allocated channel: ORA_DISK_1
channel ORA_DISK_1: sid=150 devtype=DISK
allocated channel: ORA_DISK_2
channel ORA_DISK_2: sid=149 devtype=DISK
validation failed for archived log
archive log filename=+ORADATA01/DBSID//1_106_542025636.arc recid=95 stamp=548013618
validation failed for archived log
archive log filename=+ORADATA01/DBSID//1_107_542025636.arc recid=96 stamp=548038551
validation failed for archived log
archive log filename=+ORADATA01/DBSID//1_108_542025636.arc recid=97 stamp=548074255
validation failed for archived log
archive log filename=+ORADATA01/DBSID//1_109_542025636.arc recid=98 stamp=548095159
validation failed for archived log
archive log filename=+ORADATA01/DBSID/archivelog/2005_01_21/thread_1_seq_110.301.3
recid=99 stamp=548172027
validation failed for archived log
archive log filename=+ORADATA01/DBSID/archivelog/2005_01_21/thread_1_seq_111.296.3
recid=100 stamp=548200883
validation failed for archived log
archive log filename=+ORADATA01/DBSID/archivelog/2005_01_22/thread_1_seq_112.312.5
recid=101 stamp=548229666
validation failed for archived log
```

Now the RMAN command "delete expired archivelog all;" can be run and these file entries will be removed from the RMAN controlfile/repository.

```
RMAN> delete expired archivelog all;2
```

```
released channel: ORA_DISK_1
released channel: ORA_DISK_2
allocated channel: ORA_DISK_1
channel ORA_DISK_1: sid=150 devtype=DISK
allocated channel: ORA_DISK_2
channel ORA_DISK_2: sid=149 devtype=DISK
```

List of Archived Log Copies

Key	Thrd	Seq	S	Low Time	Name
95	1	106	X	19-JAN-05	+ORADATA01/DBSID//1_106_542025636.arc
96	1	107	X	19-JAN-05	+ORADATA01/DBSID//1_107_542025636.arc
97	1	108	X	20-JAN-05	+ORADATA01/DBSID//1_108_542025636.arc
98	1	109	X	20-JAN-05	+ORADATA01/DBSID//1_109_542025636.arc
100	1	111	X	21-JAN-05	
					+ORADATA01/DBSID/archivelog/2005_01_21/thread_1_seq_111.296.3
101	1	112	X	21-JAN-05	
					+ORADATA01/DBSID/archivelog/2005_01_22/thread_1_seq_112.312.5
102	1	113	X	22-JAN-05	
					+ORADATA01/DBSID/archivelog/2005_01_22/thread_1_seq_113.295.3

Do you really want to delete the above objects (enter YES or NO)? yes

```
deleted archive log
archive log filename=+ORADATA01/DBSID//1_106_542025636.arc recid=95 stamp=548013618
deleted archive log
archive log filename=+ORADATA01/DBSID//1_107_542025636.arc recid=96 stamp=548038551
deleted archive log
archive log filename=+ORADATA01/DBSID//1_108_542025636.arc recid=97 stamp=548074255
deleted archive log
```

<sup>1</sup> While accurate, this command and the resulting output was performed on a different system.

<sup>2</sup> While accurate, this command and the resulting output was performed on a different system.

```
archive log filename=+ORADATA01/DBSID//1_109_542025636.arc recid=98 stamp=548095159
deleted archive log
archive log filename=+ORADATA01/DBSID/archivelog/2005_01_21/thread_1_seq_111.296.3
recid=100 stamp=548200883
deleted archive log
archive log filename=+ORADATA01/DBSID/archivelog/2005_01_22/thread_1_seq_112.312.5
recid=101 stamp=548229666
deleted archive log
archive log filename=+ORADATA01/DBSID/archivelog/2005_01_22/thread_1_seq_113.295.3
recid=102 stamp=548262885
deleted archive log
```

The following query now shows that there is plenty of space available in the flash recovery area.

```
SQL> select * from v$recovery_file_dest;
```

```
SQL> /
```

NAME	SPACE_LIMIT	SPACE_USED	SPACE_RECLAIMABLE	NUMBER_OF_FILES
+ORADATA01	429,496,729,600	87,896,880,640	7,340,032	37

At this point it is important to take a valid backup to insure that the database can be recovered.

## References

Oracle Database Backup and Recovery Basics, 10g Release 1 (10.1), Part Number B10735-01

Metalink Note: 249452.1, Unable to Archive Due to flash\_recovery\_area full