

RMAN ist einfach!

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- Oracle Spezialist seit 1992
 - 1992: Presales bei Oracle in Düsseldorf
 - 1999: Projektleiter bei Herrmann & Lenz Services GmbH
 - 2005: Technischer Direktor ADM Presales bei Quest Software GmbH
 - 2011: Geschäftsführer CarajanDB GmbH
- 2011 → Ernennung zum Oracle ACE
- Autor der Bücher:
 - Oracle9i für den DBA, Oracle10g für den DBA, Oracle 11g Release 2 für den DBA
- DOAG Themenverantwortlicher Datenbankadministration, Standard Edition
- Hobbies:
 - Drachen steigen lassen (Kiting) draußen wie drinnen (Indoorkiting)
 - Motorradfahren (nur draußen)



- Was ist RMAN?
- Vorbereitungen für ein Backup
- Verschiedene Back Szenarien
- Restore und Recovery
- Cloning
- Fazit

Vorbereitungen

- Sichern der archivierten Redo Log Dateien
 - Nach jedem Logswitch
 - Nach n Minuten
- Best Practices: Verwendung von Oracle Managed Files (OMF)
 - db_create_file_dest
 - db_recovery_file_dest_size
 - db_recovery_file_dest

```
SQL> show parameter file_dest
```

NAME	TYPE	VALUE
-----	-----	-----
audit_file_dest	string	/opt/oracle/admin/PAUL/adump
db_create_file_dest	string	/u02/oradata
db_recovery_file_dest	string	/u03/orabackup
db_recovery_file_dest_size	big integer	12918M

```
SQL> SELECT name FROM v$datafile;
```

```
NAME
```

```
-----  
/u02/oradata/PAUL/datafile/o1_mf_system_gfqxv3xm_.dbf  
/u02/oradata/PAUL/datafile/o1_mf_sysaux_gfqxy3cn_.dbf  
/u02/oradata/PAUL/datafile/o1_mf_undotbs1_gfqxztmj_.dbf  
/u02/oradata/PAUL/datafile/o1_mf_system_gfqy2zho_.dbf  
/u02/oradata/PAUL/datafile/o1_mf_sysaux_gfqy2zhk_.dbf  
/u02/oradata/PAUL/datafile/o1_mf_users_gfqxzvw6_.dbf  
/u02/oradata/PAUL/datafile/o1_mf_undotbs1_gfqy2zhs_.dbf  
/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_system_gfqzc581_.dbf  
/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_sysaux_gfqzc582_.dbf  
/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_undotbs1_gfqzc583_.dbf  
/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_users_gfqznp2m_.dbf
```

```
SQL> SHUTDOWN IMMEDIATE
```

```
SQL> STARTUP MOUNT
```

```
SQL> ALTER DATABASE ARCHIVELOG;
```

```
SQL> ALTER DATABASE OPEN;
```

```
SQL> ARCHIVE LOG LIST
```

Database log mode	Archive Mode
Automatic archival	Enabled
Archive destination	USE_DB_RECOVERY_FILE_DEST
Oldest online log sequence	1
Next log sequence to archive	2
Current log sequence	2


```
SQL> ALTER SYSTEM SWITCH LOGFILE;
```

```
SQL> SELECT name, sequence# FROM v$archived_log;
```

NAME	SEQUENCE#

/u03/orabackup/PAUL/archivelog/2019_05_15/o1_mf_1_2_gfr0hol6_.arc	2

```
SQL> !ls -l /u03/orabackup/PAUL/archivelog/2019_05_15
```

```
total 133064
```

```
-rw-r----- 1 oracle oinstall 136255488 May 15 14:11 o1_mf_1_2_gfr0hol6_.arc
```

RMAN Backup

Backup der Datenbank (1)

```
oracle@simon[PAUL]% rman target /
```

```
Recovery Manager: Release 18.0.0.0.0 - Production on Wed May 15 12:40:38 2019  
Version 18.4.0.0.0
```

```
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```

```
connected to target database: PAUL (DBID=1975738546)
```

```
RMAN> BACKUP DATABASE;
```

Backup der Datenbank (1)

```
Starting backup at 15-MAY-19
using target database control file instead of recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=79 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=/u02/oradata/PAUL/datafile/o1_mf_system_gfqxv3xm_.dbf
input datafile file number=00003 name=/u02/oradata/PAUL/datafile/o1_mf_sysaux_gfqxy3cn_.dbf
input datafile file number=00004 name=/u02/oradata/PAUL/datafile/o1_mf_undotbs1_gfqxztmj_.dbf
input datafile file number=00007 name=/u02/oradata/PAUL/datafile/o1_mf_users_gfqxzvw6_.dbf
channel ORA_DISK_1: starting piece 1 at 15-MAY-19
channel ORA_DISK_1: finished piece 1 at 15-MAY-19
piece handle=/u03/orabackup/PAUL/backupset/2019_05_15/o1_mf_nnndf_TAG20190515T141516_gfr0pnr2_.bkp tag=TAG20190515T141516
comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:35
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00014 name=/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_sysaux_gfqzc582_.dbf
input datafile file number=00013 name=/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_system_gfqzc581_.dbf
input datafile file number=00015 name=/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_undotbs1_gfqzc583_.dbf
input datafile file number=00016 name=/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_users_gfqznp2m_.dbf
channel ORA_DISK_1: starting piece 1 at 15-MAY-19
channel ORA_DISK_1: finished piece 1 at 15-MAY-19
```

Backup der Datenbank (1)

```
piece handle=/u03/orabackup/PAUL/88ECC48AE4632772E0530D63A8C04AEF/backupset/2019_05_15/o1_mf_nnndf_TAG20190515T141516_gfr0qrv5_.bkp
tag=TAG20190515T141516 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:25
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00006 name=/u02/oradata/PAUL/datafile/o1_mf_sysaux_gfqy2zhk_.dbf
input datafile file number=00005 name=/u02/oradata/PAUL/datafile/o1_mf_system_gfqy2zho_.dbf
input datafile file number=00008 name=/u02/oradata/PAUL/datafile/o1_mf_undotbs1_gfqy2zhs_.dbf
channel ORA_DISK_1: starting piece 1 at 15-MAY-19
channel ORA_DISK_1: finished piece 1 at 15-MAY-19
piece handle=/u03/orabackup/PAUL/88EC7E4263971E50E0530D63A8C0199C/backupset/2019_05_15/o1_mf_nnndf_TAG20190515T141516_gfr0rkkp_.bkp
tag=TAG20190515T141516 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:15
Finished backup at 15-MAY-19

Starting Control File and SPFILE Autobackup at 15-MAY-19
piece handle=/u03/orabackup/PAUL/autobackup/2019_05_15/o1_mf_s_1008339392_gfr0s1kp_.bkp comment=NONE
Finished Control File and SPFILE Autobackup at 15-MAY-19
```

Reicht das?

Das ist kein gültiges Backup!

Es fehlen die archivierten Redolog Dateien

Backup der Datenbank (2)

```
oracle@simon[PAUL]% rman target /
```

```
Recovery Manager: Release 18.0.0.0.0 - Production on Wed May 15 12:40:38 2019  
Version 18.4.0.0.0
```

```
Copyright (c) 1982, 2018, Oracle and/or its affiliates. All rights reserved.
```

```
connected to target database: PAUL (DBID=1975738546)
```

```
RMAN> BACKUP DATABASE PLUS ARCHIVELOG;
```


Teil 1 - Archivelogs

```
Starting backup at 15-MAY-19
current log archived
using channel ORA_DISK_1
channel ORA_DISK_1: starting archived log backup set
channel ORA_DISK_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=2 RECID=1 STAMP=1008339097
input archived log thread=1 sequence=3 RECID=2 STAMP=1008339575
channel ORA_DISK_1: starting piece 1 at 15-MAY-19
channel ORA_DISK_1: finished piece 1 at 15-MAY-19
piece handle=/u03/orabackup/PAUL/backupset/2019_05_15/o1_mf_annnn_TAG20190515T141936_gfr0yrdn_.bkp
tag=TAG20190515T141936 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:07
Finished backup at 15-MAY-19
```

```
Starting backup at 15-MAY-19
using channel ORA_DISK_1
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=/u02/oradata/PAUL/datafile/o1_mf_system_gfqxv3xm_.dbf
...
channel ORA_DISK_1: starting piece 1 at 15-MAY-19
channel ORA_DISK_1: finished piece 1 at 15-MAY-19
piece handle=/u03/orabackup/PAUL/backupset/2019_05_15/o1_mf_nnndf_TAG20190515T141943_gfr0z05c_.bkp tag=TAG20190515T141943
comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:35
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00014 name=/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_sysaux_gfqzc582_.dbf
...
channel ORA_DISK_1: starting piece 1 at 15-MAY-19
channel ORA_DISK_1: finished piece 1 at 15-MAY-19
piece handle=/u03/orabackup/PAUL/88ECC48AE4632772E0530D63A8C04AEF/backupset/2019_05_15/o1_mf_nnndf_TAG20190515T141943_gfr103o6_.bkp
tag=TAG20190515T141943 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:15
channel ORA_DISK_1: starting full datafile backup set
channel ORA_DISK_1: specifying datafile(s) in backup set
input datafile file number=00006 name=/u02/oradata/PAUL/datafile/o1_mf_sysaux_gfqy2zhk_.dbf
...
channel ORA_DISK_1: starting piece 1 at 15-MAY-19
channel ORA_DISK_1: finished piece 1 at 15-MAY-19
piece handle=/u03/orabackup/PAUL/88EC7E4263971E50E0530D63A8C0199C/backupset/2019_05_15/o1_mf_nnndf_TAG20190515T141943_gfr10m8y_.bkp
tag=TAG20190515T141943 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:15
Finished backup at 15-MAY-19
```

Teil 3 - Archivelogs

```
Starting backup at 15-MAY-19
current log archived
using channel ORA_DISK_1
channel ORA_DISK_1: starting archived log backup set
channel ORA_DISK_1: specifying archived log(s) in backup set
input archived log thread=1 sequence=4 RECID=3 STAMP=1008339650
channel ORA_DISK_1: starting piece 1 at 15-MAY-19
channel ORA_DISK_1: finished piece 1 at 15-MAY-19
piece handle=/u03/orabackup/PAUL/backupset/2019_05_15/o1_mf_annnn_TAG20190515T142050_gfr1134p_.bkp
tag=TAG20190515T142050 comment=NONE
channel ORA_DISK_1: backup set complete, elapsed time: 00:00:01
Finished backup at 15-MAY-19
```

Teil 4 – Controlfile und spfile

```
Starting Control File and SPFILE Autobackup at 15-MAY-19  
piece handle=/u03/orabackup/PAUL/autobackup/2019_05_15/o1_mf_s_1008339652_gfr114nk_.bkp  
comment=NONE  
Finished Control File and SPFILE Autobackup at 15-MAY-19
```

Vielen Dank für Ihre Aufmerksamkeit

Fehlt da etwa noch etwas?

- Recovery einer defekten Datendatei
- Fehlermeldung

```
SQL> select count(*) from auftraege;  
select count(*) from auftraege  
      *  
ERROR at line 1:  
ORA-01578: ORACLE data block corrupted (file # 16, block # 482)  
ORA-01110: data file 16:  
'/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_users_gfqznp2m_.dbf'
```

```
BOXER(4):Hex dump of (file 16, block 474) in trace file
/opt/oracle/diag/rdbms/paul/PAUL/trace/PAUL_ora_3771.trc
BOXER(4):
BOXER(4):Corrupt block relative dba: 0x040001da (file 16, block 474)
BOXER(4):Completely zero block found during buffer read
BOXER(4):
BOXER(4):Reading datafile
'/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_users_gfqznp2m_.dbf' for
corrupt data at rdba: 0x040001da (file 16, block 474)
BOXER(4):Reread (file 16, block 474) found same corrupt data (no logical check)
2019-05-15T14:26:27.705235+02:00
Errors in file /opt/oracle/diag/rdbms/paul/PAUL/trace/PAUL_mz00_3820.trc:
ORA-01110: data file 16:
'/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_users_gfqznp2m_.dbf'
ORA-01565: error in identifying file
'/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_users_gfqznp2m_.dbf'
ORA-27048: skgfifi: file header information is invalid
Additional information: 2
```



```
RMAN> LIST FAILURE;
```

```
using target database control file instead of recovery catalog
```

```
Database Role: PRIMARY
```

```
List of Database Failures
```

```
=====
```

Failure ID	Priority	Status	Time Detected	Summary
-----	-----	-----	-----	-----
202	HIGH	OPEN	15-MAY-19	One or more non-system datafiles are corrupt

```
RMAN> ADVISE FAILURE;
```

```
Database Role: PRIMARY
```

```
List of Database Failures
```

```
=====
```

Failure ID	Priority	Status	Time Detected	Summary
-----	-----	-----	-----	-----
202	HIGH	OPEN	15-MAY-19	One or more non-system datafiles are corrupt

```
analyzing automatic repair options; this may take some time
```

```
allocated channel: ORA_DISK_1
```

```
channel ORA_DISK_1: SID=79 device type=DISK
```

```
analyzing automatic repair options complete
```

```
Mandatory Manual Actions
```

```
=====
```

```
no manual actions available
```

Recovery Advisor – Advise Failure

Optional Manual Actions

=====

1. Automatic repairs may be available if you shutdown the database and restart it in mount mode

Automated Repair Options

=====

Option Repair Description

1 Restore and recover datafile 16

Strategy: The repair includes complete media recovery with no data loss

Repair script: /opt/oracle/diag/rdbms/paul/PAUL/hm/reco_1304580712.hm

Recovery Advisor – Advise Failure

```
oracle@simon[PAUL]% cat /opt/oracle/diag/rdbms/paul/PAUL/hm/reco_1304580712.hm
# restore and recover datafile
sql 'BOXER' 'alter database datafile 16 offline';
restore ( datafile 16 );
recover datafile 16;
sql 'BOXER' 'alter database datafile 16 online'
```

Recovery Advisor – Repair Failure

```
RMAN> REPAIR FAILURE;
```

Strategy: The repair includes complete media recovery with no data loss

Repair script: /opt/oracle/diag/rdbms/paul/PAUL/hm/reco_3216729380.hm

contents of repair script:

```
# restore and recover datafile
sql 'BOXER' 'alter database datafile 16 offline';
restore ( datafile 16 );
recover datafile 16;
sql 'BOXER' 'alter database datafile 16 online';
```

Do you really want to execute the above repair (enter YES or NO)?

```
Do you really want to execute the above repair (enter YES or NO)? YES
executing repair script
```

```
sql statement: alter database datafile 16 offline
```

```
Starting restore at 15-MAY-19
using channel ORA_DISK_1
```

```
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 00016 to
/u02/oradata/PAUL/88ECC48AE4632772E0530D63A8C04AEF/datafile/o1_mf_users_gfqznp2m_.dbf
channel ORA_DISK_1: reading from backup piece
/u03/orabackup/PAUL/88ECC48AE4632772E0530D63A8C04AEF/backupset/2019_05_15/o1_mf_nnndf_TAG20190515T141943_gfr103o6_.bkp
channel ORA_DISK_1: piece
handle=/u03/orabackup/PAUL/88ECC48AE4632772E0530D63A8C04AEF/backupset/2019_05_15/o1_mf_nnndf_TAG20190515T141943_gfr103o6_.bkp
tag=TAG20190515T141943
channel ORA_DISK_1: restored backup piece 1
channel ORA_DISK_1: restore complete, elapsed time: 00:00:01
Finished restore at 15-MAY-19
```

```
Starting recover at 15-MAY-19
using channel ORA_DISK_1
```

```
starting media recovery
media recovery complete, elapsed time: 00:00:01
```

```
Finished recover at 15-MAY-19
```

```
sql statement: alter database datafile 16 online
repair failure complete
```

- RMAN Advisor funktioniert nicht für RAC

Cloning

Cloning mit RMAN

- Erstellen von Testdatenbanken
- Überprüfen, ob das Backup funktioniert!!!

- Erstellen einer init.ora für die Testdatenbank
 - Kopie des Originals
 - Anpassen der Parameter (z.B. sga_target)
 - Löschen der Controlfile Einträge
- Erstellen der notwendigen Verzeichnisse (möglichst identisch mit dem Original)
 - adump → `$ORACLE_BASE/admin/<SID>/adump`
 - dpdump → `$ORACLE_BASE/admin/<SID>/dpdump`
 - data
 - dackup

- Original (simon)

```
SQL> CREATE pfile='/tmp/initPAUL.ora' from spfile;  
  
scp /tmp/initPAUL.ora clapton:/tmp
```

```
mkdir -p /opt/oracle/admin/PAUL/adump  
mkdir -p /opt/oracle/admin/PAUL/dpdump  
mkdir -p /u02/oradata  
mkdir -p /u03/orabackup  
chown -R oracle:oinstall /opt/oracle/admin /u02/oradata /u03/orabackup
```

- scp des Backup Verzeichnisses (ArchiveLogs nicht vergessen)

```
scp -r simon:/u03/orabackup/PAUL /u03/orabackup/PAUL
```

- Vorsicht: keinen NFS-Mount benutzen
 - Das zweite Controlfile und der zweite Member der Redologs liegen bei OMF im Backup Verzeichnis

Instanz starten

```
sqlplus / as sysdba
```

```
SQL> CREATE SPFILE FROM PFILE='/tmp/initPAUL.ora';
```

```
SQL> startup nomount
```

Restore Controlfile

```
RMAN> RESTORE CONTROLFILE FROM AUTOBACKUP;
```

```
Starting restore at 29-MAY-19  
using channel ORA_DISK_1
```

```
recovery area destination: /u03/orabackup  
database name (or database unique name) used for search: PAUL  
channel ORA_DISK_1: AUTOBACKUP  
/u03/orabackup/PAUL/autobackup/2019_05_29/o1_mf_s_1009541851_ggwqlw6x_.bkp found in the recovery  
area  
AUTOBACKUP search with format "%F" not attempted because DBID was not set  
channel ORA_DISK_1: restoring control file from AUTOBACKUP  
/u03/orabackup/PAUL/autobackup/2019_05_29/o1_mf_s_1009541851_ggwqlw6x_.bkp  
channel ORA_DISK_1: control file restore from AUTOBACKUP complete  
output file name=/u02/oradata/PAUL/controlfile/o1_mf_gfqy132z_.ctl  
output file name=/u03/orabackup/PAUL/controlfile/o1_mf_gfqy13hk_.ctl  
Finished restore at 29-MAY-19
```

Mount Database

```
RMAN> ALTER DATABASE MOUNT;  
released channel: ORA_DISK_1  
Statement processed
```


Restore Database (1)

```
RMAN> RESTORE DATABASE;
```

```
Starting restore at 29-MAY-19
```

```
Starting implicit crosscheck backup at 29-MAY-19
```

```
allocated channel: ORA_DISK_1
```

```
channel ORA_DISK_1: SID=38 device type=DISK
```

```
Crosschecked 23 objects
```

```
Finished implicit crosscheck backup at 29-MAY-19
```

```
Starting implicit crosscheck copy at 29-MAY-19
```

```
using channel ORA_DISK_1
```

```
Finished implicit crosscheck copy at 29-MAY-19
```

```
searching for all files in the recovery area
```

```
cataloging files...
```

```
cataloging done
```

Restore Database (2)

List of Cataloged Files

=====

File Name: /u03/orabackup/PAUL/autobackup/2019_05_29/o1_mf_s_1009547148_ggww7djy_.bkp

using channel ORA_DISK_1

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 00001 to /u02/oradata/PAUL/datafile/o1_mf_system_gfqxv3xm_.dbf

channel ORA_DISK_1: restoring datafile 00003 to /u02/oradata/PAUL/datafile/o1_mf_sysaux_gfqxy3cn_.dbf

channel ORA_DISK_1: restoring datafile 00004 to /u02/oradata/PAUL/datafile/o1_mf_undotbs1_gfqxztmj_.dbf

channel ORA_DISK_1: restoring datafile 00007 to /u02/oradata/PAUL/datafile/o1_mf_users_gfqxzvw6_.dbf

channel ORA_DISK_1: reading from backup piece

/u03/orabackup/PAUL/backupset/2019_05_29/o1_mf_nnndf_TAG20190529T134448_ggww5jj6_.bkp

channel ORA_DISK_1: piece handle=/u03/orabackup/PAUL/backupset/2019_05_29/o1_mf_nnndf_TAG20190529T134448_ggww5jj6_.bkp

tag=TAG20190529T134448

channel ORA_DISK_1: restored backup piece 1

channel ORA_DISK_1: restore complete, elapsed time: 00:00:15

channel ORA_DISK_1: starting datafile backup set restore

...

channel ORA_DISK_1: restored backup piece 1

channel ORA_DISK_1: restore complete, elapsed time: 00:00:07

Finished restore at 29-MAY-19

```
RMAN> RECOVER DATABASE;
```

```
Starting recover at 29-MAY-19  
using channel ORA_DISK_1
```

```
starting media recovery
```

```
archived log for thread 1 with sequence 13 is already on disk as file  
/u03/orabackup/PAUL/archivelog/2019_05_29/o1_mf_1_13_ggww7bkc_.arc
```

```
archived log file
```

```
name=/u03/orabackup/PAUL/archivelog/2019_05_29/o1_mf_1_13_ggww7bkc_.arc thread=1  
sequence=13
```

```
unable to find archived log
```

```
archived log thread=1 sequence=14
```

```
RMAN-00571: =====
```

```
RMAN-00569: ===== ERROR MESSAGE STACK FOLLOWS =====
```

```
RMAN-00571: =====
```

```
RMAN-03002: failure of recover command at 05/29/2019 14:16:46
```

```
RMAN-06054: media recovery requesting unknown archived log for thread 1 with sequence  
14 and starting SCN of 1599466
```

- Quelldatenbank

```
oracle@simon[PAUL]% ls -ltr /u03/orabackup/PAUL/archivelog/2019_05_29
total 6848
-rw-r----- 1 oracle oinstall 2523136 May 29 12:02 o1_mf_1_5_ggwp5866_.arc
-rw-r----- 1 oracle oinstall 1866752 May 29 12:10 o1_mf_1_6_ggwpokcx_.arc
-rw-r----- 1 oracle oinstall    1536 May 29 12:11 o1_mf_1_7_ggwppycw_.arc
-rw-r----- 1 oracle oinstall 484352 May 29 12:16 o1_mf_1_8_ggwpzhhp_.arc
-rw-r----- 1 oracle oinstall  10752 May 29 12:17 o1_mf_1_9_ggwq1t27_.arc
-rw-r----- 1 oracle oinstall  31232 May 29 12:25 o1_mf_1_10_ggwqj1w2_.arc
-rw-r----- 1 oracle oinstall  24576 May 29 12:30 o1_mf_1_11_ggwqsr3l_.arc
-rw-r----- 1 oracle oinstall 2038272 May 29 13:44 o1_mf_1_12_ggww55pg_.arc
-rw-r----- 1 oracle oinstall  16896 May 29 13:45 o1_mf_1_13_ggww7bkc_.arc
```

Öffnen der Datenbank

```
RMAN> ALTER DATABASE OPEN RESETLOGS;
```

```
Statement processed
```

Löschen des Clones

```
SQL> SHUTDOWN ABORT  
ORACLE instance shut down.
```

```
SQL> STARTUP MOUNT RESTRICT  
Database mounted.
```

```
SQL> DROP DATABASE;
```

```
Database dropped.
```

```
oracle@clapton[PAUL]% rm -rf /u03/orabackup/PAUL
```

- Die Vorgehensweise setzt Oracle Managed Files voraus
 - Ansonsten muss ggf. mit `file_name_convert` gearbeitet werden

- Ein Backup ist nur so gut, wie der Restore, den man tatsächlich durchgeführt hat
- Bei Oracle Managed Files liegen die Backup Pieces in verschiedenen Verzeichnissen
- VORSICHT: ein Clone ist zunächst eine 1:1 Kopie des Originals
 - Sensible Daten
 - DSGVO
 - Falsch Datenbank ...

Housekeeping

- Wird über zwei Parameter definiert

```
SQL> show parameter db_recovery
```

NAME	TYPE	VALUE
-----	-----	-----
db_recovery_file_dest	string	/u03/orabackup
db_recovery_file_dest_size	big integer	12918M

- Für die Datenbank

```
<db_recovery_file_dest>  
  → <DB_UNIQUE_NAME>  
    → controlfile  
    → onlinelog  
    → flashback
```

- Für Backups

```
<db_recovery_file_dest>  
  → <DB_UNIQUE_NAME>  
    → archivelog/<DATUM>  
    → autobackup/<DATUM>  
    → backupset/<DATUM>  
    → <GUID der PDBS>/backupset/<DATUM>
```

- Backups werden gelöscht wenn:
 - die Fast Recovery Area zu mehr als 80% gefüllt ist
 - die Backup Retention überschritten wurde
 - Es mind. ein gültiges Backup gibt

- Archivierte Redolog Dateien werden automatisch gelöscht, wenn:
 - der Platz in der Fast Recovery Area zu mehr als 80 % gefüllt ist
 - die Dateien mindestens einmal gesichert worden sind

- Kontrolle

```
SQL> SELECT * FROM v$recovery_file_dest;
```

NAME	SPACE_LIMIT	SPACE_USED	SPACE_RECLAIMABLE	NUMBER_OF_FILES	CON_ID
/u03/orabackup	13,545,504,768	10,038,767,104	7,183,131,136	38	0

- Löschen von Obsoleteren Dateien

```
2019-05-29T13:44:59.805145+02:00
```

```
Deleted Oracle managed file
```

```
/u03/orabackup/PAUL/archivelog/2019_05_15/o1_mf_1_2_gfr0hol6_.arc
```

```
2019-05-29T13:45:00.853891+02:00
```

```
Deleted Oracle managed file
```

```
/u03/orabackup/PAUL/backupset/2019_05_15/o1_mf_nnndf_TAG20190515T141516_gfr0pnr2_.bkp
```

```
2019-05-29T13:45:32.421768+02:00
```

```
PDB$SEED(2):Deleted Oracle managed file
```

```
/u03/orabackup/PAUL/88ECC48AE4632772E0530D63A8C04AEF/backupset/2019_05_15/o1_mf_nnndf_TAG20190515T141516_gfr0qrv5_.bkp
```

```
2019-05-29T13:45:46.515309+02:00
```

Archive Stuck

- Bei einem Archive Stuck bleibt die Datenbank stehen!
 - Bitte auf keinen Fall die Datenbank stoppen!
 - Besser: Parameter `db_recovery_file_dest_size` vergrößern

- Experten mit über 25 Jahren Oracle Erfahrung
- Firmensitz in Erftstadt bei Köln
- Spezialisten für
 - Oracle Datenbank Administration
 - Hochverfügbarkeit (RAC, Data Guard, Failsafe, etc.)
 - Einsatz der Oracle Standard Edition
 - Oracle Migrationen (HW, Unicode, Standard Edition)
 - Replikation
 - Performance Tuning
 - Datenbank Cloning (Delphix, Actifio, CloneDB)
- Fernwartung
- Schulung und Workshops (Oracle, Toad)



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