

BR*Tools Support for Oracle 11g ASM and RAC

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Agenda

- Motivation for the project
- Goals of the project
- Prerequisites for using BR*Tools in Oracle 11g ASM / RAC environment
- Configuration of BR*Tools in Oracle 11g ASM / RAC environment
- ASM impact on BR*Tools functionality
- Supported backup scenarios in ASM environment
- Space management in ASM environment
- Oracle Exadata support in BR*Tools
- BR*Tools development update
- Additional sources of information

BR*Tools - Overview

SAP BRTOOLS 6.40 (9)

BR*TOOLS

Cancel Detail Log Patches Documentation

BR*Tools main menu

- Instance management
- Space management
- Segment management
- Backup and database copy
- Restore and recovery
- Check and verification
- Database statistics
- Additional functions
- Exit program

SAP BR*TOOLS for Oracle Database Administration

BR*Tools are SAP's recommended solution for administrating the Oracle database underlying your SAP system. You can use these tools both in daily routine tasks and in less frequent, complex tasks, such as recovering or reorganizing the database. You can configure and execute functions individually.

BR*Tools also offer certified interface solutions for external backup tools and integrate the latest in database technology, including standby databases and split-mirroring.

BrGui 6.40 (9) © 2005 SAP AG.

Welcome, Administrator my Profile **BR*TOOLS STUDIO** Logged on to C13 | Log off

SAP Developer Network | Documentation | Patches | About

BR*Tools Wizard Administration

Overview | Instance | Database | Maintenance | Availability | Advanced

BR*Tools Studio Console

Instance Status

- Access State**
The database is open.
- SAP Connections**
17 connections detected.
- Archiving**
Archiving is active.

My Favorite Tasks

Select an entry from the list to directly proceed to executing this task.

Favorite Tasks

My Instance Shutdown

Go!

Jobs in Process

1	⊙ ⊙ ⊙
2	⊙ ⊙ ⊙
3	⊙ ⊙ ⊙

Overview

Instance

Start up or shut down the database instance. Additionally, you can change a database parameter or force a database checkpoint. This section also provides you with a detailed instance status report.

Quick Links
[Startup](#) | [Shutdown](#) | [Status](#)

Database

This section provides you with a detailed view on the database itself, presenting an overview of the relational architecture of your database and the underlying file structures which physically implement this architecture.

Quick Links
[Owners](#) | [Tablespaces](#) | [Tables](#) | [Indices](#) | [Data Files](#) | [Control Files](#) | [Redolog Files](#)

Maintenance

This item comprises all major maintenance functions for the database. It includes storage administration, reorganization, statistics maintenance and export/import of database objects.

Quick Links
[Check](#) | [Archiving](#) | [Reorganization](#) | [Statistics](#) | [Export](#) | [Import](#)

Availability

Backup the database to different media, and restore and recover the database in case of a potential system failure. Disaster Recovery supports you step by step in regaining an operative system status in case of a worst-case crash scenario.

Quick Links
[Backup](#) | [Restore](#) | [Recovery](#) | [Disaster Recovery](#)

Advanced

The advanced mode enables you to directly execute BR*Tools functionality that is not covered by the regular sections above. Command line style input allows for an adaption to all situational requirements.

Quick Links
[BR*Tools Online Documentation](#)



Motivation for the Project

Why should BR*Tools support Oracle 11g ASM and RAC?

Motivation

ASM certification for SAP Installations, February 2011

- ASM is the preferred storage platform for Oracle 11g RAC
- ASM is an alternative storage platform for raw disks
- ASM is a homogeneous storage platform across hardware platforms

Oracle Exadata Database Machine in SAP environment, June 2011

- Oracle Exadata Database Machine is a RAC system based on ASM

Significant changes in the installation of Oracle 11g RAC

- Oracle 11g RAC and ASM are using the same new installation standards



Goals of the Project

To what extent should BR*Tools support Oracle 11g ASM and RAC?

Goals

The main BR*Tools functionality should be available for ASM

- Backup, restore, recovery
- Database instance, space and segment management
- Database statistics, database check
- ...

Oracle ASM and GRID management will not be covered

- No BR*Tools support for ASM instance management
- No BR*Tools support for ASM disk group management
- No BR*Tools support for GRID infrastructure / CRS management



Prerequisites for using BR*Tools

What is the setup of Oracle 11g ASM / RAC environment in which BR*Tools are running?

Prerequisites

Oracle software installation under OS user 'oracle'

- 'oracle' OS user replaces 'ora<dbname>' user
- 'ora<dbname>' OS user is not used anymore – it can be deleted
- One OS user for multiple databases – mix-up environment problem
- Valid only for Oracle 11g ASM and RAC – not for the standard installations

Oracle version 11.2.0.2 or higher

BR*Tools version 7.20 patch level 18 or higher



Configuration of BR*Tools

What are the changes to the standard configuration of BR*Tools?

1-2

- File permissions of BR*Tools executables
- File permissions of BR*Tools directories

3-4

- New BR*Tools profile directory
- New run-time environment of BR*Tools

5-6

- New init<DBSID>.sap parameters
- Names of database files in ASM

Configuration of BR*Tools and Oracle Environment (1)

File permissions of BR*Tools executables in sap-exe directory

```
-rwsrwsr-- 1 oracle oinstall 7732338 May 31 16:30 brarchive*  
-rwsrwsr-- 1 oracle oinstall 7908129 May 31 16:30 brbackup*  
-rwsrwsr-- 1 oracle oinstall 9970354 May 31 16:30 brconnect*  
-rwsrwsr-- 1 oracle oinstall 8376747 May 31 16:31 brrecover*  
-rwsrwsr-- 1 oracle oinstall 2783544 May 31 16:31 brrestore*  
-rwsrwsr-- 1 oracle oinstall 9479944 May 31 16:31 brspace*  
-rwsrwsr-- 1 oracle oinstall 4103679 May 31 16:31 brtools*
```

Configuration of BR*Tools and Oracle Environment (2)

File permissions of BR*Tools log directories in /oracle/<DBNAME>

```
lrwxrwxrwx 7 oracle oinstall 4096 May 31 14:56 112 -> 11202
drwxr-xr-x 7 oracle oinstall 4096 May 31 14:56 11202
drwxrwxr-x 2 oracle oinstall 4096 May 31 17:07 saparch
drwxrwxr-x 2 oracle oinstall 4096 May 31 17:14 sapbackup
drwxrwxr-x 2 oracle oinstall 4096 May 31 17:07 sapcheck
drwxrwxr-x 2 oracle oinstall 4096 May 31 17:12 sapprof
drwxrwxr-x 2 oracle oinstall 4096 May 31 17:12 sapreorg
drwxrwxr-x 2 oracle oinstall 4096 May 31 17:12 saptrace
```

Configuration of BR*Tools and Oracle Environment (3)

File permissions of database file directories for RAC (non-ASM)

drwxr-xr-x	2	oracle	oinstall	4096	May 31 17:07	mirrlogA
drwxr-xr-x	2	oracle	oinstall	4096	May 31 17:07	mirrlogB
drwxr-xr-x	2	oracle	oinstall	4096	May 31 17:07	oraarch
drwxr-xr-x	2	oracle	oinstall	4096	May 31 17:07	origlogA
drwxr-xr-x	2	oracle	oinstall	4096	May 31 17:07	origlogB
drwxr-xr-x	2	oracle	oinstall	4096	May 31 17:07	sapdata1
drwxr-xr-x	2	oracle	oinstall	4096	May 31 17:07	sapdata2
drwxr-xr-x	2	oracle	oinstall	4096	May 31 17:07	sapdata3
drwxr-xr-x	2	oracle	oinstall	4096	May 31 17:07	sapdata4

Configuration of BR*Tools and Oracle Environment (4)

New BR*Tools profile directory 'saprof' in /oracle/<DBNAME>

```
-rw-rw-r-- 1 oracle oinstall    1274 May 31 17:30 init<DBSID>.ora  
-rw-rw-r-- 1 oracle oinstall   26534 May 31 17:30 init<DBSID>.sap  
-rw-r----- 1 oracle asmadmin  3584 May 31 18:30 spfile<DBSID>.ora
```

Contents of Oracle pfile in \$ORACLE_HOME/dbs for ASM

```
spfile='+DATA/<DBNAME>/spfile<DBNAME>.ora'
```

Contents of Oracle pfile in \$ORACLE_HOME/dbs for RAC (non-ASM)

```
spfile='/oracle/<DBNAME>/112/dbs/spfile.ora'
```

Logon / SAP system context

Unix: <sid>adm / <password>

OS user
logon

Run-time context

Environment

Start-time context

OS user

OS group

oracle

oinstall+dba+...

BRCONNECT

UNIX context

OS user

OS group

<sid>adm

sapsys+dba+...

OS> brconnect -u / -c -f check

oracle oinstall **rsx rsx** r-- brconnect

oracle oinstall **rwX r-x--x** sqlplus

UNIX context



Configuration of BR*Tools and Oracle Environment (5)

New run-time environment of BR*Tools

- BR*Tools should be started only under OS user <sapsid>adm
- <sapsid>adm in OS groups: sapsys, dba, oper, sapinst + asmdba, asmoper, oinstall
- Execution under OS user 'oracle' is possible, but not recommended (environment!)

Standard environment setting

- ORACLE_SID
- ORACLE_HOME
- SAPDATA_HOME
- SAPEXE
- ...

Configuration of BR*Tools and Oracle Environment (6)

New init<DBSID>.sap parameters for ASM installations

Oracle system ID of ASM instance

asm_ora_sid = +ASM

Oracle home of ASM instance

asm_ora_home = /oracle/GRID/11202

Oracle ASM root directory name

asm_root_dir = ASM

asm_ora_sid = (<db_inst1>:<asm_inst1>, <db_inst2>:<asm_inst2>, ...)

asm_ora_home = (<db_inst1>:<asm_home1>, <db_inst2>:<asm_home2>, ...)

Configuration of BR*Tools and Oracle Environment (7)

Names of database files on ASM disk groups

+DATA/**PRD**/DATAFILE/system.334.761302249

+DATA/**PRD**/DATAFILE/sysaux.336.761302097

+DATA/**PRD**/DATAFILE/psaptemp.344.761302309

+OLOG/**PRD**/DATAFILE/group_1.339.761302067

+MLOG/**PRD**/DATAFILE/group_1.340.761302067

+DATA/**PRD**/spfilePRD.ora => +DATA/PRD/PARAMETERFILE/spfilePRD.ora.343.759750697

+DATA/**PRD**/cntrlPRD.dbf => +DATA/PRD/CONTROLFILE/cntrlPRD.dbf.286.761301265

+RECO/**PRD**/cntrlPRD.dbf => +RECO/PRD/CONTROLFILE/cntrlPRD.dbf.797.761301267

+ARCH/**PRD**/oraarch/1_2033_775125036.dbf =>

+ARCH/PRD/ARCHIVELOG/2011_11_09/thread_1_seq_2033.1141.766886413



ASM Impact on BR*Tools

Which functional areas of BR*Tools are effected by ASM?

ASM Impact on BR*Tools

Highly effected areas:

- Backup, restore, recovery
- Tablespace management
- File management

Medium effected areas:

- Instance management
- Database check and verification
- Database recreation

Not effected areas:

- Segment management (table reorganization, index rebuild,...)
- Database statistics
- ...



Supported Backup Scenarios for ASM

Do I have to change my backup strategy?

How to Back up ASM Files with BR*Tools?

ASM database data files can be back up only by RMAN!

backup_dev_type = rman_util | rman_disk | rman_stage

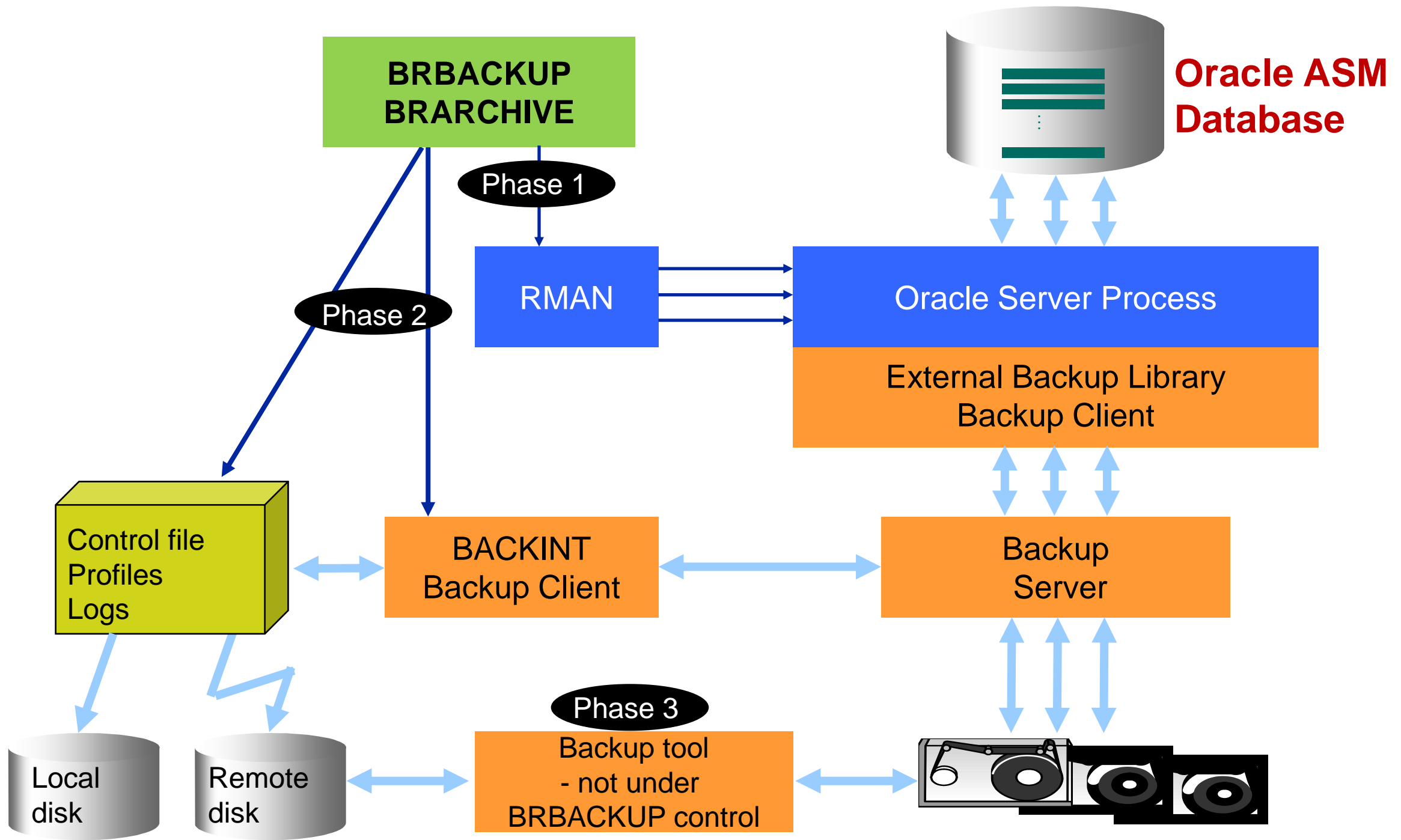
backup_dev_type = disk

disk_copy_cmd = rman_set | rman

backup_dev_type = tape | pipe

tape_copy_cmd = rman

Two-step backup scenario (1. ASM -> disk, 2. disk -> tape) is supported!



Restrictions and Recommendations Regarding Backups

No additional restrictions regarding RMAN backup strategies

- Incremental backup strategies are supported
- Backup compression, encryption and verification is available
- 3rd party SAP SBT library can be used

But, restore and recovery only with BRRECOVER!

- Starting BRRESTORE directly is not supported
- Use BRRECOVER instead:
 - "brrecover -u / -t complete" - complete recovery
 - "brrecover -u / -t dbpit" - database point-in-time recovery
 - "brrecover -u / -t reset" - database reset



Space Management in ASM

How can I create new tablespaces and data files in ASM?

Space Management in ASM with BR*Tools

No changes to BRSPACE menus regarding ASM

- Same processes for space management like for non-ASM databases
- Tablespace and online redolog files are created as Oracle Managed Files (OMF)
- Specify an ASM disk group instead of file name to create an OMF, e.g. “+DATA”
- Using ASM alias is allowed, but not recommended (restricted support)
- Renaming of ASM OMF is not supported by Oracle



Oracle Exadata Support in BR*Tools

Is there something special in BR*Tools support for Exadata?

Exadata Support in BR*Tools

The same prerequisites as for Oracle ASM

- Oracle software installation under OS user 'oracle'
- Oracle version 11.2.0.2 or higher
- BR*Tools version 7.20 patch level 18 or higher

But, there is a challenge with local Oracle homes!

- What about clean-up of Oracle trace files and checking Oracle alert logs?
 - Distributed 'cleanup' and 'check' function is available for Exadata:
 - "brconnect -u / -c -f cleanup" - cleans up trace files on all RAC nodes
 - "brconnect -u / -c -f check" - reads and checks alert logs on all RAC nodes
- Prerequisites: parameter "loc_ora_homes = yes" + rsh/ssh connection between nodes



BR*Tools Development Update

Is there something else new in BR*Tools worth to know?

BR*Tools Development Update

BR*Tools 7.20 patch set 20 available now on SAP Marketplace!

- Fixes for known bugs in patch set 18 (SAP note 1647270)
- Full support for 2-phase backup strategy for ASM databases
- Support for bigfile tablespaces (SAP note 1647271)

Deletion of Oracle 11g trace files in additional directories

- `<diagnostic_dest>/diag/rdbms/<db_name>/<INST_NAME>`
- `cleanup_ora_dir = (<ora_trace_dir1>, <ora_trace_dir2>, ...)`
- `cleanup_ora_sdir = (<ora_trace_sdir1>, <ora_trace_sdir2>, ...)`

New remote disk copy command on Windows

- Enables remote disk backup within the same Windows domain without password
- `stage_copy_cmd = wcp` (SAP note 1647272)



Additional Sources of Information

Where can I find more info about ASM and BR*Tools for ASM?

Sources of Information about ASM and BR*Tools

Oracle white papers on SAP SDN / Oracle [<http://www.sdn.sap.com/irj/sdn/ora>]

- "SAP Databases on Oracle Automatic Storage Management 11g Release 2"
- "SAP with Oracle Real Application Clusters 11g Release 2 and Oracle Automatic Storage Management 11g Release 2"
- "Using SAP NetWeaver with the Oracle Exadata Database Machine - A Best Practices Guide"

SAP notes

- 1598594 - BR*Tools configuration for Oracle installations under 'oracle' user
- 1627541 - BR*Tools support for Oracle ASM and Exadata
- 1554661 - Configuration of environment for 'oracle' user
- 1550133 - Oracle Automatic Storage Management (ASM)
- 1590515 - SAP Software and Oracle Exadata



Thank You!

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