Recommended general database layouts and storage configurations

SnapManager for SAP

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Recommended general database layouts and storage configurations

Knowing the recommended general database layouts and storage configurations can help you avoid issues related to disk groups, file types, and tablespaces.

- Do not include files from more than one type of SAN file system or volume manager in your database.

  All files making up a database must reside on the same type of file system.

- SnapManager requires a multiple of 4K block size.
- Include the database system identifier in the `oratab` file.

  Include an entry in the `oratab` file for each database to be managed. SnapManager relies on the `oratab` file to determine which Oracle home to use.

If you want to leverage the new volume-based restore or full disk group restore, consider the following guidelines related to file systems and disk groups:

- A disk group containing data files cannot contain other types of files.
- The logical unit number (LUN) for the data file disk group must be the only object in the storage volume.

The following are some guidelines for volume separation:

- Data files for only one database must be in the volume.
- You must use separate volumes for each of the following file classifications: database binaries, data files, online redo log files, archived redo log files, and control files.
- You do not need to create a separate volume for temporary database files because SnapManager does not back up temporary database files.

SAP uses a standard layout for Oracle database installations. In this layout, SAP places copies of the Oracle control file in `E:\oracle\SID\origlogA, E:\oracle\SID\origlogB`, and `E:\oracle\SID\sapdata1 file systems`.

The control file in the sapdata1 file system conflicts with the SnapManager requirements for separating the control files and data files into separate volumes and must be adjusted to allow fast restore capability.

Because BR*Tools backups include the Oracle and SAP profiles located in the dbs subdirectory of the Oracle installation, the Oracle installation must be located on storage.

In the case of a new installation, you can modify the location of the control files by using SAPINST and move the control file normally placed in the sapdata1 file system to a file system that does not reside in the same volume as the data files. (SAPINST is the tool that SAP provides for installing SAP systems.)

However, in the case of a system that has already been installed, you must move the control file from the file system to allow fast restore using SnapManager. You can do this by creating a new file system in a volume that does not contain data files, moving the control file to that file system, and then creating a symbolic link from the previous file system to the directory for the new file system. It is necessary to stop SAP and the Oracle database when moving the control file to avoid database errors.

Before making any modifications, listing of the files in the sapdata1 directory containing the control file might look like this:

```
hostname:/
#  ls -l /oracle/SID/sapdata1/cntrl
-rw-r----- 1 orasid  dba  9388032 Jun 19 01:51 cntrlSID.dbf
```

After the modification, the listing might look like this:

```
hostname:/
# ls -sl /oracle/SID/sapdata1
0 lrwxrwxrwx 1 root root 19 2008-08-06 14:55 cntrl -> /oracle/SID/control
0 -rw-r--r-- 1 root root 0 2008-08-06 14:57 data01.dbf

# ls -sl /oracle/SID/control
0 -rw-r--r-- 1 root root 0 2008-08-06 14:56 cntrlSID.dbf
```

Define the database home with the oratab file

SnapManager uses the `oratab` file during operations to determine the Oracle database home directory. An entry for your Oracle database must be in the `oratab` file for SnapManager to work correctly. The `oratab` file is created during the Oracle software installation.

The Oracle home directory is set in the `oratab` file for SAP systems, just as it is for Oracle-only systems. SAP systems also have a database home directory, which is typically `/oracle/SID/xxx_yy`, where `xxx` represents the database version and `yy` is either 32 or 64.

The `oratab` file resides in different locations based on the host operating system as shown in the following table:

Host operating system	File location
Linux	/etc/oratab
Solaris	/var/opt/oracle/oratab
IBM AIX	/etc/oratab

The sample `oratab` file contains the following information:

```
+ASM1:/u01/app/11.2.0/grid:N   # line added by Agent
oelpro:/u01/app/11.2.0/oracle:N         # line added by Agent
# SnapManager generated entry          (DO NOT REMOVE THIS LINE)
smsapclone:/u01/app/11.2.0/oracle:N
```

After Oracle is installed, you must ensure that the `oratab` file resides in the location specified in the previous table. If the `oratab` file does not reside in the correct location per your operating system, you must contact technical support for assistance.

Requirements for using RAC databases with SnapManager

You must know the recommendations for using Real Application Clusters (RAC) databases with SnapManager. The recommendations include port numbers, passwords, and authentication mode.

- In database authentication mode, the listener on each node that interacts with an instance of the RAC database must be configured to use the same port number.

  The listener that interacts with the primary database instance must be started prior to initiating a backup.

- In operating system authentication mode, the SnapManager server must be installed and running on each node in the RAC environment.
- The database user password (for example, for a system administrator or a user with the sysdba privilege) must be same for all the Oracle database instances in a RAC environment.

Supported partition devices

You must know the different partition devices that are supported in SnapManager.

The following table provides partition information and how it can be enabled for different operating systems:

Operating system	Single partition	Multiple partition	Non-partition devices	File system or RAW devices
Red Hat Enterprise Linux 5x or Oracle Enterprise Linux 5x	Yes	No	No	ext3*
Red Hat Enterprise Linux 6x or Oracle Enterprise Linux 6x	Yes	No	No	ext3 or ext4*

Operating system	Single partition	Multiple partition	Non-partition devices	File system or RAW devices
SUSE Linux Enterprise Server 11	Yes	No	No	ext3*
SUSE Linux Enterprise Server 10	No	No	Yes	ext3***

*

For a non-MPIO environment, enter the following command:

```
sfdisk -uS -f -L -q /dev/ device_name
```

For an MPIO environment, enter the following commands:

- `sfdisk -uS -f -L -q /dev/ device_name`
- `kpartx -a -p p /dev/mapper/ device_name`

***

Not applicable.

For more information on the operating system versions supported, refer to the Interoperability Matrix.

Requirements for using databases with NFS and SnapManager

You must know the requirements for using databases with Network File System (NFS) and SnapManager. The recommendations include running as root, attribute caching, and symbolic links.

- You must run SnapManager as root; SnapManager must be able to access the file systems that contain data files, control files, online redo logs, archive logs, and the database home.

  Set either of the following NFS export options to ensure that root can access the file systems:

  - root=*`host name`*
  - rw=*`host name`*, anon=0
- You must disable attribute caching for all the volumes that contain database data files, control files, redo and archive logs, and the database home.

  Export the volumes by using the noac (for Solaris and AIX) or actimeo=0 (for Linux) options.
- You must link the database data files from local storage to NFS to support symbolic links at the mount point-level only.

Sample database volume layouts

You can refer to sample database volume layouts for help in configuring your database.

Single-instance databases

File types	Volume names	Dedicated volume for file types	Automatic Snapshot copies
Oracle binaries	orabin_ *host name*	Yes	On
Data files	oradata_ *sid*	Yes	Off
Temporary data files	oratemp_ *sid*	Yes	Off
Control files	oracntrl01_ *sid* (Multiplexed) oracntrl02_ *sid* (Multiplexed)	Yes	Off
Redo logs	oralog01_ *sid* (Multiplexed) oralog02_ *sid* (Multiplexed)	Yes	Off
Archive logs	oraarch_ *sid*	Yes	Off

Real Application Clusters (RAC) databases

File types	Volume names	Dedicated volume for file types	Automatic Snapshot copies
Oracle binaries	orabin_ *host name*	Yes	On
Data files	oradata_ *dbname*	Yes	Off
Temporary data files	oratemp_ *dbname*	Yes	Off
Control files	oracntrl01_ *dbname* (Multiplexed) oracntrl02_ *dbname* (Multiplexed)	Yes	Off

File types	Volume names	Dedicated volume for file types	Automatic Snapshot copies
Redo logs	oralog01_ *dbname* (Multiplexed) oralog02_ *dbname* (Multiplexed)	Yes	Off
Archive logs	oraarch_ *dbname*	Yes	Off
Cluster files	oracrs_ *clustername*	Yes	On

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