

Introduction of ASM/Grid

(Automatic Storage Management)



Links:

ASM/GRID INSTALLATION:-

<https://asrblogger.com/asm-grid-installation/>

Migrate Non-ASM to ASM instance in 12c

<https://asrblogger.com/migrate-non-asm-to-asm-instance-in-12c/>

ASM Day to Day Life Scripts

<https://asrblogger.com/asm-scripts/>

ASM Disk Addition & Deletion

<https://asrblogger.com/asm-disk-addition-deletion/>



Oracle Storage Management

Key components of storage management.

- Oracle Automatic Storage Management (Oracle ASM)
- Oracle ASM Cluster File System (Oracle ACFS)
- Oracle ASM Dynamic Volume Manager (Oracle ADVM)



Oracle Automatic Storage Management(ASM)

Oracle ASM is a **volume manager** and a **file system** for Oracle Database files that supports –

- > single-instance Oracle Database and
- > Oracle Real Application Clusters (Oracle RAC) configurations.

Oracle ASM is Oracle's recommended storage management solution.

Oracle Automatic Storage Management(ASM)



- Oracle ASM uses disk groups to store data files.
- **Oracle ASM disk group** is a collection of disks that Oracle ASM manages as a unit.
- You can add or remove disks from a disk group while a database continues to access files from the disk group.
- When you add or remove disks from a disk group, Oracle ASM automatically redistributes the file contents and eliminates the need for downtime when redistributing the content.
- Oracle ASM also uses the Oracle Managed Files (OMF) feature to simplify database file management. OMF automatically creates files in designated locations.

Oracle Managed Files (OMF)



- ❑ An OMF name is guaranteed to be unique, so name collisions are avoided. Furthermore, the risk of overwriting an existing file is also eliminated.
- ❑ ASM automatically deletes OMF directories when they are empty, simplifying cleanup after deleting a database or PDB.
- ❑ An OMF name automatically conforms to all file name constraints, such as the length limit.



Login to ASM

Oracle ASM has easy to use management interfaces such as :

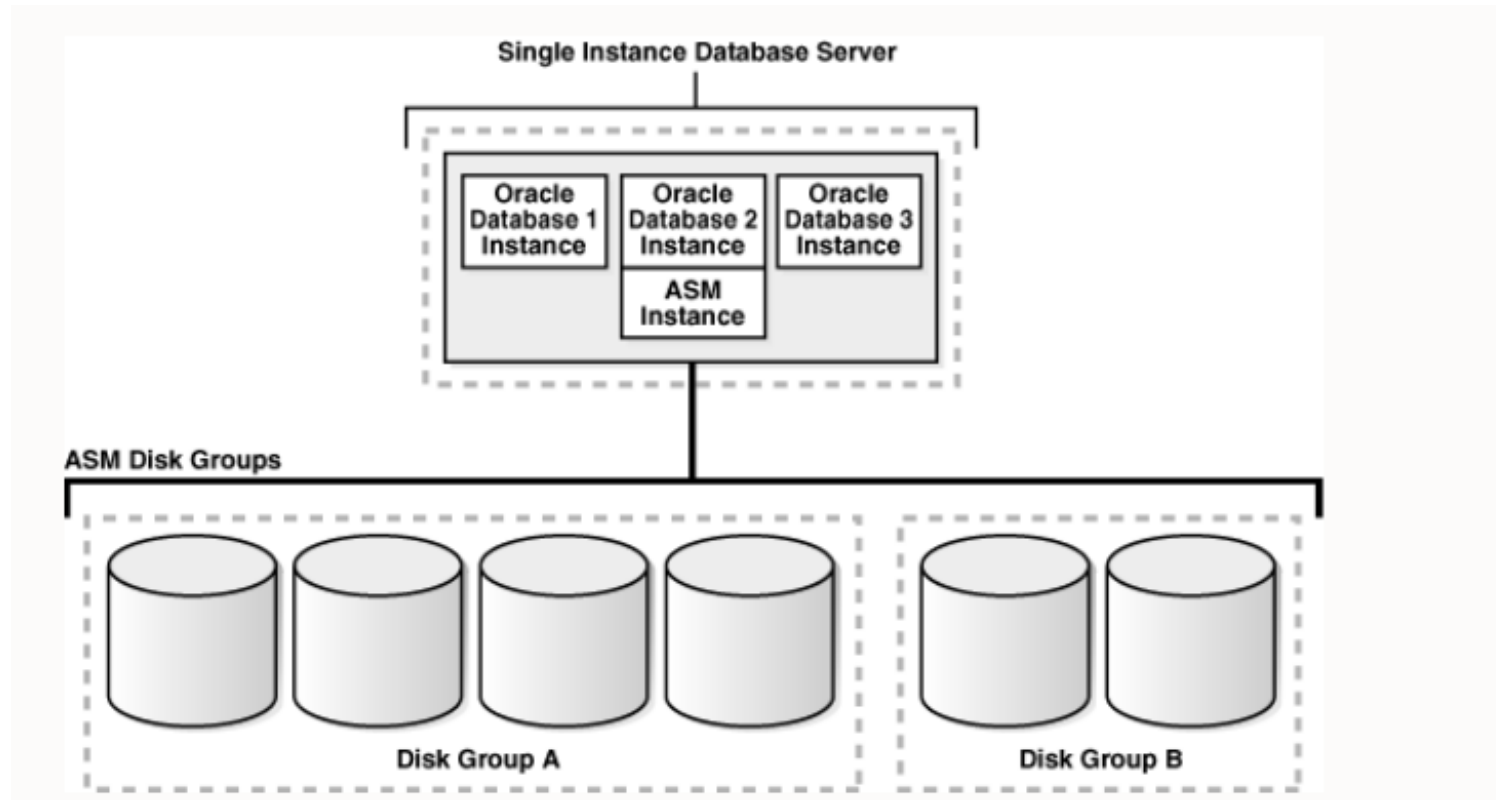
- ✓ SQL*Plus
- ✓ Oracle ASM Command Line Utility (ASMCMD) command-line interface
- ✓ Oracle ASM Configuration Assistant (ASMCA).



Oracle ASM Instances

An Oracle ASM instance is built on the same technology as an Oracle Database instance.

An Oracle ASM instance has a System Global Area (SGA) and background processes that are similar to those of Oracle Database. However, because Oracle ASM performs fewer tasks than a database, an Oracle ASM SGA is much smaller than a database SGA





Oracle ASM Instances

Oracle ASM metadata is the information that Oracle ASM uses to control a disk group and the metadata resides within the disk group.

Oracle ASM metadata includes the following information:

1. The disks that belong to a disk group
2. The amount of space that is available in a disk group
3. The file names of the files in a disk group
4. The location of disk group data file extents



Oracle ASM Disk Groups

A disk group consists of multiple disks and is the fundamental object that Oracle ASM manages.

In most cases you will only need two disk groups (DATA and FRA), where

- › DATA holds all database related files and
- › FRA holds the fast recovery area, including multiplexed copies on online redo logs and controlfiles.

Typically, the FRA disk group will be twice the size of the DATA disk group, since it must hold all backups.

Mirroring and Failure Groups

When you create a disk group, you specify an Oracle ASM disk group type based on one of the following three redundancy levels:

- **Normal** for 2-way mirroring
- **High** for 3-way mirroring
- **External** to not use Oracle ASM mirroring, such as when you configure hardware RAID for redundancy

Oracle ASM Disk Groups



Disk groups are mounted at ASM instance startup and unmounted at ASM instance shutdown.

Manual mounting and dismounting can be accomplished using the ALTER DISKGROUP statement as seen below.

```
ALTER DISKGROUP ALL DISMOUNT;
```

```
ALTER DISKGROUP ALL MOUNT;
```

```
ALTER DISKGROUP disk_group_1 DISMOUNT;
```

```
ALTER DISKGROUP disk_group_1 MOUNT;
```



Oracle ASM Disks

Oracle ASM disks are the storage devices that are provisioned to Oracle ASM disk groups.

Examples of Oracle ASM disks include:

- ✓ A disk or partition from a storage array
- ✓ An entire disk or the partitions of a disk
- ✓ Logical volumes
- ✓ Network-attached files (NFS)

Oracle ASM Files



Files that are stored in Oracle ASM disk groups are called Oracle ASM files.

Each Oracle ASM file is contained within a single Oracle ASM disk group. Oracle Database communicates with Oracle ASM in terms of files. Various file types in Oracle ASM disk groups, including:

- Control files
- Data files, temporary data files, and data file copies
- SPFILEs
- Online redo logs, archive logs, and Flashback logs
- RMAN backups
- Disaster recovery configurations
- Change tracking bitmaps
- Data Pump dumpsets

Important Parameter :

ASM POWER LIMIT

The ASM_POWER_LIMIT initialization parameter specifies the default power for disk rebalancing in a disk group.

The range of values is 0 to 1024. The default value is 1.

```
ALTER DISKGROUP disk_group_1 REBALANCE POWER 5;
```

ASM DISKSTRING

The ASM_DISKSTRING initialization parameter specifies a comma-delimited list of strings that limits the set of disks that an Oracle ASM instance discovers.

Startup of ASM Instances



ASM instances are started and stopped in a similar way to normal database instances.

The options for the STARTUP command are:

FORCE - Performs a SHUTDOWN ABORT before restarting the ASM instance.

MOUNT - Starts the ASM instance and mounts the disk groups specified by the ASM_DISKGROUPS parameter.

NOMOUNT - Starts the ASM instance without mounting any disk groups.

OPEN - This is not a valid option for an ASM instance.

Shutdown of ASM Instances



The options for the SHUTDOWN command are:

NORMAL - The ASM instance waits for all connected ASM instances and SQL sessions to exit then shuts down.

IMMEDIATE - The ASM instance waits for any SQL transactions to complete then shuts down. It doesn't wait for sessions to exit.

TRANSACTIONAL - Same as IMMEDIATE.

ABORT - The ASM instance shuts down instantly.

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Completed

