**1. Prepare Disks for ASM**

Before you can create an ASM instance and disk group, you need to prepare raw disks or disk partitions that ASM will manage. These disks should be visible to the operating system but not mounted or formatted.

Identify Disks: Use tools like fdisk, lsblk, or blkid to list available disks.

fdisk -l

lsblk

Partition Disks (if needed): Use fdisk or parted to create partitions.

fdisk /dev/sdX

Replace /dev/sdX with your disk identifier.

Set Disk Permissions: Ensure the oracle user has appropriate permissions to access the disks. You can use chown and chmod commands.

chown oracle:oinstall /dev/sdX

chmod 660 /dev/sdX

**2. Install Oracle Grid Infrastructure (if not already installed)**

ASM is part of the Oracle Grid Infrastructure. If it's not already installed, you will need to install it:

Download the Oracle Grid Infrastructure software from the Oracle website.

Run the Oracle Universal Installer (OUI) and select the option to install Oracle Grid Infrastructure for a standalone server or Oracle Real Application Clusters (RAC) as required.

**3. Create ASM Instance**

ASM requires a dedicated Oracle instance to manage disk groups.

Set Oracle Environment Variables:

export ORACLE_HOME=/u01/app/grid

export PATH=$ORACLE_HOME/bin:$PATH

export ORACLE_SID=+ASM

Run ASM Configuration Assistant (ASMCA):

ASMCA is a graphical tool for ASM configuration. If you're using a GUI, you can start ASMCA:

**asmca**

Follow the wizard to create an ASM instance. If you prefer a command-line approach, you can use SQL*Plus to create the instance:

sqlplus / as sysasm

STARTUP NOMOUNT;

CREATE SPFILE FROM PFILE='/path/to/your/init.ora';

ALTER SYSTEM SET asm_diskstring='/dev/sdX' SCOPE=BOTH;

ALTER SYSTEM SET asm_diskgroups='DATA','FRA' SCOPE=SPFILE;

Replace '/dev/sdX' with your disk identifier, and specify your disk groups.

**4. Configure ASM Initialization Parameters**

Some key parameters for ASM include:

asm_diskstring: Specifies the location of ASM disks. This could be a pattern like '/dev/sd*'.

asm_diskgroups: Lists the names of disk groups managed by this instance.

Example of setting these parameters in init+ASM.ora or using ALTER SYSTEM:

ALTER SYSTEM SET asm_diskstring='/dev/sdX' SCOPE=BOTH;

ALTER SYSTEM SET asm_diskgroups='DATA','FRA' SCOPE=SPFILE;

**5. Create ASM Disk Group**

Once the ASM instance is up and running, create disk groups:

Using ASMCA (Graphical Tool):

Open ASMCA.

Navigate to the Disk Groups tab.

Click Create, specify a disk group name (e.g., DATA), select redundancy (e.g., EXTERNAL, NORMAL, HIGH), and choose the disks you prepared earlier.

sqlplus / as sysasm

CREATE DISKGROUP DATA EXTERNAL REDUNDANCY DISK '/dev/sdX1', '/dev/sdX2';

Replace '/dev/sdX1', '/dev/sdX2' with your actual disk identifiers.

**6. Verify ASM Disk Group Creation**

Check that the ASM disk group was created successfully:

SELECT name, state, type, total_mb, free_mb FROM v$asm_diskgroup;

**7. Use ASM Disk Group for Database Storage**

Now that you have created an ASM disk group, you can use it for database storage:

When creating a database, specify the disk group name in the CREATE DATABASE statement or through the Oracle Database Configuration Assistant (DBCA).

**8. Monitor and Manage ASM Disk Groups**

Use the asmcmd command-line utility to manage ASM disk groups.

Use SQL queries to monitor disk group usage:

SELECT group_number, name, state, type, total_mb, free_mb FROM v$asm_diskgroup;

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