Installing, Tuning, and Deploying Oracle Database on SUSE® Linux Enterprise Server 12
Technical Introduction

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Agenda

• Introduction
• SUSE Components
• Oracle Components
• Installation
  - Grid Infrastructure
  - Database
• Tuning
• Q&A
SUSE & Oracle
Technology Partner

• Strong Partnership
  – 800+ certified Oracle Apps in SUSE ISV Catalog
  – Relationship since first Oracle version 8.0.5 on SUSE® 6.0
  – Testing, supporting partners/customers on technical issues
  – Bugs, customer problem escalation, future features, etc.
  – Combined testing efforts - service packs and Oracle patches

• Oracle products are certified to run on SUSE® Linux Enterprise Server
  – Supported platforms : Linux x86-64 and IBM System z
SUSE Components
Software
Select Oracle Server Base (orarun)

Software
- Product: SUSE Linux Enterprise Server 12
- Patterns:
  - Help and Support Documentation
  - Base System
  - AppArmor
  - 32-Bit Runtime Environment
  - Minimal System (Appliances)
  - GNOME Desktop Environment
  - X Window System
  - Oracle Server Base
- Size of Packages to Install: 2.5 GiB

Booting
- Boot Loader Type: GRUB2
- Status Location: /dev/sda3 (/)
- Change Location:
  - Do not install bootcode into MBR (install)
  - Install bootcode into "/" partition (do not install)
- Order of Hard Disks: /dev/sda, /dev/sdb

Firewall and SSH
- Firewall will be disabled (enable)
- SSH service will be enabled (disable)

Kdump
- Kdump status: enabled
- Value of crashkernel option: 226M-:113M
- Dump format: lzo
- Target of dumps: file:///var/crash
- Number of dumps: 5

Default systemd target
- Graphical mode
Oracle Server Base (orarun)

What it provides:

Helps to meet Oracle Database Installation prerequisites:

- Creates user
  - oracle
- Creates groups
  - dba, oinstall
- Install required packages
- Sets required SUSE Linux Enterprise kernel parameters
- Sets Oracle environment variables
  - ORACLE_SID
  - ORACLE_BASE
  - ORACLE_HOME
**Oracle Server Base (orarun)**
Adopting new directory location

**Steps to change default /opt/oracle to /home/oracle:**
- Creates new directory: `$mkdir /home/oracle`
- Set proper owner & groups
  - `$chown oracle /home/oracle`
  - `$chgrp oinstall /home/oracle`
- Set ORACLE_BASE=/home/oracle in `/etc/sysconfig/oracle`
- Change ORACLE_BASE in `/etc/profile.d/oracle.s[sh]`
  - ORACLE_BASE=/home/oracle
Oracle Database Storage
File System

Storage/File System

- XFS
- Oracle ASM
  - ASMLib
  - ASM Cluster File System
- NFS/NAS
- OCFS2
  - Part of SLE12 HAE

Note: “raw” storage is not supported
SUSE Linux Install
File System Selection

Role
- Operating System
- Data and ISV Applications
- Swap
- Raw Volume (unformatted)

Formatting Options
- Format partition
  File System: XFS
  Options...

Mounting Options
- Mount partition
  Mount Point: /home
  Fstab Options...

- Do not format partition
  File system ID: 0x83 Linux

- Do not mount partition
  Encrypt Device
Oracle Components
## Oracle Database Support/Certification Matrix

<table>
<thead>
<tr>
<th>Name (Version)</th>
<th>SLES10 (SP4)</th>
<th>SLES11 (SP3)</th>
<th>SLES12</th>
</tr>
</thead>
<tbody>
<tr>
<td>10gR2 (10.2.0.5)</td>
<td><img src="sprite.png" alt="Validate" /></td>
<td><img src="sprite.png" alt="Validate" /></td>
<td></td>
</tr>
<tr>
<td>11gR2 (11.2.0.4)</td>
<td><img src="sprite.png" alt="Validate" /></td>
<td><img src="sprite.png" alt="Validate" /></td>
<td>Validated</td>
</tr>
<tr>
<td>12cR1 (12.1.0.2)</td>
<td><img src="sprite.png" alt="Validate" /></td>
<td></td>
<td>Validated</td>
</tr>
</tbody>
</table>
Oracle Database Software
Download & Unzip Locally

• Oracle Database 11gR2
  - p13390677_112040_Linux-x86-64_1of7.zip
  - p13390677_112040_Linux-x86-64_2of7.zip

• Oracle Database 12cR1
  - linuxamd64_12102_database_1of2.zip
  - linuxamd64_12102_database_2of2.zip

Change “CV_ASSUME_DISTID=SUSE11” in database/stage/cvu/cv/admin/cvu_config
Oracle Grid Infrastructure Software
Download & Unzip Locally

Includes Oracle Clusterware & Oracle ASM

- Oracle Grid Infrastructure 11gR2
  - p13390677_112040_Linux-x86-64_3of7.zip

- Oracle Grid Infrastructure 12cR1
  - linuxamd64_12102_grid_1of2.zip
  - linuxamd64_12102_grid_2of2.zip

Change “CV_ASSUME_DISTID=SUSE11” in grid/stage/cvu/cv/admin/cvu_config
Installation
Oracle Grid Infrastructure
Oracle Grid Infrastructure
Prepare

• Oracle recommends creating separate user/groups for Grid Infrastructure & Database
  - Create user grid
  - Create asmdba, asmadmin groups
• Create raw disk partitions to be used by Oracle ASM
• Set owner/group of ASM disks
  - Use udev rules for boot persistence
• Check & Install libcap1 packages
  - To avoid clscfg.bin error at install time
Installation
Oracle Grid Infrastructure

```
status: sles12:/home/SW/12102

File Edit View Search Terminal Help

total 4962992
+----------------------------------
+  drwxr-xr-x 4 oracle oinstall  194 Nov 14 13:16 .
+  drwxr-xr-x 4 oracle oinstall  59 Oct 21 22:24 ..
+  drwxr-xr-x 7 oracle oinstall  117 Jul  7 07:39 database
+  drwxr-xr-x 7 oracle oinstall  137 Jul  7 07:43 grid
+  -rw-r--r-- 1 oracle oinstall 1673544724 Nov 14 13:15 linuxamd64_12102_database_1of2.zip
+  -rw-r--r-- 1 oracle oinstall 1014530602 Nov 14 13:15 linuxamd64_12102_database_2of2.zip
+  -rw-r--r-- 1 oracle oinstall 1747043545 Nov 14 13:16 linuxamd64_12102_grid_1of2.zip
+  -rw-r--r-- 1 oracle oinstall  646972897 Nov 14 13:16 linuxamd64_12102_grid_2of2.zip

oracle@sles12:/home/SW/12102> id
uid=492(oracle) gid=491(oinstall) groups=491(oinstall),490(dba)

ORACLE_SID=orcl
ORACLE_BASE=/home/oracle
ORACLE_HOME=/home/oracle/product/12cR1/grid

oracle@sles12:/home/SW/12102> ls -al /dev/sdb*
+----------------------------------
+  brw-r----- 1 root disk   8, 16 Nov 14 13:12 /dev/sdb
+  brw-r----- 1 oracle oinstall  8, 17 Nov 14 13:12 /dev/sdb1
+  brw-r----- 1 oracle oinstall  8, 18 Nov 14 13:12 /dev/sdb2

oracle@sles12:/home/SW/12102> grep SUSE11 grid/stage/cvu/cv/admin/cvu_config
CV_ASSUME_DISTID=SUSE11

oracle@sles12:/home/SW/12102> grep SUSE11 database/stage/cvu/cv/admin/cvu_config
CV_ASSUME_DISTID=SUSE11

oracle@sles12:/home/SW/12102> 
```
Installation
Oracle Grid Infrastructure

Start Installation: grid/runInstaller
# Installation

Oracle Grid Infrastructure

---

**Oracle Grid Infrastructure 12c Release 1 Installer - Step 2 of 9**

**Select Product Languages**

Select the languages in which your product will run.

**Available languages:**
- Arabic
- Bengali
- Brazilian Portuguese
- Bulgarian
- Canadian French
- Catalan
- Croatian
- Czech
- Danish
- Dutch
- Egyptian
- English (United Kingdom)
- Estonian
- Finnish
- French
- German
- Greek
- Hebrew
- Hungarian
- Icelandic
- Indonesian

**Selected languages:**
- English

---

**Installation Option**

**Product Languages**

**Operating System Groups**

**Installation Location**

**Root script execution**

**Prerequisite Checks**

**Summary**

**Install Product**

**Finish**

---

**Help**

< Back  Next >  Install  Cancel
Installation
Oracle Grid Infrastructure

Create ASM Disk Group

Select Disk Group characteristics and select disks
- Disk group name: DATA
- Redundancy: External
- Allocation Unit Size: 2 MB

Add Disks
- Candidate Disks

<table>
<thead>
<tr>
<th>Disk Path</th>
<th>Size (in MB)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sdb1</td>
<td>204796</td>
<td>Candidate</td>
</tr>
<tr>
<td>/dev/sdb2</td>
<td>204798</td>
<td>Candidate</td>
</tr>
</tbody>
</table>

Change Discovery Path...
The new Oracle Automatic Storage Management (Oracle ASM) instance requires its own SYS user with SYSASM privileges for administration. Oracle recommends that you create a less privileged ASMSNMP user with SYSDBA privileges to monitor the ASM instance.

Specify the password for these user accounts.

- Use different passwords for these accounts

<table>
<thead>
<tr>
<th>Password</th>
<th>Confirm Password</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYS</td>
<td></td>
</tr>
<tr>
<td>ASMSNMP</td>
<td></td>
</tr>
</tbody>
</table>

- Use same passwords for these accounts

  Specify Password: **********  Confirm Password: **********
You can configure to have this instance of Oracle Grid Infrastructure and Oracle Automatic Storage Management to be managed by Enterprise Manager Cloud Control. Specify the details of the Cloud Control configuration to perform the registration.

- Register with Enterprise Manager (EM) Cloud Control
  - OMS host:
  - OMS port:
  - EM Admin User Name:
  - EM Admin Password:
Installation
Oracle Grid Infrastructure

Privileged Operating System Groups

- **Installation Option**
- **Product Languages**
- **Create ASM Disk Group**
- **ASM Password**
- **Management Options**
- **Operating System Groups**

Select the name of the operating system group that you want to use for operating system authentication to Oracle Automatic Storage Management.

- **Oracle ASM Administrator (OSASM) Group**: dba
- **Oracle ASM DBA (OSDBA for ASM) Group**: oinstall
- **Oracle ASM Operator (OSOPER for ASM) Group (Optional)**: [blank]

Help

< Back  Next >  Install  Cancel
Installation
Oracle Grid Infrastructure

Oracle Grid Infrastructure 12c Release 1 Installer - Step 7 of 12

Specify Installation Location

- Installation Option
- Product Languages
- Create ASM Disk Group
- ASM Password
- Management Options
- Operating System Groups
- Installation Location
- Root script execution
- Prerequisite Checks
- Summary
- Install Product
- Finish

Specify a base location for storing all Oracle software and configuration-related files. This location is the Oracle base directory. Create one Oracle base for each operating system user. By default, software and configuration files are installed by version and database name in the Oracle base directory.

Oracle base: /home/oracle

Specify a location for storing Oracle software files separate from configuration files in the Oracle base directory. This software directory is the Oracle Grid Infrastructure home directory.

Software location: /home/oracle/product/12cR1/grid
Installation
Oracle Grid Infrastructure

You are starting your first installation on this host. Specify a directory for installation metadata files (for example, install log files). This directory is called the “inventory directory”. The installer automatically sets up subdirectories for each product to contain inventory data. The subdirectory for each product typically requires 150 kilobytes of disk space.

Inventory Directory: /home/oracle/orainventory

Members of the following operating system group (the primary group) will have write permission to the inventory directory (orainventory).

orainventory Group Name: oinstall
Installation
Oracle Grid Infrastructure

Root script execution configuration

While configuring the software, certain operations have to be performed as "root" user. You can choose to have the installer perform these operations automatically by specifying inputs for one of the options below.

- Automatically run configuration scripts
  - Use "root" user credential
    - Password:
  - Use sudo
    - Program path: /usr/local/bin/sudo
    - User name: oracle
    - Password:
Installation
Oracle Grid Infrastructure

Note: Verify these warnings manually & then select “Ignore”
Installation
Oracle Grid Infrastructure

Note: Save response file to use later for unattended install.
Installation
Oracle Grid Infrastructure

Oracle Grid Infrastructure 12c Release 1 Installer - Step 12 of 13

Progress
Completed 'Prepare for configuration steps'

Status
- Install Oracle Grid Infrastructure and Automatic Storage Management for a Standalone Server: Succeeded
- Prepare: Succeeded
- Copy files: Succeeded
- Link binaries: Succeeded
- Setup: Succeeded
- Setup Oracle Base: Succeeded
- Update Inventory: In Progress
- Execute Root Scripts: Pending
- Install and Configure Oracle Grid Infrastructure for a Standalone Server: Pending

Policy Management
Critical Resources On Demand
Installation
Oracle Grid Infrastructure

The following configuration scripts need to be executed as the "root" user.

Scripts to be executed:

<table>
<thead>
<tr>
<th>Number</th>
<th>Script Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>/home/oracle/oralinventory/orainstRoot.sh</td>
</tr>
<tr>
<td>2</td>
<td>/home/oracle/product/12cR1/grid/root.sh</td>
</tr>
</tbody>
</table>

To execute the configuration scripts:
1. Open a terminal window
2. Log in as "root"
3. Run the scripts
4. Return to this window and click "OK" to continue

Run the script on the local node.
Installation
Oracle Grid Infrastructure

The following environment variables are set as:
ORACLE_OWNER= oracle
ORACLE_HOME= /home/oracle/product/12cR1/grid

Enter the full pathname of the local bin directory: [/usr/local/bin]:
The contents of "dbhome" have not changed. No need to overwrite.
The contents of "oraenv" have not changed. No need to overwrite.
The contents of "coraenv" have not changed. No need to overwrite.

Creating /etc/oratab file...
Entries will be added to the /etc/oratab file as needed by
Database Configuration Assistant when a database is created
Finished running generic part of root script.
Now product-specific root actions will be performed.
Using configuration parameter file: /home/oracle/product/12cR1/grid/crs/install/
crsconfig_params
LOCAL ADD MODE
Creating OCR keys for user 'oracle', privgrp 'oinstall'.
Operation successful.
LOCAL ONLY MODE
Successfully accumulated necessary OCR keys.
Creating OCR keys for user 'root', privgrp 'root'.
Operation successful.
CRS-4664: Node sles12 successfully pinned.

sles12  2014/11/14 13:35:09  /home/oracle/product/12cR1/grid/cdata/sles12/backup_26141114_133509.ctl  0
CRS-2791: Starting shutdown of Oracle High Availability Services-managed resources on 'sles12'
CRS-2673: Attempting to stop 'ora.evmd' on 'sles12'
CRS-2677: Stop of 'ora.evmd' on 'sles12' succeeded
CRS-2793: Shutdown of Oracle High Availability Services-managed resources on 'sles12' has completed
CRS-4133: Oracle High Availability Services has been stopped.
CRS-4123: Oracle High Availability Services has been started.
Installation
Oracle Grid Infrastructure

Oracle Grid Infrastructure 12c Release 1 Installer - Step 12 of 13

Install Product

Progress
92%
Starting 'Automatic Storage Management Configuration Assistant'

Status
- Install Oracle Grid Infrastructure and Automatic Storage Management for a Standalone Server: Succeeded
- Prepare: Succeeded
- Copy files: Succeeded
- Link binaries: Succeeded
- Setup: Succeeded
- Setup Oracle Base: Succeeded
- Update Inventory: Succeeded
- Execute Root Scripts: Succeeded
- Install and Configure Oracle Grid Infrastructure for a Standalone Server: In Progress
- Update Inventory: Succeeded
- Oracle Net Configuration Assistant: Succeeded
- Automatic Storage Management Configuration Assistant: Pending
- Oracle Cluster Verification Utility: Pending

Oracle Grid Infrastructure 12c
Grid Computing
Consolidate on Fast, Reliable, and Scalable Low-Cost Grids

Help  Retry  Skip
Installation
Oracle Grid Infrastructure

The installation of Oracle Grid Infrastructure for a Standalone Server was successful.
## Installation

Oracle Grid Infrastructure

```
oracle@sles12:/home/oracle/product/12cR1/grid/bin> ps -ef |grep asm
oracle  8350  1  0 13:38 ?  00:00:00 asm_pmon_+ASM
oracle  8352  1  0 13:38 ?  00:00:00 asm_psp0_+ASM
oracle  8354  1  2 13:38 ?  00:00:04 asm_vktm_+ASM
oracle  8358  1  0 13:38 ?  00:00:00 asm_gen0_+ASM
oracle  8360  1  0 13:38 ?  00:00:00 asm_mman_+ASM
oracle  8364  1  0 13:38 ?  00:00:00 asm_diag_+ASM
oracle  8366  1  0 13:38 ?  00:00:00 asm_dia0_+ASM
oracle  8368  1  0 13:38 ?  00:00:00 asm_dbw0_+ASM
oracle  8370  1  0 13:38 ?  00:00:00 asm_lgwr_+ASM
oracle  8372  1  0 13:38 ?  00:00:00 asm_ckpt_+ASM
oracle  8374  1  0 13:38 ?  00:00:00 asm_smon_+ASM
oracle  8376  1  0 13:38 ?  00:00:00 asm_lreg_+ASM
oracle  8378  1  0 13:38 ?  00:00:00 asm_pmmn_+ASM
oracle  8380  1  0 13:38 ?  00:00:00 asm_rbal_+ASM
oracle  8382  1  0 13:38 ?  00:00:00 asm_gmon_+ASM
oracle  8384  1  0 13:38 ?  00:00:00 asm_mmmon_+ASM
oracle  8386  1  0 13:38 ?  00:00:00 asm_mmnl_+ASM
oracle  8745  1  0 13:38 ?  00:00:00 asm_fd00_+ASM
oracle@sles12:/home/oracle/product/12cR1/grid/bin> grep --color=auto asm
```
Installation

Oracle Database
Installation
SUSE Linux Enterprise Server 12

Note: Static IP Address
Installation
Oracle Database 12c

Start Installation: database/runInstaller
Installation
Oracle Database 12c

Select Installation Option

Select any of the following install options.

- Create and configure a database
- Install database software only
- Upgrade an existing database
Installation
Oracle Database 12c

System Class

- **Configure Security Updates**
- **Installation Option**
- **System Class**
  - **Typical Installation**
  - **Prerequisite Checks**
  - **Summary**
  - **Install Product**
  - **Finish**

- **Desktop class**
  Choose this option if you are installing on a laptop or desktop class system. This option includes a starter database and allows minimal configuration.

- **Server class**
  Choose this option if you are installing on a server class system, which Oracle defines as a system used in a production data center. This option allows for more advanced configuration options.
Installation
Oracle Database 12c

Select the type of database installation you want to perform:

- Single instance database installation
- Oracle Real Application Clusters database installation
- Oracle RAC One Node database installation
Installation
Oracle Database 12c

Typical install
Perform full Oracle Database installation with basic configuration.

Advanced install
Allows advanced selections such as different passwords for the SYS, SYSMAN, SYSTEM and DBSNMP accounts, database character set, product languages, automated backups, custom installation, and alternative storage options such as Oracle Automatic Storage Management.
Installation
Oracle Database 12c

Typical Install Configuration

- **Configure Security Updates**
- **Installation Option**
- **System Class**
- **Grid Installation Options**
- **Install Type**
- **Typical Installation**
- **Preprerequisite Checks**
- **Summary**
- **Install Product**
- **Finish**

Perform full database installation with basic configuration.

- **Oracle base**: /home/oracle
- **Software location**: /home/oracle/product/12cR1/db
- **Storage type**: File system
- **Database file location**: /home/oracle/oradata
- **Database edition**: Enterprise Edition (6.4GB)
- **OSDBA group**: dba
- **Global database name**: orcl
- **Administrative password**: ********
- **Confirm password**: ********
- **Service name**: 
- **Create as Container database**
- **Pluggable database name**: pdborcl

[Installer interface screenshot]

**Help**  **< Back**  **Next >**  **Install**  **Cancel**
**Create Inventory**

You are starting your first installation on this host. Specify a directory for installation metadata files (for example, install log files). This directory is called the "inventory directory". The installer automatically sets up subdirectories for each product to contain inventory data. The subdirectory for each product typically requires 150 kilobytes of disk space.

**Inventory Directory** `/home/oracle/prainventory`  
Specify an operating system group whose members have write permission to the inventory directory (prainventory).

**orainventory Group Name:** `oinstall`
Installation
Oracle Database 12c

Note: Verify these warnings manually & then select “Ignore”
Installation
Oracle Database 12c

Note: Save response file to use later for unattended install.
Installation
Oracle Database 12c

Oracle Database 12c Release 1 Installer – Step 10 of 11

Install Product

Configure Security Updates
Installation Option
System Class
Grid Installation Options
Install Type
Typical Installation
Create Inventory
Prerequisite Checks
Summary
Install Product
Finish

Progress

61%

Saving inventory

Status

<table>
<thead>
<tr>
<th>Status</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle Database installation</td>
<td>In Progress</td>
</tr>
<tr>
<td>- Prepare</td>
<td>Succeeded</td>
</tr>
<tr>
<td>- Copy files</td>
<td>Succeeded</td>
</tr>
<tr>
<td>- Link binaries</td>
<td>Succeeded</td>
</tr>
<tr>
<td>- Setup</td>
<td>In Progress</td>
</tr>
<tr>
<td>Setup Oracle Base</td>
<td>Pending</td>
</tr>
<tr>
<td>Execute Root Scripts</td>
<td>Pending</td>
</tr>
<tr>
<td>Oracle Database configuration</td>
<td>Pending</td>
</tr>
</tbody>
</table>

Details  Retry  Skip

< Back  Next >  Install  Cancel

45
Installation
Oracle Database 12c

The following configuration scripts need to be executed as the "root" user:

<table>
<thead>
<tr>
<th>Number</th>
<th>Script Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>/home/oracle/oralInventory/orainstRoot.sh</td>
</tr>
<tr>
<td>2</td>
<td>/home/oracle/product/12cR1/db/root.sh</td>
</tr>
</tbody>
</table>

To execute the configuration scripts:
1. Open a terminal window
2. Log in as "root"
3. Run the scripts
4. Return to this window and click "OK" to continue

Creating /etc/oratab file...
Entries will be added to the /etc/oratab file as needed by Database Configuration Assistant when a database is created
Finished running generic part of root script.
Now product-specific root actions will be performed.
Installation
Oracle Database 12c

Oracle Database 12c Release 1 Installer - Step 10 of 11

Install Product
- Configure Security Updates
- Installation Option
- System Class
- Grid Installation Options
- Install Type
- Typical Installation
- Create Inventory
- Prerequisite Checks
- Summary

Install Product

Progress
- 92%

Starting 'Oracle Database Configuration Assistant'

Status
- Oracle Database installation
  - Prepare: Succeeded
  - Copy files: Succeeded
  - Link binaries: Succeeded
  - Setup: Succeeded
- Setup Oracle Base
  - Execute Root Scripts: Succeeded
- Oracle Database configuration
  - Oracle Net Configuration Assistant: Succeeded
  - Oracle Database Configuration Assistant: In Progress

Help
Details
Retry
Skip
< Back
Next >
Install
Cancel
Installation
Oracle Database 12c

Database Configuration Assistant

Progress
Clone database "orcl.site" creation in progress...
73%

Steps
- Copying database files
- Creating and starting Oracle instance
- Completing Database Creation
- Creating Pluggable Databases

Database creation complete. For details check the logfiles at:
/home/oracle/cfgtoollogs/dbca/orcl.

Database Information:
- Global Database Name: orcl.site
- System Identifier(SID): orcl
- Server Parameter File name: /home/oracle/product/12cR1/db/dbs/spfileorcl.ora

EM Database Express URL: https://sles12site:5500/em

Note: All database accounts except SYS and SYSTEM are locked. Select the Password Management button to view a complete list of locked accounts or to manage the database accounts. From the Password Management window, unlock only the accounts you will use. Oracle strongly recommends changing the default passwords immediately after unlocking the account.
Installation
Oracle Database 12c

Note: Change Oracle Database start settings in /etc/oratab & /etc/sysconfig/oracle, so that database starts after server reboot.
Installation
Oracle Database 11gR2

Note: Fix above error & select “Retry”
Installation
Oracle Database 11gR2

Note: Ignore this error as libaio1 is new name for libaio
Tuning
Tuning

Optimize

- Storage/File System
- SUSE Linux Enterprise Server OS
  - iostat/vmstat/top
  - I/O scheduler
    - elevator=cfq/noop/deadline
    - echo cfq/noop/deadline > /sys/block/DEVICE/queue/scheduler
- Oracle Database
  - Configure & use “hugepages”
  - Distribute “redo log” files
Tuning
Server Report

• Oracle Enterprise Manager
  – Configure Parameters
  – Analyze Performance

• AWR (Automatic Workload Repository)
  – Create Snapshot:
    SQL> EXEC DBMS_WORKLOAD_REPOSITORY.create_snapshot;
    - run workload/test
    SQL> EXEC DBMS_WORKLOAD_REPOSITORY.create_snapshot;
  – Generate html report (in current working directory):
    - SQL>@$ORACLE_HOME/rdbms/admin/awrrpt.sql
Tuning
Oracle Enterprise Manager
Tuning
AWR Snapshot

oracle@sles12:~

oracle@sles12:~> sqlplus / as sysdba

SQL*Plus: Release 12.1.0.2.0 Production on Sat Nov 15
Copyright (c) 1982, 2014, Oracle. All rights reserved

Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0
With the Partitioning, Automatic Storage Management,
and Real Application Testing options

SQL> EXEC DBMS_WORKLOAD_REPOSITORY.create_snapshot;
PL/SQL procedure successfully completed.

SQL>
### Tuning

**AWR Demo Report**

![AWR Report](image)

**WORKLOAD REPOSITORY report for**

<table>
<thead>
<tr>
<th>DB Name</th>
<th>DB Id</th>
<th>Instance</th>
<th>Inst num</th>
<th>Startup Time</th>
<th>Release</th>
<th>RAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORCL</td>
<td>1391406529</td>
<td>orcl</td>
<td>1</td>
<td>15-Nov-14 11:11</td>
<td>12.1.0.2.0</td>
<td>NO</td>
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<table>
<thead>
<tr>
<th>Host Name</th>
<th>Platform</th>
<th>CPUs</th>
<th>Cores</th>
<th>Sockets</th>
<th>Memory (GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>sle$12</td>
<td>Linux x86 64-bit</td>
<td>12</td>
<td>6</td>
<td>1</td>
<td>31.43</td>
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<table>
<thead>
<tr>
<th>Snap Id</th>
<th>Snap Time</th>
<th>Sessions</th>
<th>Cursors/Session</th>
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<tbody>
<tr>
<td></td>
<td>9</td>
<td>15-Nov-14 13:00:29</td>
<td>38</td>
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<tr>
<td></td>
<td>11</td>
<td>15-Nov-14 13:29:31</td>
<td>37</td>
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<td></td>
<td></td>
<td>29.03 (mins)</td>
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</table>

**Report Summary**

**Load Profile**

<table>
<thead>
<tr>
<th></th>
<th>Per Second</th>
<th>Per Transaction</th>
<th>PerExec</th>
<th>Per Call</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB Time(s):</td>
<td>0.00</td>
<td>0.1</td>
<td>0.00</td>
<td>0.01</td>
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<tr>
<td>DB CPU(s):</td>
<td>0.00</td>
<td>0.0</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>Background CPU(s):</td>
<td>0.00</td>
<td>0.0</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>Read size (bytes):</td>
<td>12,205.7</td>
<td>35,081.3</td>
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<tr>
<td>Logical read (blocks):</td>
<td>218.3</td>
<td>628.0</td>
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<tr>
<td>Block changes:</td>
<td>59.9</td>
<td>170.6</td>
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<tr>
<td>Physical read (blocks):</td>
<td>1.8</td>
<td>5.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical write (blocks):</td>
<td>0.8</td>
<td>2.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read IO requests:</td>
<td>1.1</td>
<td>3.3</td>
<td></td>
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<tr>
<td>Write IO requests:</td>
<td>0.4</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read IO (MB):</td>
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<td>0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Write IO (MB):</td>
<td>0.0</td>
<td>0.0</td>
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<td>Rf scan rows:</td>
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<td></td>
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<tr>
<td>Session Logical Read IM:</td>
<td>1.2</td>
<td>3.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**57**
Installation & Tuning

Helpful Documents

• Oracle Database Installation (11gR2/12cR1)

• SUSE Linux Enterprise System Analysis & Tuning

• Oracle Database Performance Tuning
SUSE Linux – Misc.
Oracle Software and Support

• SUSE Software
  - http://www.suse.com/download-linux
  - http://www.suse.com/oracle

• Oracle Software
  - http://download.oracle.com
  - https://edelivery.oracle.com/

• Oracle Support
  - http://support.oracle.com (Metalink)
Questions & Answers

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