



Oracle Products on SUSE® Linux Enterprise Server 15 SP3

Technical Introductions

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Agenda

Introduction

SUSE Components

Oracle Components

Installation

Tuning

Oracle Cloud

Q&A

SUSE & Oracle Technology Partner



PARTNER

Strong Partnership

- 900+ 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

Oracle Database Storage

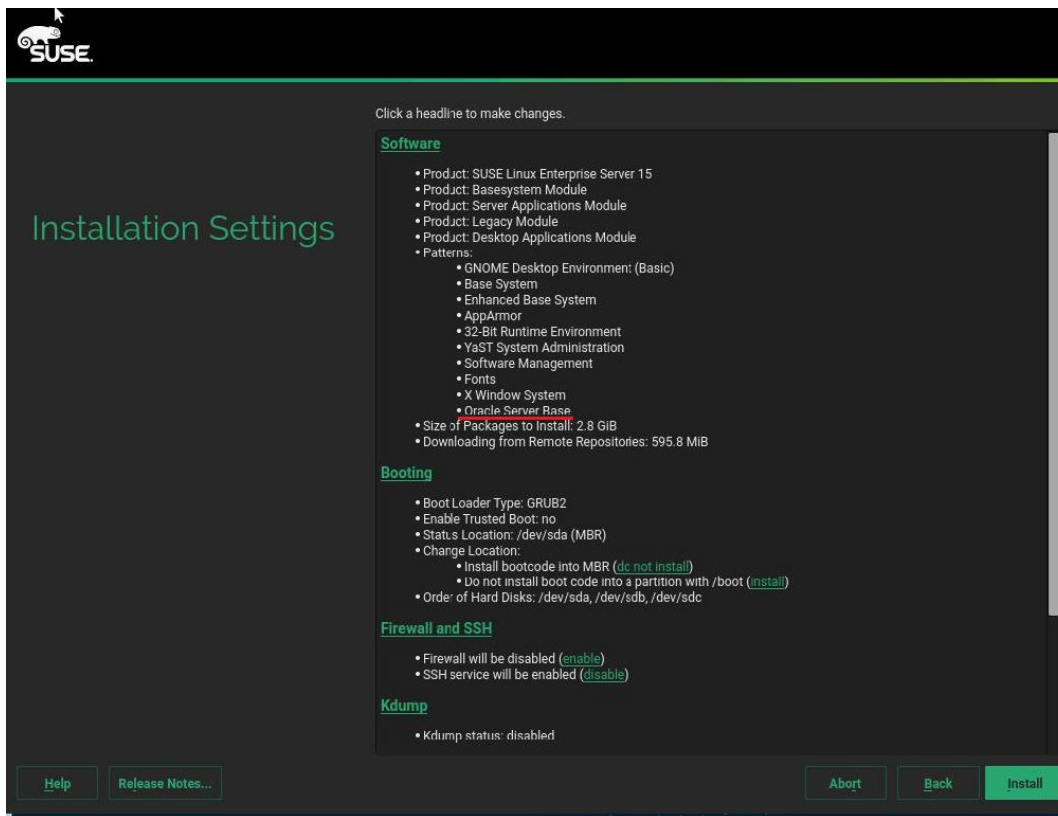
Storage/File System

- XFS
- NFS/NAS
- Oracle ASM
 - ASMLib
 - ASM Cluster File System
- OCFS2

Note: “raw” storage is not supported

Software

Install SLES15 (SP3) with Oracle Server Base (orarun-2.1)



The screenshot shows the 'Installation Settings' window in the SUSE installer. The 'Software' section is active, displaying a list of product and pattern selections. The 'Booting' section shows the boot loader type as GRUB2 and the status location as /dev/sda (MBR). The 'Firewall and SSH' section shows that the firewall will be disabled and SSH service will be enabled. The 'Kdump' section shows that kdump status is disabled. At the bottom, there are buttons for 'Help', 'Release Notes...', 'Abort', 'Back', and 'Install'.

SUSE

Click a headline to make changes.

Installation Settings

Software

- Product: SUSE Linux Enterprise Server 15
- Product: Basesystem Module
- Product: Server Applications Module
- Product: Legacy Module
- Product: Desktop Applications Module
- Patterns:
 - GNOME Desktop Environment (Basic)
 - Base System
 - Enhanced Base System
 - AppArmor
 - 32-Bit Runtime Environment
 - YaST System Administration
 - Software Management
 - Fonts
 - X Window System
 - Oracle Server Base
- Size of Packages to Install: 2.8 GiB
- Downloading from Remote Repositories: 595.8 MiB

Booting

- Boot Loader Type: GRUB2
- Enable Trusted Boot: no
- Status Location: /dev/sda (MBR)
- Change Location:
 - Install bootcode into MBR ([do not install](#))
 - Do not install boot code into a partition with /boot ([install](#))
- Order of Hard Disks: /dev/sda, /dev/sdb, /dev/sdc

Firewall and SSH

- Firewall will be disabled ([enable](#))
- SSH service will be enabled ([disable](#))

Kdump

- Kdump status: disabled

[Help](#) [Release Notes...](#) [Abort](#) [Back](#) [Install](#)

Software

Install SLES15 (SP3) with Oracle Server Base (orarun-2.1)

The screenshot shows the YaST2 software selection window for a SLES15-SP3 system. The window title is "YaST2 — YaST2 - sw_single @ sles15-sp3". The "Installation Summary" tab is active, displaying a list of patterns on the left and a table of selected packages on the right.

Pattern Selection List:

- Mail and News Server
- Web and LAMP Server
- Internet Gateway
- DHCP and DNS Server
- Directory Server (LDAP)
- Xen Virtual Machine Host Server
- KVM Host Server
- Primary Functions**
- FIPS 140-2 specific packages
- Infiniband (OFED)
- SAP Application Server Base
- Oracle Server Base**
- Development**
- Base Development
- Linux Kernel Development
- YaST Development

Selected Packages Table:

Package	Summary	Installed (Availab	Size
<input checked="" type="checkbox"/> orarun	An Environment ...	2.1-15.13	72.8 KIB
<input checked="" type="checkbox"/> patterns-base-basesystem	Minimal Base Sy...	20200124-8.1	56 B
<input checked="" type="checkbox"/> patterns-server-enterprise-oracle_server	Oracle Server Ba...	20171206-12.3.1	59 B

Description of orarun:

orarun - An Environment for Running Oracle Products

This package creates the user and the groups for Oracle, sets the Oracle environment variables, sets kernel parameters to values recommended by Oracle, and provides for automated start and stop of Oracle components at system start and stop time. It also includes dependencies for other software packages needed to install and use Oracle, so that when you select this package the other packages are included automatically (when you install via YaST2) or that you are at least reminded to install them (when installing via the

Buttons:

Oracle Server Base (orarun)

Helps to meet Oracle Database Installation prerequisites:

- Creates user
 - oracle
- Creates group
 - dba, oinstall
- Installs required packages
- Sets required SUSE Linux Enterprise kernel parameters
- Sets Oracle environment variables
 - ORACLE_SID
 - ORACLE_BASE
 - ORACLE_HOME

Oracle Server Base (orarun)

Steps to start/stop orarun services (systemd)

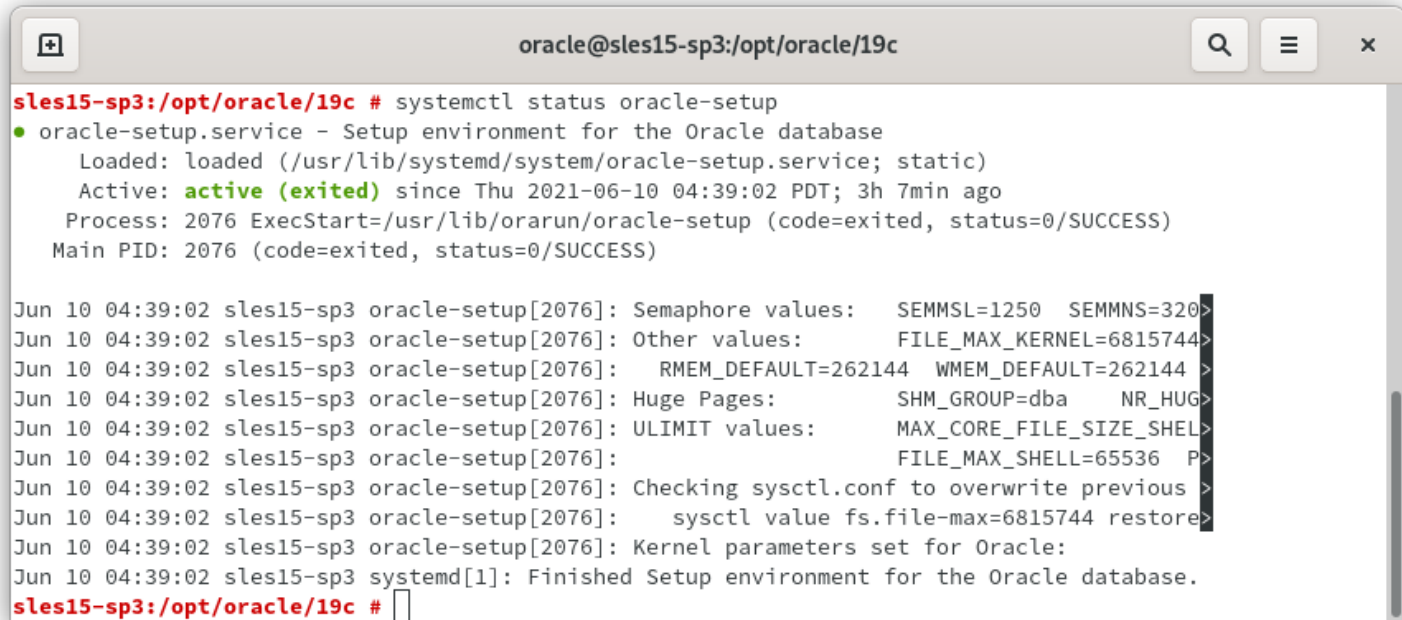
- `systemctl start/stop/restart/status oracle-setup.service`
- `systemctl start/stop/restart/status oracle.service`

Steps to change default `/opt/oracle` to `/home/oracle`:

- Create new directory: `$mkdir /home/oracle`
- Set proper owner and groups
 - `$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 Server Base (orarun) – systemd

systemctl status oracle-setup



```
oracle@sles15-sp3:/opt/oracle/19c
sles15-sp3:/opt/oracle/19c # systemctl status oracle-setup
● oracle-setup.service - Setup environment for the Oracle database
   Loaded: loaded (/usr/lib/systemd/system/oracle-setup.service; static)
   Active: active (exited) since Thu 2021-06-10 04:39:02 PDT; 3h 7min ago
     Process: 2076 ExecStart=/usr/lib/orarun/oracle-setup (code=exited, status=0/SUCCESS)
    Main PID: 2076 (code=exited, status=0/SUCCESS)

Jun 10 04:39:02 sles15-sp3 oracle-setup[2076]: Semaphore values:  SEMMSL=1250  SEMMNS=320>
Jun 10 04:39:02 sles15-sp3 oracle-setup[2076]: Other values:      FILE_MAX_KERNEL=6815744>
Jun 10 04:39:02 sles15-sp3 oracle-setup[2076]: RMEM_DEFAULT=262144  WMEM_DEFAULT=262144 >
Jun 10 04:39:02 sles15-sp3 oracle-setup[2076]: Huge Pages:      SHM_GROUP=dba    NR_HUG>
Jun 10 04:39:02 sles15-sp3 oracle-setup[2076]: ULIMIT values:     MAX_CORE_FILE_SIZE_SHELL>
Jun 10 04:39:02 sles15-sp3 oracle-setup[2076]:                               FILE_MAX_SHELL=65536 P>
Jun 10 04:39:02 sles15-sp3 oracle-setup[2076]: Checking sysctl.conf to overwrite previous >
Jun 10 04:39:02 sles15-sp3 oracle-setup[2076]:   sysctl value fs.file-max=6815744 restore>
Jun 10 04:39:02 sles15-sp3 oracle-setup[2076]: Kernel parameters set for Oracle:
Jun 10 04:39:02 sles15-sp3 systemd[1]: Finished Setup environment for the Oracle database.
sles15-sp3:/opt/oracle/19c #
```

Oracle Server Base (orarun) – systemd

systemctl status oracle

```
oracle@sles15-sp3:/opt/oracle/19c
sles15-sp3:/opt/oracle/19c # systemctl status oracle
● oracle.service - Start the Oracle database
   Loaded: loaded (/usr/lib/systemd/system/oracle.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2021-06-10 07:51:05 PDT; 1min 15s ago
     Process: 18339 ExecStart=/usr/lib/orarun/oracle start (code=exited, status=0/SUCCESS)
    Tasks: 60
   CGroup: /system.slice/oracle.service
           └─18467 ora_pmon_orcl
             └─18469 ora_clmn_orcl
               └─18471 ora_psp0_orcl
                 └─18473 ora_vktn_orcl
                   └─18477 ora_gen0_orcl
                     └─18479 ora_mman_orcl
                       └─18483 ora_gen1_orcl
                         └─18486 ora_diag_orcl
                           └─18488 ora_ofsd_orcl
                             └─18491 ora_dbrm_orcl
                               └─18493 ora_vkrm_orcl
                                 └─18495 ora_svcb_orcl
                                   └─18497 ora_pman_orcl
                                     └─18499 ora_dia0_orcl
                                       └─18501 ora_dbw0_orcl
                                         └─18503 ora_lgwr_orcl
                                           └─18505 ora_ckpt_orcl
                                             └─18507 ora_lg00_orcl
                                               └─18570 ora_tt01_orcl
                                                 └─18572 ora_tt02_orcl
                                                   └─18576 ora_aqpc_orcl
                                                     └─18580 ora_w002_orcl
                                                       └─18769 ora_cjq0_orcl
                                                         └─18854 ora_w003_orcl
                                                           └─18858 ora_m002_orcl
                                                             └─18860 ora_m003_orcl
                                                               └─18884 ora_m004_orcl
                                                                 └─18888 ora_qm02_orcl
                                                                   └─18892 ora_q002_orcl
                                                                     └─18894 ora_q003_orcl
                                                                       └─18896 ora_w004_orcl

Jun 10 07:51:05 sles15-sp3 oracle[18339]: - Starting Application Server Console....unused
Jun 10 07:51:05 sles15-sp3 oracle[18339]: - Starting Agent....done
Jun 10 07:51:05 sles15-sp3 oracle[18339]: - Starting Enterprise Manager....skipped
Jun 10 07:51:05 sles15-sp3 oracle[18339]: - Starting iSQLPLUS Manager....unused
Jun 10 07:51:05 sles15-sp3 oracle[18339]: - Starting Oracle Internet Filesystem....unused
Jun 10 07:51:05 sles15-sp3 oracle[18339]: - Starting Oracle Internet Directory....unused
Jun 10 07:51:05 sles15-sp3 oracle[18339]: #####
Jun 10 07:51:05 sles15-sp3 oracle[18339]: # End of O R A C L E section#####
Jun 10 07:51:05 sles15-sp3 oracle[18339]: #####
Jun 10 07:51:05 sles15-sp3 systemd[1]: Started Start the Oracle database.
sles15-sp3:/opt/oracle/19c #
```

Oracle Components

Oracle Database Software

Support Matrix

Name (Version)	SLES11 (SP4)	SLES12 (SP5)	SLES15 (SP3)
11gR2 (11.2.0.4)			
12cR2 (12.2.0.1)			
19c (19.4)			

Oracle Database Software

Oracle Database 12cR2

- linuxx64_12201_database.zip

Oracle Database 19c

- LINUX.X64_193000_db_home.zip

Add “CV_ASSUME_DISTID=SUSE12” in `cv/admin/cvu_config`

Oracle Grid Infrastructure

Includes Oracle Clusterware and Oracle ASM

Oracle Grid Infrastructure 12cR2

- linuxx64_12201_grid_home.zip

Oracle Grid Infrastructure 19c

- LINUX.X64_193000_grid_home.zip

Add “CV_ASSUME_DISTID=SUSE12” in `cv/admin/cvu_config`

Oracle FUSION MiddleWare 12c

Includes Oracle WebLogic Server

Oracle Java SE Development Kit 8

- jdk-8u202-linux-x64.rpm

Oracle Fusion Middleware Infrastructure 12c

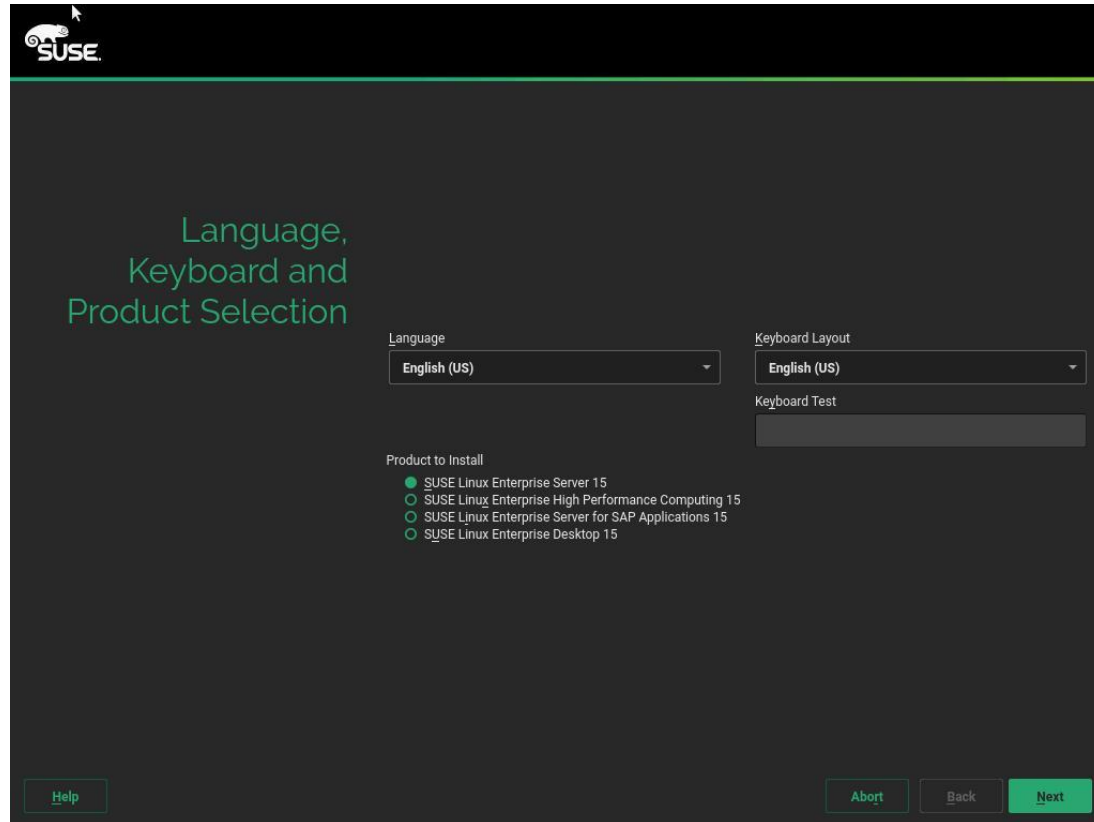
- fmw_12.2.1.3.0_infrastructure_Disk1_1of1.zip

Oracle WebLogic Server 12cR2 (12.2.1.3)

- fmw_12.2.1.3.0_wls_Disk1_1of1.zip

Installation

SLES15 (SP3) OS Install



The screenshot shows the SUSE Linux Enterprise Server 15 installation interface. At the top left is the SUSE logo. The main heading is "Language, Keyboard and Product Selection". There are three main sections: "Language" with a dropdown menu set to "English (US)", "Keyboard Layout" with a dropdown menu set to "English (US)", and "Keyboard Test" with an empty text input field. Below these is the "Product to Install" section, which lists four options with radio buttons: "SUSE Linux Enterprise Server 15" (selected), "SUSE Linux Enterprise High Performance Computing 15", "SUSE Linux Enterprise Server for SAP Applications 15", and "SUSE Linux Enterprise Desktop 15". At the bottom, there are three buttons: "Help", "Abort", and "Next".

SUSE

Language, Keyboard and Product Selection

Language: English (US)

Keyboard Layout: English (US)

Keyboard Test:

Product to Install

- SUSE Linux Enterprise Server 15
- SUSE Linux Enterprise High Performance Computing 15
- SUSE Linux Enterprise Server for SAP Applications 15
- SUSE Linux Enterprise Desktop 15

[Help](#) [Abort](#) [Back](#) [Next](#)

SLES15 (SP3) OS Install

SUSE

Extension and Module Selection

Available Extensions and Modules

- Hide Beta Versions
- SUSE Linux Enterprise High Availability Extension 15 x86_64
- SUSE Linux Enterprise Workstation Extension 15 x86_64
- SUSE Package Hub 15 x86_64
- SUSE Linux Enterprise Live Patching 15 x86_64
- Basesystem Module 15 x86_64
- Containers Module 15 x86_64
- Desktop Applications Module 15 x86_64
- Development Tools Module 15 x86_64
- Legacy Module 15 x86_64
- Public Cloud Module 15 x86_64
- SUSE Cloud Application Platform Tools Module 15 x86_64
- Server Applications Module 15 x86_64
- Web and Scripting Module 15 x86_64

Details (English only)

The SUSE Linux Enterprise Desktop Applications Module delivers a basic set of Desktop functionality. Access to the Desktop Applications Module is included in your SUSE Linux Enterprise product subscription.

[Help](#) [Abort](#) [Back](#) [Next](#)

SLES15 (SP3) OS Install

Role

- Operating System
- Data and ISV Applications
- Swap
- Raw Volume

Formatting Options

- Format partition

File System

XFS

Options...

- Do not format partition

File system ID:

0x83 Linux

Encrypt Device

Mounting Options

- Mount partition

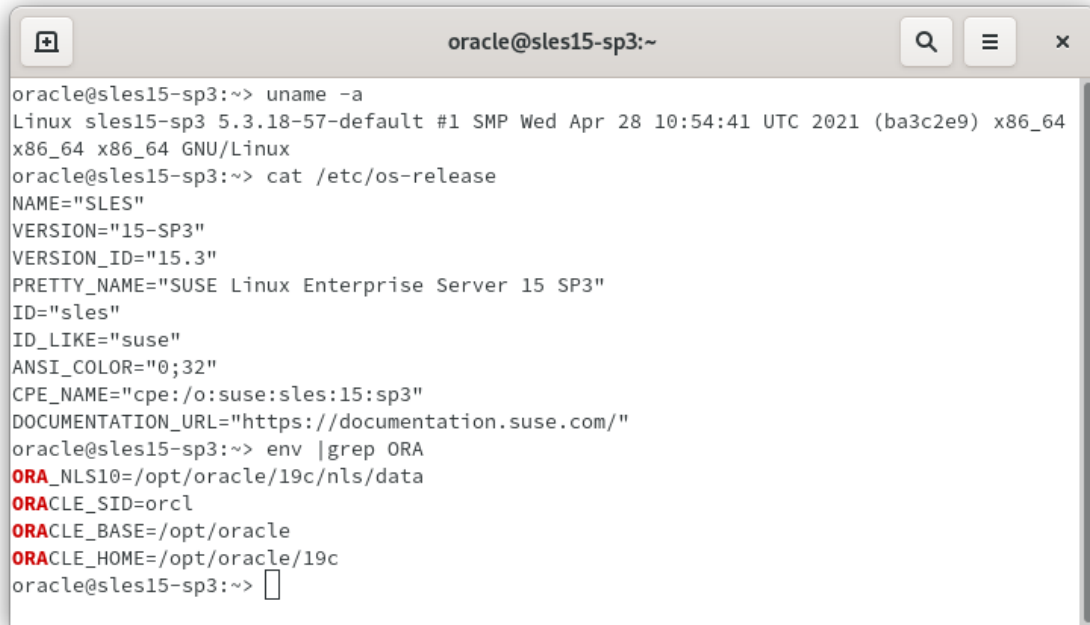
Mount Point

/home

Fstab Options...

- Do not mount partition

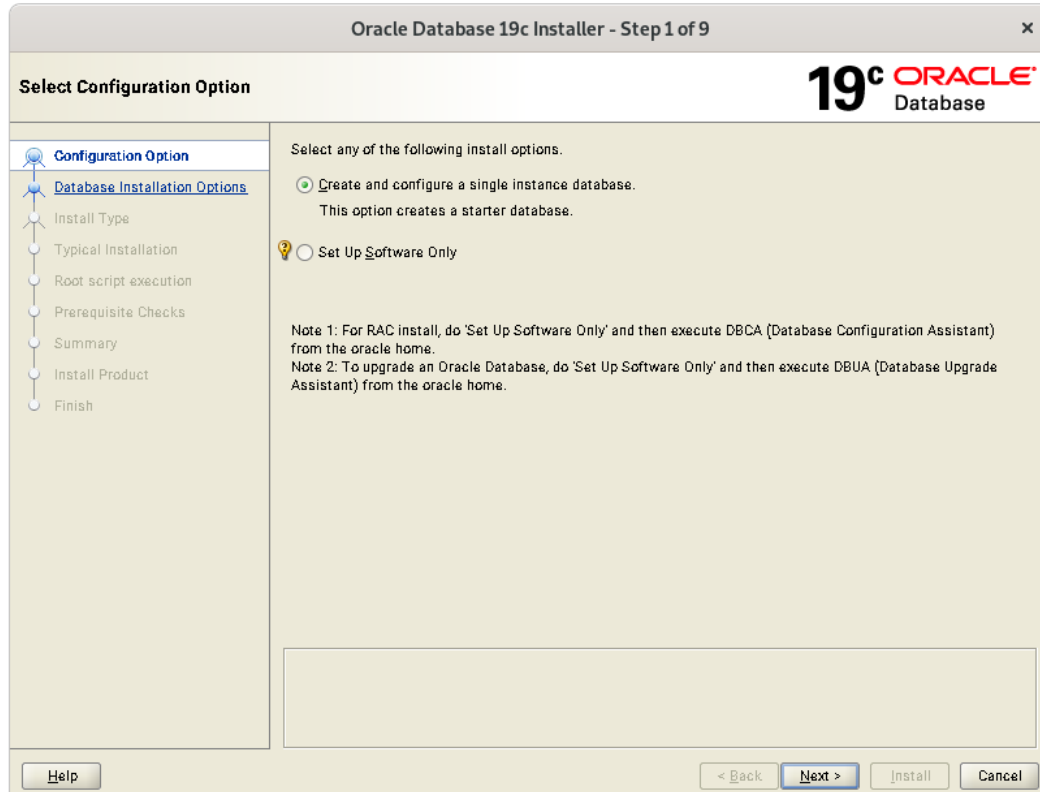
SLES15 (SP3) Setup for Oracle Install



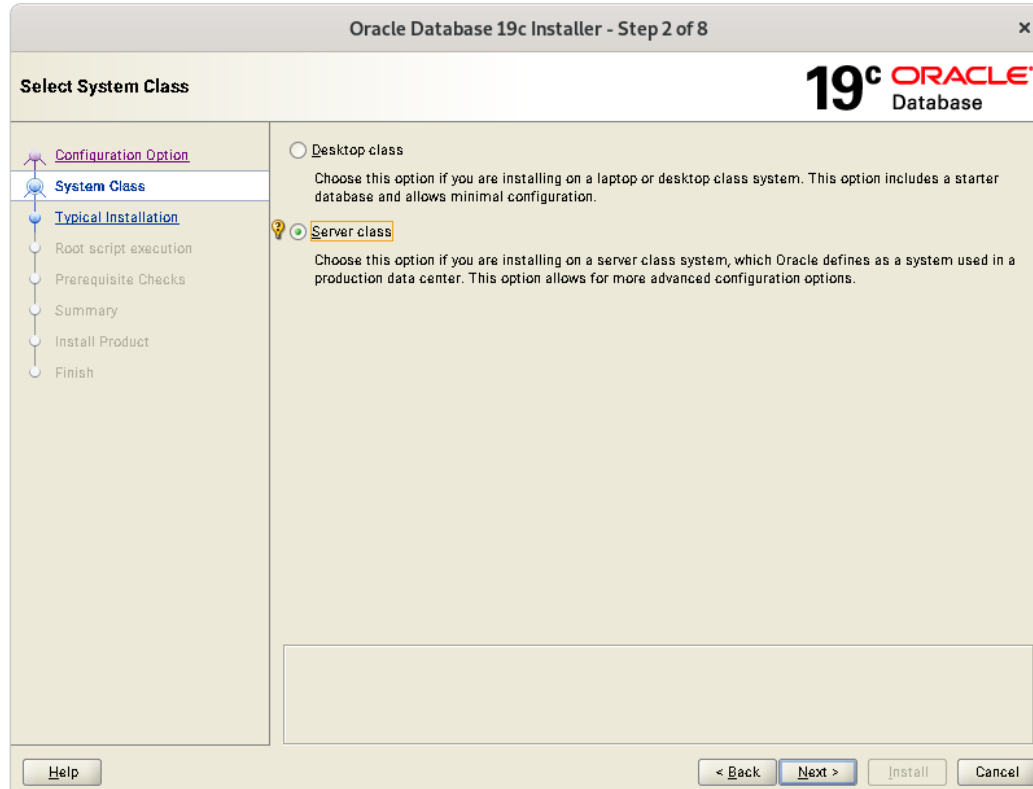
```
oracle@sles15-sp3:~  
oracle@sles15-sp3:~> uname -a  
Linux sles15-sp3 5.3.18-57-default #1 SMP Wed Apr 28 10:54:41 UTC 2021 (ba3c2e9) x86_64  
x86_64 x86_64 GNU/Linux  
oracle@sles15-sp3:~> cat /etc/os-release  
NAME="SLES"  
VERSION="15-SP3"  
VERSION_ID="15.3"  
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP3"  
ID="sles"  
ID_LIKE="suse"  
ANSI_COLOR="0;32"  
CPE_NAME="cpe:/o:suse:sles:15:sp3"  
DOCUMENTATION_URL="https://documentation.suse.com/"  
oracle@sles15-sp3:~> env |grep ORA  
ORA_NLS10=/opt/oracle/19c/nls/data  
ORACLE_SID=orcl  
ORACLE_BASE=/opt/oracle  
ORACLE_HOME=/opt/oracle/19c  
oracle@sles15-sp3:~> 
```

Note: Login as oracle user and start Oracle Installation

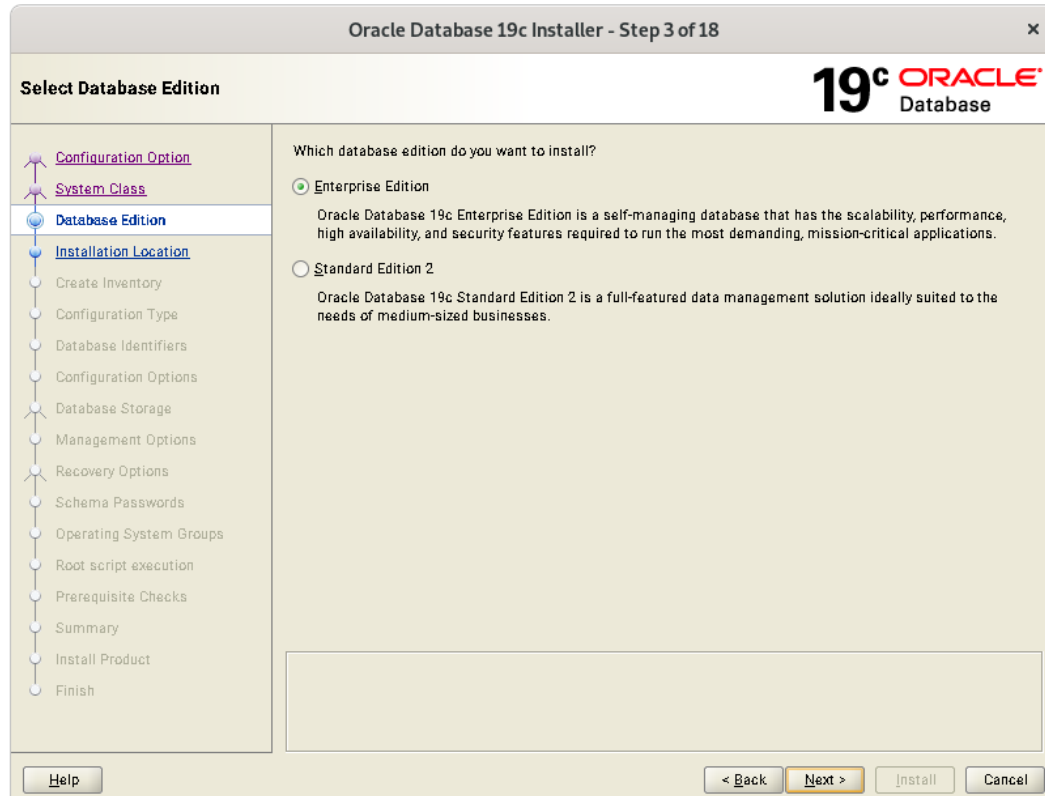
Oracle Database 19c Installation



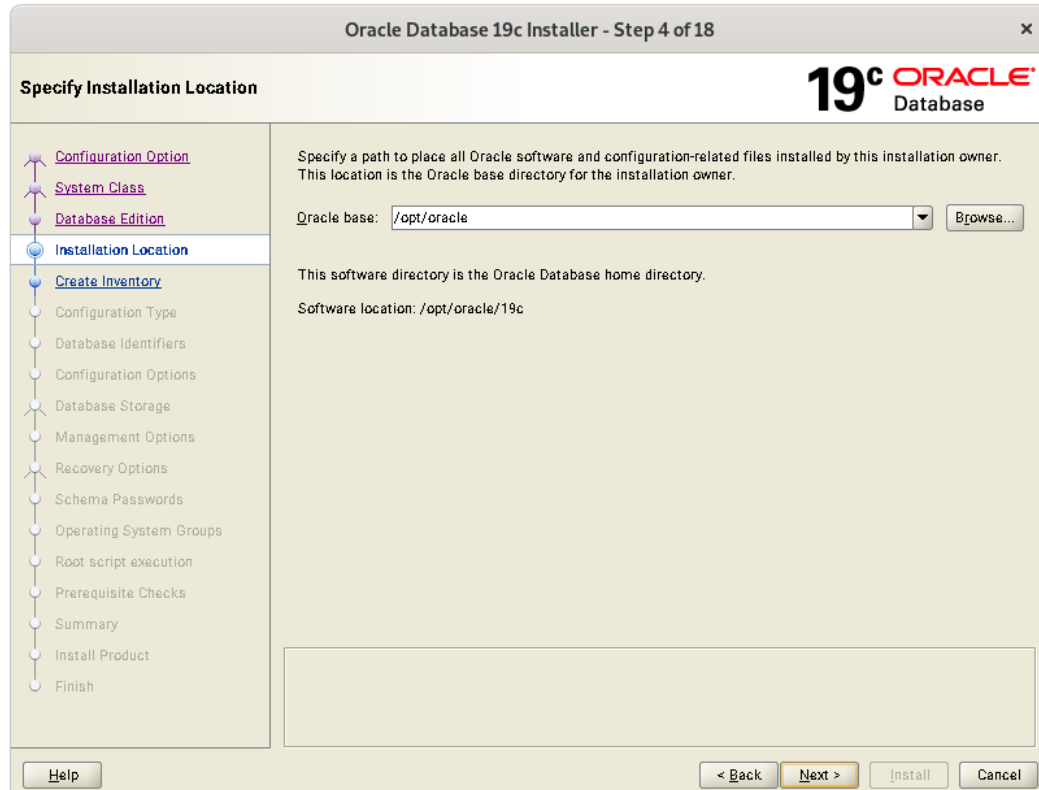
Oracle Database 19c Installation



Oracle Database 19c Installation



Oracle Database 19c Installation



Oracle Database 19c Installation

Oracle Database 19c Installer - Step 5 of 18

Create Inventory

19^c ORACLE[®] Database

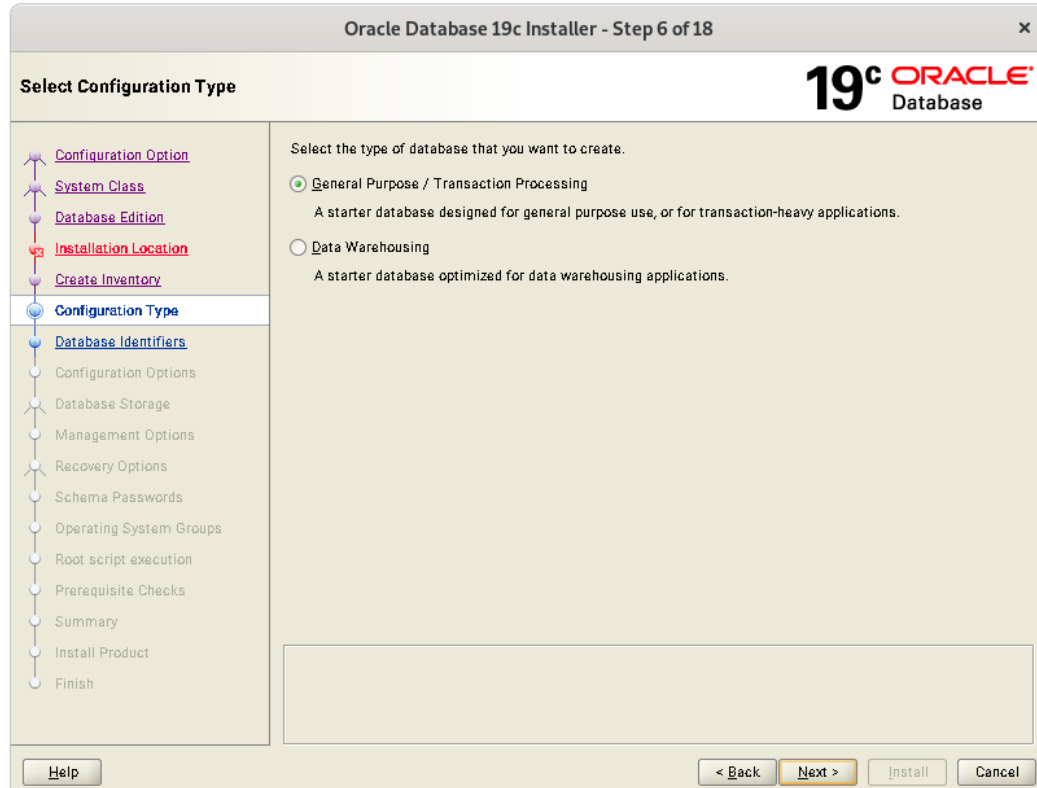
You are starting your first installation on this host. Specify a directory for installation metadata files (for example, install log files). This directory is called the "inventory directory". The installer automatically sets up subdirectories for each product to contain inventory data. The subdirectory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

Inventory Directory:

Specify an operating system group whose members have write permission to the inventory directory (/opt/orainventory).

oraInventory_Group Name:

Oracle Database 19c Installation



Oracle Database 19c Installation

Oracle Database 19c Installer - Step 7 of 18

19^c ORACLE[®] Database

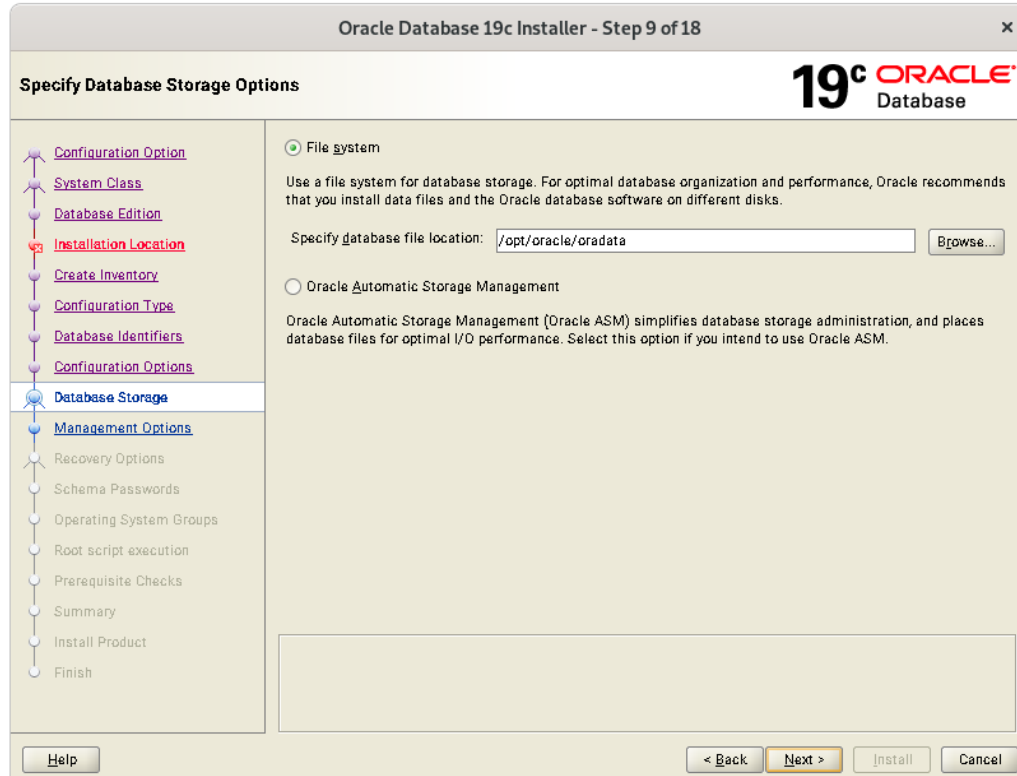
Specify Database Identifiers

Provide the identifier information required to access the database uniquely. An Oracle database is uniquely identified by a Global database name, typically of the form "name.domain". A database is referenced by at least one Oracle instance which is uniquely identified from any other instance on this computer by an Oracle system identifier (SID).

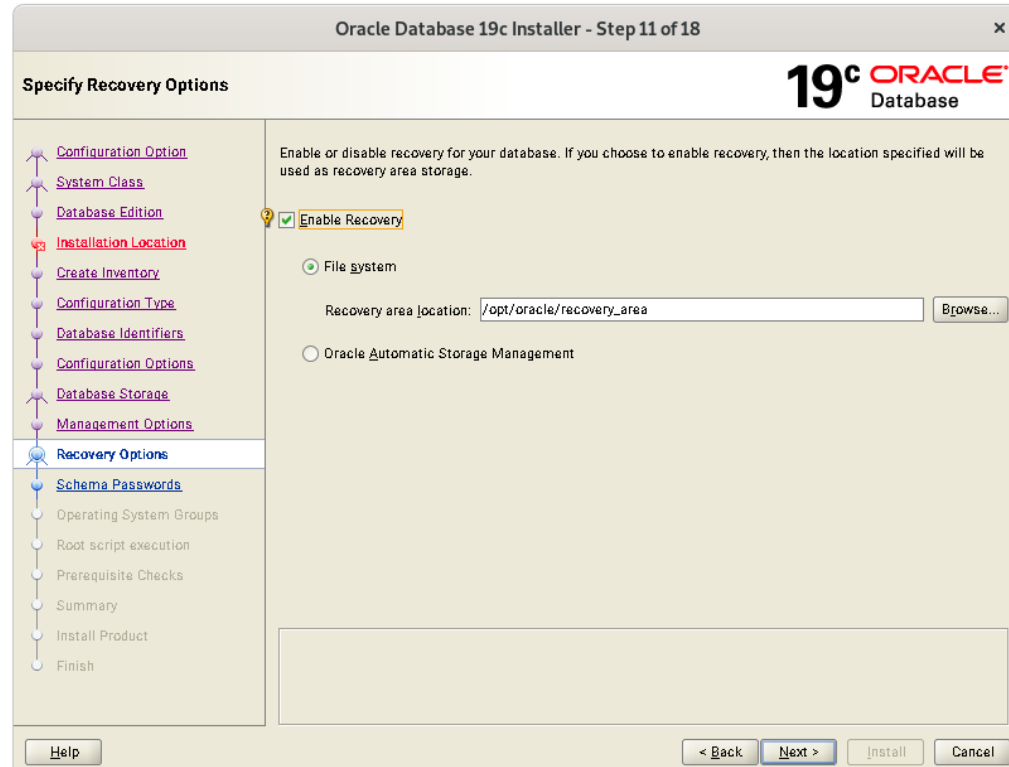
[Configuration Option](#)
[System Class](#)
[Database Edition](#)
[Installation Location](#)
[Create Inventory](#)
[Configuration Type](#)
Database Identifiers
[Configuration Options](#)
Database Storage
Management Options
Recovery Options
Schema Passwords
Operating System Groups
Root script execution
Prerequisite Checks
Summary
Install Product
Finish

Global database name:
 Oracle system identifier (SID):
 Create as Container database
Creates a database container for consolidating multiple databases into a single database and enables database virtualization.
 Pluggable database name:

Oracle Database 19c Installation



Oracle Database 19c Installation



Oracle Database 19c Installation

Oracle Database 19c Installer - Step 15 of 18

Perform Prerequisite Checks

19^c ORACLE Database

Configuration Option
System Class
Database Edition

Verification Result Fixup Result

Some of the minimum requirements for installation are not completed. Review and fix the issues listed in the following table, and recheck the system.

Check Again Fix & Check Again Show Failed Ignore All

Fixup Script

Some of the prerequisites have failed on the following nodes. Installer has generated a fixup script that needs to be run as a privileged user (root) on the listed nodes.

Script: /tmp/InstallActions2021-06-10_05-48-54AM/CVU_19.D.D.D.D_oracle/runfixup.sh

Nodes: sles15-sp3

To execute the fixup script:

1. Open a terminal window
2. Login as "root"
3. Run the script
4. Return to this window and click "OK" to continue

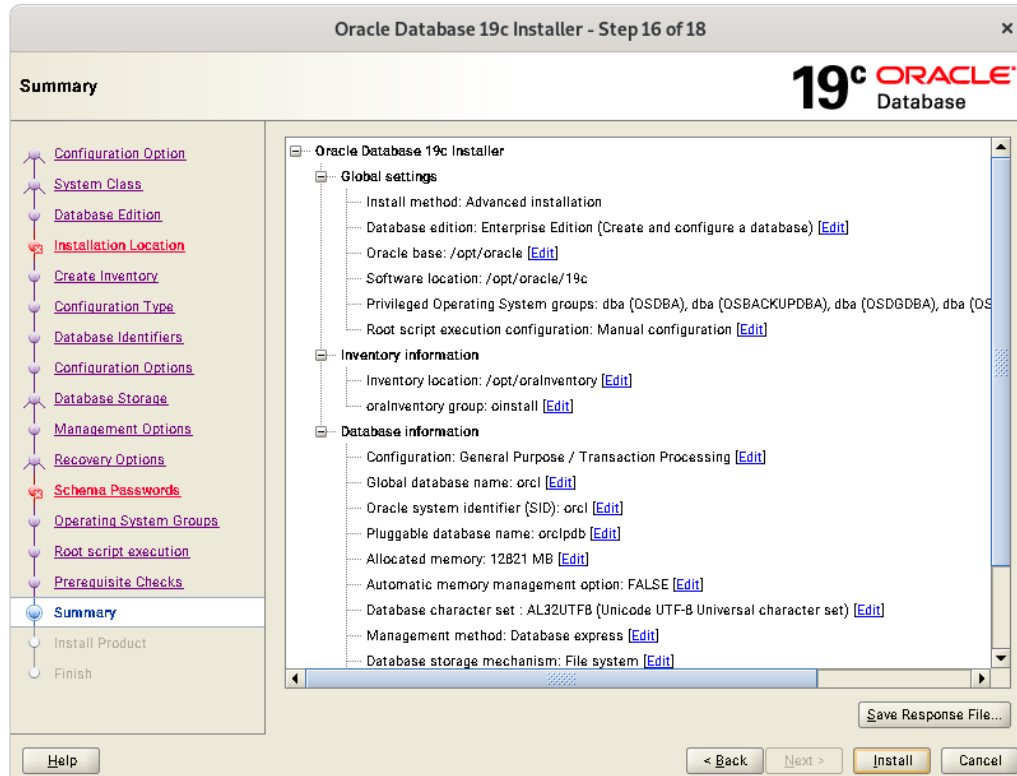
OK Cancel

Status	Fixable
Ignored	No
Ignored	No
Ignored	No
Ignored	No
Ignored	No
Ignored	No
Ignored	No
Ignored	No
Ignored	No
Ignored	No
Ignored	No
Ignored	No
Ignored	No
Ignored	No
Ignored	No

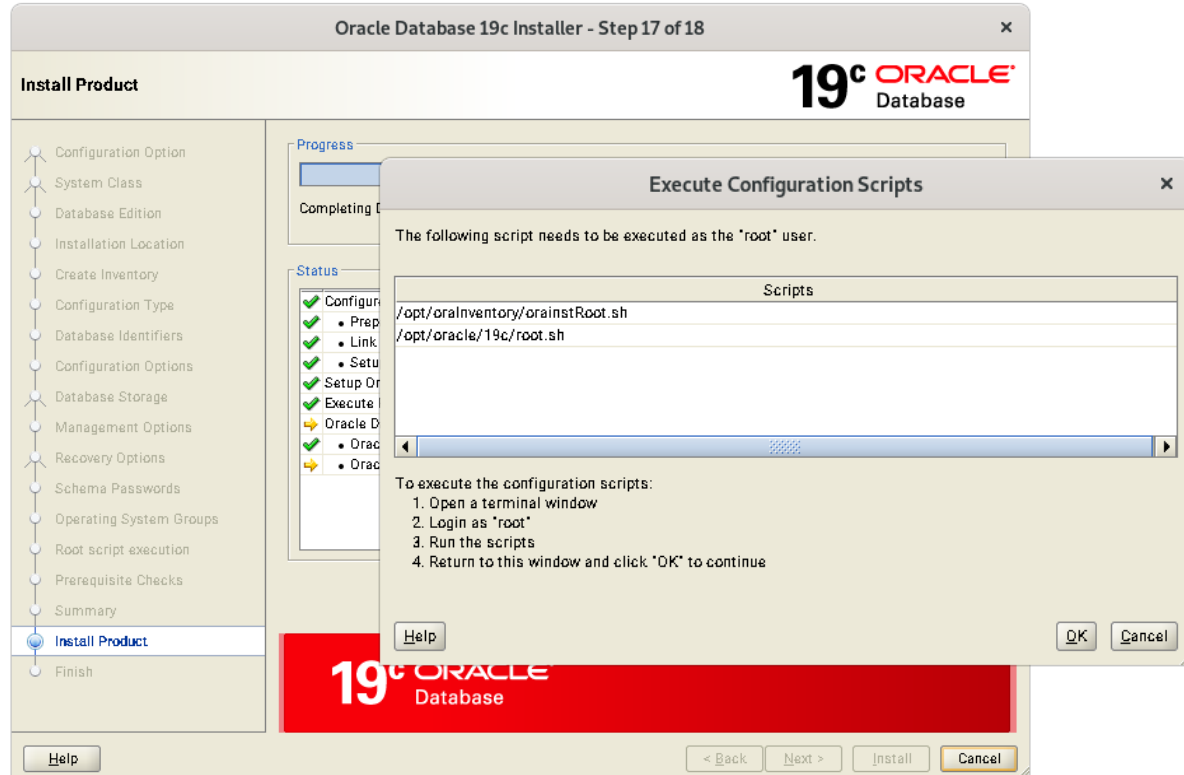
Actual Value : missing

Help < Back Next > Install Cancel

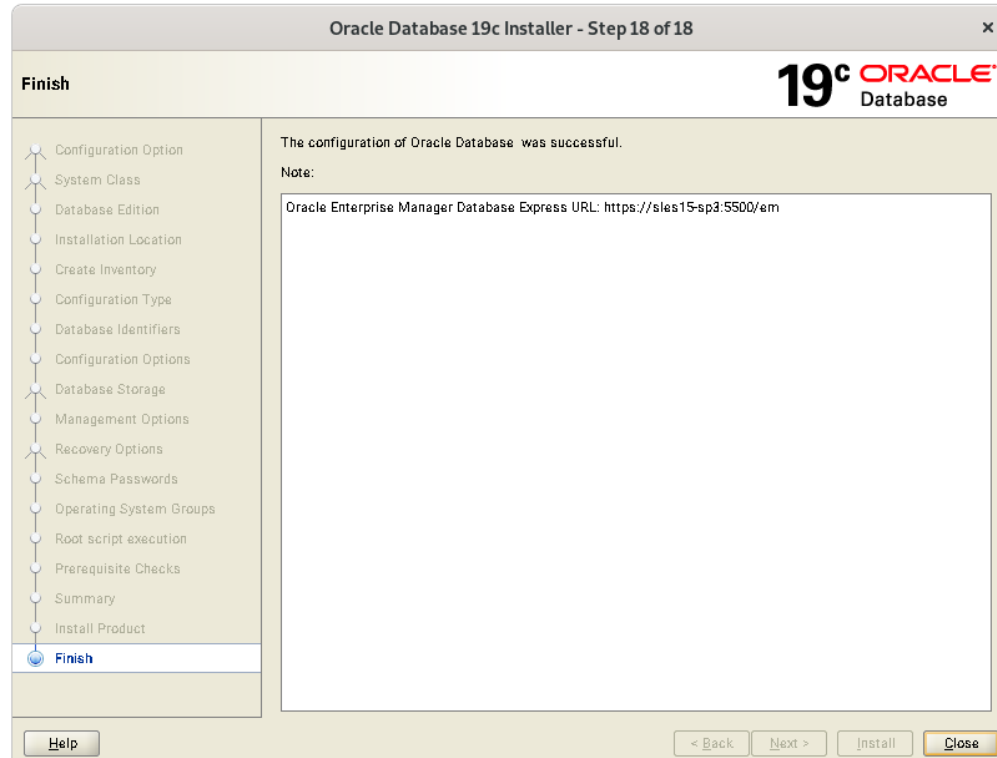
Oracle Database 19c Installation



Oracle Database 19c Installation



Oracle Database 19c Installation



Oracle Database 19c – Post-Install

Edit /etc/oratab

Enable Database Start: “orcl:/opt/oracle/19c:Y”

Edit /etc/sysconfig/oracle

- START_ORACLE_DB="yes`"
- START_ORACLE_DB_LISTENER="yes"

Verify that ORACLE_HOME is pointing to the correct directory.

Oracle Database 19c Check

```
oracle@sles15-sp3:~/19c
oracle@sles15-sp3:~/19c> sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Thu Jun 10 07:43:29 2021
Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle. All rights reserved.

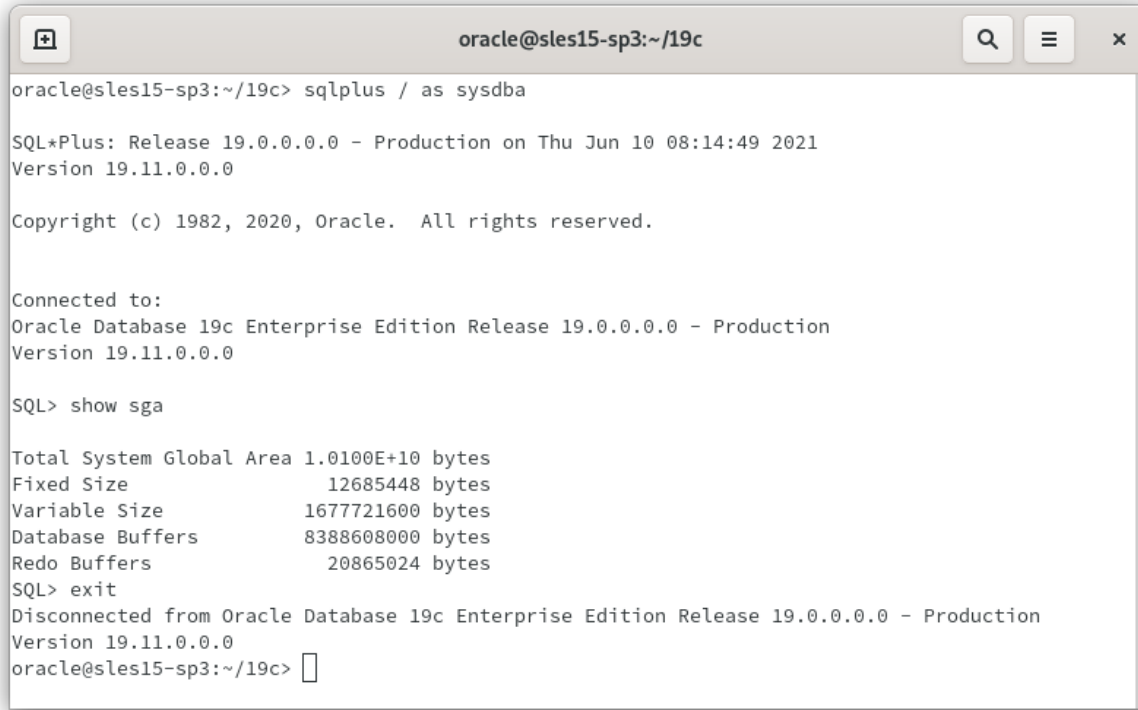
Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.3.0.0.0

SQL> show sga

Total System Global Area 1.0100E+10 bytes
Fixed Size                12685456 bytes
Variable Size             1677721600 bytes
Database Buffers         8388608000 bytes
Redo Buffers              20865024 bytes
SQL> exit
Disconnected from Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.3.0.0.0
oracle@sles15-sp3:~/19c> 
```


Oracle Database 19c Check

(apply latest patch)

A terminal window titled 'oracle@sles15-sp3:~/19c' showing the execution of SQL*Plus as sysdba. The output displays the SQL*Plus version (19.11.0.0.0) and the Oracle Database 19c Enterprise Edition version (19.0.0.0.0). The user runs the command 'show sga', which returns the following statistics:

Total System Global Area	1.0100E+10 bytes
Fixed Size	12685448 bytes
Variable Size	1677721600 bytes
Database Buffers	8388608000 bytes
Redo Buffers	20865024 bytes

The session ends with 'SQL> exit' and a disconnect message. The prompt returns to 'oracle@sles15-sp3:~/19c>'.

Oracle Grid Infrastructure Installation

Download and unzip: LINUX.X64_190000_grid_home.zip

Set "CV_ASSUME_DISTID=SUSE12" in /grid/cv/admin /cvu_config

Create shared disks (Persistent at boot):

1. Get ID detail of the disk:

```
c2n1:/opt/oracle # /usr/lib/udev/scsi_id -g /dev/sdf =>3600601606bb122005eb5e40c38bee411
```

2. Create/Add udev rules:

```
oracle@c2n1:~> cat /etc/udev/rules.d/99-oracle-asm.rules
```

```
KERNEL=="sd?1", ENV{ID_SERIAL}=="3600601606bb122005eb5e40c38bee411", SYMLINK+="oradata/disk1", OWNER="oracle",  
GROUP="dba", MODE="0660"
```

3. udevadm control -reload
4. partprobe /dev/sdc
5. ls -al /dev/asm

Oracle Grid Infrastructure Installation

```
oracle@c2n1:/home/grid> ./runcluvfy.sh stage -pre crsinst -n c2n1,c2n2,c2n3,c2n4 -r 19 -verbose
```

```
Verifying Physical Memory ...
```

Node Name	Available	Required	Status
c2n4	62.7639GB (6.5812708E7KB)	8GB (8388608.0KB)	passed
c2n3	62.7695GB (6.5818608E7KB)	8GB (8388608.0KB)	passed
c2n2	62.7632GB (6.5811956E7KB)	8GB (8388608.0KB)	passed
c2n1	62.6316GB (6.5673964E7KB)	8GB (8388608.0KB)	passed

```
Verifying Physical Memory ...PASSED
```

```
...
```

```
CVU operation performed: stage -pre crsinst
```

```
Date: Jun 15, 2021 4:13:11 PM
```

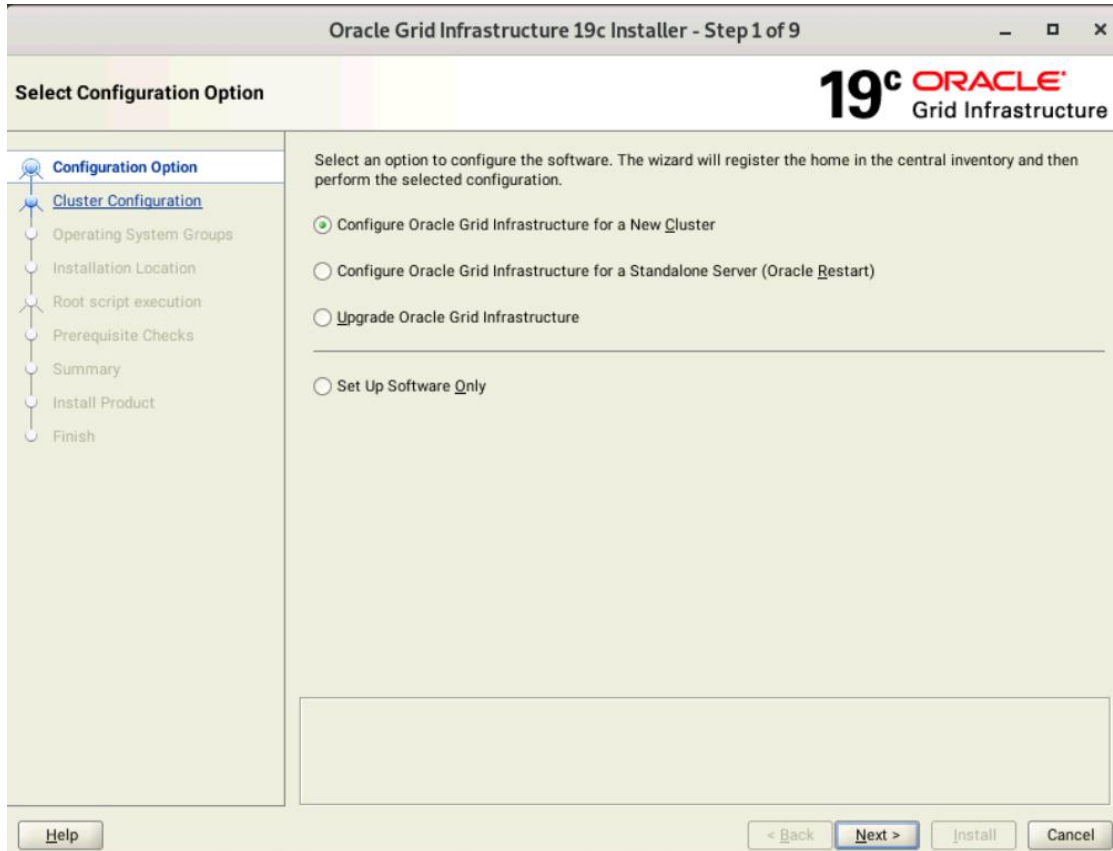
```
CVU home: /home/grid/
```

```
User: oracle
```

```
oracle@c2n1:/home/grid>unset ORACLE_BASE Oracle_HOME
```

```
oracle@c2n1:/home/grid>./gridSetup -applyRU directory_to_latest_RU
```

Oracle Grid Infrastructure Installation



Oracle Grid Infrastructure 19c Installation



Oracle Grid Infrastructure Installation

Oracle Grid Infrastructure 19c Installer - Step 3 of 17

Grid Plug and Play Information

19c ORACLE
Grid Infrastructure

Single Client Access Name (SCAN) allows clients to use one name in connection strings to connect to the cluster as a whole. Client connect requests to the SCAN name can be handled by any cluster node.

Create Local SCAN

Cluster Name:

SCAN Name:

SCAN Port:

Use Shared SCAN

SCAN Client Data:

Configure GNS

Configure nodes Virtual IPs as assigned by the Dynamic Networks

Create a new GNS

GNS VIP Address:

GNS Sub Domain:

Use Shared GNS

GNS Client Data:

Oracle Grid Infrastructure Installation

Oracle Grid Infrastructure 19c Installer - Step 4 of 17

19^c ORACLE[®]
Grid Infrastructure

Cluster Node Information

Provide the list of nodes to be managed by Oracle Grid Infrastructure with their Public Hostname and Virtual Hostname.

Public Hostname	Virtual Hostname
c2n1.olab.prv.suse.com	c2n1-vip.olab.prv.suse.com
c2n2.olab.prv.suse.com	c2n2-vip.olab.prv.suse.com
c2n3.olab.prv.suse.com	c2n3-vip.olab.prv.suse.com
c2n4.olab.prv.suse.com	c2n4-vip.olab.prv.suse.com

SSH connectivity... Use Cluster Configuration File... Add... Edit... Remove

OS Username: oracle OS Password:

Reuse private and public keys existing in the user home

Test Setup

Help < Back Next > Install Cancel

Oracle Grid Infrastructure Installation

Oracle Grid Infrastructure 19c Installer - Step 4 of 17

19^c ORACLE[®]
Grid Infrastructure

Cluster Node Information

Provide the list of nodes to be managed by Oracle Grid Infrastructure with their Public Hostname and Virtual Hostname.

Public Hostname	Virtual Hostname
c2n1.olab.prv.suse.com	c2n1-vip.olab.prv.suse.com
c2n2.olab.prv.suse.com	c2n2-vip.olab.prv.suse.com
c2n3.olab.prv.suse.com	c2n3-vip.olab.prv.suse.com
c2n4.olab.prv.suse.com	c2n4-vip.olab.prv.suse.com

Testing passwordless SSH connectivity between the selected nodes. This may take several minutes, please wait...

SSH connectivity... Use Cluster Configuration File... Add... Edit... Remove

Oracle Grid Infrastructure 19c Installer

Information Passwordless SSH connectivity between the selected nodes already established.

OK

Test Setup

Help < Back Next > Install Cancel

Oracle Grid Infrastructure Installation

Oracle Grid Infrastructure 19c Installer - Step 5 of 17

Specify Network Interface Usage

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Grid Infrastructure

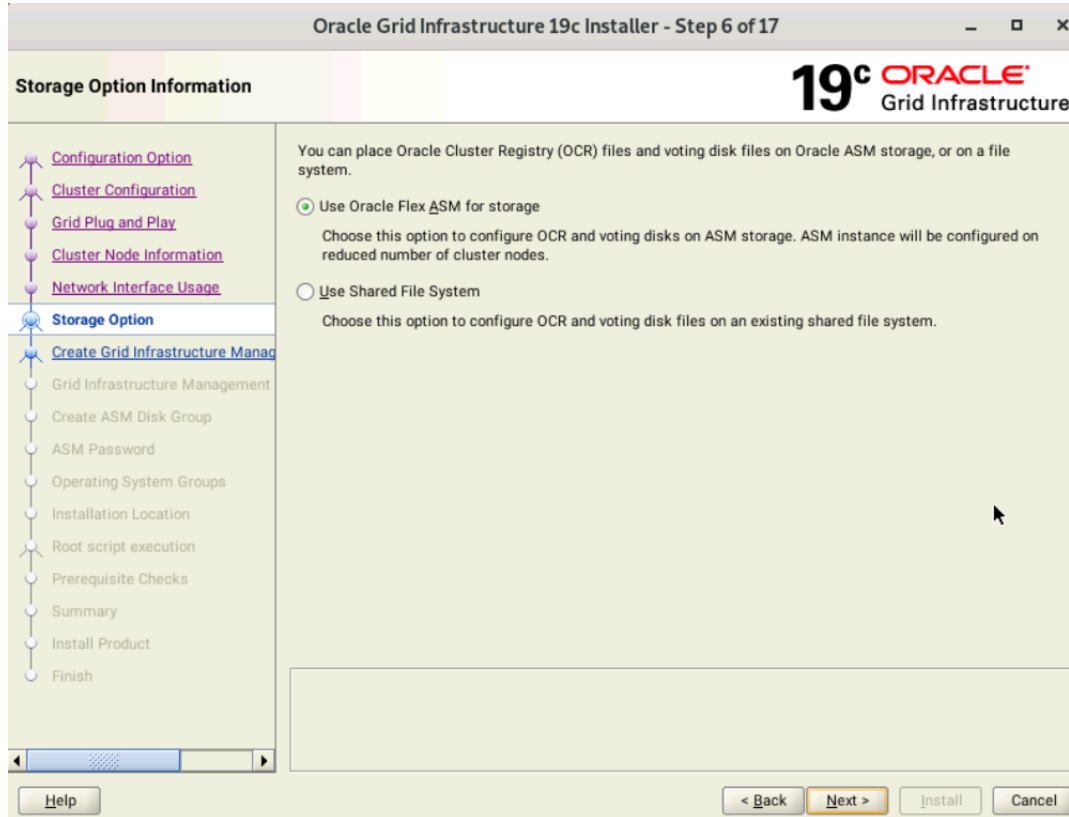
Private interfaces are used by Oracle Grid Infrastructure for internode traffic.

Interface Name	Subnet	Use for
bond1	10.156.215.0	Public
bond0	10.1.1.0	ASM & Private

Navigation: Configuration Option, Cluster Configuration, Grid Plug and Play, Cluster Node Information, **Network Interface Usage**, Storage Option, Create Grid Infrastructure Management, Grid Infrastructure Management, Create ASM Disk Group, ASM Password, Operating System Groups, Installation Location, Root script execution, Prerequisite Checks, Summary, Install Product, Finish

Buttons: Help, < Back, Next >, Install, Cancel

Oracle Grid Infrastructure Installation



Oracle Grid Infrastructure Installation

Oracle Grid Infrastructure 19c Installer - Step 8 of 16

19c ORACLE[®]
Grid Infrastructure

Create ASM Disk Group

Configuration Option
Cluster Configuration
Grid Plug and Play
Cluster Node Information
Network Interface Usage
Storage Option
Create Grid Infrastructure Manag
Create ASM Disk Group
ASM Password
Operating System Groups
Installation Location
Root script execution
Prerequisite Checks
Summary
Install Product
Finish

OCR and Voting disk data will be stored in the following ASM Disk group. Select disks and characteristics of this Disk group.

Disk group name:

Redundancy: Flex High Normal External

Allocation Unit Size: MB

Select Disks

<input type="checkbox"/>	Disk Path	Size (in MB)	Status	Failure Group
<input type="checkbox"/>	/dev/sdd1	266240	Candidate	
<input type="checkbox"/>	/dev/sdd2	266240	Candidate	
<input checked="" type="checkbox"/>	/dev/sdf1	7629	Candidate	
<input checked="" type="checkbox"/>	/dev/sdf2	7629	Candidate	
<input checked="" type="checkbox"/>	/dev/sdf3	7629	Candidate	

Disk Discovery Path: /dev/sd*

Configure Oracle ASM Filter Driver

Select this option to configure ASM Filter Driver (AFD) to simplify configuration and management of disk devices by Oracle ASM.

Oracle Grid Infrastructure Installation

Oracle Grid Infrastructure 19c Installer - Step 9 of 16

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Grid Infrastructure

Specify ASM Password

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

	Password	Confirm Password
SYS	<input type="text"/>	<input type="text"/>
ASMSNMP	<input type="text"/>	<input type="text"/>

Use same passwords for these accounts

Specify Password: Confirm Password:

Messages:

 Specify Password:[INS-30011] The password entered does not conform to the Oracle recommended standards.

Oracle Grid Infrastructure Installation

Oracle Grid Infrastructure 19c Installer - Step 12 of 18

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Grid Infrastructure

Privileged 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

Oracle ASM DBA (OSDBA for ASM) Group

Oracle ASM Operator (OSOPER for ASM) Group (Optional)

[Configuration Option](#)

[Cluster Configuration](#)

[Grid Plug and Play](#)

[Cluster Node Information](#)

[Network Interface Usage](#)

[Storage Option](#)

[Create Grid Infrastructure Manag](#)

[Create ASM Disk Group](#)

ASM Password

[Failure Isolation](#)

[Management Options](#)

Operating System Groups

[Installation Location](#)

Root script execution

Prerequisite Checks

Summary

Install Product

Finish

Oracle Grid Infrastructure Installation

Oracle Grid Infrastructure 19c Installer - Step 13 of 18

Specify Installation Location

19^c ORACLE[®]
Grid Infrastructure

[Configuration Option](#)
[Cluster Configuration](#)
[Grid Plug and Play](#)
[Cluster Node Information](#)
[Network Interface Usage](#)
[Storage Option](#)
[Create Grid Infrastructure Manag](#)
[Create ASM Disk Group](#)
ASM Password
[Failure Isolation](#)
[Management Options](#)
[Operating System Groups](#)
Installation Location
[Root script execution](#)
Prerequisite Checks
Summary
Install Product
Finish

Specify the Oracle base. The Oracle base directory for the Oracle Grid Infrastructure installation is the location where diagnostic and administrative logs, and other logs associated with Oracle ASM and Oracle Clusterware are stored. This location would also contain files pertaining to the configuration of Oracle Clusterware.

Oracle base:

This software directory is the Oracle Grid Infrastructure home directory.

Software location: /home/grid

Oracle Grid Infrastructure Installation

Oracle Grid Infrastructure 19c Installer - Step 14 of 19

Create Inventory

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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:

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

orainventory Group Name: oinstall

Oracle Grid Infrastructure Installation

Oracle Grid Infrastructure 19c Installer - Step 15 of 19

19^c ORACLE[®]
Grid Infrastructure

Root script execution configuration

During the software configuration, 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. The input specified will also be used by the installer to perform additional prerequisite checks.

Automatically run configuration scripts

Use "root" user credential

Password :

Use sudo

Program path :

User name :

Password :

Help < Back Next > Install Cancel

Oracle Grid Infrastructure Installation

Oracle Grid Infrastructure 19c Installer - Step 16 of 19

19^c ORACLE[®]
Grid Infrastructure

Perform Prerequisite Checks

Configuration Option
Cluster Configuration
Grid Plug and Play
Cluster Node Information
Network Interface Usage
Storage Option
Create Grid Infrastructure Ma
Create ASM Disk Group
ASM Password
Failure Isolation
Management Options
Operating System Groups
Installation Location
Create Inventory
Root script execution
Prerequisite Checks
Summary
Install Product
Finish

Verification Result

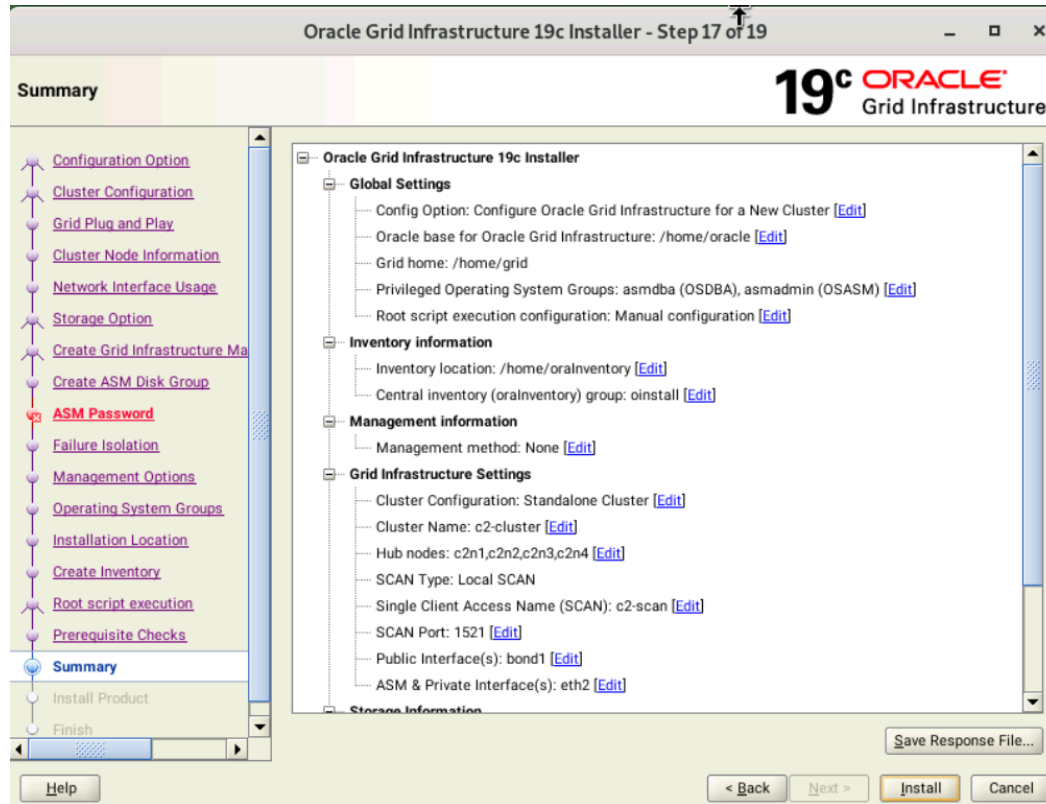
Some of the minimum requirements for installation are not completed. Review and fix the issues listed in the following table, and recheck the system.

Checks	Status	Fixable
Checks		
Domain Sockets	Ignored	No
zeroconf check	Ignored	No
[Device Checks for ASM]		
Device Checks for ASM	Ignored	No
Access Control List check	Ignored	No
I/O scheduler	Ignored	No

This task verifies Clusterware domain sockets ([more details](#))

Check Failed on Nodes: [c2n4, c2n3, c2n2, c2n1]

Oracle Grid Infrastructure Installation



Oracle Grid Infrastructure Installation

Oracle Grid Infrastructure 19c Installer - Step 18 of 19

19^c ORACLE[®]
Grid Infrastructure

Install Product

Configuration Option
Cluster Configuration
Grid Plug and Play
Cluster Node Information
Network Interface Us
Storage Option
Create Grid Infrast
Create ASM Disk Gro
ASM Password
Failure Isolation
Management Options
Operating System Gr
Installation Location
Create Inventory
Root script execution
Prerequisite Checks
Summary
Install Product
Finish

Progress
32%
Saving Cluster Inventory

Oracle Grid Infrastructure 19c Installer

Configuration scripts generated by the Installer need to be run as a privileged user (root). Installer will run these scripts using the privileged user credentials provided earlier.

Are you sure you want to continue ?

Yes No

Succeeded
Succeeded
Succeeded
Succeeded
Succeeded
Succeeded
Succeeded
Succeeded
Succeeded
Succeeded
In Progress
Pending
Pending

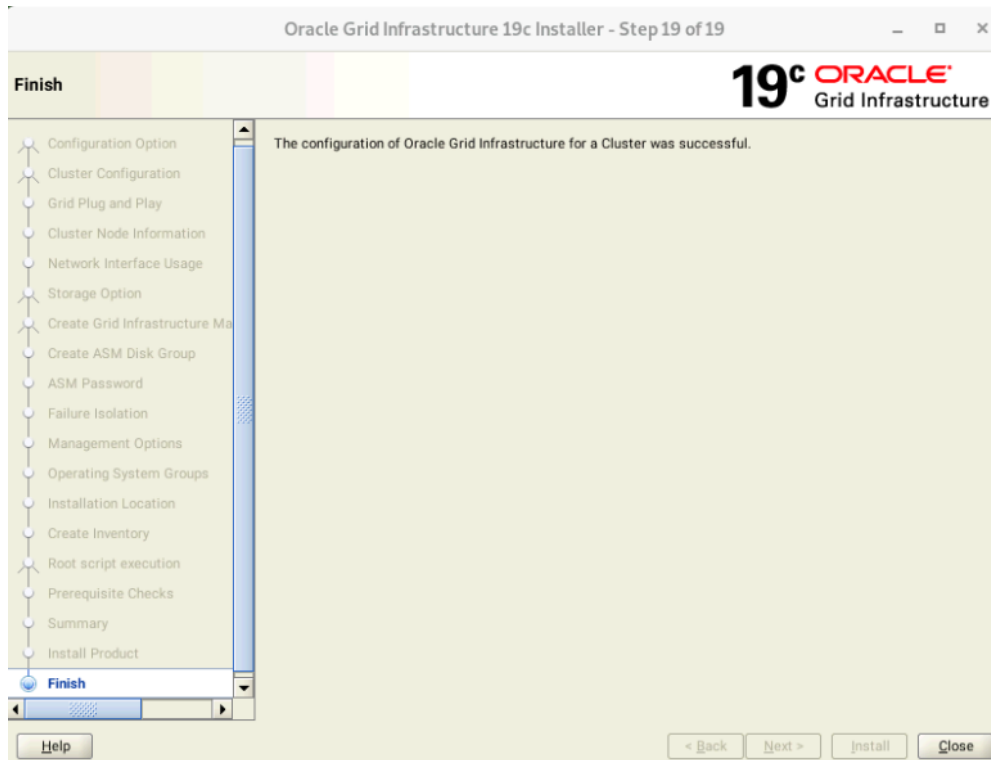
Configure Oracle Grid Infrastructure for a Cluster

Details Revert All Revert Retry Skip

19^c ORACLE[®]
Grid Infrastructure

Help < Back Next > Install Cancel

Oracle Grid Infrastructure Installation

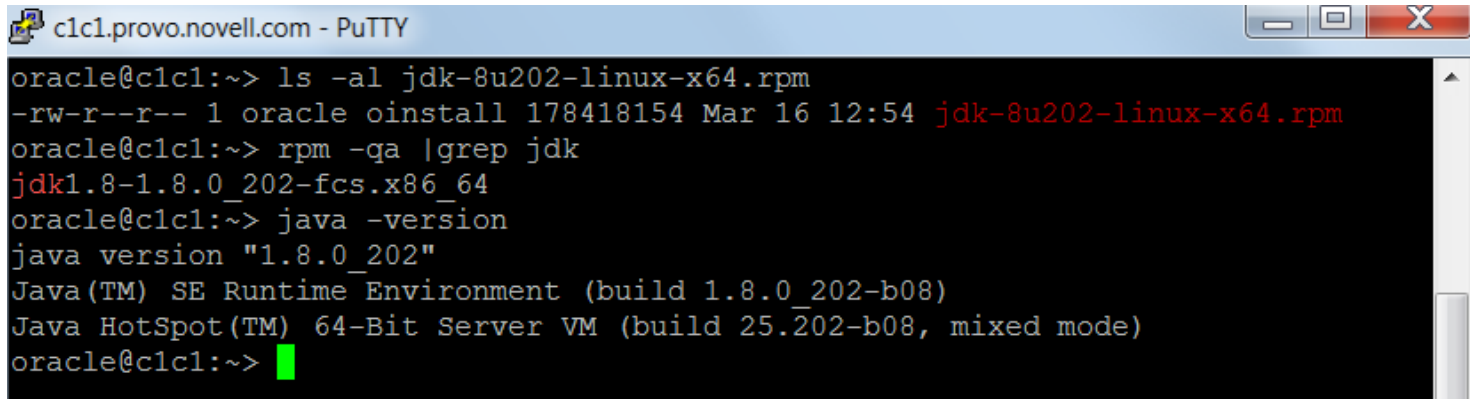


Oracle Grid Infrastructure Installation

```
c2n1.olab.prv.suse.com - PuTTY
oracle@c2n1:/home/grid/bin> ./crsctl check cluster -all
*****
c2n1:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
c2n2:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
c2n3:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
c2n4:
CRS-4537: Cluster Ready Services is online
CRS-4529: Cluster Synchronization Services is online
CRS-4533: Event Manager is online
*****
oracle@c2n1:/home/grid/bin> ./srvctl status nodeapps
VIP 10.156.215.35 is enabled
VIP 10.156.215.35 is running on node: c2n1
VIP 10.156.215.36 is enabled
VIP 10.156.215.36 is running on node: c2n2
VIP 10.156.215.37 is enabled
VIP 10.156.215.37 is running on node: c2n3
VIP 10.156.215.38 is enabled
VIP 10.156.215.38 is running on node: c2n4
Network is enabled
Network is running on node: c2n1
Network is running on node: c2n2
Network is running on node: c2n3
Network is running on node: c2n4
ONS is enabled
ONS daemon is running on node: c2n1
ONS daemon is running on node: c2n2
ONS daemon is running on node: c2n3
ONS daemon is running on node: c2n4
oracle@c2n1:/home/grid/bin>
```

Oracle Java Installation

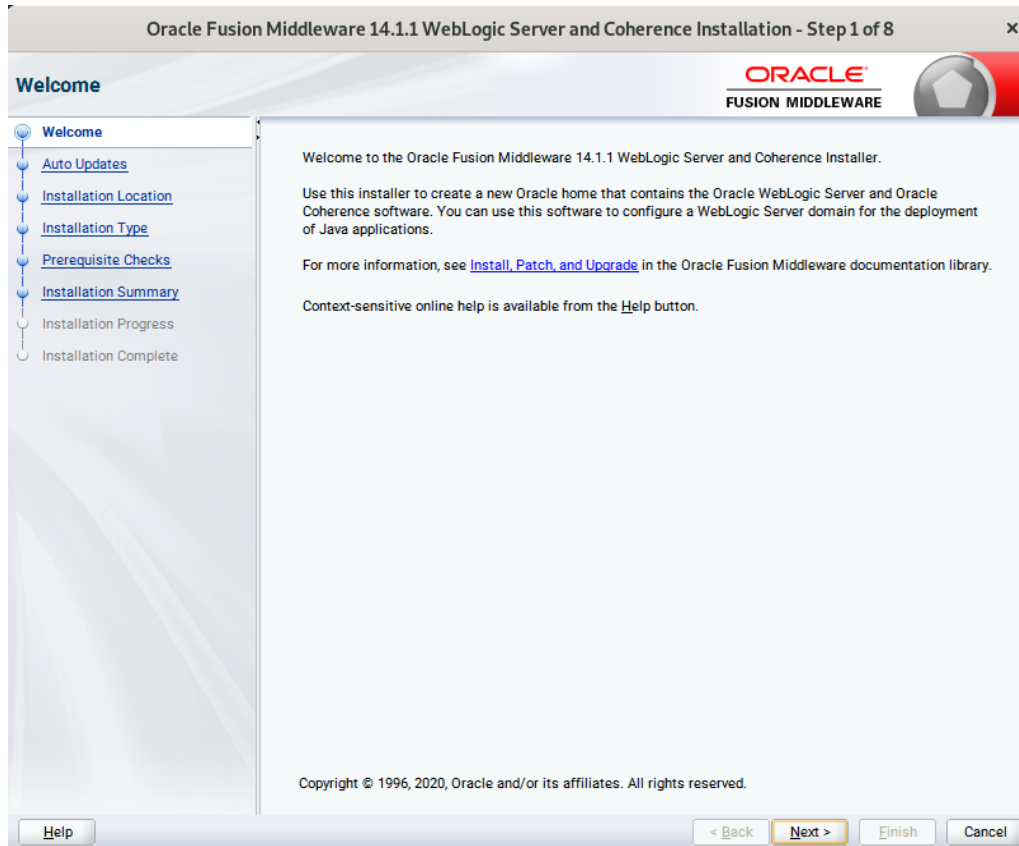
- Download JDK 1.8.0_131 (or later)
- Login to SLES15 Server as oracle user
- Set JAVA_HOME and PATH



```
clc1.provo.novell.com - PuTTY
oracle@clc1:~> ls -al jdk-8u202-linux-x64.rpm
-rw-r--r-- 1 oracle oinstall 178418154 Mar 16 12:54 jdk-8u202-linux-x64.rpm
oracle@clc1:~> rpm -qa |grep jdk
jdk1.8-1.8.0_202-fcs.x86_64
oracle@clc1:~> java -version
java version "1.8.0_202"
Java(TM) SE Runtime Environment (build 1.8.0_202-b08)
Java HotSpot(TM) 64-Bit Server VM (build 25.202-b08, mixed mode)
oracle@clc1:~> █
```

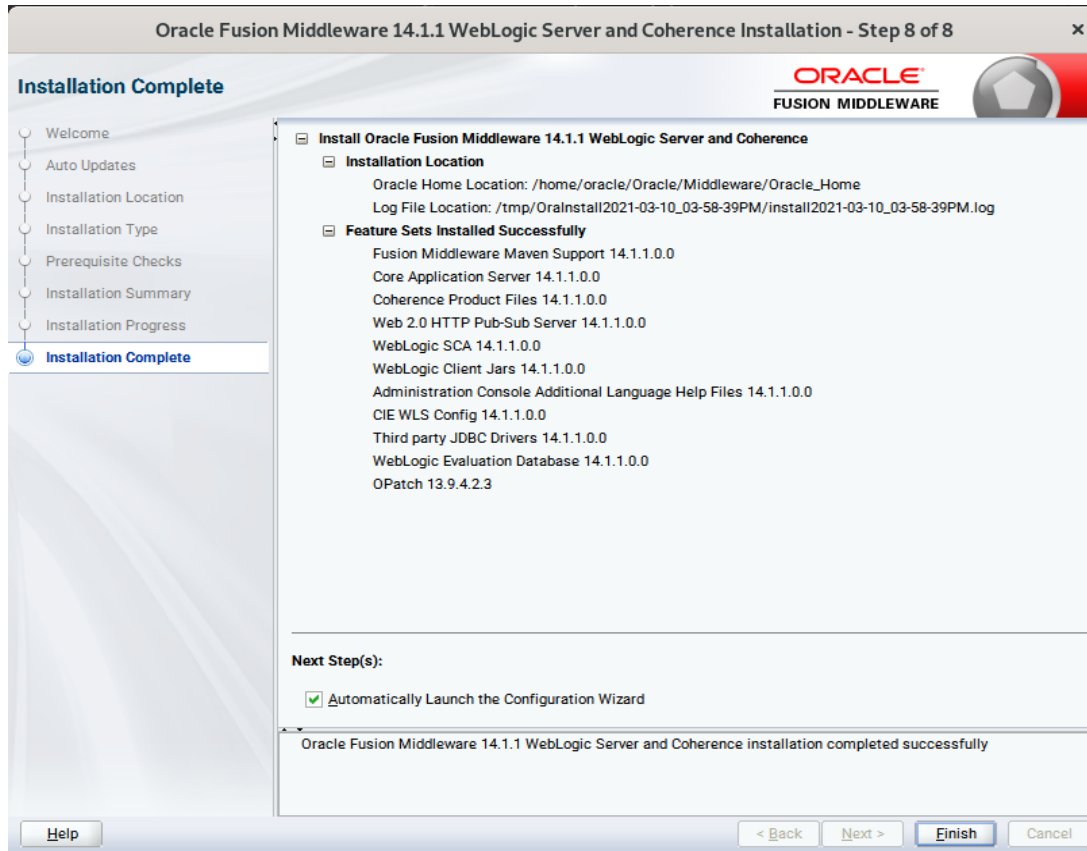
Oracle FUSION MiddleWare

WebLogic Server 14c Installation



Oracle FUSION MiddleWare

WebLogic Server 14c Installation



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
 - Disable Transparent HugePages and use Normal “hugepages”
 - Distribute “redo log” files

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

Oracle AWR Snapshot

```
File Edit View Search Terminal Help
oracle@sles15:~/SW> sqlplus / as sysdba

SQL*Plus: Release 18.0.0.0.0 - Production on Sat Mar 16 23:59:03 2019
Version 18.3.0.0.0

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Connected to:
Oracle Database 18c Enterprise Edition Release 18.0.0.0.0 - Production
Version 18.3.0.0.0

SQL> EXEC DBMS_WORKLOAD_REPOSITORY.create_snapshot;

PL/SQL procedure successfully completed.

SQL> EXEC DBMS_WORKLOAD_REPOSITORY.create_snapshot;

PL/SQL procedure successfully completed.

SQL> @$ORACLE_HOME/rdbms/admin/awrrpt.sql
```

AWR Report for DB: ORCL, Instance: orcl

file:///opt/oracle/SW/suse_awrrpt.html

WORKLOAD REPOSITORY report for

DB Name	DB Id	Unique Name	Role	Edition	Release	RAC	CDB
ORCL	1530879612	orcl	PRIMARY	EE	18.0.0.0.0	NO	YES

Instance	Inst Num	Startup Time
orcl	1	16-Mar-19 23:29

Container DB Id	Container Name	Open Time
1528807769	ORCLPDB	16-Mar-19 23:29
1530292996	PDB\$SEED	16-Mar-19 23:29
1530879612	CDB\$ROOT	16-Mar-19 23:29

Host Name	Platform	CPUs	Cores	Sockets	Memory (GB)
sles15	Linux x86 64-bit	12	6	1	31.36

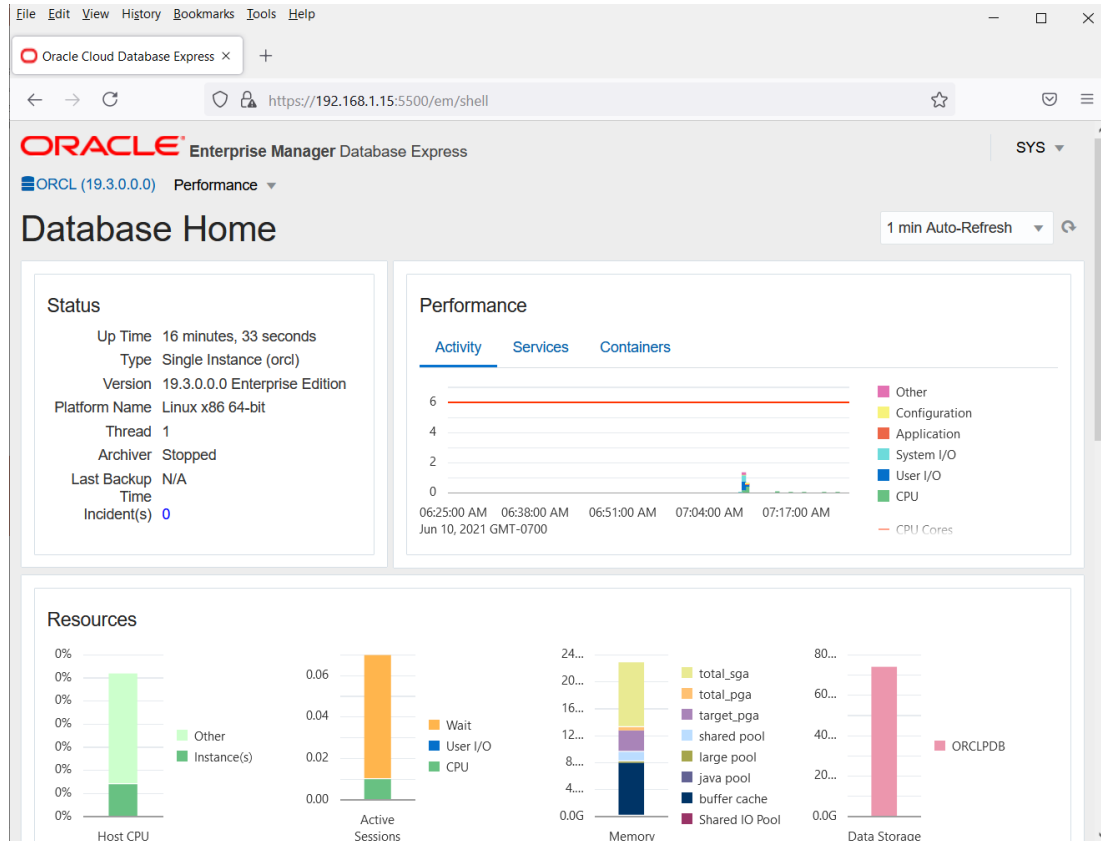
Snap Id	Snap Time	Sessions	Cursors/Session	Pluggable Databases Open
1	16-Mar-19 23:48:47	66	.7	3
3	17-Mar-19 00:00:04	70	.7	3
Elapsed:		11.29 (mins)		
DB Time:		0.33 (mins)		

Report Summary

Load Profile

	Per Second	Per Transaction	Per Exec	Per Call
DB Time(s):	0.0	0.8	0.00	0.02
DB CPU(s):	0.0	0.7	0.00	0.02
Background CPU(s):	0.0	0.3	0.00	0.00
Redo size (bytes):	14,633.1	381,114.6		

Oracle Enterprise Manager



Oracle Cloud

The screenshot shows the Oracle Cloud Marketplace interface. At the top, there is a navigation bar with the Oracle logo and 'Cloud Marketplace', along with links for 'Oracle Cloud Home', 'Publishers', 'Resources', 'Sign In', and 'English'. Below this, the 'Applications' section is active, and a search for 'SLES 15' has been performed. The search results are displayed in a grid format, showing three SUSE Linux Enterprise Server products. A filter sidebar on the left allows filtering by region/country and device type. The search results table includes columns for product name, version, and license type (BYOL).

Region/Country	Device Type
<input type="checkbox"/> Asia Pacific	<input type="checkbox"/> Browser
<input type="checkbox"/> Middle East	<input type="checkbox"/> Desktop
<input type="checkbox"/> Japan	
<input type="checkbox"/> Latin America	
<input type="checkbox"/> North America	
<input type="checkbox"/> Europe	
<input type="checkbox"/> Africa	

Product Name	Version	License
SUSE Linux Enterprise Server 15 (BYOS)	SLES 15	BYOL
SUSE Linux Enterprise Server 15 SP1 For SAP (BYOS)	SLES 15 SP1 For SAP	BYOL
SUSE Linux Enterprise Server 15 SP2 For SAP (BYOS)	SLES 15 SP2 For SAP	BYOL



SUSE Linux Enterprise Server 15 SP2 (BYOS)

Get App >

SLES 15 SP2

Oracle Cloud Infrastru | Operating Systems

Contact Listing Provider

★★★★★ (0)

💰 Software Price: BYOL ⓘ



Click “[Get App](#)” to launch your own instance. This requires an Oracle Cloud account.

SUSE Install Documents

SUSE Linux Enterprise Server 15

Installation Guides

- Oracle Database Server 19c on SLES15 SP2
- Oracle WebLogic Server 14c on SLES15 SP2
- Oracle FUSION MiddleWare 12c on SLES15 SP2
- Oracle FUSION MiddleWare 12cR2 on SLES15 SP1 (PDF)
- Oracle WebLogic Server 12cR2 on SLES15 SP1 (PDF)
- Oracle GI/RAC 19c on SLES15 SP1 (PDF)
- Oracle FUSION MiddleWare 12cR2 on SLES15 (PDF)
- Oracle Database Server 19c on SLES15 (PDF)
- Oracle Database Server 18c on SLES15 (PDF)
- Oracle Database Server 12cR2 on SLES15 (PDF)
- Oracle WebLogic Server 12cR2 on SLES15 (PDF)
- Oracle WebLogic Server 14c on SLES15 SP1 (PDF)
- Oracle GI/RAC 12cR2 on SLES15 (PDF)
- Oracle KVM and SLES15 SP1 as a guest OS (PDF)

<https://www.suse.com/partners/alliance/oracle/documents.html>

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)





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