

# Oracle Database 19c (19.4.0.0.0) on SUSE Linux Enterprise Server 15

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April 20<sup>th</sup>, 2020



## Introduction

This document is not a replacement for official Oracle install document, but to help you understand minor difference you may encounter while installing Oracle Database 19c on SUSE Linux Enterprise Server 15. This document covers x86\_64 version but installation steps are same for other platforms. We will use latest versions of Oracle Database Enterprise version 19c.

## Oracle Database Software

Oracle Database Enterprise Edition 19c is available for public download at:  
<https://www.oracle.com/technetwork/database/enterprise-edition/downloads/index.html>

## SUSE Linux Software

Download SUSE Linux Enterprise Server 15 here use 60 Day's free trial:  
<https://www.suse.com/products/server/download/>

## Installation

Install SUSE Linux Enterprise Server 15 with “**Enhanced Base System, Software Management, X Window System, Oracle Server Base**” pattern. Please note that SLES15 comes with SLE-15-Installer-DVD and SLE-15-Packages DVD.

You can follow official Oracle Installation manual for selective SLES OS required rpms, however **Oracle Server Base** pattern from SUSE will fulfil minimum setup required for Oracle Database Installation.

```
oracle@sles15:~> uname -a
Linux sles15 4.12.14-150.14-default #1 SMP Thu Mar 21 14:37:02 UTC 2019 (01b35ce)
 x86_64 x86_64 x86_64 GNU/Linux
oracle@sles15:~> cat /etc/os-release
NAME="SLES"
VERSION="15"
VERSION_ID="15"
PRETTY_NAME="SUSE Linux Enterprise Server 15"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15"
oracle@sles15:~> env |grep ORA
ORA_NLS10=/opt/oracle/SW/nls/data
ORACLE_SID=orcl
ORACLE_BASE=/opt/oracle
ORACLE_HOME=/opt/oracle/SW
oracle@sles15:~> █
```

## Installing Oracle Database 19c (19.3)

Installing Oracle Database 19c on SLES15 is straightforward, please follow:

1. Download Oracle SW (LINUX.X64\_193000\_db\_home.zip)
  - a. unzip in **\$ORACLE\_HOME** directory.
  - b. cd **\$ORACLE\_HOME**
  - c. **./runInstaller**

**Note:** There is a change in Oracle Database 19c Installation process. Now runInstaller is a script, please check Oracle Official document for explanation.

2. Watch for following minor error/warning messages (**Fix before starting Installer**):

1. Make sure server is assigned static IP address.
2. Make sure you have enabled oracle user & logged-in as user “**oracle**”.
3. Install (or verify) any missing packages i.e.

**zypper** in libcap1 libcap1-32bit libcap-ng-utils libcap-ng0-32bit libXtst6-32bit nfs-kernel-server

**Note:** libcap1 & libcap1-32bit are part of **SLES 15 Legacy Module**. Refer <https://documentation.suse.com/sles/15-SP1/html/SLES-all/cha-register-sle.html> on how to enable Legacy Module.

4. **DBCA Error:** ORA-27104: system-defined limits for shared memory was misconfigured

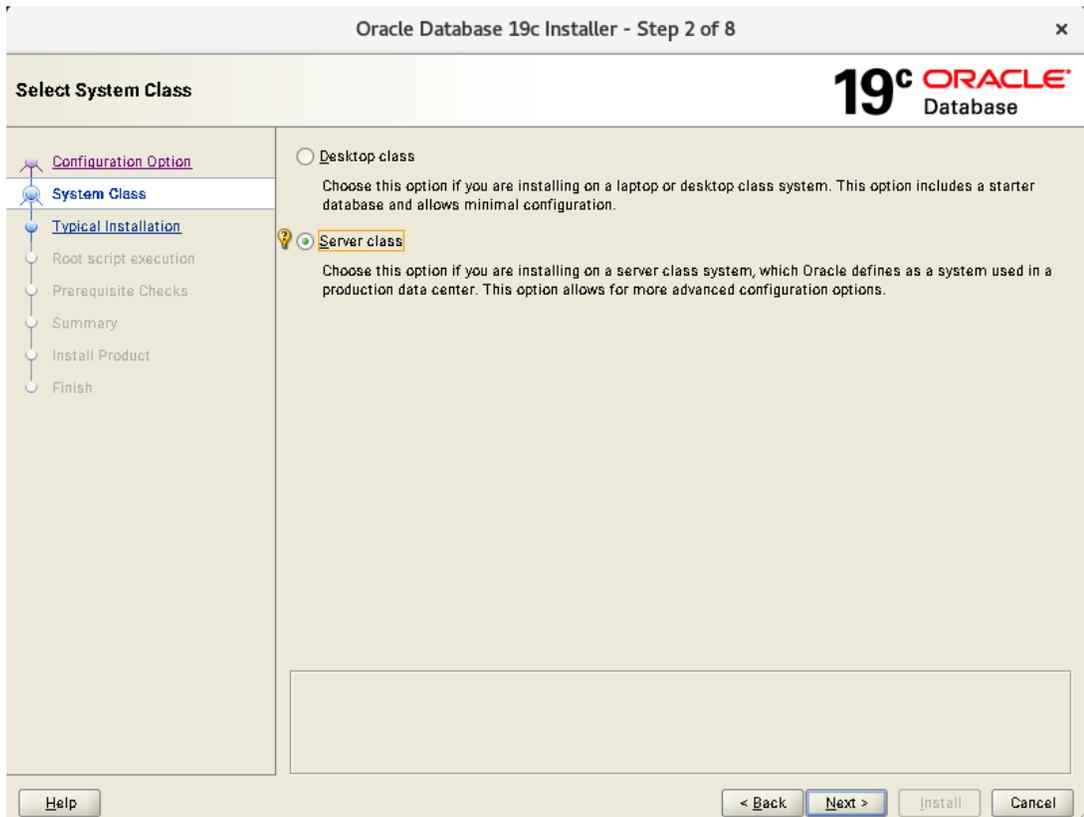
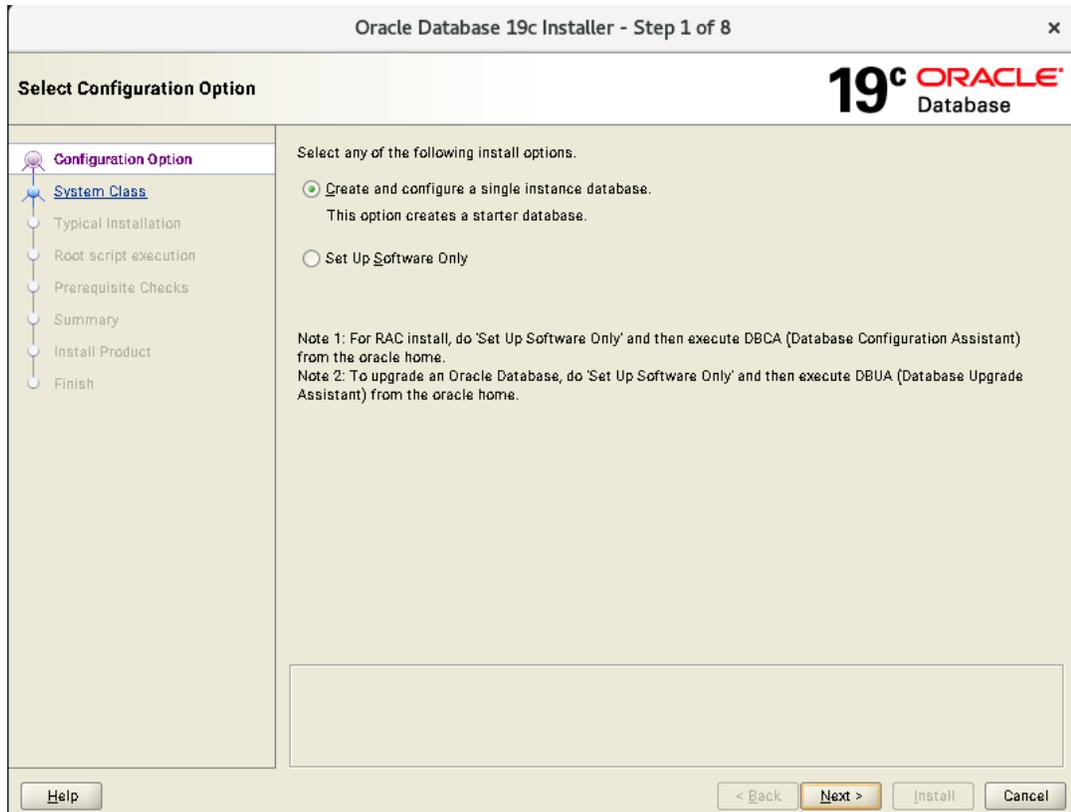
**Fix:** Increase kernel.shmmax & kernel.shmall based on your Server RAM in **/etc/sysconfig/oracle** & run “**systemctl restart oracle-setup**”.

Please refer Oracle Metalink Note [ID 567506.1] - Maximum SHMMAX values for Linux x86 and x86-64

Example values for x86\_64 Server with 32GB RAM:

shmmax=16833714176, shmall=3287834

3. Login as user oracle and Start Oracle Universal Installer (OUI):  
**\$ORACLE\_HOME/runInstaller**



Oracle Database 19c Installer - Step 4 of 18

### Specify Installation Location

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

Specify a path to place all Oracle software and configuration-related files installed by this installation owner. This location is the Oracle base directory for the installation owner.

Oracle base:

This software directory is the Oracle Database home directory.

Software location: /opt/oracle/SW

Oracle Database 19c Installer - Step 5 of 18

### Create Inventory

- [Configuration Option](#)
- [System Class](#)
- [Database Edition](#)
- [Installation Location](#)
- [Create Inventory](#)
- [Configuration Type](#)
- [Database Identifiers](#)
- [Configuration Options](#)
- [Database Storage](#)
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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 (orainventory).

orainventory\_group Name:

Oracle Database 19c Installer - Step 6 of 18

### Select Configuration Type

- [Configuration Option](#)
- [System Class](#)
- [Database Edition](#)
- [Installation Location](#)
- [Create Inventory](#)
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- [Database Identifiers](#)
- [Configuration Options](#)
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Select the type of database that you want to create.

**General Purpose / Transaction Processing**  
A starter database designed for general purpose use, or for transaction-heavy applications.

**Data Warehousing**  
A starter database optimized for data warehousing applications.

Help
< Back
Next >
Install
Cancel

Oracle Database 19c Installer - Step 7 of 18

### Specify Database Identifiers

- [Configuration Option](#)
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- [Create Inventory](#)
- [Configuration Type](#)
- [Database Identifiers](#)
- [Configuration Options](#)
- [Database Storage](#)
- [Management Options](#)
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- [Install Product](#)
- [Finish](#)

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).

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:

Help
< Back
Next >
Install
Cancel

Oracle Database 19c Installer - Step 8 of 18

### Specify Configuration Options

- [Configuration Option](#)
- [System Class](#)
- [Database Edition](#)
- [Installation Location](#)
- [Create Inventory](#)
- [Configuration Type](#)
- [Database Identifiers](#)
- [Configuration Options](#)
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- [Finish](#)

Memory   **Character sets**   Sample schemas

Enabling Automatic Memory Management allows the database to distribute memory automatically between the system global area (SGA) and the program global area (PGA), based on user-specified overall database memory target size. If automatic memory management is not enabled, then the SGA and PGA must be sized manually.

Enable Automatic Memory Management

Allocate memory: 
256
12842
32104
12,842
40 %

SGA target:	9631 MB
PGA aggregate target:	3211 MB
<b>Target database memory:</b>	<b>12842 MB</b>

Help
< Back
Next >
Install
Cancel

Oracle Database 19c Installer - Step 9 of 18

### Specify Database Storage Options

- [Configuration Option](#)
- [System Class](#)
- [Database Edition](#)
- [Installation Location](#)
- [Create Inventory](#)
- [Configuration Type](#)
- [Database Identifiers](#)
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- [Install Product](#)
- [Finish](#)

File system

Use a file system for database storage. For optimal database organization and performance, Oracle recommends that you install data files and the Oracle database software on different disks.

Specify database file location?  Browse...

Oracle Automatic Storage Management

Oracle Automatic Storage Management (Oracle ASM) simplifies database storage administration, and places database files for optimal I/O performance. Select this option if you intend to use Oracle ASM.

Help
< Back
Next >
Install
Cancel

Oracle Database 19c Installer - Step 10 of 18

### Specify Management Options

- 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

Oracle Database 12c is managed by Oracle Database Express by default. You can use Oracle Enterprise Manager 12c Cloud Control to manage each Oracle Database 19c centrally. Specify the details of the Cloud Control configuration to manage your database.

Register with Enterprise Manager (EM) Cloud Control

O<sub>M</sub>S Host:

O<sub>M</sub>S Port:

EM Admin User Name:

EM Admin Password:

Help
< Back
Next >
Install
Cancel

Oracle Database 19c Installer - Step 11 of 18

### Specify Recovery Options

- 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

Enable or disable recovery for your database. If you choose to enable recovery, then the location specified will be used as recovery area storage.

Enable Recovery

File system

Recovery area location:  Browse...

Oracle Automatic Storage Management

Help
< Back
Next >
Install
Cancel

Oracle Database 19c Installer - Step 12 of 18

### Specify Schema Passwords

The starter database contains pre-loaded schemas, most of which have passwords that are expired and locked at the end of installation. After installation is complete, you must unlock and set new passwords for those accounts you want to use. Schemas used for database management and postinstallation functions are left unlocked, and passwords for these accounts will not expire. Specify the passwords for these accounts.

Use different passwords for these accounts

	Password	Confirm password
SYS	<input type="text"/>	<input type="text"/>
SYSTEM	<input type="text"/>	<input type="text"/>
PDBADMIN	<input type="text"/>	<input type="text"/>

Use the same password for all accounts

Password:  Confirm password:

Oracle Database 19c Installer - Step 13 of 18

### Privileged Operating System groups

SYS privileges are required to create a database using operating system (OS) authentication. Membership in OS Groups grants the corresponding SYS privilege, eg. membership in OSDBA grants the SYSDBA privilege.

Database Administrator (OSDBA) group:

Database Operator (OSOPER) group (Optional):

Database Backup and Recovery (OSBACKUPDBA) group:

Data Guard administrative (OSDGDBA) group:

Encryption Key Management administrative (OSKMDBA) group:

Real Application Cluster administrative (OSRACDBA) group:

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### Root script execution configuration

- [Configuration Option](#)
- [System Class](#)
- [Database Edition](#)
- [Installation Location](#)
- [Create Inventory](#)
- [Configuration Type](#)
- [Database Identifiers](#)
- [Configuration Options](#)
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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 :

Oracle Database 19c Installer - Step 15 of 18

### Perform Prerequisite Checks

- [Configuration Option](#)
- [System Class](#)
- [Database Edition](#)
- [Installation Location](#)
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- [Database Identifiers](#)
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- [Prerequisite Checks](#)
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- [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.

Ignore All

Checks	Status	Fixable
[OS Kernel Parameters]		
OS Kernel Parameter: shmall	Warning	Yes
OS Kernel Parameter: panic_on_oops	Warning	Yes
[Packages]		
Package: libstdc++33-3.3.3-62.1	Failed	No
Package: bc-1.06.95	Warning	No
Package: libXext-devel-1.3.3	Warning	No
Package: libXi-devel-1.7.9	Warning	No
Package: libXi6-32bit-1.7.9	Warning	No
Package: libXrender-devel-0.9.10	Warning	No
Package: libXrender1-32bit-0.9.10	Warning	No
Package: libjpeg-turbo-1.3.1	Warning	No
Package: libjpeg62-32bit-62.1.0	Warning	No
Package: libjpeg62-turbo-1.3.1	Warning	No

This is a prerequisite condition to test whether the OS kernel parameter "shmall" is properly set. [\(more details\)](#)  
 Expected Value : 4109764  
 Actual Value : Current=3287811; Configured=undefined

Oracle Database 19c Installer - Step 15 of 18

**19<sup>c</sup> ORACLE<sup>®</sup> Database**

Perform Prerequisite Checks

**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.

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/InstallActions2019-05-04\_09-40-36PM/CVU\_19.0.D.D.oracle/runfixup.sh

Nodes: sles15

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

Oracle Database 19c Installer - Step 15 of 18

**19<sup>c</sup> ORACLE<sup>®</sup> Database**

Perform Prerequisite Checks

**Verification Result** **Fixup Result**

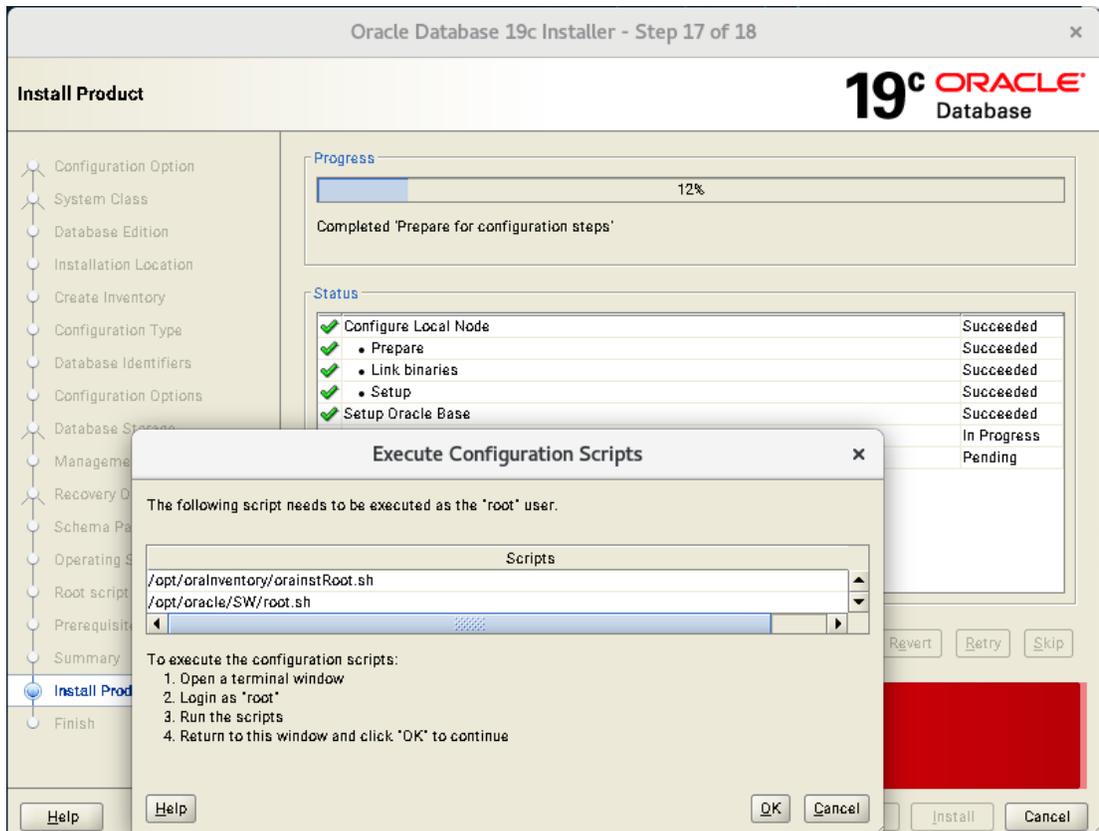
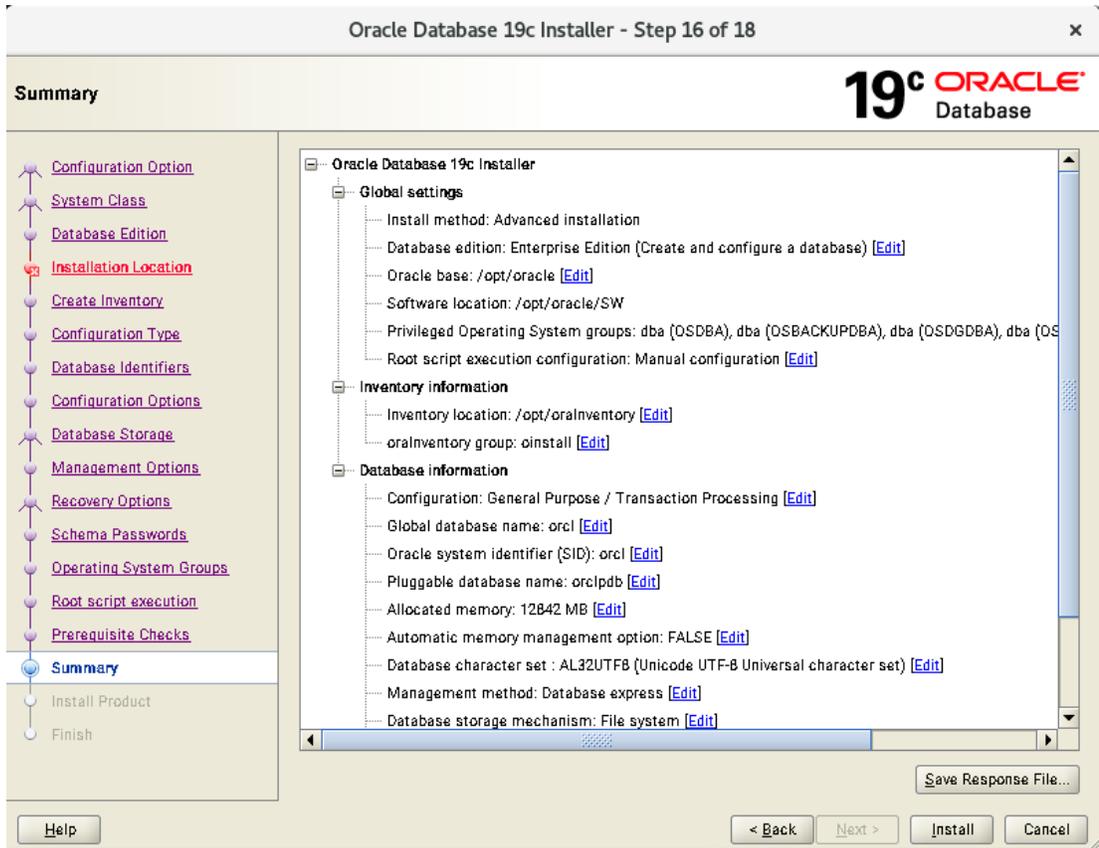
Some of the minimum requirements for installation are not completed. Review and fix the issues listed in the following table, and recheck the system.

Ignore All

Checks	Status	Fixable
Checks		
[Packages]		
Package: libstdc++33-3.3.3-62.1	Ignored	No
Package: bc-1.06.95	Ignored	No
Package: libXext-devel-1.3.3	Ignored	No
Package: libXi-devel-1.7.9	Ignored	No
Package: libXi6-32bit-1.7.9	Ignored	No
Package: libXrender-devel-0.9.10	Ignored	No
Package: libXrender1-32bit-0.9.10	Ignored	No
Package: libjpeg-turbo-1.3.1	Ignored	No
Package: libjpeg62-32bit-62.1.0	Ignored	No
Package: libjpeg62-turbo-1.3.1	Ignored	No
Package: libpcap1-1.5.3	Ignored	No
Package: libpcr16-0-8.41	Ignored	No
Package: libpng16-16-32bit-1.6.B	Ignored	No

This is a prerequisite condition to test whether the package 'libstdc++33-3.3.3-62.1' is available on the system. [\(more details\)](#)

Expected Value : libstdc++33-3.3.3-62.1  
Actual Value : missing



Oracle Database 19c Installer - Step 17 of 18

## Install Product

**19<sup>c</sup> ORACLE<sup>®</sup> Database**

**Progress**

74%

Creating and starting Oracle instance

**Status**

✓	Configure Local Node	Succeeded
✓	• Prepare	Succeeded
✓	• Link binaries	Succeeded
✓	• Setup	Succeeded
✓	Setup Oracle Base	Succeeded
✓	Execute Root Scripts	Succeeded
➔	Oracle Database configuration	In Progress
✓	• Oracle Net Configuration Assistant	Succeeded
➔	• Oracle Database Configuration Assistant	In Progress

**19<sup>c</sup> ORACLE<sup>®</sup> Database**

Oracle Database 19c Installer - Step 18 of 18

## Finish

**19<sup>c</sup> ORACLE<sup>®</sup> Database**

The configuration of Oracle Database was successful.

**Note:**

Oracle Enterprise Manager Database Express URL: <https://sles15:5500/em>

Verify successful Database Installation using sqlplus:

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

SQL*Plus: Release 19.0.0.0.0 - Production on Sat May 4 23:10:38 2019
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

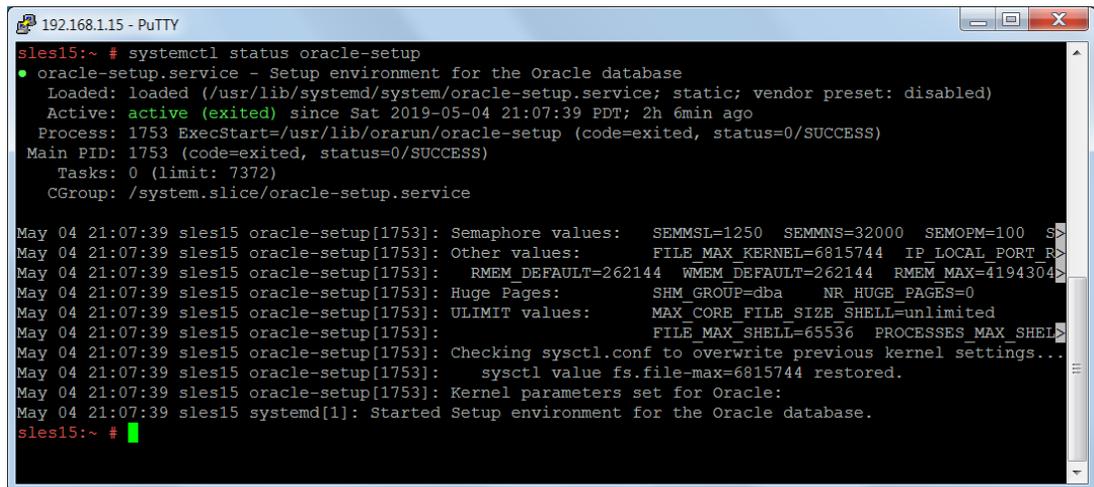
SQL> show sga

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:~/SW>
```

### SUSE SLES 15 setup (After successful Oracle DB Install):

Please do following changes for successful Oracle Database start after reboot:

1. edit “orcl:/opt/oracle/SW/database:Y” in /etc/oractab
2. Set START\_ORACLE\_DB & START\_ORACLE\_DB\_LISTENER to “yes” in /etc/sysconfig/oracle setup file.
3. Check status using **systemctl** commands:



```
192.168.1.15 - PuTTY
sles15:~ # systemctl status oracle-setup
● oracle-setup.service - Setup environment for the Oracle database
   Loaded: loaded (/usr/lib/systemd/system/oracle-setup.service; static; vendor preset: disabled)
   Active: active (exited) since Sat 2019-05-04 21:07:39 PDT; 2h 6min ago
   Process: 1753 ExecStart=/usr/lib/orarun/oracle-setup (code=exited, status=0/SUCCESS)
  Main PID: 1753 (code=exited, status=0/SUCCESS)
     Tasks: 0 (limit: 7372)
    CGroup: /system.slice/oracle-setup.service

May 04 21:07:39 sles15 oracle-setup[1753]: Semaphore values: SEMMSL=1250 SEMMNS=32000 SEMOPM=100 S
May 04 21:07:39 sles15 oracle-setup[1753]: Other values: FILE_MAX_KERNEL=6815744 IP_LOCAL_PORT_R
May 04 21:07:39 sles15 oracle-setup[1753]: RMEM_DEFAULT=262144 WMEM_DEFAULT=262144 RMEM_MAX=4194304
May 04 21:07:39 sles15 oracle-setup[1753]: Huge Pages: SHM_GROUP=dba NR_HUGE_PAGES=0
May 04 21:07:39 sles15 oracle-setup[1753]: ULIMIT values: MAX_CORE_FILE_SIZE_SHELL=unlimited
May 04 21:07:39 sles15 oracle-setup[1753]: FILE_MAX_SHELL=65536 PROCESSES_MAX_SHELL
May 04 21:07:39 sles15 oracle-setup[1753]: Checking sysctl.conf to overwrite previous kernel settings...
May 04 21:07:39 sles15 oracle-setup[1753]: sysctl value fs.file-max=6815744 restored.
May 04 21:07:39 sles15 oracle-setup[1753]: Kernel parameters set for Oracle:
May 04 21:07:39 sles15 systemd[1]: Started Setup environment for the Oracle database.
sles15:~ #
```

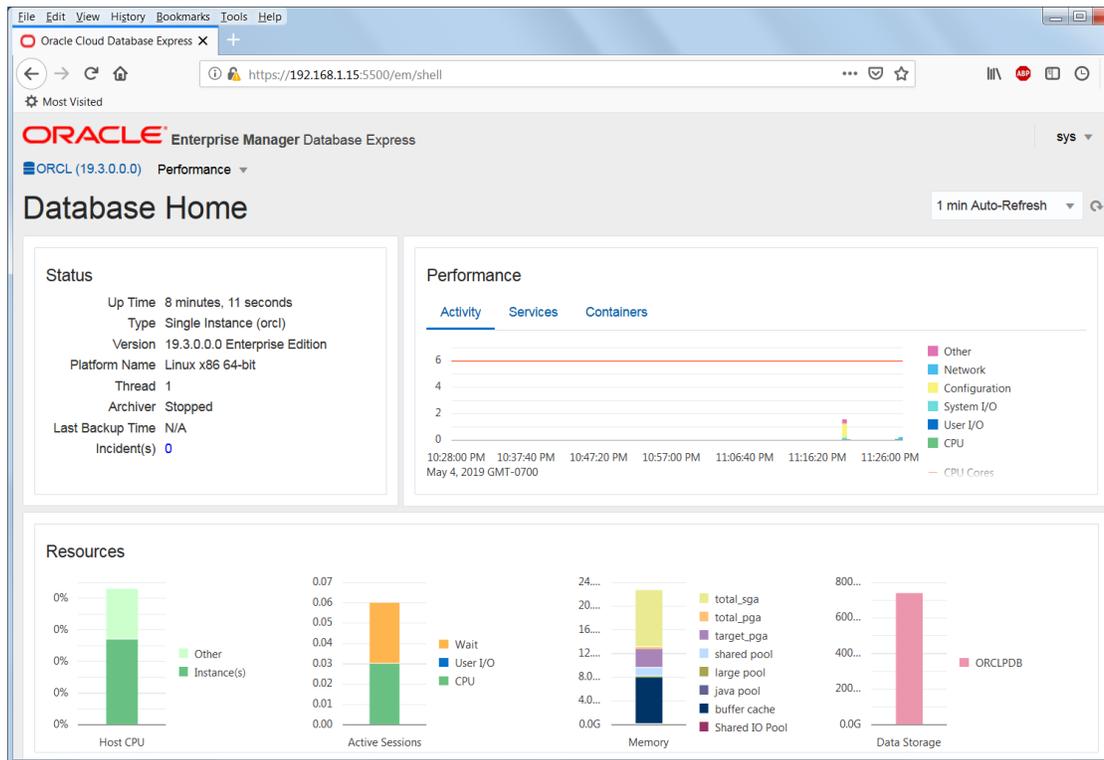
```

sles15:/opt/oracle/SW # 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 2019-05-09 14:30:48 PDT; 43min ago
     Process: 1982 ExecStart=/usr/lib/orarun/oracle start (code=exited, status=0/SUCCESS)
    Tasks: 95 (limit: 7372)
   CGroup: /system.slice/oracle.service
           └─2070 /opt/oracle/SW/bin/tnslsnr LISTENER -inherit
             └─2420 ora_pmon_orcl
               └─2422 ora_clmn_orcl
                 └─2424 ora_psp0_orcl
                   └─2517 ora_vktm_orcl
                     └─2521 ora_gen0_orcl
                       └─2523 ora_mman_orcl
                         └─2527 ora_gen1_orcl
                           └─2530 ora_diag_orcl
                             └─2533 ora_ofsd_orcl
                               └─2536 ora_dbrm_orcl
                                 └─2538 ora_vkrn_orcl
                                   └─2540 ora_svcb_orcl
                                     └─2542 ora_pman_orcl
                                       └─4694 ora_w00m_orcl
                                         └─4696 ora_w00n_orcl

May 09 14:30:48 sles15 oracle[1982]: - Starting Application Server Console....unused
May 09 14:30:48 sles15 oracle[1982]: - Starting Agent....unused
May 09 14:30:48 sles15 oracle[1982]: - Starting Enterprise Manager....skipped
May 09 14:30:48 sles15 oracle[1982]: - Starting iSQLPLUS Manager....unused
May 09 14:30:48 sles15 oracle[1982]: - Starting Oracle Internet Filesystem....unused
May 09 14:30:48 sles15 oracle[1982]: - Starting Oracle Internet Directory....unused
May 09 14:30:48 sles15 oracle[1982]: #####
May 09 14:30:48 sles15 oracle[1982]: #                               End of O R A C L E section                               #
May 09 14:30:48 sles15 oracle[1982]: #####
May 09 14:30:48 sles15 systemd[1]: Started Start the Oracle database.
sles15:/opt/oracle/SW #

```

## Oracle Enterprise Manager Screen:



## **Update to Oracle Database 19.4:**

SLES 15 is certified with Oracle Database 19.4.x (or above). Above instructions covers 19.3, which is publically downloadable (and required for 19.4 update). Follow the instructions to update to 19.4.x from Oracle patch set 29834714.

In production environment, please apply following Oracle Patches (or later):

For DB Only: **Patch 29834717 - Database Release Update 19.4.0.0.190716**

For GI: **Oracle® Database Patch 29708769 - GI Release Update 19.4.0.0.190716**

Thanks for selecting **SUSE Linux Enterprise Server** as your Linux platform of choice!

### **Document Update/Correction:**

1. **Sept. 3<sup>rd</sup> 2019** – Added SLES 15 Certification info for Oracle Database 19.4
2. **April 20<sup>th</sup> 2020** – Added repository info for libcap1 & libcap1-32bit (SLE 15 Legacy Module)