

# Oracle Database 19c (19.8.0.0) on SUSE Linux Enterprise Server 15 SP2

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## 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 SP2. 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 SP2 here, you can use 60 Day's free trial:

<https://www.suse.com/products/server/download/>

## SUSE Linux Installation

Install SUSE Linux Enterprise Server 15 SP2 with “**Enhanced Base System, Software Management, X Window System, Oracle Server Base**” pattern. Please note that SLES15 SP2 comes with SLE-15-SP2-Online-x86\_64-GM-Media1.iso and SLE-15-SP2-Full-x86\_64-GM-Media1.iso. Use Online version if you are connected to internet & ready to register your server with SUSE Customer Center (scc.suse.com).

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@sles15sp2:~> uname -a
Linux sles15sp2 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba) x
86_64 x86_64 x86_64 GNU/Linux
oracle@sles15sp2:~> cat /etc/os-release
NAME="SLES"
VERSION="15-SP2"
VERSION_ID="15.2"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp2"
oracle@sles15sp2:~> env |grep ORA
ORA_NLS10=/opt/oracle/19c/nls/data
ORACLE_SID=orcl
ORACLE_BASE=/opt/oracle
ORACLE_HOME=/opt/oracle/19c
oracle@sles15sp2:~> █
```

## Installing Oracle Database 19c (19.3)

Installing Oracle Database 19c on SLES15 SP2 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-SP2/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

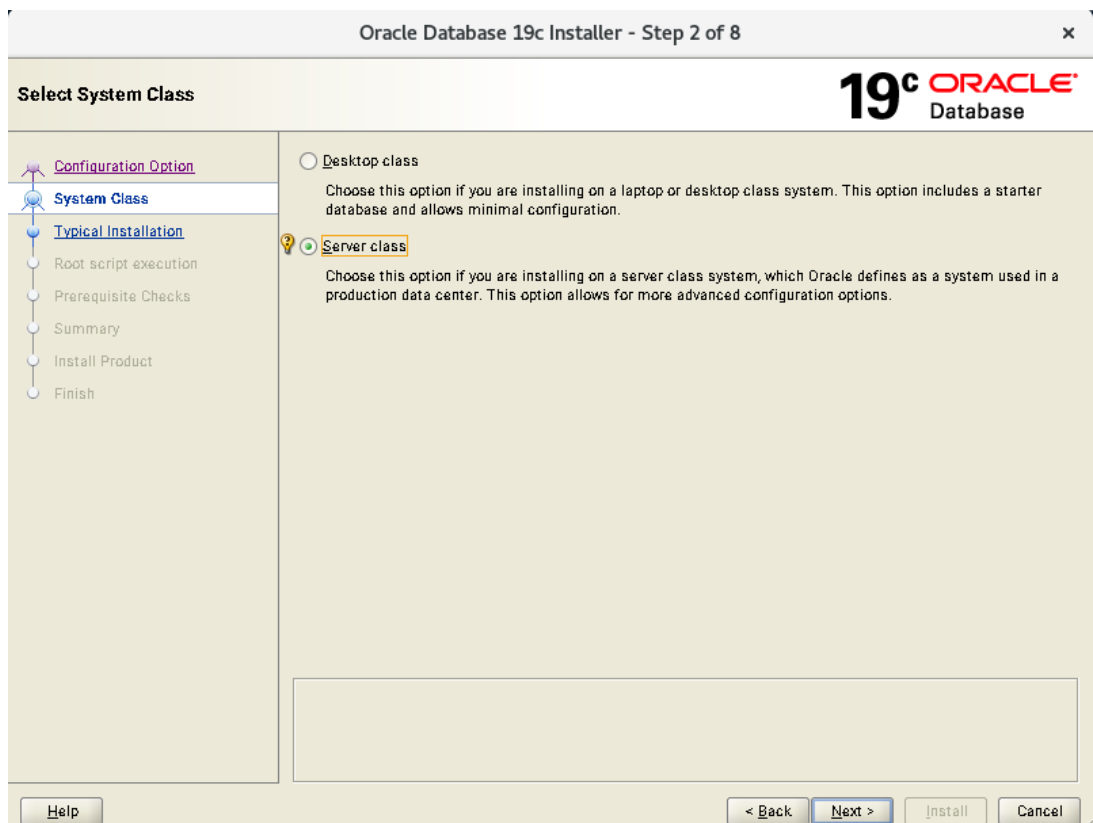
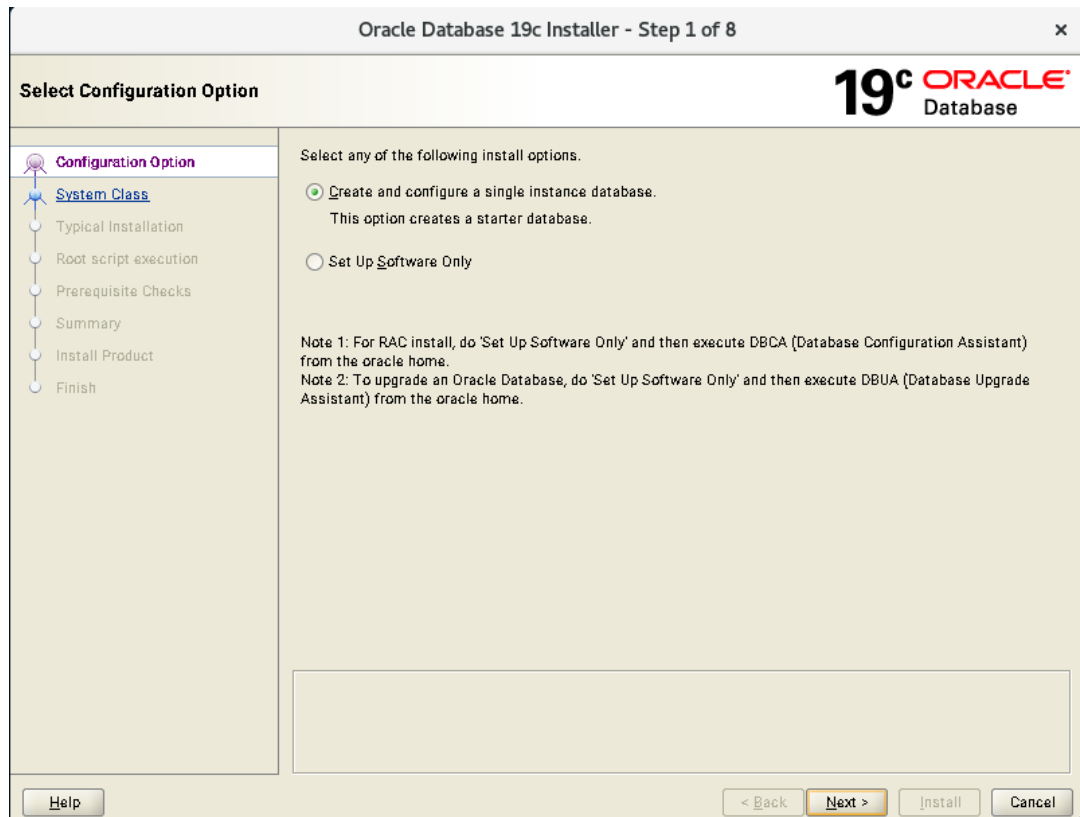
**Fix:** Increase kernel.shmmax & kernel.shmall based on your Server RAM in `/etc/sysconfig/oracle` & run “**systemctl restart oracle-setup**”.

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
- Operating System Groups
- Root script execution
- Prerequisite Checks
- Summary
- Install Product
- Finish

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

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
- Management Options
- Recovery Options
- Schema Passwords
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19<sup>c</sup> ORACLE<sup>®</sup>  
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 (orainventory).

orainventory\_group Name:

Oracle Database 19c Installer - Step 6 of 18

## Select Configuration Type

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

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.

**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

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

Oracle Database 19c Installer - Step 7 of 18

## Specify Database Identifiers

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

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:**

**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

**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**
- Database Storage
- Management Options
- Recovery Options
- Schema Passwords
- Operating System Groups
- Root script execution
- Prerequisite Checks
- Summary
- Install Product
- 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
Target database memory:	12842	MB

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
- Configuration Options
- Database Storage**
- Management Options**
- Recovery Options
- Schema Passwords
- Operating System Groups
- Root script execution
- Prerequisite Checks
- Summary
- Install Product
- Finish

File system
Oracle Automatic Storage Management

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

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

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

DMS Host:

DMS 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

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

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:

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:

### Oracle Database 19c Installer - Step 14 of 18

#### Root script execution configuration

- [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](#)

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](#)
- [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](#)

#### Verification Result

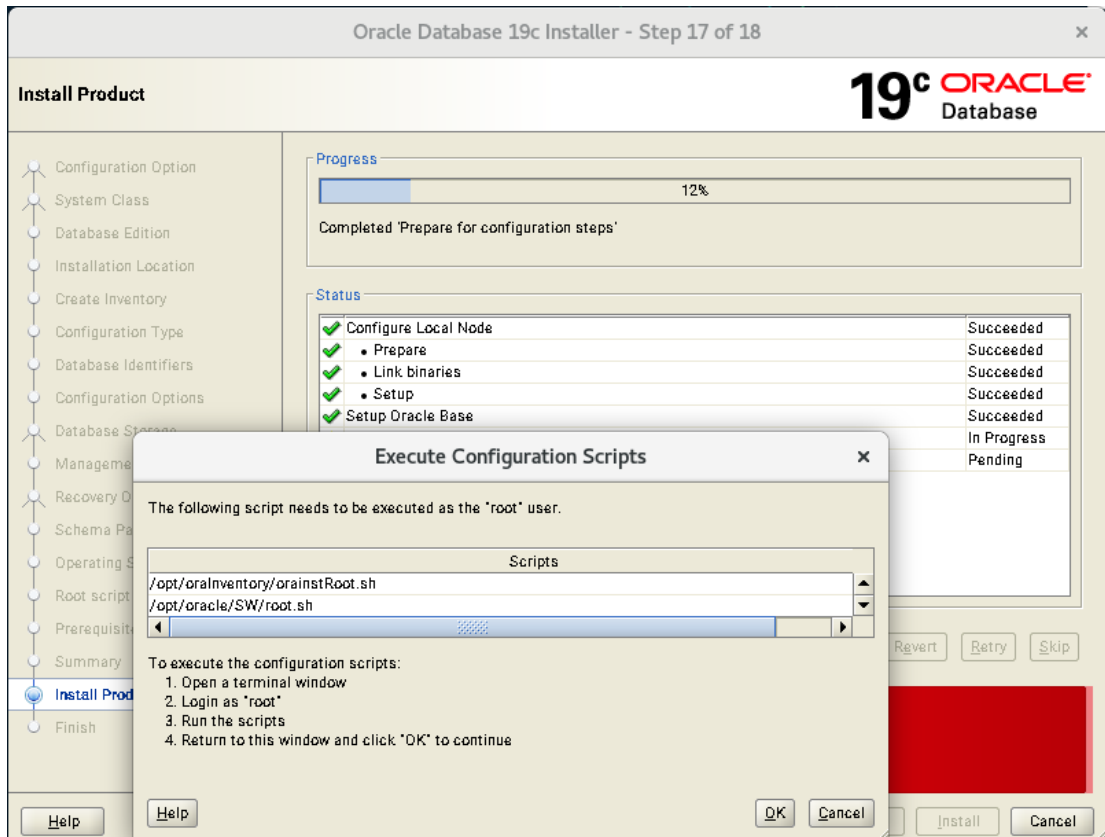
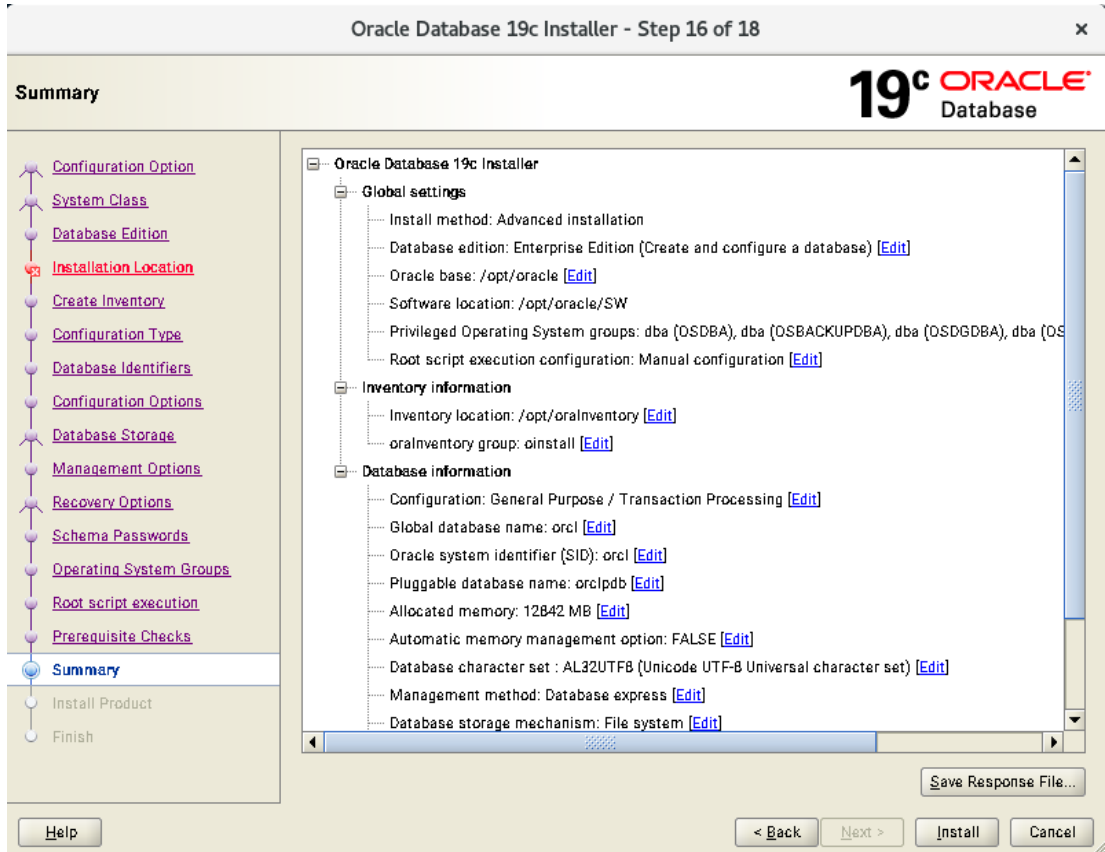
Some of the minimum requirements for installation are not completed. Review and fix the issues listed in the following table, and recheck the system.

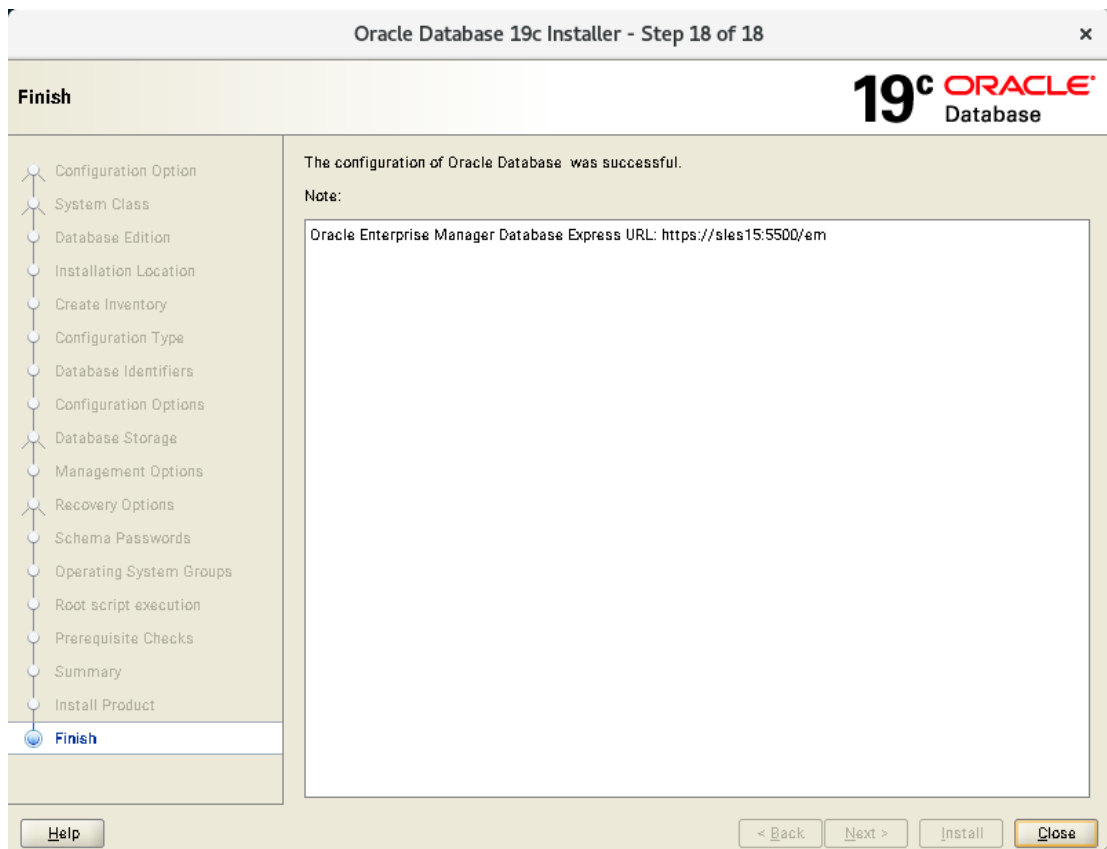
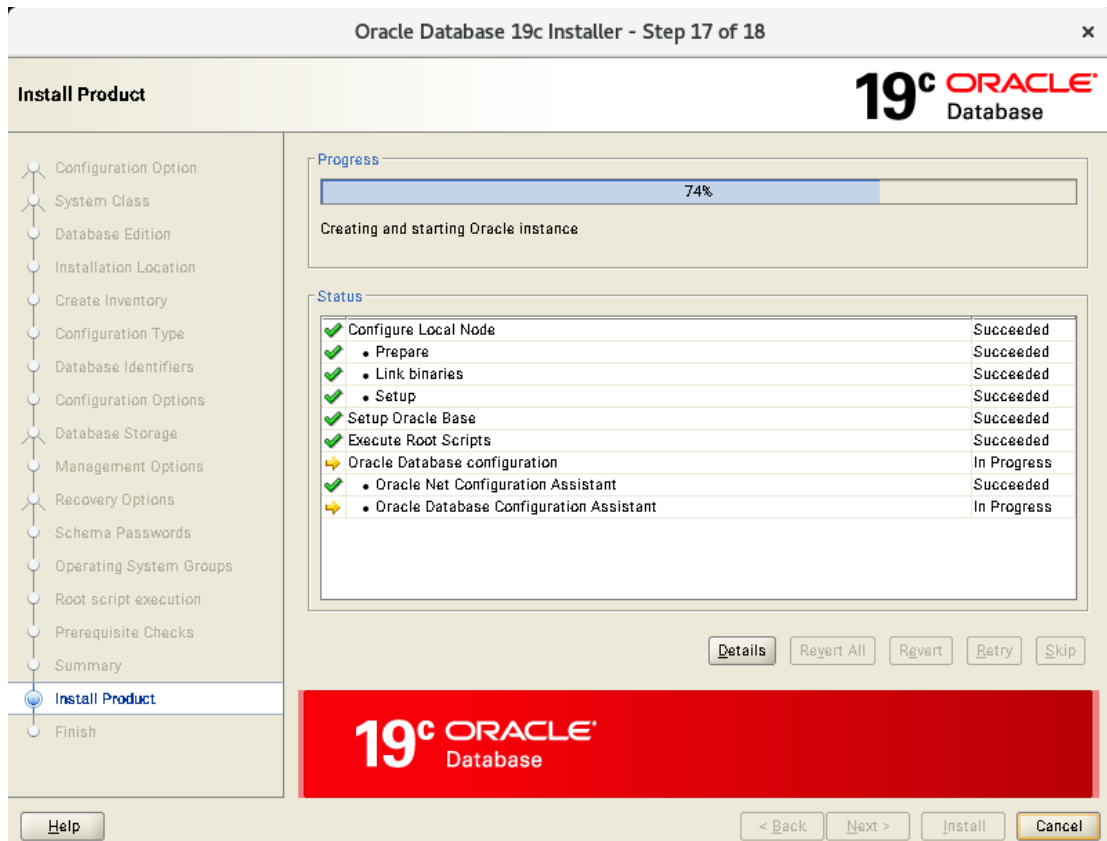
Ignore All

Checks	Status	Fixable
Checks		
[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







Verify successful Database Installation using sqlplus:

```
oracle@sles15sp2:~> sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Thu Jul 23 07:32:23 2020
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 2483027664 bytes
Fixed Size 9137872 bytes
Variable Size 536870912 bytes
Database Buffers 1929379840 bytes
Redo Buffers 7639040 bytes
SQL> exit
Disconnected from Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.3.0.0.0
oracle@sles15sp2:~> █
```

## SUSE SLES 15 SP2 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/oratab
2. Set START\_ORACLE\_DB & START\_ORACLE\_DB\_LISTENER to “yes” in /etc/sysconfig/oracle setup file.
3. Check status using **systemctl** commands:

```
sles15sp2:/opt/oracle # 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: d>
   Active: active (exited) since Thu 2020-07-23 04:45:45 PDT; 2h 50min ago
   Process: 1709 ExecStart=/usr/lib/orarun/oracle-setup (code=exited, status=0/SUCCESS)
   Main PID: 1709 (code=exited, status=0/SUCCESS)
   Tasks: 0
   CGroup: /system.slice/oracle-setup.service

Jul 23 04:45:45 sles15sp2 oracle-setup[1709]: Shared memory: SHMMAX=3294967296 SHMM>
Jul 23 04:45:45 sles15sp2 oracle-setup[1709]: Semaphore values: SEMMSL=1250 SEMMNS=320>
Jul 23 04:45:45 sles15sp2 oracle-setup[1709]: Other values: FILE_MAX_KERNEL=6815744>
Jul 23 04:45:45 sles15sp2 oracle-setup[1709]: RMEM_DEFAULT=262144 WMEM_DEFAULT=262144 >
Jul 23 04:45:45 sles15sp2 oracle-setup[1709]: Huge Pages: SHM_GROUP=dba NR_HUG>
Jul 23 04:45:45 sles15sp2 oracle-setup[1709]: ULIMIT values: MAX_CORE_FILE_SIZE_SHEL>
Jul 23 04:45:45 sles15sp2 oracle-setup[1709]: FILE_MAX_SHELL=65536 P>
Jul 23 04:45:45 sles15sp2 oracle-setup[1709]: Checking sysctl.conf to overwrite previous >
Jul 23 04:45:45 sles15sp2 oracle-setup[1709]: Kernel parameters set for Oracle:
Jul 23 04:45:45 sles15sp2 systemd[1]: Started Setup environment for the Oracle database.
sles15sp2:/opt/oracle #
```

```

sles15sp2:/opt/oracle # systemctl status oracle
● oracle.service - Start the Oracle database
   Loaded: loaded (/usr/lib/systemd/system/oracle.service; enabled; vendor preset: enable
   Active: active (running) since Thu 2020-07-23 04:46:55 PDT; 2h 51min ago
   Process: 1962 ExecStart=/usr/lib/orarun/oracle start (code=exited, status=0/SUCCESS)
   Tasks: 56
   CGroup: /system.slice/oracle.service
           └─2072 /opt/oracle/19c/bin/tnslsnr LISTENER -inherit
             └─2317 ora_pmon_orcl
               └─2319 ora_clmn_orcl
                 └─2321 ora_psp0_orcl
                   └─2323 ora_vktm_orcl
                     └─2327 ora_gen0_orcl
                       └─2329 ora_mman_orcl
                         └─2333 ora_gen1_orcl
                           └─2336 ora_diag_orcl
                             └─2338 ora_ofsd_orcl
                               └─2341 ora_dbrm_orcl
                                 └─2343 ora_vkrm_orcl
                                   └─2345 ora_svcb_orcl
                                     └─2347 ora_pman_orcl
                                       └─2349 ora_dia0_orcl
                                         └─2351 ora_dbw0_orcl
                                           └─2587 ora_w003_orcl
                                             └─2597 ora_w004_orcl
                                               └─2599 ora_cjq0_orcl
                                                 └─2605 ora_m001_orcl
                                                   └─2607 ora_m002_orcl
                                                     └─2696 ora_qm02_orcl
                                                       └─2716 ora_q00a_orcl
                                                         └─2740 ora_m003_orcl
                                                           └─5979 ora_m004_orcl
                                                             └─5983 ora_w005_orcl
                                                               └─5985 ora_w006_orcl
                                                                 └─5987 ora_w007_orcl

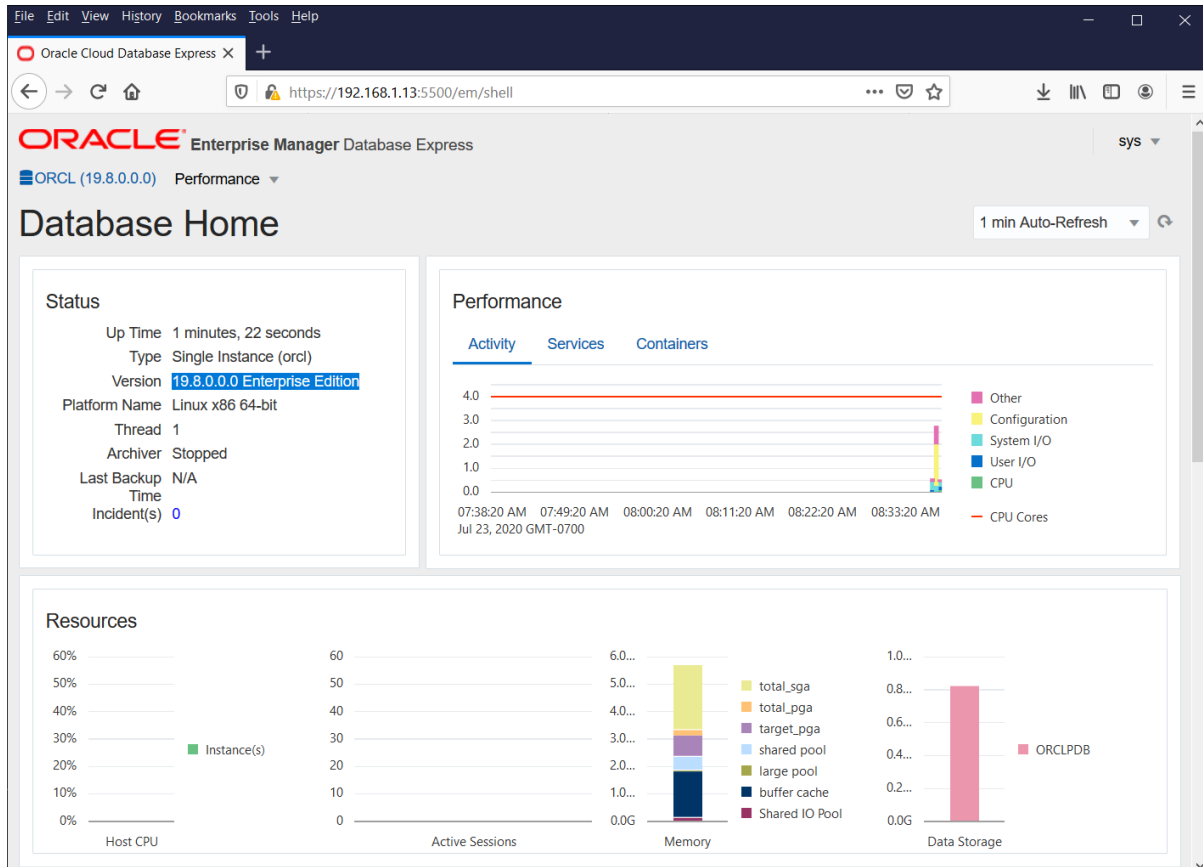
Jul 23 04:46:55 sles15sp2 oracle[1962]: - Starting Application Server.....unused
Jul 23 04:46:55 sles15sp2 oracle[1962]: - Starting Application Server Console.....unused
Jul 23 04:46:55 sles15sp2 oracle[1962]: - Starting Agent.....unused
Jul 23 04:46:55 sles15sp2 oracle[1962]: - Starting Enterprise Manager.....unused
Jul 23 04:46:55 sles15sp2 oracle[1962]: - Starting iSQLPLUS Manager.....unused
Jul 23 04:46:55 sles15sp2 oracle[1962]: - Starting Oracle Internet Filesystem.....unused
Jul 23 04:46:55 sles15sp2 oracle[1962]: - Starting Oracle Internet Directory.....unused
Jul 23 04:46:55 sles15sp2 oracle[1962]: #####>
Jul 23 04:46:55 sles15sp2 oracle[1962]: #                               End of  O R A C L E   sec>
Jul 23 04:46:55 sles15sp2 systemd[1]: Started Start the Oracle database.
sles15sp2:/opt/oracle # █

```



## Update Oracle Database to latest version 19.8

SLES 15 SP2 is certified with Oracle Database 19.4.x (or above). Above instructions covers 19.3 (available for public download). Download and install latest update i.e. Oracle DB Release Update 19.8.0.0 (July, 2020) - p31281355\_190000\_Linux-x86-64.zip.



In production environment, please apply latest SUSE and Oracle Patches.

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