Oracle Database 19c on SUSE Linux Enterprise Server 15 SP6

Arun Singh June 30th, 2024

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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 SP6. 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 SP6 here, you can use 60 Day's free trial: <u>https://www.suse.com/products/server/download/</u>

SUSE Linux Installation

Install SUSE Linux Enterprise Server 15 SP6 with "**Enhanced Base System, Software Management, X Window System, Oracle Server Base**" pattern. Please note that SLES15 SP6 comes with SLE-15-SP6-Online-x86_64-GM-Media1.iso and SLE-15-SP6-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 the 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@c1c1:~> uname -a
Linux clc1 6.4.0-150600.23.17-default #1 SMP PREEMPT_DYNAMIC Tue Jul 30 06:37:32 UTC 2024 (9
c450d7) x86_64 x86_64 x86_64 GNU/Linux
oracle@c1c1:~> env |grep ora
LD_LIBRARY_PATH=/home/oracle/19c/lib:/home/oracle/19c/ctx/lib
ORA_NLS10=/home/oracle/19c/nls/data
ORACLE_BASE=/home/oracle
ORACLE_HOME=/home/oracle/19c
USERNAME=oracle
CLASSPATH=/home/oracle/19c/JRE:/home/oracle/19c/jlib:/home/oracle/19c/rdbms/jlib:/home/oracl
e/19c/network/jlib
USER=oracle
PWD=/home/oracle
HOME=/home/oracle
SDK_HOME=/usr/lib/jvm/jdk-1.8-oracle-x64
XDG_DATA_DIRS=/home/oracle/.local/share/flatpak/exports/share:/var/lib/flatpak/exports/share
:/usr/local/share:/usr/share
JDK_HOME=/usr/lib/jvm/jdk-1.8-oracle-x64
MAIL=/var/spool/mail/oracle
TNS_ADMIN=/home/oracle/19c/network/admin
LOGNAME=oracle
JRE_HOME=/usr/lib/jvm/jdk-1.8-oracle-x64
PATH=/usr/local/bin:/usr/bin:/bin:/home/oracle/19c/bin
AGENT_HOME=/home/oracle/product/10.2/agent
oracle@c1c1:~>
```

Installing Oracle Database 19c (19.3)

Installing Oracle Database19c on SLES15 SP6 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".
 - 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 <u>https://documentation.suse.com/sles/15-SP2/html/SLES-all/cha-register-sle.html</u> 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".

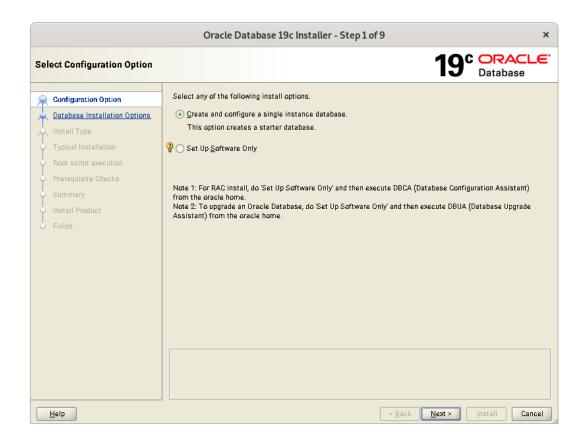
Please refer Oracle Metalink Note [ID 567506.1] - Maximum SHMMAX values for Linux x86 and x86-64

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**

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	Oracle Database 19c Installer - Step 2 of 8
Select System Class	19° ORACLE Database
Configuration Option	○ <u>D</u> esktop class
System 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.
Typical Installation	
Root script execution	Choose this option if you are installing on a server class system, which Oracle defines as a system used in a
Prerequisite Checks	production data center. This option allows for more advanced configuration options.
Summary	
Install Product	
J Finish	

		Orac	le Database 19c Installer - Step 4 of 18	×
Spe	cify Installation Location			ACLE.
Ť	Configuration Option System Class		to place all Oracle software and configuration-related files installed by this installat is the Oracle base directory for the installation owner.	ion owner.
Ļ	Database Edition	<u>O</u> racle base:	/opt/oracle	B <u>r</u> owse
•	Installation Location			
-	Create Inventory	This software	directory is the Oracle Database home directory.	
4	Configuration Type	Software loca	tion: /opt/oracle/19c	
4	Database Identifiers			
4	Configuration Options			
*	Database Storage			
4	Management Options			
· 🖗	Recovery Options			
	Schema Passwords			
Ý	Operating System Groups			
Ý	Root script execution			
Ý	Prerequisite Checks			
Ý	Summary			
Ý	Install Product			
0	Finish			
	Help		< <u>B</u> ack <u>Next</u> > <u>I</u> nstall	Cancel

	Oracle Database 19c Installer - Step 5 of 18 ×
Create Inventory	19° DRACLE Database
Configuration Option System Class Database Edition Installation Location 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: /opt/oralnventory Browse
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	Specify an operating system group whose members have write permission to the inventory directory (oralnventory). oralnventory Group Name: oinstall V
U Finish	< Back Next > Install Cancel

	Oracle Database 19c Installer - Step 6 of 18
Select Configuration Type	19° Database
Configuration Option System Class Database Edition Installation Location Create Inventory	Select the type of database that you want to create.
Configuration Type	
 <u>Database Identifiers</u> 	
Configuration Options	
Database Storage	
Management Options	
Recovery Options	
 Schema Passwords 	
Operating System Groups	
Root script execution	
Prerequisite Checks	
Summary	
Install Product	
5 Finish	
Help	< Back Next > Install Cancel

	Oracle Database	19c Installer - Step 7 of 18	×
Specify Database Identifiers			19° DRACLE
Configuration Option System Class Database Edition	identified by a Global database	n required to access the database uniqu name, typically of the form "name.domain iquely identified from any other instance orcl	n . A database is referenced by at least
🙀 Installation Location	<u>O</u> racle system identifier (SID):		
<u>Create Inventory</u> Operation Trans		orci	
<u>Configuration Type</u> Database Identifiers	Create as Container databas	e	
	Creates a database contair database virtualization.	er for consolidating multiple databases i	into a single database and enables
Configuration Options Database Storage Management Options Recovery Options Schema Passwords Operating System Groups Root script execution Prerequisite Checks Summary Install Product Finish	Pl <u>ugg</u> able database name:	orcipdb	
Help		< <u>B</u> ack	: <u>N</u> ext > Install Cancel

Oracle Database 19c Installer - Step 8 of 18							
Specify Configuration Options	19° DRAC Database	LE.					
Configuration Option System Class Database Edition Installation Location Create Inventory Configuration Type Database Identifiers Configuration Options Database Storage Management Options Recovery Options Schema Passwords	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 over database memory target size. If automatic memory management is not enabled, then the SGA and PGA must be sized manually.	all ID %					
Root script execution Prerequisite Checks Summary Install Product Finish							
Management Options Recovery Options Schema Passwords Operating System Groups Root script execution Prerequisite Checks Summary Install Product	PGA aggregate target: 32D6 MB Target database memory: 12821 MB	ancel					

Oracle Database 19c Installer - Step 9 of 18							
Specify Database Storage Opt	ons 19° ORACLE	Ξ.					
Configuration Option System Class Database Edition Installation Location Create Inventory Configuration Type Database Identifiers Configuration Options Database Storage Management Options Schema Passwords Operating System Groups Root script execution Prerequisite Checks Summary Install Product Finish	File system Use a file system for database storage. For optimal database organization and performance, Oracle recommend that you install data files and the Oracle database software on different disks. Specify database file location: /opt/oracle/oradata 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	< <u>Back</u> Install Cance						

	Oracle Database 19c Insta	aller - Step 10 of 18	×
Specify Management Options		19 °	Database
Configuration Option		le Database Express by default.You can use Oracl Database 19c centrally. Specify the details of the	
Database Edition	📃 Register with Enterprise Manager (EM)) Cloud Control	
Installation Location	0 <u>M</u> S Host:]
Create Inventory	OM <u>S</u> Port:]
Configuration Type	EM Admin User Name:]
 <u>Database Identifiers</u> 	EM Admin Password:]
Configuration Options	EM Admin Pass <u>w</u> ord.		
Database Storage			
Management Options			
<u>Recovery Options</u> Schema Passwords			
Operating System Groups			
Root script execution			
Prerequisite Checks			
↓ Summary			
unstall Product			
J Finish			
Help		< <u>B</u> ack <u>N</u> ext >	Install Cancel

	Oracle Database 19c Installer - Step 11 of 18 ×
Specify Recovery Options	19° Database
Configuration Option System Class Database Edition Installation Location Create Inventory Configuration Type Database Identifiers Configuration Options Database Storage	Enable or disable recovery for your database. If you choose to enable recovery, then the location specified will be used as recovery area storage.
Management Options Recovery Options	
Schema Passwords Operating System Groups Root script execution Prerequisite Checks Summary Install Product Finish	
Help	< Back Next > Install Cancel

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	Oracle I	Database 19c Installer - Ste	p 12 of 18		×
Specify Schema Passwords				19^c 	RACLE [.] tabase
Configuration Option System Class Database Edition Installation Location Create Inventory Configuration Type Database Identifiers Configuration Options Database Storage Management Options Recovery Options	the end of installa you want to use. S passwords for the Use different p Pr SYS SYS SYSTEM POBADMIN	ase contains pre-loaded schemas, m tition. After installation is complete, j Schemas used for database manager ise accounts will not expire. Specify wasswords for these accounts assword	ou must unlock and s ment and postinstalla	et new passwords for tion functions are left ise accounts.	those accounts
Schema Passwords Operating System Groups Root script execution Prerequisite Checks Summary Install Product Finish	Password: [Confirm password:		
Help			< <u>B</u> ack	<u>N</u> ext > Insta	II Cancel

Oracle Database 19c Installer - Step 13 of 18 ×							
Privileged Operating System g	roups	19° ORACLE Database					
Configuration Option System Class Database Edition Installation Location Create Inventory Configuration Type Database Identifiers Configuration Options Database Storage Management Options Recovery Options Scheme Passwords Operating System Groups Root Script execution Prerequisite Checks Summary Install Product Finish	SYS privileges are required to create a database using operating Groups grants the corresponding SYS privilege, eg. membership Database Administrator (DSDBA) group: Database Operator (DSOPER) group (Optional): Database Backup and Recovery (DSBACKUPDBA) group: Data Guard administrative (DSDGDBA) group: Encryption Key Management administrative (OSKMDBA) group: Real Application Cluster administrative (DSRACDBA) group:						
Help	(< <u>B</u> ack <u>Next</u> > <u>Install</u> Cancel					

	Oracle Database 19c Installer -	- Step 14 of 18	×	
Root script execution configuration 19° DRACLE				
Configuration Option System Class		tions have to be performed as "root" user. You can che omatically by specifying inputs for one of the options b to perform additional prerequisite checks.		
 Database Edition 	Automatically run configuration scripts			
Band Installation Location	 Use 'root' user <u>c</u>redential 			
Create Inventory	Password :			
Configuration Type	O Use sudo			
<u>Database Identifiers</u>				
Configuration Options	Program path : /usr/bin/sudo		Browse	
here and the terminal termina	User name : oracle			
Management Options	Password :			
Recovery Options				
😋 <u>Schema Passwords</u>				
Operating System Groups				
Root script execution				
 Prerequisite Checks 				
Summary				
Install Product				
O Finish				
Help		< Back Next > Install	Cancel	

	Oracle Database 19c Installer - Step 15 of 18	×
Perform Prerequisite Checks	19° DRACLE	Ξ.
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 Chacks Summary Install Product Finish	Yerification 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 Ex & Check Again Show Failed Ignore A Checks Status Fixable Ignore A Some of the prarameter: shmall Warning Yes Yes So S Kernel Parameter: shmall Warning Yes Yes Some of the prerequisites have failed on the following nodes. Installer has generated a fixup scrin needs to be run as a privileged user (root) on the listed nodes. Script: /tmp/InstallActions2021-06-10_05-48-54AM/CVU_19.0.0.0.0_oracle/runfixup.sh Nodes: siles15-sp3 Secript: 1. Open a terminal window Actual Value Actual Value Actual Value 8. Run the script 4. Return to this window and click "DK" to continue Actual Value 8. Run to this window and click "DK" to continue	pt tha
	<u>D</u> K	Can

	Oracle Database 19c Installer - Step 15 of 18		×
Perform Prerequisite Checks		19°	ORACLE [®] Database
Configuration Option System Class Database Edition Installation Location	Verification Result Fixup Result Some of the minimum requirements for installation are not completed. Review following table, and recheck the system. Exact Again Check Again Eix & Check Again Show Failed	and fix the iss	sues listed in the
Create Inventory	Checks	Status	Fixable
<u>Configuration Type</u>			
Database Identifiers	Package: libstdc++33-3.3.3-62.1	Ignored	No
 <u>Configuration Options</u> 	Package: bc-1.06.95 Package: libXext-devel-1.3.3	lgnored Ignored	No No
Latabase Storage	Package: libXi-devel-1.7.9	Ignored	No
Management Options	Package: libXi6-32bit-1.7.9	Ignored	No
Recovery Options	Package: libXrender-devel-0.9.10 Package: libXrender1-32bit-0.9.10	lgnored Ignored	No
Chema Passwords	Package: libjpeg-turbo-1.3.1	Ignored	No
	Package: libjpeg62-32bit-62.1.0	Ignored	No
 Operating System Groups 	Package: libjpeg62-turbo-1.3.1	Ignored	No
Root script execution	Package: libpcre16-0-8.41	Ignored	No
Prerequisite Checks	·····Package: pixz-1.0.2	Ignored	No
U Summary	Package: rdma-core-devel-16.4	Ignored	No
Install Product	This is a prerequisite condition to test whether the package "libstdc++33-3.3-6 system. <u>(more details)</u> Expected Value : libstdc++33-3.3.3-62.1 Actual Value : missing	52.1° is availab	le on the
Help	< Back	ext >	nstall Cancel

• Verify these packages are installed, then select "Ignore All"

	Oracle Database 19c Installer - Step 16 of 18
Summary	19° DRACLE Database
Configuration Option System Class Database Edition Installation Location Create Inventory Configuration Type Database Identifiers Configuration Options Database Storage Management Options Recovery Options Recovery Options Recovery Options Continue System Groups Root script execution Prerequisite Checks Summary Install Product Finish	Oracle Database 19: Installer Global settings Install method: Advanced installation Database edition: Enterprise Edition (Create and configure a database) [Edit] Oracle base: /opt/oracle [Edit] Software location: /opt/oracle/19c Privileged Operating System groups: dba (OSDBA), dba (OSDGDBA), dba (OSDGDBA), dba (OS Root script execution configuration: Manual configuration [Edit] Inventory information Inventory location: /opt/oralnventory [Edit] oralle base information Configuration: General Purpose / Transaction Processing [Edit] Global database name: orcl [Edit] Oracle system identifier (SID): orcl [Edit] Allocated memory: 12821 MB [Edit] Automatic memory management option: FALSE [Edit] Database character set : AL32UTFB (Unicode UTF-8 Universal character set) [Edit] Database storage mechanism: File system [Edit]
Help	Save Response File

_

	Oracle Database 19c Installer - Step 17 of 18	×
Install Product		BACLE
Configuration Option System Class Database Edition Installation Location Create Inventory	Progress B0% Completing Database Creation Status	
Configuration Type Database Identifiers Configuration Options	Execute Configuration Scripts	cceeded eeded eeded eeded
Database Storage Management Options	The following script needs to be executed as the "root" user.	eeded eeded ogress eeded
Recovery Options	/opt/oralnventory/orainstRoot.sh /opt/oracle/19c/root.sh	ogress
Root script execution Prerequisite Checks Summary	To execute the configuration scripts:	/ <u>S</u> kip
Install Product	Open a terminal window Login as 'root' Return to this window and click 'OK' to continue	
Help	Help QK Cancel	Cancel

	Oracle Database 19c Installer - Step 18 of 18	×
Finish	19°	DRACLE.
Configuration Option	The configuration of Oracle Database was successful. Note:	
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	Dracle Enterprise Manager Database Express URL: https://sles15-sp3:SS00/em	
Summary Install Product		
Help	<back next=""> Inst</back>	all <u>Close</u>

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SUSE SLES 15 SP6 setup (After successful Oracle DB Install)

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

- 1. Edit "orcl:/opt/oracle/19c: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:

```
oracle@clcl:~> 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 2024-08-08 16:15:50 MDT; 3 days ago
    Process: 1914 ExecStart=/usr/lib/orarun/oracle-setup (code=exited, status=0/SUCCESS)
   Main PID: 1914 (code=exited, status=0/SUCCESS)
        CPU: 303ms
oracle@c1c1:~> systemctl status oracle
• oracle.service - Oracle Database
     Loaded: loaded (/usr/lib/system/system/oracle.service; enabled; preset: enabled)
     Active: active (running) since Thu 2024-08-08 16:16:42 MDT; 3 days ago
    Process: 2127 ExecStart=/usr/lib/orarun/oracle start (code=exited, status=0/SUCCESS)
      Tasks: 99 (limit: 65535)
        CPU: 2h 42min 13.329s
     CGroup: /system.slice/oracle.service
               - 3054 ora_pmon_orcl

3058 ora_clmn_orcl
3062 ora_psp0_orcl

               - 3066 ora_vktm_orcl
               — 3072 ora_gen0_orcl
— 3076 ora_mman_orcl

    3082 ora_gen1_orcl

               - 3085 ora_diag_orcl
               -25421 ora_w015_orcl
               -25565 ora_w005_orcl
               -25569 ora_w01j_orcl
               -25575 ora_w018_orcl
               -25577 ora_w01h_orcl
               -25579 ora_w00n_orcl
               -25717 ora_w00x_orcl
               -25719 ora_w00f_orcl
               -25721 ora_w00g_orcl
               -25723 ora_w00r_orcl
```

oracle@c1c1:~>

-25725 ora_w0ll_orcl -25727 ora_w0lr_orcl -25729 ora_w00e_orcl -25731 ora_w003_orcl -25733 ora_w0l2_orcl -29048 ora_w0l3_orcl -29050 ora_w007_orcl -29050 ora_w007_orcl -29056 ora_w002_orcl -29058 ora_w0la_orcl -29064 ora_w008_orcl

Update Oracle Database to latest version

SLES 15 SP6 is certified with Oracle Database 19.4.x (or above). Above instructions covers 19.3 (available for public download). Download and install latest Oracle update i.e. Oracle DB Release Update 19.22.0.0 (April, 2024) - p35943157_190000_Linux-x86-64.zip.

```
oracle@clc1:~> sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Mon Aug 12 12:02:14 2024

Version 19.22.0.0.0

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Connected to:

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production

Version 19.22.0.0.0

SQL> show sga

Total System Global Area 2.0133E+10 bytes

Fixed Size 23393032 bytes

Variable Size 2617245696 bytes

Database Buffers 1.7448E+10 bytes

Redo Buffers 43712512 bytes

SQL> exit

Disconnected from Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production

Version 19.22.0.0.0

oracle@clc1:~>
```

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

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