Juniper

Software Version: 1.0

March 17, 2019

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# Introduction

## Purpose

The purpose of this is to describe in technical terms the steps necessary to install the software and make it operational.

## Juniper Module

This module of Juniper consists of all relevant microservices responsible for migrating a File from a Linux premises to Google Cloud Storage.

## Revision history

The Revision history table shows the date, changes, and authors who have worked on this document.

| Version/Change request number | Version date | Description of changes | Author |
| --- | --- | --- | --- |
| 1.0 | 16/03/2019 | First Draft | To be filled… |

## Intended audience and reading suggestions

This is intended to be used by technical stakeholders of the project who will be responsible for planning, performing, or maintaining the installation or deployment, such as the Systems Administrator, Chief Information Officer (CIO), Analysts, or Developers.

It is intended that stakeholders and software support personnel can read this document and coordinate their efforts in the installation/deployment of the application.

## Technical project stakeholders

This section provides a list of all known stakeholders with an interest in the project.

| Name | E-mail address | Phone | Role |
| --- | --- | --- | --- |
|  |  |  | Owner |
|  |  |  | Lead Developer |
|  |  |  | Systems Administrator |

To be filled..

## Objectives

Juniper is an Open source tool which establishes Industry standards for Enterprise grade secure and scaling to Cloud platform enabling community based enrichment of data services using Micro-services based architecture at low cost.

## Public GIT Details

To be filled

## References

Refer the below links for installations of the following software/tools

| Reference No. | Document | Tools(s) |
| --- | --- | --- |
| REF-1 | <https://nifi.apache.org/> | Apache Nifi |
| REF-2 | <https://kafka.apache.org/downloads> | Kafka |
| REF-3 | <https://www.linode.com/docs/development/java/how-to-deploy-spring-boot-applications-nginx-ubuntu-16-04/> | Java |
| REF-4 | <https://www.linode.com/docs/development/java/how-to-deploy-spring-boot-applications-nginx-ubuntu-16-04/> | Spring Boot |
| REF-5 | <https://tecadmin.net/install-python-2-7-on-centos-rhel/> | Python |
| REF-6 | <https://www.tecmint.com/install-oracle-database-12c-on-centos-7/> | Oracle |
| REF-7 | <https://www.linode.com/docs/development/java/how-to-deploy-spring-boot-applications-nginx-ubuntu-16-04/> | Maven |

# Server Configurations

## Server 1 (Micro Services – Frontend and Backend)

Installation of this product is supported on the following operation systems and versions:

* RHEL 7

### Roles, Features, and Packages

**Packages**

The following software packages must be installed on the operating system prior to installation of the software:

* Unzip
* wget

### Configuration

Server Configuration:

Virtual Cores – 4

RAM – 15 GB

Authentication

SSH

SFTP

Server Network Configuration

TCP/IP should be allowed

Firewall Allow ports – TCP:5771, 5772, 5774, 5776, 8189.

### Software Installations

#### Prerequisites

JDK1.7 or later

Java 7.0 or later

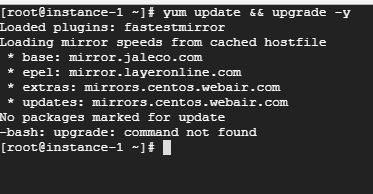
JSP/JavaScript/jQuery 3.3.1

Spring Tool Suite 3.9.5

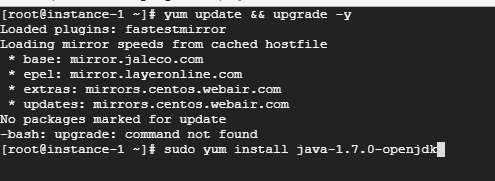
Maven 3.0

#### Installation Steps

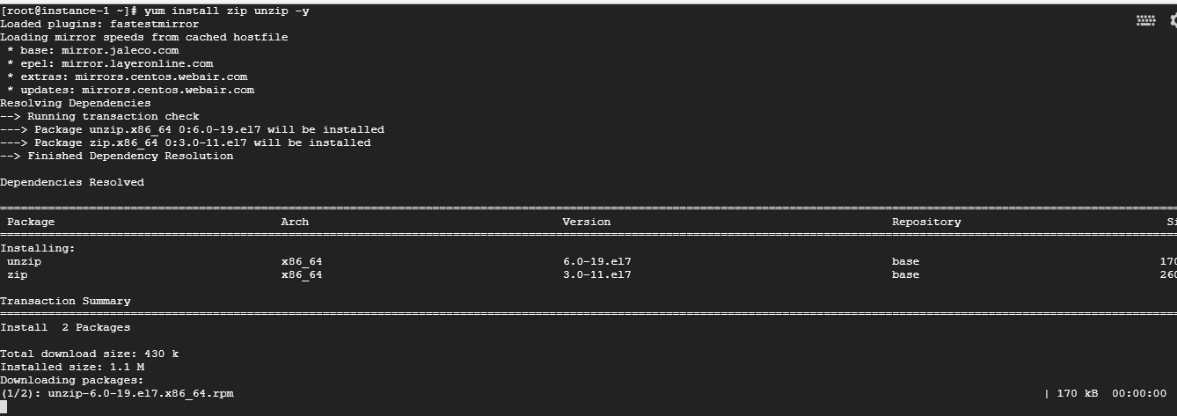
1. Switch to Root User -- sudo -i
2. Update and Upgrade if any patches available -- yum update && upgrade -y



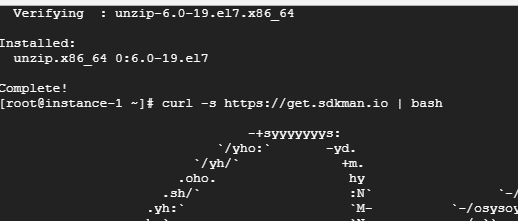
1. Install open jdk version 1.7 -- yum install java-1.7.0-openjdk -y



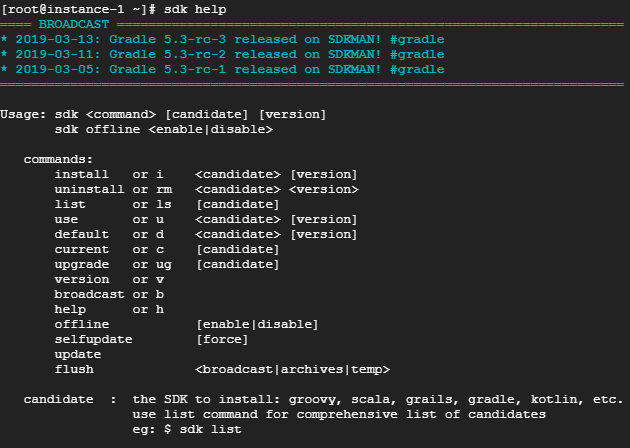
1. Install zip unzip for compression and extraction -- yum install zip unzip



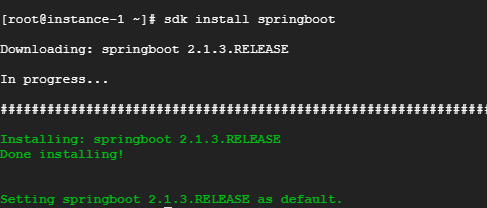
1. Install sdkman -- curl -s https://get.sdkman.io | bash



1. Verify SDKMAN is installed – sdk help



1. Install Spring Boot -- sdk install springboot



1. Verify Installation – spring version
2. Install maven -- sdk install maven
3. Dump the project source codes into a directory.
4. Create an initialization script -- /etc/systemd/system/juniper.service

[Unit]

Description=Spring Boot HelloWorld

After=syslog.target

After=network.target[Service]

User=username

Type=simple

[Service]

ExecStart=/usr/bin/java -jar /[path to the project directory]

Restart=always

StandardOutput=syslog

StandardError=syslog

SyslogIdentifier=helloworld

[Install]

WantedBy=multi-user.target

1. Start the service -- systemctl start helloworld

## Server 2 (Scheduler Host)

Installation of this product is supported on the following operation systems and versions:

* CentOS 7

### Roles, Features, and Packages

**Packages**

The following software packages must be installed on the operating system prior to installation of the software:

* Unzip

### Configuration

SQL Server Configuration:

Virtual Cores – 1

RAM – 3.75 GB

Authentication

SSH/FTP

Server Network Configuration

TCP/IP should be enabled

Firewall

To be filled

### Software Installations

#### Prerequisites

To be filled

#### Installation Steps

To be filled

## Server 3 (Middleware)

Installation of this product is supported on the following operation systems and versions:

* CentOS 7

### Roles, Features, and Packages

**Packages**

The following software packages must be installed on the operating system prior to installation of the software:

* unzip

### Configuration

SQL Server Configuration:

Virtual Cores – 2

RAM – 7.5 GB

Authentication

SSH/FTP

Server Network Configuration

TCP/IP should be enabled

Firewall allow port – TCP: 9092 and 8080

### Software Installations

#### Prerequisites

• Install JDK 8.0 64 bit.

• Install Java to C:/java instead of C:/Program Files.

• Recent Windows versions mark everything in C:\Program Files as read only.

• Set the JAVA\_HOME environment variable using the 8.3 style name conventions.

For example: C:\Program\jdk1.8.0.

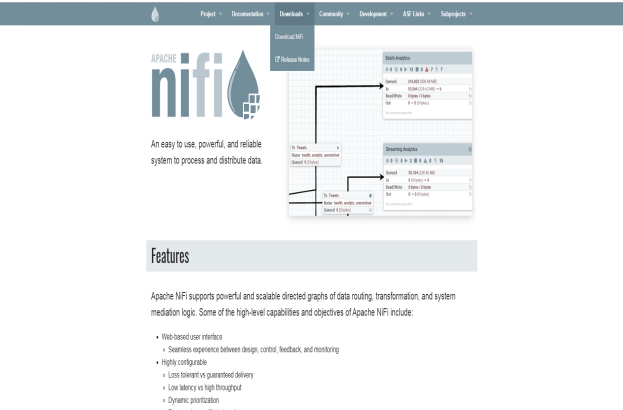
• Ensure JAVA\_HOME is pointing to a 64-bit JRE/JDK.

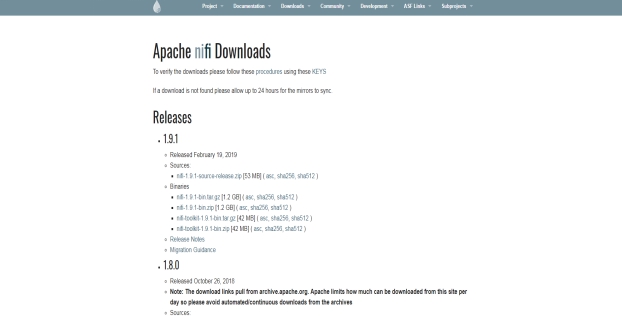
• Ensure your system meets the minimum memory requirement for Windows which is 4GB.Linux default packages

#### Installation Steps

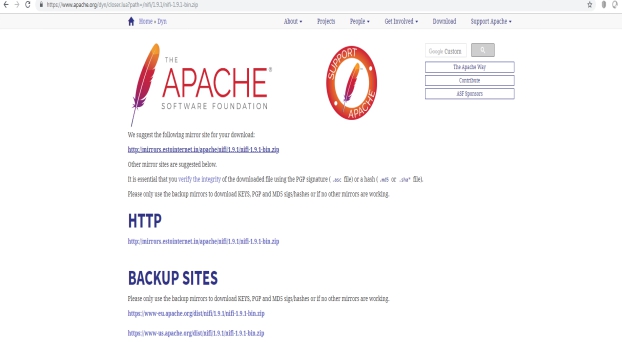
Steps:

1)Go to <https://nifi.apache.org/>

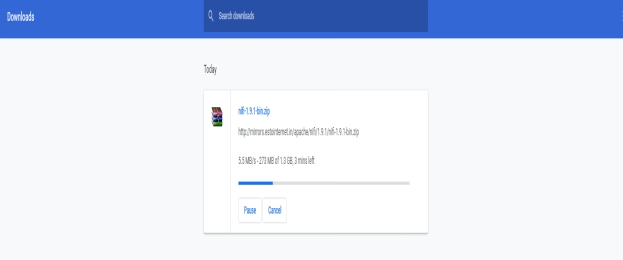
2)



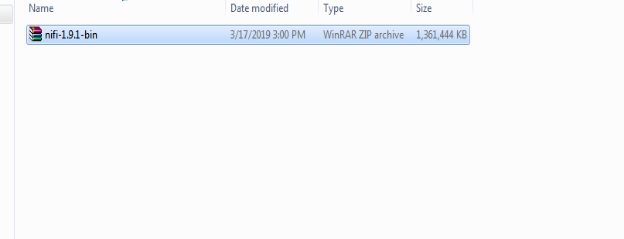
3)



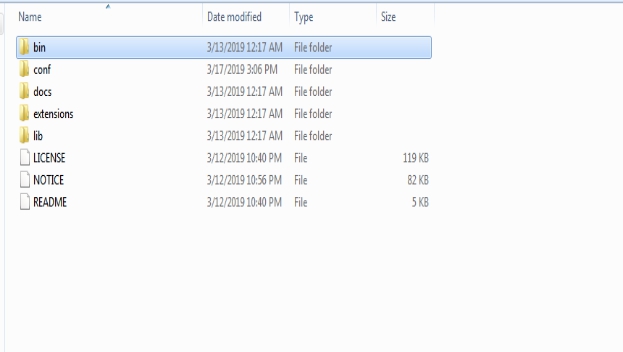
4)



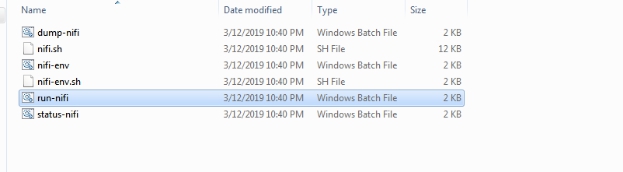
5)



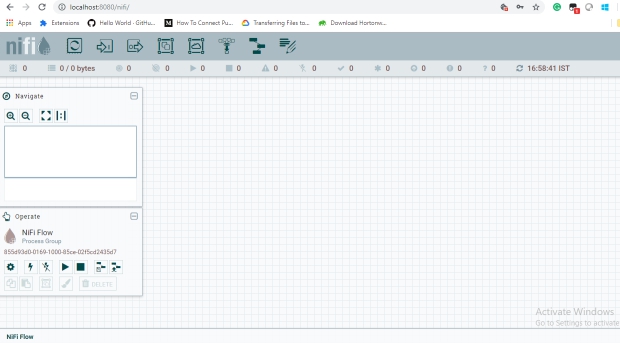
6)



7)

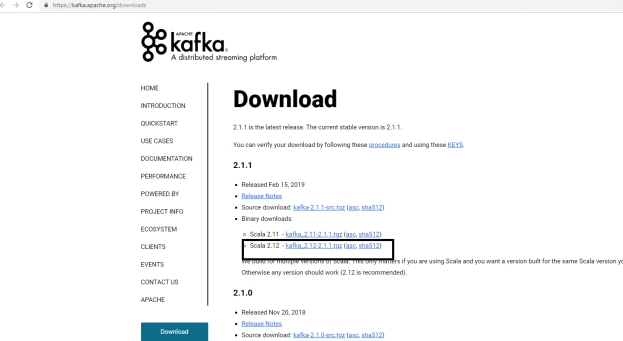


8)



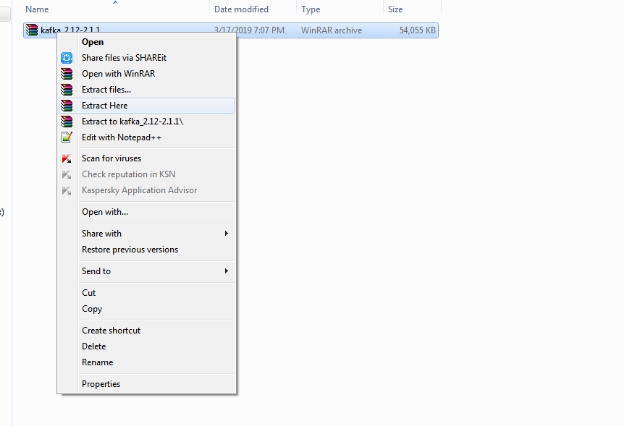
**Installation of Kafka**

1)Go to <https://kafka.apache.org/downloads>



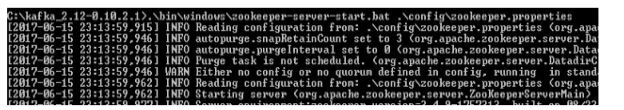
2) Click on the hyperlink to download

3) Download and keep the zip file in the C drive and extract the contents.

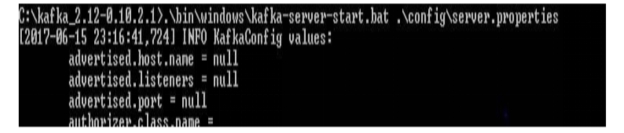


4) We will now start Apache Kafka-

* This Kafka installation comes with an inbuilt zookeeper. Zookeeper is mainly used to track status of nodes present in Kafka cluster and also to keep track of Kafka topics, messages, etc.  
  Open a command prompt and **start the Zookeeper-**
* C:\kafka\_2.12-0.10.2.1>.\bin\windows\zookeeper-server-start.bat .\config\zookeeper.properties



5) Open a new command prompt and **start the Apache Kafka-**



## Server 4 (Database)

Installation of this product is supported on the following operation systems and versions:

* CentOS 7

### Roles, Features, and Packages

**Packages**

The following software packages must be installed on the operating system prior to installation of the software:

* Wget
* Zip unzip

### Configuration

SQL Server Configuration:

Virtual Cores – 2

RAM – 7.5 GB

Authentication

SSH/FTP

Server Network Configuration

TCP/IP should be enabled

Firewall allow port – TCP: 1521

### Software Installations

#### Prerequisites

Update and upgrade Linux default packages

#### Installation Steps

**Step1 – Configure a suitable swap space:**

* Check if your machine already has a swap space configured

[root@centos7 ~]# swapon --show

* If no output seen, configure a suitable swap space:

[root@centos7 ~]# dd if=/dev/zero of=/swapfile bs=1K count=1M

[root@centos7 ~]# chmod 600 /swapfile

[root@centos7 ~]# mkswap /swapfile

[root@centos7 ~]# swapon /swapfile

[root@centos7 ~]# vi /etc/fstab

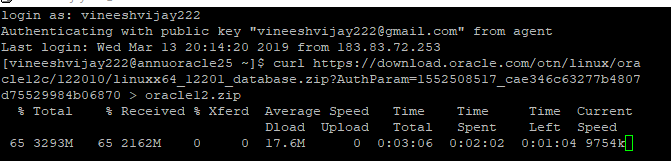
/swapfile swap swap defaults 0 0 **<- Add this to /etc/fstab**

[root@centos7 ~]# swapon –show

**Step 2 - Downloading Oracle 12C release 2**

* Initiate the download using your computer’s browser, pausing the download and copying the download URL, which contains the authentication token in it.

[root@centos7 ~]# *curl download\_url > file\_name.zip*



**Step 3- Add Groups and Users**

[root@centos7 ~]# groupadd oinstall

[root@centos7 ~]# groupadd dba

[root@centos7 ~]# useradd -g oinstall -G dba oracle

[root@centos7 ~]# passwd oracle

**Edit Kernel Parameters**

Add the following kernel parameters to the /etc/sysctl.conf

[root@centos7 ~]# vi /etc/sysctl.conf

Add following parameters in the file: (Make sure no ‘#’ are pre-fixed before these parameters)

fs.file-max = 6815744

kernel.sem = 250 32000 100 128

kernel.shmmni = 4096

kernel.shmall = 1073741824

kernel.shmmax = 4398046511104

net.core.rmem\_default = 262144

net.core.rmem\_max = 4194304

net.core.wmem\_default = 262144

net.core.wmem\_max = 1048576

fs.aio-max-nr = 1048576

net.ipv4.ip\_local\_port\_range = 9000 65500

[root@centos7 ~]# sysctl -p **<- apply changes**

**Step 4- Edit Limits file**

[root@centos7 ~]# vi etc/security/limits.conf

**ADD at EOF ->**

\* soft stack 10240

oracle soft nofile 1024

oracle hard nofile 65536

oracle soft nproc 2047

oracle hard nproc 16384

oracle soft stack 10240

oracle hard stack 32768

**Step 5: Install dependencies**

[root@centos7 ~]# yum install -y binutils.x86\_64 compat-libcap1.x86\_64 gcc.x86\_64 gcc-c++.x86\_64 glibc.i686 glibc.x86\_64 \

glibc-devel.i686 glibc-devel.x86\_64 ksh compat-libstdc++-33 libaio.i686 libaio.x86\_64 libaio-devel.i686 libaio-devel.x86\_64 \

libgcc.i686 libgcc.x86\_64 libstdc++.i686 libstdc++.x86\_64 libstdc++-devel.i686 libstdc++-devel.x86\_64 libXi.i686 libXi.x86\_64 \

libXtst.i686 libXtst.x86\_64 make.x86\_64 sysstat.x86\_64

**Step 6: Unzipping the downloaded file**

[root@centos7 ~]# unzip *file\_name.zip –d /oracle/*

This will unzip the file in a directory /oracle, which is placed at the root.

Run *yum install unzip,* if unzip is unavailable, then re-try

**Step 7: Changing the ownership of the file /oracle to the user created in Step2**

[root@centos7 ~]# chown -R oracle:oinstall /oracle

[root@centos7 ~]# chmod -R 775 /oracle

[root@centos7 ~]# chmod g+s /oracle

**Step 8:**  **Also install the** "X Window System" **package group, because the Oracle installation requires GUI**

[root@centos7 ~]# yum groupinstall -y "X Window System"

[root@centos7 ~]# yum install xorg-x11-apps.x86\_64 <- To test the UI tool

Disconnect from the present session, we will reconnect with a fresh connection with xming associated with it

**Step 9: (To be done on your personal/local machines) Download Xming in your local/personal machine and keep it running.**

Xming is also available in the software centre, install and keep it running in your local machine.

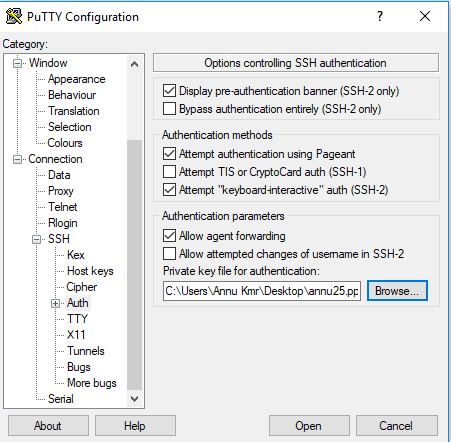
Alternatively, Download from this link: *https://sourceforge.net/projects/xming/*

**Step 10: Open up putty to associate Xming (Make sure Xming is running in the background)**

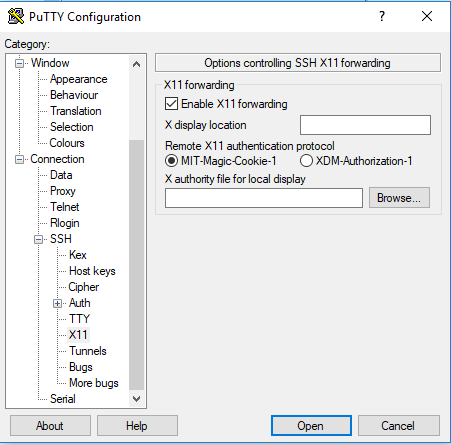
**Type in the IP Address of the VM**

**AND**

**A**: Open putty, under ‘Auth’, define the proper private key to connect



**B:** Under **X11** make sure to check “*Enable X11 forwarding”*



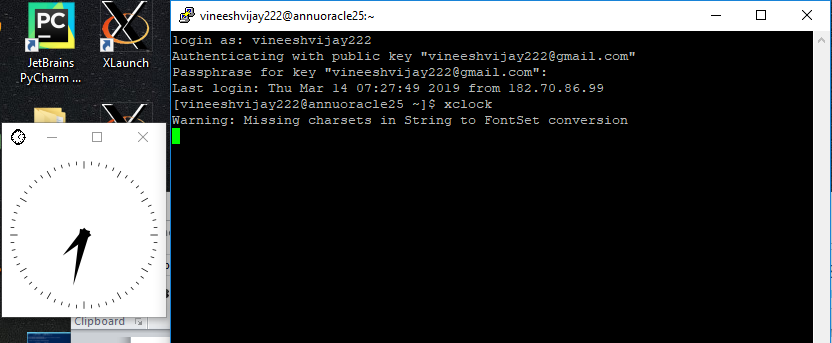
Also select **MIT-Magic-Cookie-**1 as the authentication protocol

Open up the connection now.

**Step 11: Run xclock to verify if you can see a Graphics clock**

[username@centos7 ~]# xclock

A small clock should pop up in your local machine, as shown



If you can see the clock, you are good to proceed with the oracle installation.

**Step 12: Switch to user oracle, (created in step2)**

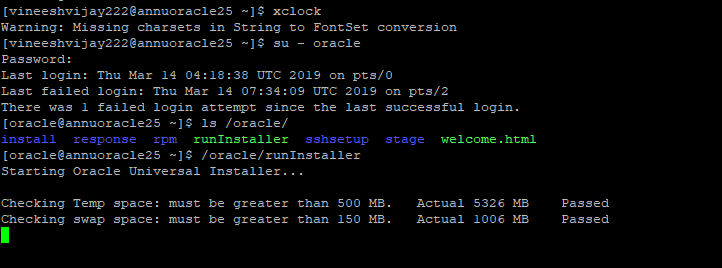
[username@centos7 ~]# su – oracle

Give the password for it when prompted

Run the installer file previously unzipped in oracle (Absolute path may change, but make sure you run the executable “runInstaller”)

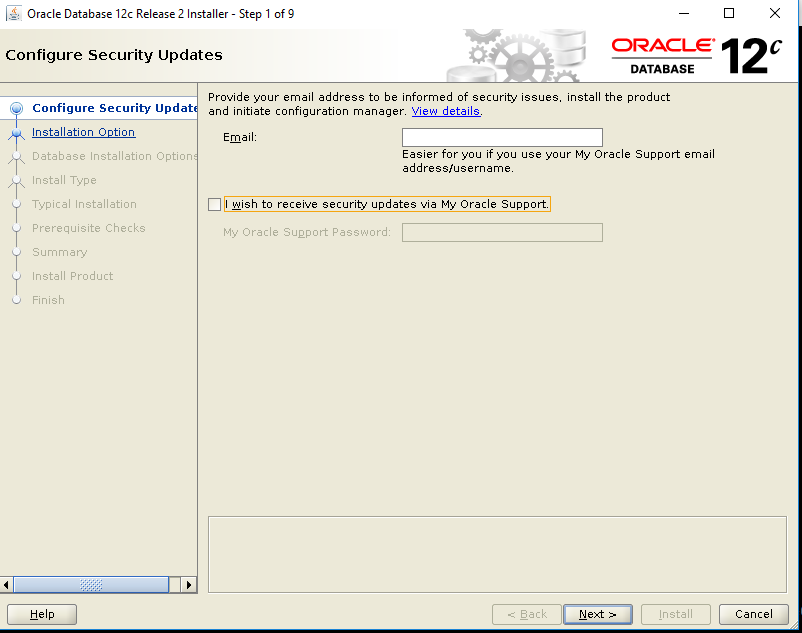
[oracle@centos7 ~]$ /oracle/database/runInstaller

Starting Oracle Universal Installer...

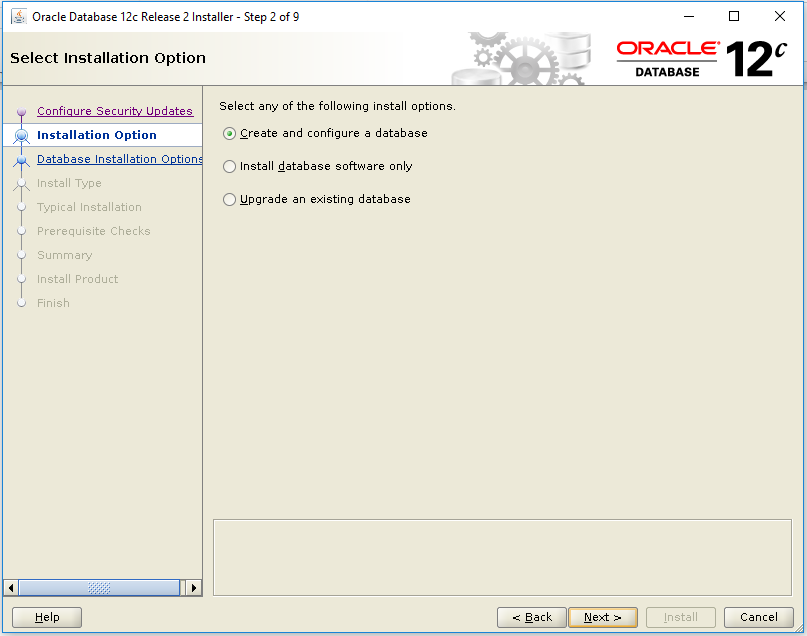


After performing few checks, you’ll see an Oracle12C installation screen pop up,

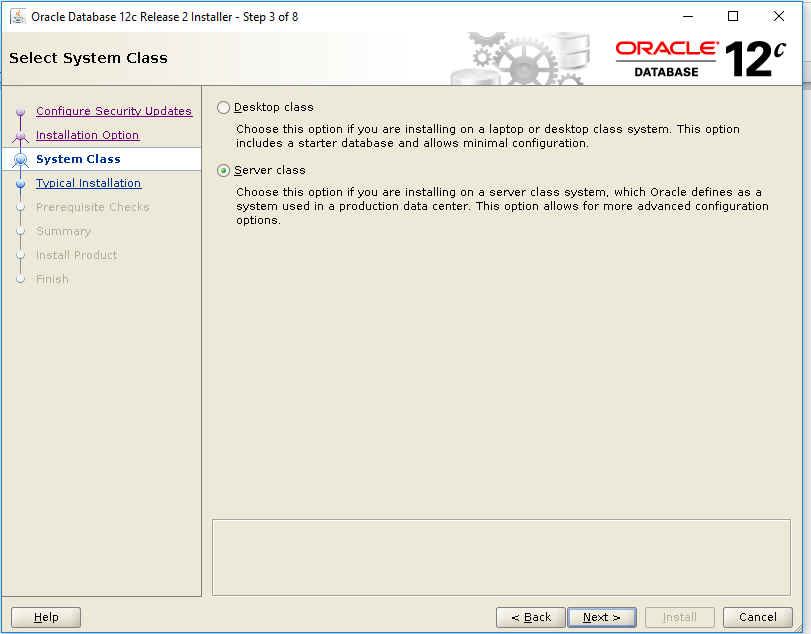
1. This is an optional step, feed in your email ID if willing to receive security updates, Click next.



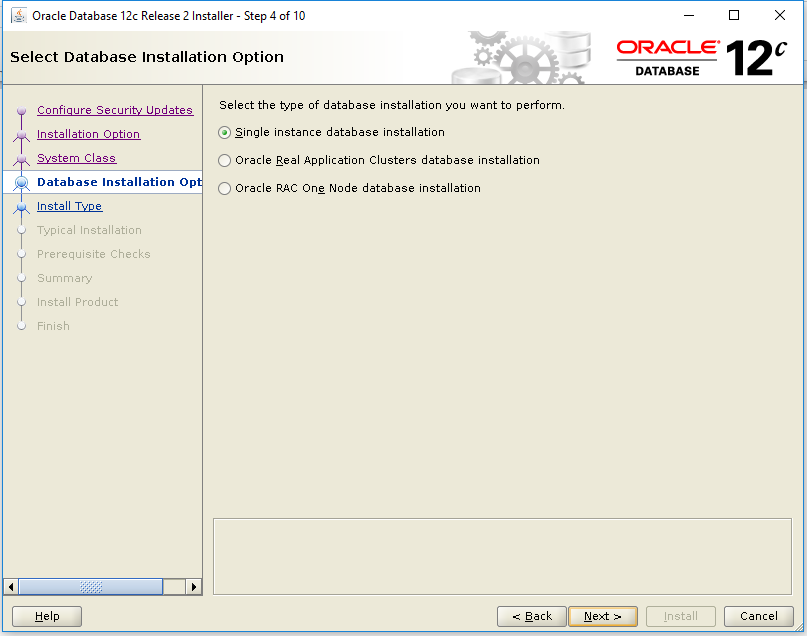
1. Select Create and Configure a Database.



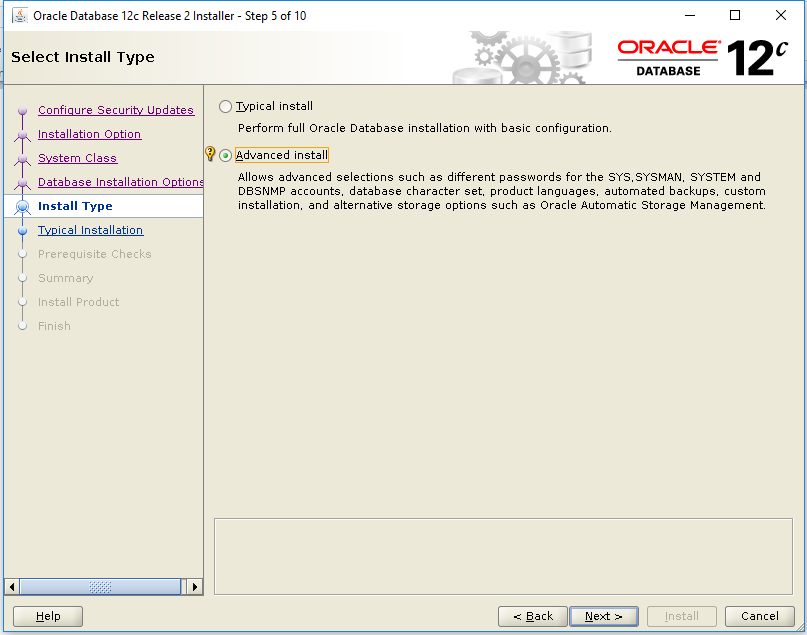
1. Select option Server class.



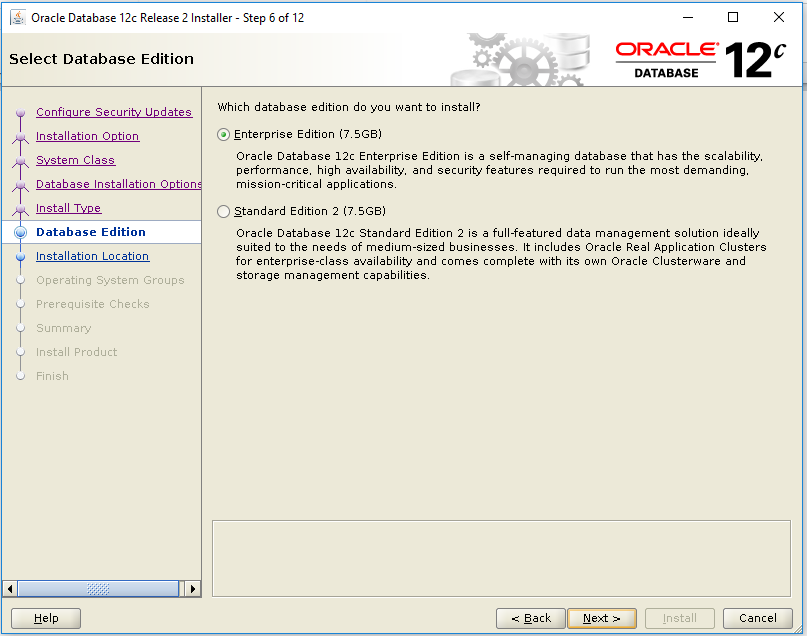
1. Select Option single Instance database installation.



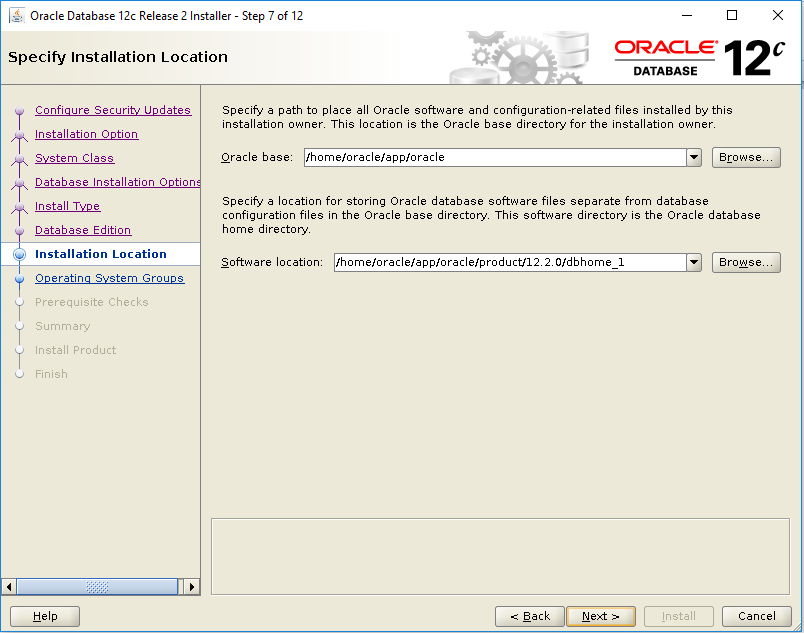
1. Select option Advanced install.



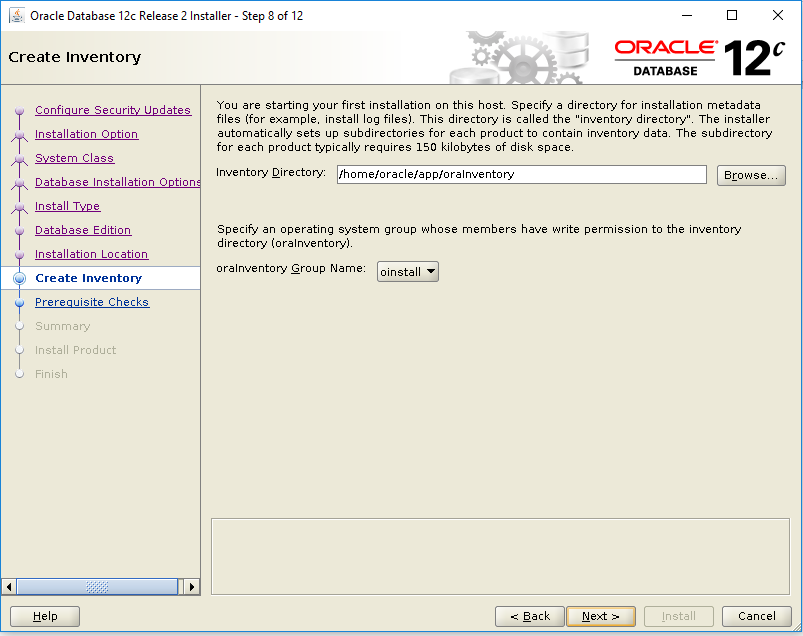
1. Select option Enterprise Edition.



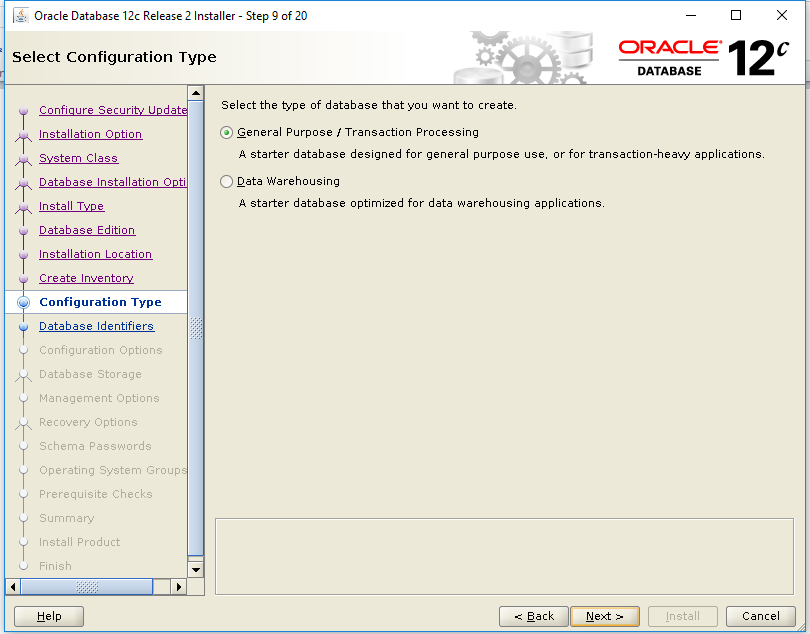
### Feed in the path for Oracle base and Software Location.



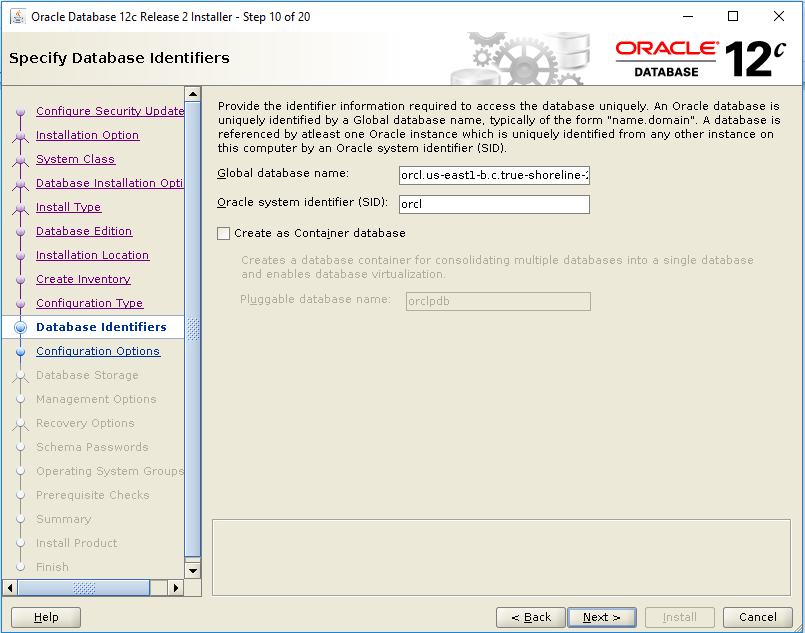
1. Specify the path for inventory directory.

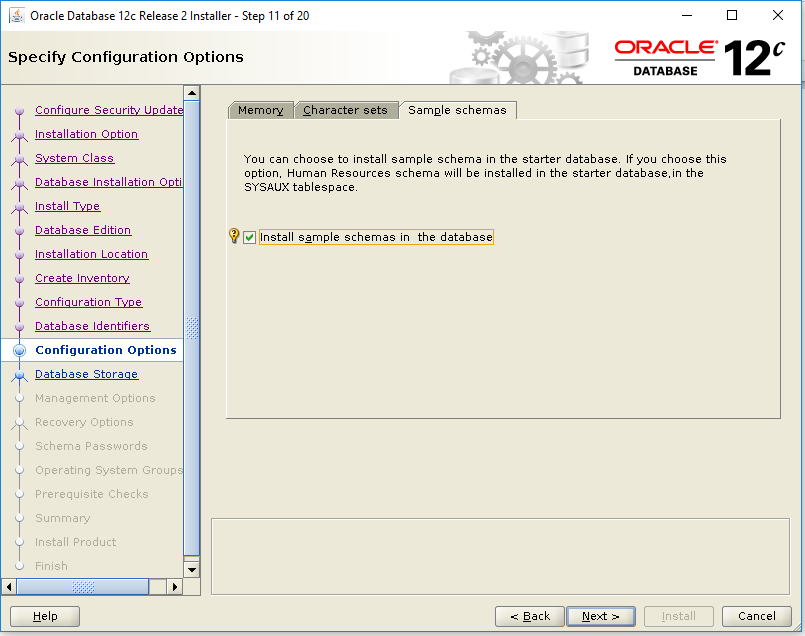


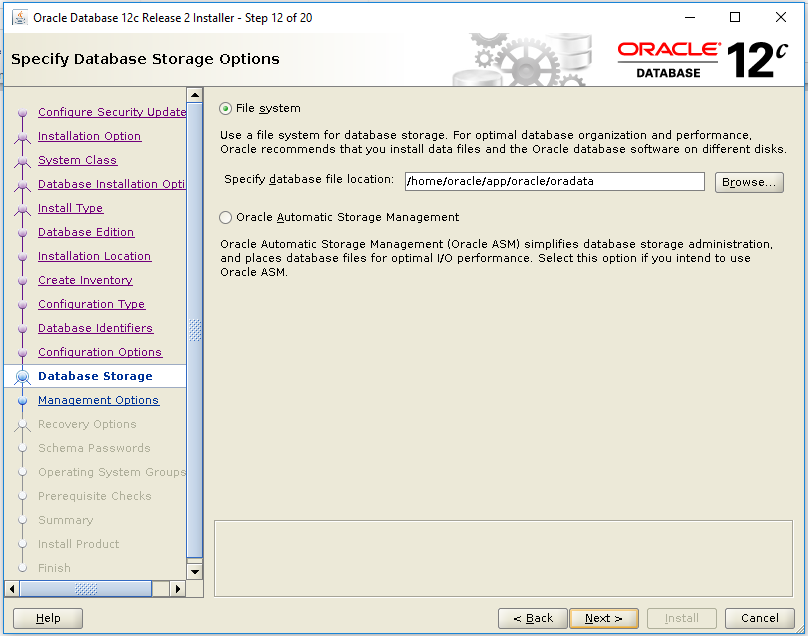
1. Select option General Purpose.



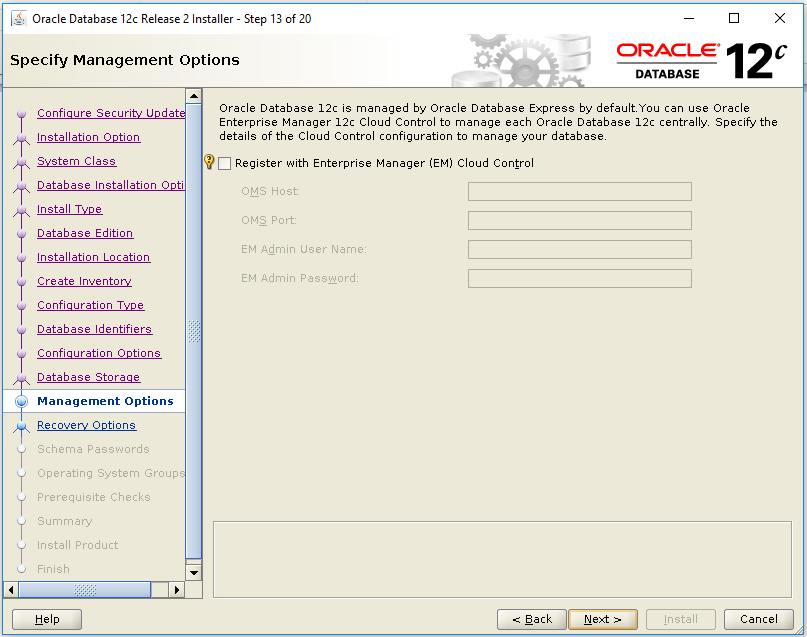
1. Feed in Global Database name and SID.



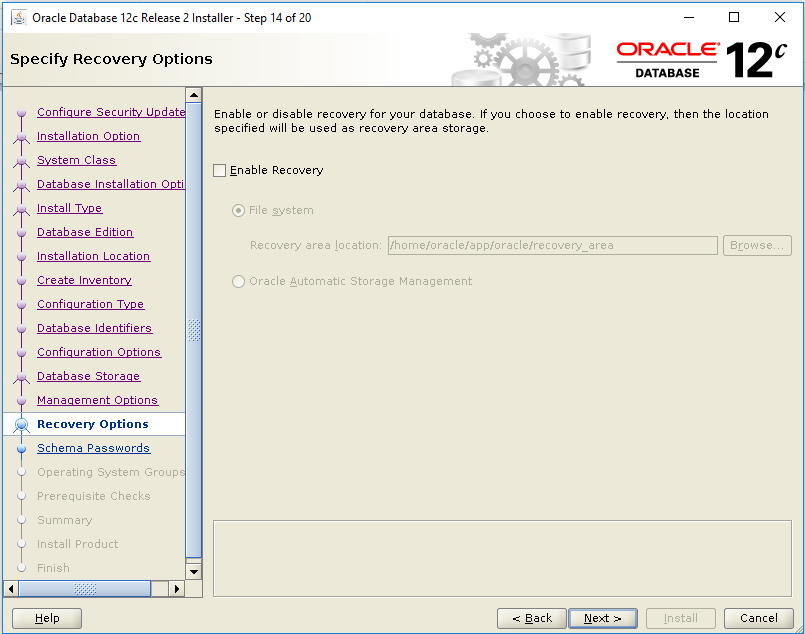
1. Select Install Sample Schemas if you want the sample schema.
2. Select option File System and feed in the path for it.



1. Optional, can opt to Register for EM Cloud Manager

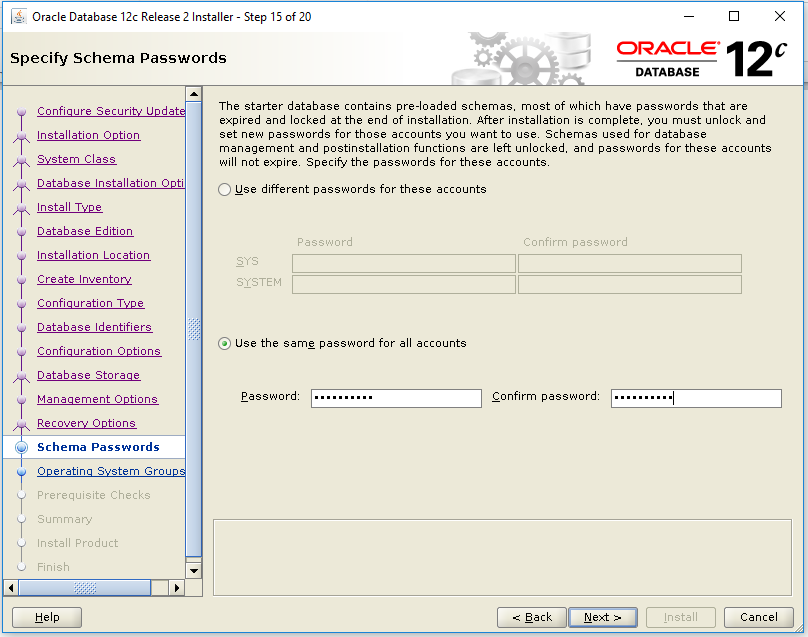


1. Optional, can opt to enable recovery and specify a path for Recovery

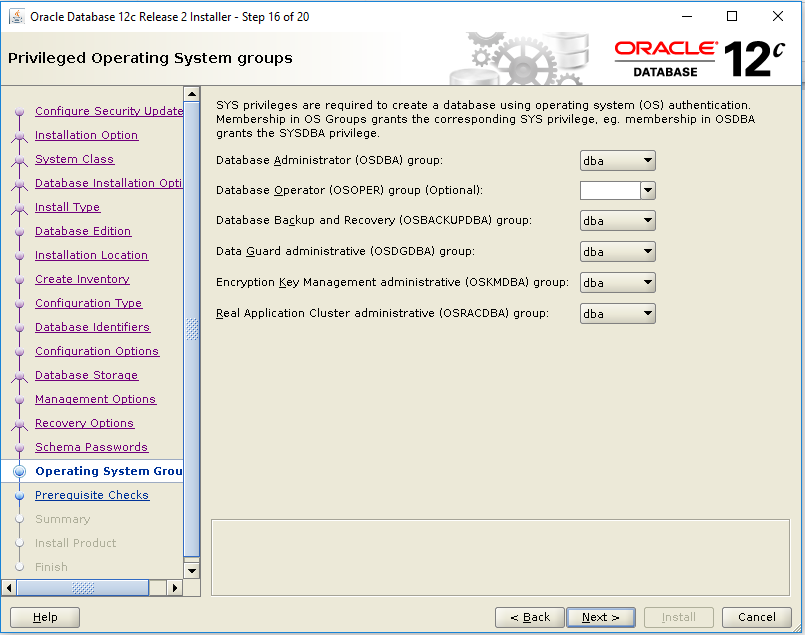


15

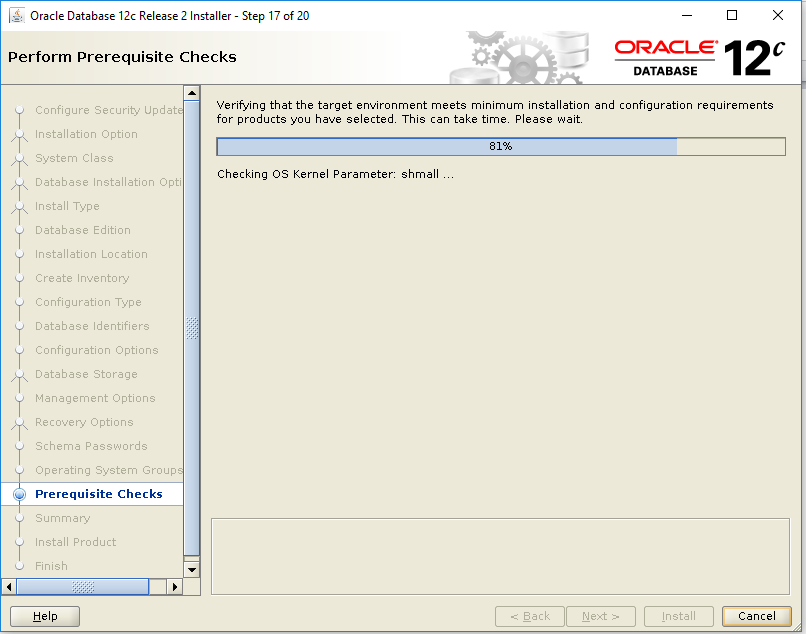
1. Here, you can choose to specify different/same passwords for sys and system



1. Select dba in options.

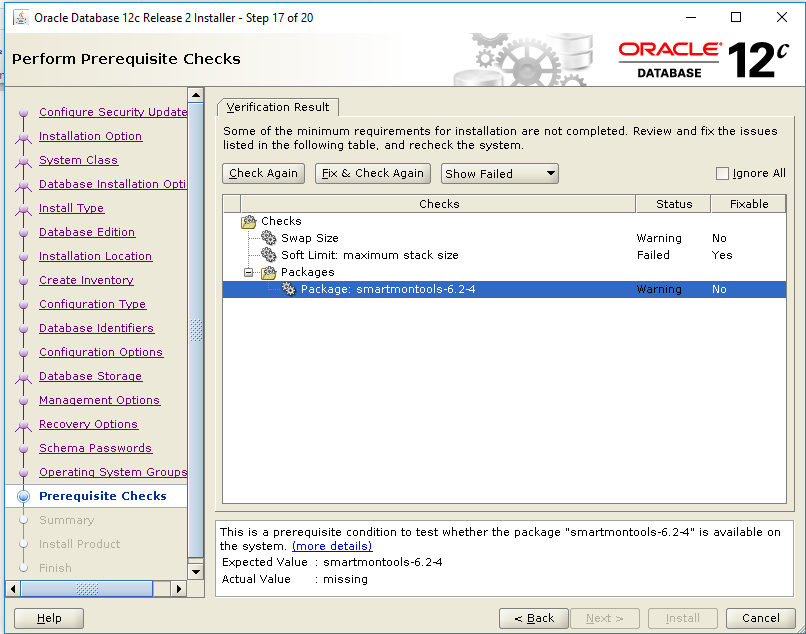


1. This performs prerequisite checks before actually installing



During checks if there are any discrepancies, you can go back to the new shell as root and fix them.

(Do not close the oracle installation screen)

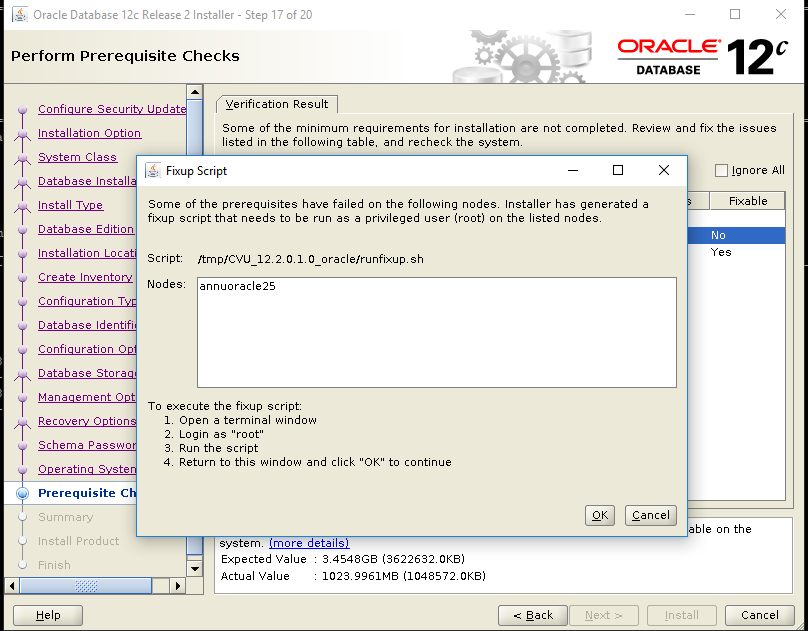


For smartmontools-6.2-4

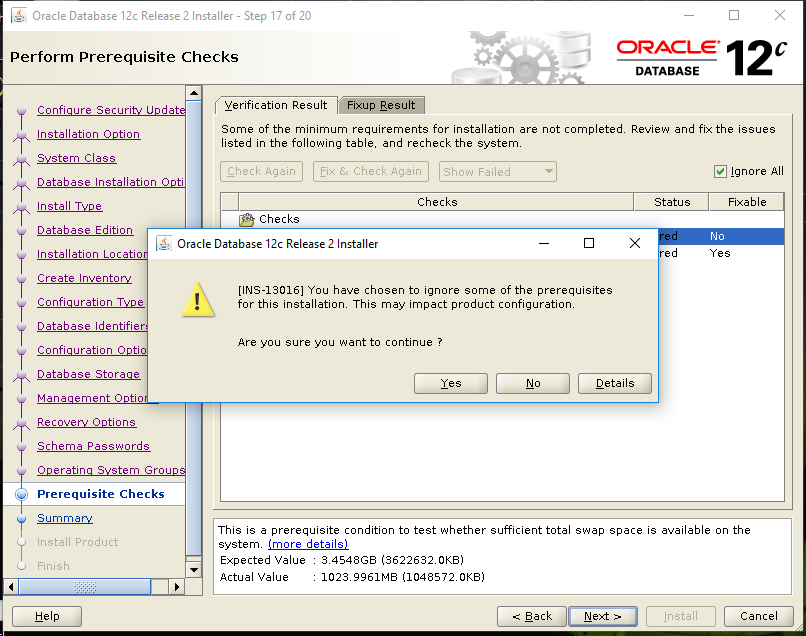
[root@centos7 ~]# yum install smartmontools

You can choose to ignore Swap size, check on Ignore All checkbox

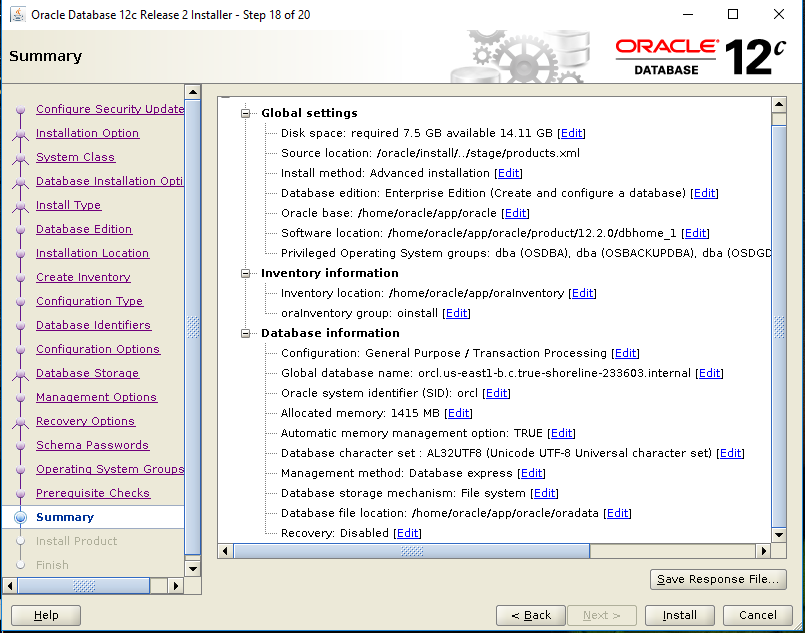
Once fixed the failed checks, click “Fix & Check Again”, go back to root shell and execute the script specified.



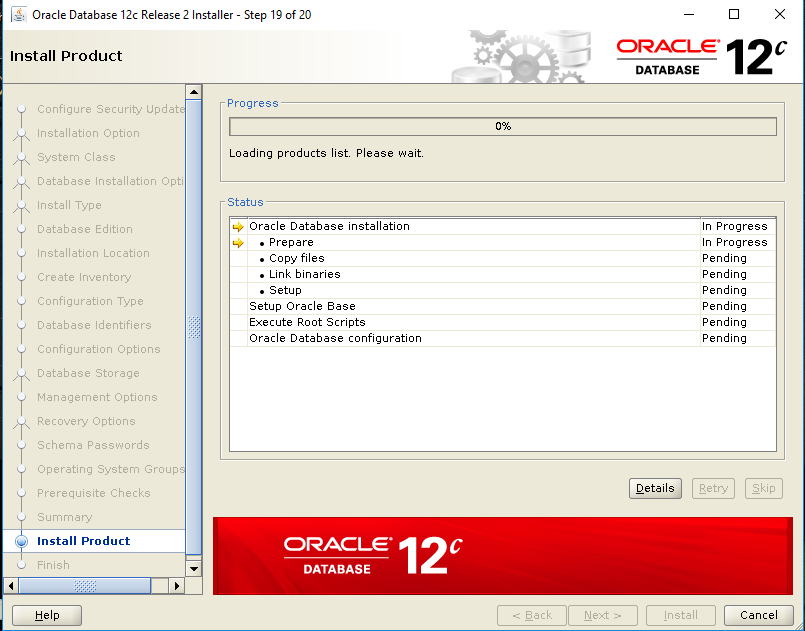
Click YES after checking “Ignore ALL”



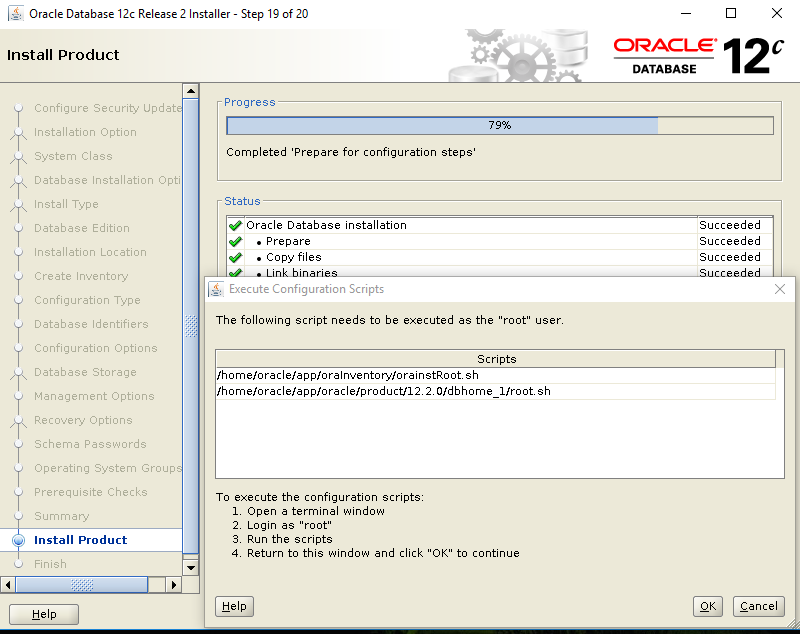
1. A summary of all configurations done so far

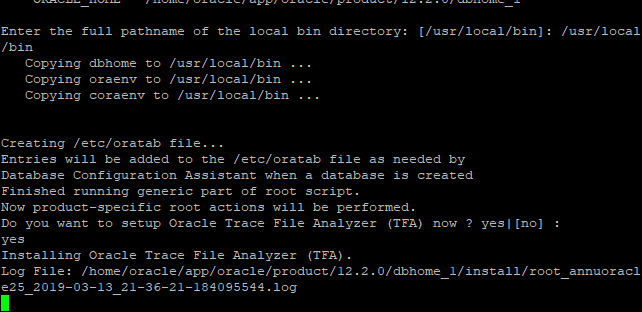


1. Product Installation.

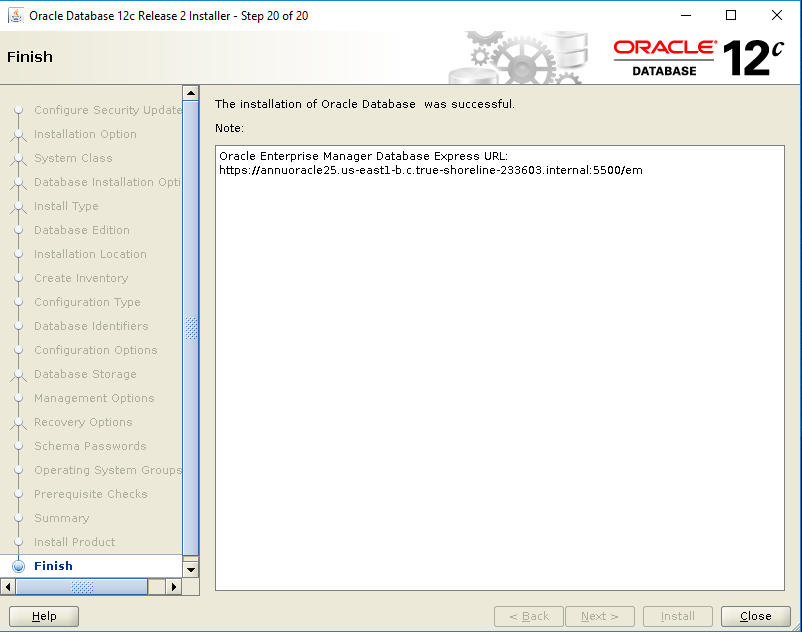


This would require you to go back to shell log in as root, and execute the scripts specified





1. Finish and close.



**Step 13. Post Installation.**

1. Setting environment variables

[oracle@centos7 ~]$ vi /.bash\_profile

1. Adding the values, change these to your installation specific values

export TMP=/tmp

export TMPDIR=$TMP

export ORACLE\_SID=orcl

export ORACLE\_BASE=/home/oracle/app/oracle

export ORACLE\_HOME=$ORACLE\_BASE/product/12.2.0/dbhome\_1

export PATH=/usr/sbin:$PATH

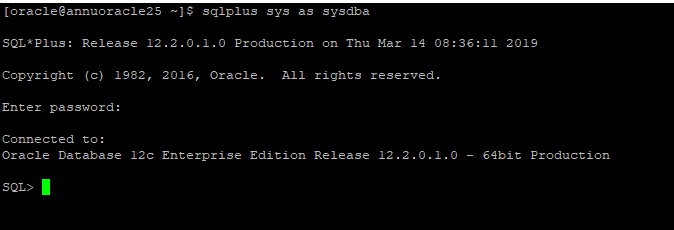
export PATH=$ORACLE\_HOME/bin:$PATH

export LD\_LIBRARY\_PATH=$ORACLE\_HOME/lib:/lib:/usr/lib

export CLASSPATH=$ORACLE\_HOME/jlib:$ORACLE\_HOME/rdbms/jlib

[oracle@centos7 ~]$ . .bash\_profile

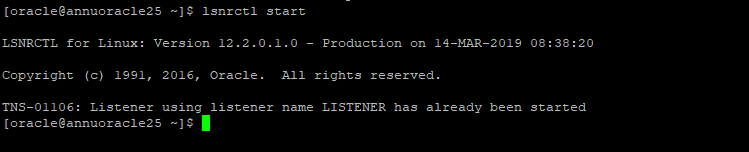
1. **Connecting to Oracle12c**



1. **To Connect remotely,**

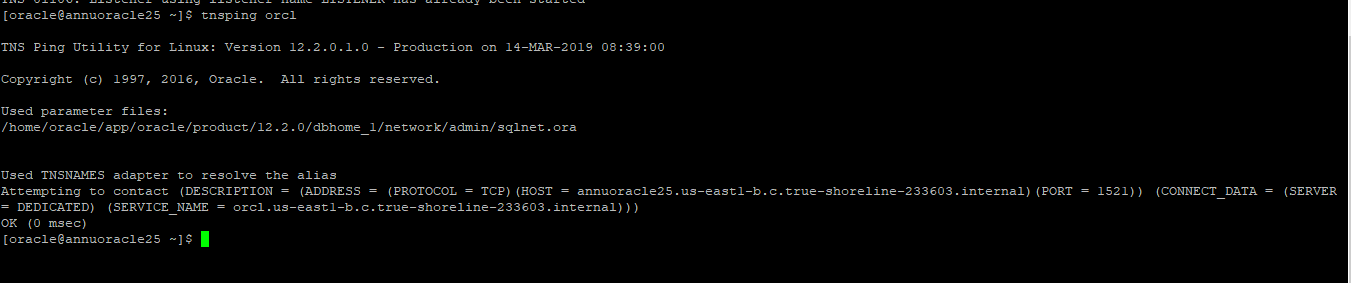
* Start Listener

[oracle@annuoracle25 ~]$ lsnrctl start



Also Check if Oracle SID is running *tnsping orcl*

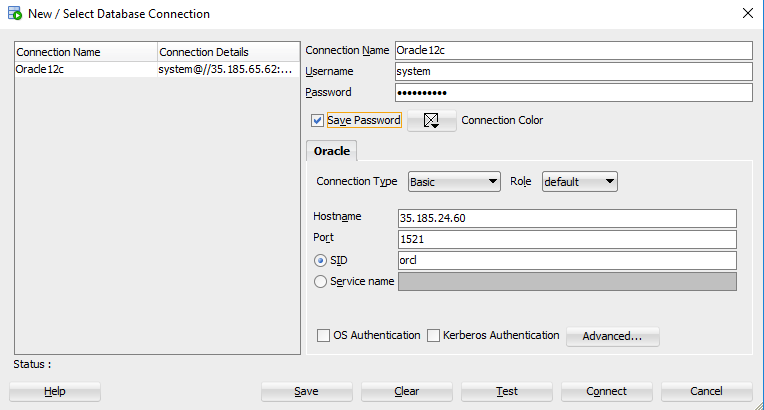
[oracle@annuoracle25 ~]$ tnsping orcl



1. **Using Sql Developer to connect**

You might have to add a firewall rule to allow connections through port 1521 and other related ports

Once ports are open, you can test the connection once all values are fed in.



# Other Prerequisites

1. Set up an AD server for user authentication, and configure the same in Juniper, in the file “*application.properties”,* Juniper has integrated AD configuration for user management.
2. After installing the deploying the tools configure the “*application.properties”* file for db connections, ad connections and middleware connections.

# Testing the Installation

1. Navigate your web browser to the IP address you noted for Juniper Microservices and the ports.
2. Ensure that the login prompt appears.

# Glossary

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