IT Analytics Installation and Upgrade Guide for Linux

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COHESITY

IT Analytics Installation and Upgrade Guide for Linux

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There are several ways to create a Cohesity support case.

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- Log in to the Cohesity Support Portal to create a new case.
- Click the (**?**) icon on the Cohesity UI and select Support Portal.

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- Log in to the Cohesity Support Portal to create a new case.
- To monitor your open cases, log in to the portal and click the **Cases** tab on the home page. This page should have all the case statuses and updates. You can also view individual case status.

Cohesity Software Running on Partner Hardware

For Cohesity software running on qualified third-party hardware, the following support workflow applies:

1. The customer may contact Cohesity Support first if the issue cannot be determined as a hardware issue.

   Note: Cohesity cannot process hardware replacement requests for partner hardware.

2. Cohesity Support triages the issue. If it is a software issue, Cohesity Support continues to work on it.
3. If it is a hardware/firmware issue or is suspected to be a hardware/firmware issue, Cohesity provides information about the issue to the customer and requests that the customer open a support ticket with the appropriate partner.
4. If needed, Cohesity Support can join a three-way call with the partner and the customer.
5. The customer informs Cohesity Support on the progress of the partner's case.

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Chapter 1

Installation overview

This chapter includes the following topics:

- Introduction
- IT Analytics components
- Standard or Shared Services licensing edition
- Install options
- Multi-language support and locale considerations (Linux)
- Third-party and Open Source Products Used

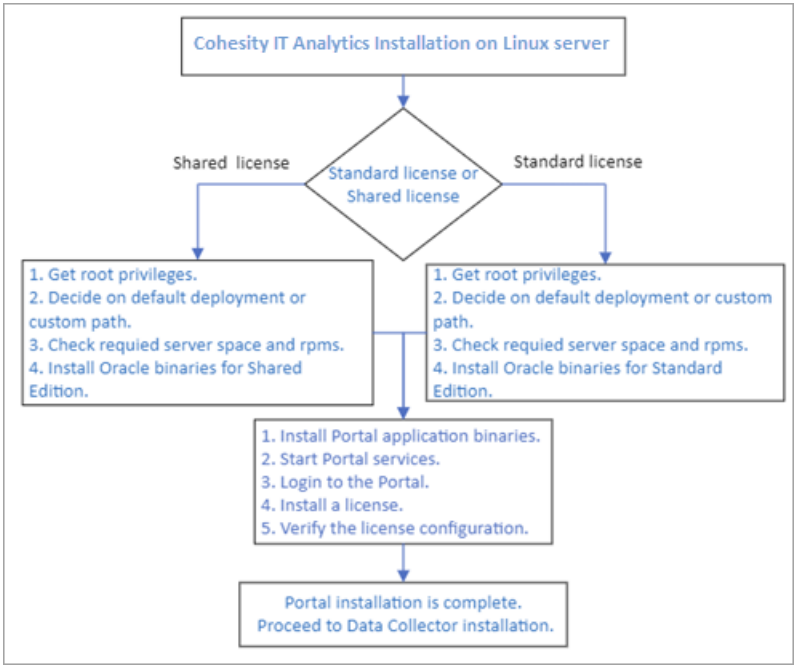
Introduction

This document describes the IT Analytics Portal installation on a Linux server. Before you begin with the installation, you must know the:

- IT Analytics components that get installed
- Install options
- Standard or Shared Services licensing edition
- Multi-language support and locale considerations (Linux)
- IT Analytics Third-party and Open Source Products Used used by IT Analytics Portal

In addition to the requirements mentioned within this guide, also refer to the *IT Analytics Certified Configuration Guide*, which includes sections detailing recommended portal configurations (CPU, Memory, and Disk), supported third party and open source products, and firewall configuration (default ports).

Installation workflow



Throughout this document, screen shots and command-line prompts and responses are used to provide a reasonable representation of the interaction you will be viewing. However, they may not display precisely the same text that you will see during the installation.

IT Analytics components

IT Analytics Portal installation involves deployments of the product components and the install mechanism allows you to choose the deployment option depending on your environment.

The following components are installed during the Portal installation:

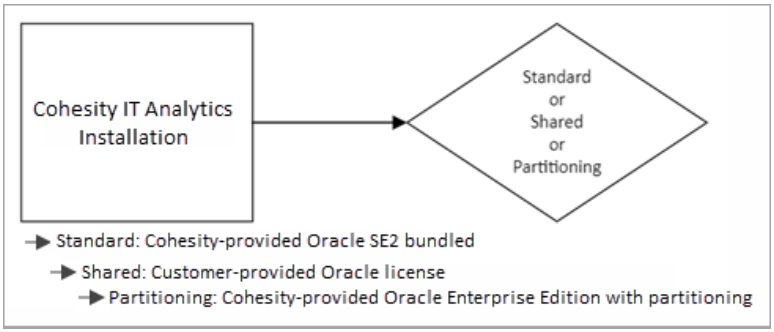
- Portal Server: The server on which the IT Analytics Portal Server software resides.
- Portal Server Software: The binaries, SQL scripts, configuration files, and open-source and third-party software products needed to retrieve and render reporting data from the Reporting Database.

- Reporting Database: The Oracle database that stores all the report data. The Reporting Database is usually installed on the Portal server.

After the Portal installation, you are also required to install the Data Collector software on a separate server to retrieve and report data for analytics.

Standard or Shared Services licensing edition

Knowing the inclusions in your license edition helps you understand whether you are entitled to receiving Oracle Standard edition software bundled with IT Analytics or whether you need to provide your own Oracle license.



Standard Edition

Standard edition licensing includes a single instance of Oracle Standard Edition embedded within the IT Analytics software. With Standard edition, Oracle must be installed on the IT Analytics Portal server. Standard Edition is the most common licensing option.

Shared Services Edition

A Shared Services license edition means you must provide your own Oracle license. You can subscribe to this edition if you already have an Oracle license which you can use to store the IT Analytics data.

Partitioning Edition

Partitioning edition enables the underlying database to split large tables into partitions to improve the database performance and scalability. IT Analytics leverages the Oracle enterprise edition database with the Oracle Partitioning option.

Note: With Standard or Shared Services, you can also purchase a Disaster Recovery (DR) License, which is required if you deploy two or more copies on a second or subsequent Portal server for the purpose of disaster recovery, availability, or fail-over from production.

Install options

The installer-based options available for IT Analytics deployment on a Linux server are described in the table below.

Table 1-1 Deployment options for IT Analytics

Install method		Description
Installer-based deployment:		IT Analytics installers for Oracle and Portal server provides ways to deploy the Portal either in Standard or in Split Architecture.
	Standard installation	This is the most common installation method that involves installing Oracle locally on the same server as IT Analytics Portal server.
	Split Architecture installation	In a Split Architecture, the database and IT Analytics Portal application reside on two different systems.

If you have Shared Services edition of License for IT Analytics and are providing your own Oracle, you can install Oracle either on the IT AnalyticsPortal server or install Oracle on a separate server. In this case, use the Oracle installer for the Shared Service Edition. Refer Install Oracle database binaries for Shared Service Edition section for details.

Multi-language support and locale considerations (Linux)

Apart form English, you can perform the portal installation in Simplified Chinese, French, Korean, and Japanese. To install the portal in one of the supported languages, you need to first check if the system has multiple languages and then add the preferred language for the installation. Once you have set the language preference, the installation progress and responses appear in the preferred language. Note that this language preference setting is only confined to the installation process and has no impact on the text of the portal UI.

1. To check the current system language:

```
#locale
```

2. To check if your system has multiple languages:

```
#locale -a
```

3. To add a language, run the command `# vi /etc/profile` and go to the end of the file and add the language as follows:
   - To add Simplified Chinese:

     ```
     export LANG=zh_CN.utf8
     export LC_ALL=zh_CN.utf8
     ```

   - To add French:

     ```
     export LANG=fr_FR.utf8
     export LC_ALL=fr_FR.utf8
     ```

   - To add Korean

     ```
     export LANG=ko_KR.utf8
     export LC_ALL=ko_KR.utf8
     ```

   - To add Japanese

     ```
     export LANG=ja_JP.utf8
     export LC_ALL=ja_JP.utf8
     ```

4. Reboot the system to set your language preference for the portal installation.

Having completed the language settings, you can proceed with the installation of the IT Analytics Portal.

Third-party and Open Source Products Used

When you install the portal and reporting database, you install a compilation of software, which includes open source and third-party software.

For a list of open source components and licenses, see the license.txt file on the portal server.

Table 1-2 Open Source Products Used

Software Product	Linux	Windows
Apache HTTP Web Server	2.4.67	2.4.67
Apache Tomcat Java Servlet Engine	10.1.55	10.1.55
Java	Amazon Corretto 17.0.19.10.1	Amazon Corretto 17.0.19.10.1
Kafka	4.1.2.1	4.1.2.1
Oracle 19c	19c: 19.3.0.0.0	19c: 19.3.0.0.0

Note: If your environment has IT Analytics portal server and Data Collector installed on separate Linux servers and use Cohesity-provided Oracle, ensure the Oracle client RPM is installed or upgraded to 21.21.0.0.0-1.el8.x86_64.

If other versions of the above components are already running on the designated IT Analytics system, or other components are utilizing resources (such as specific ports) typically used by IT Analytics, the product usually can be reconfigured to work around these conflicts; however, this cannot be guaranteed.

*Refer to Support for updated binaries as they become available.

Chapter 2

Install IT Analytics on a Linux server

This chapter includes the following topics:

- Step-1: Get the IT Analytics license key file
- Step-2: Portal and database deployment strategies
- Step-3: Portal and database prerequisites
- Step-4: Install Oracle database application binaries
- Step-5: Install the Portal application binaries (Linux)
- Step-6: Start the Portal services (Linux)
- Step-7: Log into the Portal
- Step-8: Install a license
- Verify the current license configuration
- Next steps

Step-1: Get the IT Analytics license key file

A valid license file is required to run the Portal application. If you already have a license file, proceed to the Installation section.

To generate a license key:

1. Open the Veritas support portal. (https://support.cohesity.com/s//*en_US*/)
2. Click **Licensing** and login to the Veritas Entitlement Management System using your Administrator credentials.

3. Open the **Entitlements** tab and use the filters at the top to filter and locate the entitlements granted to your account.
4. Click the key icon located against the entitlement ID for which you wish to generate a license key. The **Generate License Key** page is displayed. Verify your account details for which you plan to generate the license key.
5. Select the product version for which you want to generate the key. By default, the latest product version is selected.
6. Specify the license quantity that you wish to deploy using the key. By default, the entire available quantity is displayed in the field. You can utilize a partial subset of your entitled licenses with this key and generate a separate key for the remainder.

Note: If you create a key for less than the entitled quantity and if you wish to increase the quantity of the systems later using the entitlement associated with the key, you must create a new key for the additional systems. On the contrary, to reduce the number of systems associated with a key, you need to assign a new key to the reduced systems and edit the older key.

---

7. Provide the host lock string of the system where IT Analytics will be installed using this key. To get the correct host lock string, run one of these commands on the portal server:

   ```
   /opt/aptare/utils/VxLicGetHostLock.sh
   ```

   On Linux, `VxLicGetHostLock.sh` uses `hostname --fqdn` commands to get the hostname of the system and uses it to create the host string. Hence, ensure `hostname --fqdn` returns a fully qualified host name, instead of a short name. For example, the command output must have at least one dot (.) character.

   If you have not installed the IT Analytics Portal, you can download the `VxLicGetHostLock.sh` from the Cohesity download center and run the appropriate script depending on the OS of the Portal server.

8 After running the `VxLicGetHostLock.sh` file, you get the following output:

```
Veritas Get Host Lock utility v1.0.0.0
Copyright (c) 2022 Veritas Technologies LLC. All rights reserved.

FQDN: xyz.abc.com
Host Lock String: [sha512]4aba838e350d3c9471aa5334db5de8ad4a0ff
45e34a6cfaea064f4ca77812acd4c8abc7be6b2d756574b7d6e06ceb9581357
b824f4f70f84b39d938e85ee62b5
```

While generating the license key on VEMS, use the same host lock string including `[sha512]`.

For example:

```
[sha512]4aba838e350d3c9471aa5334db5de8ad4a0ff
45e34a6cfaea064f4ca77812acd4c8abc7be6b2d756574b7d6e06ceb9581357
b824f4f70f84b39d938e85ee62b5
```

9 Add comments about to the license key if required for the future reference.

10 Click **Generate**. The Generated Key page is displayed with the new key in the **License Key** column. You can click the key link and save it locally.

Step-2: Portal and database deployment strategies

IT Analytics Portal and Oracle database components are typically installed on the same server. If the components are to be installed on the same server, you must check the required rpms and server space, and install the Oracle database application on the same machine. If the Portal and database components are installed on different systems, you must perform both the tasks on the respective systems.

If you are performing an installer-based deployment, you can choose between a Standard and Split Architecture install. The decision to install Portal and Oracle on the same or different systems will depend on your choice of architecture and your license edition (Standard or Shared Services).

The portal and database installers allow installations on custom or default (`/opt`) path on the system. When installing Oracle, you will be prompted for the install path. For a Standard install, the path specified for Oracle will also be used for the Portal installer. For a Split Architecture install, the Portal installer will prompt for the install directory. Hence, the absolute install path of Oracle and Portal is represented as `<install_path>`. Substitute `<install_path>` with the absolute path of the Portal

or Oracle database installation as applicable. If Oracle or the Portal is installed on the default path, substitute `<install_path>` with the default path.

Installing Portal and Oracle database binaries

Installing all Portal server components requires **root** privileges. TheIT Analytics Portal installation is performed in the following order.

To install IT Analytics Portal server and oracle database on the same system (Standard installation):

1. Install Oracle database application binaries and create a database. Select the Standard or Shared Services Edition according to your requirements.
   - If your IT Analytics product license includes entitlement to the embedded Oracle distribution, follow the instructions in the section: Install Oracle database binaries for Standard Edition.
   - If you are providing your own Oracle database license, follow the instructions in section: Install Oracle database binaries for Shared Service Edition.
2. Install the IT Analytics Portal software components and create the database schema objects.

   See “Step-5: Install the Portal application binaries (Linux)” on page 40.

To install IT Analytics on different systems (Split Architecture):

1. If you already have Oracle database license and Oracle database application binaries installed and you wanted to use the same server for IT Analytics as well, you can directly create database in the database server:

   See “ Create database and users in existing Oracle farm in a Split Architecture deployment” on page 33..
2. Login to the Portal system, install the IT Analytics Portal software components, and create the database schema objects.

   See “Step-5: Install the Portal application binaries (Linux)” on page 40..

   The installer creates database schema objects remotely on the database server. The Portal installer installs Oracle client rpms to remotely connect to the database server in this case.

If you do not have Oracle database application binaries already installed:

1. Login to the database server system, install Oracle database application binaries and create the database, and select the Standard or Shared Services Edition according to your requirements.

2. - If you do not have Oracle Database license, follow the instructions in the section: Install Oracle database binaries for Standard Edition.
   - If you already have a Oracle Database license, follow the instructions in section: Install Oracle database binaries for Shared Service Edition.
3. Install the IT Analytics Portal software components.

   See "Step-5: Install the Portal application binaries (Linux)" on page 40.

   The installer creates database schema objects remotely on the database server. The Portal installer installs Oracle client rpms to remotely connect to the database server in this case.

Step-3: Portal and database prerequisites

1. Choose a Portal Server. Install the IT Analytics Portal software on its own, dedicated server. For performance reasons, the IT Analytics Portal software must not be installed on the same server as the Data Collector. Root privileges are required for the Portal software installation tasks.
2. For new Portal installations, the minimum server memory requirement is 64 GB. Oracle database requires a minimum of 24 GB of memory. Portal installations will fail if sufficient memory resources are not available on the Portal server.
3. The Oracle server has the following memory requirements:
   - Total physical memory (physical + virtual) must be greater than 64 GB, otherwise Oracle will fail to start. Add more physical memory to the Portal server.
   - Total temporary file system (tmpfs) memory must be 24 GB or greater, otherwise Oracle will fail to start. Increase the size of tmpfs, typically in `/etc/fstab`.
   - Shared memory (kernel.shmmax parameter) must be 24 GB or greater, otherwise Oracle will fail to start. Increase the value of the shmmax parameter, typically in /etc/sysctl.conf. After increasing the value for the shmmax parameter, execute: **sysctl -p**.
   - Swap space of minimum 16 GB must be created.

Note: If you need to install Oracle or the IT Analytics portal with less than the default memory requirements, you can copy the `config.sh` file inside the ISO mount path to the local system, edit it appropriately, and then pass the absolute path of `config.sh` to the installer script with **-C** option.

Example:

```
<Installer_script> -C <path of config.sh>
Itanalyticsinstaller.sh -C /tmp/config.sh
```

The parameters that you can modify are:

- `ORACLEMEMORYTARGET=` for Oracle installation.
- `PORTALMEMORYTARGET=` for portal installation.
- `SPLITPORTALMEMORYTARGET=` for split portal installation.

4. Verify the OS of the Portal Server. Check that the OS is one of the certified operating systems listed in the *Certified Configurations Guide*.

   Verify that sufficient disk space exists on the designated Portal Server. For the database file systems, the amount specified is the minimum to create the database. The database grows in size over the period of time. The growth of database dependents on various factors such as subsystems from which data is collected, type of systems collecting data from, retention periods for data(which is configurable), and so on.

   IT Analytics supports installation of binaries and database files at custom locations on the file system. By default, the binaries are installed under `/opt` and the database files are created under `/data01` through `/data06` folders. If you choose to install at the default path, the file system space requirements must be as below.

File System/ Directory	Minimum Disk Space	Recommended Disk Space	Maximum Disk Space for DB Growth	Notes
/opt	50 GiB	100 GB	200 GB	
/tmp	5 GiB	10 GiB	20 GiB	Both /tmp and /var/tmp must be writable by the user aptare and /tmp must not be mounted with noexec option.

File System/ Directory	Minimum Disk Space	Recommended Disk Space	Maximum Disk Space for DB Growth	Notes
/data01	50 GiB	100 GiB	750 GiB	Required for data and index tablespaces.
/data02	50 GiB	100 GiB	750 GiB	Required for data and index tablespaces.
/data03	90 GiB	250 GiB	1800 GiB	Required for data and index tablespaces.
/data04	200 GiB	200 GiB	300 GiB	Temporary table space.
/data05	60 GiB	60 GiB	60 GiB	Temporary table space (undo log).
/data06	10 GiB	10 GiB	10 GiB	Temporary table space (redo log).

- If you choose to install at a custom path, the file and space requirements are as below:

File System/ Directory	Minimum Disk Space	Recommended Disk Space	Maximum Disk Space for DB Growth	Notes
<install_path> (custom install path of the Portal)	50 GiB	100 GiB	200 GiB	

File System/ Directory	Minimum Disk Space	Recommended Disk Space	Maximum Disk Space for DB Growth	Notes
/tmp	5 GiB	10 GiB	20 GiB	Both /tmp and /var/tmp must be writable by the user aptare and /tmp must not be mounted with noexec option.
<install_path> (custom install path of the database)	305 GiB	565 GiB	3445 GiB	

- If you choose to install a custom path with Split Architecture, the file and space requirements are as below:

File System/ Directory	Minimum Disk Space	Recommended Disk Space	Maximum Disk Space for DB Growth	Notes
/opt/aptare (install_path for oracle on Database server)	50 GiB	100 GiB	200 GiB	
/opt (install_path for Portal on Portal server)	30 GiB	50 GiB	50 GiB	

File System/ Directory	Minimum Disk Space	Recommended Disk Space	Maximum Disk Space for DB Growth	Notes
/tmp	2 GiB	2 GiB	10 GiB	Both /tmp and /var/tmp must be writable by the user aptare and /tmp must not be mounted with noexec option.
/data01 /data02 /data03 /data04 /data05 /data06	300 GiB	560 GiB	3400 GiB	dbf files are created here.

5. Review third-party software details.

   See "Third-party and Open Source Products Used" on page 10.

6. If you plan to export or email reports as PDF files, to ensure proper rendering of these output formats, a graphics manager such as X Virtual Frame Buffer (Xvfb) is required. Contact your IT organization to configure this capability. See "Configure X Virtual Frame Buffer (Xvfb)" on page 74.

7. Verify the rpm fontconfig is installed. This is required for the Portal installer. Fontconfig is a library designed to provide system-wide font configuration, customization and application access. If the rpm fontconfig is not installed, exporting reports to XLS and PDF formats will fail.

8. If the Portal system is having low entropy, it can affect the performance of cryptographic functions and such steps can take considerable amount of time to complete. You can identify the entropy level of the system from the content of the `/proc/sys/kernel/random/entropy_avail` file using command `# cat /proc/sys/kernel/random/entropy_avail`. If this value is not more than 400 consistently, install the rng-tools and start the services as described below on the Portal system.

For RHEL or OEL:

- Access the command prompt.
- Install the rng-tools.

```
yum install rng-tools
```

- Start the services.

```
systemctl start rngd
```

- Enable the services.

```
systemctl enable rngd
```

For SUSE:

- Access the command prompt.
- Install the rng-tools.

```
zypper install rng-tools
```

- Start the services.

```
systemctl start rng-tools
```

- Enable the services.

```
systemctl enable rng-tools
```

9. Verify that the necessary rpms exist on your system based on the OS.
   - For RHEL 9, use the following command:

```
rpm -q bc binutils compat-openssl11 elfutils-libelf fontconfig
 gcc glibc glibc-devel ksh libaio libasan liblsan libX11 libXau
 libXi libXrender libXtst libxcrypt-compat libgcc libibverbs
libnsl librdmacm libstdc++ libxcb libvirt-libs make
policycoreutils policycoreutils-python-utils smartmontools
sysstat perl-TermReadKey perl-English-1.11-480.el9.noarch --qf
 '%{name}.%{arch}\n'|sort
```

   The command returns:

```
bc.x86_64
binutils.x86_64
```

```
compat-openssl11.x86_64
elfutils-libelf.x86_64
fontconfig.x86_64
gcc.x86_64
glibc-devel.x86_64
glibc.x86_64
ksh.x86_64
libaio.x86_64
libasan.x86_64
libgcc.x86_64
libibverbs.x86_64
liblsan.x86_64
libnsl.x86_64
librdmacm.x86_64
libstdc++.x86_64
libvirt-libs.x86_64
libX11.x86_64
libXau.x86_64
libxcb.x86_64
libxcrypt-compat.x86_64
libXi.x86_64
libXrender.x86_64
libXtst.x86_64
make.x86_64
perl-English.noarch
perl-TermReadKey.x86_64
policycoreutils-python-utils.noarch
policycoreutils.x86_64.
smartmontools.x86_64
sysstat.x86_64
```

The following Oracle patches are required to install the Oracle 19c database on a RHEL9 host for both Standard Edition and Shared Edition licenses. Download these 4 patches from the Veritas Download Center if Oracle is provided by Veritas or from Oracle Support Center if you have your own Oracle license.

- patch 35775632 (p35775632_190000_Linux-x86-64.zip)
- patch 6880880 by selecting the 19.0.0.0.0 release (p6880880_190000_Linux-x86-64.zip)
- 19.20 DBRU Patch 35320081 (p35320081_190000_Linux-x86-64.zip)
- 19.20 DB MLR 35904951 (p35904951_1920000DBRU_Linux-x86-64.zip)

- For RHEL 8, use the following command:

```
rpm -q perl-TermReadKey perl-Data-Dumper binutils glibc libaio
 elfutils-libelf perl-Getopt-Long binutils  gcc gcc-c++
glibc-devel ksh libaio-devel libgcc libstdc++ libXtst
libXrender libstdc++-devel sysstat psmisc bc make libnsl.x86_64
 --qf '%{name}.%{arch}\n'|sort
```

  The command returns:

```
bc.x86_64
binutils.x86_64
elfutils-libelf.x86_64
gcc-c++.x86_64
gcc.x86_64
glibc-devel.x86_64
glibc.x86_64
ksh.x86_64
libaio-devel.x86_64
libaio.x86_64
libgcc.x86_64
libnsl.x86_64
libstdc++-devel.x86_64
libstdc++.x86_64
libXtst.x86_64
libXrender.x86_64
make.x86_64
perl-Data-Dumper.x86_64
perl-Getopt-Long.noarch
perl-TermReadKey.x86_64
psmisc.x86_64
sysstat.x86_64
unzip
```

- For SLES 12 Linux Enterprise, use the following command:

```
rpm -q perl-Term-ReadKey bc binutils glibc glibc-devel libXau6
 libXtst6 libcap-ng-utils libcap-ng0 libcap-progs libcap1
libcap2 libgcc_s1 libpcap1 libpcre1 libpcre16-0 libpng16-16
libstdc++6 libtiff5 libaio-devel libaio1 libXrender1 make mksh
 pixz rdma-core smartmontools sysstat xorg-x11-libs xz unzip
libX11-6 libelf-devel libjpeg-turbo libjpeg62 libjpeg62-turbo
 --qf '%{name}.%{arch}\n'|sort
```

- For SLES 15 Linux Enterprise, user the following command:

```
rpm -q perl-Term-ReadKey bc binutils glibc glibc-devel libXau6
 libXtst6 libcap-ng-utils libcap-ng0 libcap-progs libcap1
libcap2 libgcc_s1 libpcap1 libpcre1 libpcre16-0 libpng16-16
libstdc++6 libtiff5 libaio-devel libaio1 libXrender1 make mksh
 pixz rdma-core rdma-core-devel smartmontools sysstat
xorg-x11-libs xz unzip insserv-compat libX11-6 libXext-devel
libXext6 libXi-devel libXi6 libXrender-devel libelf1 libjpeg8
 libgfortran4 compat-libpthread-nonshared --qf
'%{name}.%{arch}\n'|sort
```

10. Download the application binaries for both the Oracle Database Installer and the Portal Installer from www.veritas.com. Use the instructions provided in the confirmation of your purchase agreement.
11. Troubleshooting User Account Creation: The Portal installation process will create user accounts for Oracle, Portal, Apache and Tomcat. If you are using non-local user management (such as LDAP or NIS) to manage the Linux user accounts, the useradd command may fail to execute successfully. Take the following steps to manually pre-create the required users:

    - Using your normal process of creating user accounts in LDAP, pre-create the user accounts aptare and tomcat with home directories under **/home**.

Application component	User ID	Primary Group	Supplementary Groups
ORACLE	aptare	aptare	dba
TOMCAT	tomcat	tomcat	aptare
APACHE	apache	apache	
PORTAL	aptare	aptare	

Note: You can customize these user group names or create them in advance according to your organization's user management policy. Copy the `config.sh` file inside the ISO mount path to the local system, edit it appropriately, and then pass the absolute path of config.sh to the installer script with -C option.

Example:

```
<Installer_script> -C <path of config.sh>

Itanalyticsinstaller.sh -C /tmp/config.sh
```

- Some environments, particularly virtualized ones, using **automount**, will fail to create the home directories when the **useradd** command is used. In this situation, manually create the **/home/aptare** and **/home/tomcat** directories and **chown** them to aptare and tomcat respectively.
- Verify that the users, groups, permissions, and home directory paths match the values listed in the table above before proceeding.

Considerations:

- The Tomcat user name and Tomcat primary group name must be identical, and the Tomcat supplementary group name must match with Oracle primary group.
- The Oracle user name and Oracle primary group name must be identical.
- The Portal user name must match the Oracle user name, and the Portal primary group name must match the Portal user name.

In modern Linux distributions and some other Unix systems, it is a standard and a recommended practice to have a default primary group created with the same name as the user. This is known as the User Private Group (UPG) scheme. This practice, while not a universal original UNIX standard, is practically a standard in the Linux world (used by default on systems like Red Hat, Debian, and Arch Linux) for several key reasons, such as:

- Enhanced security
- Simplified group collaboration
- Flexibility

12. Troubleshooting script issues: A known issue associated with Security Enhanced Linux (SELinux) may arise when executing scripts that require Java. This results in a permission denied error message. To resolve this issue, configure SELinux to allow the use of shared libraries with text relocation.

    The installer expects the SELinux configuration to be either disabled or permissive.

13. Ensure ports 80/tcp, 8011, and 8017 are open in the firewall for proper functioning of the portal.
14. Ensure that either `ss` or `netstat` command is available on the system.

Step-4: Install Oracle database application binaries

Oracle installer requires sydba privileges to create database and users in it.

This section covers:

1. Prerequisites of the installation.
2. Required Oracle patches to install the binaries on a RHEL9 host
3. Installation of Oracle database application binaries:
   - Install Oracle database binaries for Standard Edition: This is the most common installation, in which you install the database binaries for Cohesity-provided Oracle and you have the Standard license. This involves a single instance of Oracle Standard Edition embedded within the IT Analytics software and is usually installed on the IT Analytics Portal server.
   - Install Oracle database binaries for Shared Service Edition: You need to provide your own Oracle license in this deployment.
4. Installation of Oracle database after installing the Oracle database application binaries.

Prerequisites

Make sure there are no other Oracle database instances installed on the portal server when you check for the following prerequisites:

- Current version of the Oracle 19c Installer binaries
- Absolute path of the Oracle install location
- Absolute path of database install location
- Oracle service name
- Database server IP

Note: Ensure you install the latest Oracle patch during the installation. Get the latest patch from the download site if you are performing installation for a Standard Edition. For Shared Service Edition, see Oracle documentation to obtain the latest patch.

Oracle patches required to install the database on RHEL9 host

The following Oracle patches are required to install the Oracle 19c database on a RHEL9 host for both Standard Edition and Shared Edition licenses. Download these four patches from the Cohesity Download Center if Oracle is provided by Cohesity or from Oracle Support Center if you have your own Oracle license. If you download from Cohesity Download Center, these patches are bundled in a single patchset zip file, for example `itanalytics_dbinstaller_193000-01_SE2_EE_RH9_oracle_patchset_v1.zip`. Unzip this downloaded zip file and extract the four patch files prior to running the installer. Provide the absolute path of the directory containing these Oracle patches wherever prompted by the installer.

- patch 35775632 (`p35775632_190000_Linux-x86-64.zip`)
- patch 6880880 by selecting the 19.0.0.0.0 release (`p6880880_190000_Linux-x86-64.zip`)
- 19.20 DBRU Patch 35320081 (`p35320081_190000_Linux-x86-64.zip`)
- 19.20 DB MLR 35904951 (`p35904951_1920000DBRU_Linux-x86-64.zip`)

Install Oracle database binaries for Standard Edition

Follow this installation provided you plan to use Cohesity-provided Oracle with IT Analytics and you have a Standard edition license.

To install the Oracle database binaries for Standard Edition:

1. Verify that you have the current version of the Oracle 19c installer binaries.
2. Login as **root** on the server where the IT Analytics database will be installed. Typically, this is also the Portal server.
3. Place the ISO image into the `/mnt` directory.
4. Mount the ISO image that you downloaded.

   ```
   mkdir /mnt/diskd

   mount -o loop <itanalytics_dbinstaller_XXXXX_XXX_linux.iso>
   /mnt/diskd
   ```

   Substitute the relevant name of the ISO file that you downloaded in the above command.
5. Enter the following commands to start the installer:

   ```
   cd /
   /mnt/diskd/install_oracle.sh
   ```

6 Press **Enter** to read the entire EULA and the pre-acceptance process will begin.

```
*************************************************************************
*  IT Analytics ORACLE Installer Version 19.3.x.x ()
*************************************************************************
To use this software you must agree to the following terms and
 conditions. Press ENTER to continue:
Enter "accept" to accept these Terms and Conditions
```

7 Enter the absolute path of the directory where you want to install Oracle and press **Enter**.

To install Oracle at the default location (`/opt`), just press **Enter**.

```
Enter the absolute path to install the Oracle 19c database
binaries. Ensure minimum 10.00 GB free space is available at the
 specified location. (Default install location: /opt):
```

8 Enter the absolute path of the directory where you want to install Oracle database and press **Enter**.

To install the database at the default location (`/`), just press **Enter**.

```
Enter the absolute path of the directory where Oracle 19c can
create its database files. This directory must have minimum 110
GB free space and must have the ability to expand as required.
(Default database location: /):
```

9 Enter the Oracle Service name and press **Enter**.

```
Enter the Oracle Service name of the Oracle 19c database instance:
 (default Oracle service name is scdb):
```

10 Enter the database server IP and press **Enter**.

```
Enter IP Address for your database server: (N.N.N.N):
```

11 Verify the details entered for Oracle installation and enter **y** to continue with the installation.

12 This step is required only when you are installing the binaries on a RHEL9 host. The installer prompts to download the required Oracle binaries and provide the absolute path of their location as mentioned below. Since this requirement

is already covered in the prerequisites of this section, you must have the patches already downloaded.

The following Oracle patches are required to install the database. (Download them from Oracle Support.)

- patch 35775632 (`p35775632_190000_Linux-x86-64.zip`)
- patch 6880880 by selecting the 19.0.0.0.0 release (`p6880880_190000_Linux-x86-64.zip`)
- 19.20 DBRU Patch 35320081 (`p35320081_190000_Linux-x86-64.zip`)
- 19.20 DB MLR 35904951 (`p35904951_1920000DBRU_Linux-x86-64.zip`)

The aptare user must have write access to the directory where these patches are downloaded. Enter the absolute directory path where these patches are downloaded.

13 At this step, you can choose to create the database along with the Oracle installation or create it later. Enter **y** to install the database, or else enter **n** when the below message is displayed.

```
Oracle Database xx.x.x is installed. Refer to the Oracle
documentation and apply the latest Critical Patch Updates from
Oracle.
You can create the database as a part of this installation or
create it later using create_itanalytics_database.sh script.
Do you want to create the database as a part of this installation
 (y/n)?
```

This completes the Oracle installation. If the Portal database was not created during the above-mentioned Oracle installation, see Create database after Oracle installation. Database creation is essential for the Portal installation to succeed.

Install Oracle database binaries for Shared Service Edition

Follow this installation provided you already have a licensed Oracle database and you plan to use it as IT Analytics database.

Prerequisites for the installation:

- Download `LINUX.X64_193000_db_home.zip` from *Oracle Download Center*.
- Standard or Enterprise edition Oracle license.
- For the Enterprise Edition license, you must set the environment variable ORACLE_LICENSE_OPTION to EE and export the variable.

```
export ORACLE_LICENSE_OPTION=EE
```

To install the Oracle database binaries for Shared Service Edition:

1. Verify that you have the current version of the Oracle 19c installer binaries.
2. Login as **root** on the server where the IT Analytics database will be installed. Typically, this is also the Portal server.
3. Place the ISO image into the `/mnt` directory.
4. Mount the ISO image that you downloaded.

   ```
   mkdir /mnt/diskd
   ```

   ```
   mount -o loop <itanalytics_dbinstaller_shared-service_linux.iso>
    /mnt/diskd
   ```

   Substitute the relevant name of the ISO file that you downloaded in the above command.
5. Enter the following commands to start the installer:

   ```
   cd /
   /mnt/diskd/install_oracle.sh
   ```

6. Press **Enter** to read the entire EULA and the pre-acceptance process will begin.

   ```
   ************************************************************************
   *  IT Analytics ORACLE Installer Version 19.3.x.x ()
   ************************************************************************
   To use this software you must agree to the following terms and
    conditions. Press ENTER to continue:
   Enter "accept" to accept these Terms and Conditions
   ```

7. Enter the absolute path of the directory where you want to install Oracle and press **Enter**.

   To install Oracle at the default location (`/opt`), just press **Enter**.

   ```
   Enter the absolute path to install the Oracle 19c database
   binaries. Ensure minimum 10.00 GB free space is available at the
    specified location. (Default install location: /opt):
   ```

8 Enter the absolute path of the directory where you want to install Oracle database and press **Enter**.

To install the database at the default location (`/`), just press **Enter**.

```
Enter the absolute path of the directory where Oracle 19c can
create its database files. This directory must have minimum 110
GB free space and must have the ability to expand as required.
(Default database location: /):
```

9 Enter the Oracle Service name press **Enter**.

```
Enter the Oracle Service name of the Oracle 19c database instance:
 (Default Oracle Service name: scdb):
```

10 Enter the database server IP and press **Enter**.

```
Enter IP Address for your database server: (N.N.N.N):
```

11 Verify the details entered for Oracle installation and enter **y** to continue with the installation.

```
The following details will be used for Oracle installation. Please
 verify:
INSTALLATION PATH: /<install-path>
DATABASE DIRECTORY PATH: /
ORACLE SERVICE NAME: scdb
DATABASE IP: N.N.N.N
Continue?  (y/n)
```

12 This step is required only when you are installing the binaries on a RHEL9 host. The installer prompts to download the required Oracle binaries and provide the absolute path of their location as mentioned below. Since this requirement is already covered in the prerequisites of this section, you must have the patches already downloaded.

The following Oracle patches are required to install the database. (Download them from Oracle Support.)

- patch 35775632 (`p35775632_190000_Linux-x86-64.zip`)
- patch 6880880 by selecting the 19.0.0.0.0 release (`p6880880_190000_Linux-x86-64.zip`)
- 19.20 DBRU Patch 35320081 (`p35320081_190000_Linux-x86-64.zip`)
- 19.20 DB MLR 35904951 (`p35904951_1920000DBRU_Linux-x86-64.zip`)

The aptare user must have write access to the directory where these patches are downloaded. Enter the absolute directory path where these patches are downloaded:

13 Enter the absolute directory path containing the Oracle Universal Installer zip file `LINUX.X64_193000_db_home.zip` and press **Enter**

14 At this step, you can choose to create the database along with the Oracle installation or create it later. Enter **y** to install the database, or else enter **n** when the below message is displayed.

```
Oracle Database xx.x.x is installed. Refer to the Oracle
documentation and apply the latest Critical Patch Updates from
Oracle.
You can create the database as a part of this installation or
create it later using create_itanalytics_database.sh script.
Do you want to create the database as a part of this installation
 (y/n)?
```

This completes the Oracle installation in a shared environment. If the Portal database was not created during the above-mentioned Oracle installation, see Create database after Oracle installation below. Database creation is essential for the Portal installation to succeed.

Create database after Oracle installation

To create database after installing Oracle for Standard or Shared Edition:

1 Logon to the Oracle server with your Oracle credentials and run these commands:

```
su - <oracle-user>
```

For example: `su - aptare`

```
/mnt/diskd/create_itanalytics_database.sh
```

2 Type **continue** and press **Enter** when you see the below message.

```
WARNING. WARNING. WARNING.
WARNING. WARNING. WARNING.
WARNING. WARNING. WARNING.
By continuing this script you will be COMPLETELY ERASING YOUR
ENTIRE IT Analytics database. ARE YOU ABSOLUTELY SURE that you
wish to continue (type the word \continue\ to proceed) ?
```

Database is created on the Oracle server.

Create database and users in existing Oracle farm in a Split Architecture deployment

This procedure provides the steps to create database and users in an existing Oracle farm during a Split-Architecture deployment of IT Analytics.

Prerequisites

Table 2-1 Prerequisites for creating database and users in existing Oracle farm

Requirement	Description
Oracle	Version 19c with latest security patches applied.
Pluggable Database (PDB)	■ Create a PDB on central database server. The name can be anything that Oracle supports. Example: scdb or itadb. ■ Ensure 16k block sizes are supported. `SQL> select name, block_size, current_size from v$buffer_pool;`

Create database and users:

1 Create tablespaces specific to IT Analytics.

Tablespace name	Reference commands

aptare_tbs_data_1m	`CREATE TABLESPACE aptare_tbs_data_1m`
	`DATAFILE <datafile path> SIZE 8G`
	`AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED`
	`LOGGING ONLINE PERMANENT BLOCKSIZE 8192`
	`EXTENT MANAGEMENT LOCAL AUTOALLOCATE`
	`DEFAULT`
	`NOCOMPRESS  SEGMENT SPACE MANAGEMENT`
	`AUTO`
	`/`

aptare_tbs_idx_1m	`CREATE TABLESPACE aptare_tbs_idx_1m`
	`DATAFILE <datafile path> SIZE 8G`
	`AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED`
	`LOGGING ONLINE PERMANENT BLOCKSIZE 8192`
	`EXTENT MANAGEMENT LOCAL AUTOALLOCATE`
	`DEFAULT`
	`NOCOMPRESS SEGMENT SPACE MANAGEMENT AUTO`
	`/`

aptare_tbs_data_20m	`CREATE TABLESPACE aptare_tbs_data_20m`
	`DATAFILE <datafile path> SIZE 8G`
	`AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED`
	`LOGGING ONLINE PERMANENT BLOCKSIZE 8192`
	`EXTENT MANAGEMENT LOCAL AUTOALLOCATE`
	`DEFAULT`
	`NOCOMPRESS SEGMENT SPACE MANAGEMENT AUTO`
	`/`

aptare_tbs_idx_10m	`CREATE TABLESPACE aptare_tbs_idx_10m`
	`DATAFILE <datafile path> SIZE 8G`
	`AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED`
	`LOGGING ONLINE PERMANENT BLOCKSIZE 8192`
	`EXTENT MANAGEMENT LOCAL AUTOALLOCATE`
	`DEFAULT`
	`NOCOMPRESS SEGMENT SPACE MANAGEMENT AUTO`
	`/`

Tablespace name	Reference commands

aptare_tbs_data_200m	`CREATE TABLESPACE aptare_tbs_data_200m`
	`DATAFILE <datafile path> SIZE 8G`
	`AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED`
	`LOGGING ONLINE PERMANENT BLOCKSIZE 16K`
	`EXTENT MANAGEMENT LOCAL AUTOALLOCATE`
	`DEFAULT`
	`NOCOMPRESS SEGMENT SPACE MANAGEMENT AUTO`
	`/`

aptare_tbs_idx_100m	`CREATE TABLESPACE aptare_tbs_idx_100m`
	`DATAFILE <datafile path> SIZE 8G`
	`AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED`
	`LOGGING ONLINE PERMANENT BLOCKSIZE 16K`
	`EXTENT MANAGEMENT LOCAL AUTOALLOCATE`
	`DEFAULT`
	`NOCOMPRESS SEGMENT SPACE MANAGEMENT AUTO`
	`/`

aptare_tbs_data_200m_lob	`CREATE TABLESPACE`
	`aptare_tbs_data_200m_lob`
	`DATAFILE <datafile path> SIZE 8G`
	`AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED`
	`LOGGING ONLINE PERMANENT BLOCKSIZE 16K`
	`EXTENT MANAGEMENT LOCAL AUTOALLOCATE`
	`DEFAULT`
	`NOCOMPRESS  SEGMENT SPACE MANAGEMENT`
	`AUTO`
	`/`

aptare_tbs_data_200m_col	`CREATE TABLESPACE`
	`aptare_tbs_data_200m_col`
	`DATAFILE <datafile path> SIZE 8G`
	`AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED`
	`LOGGING ONLINE PERMANENT BLOCKSIZE 16K`
	`EXTENT MANAGEMENT LOCAL AUTOALLOCATE`
	`DEFAULT`
	`NOCOMPRESS SEGMENT SPACE MANAGEMENT AUTO`
	`/`

Tablespace name	Reference commands

aptare_tbs_iot_200m	`CREATE TABLESPACE aptare_tbs_iot_200m`
	`DATAFILE <datafile path> SIZE 8G`
	`AUTOEXTEND ON NEXT 1G MAXSIZE UNLIMITED`
	`LOGGING ONLINE PERMANENT BLOCKSIZE 16K`
	`EXTENT MANAGEMENT LOCAL AUTOALLOCATE`
	`DEFAULT`
	`NOCOMPRESS SEGMENT SPACE MANAGEMENT AUTO`
	`/`

Information on the file system size to be provisioned for the data files is provided in Step-3. See "Step-3: Portal and database prerequisites" on page 16.

2 Create two database schema users: **PORTAL** and **APTARE_RO**.

For **PORTAL** user, assign the password **portal** and for **APTARE_RO** user, assign the password **aptaresoftware123**. You can change these while creating a user with the SQL query below.

```
CREATE USER PORTAL
    PROFILE DEFAULT
    IDENTIFIED BY portal
    DEFAULT TABLESPACE aptare_tbs_data_1m
    TEMPORARY TABLESPACE aptare_temp_tbs
    ACCOUNT UNLOCK;


CREATE USER APTARE_RO
    IDENTIFIED BY aptaresoftware123
    DEFAULT TABLESPACE APTARE_TBS_DATA_1M
    TEMPORARY TABLESPACE APTARE_TEMP_TBS;
```

3 Create the following required database directories with the required permissions:

```
CREATE OR REPLACE DIRECTORY UNIX_DIR AS '/u01/aptare/database';
CREATE OR REPLACE DIRECTORY LOGFILE_DIR AS '/tmp';
GRANT READ,WRITE ON DIRECTORY UNIX_DIR to portal;
GRANT READ,WRITE ON DIRECTORY LOGFILE_DIR to portal;
```

Note that he folder path on the database server filesystem can be changed to other path as well.

4 Grant the following privileges to the respective user schema:

User-specific Schema	Grants required for the schema

APTARE_RO	`GRANT CONNECT TO aptare_ro;`
	`GRANT CREATE ANY CONTEXT TO aptare_ro;`
	`GRANT CREATE SYNONYM TO aptare_ro;`

PORTAL	`GRANT CONNECT TO PORTAL;`
	`GRANT RESOURCE TO PORTAL;`
	`GRANT CREATE TABLESPACE TO PORTAL;`
	`GRANT UNLIMITED TABLESPACE TO PORTAL;`
	`GRANT QUERY REWRITE TO PORTAL;`
	`GRANT SELECT_CATALOG_ROLE TO PORTAL;`
	`GRANT SELECT ANY DICTIONARY TO PORTAL;`
	`GRANT CREATE ANY LIBRARY TO PORTAL;`
	`GRANT SELECT ON dba_free_space TO PORTAL;`
	`GRANT SELECT ON dba_data_files TO PORTAL;`
	`GRANT SELECT ON dba_temp_files TO PORTAL;`
	`GRANT CREATE SESSION, CREATE ANY CONTEXT TO PORTAL;`
	
	Statement to execute the dbms_session package:
	
	`GRANT EXECUTE ON DBMS_SESSION TO PORTAL;`
	`GRANT EXECUTE ON DBMS_LOCK TO PORTAL;`
	
	Statement to execute the dbms_utility package
	
	`GRANT EXECUTE ON DBMS_UTILITY TO PORTAL;`
	`GRANT CREATE VIEW TO PORTAL;`
	`GRANT CREATE TABLE TO PORTAL;`
	
	Statement to create materialized views
	
	`GRANT CREATE MATERIALIZED VIEW TO PORTAL;`

User-specific Schema	Grants required for the schema
	Statement to set up the logging directory `GRANT CREATE ANY DIRECTORY TO PORTAL;`

	Statement to add for Oracle 19c
	`GRANT CREATE JOB TO PORTAL;`
	`GRANT EXECUTE ON DBMS_SCHEDULER TO PORTAL;`

	Statement to add security
	`GRANT EXECUTE ON SYS.DBMS_LOB TO PORTAL;`
	`GRANT EXECUTE ON SYS.UTL_FILE TO PORTAL;`
	`GRANT EXECUTE ON SYS.DBMS_RANDOM TO PORTAL;`
	`GRANT EXECUTE ON SYS.DBMS_JOB TO PORTAL;`
	`GRANT EXECUTE ON SYS.DBMS_SQL TO PORTAL;`
	`GRANT READ ON SYS.ALL_DIRECTORIES TO PORTAL;`
	`GRANT READ ON SYS.DUAL TO PORTAL;`

	Statement to enable FIPS compliance `GRANT EXECUTE ON DBMS_CRYPTO TO PORTAL;`

5 To install IT Analytics with a custom password:

- Copy the `config.sh` file to a local directory on the Portal server so that files can be edited.

```
# mount -o loop itanalytics_installer_11400_linux.iso
/mnt/diska
# mkdir /tmp/portal
# cp  /mnt/diska/config.sh /tmp/portal
```

- Update **PORTAL** and **APTARE_RO** user passwords in `/tmp/portal/config.sh`.

Note: If you are using customized password for **PORTAL** and **APTARE_RO** database users during a fresh IT Analytics Portal installation, exclude special characters like **&**, **?**, ****, **<**, **>**, **!** from the passwords.

```
ORACLE_PORTAL_SEC_CODE=<password for PORTAL user>
ORACLE_APTARE_RO_SEC_CODE=<password for APTARE_RO user>
```

- Run the Portal installer `Itanalyticsinstaller.sh`.

  ```
  /mnt/diska/Itanalyticsinstaller.sh -C /tmp/portal/config.sh
  ```

- Follow the step-4 onwards described in Install Portal binaries where Oracle application binaries are deployed on a separate machine section on a separate machine to deploy the Portal binaries.

6 To install IT Analytics with a default password, follow the step-3 onwards described in Install Portal binaries where Oracle application binaries are deployed on a separate machine section on a separate machine to deploy the Portal binaries.

Step-5: Install the Portal application binaries (Linux)

This section covers the installation of the Portal application binaries. The Portal binaries are installed on the same server as the Oracle database binaries when you install the Standard edition of IT Analytics , which is the most common install. With Shared Service edition, it is possible to install Oracle on the same server as the Portal server (recommended) or install Oracle on a separate server from the Portal. Installing Oracle on a server remote from the Portal server is called Split Architecture.

Typically, the Portal binaries are installed on the same server as the Oracle database binaries. In some cases, a separate server may be designated.

The absolute install path of Portal is represented as `<install_path>`. Substitute `<install_path>` with the absolute path of the Portal or Oracle database installation as applicable. If Oracle or the Portal is installed on the default path, substitute by `/opt` which is the default path.

This section includes steps to:

- Install Portal application binaries on the same server where Oracle binaries are installed
- Install Portal binaries where Oracle application binaries are deployed on a separate machine

Prerequisites

- IT Analytics Portal installer ISO (obtained from the download site)

- IP address of the server on which you are installing the Portal binaries
- IP address of the Oracle server
- Oracle server listener port number

Install Portal application binaries on the same server where Oracle binaries are installed

To install the Portal binaries where Oracle is installed:

1. Login as **root** on the server where IT Analytics Portal will be installed. In this case, this is the same server where you have installed the Oracle binaries.
2. Mount the ISO image that you downloaded.

   ```
   mkdir /mnt/diska

   mount -o loop <itanalytics_installer_xxxxx_linux.iso> /mnt/diska
   ```

   Substitute the relevant name of the ISO file that you downloaded in the above command.
3. Start the installer:

   ```
   /mnt/diska/Itanalyticsinstaller.sh
   ```

4. Determine what Portal server configuration you are deploying.

   Confirm whether you want your current server to function as the Portal web server. Enter **y** to continue.

   ```
   A complete log of this session is in this file
   <install_path>/aptare/logs/install/Itanalyticsinstaller_xxxx.log
   ****************************************************************

    IT Analytics Installer Vers 11.8
   ****************************************************************
   Revision 11.8.xx.xxxxxxxxxxxxxxxxx build xxxxxxxx-xxxx

   IT Analytics requires a Web Server and a Database server.
   They can be on separate machines or on same machine.
   This script will only install the Web Server components.
   Will this machine be the Web Server (y/n)?
   ```

5. Enter **y** to confirm you have mounted the installer ISO.

   ```
   IT Analytics ISO:  IT Analytics Portal Software
   Do you have this ISO (y/n)?
   ```

6 The End User License Agreement (EULA) is displayed. Type **accept** (all lowercase) and press**Enter**.

7 Enter your domain name.

Make a note of this domain value since you are required to provide this value during the installation of the Data Collector components that collect data from the servers in your enterprise.

From here on, `yourdomain` represents your full domain name, including its suffix such as .com or .net. (Example: companyabc.com will be represented as `yourdomain`.)

Note: The domain name value you enter here determines the URL that will be used to login to the IT Analytics Portal. For example, if you enter **companyabc.com**, you Portal URL will be **http://itanalyticsportal.companyabc.com**.

```
We need to configure machine names and IP addresses for the
Portal, Agent, and database server.
The portal and agent machines will be called
itanalyticsportal.yourdomain and itanalyticsagent.yourdomain
Enter your domain name: (yourdomain)
```

Make sure the domain name displayed in parentheses is correct before you press **Enter**.

8 Validate the system's IP address for the Portal.

```
Enter IP Address for itanalyticsportal.yourdomain: (N.N.N.N)
```

9 Confirm the entered IP addresses

```
You have entered:
Hostname                      IP Address
itanalyticsportal.yourdomain N.N.N.N
itanalyticsagent.yourdomain  N.N.N.N
database server              N.N.N.N
Is this correct (y/n)?
```

10 Confirm changes to be automatically made to `/etc/hosts`.

```
These names will be set up in /etc/hosts.
You can remove the entries and add them to your local DNS later.
Would you like to add them to /etc/hosts (y/n)?
```

11 Choose whether to run the database creation script. This avoids the manual step of running `create_itanalytics_database.sh` later.

```
You can create the Database schema as a part of this installation
 or create it later using create_itanalytics_database.sh script.

Do you want to create the Database schema as a part of this
installation (y/n)?
```

12 After specifying your choice, press **Enter** .

Java and Apache software components are installed irrespective of your choice specified for the database schema. Tomcat Java Servlet Engine is installed as apart of this installation and it may take 1-2 minutes to execute.

This completes the installation of theIT Analytics Portal. If you have not installed the database schema during the above procedure, see Install database schema.

Install Portal binaries where Oracle application binaries are deployed on a separate machine

Make sure that you have created the database and users in the existing Oracle farm when Oracle binaries are deployed on a separate system.

See " Create database and users in existing Oracle farm in a Split Architecture deployment" on page 33.

To install portal application binaries where Oracle application binaries are deployed on a separate host machine:

1 Login as **root** on the server where IT Analytics Portal will be installed. This is a different server from where you installed the Oracle binaries.

2 Mount the ISO image that you downloaded.

```
mkdir /mnt/diska

mount -o loop <itanalytics_installer_xxxxx_linux.iso> /mnt/diska
```

Substitute the relevant name of the ISO file that you downloaded in the above command.

3 Start the installer:

```
/mnt/diska/Itanalyticsinstaller.sh
```

4 Determine what Portal server configuration you are deploying.

Confirm whether you want your current server to function as the Portal web server. Enter **y** to continue.

```
A complete log of this session is in this file
/<install_path>/aptare/logs/install/aptareInstaller_xxxxxxxxxx.log
****************************************************************
* IT Analytics Intaller Vers 11.8
****************************************************************
Revision 11.8.xx.xxxxxxxxxxxxxxxxx build xxxxxxxx-xxxx

IT Analytics requires a Web Server and a Database server.
They can be on separate machines or on same machine.
This script will only install the Web Server components.
Will this machine be the Web Server (y/n)?
```

5 Enter **y** to confirm you have mounted the installer ISO.

```
IT Analytics ISO: IT Analytics Portal Software
Do you have this ISO (y/n)?
```

6 The End User License Agreement (EULA) is displayed. Type **accept** (all lowercase) and press**Enter**.

7 Enter the absolute path of IT Analytics Portal install location.

```
Enter the absolute installation path of IT Analytics Portal on
this system. (Default install location: /opt):
```

8 Provide the IP address, SID, Service name, and listener port number of the Oracle server.

```
Oracle 19c Database server is not available on this system. Enter
 the following details of the database deployed on remote system.
Oracle database server IP address:
Oracle database SID (Default Oracle SID: scdb):
Oracle database Service name (Default Oracle Service name: scdb):
Oracle database listener port. (Default Oracle listener port:
1521):
```

9 Verify Oracle database server details.

```
The following details will be used to connect Oracle server,
please verify:
ORACLE SERVER IP ADDRESS: N.N.N.N
ORACLE SID: xxx
ORACLE SERVICE NAME: xxx
ORACLE LISTENER PORT: xxx
Continue?  (y/n)
```

10 Enter your domain name.

Make a note of this domain value since you are required to provide this value during the installation of the Data Collector components that collect data from the servers in your enterprise.

From here on, `yourdomain` represents your full domain name, including its suffix such as .com or .net. (Example: companyabc.com will be represented as `yourdomain`.)

Note: The domain name value you enter here determines the URL that will be used to login to the IT Analytics Portal. For example, if you enter **companyabc.com**, you Portal URL will be **http://itanalyticsportal.companyabc.com**.

```
We need to configure machine names and IP addresses for the
Portal, Agent, and database server.
The portal and agent machines will be called
itanalyticsportal.yourdomain and itanalyticsagent.yourdomain
Enter your domain name: (yourdomain)
```

Make sure the domain name displayed in parentheses is correct before you press **Enter**.

11 Validate the system's IP address for the Portal.

```
Enter IP Address for itanalyticsportal.yourdomain: (N.N.N.N)
```

12 Confirm the entered IP addresses.

```
You have entered:
Hostname                      IP Address
itanalyticsportal.yourdomain N.N.N.N
itanalyticsagent.yourdomain  N.N.N.N
database server              N.N.N.N
Is this correct (y/n)?
```

13 Confirm changes to be automatically made to `/etc/hosts`.

```
These names will be set up in /etc/hosts.
You can remove the entries and add them to your local DNS later.
Would you like to add them to /etc/hosts (y/n)?
```

14 Choose whether to run the database creation script. This avoids the manual step of running `create_itanalytics_schema_objects.sh` later.

```
You can create the Database schema as a part of this installation
 or create it later using create_itanalytics_database.sh script.

Do you want to create the Database schema as a part of this
installation (y/n)?
```

15 After specifying your choice, press **Enter** .

Java and Apache software components are installed irrespective of your choice specified for the database schema. Tomcat Java Servlet Engine is installed as apart of this installation and it may take 1-2 minutes to execute.

This completes the installation of theIT Analytics Portal. If you have not installed the database schema during the above procedure, see Install database schema.

Install database schema

You can use this command to install database schema in Portal and Oracle installations on same or separate machines.

Login as Oracle user on the Portal server and run these commands:

```
su - aptare
<mount-point>/create_itanalytics_schema_objects.sh -h <Oracle database
 server IP address> -p <Oracle database listener port>
```

Step-6: Start the Portal services (Linux)

Prior to installing the license key, you must start the Portal services to ensure that the installation was successful. You will not be able to log into the Portal yet, because you haven't installed the license key.

As user root, at the command line, enter this command: `systemctl start aptare`

This starts all the services required for IT Analytics that includes:

- Oracle
- TNS listener
- Portal Tomcat instance
- Agent Tomcat instance
- Apache

Step-7: Log into the Portal

Log into the Portal (http://itanalyticsportal.yourcompany.com) with your username as <admin@yourcompany.com>. The Portal has an initial default password **P@ssw0rd**. You must change this password after your first login.

Note: The default password contains a zero, not an uppercase O.

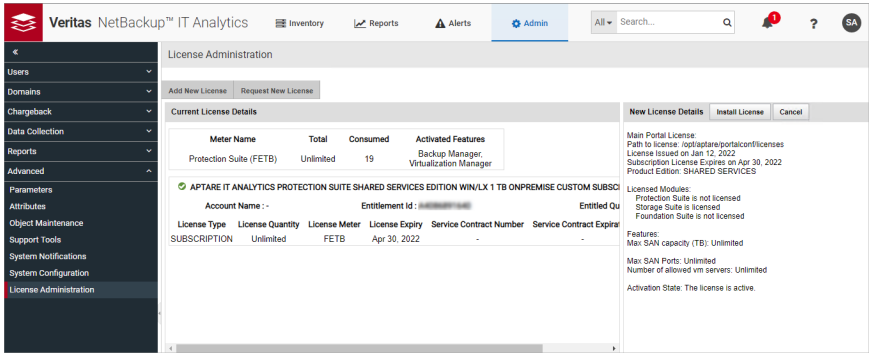
Step-8: Install a license

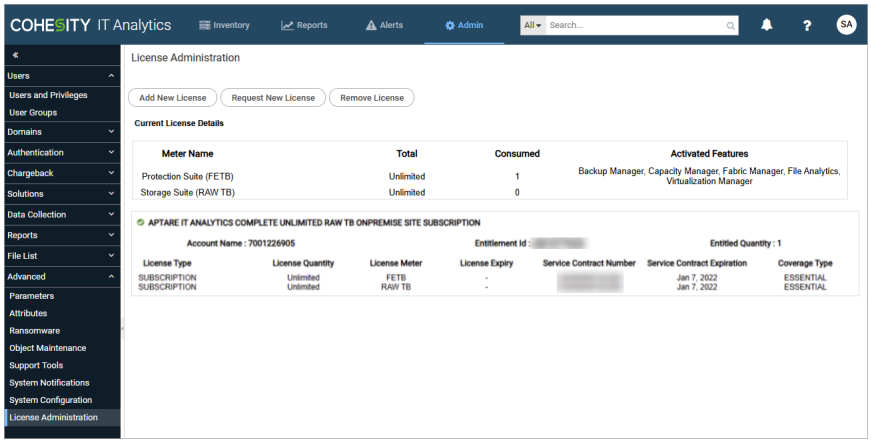
Use the procedures listed in this section to install the Portal license. Your login credentials must be assigned the Super User role.

As a best practice, install your license directly through the Portal. Instructions for the command-line installation practices are available.

To install a license:

1. Receive the new license file and save the new license file on your Portal server and complete the subsequent steps.
2. Upload the New License
   - Navigate to **Admin > Advanced > License Administration**. The Portal displays your current license details.
   - Click **Add New License**.
   - Browse to locate the license file on your Portal server and click **OK**.





3 Verify the License Installation.

If you have issues with license installation, try uploading the license file again to overwrite the previous one.

Note: After you apply a new license or when you remove an existing license, the Portal takes about 30 seconds to display the changes.

Verify the current license configuration

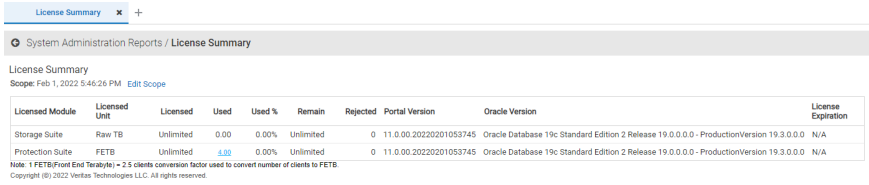
As a Super User, there are a number of ways that you can validate your current license configuration:

- Run the License Summary report in the Portal.
  See "Run the License Summary report " on page 49.

- Click Help About in the Portal.
  See “About IT Analytics version and license” on page 49.
- View the License Details.
  See “View License Details ” on page 50.

Run the License Summary report

1. Log into the Portal as a Super User.
2. Search for License Summary.
3. Generate the **License Summary** report.



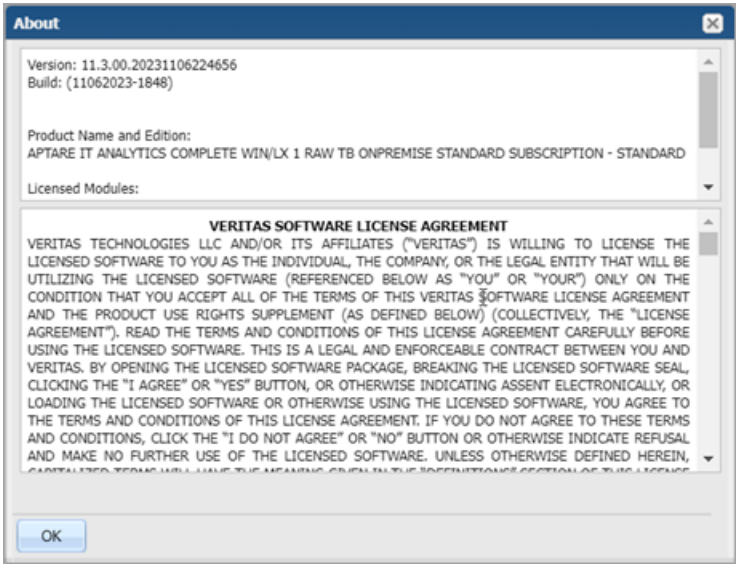
Using this report, you can drill down to additional details about counted objects.

About IT Analytics version and license

Log in to the Portal as a Super User and in the Portal toolbar, select:

Help > **About**

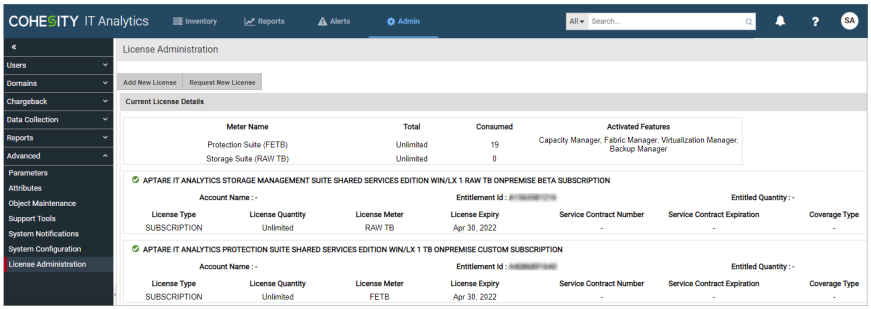
The license details are displayed.



Note: Users without Super User privileges cannot view the license configuration details. Only the end user license agreement is displayed.

View License Details

View license details--that is, the specific capabilities that are associated with the license that was purchased for your environment by navigating to **Admin** > **Advanced** > **License Administration**. Your current license details are displayed.



Next steps

After completing the Portal installation:

1. The best practice is to perform a cold backup of the Oracle database before you make the Portal operational use. This will save a copy for restore in the event of an accidental data loss.
2. Add a Data Collector on the Portal and install the Data Collector software on the Data Collector server. Refer to the Data Collector installation guide relevant to the workload from which you wish to derive data.

Data Collector installation guides:

- IT Analytics Data Collector Installation and Configuration Guide for Veritas NetBackup
- IT Analytics Data Collector Installation and Configuration Guide

Perform a cold backup of the database

Prior to deploying the Portal for operational use, perform a cold backup of the Oracle database. This offline, cold backup simply means that you will physically copy or back up the files to another location. This cold backup will simplify the restore process, in the event of unanticipated data loss. With a cold backup, you simply have to restore the files and then import the most recent database export. In addition to this initial cold backup, you may consider performing a cold backup periodically--for example, after a significant software upgrade--to re-capture the database schema.

Recommended database backup process

1. Cold Backup
2. Daily Exports of the database
3. In the event of data loss, restore the database and then import the most recent database export.

Chapter 3

Upgrade IT Analytics Portal on Linux

This chapter includes the following topics:

- Overview
- Upgrade path
- Before upgrading
- Upgrade IT Analytics Portal
- Data Collector upgrades
- Troubleshoot - Downgrade of Data Collector is not supported
- Troubleshoot - Manual Data Collector upgrades
- Troubleshoot Data Collector upgrade manager upgrade failure and collector bundle download failure on Linux
- Collector updates from the IT Analytics Portal

Overview

If you are upgrading IT Analytics Portal to 11.8 and later, you must have Oracle 19c installed. Having installed Oracle 19c, you only require to upgrade the IT Analytics Portal. See "Upgrade IT Analytics Portal" on page 55.

While upgrading to version 11.8 or later for the first time:

- The upgrade also succeeds using evaluation license.
- The upgrade utility can accept more than one licenses during the upgrade.

- The upgrade utility compares the used capacity with the entitled capacity of the new license. If the entitled capacity is less than the used capacity, it displays a warning, but continues with the upgrade. However, you must comply with the Cohesity licensing guidelines to access all the features of the IT Analytics Portal.

For complete details about system requirements and upgrading, refer to the *Certified Configurations Guide*. Separate upgrade instructions are provided for Windows and Linux with the assumption that the Portal and database components are installed on the same server.

Upgrade path

The Portal must be running a minimum of version 11.6 to upgrade to IT Analytics 11.8. For complete details about system requirements and upgrading, refer to the *IT Analytics Certified Configurations Guide*. In addition, Oracle 19c is required for IT Analytics 11.8.

Before upgrading

- License mechanism has been changed in IT Analytics 10.6 to Cohesity Standard Licensing method. To upgrade to version 10.6 or later, you must obtain a new license key with matching entitlement prior to the upgrade. Ensure the new license entitlements are equal or greater than the installed license for the upgrade to succeed. See *IT Analytics Licensing Guide* for more information.
- Ensure that you have a valid system backup. For additional information refer to the *System Administrator Guide*. Prior to executing the upgrade utility:
  - A cold backup of the Portal / Database server(s) file systems.
  - A backup of the file systems containing the Oracle database (typically /data01-06 on Linux) is only valid if it was taken while Oracle was completely shut down.

    Note: The portal upgrader prompts you that a mandatory cold backup is required and you are required to acknowledge that it was completed before your proceed.

  - An export of the database.
- If you have installed any patches on your present IT Analytics version, check the Release Notes to verify that they are included in this release. If you are uncertain, check with the Cohesity Support. In most cases, previously installed patches are included in this release.

- Verify that the libXtst.so.6 libraries are installed.
- In the Portal, verify that the Data Collectors are set for automatic updates. This setting triggers the automatic download of updated application logic to the Data Collectors in your enterprise. This download is required to ensure the Data Collectors are running with the latest compatible version. Refer to the vendor-specific Data Collector Installation Guide for additional information about Data Collectors.
  See "Data Collector upgrades" on page 63.
- The Portal and Database components should be installed on the same server.
- Identify the Java Version on the Data Collector Server and ensure that a 64-bit server is used for the Data Collector Server.
- Portal upgrades automatically enable privileges for newly added reports and certain features/functions, for all Administrators. This does not impact previously configured privileges. The Super User can manually revoke any Administrator privileges that have been automatically enabled.
- Before upgrading to 10.6 or later for the first time, generate a new Cohesity license with `.slf` extension having equal or more entitlement than the currently installed license. This license file will be required during the upgrade.
- If upgrading to version 11.8 in a Shared Service environment, an additional database privilege should be provided using the following command.

  ```
  su - aptare
  sqlplus / as sysdba
  alter session set container = scdb;
  ```
  or IT Analytics database Service name if not 'scdb'
  ```
  GRANT EXECUTE ON DBMS_CRYPTO TO PORTAL;
  ```

  Note: Not providing the privilege on a limited access environment can cause upgrade failure.

- While upgrading from v11.3 to a higher version, if the password of the Java Development Kit (JDK) truststore located at `/usr/java/lib/security/cacerts` was changed in the interim, you must update the new password in the `portal.jdk.trustStore.password` parameter.
  Go to **Admin** > **System Configuration** > **Custom** on the Portal and edit the `portal.jdk.trustStore.password` parameter to update its value.
- Ensure a minimum of 15 GB of space is available.
- To help ensure a smooth and successful upgrade, run the utility **preUpgradeCheck.sh**. This script performs important system checks before

the upgrade begins and is built into the main upgrade tool (upgrade.sh) used for IT Analytics upgrades. Before you run this script, make sure to set the APT_DB_PASSWORD environment variable with your database password of Portal user. This is required for the checks to work properly. You can automate the running of this utility before starting the upgrade. The utility is available at:

- `/opt/aptare/upgrade/preUpgradeCheck.sh`
- `/opt/aptare/utils/preUpgradeCheck.sh`

Example:

```
export APT_DB_PASSWORD=your_db_password
./preUpgradeCheck.sh
```

Upgrade IT Analytics Portal

Download the IT Analytics Portal upgrade utility installer for Linux and copy it to the portal server before you proceed with the next steps.

Upgrade a shared services environment

In a shared services environment, where the connect as sysdba privilege is not present, you must provide a CREATE SYNONYM privilege to the APTARE_RO user before upgrading. APTARE_RO is a read-only user for the Portal.

Unless this privilege has been deliberately revoked, this step is mandatory for an upgrade. If this privilege is not granted, errors in the upgrade script will occur and functionality within the SQL Template Designer will be impacted.

The absolute install path of Portal is represented as `<install_path>`. Substitute `<install_path>` with the absolute path of the Portal installation as applicable. If the Portal is installed on the default path, substitute by `/opt` which is the default path.

Note: If the portal is configured with non default APTARE and Tomcat users, update the users in `/<install_path>/aptare/upgrade/ant/sc_upgrader.xml` before executing `/<install_path>/aptare/upgrade/upgrade.sh`

---

1. Log in with root access.
2. Stop the portal and data receiver Tomcat services.
3. At the command line, execute the following commands:

   ```
   su - aptare
   ```

```
sqlplus / as sysdba

SQL >GRANT CREATE SYNONYM TO APTARE_RO;
```

In a shared services environment, where the connect as sysdba privilege is not present, you must provide a CREATE JOB and DBMS_SCHEDULER privilege to the PORTAL user before upgrading.

Note: Unless this privilege has been deliberately revoked, this step is mandatory for an upgrade. If this privilege is not granted, errors in the upgrade script will occur and functionality for Oracle jobs will be impacted.

---

1. Log in with root access.
2. Stop the portal and data receiver Tomcat services.
3. At the command line, execute the following commands:

```
su - aptare

sqlplus / as sysdba

SQL > GRANT CREATE JOB TO PORTAL;

SQL > GRANT EXECUTE ON DBMS_SCHEDULER TO PORTAL;
```

Run the upgrade utility installer (Linux)

The absolute install path of Portal is represented as `<install_path>`. Substitute `<install_path>` with the absolute path of the Portal installation as applicable. If the Portal is installed on the default path, substitute by `/opt` which is the default path.

If you have configured a custom OS user or a group for Oracle or portal, instead of the default users or groups:

- Update the OS user and group details in the environment file `/<install_path>/aptare/bin/aptare_env.sh`.
- Ensure environment variables for Oracle, such as ORACLE_HOME, ORACLE_SID, PATH, LD_LIBRARY_PATH are set appropriately in `/<install_path>/aptare/bin/aptare_env.sh` and are exported correctly.
- Update `/<install_path>/aptare/upgrade/ant/sc_upgrade.xml` with appropriate values for the custom OS user or group for Oracle and portal.

If you have the portal running with shared services and Oracle parameters such as service name and port are different than the default configuration, the upgrade utility installer will detect the parameters from the portal configuration file.

The following instructions assume you have the specific upgrade installer file for just your platform. You must perform these steps as a root user on the Linux system.

To mount the utility installer ISO:

1 Mount the ISO image that you have downloaded on the server by entering the following commands. Replace *xxxx* with the relevant ISO file name.

```
mkdir /mnt/diska
mount -o loop <sc_upgrader_xxxx_linux.iso> /mnt/diska
```

```
mkdir /mnt/diska
mount -o loop <itanalytics_upgrader_xxxx_linux.iso> /mnt/diska
```

Note: The portal upgrader prompts you that a mandatory cold backup is required and you are required to acknowledge that it was completed before your proceed.

Example message:

```
***************************************************************************
IT Analytics Upgrade Utility Installer 11.7.00
***************************************************************************
Revision 11.7.00.20250827161815 build 08272025-1233

To use this software you must agree to the following terms and
conditions.
Enter "accept" to accept these Terms and Conditions: accept
***************************************************************************




Before Upgrading IT Analytics: Mandatory cold (file system) backup
***************************************************************************

To prevent data loss in the event of unexpected issues during the
 upgrade, you must create a recent cold (file system) backup of
the IT Analytics application and its database.

Steps to Perform a Cold Backup:

   1. Shutdown IT Analytics application
   2. Back up the file system and Oracle data files using your
preferred backup software or the cp command.

     NOTE:
```

```
    By default, IT Analytics files are located in the following
 directories on Linux:
    /opt, /data01, /data02, /data03, /data04, /data05 and
/data06.

For detailed instructions on backup and restores procedures, refer
 to the IT Analytics System Administrator Guide (see the section:
 Backing up and restoring data).
***********************************************************************

Ready to Proceed?

If you have completed the cold backup and are ready to continue
with the upgrade, type: PROCEED
If you have not completed the backup or wish to exit, type: EXIT

Proceed with IT Analytics Upgrade:  (PROCEED/EXIT)
```

2 Run the installer with the following commands:

```
cd /
/mnt/diska/portal_upgrader.sh
```

Caution: IT Analytics no longer supports data collection from Compute Resources policy and NetBackup Resources Monitor probe of the NetBackup policy. Existing policies and scheduled probes will be removed with this upgrade. Previously collected data will be retained in the database. You can ignore this caution if you have not configured the Compute Resource policy or the Resource Monitor probe in your older version.

---

3 Follow the instructions to complete the installation.

Known issues

- A known issue associated with Security Enhanced Linux (SELinux) may arise when executing scripts that require Java. This results in a permission denied error message. To resolve this issue, configure SELinux to enable Java processes to run. Consult the operating system documentation.
- When upgrading to release version 10.x.xx, the date format defaults to the Portal operating system locale, and ignores any previous configuration in the `portal.properties` file.

Run the upgrade utility

The following instructions assume that the Portal and Database components reside on the same server.

Note: The absolute install path of Portal is represented as `<install_path>`. Substitute `<install_path>` with the absolute path of the Portal installation as applicable. If the Portal is installed on the default path, substitute by `/opt` which is the default path.

---

1. Verify your current IT Analytics version. You must be currently running IT Analytics version 10.4.00 or greater.
2. Verify that the libXtst.so.6 libraries are installed.
3. Ensure that all IT Analytics application services are up and running. Next, as user **root** run the following command and respond to the prompts accordingly.

   ```
   sh /<install_path>/aptare/upgrade/upgrade.sh
   ```

   - While upgrading to 10.6 or later for the first time, the upgrade utility prompts for a new license file with `.slf` extension. You must have equal or more entitlement than the currently consumed license capacity.
     For information on license generation and installation, see *IT Analytics Licensing Guide*.
   - If there are errors during the upgrade, the following banner is displayed:
     ##
     # WARNING WARNING WARNING WARNING WARNING #
     # Possible problems were encountered during the upgrade. #
     # Please check the log file /<install_path>/aptare/upgrade/logs/upgrade.log #
     # for errors and contact Customer Support if necessary. #
     ##
   - If the `upgrade.log` or the console output of upgrade shows error strings like “ORA-12537: TNS:connection closed” or “SP2-0640: Not connected”, this indicates that Oracle Database or Oracle Listener are not in running state. Ensure Oracle Database Service and Oracle Listener services are in running state and again run the upgrade script.
4. If the upgrade process encountered any errors, save a copy of the log file for any correspondence with the Cohesity Support. You can find the upgrade log file in the following location:

   ```
   /<install_path>s/aptare/upgrade/logs/upgrade.log
   ```

Note that:

- If you have installed any patches on your present IT Analytics version, please check the Release Notes to verify that they are included in this release. If you are uncertain, please check with the Cohesity Support. In most cases, previously installed patches are included in the current release.
- If your upgrade fails because of an Apache version conflict, contact Cohesity Support for instructions and a link to download a new version.

After the upgrade

Clear the Portal's browser cache after upgrading. This helps avoid browser display issues after the upgrade.

Upgrade methods to incorporate enterprise objects

During a Portal upgrade, all Dynamic Template Designer Methods will be modified to associate a method with an enterprise object (such as an array or host), rather than the method being associated with a IT Analytics product (such as Capacity Manager).

The upgrader automatically makes the necessary changes, which may result in the following considerations:

- If the upgrader encounters a method that could apply to multiple enterprise objects (for example, a backup method that is relevant for both a Data Domain and a Job enterprise object), the upgrader makes a copy of the method with an Upgrade label append to the method name. This new version of the method has a populated enterprise object field so that your reports won’t fail. Note that the WITH clause alias in this new version will still reference the old name, but this will not cause reports to fail. You can modify this to make the method accurate, however, this modification is not required.
- Once upgraded, some methods may have a null value for the enterprise object. For example, a method that was created for Virtualization Manager does not have a corresponding supported enterprise object (Data Domain, Host, Job, or Storage Array). If such a method is found by the upgrader and the method is in use by a Dynamic Template, the upgrader implicitly assumes the enterprise object for the template is relevant and populates the enterprise object field accordingly. However, if the method currently is not in use, the enterprise object field remains null.
- Upgraded methods that result in null enterprise object values can be identified by viewing the list of methods: Tools > Templates > Method Designer.

- To use a method in a Dynamic Template, the enterprise object field must be populated. Therefore, when you modify and save a method (Save/Save as), you will be prompted to select an enterprise object.

Data Collector upgrades

For performance reasons, do not install Data Collectors on the same server as the IT Analytics Portal. However, if you must have both on the same server, verify that the Portal and Data Collector software do not reside in the same directory.

Mandatory prerequisites

- Do not use downloadlib.[sh|bat] to upgrade the binaries on the Data Collector. Initiate the Data Collector upgrade from the IT Analytics Portal.

Troubleshoot - Downgrade of Data Collector is not supported

Downgrade of Data Collector is not supported. When the Data Collector downgrade fails, ensure one of the below step is performed:

- Uninstall and reinstall the Data Collector to version that is compatible with the IT Analytics version on the Data Collector server.
  For example: If the Portal version is 11.4.01 and the Collector version is 11.5, uninstall the 11.5 Collector version and install either 11.4.01 or lower version for the collector for upgrade to be successful.
- Upgrade the Portal server to the current Data Collector version or higher version.
  For example: If the Portal version is 11.4.01 and the Collector version is 11.5, upgrade the Portal to either 11.5 version or higher, on the Portal server.

Troubleshoot - Manual Data Collector upgrades

If the Data Collector fails after completing the previous requirements and prerequisites, perform the following:

On the Collector Server:

1. Kill all running IT Analytics-related Java processes.
2. Start the Agent Service
   - If it starts and continues to run, proceed to the following section.
     See "Collector updates from the IT Analytics Portal" on page 68.

3. If the APTARE Agent Service does not continue to run, verify no IT Analytics-related Java processes are running. If required, kill all running IT Analytics-related Java processes.
   - Restart the Collector Server, if the Java processes cannot be killed manually. Prior to restarting the server, disable the automatic start of the APTARE Agent Service.
4. Rename <APTARE_HOME>/java to java.old.
5. Copy <APTARE_HOME>/upgrade/staging/snapshot/java to <APTARE_HOME>/
6. Enable the automatic start of Agent service, if you previously disabled the service.
7. Start the Agent Service.

   See “Collector updates from the IT Analytics Portal” on page 68.

Troubleshoot Data Collector upgrade manager upgrade failure and collector bundle download failure on Linux

IT Analytics Data Collector software includes two components - Upgrade Manager and Data Collector.

When IT Analytics Portal is upgraded successfully to a newer version, the subsequent Data Collector upgrade may fail with errors like "Collector bundle download failed for 11.8 Premature EOF" or "Upgrade Manager upgrade failed. Exception is : Premature EOF". These errors indicate that upgrade bundle could not be downloaded successfully on to the Data Collector server due to slow network/low bandwidth.

Prerequisites to troubleshoot

You must have access to:

- Data Collector server and Portal server.
- Permissions to copy files from and to Data Collector server and Portal server.

Notation used in the steps below

Table 3-1 Notations used in the code snippets

Notation	Description
<PORTAL_APTARE_HOME>	Path of Portal installation. Default value for Linux Portal: `/opt/aptare`
<DC_APTARE_HOME>	Path of Data Collector installation. Default value for Linux : `/usr/openv/analyticscollector`
<version>	Version of the IT Analytics Portal.

You can troubleshoot upgrade manager upgrade failure and collector bundle download failure individually or together as discussed below.

Troubleshoot upgrade failure of the upgrade manager component

To resolve the issue with the upgrade manager component:

1. Log on to the Portal server.
2. Go to `<PORTAL_APTARE_HOME>/updates` location and copy `<PORTAL_APTARE_HOME>/updates/aptare_dc_upgrader-linux.zip` to a temporary location on any other server or Data Collector server directly.
3. Log on to Data Collector server and copy `aptare_dc_upgrader-linux.zip` from temporary location to `<DC_APTARE_HOME>/upgrade/bundles`.
4. Remove all `*.properties` files from the `<DC_APTARE_HOME>/upgrade` directory
5. Remove `restore.txt` file from `<DC_APTARE_HOME>/upgrade` directory
6. Upgrade either from the Portal (recommended) or from the Data Collector server as described in the procedures below.

To upgrade from IT Analytics Portal:

1. Login to the Portal.
2. Go to **Admin** > **Data Collection** > **Collector Administration** and verify whether the Data Collector appears online.
3. Go to **Admin** > **Data Collection** > **Collector Updates** and select the Data Collector for which the Upgrade Manager component needs to be upgraded.
4. Click **Update Upgrade Manager**.

   The upgrade takes up to 15 minutes to complete.

To upgrade from the Data Collector server:

1. Log on to the Data Collector server.

   The upgrade takes up to 15 minutes to complete.

2. As a root user, run:

   ```
   <DC_APTARE_HOME>/mbs/bin/downloadlib.sh
   ```

   The upgrade takes up to 15 minutes to complete.

Troubleshoot upgrade failure of the Data Collector component

To resolve the failure of Data Collector component upgrade:

1. Log on to the Portal server and go to `<PORTAL_APTARE_HOME>/dc_upgraders/linux`.
2. Copy `aptare.jar` to a temporary location on any other server or Data Collector server directly.
3. Log on to the Data Collector server.
4. Copy `aptare.jar` from the temporary location to `<DC_APTARE_HOME>/upgrade/bundles`.
5. Rename `aptare.jar` to `dc_upgrader.<version>.zip`.

   For example, if <version> is 11.3.1.02, then file name will be `dc_upgrader.11.3.1.02.zip`
6. Remove all `*.properties` files from the `<DC_APTARE_HOME>/upgrade` directory
7. Remove `restore.txt` file from `<DC_APTARE_HOME>/upgrade` directory
8. Upgrade the Data Collector component either from the Portal (recommended) or from the Data Collector server as described in the procedures below.

To upgrade from IT Analytics Portal:

1. Login to the Portal.
2. Go to **Admin** > **Data Collection** > **Collector Administration** and verify whether the Data Collector appears online.
3. Go to **Admin** > **Data Collection** > **Collector Updates** and select the Data Collector for which the component needs to be upgraded.
4. Select **Upgrade aptare.jar**.

   The upgrade takes up to 15 minutes to complete.

To upgrade from the Data Collector server:

1. Log on to the Data Collector server.
2. As a root user, run:

   ```
   <DC_APTARE_HOME>/mbs/bin/downloadlib.sh
   ```

   The upgrade takes up to 15 minutes to complete.

Upgrade the Upgrade Manager and Data Collector components together

To upgrade both Upgrade Manager and Data Collector components together:

1. Log on to the Portal server.
2. Go to `<PORTAL_APTARE_HOME>/updates` location and copy `<PORTAL_APTARE_HOME>/updates/aptare_dc_upgrader-linux.zip` to a temporary location on any other server or Data Collector server directly.
3. Copy `<PORTAL_APTARE_HOME>/dc_upgraders/<version>/linux/aptare.jar` to a temporary location on any other server or Data Collector server directly.
4. Log on to Data Collector server and copy `aptare_dc_upgrader-linux.zip` and `aptare.jar` from the temporary location to `<DC_APTARE_HOME>/upgrade/bundles`.
5. Rename `aptare.jar` to `dc_upgrader.<version>.zip`.

   For example, if <version> is 11.3.1.02, then file name will be `dc_upgrader.11.3.1.02.zip`
6. Remove all `*.properties` files from the `<DC_APTARE_HOME>/upgrade` directory
7. Remove `restore.txt` file from `<DC_APTARE_HOME>/upgrade` directory
8. Upgrade the Data Collector component either from the Portal (recommended) or from the Data Collector server as described in the procedures below.

To upgrade from IT Analytics Portal:

1. Login to the Portal.
2. Go to **Admin** > **Data Collection** > **Collector Administration** and verify whether the Data Collector appears online.
3. Go to **Admin** > **Data Collection** > **Collector Updates** and select the Data Collector for which the component needs to be upgraded.
4. Select **Upgrade Both**.

   The upgrade takes up to 15 minutes to complete.

To upgrade from the Data Collector server:

1. Log on to the Data Collector server.
2. The upgrade takes up to 15 minutes to complete.
3. As a root user, run:

   ```
   <DC_APTARE_HOME>/mbs/bin/downloadlib.sh
   ```

   The upgrade takes up to 15 minutes to complete.

Upgrade logs and upgrade related database views

Logs:

- Upgrade Manager upgrade logs:

  ```
  <DC_APTARE_HOME>/mbs/logs/watchdog.log
  ```

- Data Collector upgrade logs:
  "Download of DC upgrade bundle and verification related"

  ```
  <DC_APTARE_HOME>/mbs/logs/watchdog.log
  <DC_APTARE_HOME>/upgrade/logs
  ```

Database views

- apt_v_system_upgrade: High level upgrade status
  - "Component_Name" column indicates the Data Collector server
  - "Message From" column indicates if it is a "Data Collector" component or "Upgrade Manager" component upgrade
    - If "Message From" is "Super_Upgrader" - The status is related to "Upgrade Manager" component upgrade
    - If "Message From" is "Upgrade_Manager" - The status is related to "Data Collector" component upgrade
- apt_v_system_upgrade_detail: Detailed upgrade messages for a particular upgrade session.

Collector updates from the IT Analytics Portal

1. Log in to the IT Analytics portal, and navigate to **Admin>Data Collection>Collector Updates**.
2. Select the Data Collector that failed to upgrade.

3. Verify if either aptare.jar or Upgrade Manager failed to upgrade.
4. Click **Upgrade Both**, **Upgrade aptare.jar**, or **Update Upgrade Manager**, depending on what failed to upgrade. Allow up to an hour for completion, depending on the size of your system.
5. Contact Cohesity Support for additional issues.

Chapter 4

Upgrade and Migrate to a new server

This chapter includes the following topics:

- Upgrade and migrate to a new server
- Testing
- Update Data Collector binaries (if necessary)

Upgrade and migrate to a new server

The Portal must be running a minimum of IT Analytics version 11.1 to upgrade to IT Analytics 11.8.

Note: If you migrate a portal from one machine to another, apart from copying over the database, you also need to copy the `/opt/aptare/datarcvrconf/aptare.ks` and `/opt/aptare/datarcvrconf/aptare_external_password.properties` files, and ensure the file permissions allow writing by the 'tomcat' user. If these files are not copied to the new machine, you will not be able to edit existing collector policies and data collection will stop working.

Install the latest release of IT Analytics on the new server

1. Download the latest release and installation instructions from www.veritas.com.
2. Perform a fresh install of the database and portal on the new server.
3. The IT Analytics Portal will be installed with evaluation license having validity of 60 days. Ensure you request a new license with appropriate entitlement. Refer the *IT Analytics Licensing Guide* for more information.

4. Install the new license, once you receive it.

Perform an export of the database on the existing server

The database user **Aptare** must have access to the export files stored in the directory:

`/opt/aptare/database/tools`

Verify that Oracle user has read and execute privileges on these files before starting the database export.

IT Analytics installer supports Portal and database installation on custom path. If your Portal or database is installed in a non-default location, replace `/opt` with the respective absolute installation path.

See *Oracle database: Export backups* section of the *IT Analytics Administrator guide* for detailed steps.

Stop Portal and agent services on the new server

On Linux (as root):

```
Execute /opt/aptare/bin/tomcat-agent stop
Execute /opt/aptare/bin/tomcat-portal stop
```

Drop and re-create the existing portal user on the new server

On Linux (as **aptare** user):

- Drop the existing users by running the `drop_users_linux.sql` script:

  ```
  sqlplus "/ as sysdba"
  @/opt/aptare/database/tools/drop_users_linux.sql
  ```

  Note: The `drop_users_linux.sql` script drops the **portal** and **aptare_ro** users and, in addition, drops the portal ROLE (not just the user). The script handles the situation gracefully if the users or the role do not already exist, so it can be run safely on a clean server without returning an error.

- Re-create the portal user:

  ```
  sqlplus / as sysdba
  @/opt/aptare/database/ora_scripts/create_portal_user.plb;
  ```

Import the database onto the new server

Follow the instructions for your platform in the *Import the Oracle database*section in the *IT Analytics Administrator guide*.

Start Portal and agent services on the new server

On Linux (as root):

```
Execute /opt/aptare/bin/tomcat-agent start
Execute /opt/aptare/bin/tomcat-portal start
```

Download, install, and execute to upgrade the database schema

If you are importing an old version database to 11.8 for your new IT Analytics 11.8 portal, you can follow below instructions

1. Download the upgrade installer and documentation from www.veritas.com.
2. Run the upgrade installer.

   See "Run the upgrade utility installer (Linux)" on page 56.

   This installs the upgrade executable, but does not execute them.
3. In the last step of upgrader, select **Run Later** option to continue.
4. Open a command prompt and go to `/opt/aptare/upgrade`.
5. Run `db-upgrade.sh` and follow the instructions to upgrade the database.
6. After completion of db-upgrade.sh, you can login to portal with your admin credentials and try installing the new license.
7. Login again and access IT Analytics portal.
8. Verify that all IT Analytics application services are up and running.
9. As user root, run the following relevant command and respond to the prompts accordingly:
   - On Linux:

     ```
     sh /opt/aptare/upgrade/upgrade.sh
     ```

     You will receive warnings that your current version is already up to date, proceed.
     Once the script has completed, review the log file indicated to check for any errors

Testing

If desired, you can use the local host file method of IP address resolution to test the functionality of the new portal prior to any DNS cut-over from the existing server.

Update Data Collector binaries (if necessary)

Do not install on the same machine as the new portal/database server.

1. Download the Data Collector installer and documentation from www.veritas.com.
2. Follow the instructions in the documentation for your Data Collector to uninstall.
3. Re-install the Data Collector to the latest version, giving the correct URL for the new server.

Appendix A

X Virtual Frame Buffer

This appendix includes the following topics:

- Configure X Virtual Frame Buffer (Xvfb)

Configure X Virtual Frame Buffer (Xvfb)

Xvfb is a graphic manager that ensures proper rendering of the reports or emails exported as PDF files. You can perform this configuration as a part of your pre-installation steps for IT Analytics Portal.

To configure Xvfb:

1. Ensure that system is configured to boot in graphical target, also known as runlevel 5.
   - Check existing default target.

     ```
     # systemctl get-default
     ```

   - Set default target to graphical.target.

     ```
     # systemctl set-default graphical.target
     ```

2. Use `yum` to install Xvfb.

   ```
   # yum install Xvfb
   ```

3. If the OS is RHEL 8, install `rpm libXtst` if not already installed.

   ```
   # yum install libXtst
   ```

4. Create a config file for Xvfb.
   - Run `# cd /etc/init.d`

- Create a file `Xvfb_background` with this content:

```
#!/bin/sh
# chkconfig:345 20 80
# /etc/init.d/Xvfb_background
#
# Some things that run always
#touch /var/lock/Xvfb_background
# Carry out specific functions when asked to by the system
case "$1" in
start)
echo "Starting script Xvfb_background"
/usr/bin/Xvfb :99 &
;;
stop)
echo "Stopping script Xvfb_background"
x=`pgrep Xvfb`; sudo kill -9 $x
;;
*)
echo "Usage: /etc/init.d/Xvfb_background {start|stop}"
exit 1
;;
esac
exit 0
```

- Run the commands:

```
# chmod 755 Xvfb_background
# chkconfig --add Xvfb_background
# ./Xvfb_background start
# /usr/lib/systemd/system-generators/systemd-sysv-generator
# systemctl enable Xvfb_background
```

- Confirm the Xvfb process is running on port :99 with:

```
#  ps -ef | grep Xvfb
# netstat -anp | grep Xvfb
```

5 Update the Tomcat bash profile.

```
su - tomcat
```

Modify the profile file to look like the one below:

```
# vi .bash_profile
JAVA_HOME=/usr/java
JRE_HOME=
TOMCAT_HOME=/opt/tomcat
export JAVA_HOME JRE_HOME TOMCAT_HOME
STORAGE_HOME=$PORTAL_BASE
export STORAGE_HOME
APTARE_HOME=/opt/aptare
export APTARE_HOME
PORTAL_HOME=$APTARE_HOME/portal
export PORTAL_HOME
export DISPLAY=:99

JAVA_OPTS="-server -DPORTAL_HOME=/opt/aptare/portal
-DAPTARE_HOME=/opt/aptare"
export JAVA_OPTS
umask 0022
```

6 Restart IT Analytics services.

7 Test a wide report to ensure the exported PDF appears without truncation.

Appendix B

Oracle patches for the database server

This appendix includes the following topics:

- Oracle 19c July 2026 quarterly patch instructions for Linux

Oracle 19c July 2026 quarterly patch instructions for Linux

Topics

- *Oracle Patch Overview*
- *Included patches*
- *Oracle Patch Installation*
- *Backup the IT Analytics Database*
- *Pre-install setup*
- *OPatch Installation / Upgrade*
- *Install Oracle Patches*
- *Validate the database and OJVM Patches*
- *Validate JDK/JRE version*
- *Revoke Public Grants*
- *Final Steps*
- *Appendices*
- *Appendix A: Oracle cold backup procedure*

- *Appendix B: Oracle database backup and export procedure*
- *Appendix C: Verify whether SQL Developer is present*
- *Appendix D: Verify the oraInventory folder*
- *Appendix E: Full output for the 39618649 conflict check*
- *Appendix F: Full output for patch 39472050*
- *Appendix G: Full output for patch 39222882*
- *Appendix H: Full output for the 39329591 conflict check*
- *Appendix I: Full output for patch 39329591*
- *Appendix J: Full output for datapatch*
- *Appendix K: SQL patch validation output*

Oracle Patch Overview

This guide explains how to apply the Oracle 19c July 2026 quarterly patches for IT Analytics on Linux. Use these instructions to update Oracle Database, OJVM, JDK/JRE, and OPatch components in the required order.

Note: IT Analytics Portal may not start after Oracle July 2026 Release Update 19.32.0.0. If the IT Analytics portal fails to start after applying the Oracle July 2026 Release Update (19.32.0.0), see KB article: 000040776.

The Oracle July 2026 Release Update includes changes that are not compatible with IT Analytics Portal versions released before June 2026. Compatibility fixes are available in IT Analytics Portal 11.7.2606 and 11.8.2606.

Recommended upgrade order

To avoid portal downtime, complete the IT Analytics Portal upgrade before you apply the Oracle patch.

1. Upgrade the ITA portal to 11.7.2606 or later, or 11.8.2606 or later. These versions are planned for release in early June 2026, and the Oracle patch will be made available on the Cohesity downloads page only after a compatible ITA version has been released.
2. Verify ITA portal functionality after the upgrade is completed.
3. Confirm rollback options are in place, such as validated snapshots or backups, before applying the Oracle patch.
4. Apply the Oracle July 2026 (19.32.0.0) patch only after the portal upgrade has been completed and verified.

Note: Applying the Oracle patch before completing the portal upgrade is not supported and may result in extended downtime.

Recovery if the Oracle Patch Was Already Applied

If the Oracle July 2026 patch has already been applied and the portal is impacted, recovery requires one of the following:

- Upgrade the ITA portal to 11.7.2606 or 11.8.2606 (or later), or
- Rollback (or restore) the ITA portal to a previously working version and then upgrade to a compatible version.

Included patches

- 39618649 — July 2026 combo patch, which includes the database Release Update and OJVM patches.
- 39472050 — Oracle Database Release Update 19.32.0.0.260721.
- 39222882 — OJVM Release Update 19.32.0.0.260721.
- 39329591 — JDK bundle patch 19.32.0.0.260721.

Note: Full command output is available in the Appendices. If the IT Analytics Portal does not work after patching, compare your results with the expected output and follow your rollback plan, such as reverting a snapshot or restoring the database.

Oracle Patch Installation

Backup the IT Analytics Database

Before you apply the Oracle patches, take a cold backup of the IT Analytics database. A cold backup requires the database to be stopped while you copy or back up the Oracle data files to another location. This backup helps simplify recovery if an unexpected issue occurs during patching.

If you need to restore the database, see the IT Analytics System Administrator Guide, section "Restoring the IT Analytics system," and the appendix sections for database backup, export, and import guidance.

- For cold backup instructions, see *Appendix A: Oracle cold backup procedure*.
- For database export instructions, see *Appendix B: Oracle database backup and export procedure*.

Pre-install setup

1. Download the following files from the product download area and save them to `/tmp`:
   - `p6880880_190000_Linux-x86-64.zip` (OPatch utility)
   - `p39618649_190000_Linux-x86-64.zip` (Database RU and OJVM Combo Patch)
   - `p39329591_190000_Linux-x86-64.zip` (JDK Bundle Patch)
   - `grant_public_role_grants.sql`

   Note: Earlier Oracle distributions included SQL Developer, which can interfere with patching. If `$ORACLE_HOME/sqldeveloper` exists on the portal server, remove it before you apply the patches.

   ```
   $ORACLE_HOME/sqldeveloper
   ```

   Note: By default, `$ORACLE_HOME` is `/opt/aptare/oracle`. If your installation uses a custom path, use that path instead.

   If the directory exists, see *Appendix C: Verify whether SQL Developer is present*.

2. Log in to the server as the root user, and then switch to the aptare user:

   Note: The default Oracle user account for IT Analytics is aptare. If this account was changed during implementation, use the designated account for all subsequent steps. You can verify the account in `$APTARE_HOME/bin/aptare_env.sh`. The parameter is ORACLE_USER.

   ```
   bash[]# su - aptare
   ```

3. Apply the public grants prior to patching (as the "aptare" user).

   Note: Shell prompts can differ by environment. Run the commands that appear after the bash prompt (bash[]$ or bash[]#) and the SQL prompt (SQL>).

   ```
   bash[]$ source /opt/aptare/bin/aptare_env.sh
   ```

Note: If IT Analytics is installed outside `/opt/aptare`, use your custom installation path when you source the aptare_env.sh file.

```
bash[]$ cd $APTARE_HOME/database/ora_scripts

bash[]$ sqlplus / as sysdba

SQL> alter session set container=scdb;

SQL> @/tmp/grant_public_role_grants.sql

bash[]$ exit
```

4. As the "root" user, stop all services using one of the commands below:

```
bash[]# source /opt/aptare/bin/aptare_env.sh &&
$APTARE_HOME/bin/aptare stop
```

or

```
bash[]# systemctl stop aptare
```

OPatch Installation / Upgrade

1. Switch to the aptare user, source the IT Analytics environment file, and copy the OPatch ZIP file from `/tmp` to `$ORACLE_HOME`.

```
bash[]# su - aptare

bash[]$ source /opt/aptare/bin/aptare_env.sh

bash[]$ cp /tmp/p6880880_190000_Linux-x86-64.zip $ORACLE_HOME
```

2. Set the PATH environment variable:

```
bash[]$ export PATH=$PATH:$ORACLE_HOME/OPatch:/usr/ccs/bin
```

3. Go to the `$ORACLE_HOME` directory, rename the OPatch folder, and unzip the patch file.

```
bash[]$ cd $ORACLE_HOME
```

Note: If the system was patched earlier, remove the OPatch.old directory. Otherwise, ignore the rm command.

```
bash[]$ rm -rf OPatch.old

bash[]$ rm -rf OPatch

bash[]$ yes | unzip p6880880_190000_Linux-x86-64.zip
```

4. Check the OPatch version. The expected output shows OPatch version 12.2.0.1.52.

Install Oracle Patches

1. As the aptare user, copy the Oracle database combo patch and JDK bundle patch files from `/tmp` to `$ORACLE_HOME`.

```
bash[]$ cp /tmp/p39618649_190000_Linux-x86-64.zip $ORACLE_HOME
```

```
bash[]$ cp /tmp/p39329591_190000_Linux-x86-64.zip $ORACLE_HOME
```

2. Go to the `$ORACLE_HOME` directory and unzip the patch files.

```
bash[]$ cd $ORACLE_HOME
```

```
bash[]$ yes | unzip p39618649_190000_Linux-x86-64.zip
```

```
bash[]$ yes | unzip p39329591_190000_Linux-x86-64.zip
```

3. Verify that the oraInventory directory exists:

```
bash[]$ ls -ld /opt/oraInventory
```

Expected output: The output shows the oraInventory directory. The date can differ.

```
drwxrwx--- 4 aptare aptare 4096 Oct 1 09:56 oraInventory/
```

Note: If the directory does not exist, see *Appendix D: Verify the oraInventory folder*.

---

4. Check for OPatch conflicts. This command checks for conflicts in the database RU patch and the OJVM patch.

```
bash[]$ cd $ORACLE_HOME/39618649
```

```
bash[]$ $ORACLE_HOME/OPatch/opatch prereq
CheckConflictAgainstOHWithDetail -ph ./
```

Expected output: The output shows that the prerequisite check passed and OPatch succeeded. See *Appendix E: Full output for the 39618649 conflict check*.

5. If no conflicts are found, apply the database RU patch from the `$ORACLE_HOME/39618649/39472050` directory.

Note: During patching, OPatch prompts you to proceed after it verifies the environment and prerequisite checks.

```
bash[]$ cd $ORACLE_HOME/39618649/39472050

bash[]$ $ORACLE_HOME/OPatch/opatch apply
```

Expected output: The output shows that OPatch succeeded. See *Appendix F: Full output for patch 39472050*.

6. Run the following commands to apply the OJVM patch from the `$ORACLE_HOME/39618649/39222882` directory:

Note: During patching, OPatch prompts you to proceed after it verifies the environment and prerequisite checks.

```
bash[]$ cd $ORACLE_HOME/39618649/39222882

bash[]$ $ORACLE_HOME/OPatch/opatch apply
```

Expected output: The output shows that OPatch succeeded. See *Appendix G: Full output for patch 39222882*.

7. If no conflicts are found, apply the JDK bundle patch from the `$ORACLE_HOME/39329591` directory.

```
bash[]$ cd $ORACLE_HOME/39329591

bash[]$ $ORACLE_HOME/OPatch/opatch prereq
CheckConflictAgainstOHWithDetail -ph ./
```

Expected output: The output shows that the prerequisite check passed and OPatch succeeded. See *Appendix H: Full output for the 39329591 conflict check*.

8. If no conflicts are detected, run the following commands to apply the JDK patch from the `$ORACLE_HOME/39329591` folder:

Note: If conflicts or errors occur, see *Appendix I: Full output for patch 39329591*. During patching, OPatch prompts you to proceed after it verifies the environment and prerequisite checks.

```
bash[]$ $ORACLE_HOME/OPatch/opatch apply
```

Expected output: The output shows that OPatch succeeded. See *Appendix I: Full output for patch 39329591*.

9. Connect to SQL*Plus:

```
bash[]$ sqlplus /nolog

SQL> connect / as sysdba
```

```
SQL> startup

SQL> alter pluggable database all open;

SQL> quit
```

10. Run the following command to apply the patch to the pluggable database. This step might take a few minutes.

```
bash[]$ $ORACLE_HOME/OPatch/datapatch -verbose
-ignorable_errors=ORA-01403,ORA-06512
```

Expected output: The output shows that patch installation completed successfully. See *Appendix J: Full output for datapatch*.

```
[snip]
Patch 39472050 apply (pdb CDB$ROOT): SUCCESS
Patch 39472050 apply (pdb PDB$SEED): SUCCESS
Patch 39472050 apply (pdb SCDB): SUCCESS
[snip]
Patch 39222882 apply (pdb CDB$ROOT): SUCCESS
Patch 39222882 apply (pdb PDB$SEED): SUCCESS
Patch 39222882 apply (pdb SCDB): SUCCESS
[snip]
```

Note: If you receive a message to run utlrp.sql to revalidate objects, run the following commands.

```
bash[]$ sqlplus / as sysdba

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

Validate the database and OJVM Patches

1. As the aptare user, connect to SQL*Plus and run the following queries to validate the database and OJVM patches:

```
bash[]$ sqlplus / as sysdba
```

2. Check the patch history registry:

```
SQL> select action, version, comments from sys.registry$history;
```

Expected output: The output shows BOOTSTRAP and RU_APPLY. See *Appendix K: SQL patch validation output*.

3. Check the installed patch registry:

```
SQL> select patch_id, patch_type, action, status, description,
target_version from sys.registry$sqlpatch;
```

Expected output: The output shows a status of SUCCESS. See *Appendix K: SQL patch validation output*.

4. Show the SQL patch status report:

```
SQL> set serveroutput on

SQL> exec dbms_qopatch.get_sqlpatch_status;
```

Expected output: The output shows a status of SUCCESS. See *Appendix K: SQL patch validation output*.

5. Exit SQL*Plus:

```
SQL> exit
```

Validate JDK/JRE version

1. As the aptare user, run the following command:

```
bash[]$ $ORACLE_HOME/jdk/bin/java -version
```

Expected output:

```
java version "1.8.0_501"
Java(TM) SE Runtime Environment (build 1.8.0_501-b08)
Java HotSpot(TM) 64-Bit Server VM (build 25.501-b08, mixed mode)
```

2. `bash[]$ $ORACLE_HOME/OPatch/jre/bin/java -version`

Expected output:

```
java version "1.8.0_501"
Java(TM) SE Runtime Environment (build 1.8.0_501-b08)
Java HotSpot(TM) 64-Bit Server VM (build 25.501-b08, mixed mode)
```

Revoke Public Grants

1. After patching, revoke the public grants. Switch to the aptare user by using the following command:

Note: If IT Analytics uses a split architecture or Shared Services, and does not use the embedded Oracle software provided with IT Analytics, check with your DBA team before you complete this step.

```
bash[]$ source /opt/aptare/bin/aptare_env.sh

bash[]$ cd $APTARE_HOME/database/ora_scripts

bash[]$ sqlplus / as sysdba
```

```
SQL> alter session set container=scdb;

SQL> @revoke_public_role_grants.sql

bash[]$ exit
```

Expected output: The output shows version 19.32.0.0.0, which indicates that Oracle was upgraded and patched successfully.

Final Steps

1. As root user (type `exit` from aptare user to return to root or use sudo), start all services using one of the commands below:

   - `source /opt/aptare/bin/aptare_env.sh && $APTARE_HOME/bin/aptare start`
   - `systemctl start aptare`

   The portal is now patched and running. Log in, verify operations, and run reports.

   To verify that Oracle is patched successfully, run the IT Analytics System Health Check report and review the Oracle Patch History section.

2. Verify that the following entries are present in the report output:

   Database Release Update: 19.32.0.0.260721 (39472050)

   OJVM Release Update: 19.32.0.0.260721 (39222882)

   Note: The output might include other entries. The preceding two entries indicate that the latest patches are applied.

3. As the root user, delete the folders and files that were used during patching:

```
rm -rf /opt/aptare/oracle/OPatch*

rm /opt/aptare/oracle/p6880880_190000_Linux-x86-64.zip

rm /opt/aptare/oracle/p39618649_190000_Linux-x86-64.zip

rm /opt/aptare/oracle/p39329591_190000_Linux-x86-64.zip

rm -rf /opt/aptare/oracle/39618649/* /opt/aptare/oracle/39329591/*
```

If you are using Red Hat Enterprise Linux 9, you might also have the following folder from the initial installation. You can delete it after you confirm that it is no longer required.

```
bash[]# rm -rf /opt/aptare/oracle/ora_patches_rhel9
```

Note: Previous patching might leave other ZIP files and eight-digit patch directories that are similar to the current patch directories. Delete those obsolete files and directories after you confirm that they are no longer required.

Appendices

Appendix A: Oracle cold backup procedure

1. Shut down the Oracle service:

   ```
   bash[]# source /opt/aptare/bin/aptare_env.sh &&
   $APTARE_HOME/bin/aptare stop
   ```

2. Using your organization's file system backup software, back up all the data files from:

   ```
   $ORACLE_HOME/dbs/initscdb.ora
   ```

   ```
   /data0?/*
   ```

   Note: By default, IT Analytics data files are written to `/data01` through `/data06`. Your installation might differ. For split architecture deployments, work with your DBA team to make sure that the database is backed up.

Appendix B: Oracle database backup and export procedure

The database user "aptare" must have access to the export files stored in the directory:

```
/opt/aptare/database/tools
```

Verify that the Oracle user has read and execute privileges on these files before starting the database export.

1. Log into the Linux database server and switch to user "aptare".
2. Ensure Oracle Listener and Oracle services are running.
3. Change to the directory:

   ```
   $APTARE_HOME/database/tools
   ```

4. Execute the command:

   ```
   ./export_database_template.sh
   ```

5. After successful completion, the export file `aptare_scdb.exp` is saved in the `/tmp` directory on the Linux database server.

6. Run the `cp /opt/aptare/datarcvrconf/aptare.ks /tmp` command. This file will be required during the database import.

   Note: By default, IT Analytics data files are written to `/data01` through `/data06`. Your installation might differ. For split architecture deployments, work with your DBA team to make sure that the database is backed up.

7. Run the `cp $APTARE_HOME/datarcvrconf/aptare_external_password.properties /tmp` command. This file will be required during the database import.

In the event you need to restore the database, please refer to the IT Analytics System Administrator Guide – Section "Restoring the IT Analytics system" / Import the Oracle database / Manual steps for database import / export using data pump.

Appendix C: Verify whether SQL Developer is present

To verify whether SQL Developer is present on the portal system and whether additional steps are required to complete patching, complete the following steps.

1. Log in to the server as the root user, and then switch to the aptare user:

   ```
   bash[]# su - aptare
   ```

2. As the aptare user, go to the following directory and verify whether the sqldeveloper directory exists:

   ```
   bash[]$ source /opt/aptare/bin/aptare_env.sh

   bash[]$ cd $ORACLE_HOME

   bash[]$ ls -ld sqldeveloper
   ```

If the directory appears in the output, delete the directory.

Example:

```
drwxr-xr-x. 4 aptare dba 4096 Apr 17 2019 sqldeveloper

bash[]$ rm -rf $ORACLE_HOME/sqldeveloper
```

Appendix D: Verify the oraInventory folder

If you receive an error that the oraInventory folder is not available, run the following commands to verify the folder.

1. Log in to the server as root and switch to the "aptare" user using command "su - aptare".

   ```
   bash[]# su - aptare
   ```

2. Check if oraInventory folder is available under `/opt/`. If the folder is not available, then perform the following steps:

Note: If you customized the Oracle user or installation location, replace aptare and the example paths with the values for your environment.

```
bash[]$ cd /opt
```

```
bash[]$ ls -ld oraInventory
```

Expected output: The output shows the oraInventory directory. The date might differ.

```
drwxrwx---. 4 aptare dba 4096 Oct 10 16:11 oraInventory
```

Note: If the permissions are different, run the following commands as the root user.

```
bash[]# cd /opt/
```

```
bash[]# chown -R aptare:dba oraInventory
```

```
bash[]# su - aptare
```

```
bash[]$ source /opt/aptare/bin/aptare_env.sh
```

Run the following command to attach ORACLE_HOME:

```
bash[]$ $ORACLE_HOME/oui/bin/runInstaller -silent
  -ignoreSysPrereqs
  -invPtrLoc "/opt/aptare/oracle/oraInst.loc"
  -attachHome ORACLE_HOME="/opt/aptare/oracle"
  ORACLE_HOME_NAME="OraDB19c_home"
  INVENTORY_LOCATION="/opt/oraInventory"
```

Appendix E: Full output for the 39618649 conflict check

Note: Your output might differ slightly.

```
bash[]$ $ORACLE_HOME/OPatch/opatch prereq
  CheckConflictAgainstOHWithDetail -ph ./
Oracle Interim Patch Installer version 12.2.0.1.52
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PREREQ session
```

```
Oracle Home       : /opt/aptare/oracle
Central Inventory : /opt/oraInventory
   from           : /opt/aptare/oracle/oraInst.loc
OPatch version    : 12.2.0.1.52
OUI version       : 12.2.0.7.0
Log file location :
  /opt/aptare/oracle/cfgtoollogs/opatch/opatch2026-07-23_13-06-49PM_1.log

Invoking prereq "checkconflictagainstohwithdetail"
Prereq "checkConflictAgainstOHWithDetail" passed.
OPatch succeeded.
```

Appendix F: Full output for patch 39472050

Note: Your output might differ slightly.

```
bash[]$ $ORACLE_HOME/OPatch/opatch apply
Oracle Interim Patch Installer version 12.2.0.1.52
Copyright (c) 2026, Oracle Corporation. All rights reserved.

Oracle Home       : /opt/aptare/oracle
Central Inventory : /opt/oraInventory
   from           : /opt/aptare/oracle/oraInst.loc
OPatch version    : 12.2.0.1.52
OUI version       : 12.2.0.7.0
Log file location :
  /opt/aptare/oracle/cfgtoollogs/opatch/opatch2026-07-23_13-08-34PM_1.log

Verifying environment and performing prerequisite checks...

Start OOP by Prereq process.
Launch OOP...

Oracle Interim Patch Installer version 12.2.0.1.52
Copyright (c) 2026, Oracle Corporation. All rights reserved.

Oracle Home       : /opt/aptare/oracle
Central Inventory : /opt/oraInventory
   from           : /opt/aptare/oracle/oraInst.loc
OPatch version    : 12.2.0.1.52
OUI version       : 12.2.0.7.0
Log file location :
```

```
  /opt/aptare/oracle/cfgtoollogs/opatch/opatch2026-07-23_13-08-56PM_1.log

Verifying environment and performing prerequisite checks...
OPatch continues with these patches:   39472050

Do you want to proceed? [y|n] y
User Responded with: Y
All checks passed.

Please shutdown Oracle instances running out of this ORACLE_HOME
on the local system.
(Oracle Home = '/opt/aptare/oracle')

Is the local system ready for patching? [y|n] y
User Responded with: Y
Backing up files...
Applying interim patch '39472050' to OH '/opt/aptare/oracle'
ApplySession: Optional component(s)
  [ oracle.network.gsm, 19.0.0.0.0 ],
  [ oracle.assistants.asm, 19.0.0.0.0 ],
  [ oracle.datamining, 19.0.0.0.0 ],
  [ oracle.crypto.rsf, 19.0.0.0.0 ],
  [ oracle.oraolap.mgmt, 19.0.0.0.0 ],
  [ oracle.pg4appc, 19.0.0.0.0 ],
  [ oracle.precomp.companion, 19.0.0.0.0 ],
  [ oracle.rdbms.ic, 19.0.0.0.0 ],
  [ oracle.java.sqlj.sqljruntime, 19.0.0.0.0 ],
  [ oracle.rdbms.tg4db2, 19.0.0.0.0 ],
  [ oracle.sdo.companion, 19.0.0.0.0 ],
  [ oracle.tfa, 19.0.0.0.0 ],
  [ oracle.rdbms.tg4ifmx, 19.0.0.0.0 ],
  [ oracle.oid.client, 19.0.0.0.0 ],
  [ oracle.rdbms.tg4sybs, 19.0.0.0.0 ],
  [ oracle.ldap.ztk, 19.0.0.0.0 ],
  [ oracle.ons.eons.bwcompat, 19.0.0.0.0 ],
  [ oracle.net.cman, 19.0.0.0.0 ],
  [ oracle.ons.cclient, 19.0.0.0.0 ],
  [ oracle.xdk.companion, 19.0.0.0.0 ],
  [ oracle.options.olap, 19.0.0.0.0 ],
  [ oracle.rdbms.tg4msql, 19.0.0.0.0 ],
  [ oracle.rdbms.tg4tera, 19.0.0.0.0 ],
  [ oracle.network.cman, 19.0.0.0.0 ],
  [ oracle.options.olap.api, 19.0.0.0.0 ],
```

```
  [ oracle.jdk, 1.8.0.191.0 ],
  [ oracle.jdk, 1.8.0.391.11 ]
  not present in the Oracle Home or a higher version is found.
Patching component oracle.rdbms.util, 19.0.0.0.0...
Patching component oracle.rdbms.rsf, 19.0.0.0.0...
Patching component oracle.rdbms, 19.0.0.0.0...
Patching component oracle.assistants.acf, 19.0.0.0.0...
Patching component oracle.assistants.deconfig, 19.0.0.0.0...
Patching component oracle.assistants.server, 19.0.0.0.0...
Patching component oracle.blaslapack, 19.0.0.0.0...
Patching component oracle.buildtools.rsf, 19.0.0.0.0...
Patching component oracle.wwg.plsql, 19.0.0.0.0...
Patching component oracle.ctx, 19.0.0.0.0...
Patching component oracle.dbdev, 19.0.0.0.0...
Patching component oracle.dbjava.ic, 19.0.0.0.0...
Patching component oracle.dbjava.jdbc, 19.0.0.0.0...
Patching component oracle.dbjava.ucp, 19.0.0.0.0...
Patching component oracle.duma, 19.0.0.0.0...
Patching component oracle.javavm.client, 19.0.0.0.0...
Patching component oracle.ldap.client, 19.0.0.0.0...
Patching component oracle.ldap.owm, 19.0.0.0.0...
Patching component oracle.ldap.rsf, 19.0.0.0.0...
Patching component oracle.ldap.security.osdt, 19.0.0.0.0...
Patching component oracle.marvel, 19.0.0.0.0...
Patching component oracle.network.rsf, 19.0.0.0.0...
Patching component oracle.nlsrtl.rsf, 19.0.0.0.0...
Patching component oracle.nlsrtl.rsf.core, 19.0.0.0.0...
Patching component oracle.nlsrtl.rsf.ic, 19.0.0.0.0...
Patching component oracle.swd.oui, 12.2.0.7.0...
Patching component oracle.odbc.ic, 19.0.0.0.0...
Patching component oracle.ons, 19.0.0.0.0...
Patching component oracle.ons.ic, 19.0.0.0.0...
Patching component oracle.oracore.rsf, 19.0.0.0.0...
Patching component oracle.precomp.common.core, 19.0.0.0.0...
Patching component oracle.precomp.rsf, 19.0.0.0.0...
Patching component oracle.rdbms.crs, 19.0.0.0.0...
Patching component oracle.rdbms.dbscripts, 19.0.0.0.0...
Patching component oracle.rdbms.deconfig, 19.0.0.0.0...
Patching component oracle.rdbms.install.common, 19.0.0.0.0...
Patching component oracle.rdbms.oci, 19.0.0.0.0...
Patching component oracle.rdbms.rsf.ic, 19.0.0.0.0...
Patching component oracle.rdbms.scheduler, 19.0.0.0.0...
Patching component oracle.rhp.db, 19.0.0.0.0...
```

```
Patching component oracle.rsf, 19.0.0.0.0...
Patching component oracle.sdo, 19.0.0.0.0...
Patching component oracle.sdo.locator.jrf, 19.0.0.0.0...
Patching component oracle.sqlj.sqljruntime, 19.0.0.0.0...
Patching component oracle.sqlplus, 19.0.0.0.0...
Patching component oracle.sqlplus.ic, 19.0.0.0.0...
Patching component oracle.tfa.db, 19.0.0.0.0...
Patching component oracle.xdk.rsf, 19.0.0.0.0...
Patching component oracle.rdbms.hs_common, 19.0.0.0.0...
Patching component oracle.javavm.server, 19.0.0.0.0...
Patching component oracle.rdbms.install.plugins, 19.0.0.0.0...
Patching component oracle.rdbms.locator, 19.0.0.0.0...
Patching component oracle.oraolap.api, 19.0.0.0.0...
Patching component oracle.rdbms.hsodbc, 19.0.0.0.0...
Patching component oracle.network.client, 19.0.0.0.0...
Patching component oracle.rdbms.drdaas, 19.0.0.0.0...
Patching component oracle.rdbms.dm, 19.0.0.0.0...
Patching component oracle.rdbms.rman, 19.0.0.0.0...
Patching component oracle.rdbms.rat, 19.0.0.0.0...
Patching component oracle.ovm, 19.0.0.0.0...
Patching component oracle.odbc, 19.0.0.0.0...
Patching component oracle.xdk.server, 19.0.0.0.0...
Patching component oracle.oraolap.dbscripts, 19.0.0.0.0...
Patching component oracle.xdk.xquery, 19.0.0.0.0...
Patching component oracle.network.listener, 19.0.0.0.0...
Patching component oracle.dbtoolslistener, 19.0.0.0.0...
Patching component oracle.ldap.rsf.ic, 19.0.0.0.0...
Patching component oracle.xdk.parser.java, 19.0.0.0.0...
Patching component oracle.sdo.locator, 19.0.0.0.0...
Patching component oracle.ctx.rsf, 19.0.0.0.0...
Patching component oracle.ldap.ssl, 19.0.0.0.0...
Patching component oracle.oraolap, 19.0.0.0.0...
Patching component oracle.mgw.common, 19.0.0.0.0...
Patching component oracle.install.deinstalltool, 19.0.0.0.0...
Patching component oracle.rdbms.dv, 19.0.0.0.0...
Patching component oracle.xdk, 19.0.0.0.0...
Patching component oracle.nlsrtl.rsf.lbuilder, 19.0.0.0.0...
Patching component oracle.ctx.atg, 19.0.0.0.0...
Patching component oracle.network.aso, 19.0.0.0.0...
Patching component oracle.rdbms.lbac, 19.0.0.0.0...
Patching component oracle.precomp.lang, 19.0.0.0.0...
Patching component oracle.precomp.common, 19.0.0.0.0...
Patching component oracle.oracler.server, 19.0.0.0.0...
```

```
Patching component oracle.perlint, 5.28.1.0.0...
Patching component oracle.jdk, 1.8.0.201.0...
Patch 39472050 successfully applied.
Sub-set patch [29517242] has become inactive due to the
  application of a super-set patch [39472050].
Please refer to Doc ID 2161861.1 for any possible further
  required actions.
Log file location:
  /opt/aptare/oracle/cfgtoollogs/opatch/opatch2026-07-23_13-08-56PM_1.log

OPatch succeeded.
```

Appendix G: Full output for patch 39222882

Note: Your output might differ slightly.

```
bash[]$ $ORACLE_HOME/OPatch/opatch apply
Oracle Interim Patch Installer version 12.2.0.1.52
Copyright (c) 2026, Oracle Corporation. All rights reserved.

Oracle Home       : /opt/aptare/oracle
Central Inventory : /opt/oraInventory
   from           : /opt/aptare/oracle/oraInst.loc
OPatch version    : 12.2.0.1.52
OUI version       : 12.2.0.7.0
Log file location :
  /opt/aptare/oracle/cfgtoollogs/opatch/opatch2026-07-23_13-18-01PM_1.log

Verifying environment and performing prerequisite checks...
OPatch continues with these patches:   39222882

Do you want to proceed? [y|n] y
User Responded with: Y
All checks passed.

Please shutdown Oracle instances running out of this ORACLE_HOME
on the local system.
(Oracle Home = '/opt/aptare/oracle')

Is the local system ready for patching? [y|n] y
User Responded with: Y
Backing up files...
Applying interim patch '39222882' to OH '/opt/aptare/oracle'
```

```
Patching component oracle.javavm.server, 19.0.0.0.0...
Patching component oracle.javavm.server.core, 19.0.0.0.0...
Patching component oracle.rdbms.dbscripts, 19.0.0.0.0...
Patching component oracle.rdbms, 19.0.0.0.0...
Patching component oracle.javavm.client, 19.0.0.0.0...
Patch 39222882 successfully applied.
Log file location:
  /opt/aptare/oracle/cfgtoollogs/opatch/opatch2026-07-23_13-18-01PM_1.log

OPatch succeeded.
```

Appendix H: Full output for the 39329591 conflict check

Note: Your output might differ slightly.

```
bash[]$ $ORACLE_HOME/OPatch/opatch prereq
  CheckConflictAgainstOHWithDetail -ph ./
Oracle Interim Patch Installer version 12.2.0.1.52
Copyright (c) 2026, Oracle Corporation. All rights reserved.

PREREQ session

Oracle Home       : /opt/aptare/oracle
Central Inventory : /opt/oraInventory
   from           : /opt/aptare/oracle/oraInst.loc
OPatch version    : 12.2.0.1.52
OUI version       : 12.2.0.7.0
Log file location :
  /opt/aptare/oracle/cfgtoollogs/opatch/opatch2026-07-23_13-22-53PM_1.log

Invoking prereq "checkconflictagainstohwithdetail"
Prereq "checkConflictAgainstOHWithDetail" passed.
OPatch succeeded.
```

Appendix I: Full output for patch 39329591

Note: Your output might differ slightly.

```
bash[]$ $ORACLE_HOME/OPatch/opatch apply
Oracle Interim Patch Installer version 12.2.0.1.52
Copyright (c) 2026, Oracle Corporation. All rights reserved.
```

```
Oracle Home       : /opt/aptare/oracle
Central Inventory : /opt/oraInventory
   from           : /opt/aptare/oracle/oraInst.loc
OPatch version    : 12.2.0.1.52
OUI version       : 12.2.0.7.0
Log file location :
  /opt/aptare/oracle/cfgtoollogs/opatch/opatch2026-07-23_13-25-34PM_1.log

Verifying environment and performing prerequisite checks...
OPatch continues with these patches:   39329591

Do you want to proceed? [y|n] y
User Responded with: Y
All checks passed.

Backing up files...
Applying interim patch '39329591' to OH '/opt/aptare/oracle'
ApplySession: Optional component(s)
  [ oracle.jdk, 1.8.0.191.0 ],
  [ oracle.jdk, 1.8.0.391.11 ]
  not present in the Oracle Home or a higher version is found.
Patching component oracle.jdk, 1.8.0.201.0...
Patch 39329591 successfully applied.
Log file location:
  /opt/aptare/oracle/cfgtoollogs/opatch/opatch2026-07-23_13-25-34PM_1.log
```

Appendix J: Full output for datapatch

Note: Your output might differ slightly.

```
bash[]$ $ORACLE_HOME/OPatch/datapatch -verbose
  -ignorable_errors=ORA-01403,ORA-06512
SQL Patching tool version 19.32.0.0.0 Production
  on Thu Jul 23 13:30:07 2026
Copyright (c) 2012, 2026, Oracle. All rights reserved.

Log file for this invocation:
  /opt/aptare/cfgtoollogs/sqlpatch/
  sqlpatch_11780_2026_07_23_13_30_07/sqlpatch_invocation.log

Connecting to database...OK
Gathering database info...done
```

```
Note: Datapatch will only apply or rollback SQL fixes for PDBs
      that are in an open state, no patches will be applied
      to closed PDBs.
      Please refer to Note: Datapatch: Database 12c Post Patch
      SQL Automation (Doc ID 1585822.1)

Bootstrapping registry and package to current versions...done
Determining current state...done

Current state of interim SQL patches:
Interim patch 39222882
  (OJVM RELEASE UPDATE: 19.32.0.0.260721 (39222882)):
  Binary registry: Installed
  PDB CDB$ROOT: Not installed
  PDB PDB$SEED: Not installed
  PDB SCDB: Not installed

Current state of release update SQL patches:
  Binary registry:
    19.32.0.0.0 Release_Update 260705220710: Installed
  PDB CDB$ROOT:
    No release update patches installed
  PDB PDB$SEED:
    No release update patches installed
  PDB SCDB:
    No release update patches installed

Adding patches to installation queue and performing prereq
  checks...done
Installation queue:
  For the following PDBs: CDB$ROOT PDB$SEED SCDB
    No interim patches need to be rolled back
    Patch 39472050 (Database Release Update :
      19.32.0.0.260721 (39472050)):
      Apply from 19.1.0.0.0 Feature Release
        to 19.32.0.0.0 Release_Update 260705220710
    The following interim patches will be applied:
      39222882 (OJVM RELEASE UPDATE: 19.32.0.0.260721 (39222882))

Installing patches...
Patch installation complete. Total patches installed: 6

Validating logfiles...done
```

```
Patch 39472050 apply (pdb CDB$ROOT): SUCCESS
  logfile: /opt/aptare/cfgtoollogs/sqlpatch/39472050/28919163/
  39472050_apply_SCDBCNTR_CDBROOT_2026Jul23_13_30_43.log
  (no errors)
Patch 39222882 apply (pdb CDB$ROOT): SUCCESS
  logfile: /opt/aptare/cfgtoollogs/sqlpatch/39222882/28830205/
  39222882_apply_SCDBCNTR_CDBROOT_2026Jul23_13_30_43.log
  (no errors)
Patch 39472050 apply (pdb PDB$SEED): SUCCESS
  logfile: /opt/aptare/cfgtoollogs/sqlpatch/39472050/28919163/
  39472050_apply_SCDBCNTR_PDBSEED_2026Jul23_13_33_16.log
  (no errors)
Patch 39222882 apply (pdb PDB$SEED): SUCCESS
  logfile: /opt/aptare/cfgtoollogs/sqlpatch/39222882/28830205/
  39222882_apply_SCDBCNTR_PDBSEED_2026Jul23_13_33_16.log
  (no errors)
Patch 39472050 apply (pdb SCDB): SUCCESS
  logfile: /opt/aptare/cfgtoollogs/sqlpatch/39472050/28919163/
  39472050_apply_SCDBCNTR_SCDB_2026Jul23_13_33_16.log
  (no errors)
Patch 39222882 apply (pdb SCDB): SUCCESS
  logfile: /opt/aptare/cfgtoollogs/sqlpatch/39222882/28830205/
  39222882_apply_SCDBCNTR_SCDB_2026Jul23_13_33_16.log
  (no errors)
SQL Patching tool complete on Thu Jul 23 13:36:23 2026
```

Appendix K: SQL patch validation output

Query to check registry for patch history

```
SQL> select action, version, comments from sys.registry$history;

ACTION          VERSION
--------------- ------------------------------
COMMENTS
----------------------------------------------
BOOTSTRAP       19
RDBMS_19.32.0.0.0DBRU_LINUX.X64_260705

RU_APPLY        19.0.0.0.0
Patch applied from 19.3.0.0.0 to 19.32.0.0.0:
  Release_Update - 260705220710
```

Query to check registry for installed patch

```
SQL> select patch_id, patch_type, action, status, description,
target_version from sys.registry$sqlpatch;

  PATCH_ID PATCH_TYPE ACTION  STATUS
---------- ---------- ------- -------------------------
DESCRIPTION
-------------------------------------------------------
TARGET_VERSION
---------------
  39222882 INTERIM    APPLY   SUCCESS
OJVM RELEASE UPDATE: 19.32.0.0.260721 (39222882)
19.32.0.0.0

  39472050 RU         APPLY   SUCCESS
Database Release Update : 19.32.0.0.260721 (39472050)
19.32.0.0.0
```

SQL Patch Status Report output with patch details

```
SQL> set serveroutput on

SQL> exec dbms_qopatch.get_sqlpatch_status;

Patch Id : 39222882
        Action : APPLY
        Action Time : 23-JUL-2026 13:30:43
        Description : OJVM RELEASE UPDATE: 19.32.0.0.260721 (39222882)
        Logfile :
  /opt/aptare/cfgtoollogs/sqlpatch/39222882/28830205/
  39222882_apply_SCDBCNTR_CDBROOT_2026Jul23_13_30_43.log
        Status : SUCCESS

Patch Id : 39472050
        Action : APPLY
        Action Time : 23-JUL-2026 13:33:04
        Description : Database Release Update : 19.32.0.0.260721 (39472050)
        Logfile :
  /opt/aptare/cfgtoollogs/sqlpatch/39472050/28919163/
  39472050_apply_SCDBCNTR_CDBROOT_2026Jul23_13_30_43.log
        Status : SUCCESS

PL/SQL procedure successfully completed.
```

Note: Any patches that were previously applied will be displayed in the SQL Patch Status Report output above.