

HP Operations Orchestration

Software Version: 10.50

Windows and Linux Operating Systems

Installation, Upgrade, and Configuration Guide

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Introduction

Welcome to HP OO!

This document describes how to install and configure HP Operations Orchestration version 10.x using the Installation and Configuration wizard. It also includes instructions for silent installations.

This document is relevant for customers who are:

- Installing a new installation of HP OO (on a machine where it was not previously installed)
- Installing HP OO after having installed the HP OO Community Edition
- Upgrading from an earlier version of HP OO 10.x
- Upgrading from HP OO 9.x

This document contains basic information about upgrading from HP OO 9.x, but for more detailed information, see *Upgrading to HP OO 10.x from HP OO 9.x*.

This document is also available in HTML form from the Installation and Configuration wizard. Click the links on the **Welcome**, **Upgrade**, and **Clustering** pages to open the relevant help topic in a Web browser. You can keep the help open for reference during the installation.

Notes:

- If you install the Community Edition, you will be limited in the number of flows that you can run per month.
- Installing or upgrading to HP OO 10.5x installs the Trial version. As a result, you will need to install the Enterprise Edition license within 90 days of the upgrade. For more information, see "Setting Up Licensing" in the *HP OO Central User Guide*.

Before starting the installation:

- See the ["System Requirements" on page 9](#) to verify that your system meets the minimum system requirements.
- Make sure that the person running the installation has Administrator privileges, in order to avoid UAC (user access control) errors. If you are not sure about your UAC settings, you can also right-click on the installer and choose to run it as an Administrator.

Important! If you are connecting to a database with an existing schema, which Central already ran on, make sure that you use the same encryption key (**central/var/security/encryption_repository**) as the previous Central. Otherwise, Central will not start, and will show an exception message in the **wrapper.log** file ("bad padding"). This is because there is no way to decrypt the already-encrypted data with the new encryption key. If this problem occurs, see

"Backing Up HP OO" in the *HP OO Administration Guide*.

To prevent this problem from occurring, when you install Central, select the **Do not start Central server after installation** check box in the **Connectivity** step of the installation wizard, or use the corresponding property if you're installing silently. Then, perform the task described in "Backing Up HP OO > Recovery" in the *HP OO Administration Guide*.

Note: For more information about basic HP OO concepts, see the *HP OO Concepts Guide*.

System Requirements

This section describes the system requirements for HP OO 10.x.

Software Requirements

Software Requirements for Central and RAS

The Central application requires a dedicated database schema.

Supported Operating Systems

OS	Version
Microsoft Windows Server	2008 64 bit, R2 2008 64 bit 2012 64 bit, R2 2012 64 bit
RedHat Enterprise Linux	5.x 64 bit, 6.x 64 bit
Ubuntu	14.04.x TLS

Note: You can install HP OO in a default installation of Linux. There is no need for special packages.

Supported Databases

Database	Version
Oracle	12cR1 RAC, 12c R1 (regular, non-CDB), 11g R2, 11g R2 RAC
MySQL	5.5.x, 5.6.x*
PostgreSQL	9.1.x, 9.2.x, 9.3.x
Microsoft SQL Server	R2 2008**, 2012**

* For MySQL 5.6.20 and 5.6.21, the requirements for the **innodb_log_file_size** have increased significantly. For MySQL 5.6.1 - 19, the recommendation is 256M, but for MySQL 5.6.20 - 21, the recommendation is 2GB.

** All service packs are supported.

Supported Browsers

Browser	Version
Microsoft Internet Explorer	9.x, 10.x, 11.x
Mozilla FireFox [*]	32.x and later 31.x ESR (Extended Support Release) and later
Google Chrome [*]	40.x and later

*** Disclaimer:** Future versions of Firefox and Chrome are considered supported, subject to the browser's backward-compatibility.

Recommended screen resolution for the browser: 1280x1024 or 1920x1080

Other Requirements

Requirement	Version
.NET Framework	Microsoft .NET Framework 4.5 or later, full installation. This is also required for RAS installations.
Ports	Two ports must be available to configure for the Central Server (one for HTTP and one for HTTPS). The default values for these ports are 8080 and 8443, but you can specify different ports during installation. Note: It is also possible to change the ports after HP OO is installed. See "Changing or Closing the HTTP/HTTPS Ports" in the <i>HP OO Security and Hardening Guide</i> .

Software Requirements for Studio

Supported Operating Systems

OS	Version
Microsoft Windows	8 64 bit, 8.1 64 bit, 7 64 bit*
Microsoft Windows Server	2012 64 bit, R2 2012 64 bit, 2008 64 bit, R2 2008 64 bit

* **Note:** We no longer support Studio on Windows 7 32 bit.

Other Requirements

Requirement	Version
.NET Framework	<p>Microsoft .NET Framework 4.5 or later, full installation.</p> <p>This is also required for debugging flows with .NET operations. If you don't have .NET 4.5, any flows or operations with .NET will be marked as invalid in Studio.</p>
Service packs	<p>Microsoft Visual C++ 2010 Redistributable Package (x86).</p> <p>This is required in order to use the Studio SVN integration feature.</p> <p>You need to download and install the version for the x86 platform, regardless of your Windows version (for example, if it is Windows x64).</p> <p>http://www.microsoft.com/en-us/download/confirmation.aspx?id=5555</p>
Git client	<p>In order to use the Studio Git integration feature, you must download and install the Git client version git-1.9.5-preview20150319.</p> <p>https://github.com/msysgit/msysgit/releases/download/Git-1.9.5-preview20150319/Git-1.9.5-preview20150319.exe.</p>

Note: The minimum screen resolution for Studio is 1280x1024.

Software Requirements for the Database Server

Operating system support for database servers is according to the recommendations of the database vendor.

Hardware Requirements

The hardware requirements described here are the minimal supported configuration.

Many customers may require more powerful hardware, depending on their load and usage of the system. In some cases, scaling out (adding nodes) is preferable to scaling up (stronger hardware).

Hardware Requirements for HP OO Central and Database Servers

These requirements are for on-premise installations where the key components (central servers, RAS) are installed at the customer's site.

Component	Requirement per server (minimum)
CPU	<p>3 Gigahertz (GHz) for single-processor systems or 2 GHz for multi-processor systems</p> <p>Database server:</p> <ul style="list-style-type: none">• According to the database vendor's recommendations and requirements, but no less than 2CPU cores <p>Central server:</p> <ul style="list-style-type: none">• Minimum: 1CPU core• Recommended: 4CPU cores
Memory (RAM)	<p>Database server:</p> <ul style="list-style-type: none">• As specified by the vendor, but no less than 4 GB <p>Central server:</p> <ul style="list-style-type: none">• Minimum: 2 GB• Recommended: 4 GB

Hard-drive space	<p>Database server:</p> <ul style="list-style-type: none"> Centralized database: <ul style="list-style-type: none"> 50 GB for HP OO data - out of which a few GB are for the HP OO installation and content pack deployment, and the rest is used for HP OO's operational data. <p>For extensive usage, it is recommended to allocate 100 GB or more, depending on your data retention policy.</p> Dedicated database server: <ul style="list-style-type: none"> 80 GB hard drive <p>For extensive usage, it is recommended to allocate a 140 GB hard-drive or bigger, depending on your data retention policy.</p>
	<p>Central server:</p> <ul style="list-style-type: none"> 2 GB

For off-premise installations, where the key components are installed on a cloud-based virtualized machine, the hardware requirements are:

- Central/RAS: For Cloud systems, an extra small machine
- Database: According to the database vendor's recommendations and requirements, but no less than a small machine.

For more information about database size requirements see the *HP OO Database Guide*.

Hardware Requirements for the Central Client

Web client machines for Central must meet the minimum hardware requirements for their web browser.

Hardware Requirements for RAS Installations

Component	Requirement (minimum)
CPU	<p>2 GHz for single- or multi-processor systems</p> <p>Minimum: 1 CPU core</p> <p>Recommended: 4 CPU cores</p>
Memory (RAM)	1 GB
Hard-drive space	2 GB (this includes room for the flows and operations that are included in the installation)

Hardware Requirements for HP OO Studio Installed on its Own Machine

Machines on which you install Studio must meet the minimum hardware requirements for their web browser or the following, whichever is higher.

Component	Requirement (minimum)
CPU	2 GHz for single- or multi-processor systems 1 CPU core
Memory (RAM)	2 GB (this is the amount of memory that the Studio process requires)
Hard-drive space	4 GB (this includes room for the flows and operations that are included in the installation)

Virtual Systems

Installation of the HP OO components on guest systems hosted by the following hypervisors is supported, as long as the guest systems meet the requirements described in this *System Requirements* document:

- VMware ESX Server, version 3.x or later
- Microsoft Hyper-V (for all supported Windows versions)

Cloud Deployments

HP Operations Orchestration can be installed on cloud computer units. On HP Cloud Services, the server components (Central, RAS) require a small machine, and the database should follow the database vendor's recommendations and requirements, but no less than a small machine.

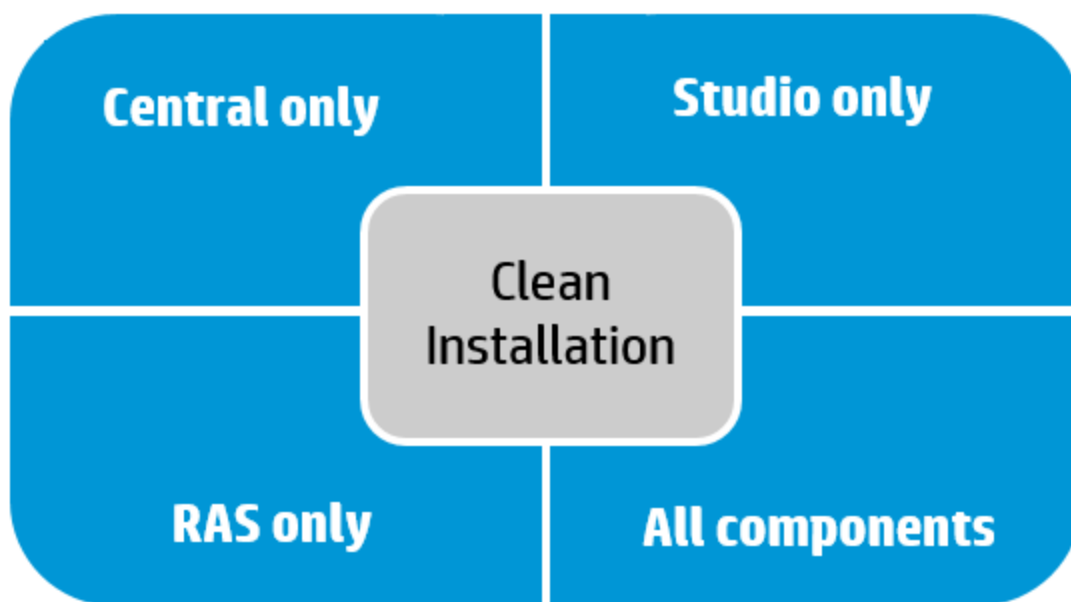
Installing a Clean Installation of HP OO

This section shows you how to perform a clean installation of HP OO—in a location where it has not been installed previously.

This section includes descriptions of how to install HP OO Central, Studio, RAS, or all three components at once.

First, see the [Prerequisites and Installation Notes](#). Then, go to the relevant installation section:

- ["Installing HP OO Central Using the Installation Wizard" on page 18](#)
- ["Installing HP OO Studio Using the Installation Wizard" on page 30](#)
- ["Installing HP OO RAS Using the Installation Wizard" on page 37](#)
- ["Installing All HP OO Components Using the Installation Wizard" on page 44](#)



The topics describe how to install HP OO using the Installation Wizard. It is also possible to perform a silent installation. For information, see ["Installing HP OO Silently" on page 80](#).

Note: The Installation wizard cannot be launched from the command line. You can only use the Installation wizard on Linux if you are in the graphical user interface or VNC. If you are working from the command line, you will need to do a silent installation.

Even if you are installing silently, it is recommended to see the flowcharts in the topics about installing with the wizard, because the decisions to be made at each point are the same.

When you install HP OO 10.5x, this installs the Trial version. You will need to install the Enterprise Edition license within 90 days. For more information, see "Setting Up Licensing" in the *HP OO Central User Guide*.

Prerequisites and Installation Notes

- Before installing HP OO 10.50, you must download and install Microsoft Visual C++ 2010 Redistributable Package (x86). You need to install the version for the x86 platform, regardless of your Windows version.

This package can be downloaded from: <http://www.microsoft.com/en-us/download/confirmation.aspx?id=5555>.

- It is recommended to install HP OO on a secured environment. For more information, see the *HP OO Security and Hardening Guide* (available in PDF form in the **docs** folder).
- If you are installing Central with MySQL, you will need to provide the MySQL JDBC driver. Use MySQL Connector release between 5.1.21 (recommended) and 5.1.30.

This driver can be downloaded from:

<http://mvnrepository.com/artifact/mysql/mysql-connector-java>

- Before installing HP OO, make sure to back up your system. Consult with your system administrator.
- If you uninstalled a previous version of HP OO and are installing 10.x in the same installation folder, make sure to back up the all the files that were under the installation folder and delete that folder before installing the new version.
- The Central server requires two ports, so make sure that two ports are available.

Note: The default ports are 8080 and 8443, but you can use any two available ports.

SQL Scripts to Create the Database Objects

If, for security reasons, the HP OO database user lacks the ability to create objects such as tables, indexes, sequences, and so on, you can use SQL scripts from the ZIP file to manually create the database objects using an elevated privileges database connection.

Before using these scripts, you need to have the database or schema already created. The scripts to create the database or schema can be found in the "Manually Creating an HP OO Database" sections of the *HP OO Database Guide* document.

The SQL scripts are located at **\docs\sql** on the ZIP file. They include:

- mssql.sql
- mysql.sql

- oracle.sql
- postgres.sql

Database-specific Adaptations

This section describes several key database-specific adaptations and requirements. For detailed instructions, see the *HP OO Database Guide*.

- **MySQL:** If you are deploying HP OO using a MySQL database, you need to configure the MySQL server configuration file **my.ini** (Windows) or **my.cnf** (Linux) with the following options:

```
transaction-isolation = READ-COMMITTED
default-storage-engine = INNODB
character-set-server = utf8
max_allowed_packet = 250M
innodb_log_file_size = 256M
max_connections = 1000
```

- **Postgres:** If you are deploying HP OO using a Postgres database, you need to configure the Postgres server configuration file **postgresql.conf** with the following options:

```
default_transaction_isolation = 'read committed'
autovacuum = on
track_counts = on
max_connections = 1000
```

- **Oracle:**

If you are deploying HP OO using an Oracle database, you need to configure the Oracle server PROCESSES and OPEN_CURSORS to guarantee up to 1000 concurrent connections for HP OO and up to 900 open cursors per session.

- **SQL Server**

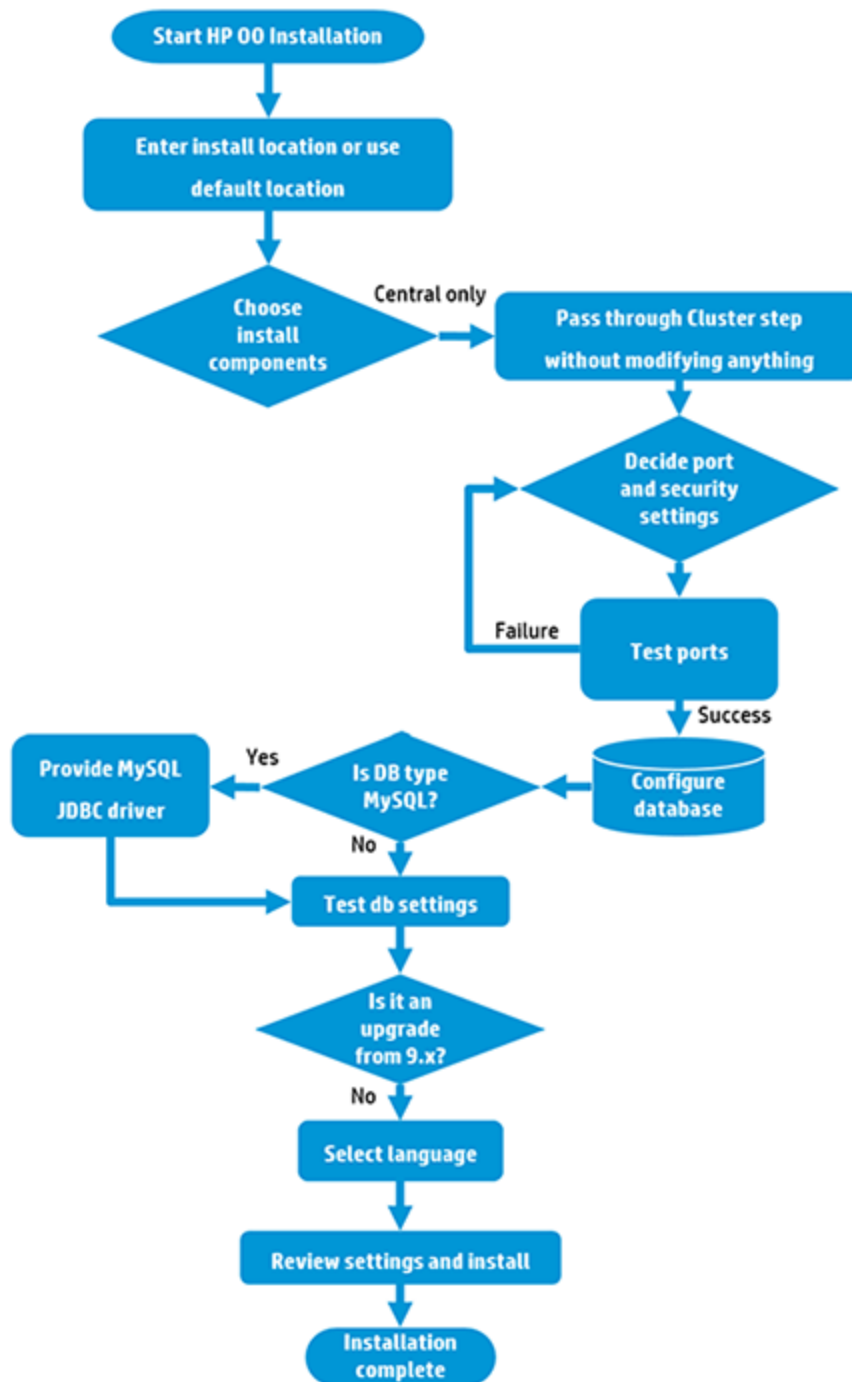
If you are deploying HP OO using an SQL Server database, you need to set the following options for the database:

ALLOW_SNAPSHOT_ISOLATION	ON
READ_COMMITTED_SNAPSHOT	ON
AUTO_CREATE_STATISTICS	ON
AUTO_SHRINK	OFF

Installing HP OO Central Using the Installation Wizard

This section describes how to perform a clean installation of a single HP OO Central on Windows or Linux.

In some cases, the screenshots display the Windows information.



Links to Steps

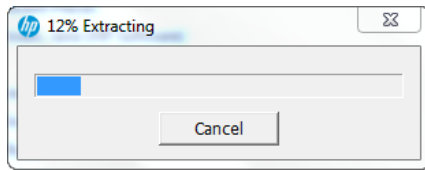
Start the HP OO Installation
Enter the Installation Location or Use the Default Location
Choose the Installation Components
Pass Through the Cluster Step Without Modifying Anything
Decide Port and Security Settings
Test the Ports
Configure the Database
Is the Database Type MySQL? <ul style="list-style-type: none"> • Yes: Provide MySQL JDBC Driver • No: Go to Test Database Settings
Test Database Settings
Is it an Upgrade from 9.x?
Select Language
Review Settings and Install
Installation Complete

Start the HP OO Installation

1. Download the ZIP file from the HP SSO Portal and extract it into a local drive on your computer.
2. To start the installer:
 - On Windows: Double-click the **installer-win64.exe** installation file.
 - On Linux: Run this command from an X Window terminal:


```
bash installer-linux64.bin
```

 To start the installer, double-click the **installer-linux64.bin** file.
3. After you start the installer, the installation package is extracted, and the **HP Operations Orchestration Installation and Configuration Wizard** automatically opens. Click **Next**.



4. In the **License** page, select **I Agree**, and then click **Next**.

[Back to the flowchart](#)

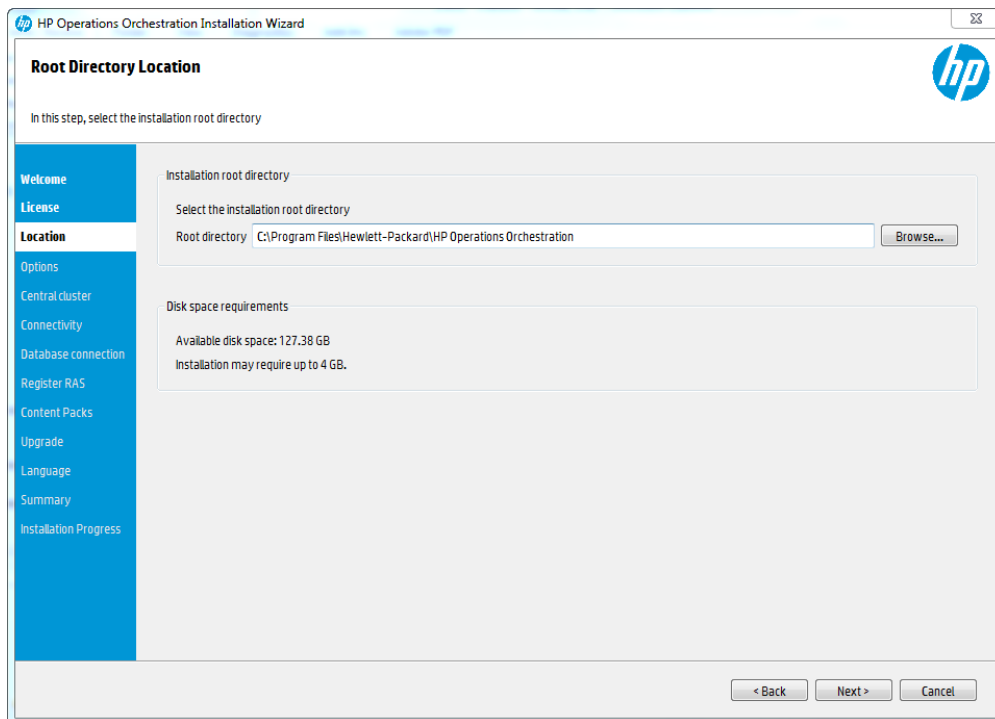
Enter the Installation Location or Use the Default Location

1. In the **Location** page, select the location for the installation root directory.

If the directory does not exist, the directory is created automatically. You are prompted to confirm the creation of the new location.

Note: Valid characters for the installation path are English letters, digits, spaces, hyphens (-) and underscores (_).

The default path is C:\Program Files\Hewlett-Packard\HP Operations Orchestration for Windows and is /opt/hp/oo for Linux.



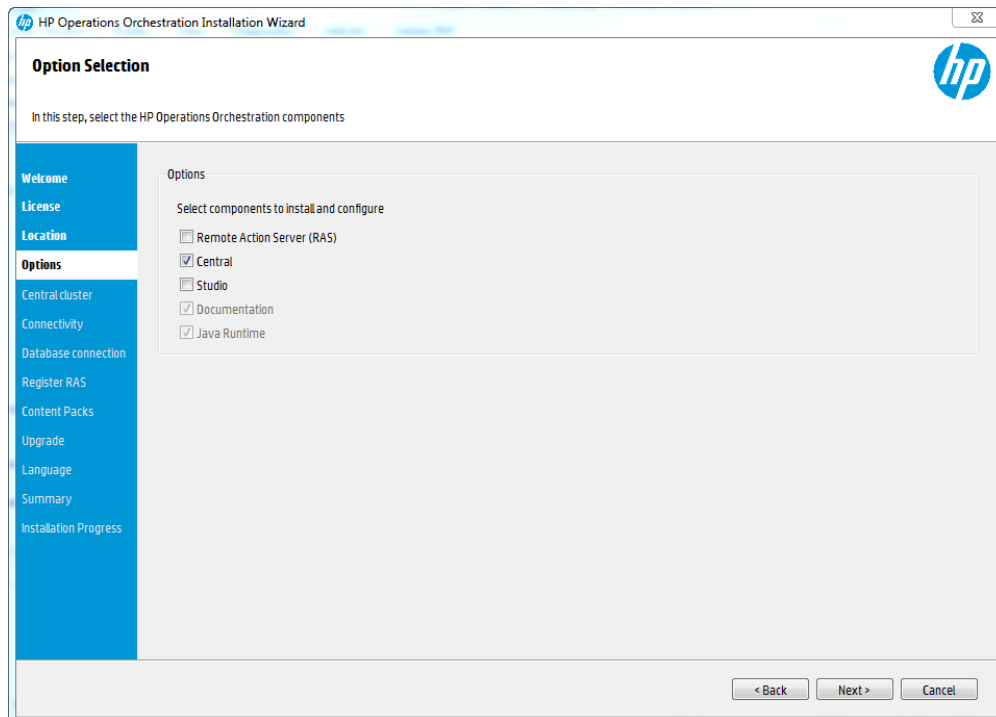
2. Click **Next**.

[Back to the flowchart](#)

Choose the Installation Components

1. In the **Options** page, select **Central**.

Note: You can install Central without setting up a RAS server. If you install a RAS Server, it is recommended that you install this on a separate server to Central. See ["Installing HP OO RAS Using the Installation Wizard" on page 37](#). See the *Architecture Guide* for more information.



2. Click **Next**.

[Back to the flowchart](#)

Pass Through the Cluster Step Without Modifying Anything

In the **Central Cluster** page, click **Next**.

For information about how to install a node in a cluster, see ["Installing an HP OO Central Cluster" on page 57](#).

[Back to the flowchart](#)

Decide Port and Security Settings

In the **Connectivity** page, configure the Central Server ports and TLS:

1. Configure available ports for the Central Server. Default values (8080 and 8443) appear for each port, but you can change these. Choose one of the following options:

- (Recommended) Select **Disable HTTP Port** and configure a port in the **HTTPS** field.

This option is recommended for security reasons, so that the communication channel is encrypted.

- (Not recommended) Select **Allow HTTP access** and configure two ports in the **HTTP** and **HTTPS** fields.

Note: Configuring at least one port is mandatory. If a port is not defined, or if the ports are occupied by other applications, you will not be able to complete the installation.

2. (Recommended) Select **Provide a secure TLS certificate**, and then click **Browse** to select the certificate.

This step is recommended, for security reasons. If you do not select a Central TLS certificate, HP OO uses a self-signed certificate.

Note: Do not use a network path for the location of the Central TLS certificate.

3. If you selected a Central TLS certificate, enter its password, and enter it again for confirmation.

4. Click **Browse** to specify the location of the CA root certificate, which will be imported into the TrustStore for Central/RAS.

Note: Do not use a network path for the location of the CA root certificate.

For more information about installing HP OO on a secured environment, see the *HP OO Security and Hardening Guide*.

5. Select **Do not start Central server after installation** if either of the following is true:

- If you are configuring HP OO to be compliant with FIPS 140-2.

For more information, see "Configuring HP OO for FIPS 140-2 Level 1 Compliance" in the *HP OO Security and Hardening Guide*.

- If you are installing a new Central in cluster mode and the installer version is older than the current Central.

Note: If you are installing Central and RAS together, or upgrading from 9.x, this option is not available. This is because the RAS server needs to connect to the Central server. If Central is not started, the installation of the RAS will fail..

[Back to the flowchart](#)

Test Ports

Click **Test ports availability**. If the ports are available, a **Success** check mark appears.

- If you encounter an error, adjust the ports accordingly and try again.
- If the **Success** check mark appears, click **Next**.

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Configure Database

In the **Database Connection** page, you configure and create the database schema.

Note: If you have user input in two languages apart from English (for example, German and Chinese) then MS SQL should not be used. You should use an alternative database such as Oracle, MySQL, or Postgres with the recommended Unicode configuration for HP OO.

1. From the **Database Type** list, select the database vendor, and then enter the connection properties.

Note: When the **Connect to existing database/schema** option is selected, do not use administrative user accounts in the **Username** and **Password** fields, because this will install HP OO under the administrative account.

When the **Create the database/schema** option is used, provide a user with the relevant privileges in the **Admin username** and **Admin password** fields.

You can select from the following database types:

- **Oracle:** Do not use **SYS**, **SYSTEM**, or other administrative accounts credentials in the **Username** and **Password** fields.

Note: If you are using Oracle 11g R2 or 11g R2 RAC, it is recommended to apply patch 20299013 before installing HP OO.

- **Microsoft SQL Server:** Do not use **sa** or other administrative account credentials in the **Username** and **Password** fields.
- **Oracle MySQL:** Do not use the **root** credential in the **Username** and **Password** fields.

If you are installing HP OO with Oracle RAC (Real Application Cluster), you must choose **Other database** and provide the URL. For more information, see "Appendix B: Additional Guidelines for Oracle > Oracle Real Application Cluster (RAC)" in the *HP OO Database Guide*.

- **PostgreSQL**: Do not use the **postgres** credential in the **Username** and **Password** fields.

Note: PostgreSQL database names are case-sensitive.

- **Internal database**: This uses an H2 local database. This should not be used for production.
- **Other database**: (use to enable advanced features in supported databases). If you select **Other database**, you can only use a database type that is supported for use with HP OO. See "Appendix C: Installation Wizard 'Other Database' Option" in the *HP OO Database Guide* for more information.

Note: The **Other database** option also supports any valid JDBC URL.

2. After selecting the database type, select one of the following:

- **Connect to existing database/schema**: Connect to an existing schema, user, or database. The installer verifies that the schema/database and user exist.
- **Create the database/schema**: Enables you to create a new database or schema. Information in the **Database**, **Username** and **Password** fields will be used in order to create the new schema, user, or database for HP OO.

Confirm the password by typing it again in the **Confirm Password** field.

Important! Make sure to use a strong password, in accordance with your organization's security policy. If the password is not strong enough, an error message will appear.

Provide existing database user credentials in the **Admin username** and **Admin password** fields. This elevated-privileges user must be able to connect to the database and create the new schema, user, or database for HP OO.

3. Enter the hostname or IP address and other connection details.

Make sure to use the FQDN (Fully Qualified Domain Name).

If you want to use IPv6, put the IPv6 address in brackets, for example, [3fff::20]. Otherwise, errors will occur.

4. (For Oracle) Select either **SID** or **Service Name**, and enter the SID or service name of the

database.

It is recommended to use Oracle database's service name rather than using the SID.

Note: If you are upgrading from a 9.x version that is installed on Oracle, you must enter the SID of this database in the **SID** field, and not the database name.

For more information about setting up the database schema, see the *HP OO Database Guide*.

[Back to the flowchart](#)

Is the Database MySQL?

Yes: Go to [Provide the JDBC Driver for MySQL](#)

No: Go to [Test Database Settings](#)

Provide the JDBC Driver for MySQL

Complete this step if the database is MySQL:

In the **Database Connection** page, click **Browse** and select the location of the JDBC driver.

[Back to the flowchart](#)

Test Database Settings

Click **Test Connection**. If you are unable to connect to the database, you will not be able to proceed to the next steps in the wizard.

If your password is not strong enough, a warning is displayed. You will still be able to proceed with the installation, but it is strongly recommended to replace it with a stronger password.

The installer checks for non-empty schemas/databases, and shows a warning message if the schema or database is not empty. If the installation fails during schema validation, the installation process is stopped.

Note: This test only verifies the connection between HP OO and the selected database, and does not verify the conditions required by the database, like the user's read/write permissions on the provided schema.

Note: For all the database vendors, if you select to create a new database, the created database uses **case-sensitive** collation as follows:

- MySQL: **utf8_bin collation** is used for the new database.
- Postgres: Case-sensitive by design. No need for specific settings. **UTF-8** encoding is supported

- Oracle: Case-sensitive by default. No need for specific settings. **UTF-8** encoding is supported.
- MS SQL: Use only the following database collations per your required language:
 - English: `SQL_Latin1_General_CP1_CS_AS`
 - Japanese: `Japanese_Unicode_CS_AS`
 - Simplified Chinese: `Chinese_Simplified_Stroke_Order_100_CS_AS`
 - German: `SQL_Latin1_General_CP1_CS_AS`
 - French: `French_100_CS_AS`
 - Spanish: `SQL_Latin1_General_CP1_CS_AS`

However, if you already have a database installed, HP OO creates the tables using the database specific collation. It is important to note that using other collations can cause characters to appear in gibberish in the user interface for localized installations. In addition, other collations are not officially supported in Microsoft SQL Server for localized installations.

If the installer is used in order to create a new SQL Server database, selecting your language in the language selection page sets the correct collation for the new database.

Using one of the above collations enables using the **varchar** datatype for textual columns instead of the **nvarchar** data type. Using the **varchar** data type is more efficient and reduces overall database size.

Selecting a specific language also means that an HP OO system that uses SQL Server is limited to the set of languages supported by that specific collation. For example, if the **SQL_Latin1_General_CP1_CS_AS** collation is used, English, German, and Spanish characters may be used, but Japanese characters may not. If **Japanese_Unicode_CS_AS** is used, French accent characters will not be presented properly. For the complete specification of each collation, see the Microsoft SQL Server documentation.

[Back to the flowchart](#)

Is it an Upgrade from 9.x?

In the **Upgrade** page, click **Next** without modifying anything.

This procedure describes how to perform a clean installation of HP OO 10.x. For information about upgrading from 9.x, see the document *Upgrading to HP OO 10.x from HP OO 9.x*.

[Back to the flowchart](#)

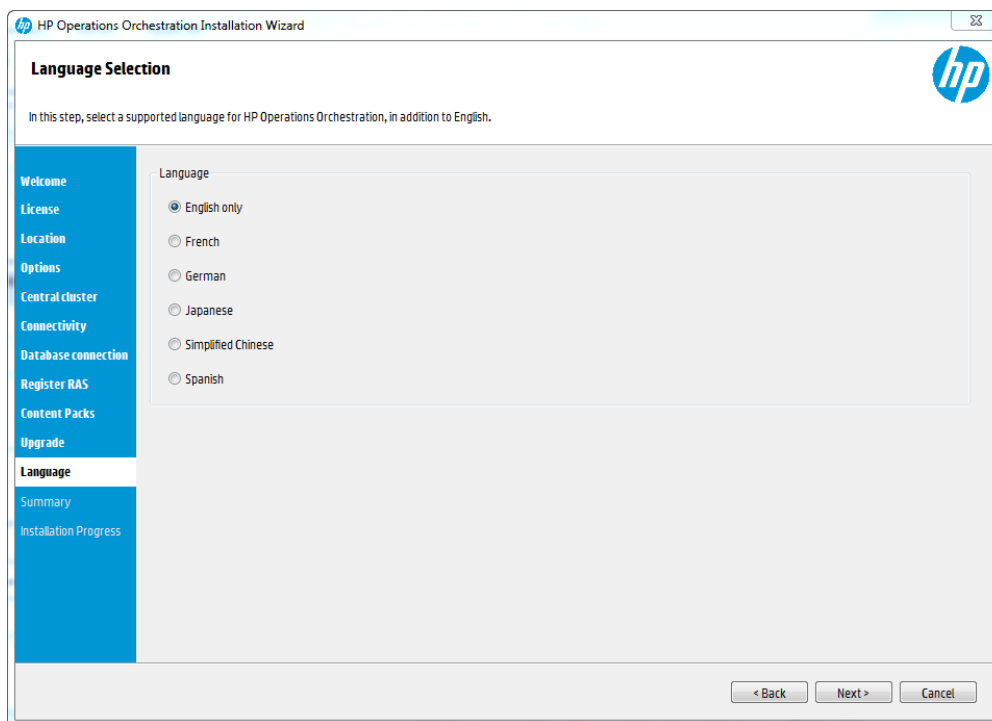
Select Language

In the **Language** page, select a supported language for HP Operations Orchestration, in addition to English, and then click **Next**.

This language support will be used for:

- The MS SQL collation language, if relevant
- The **central-wrapper.conf** language for content. This language support may be required if, for example, you need to ping a server that is configured in Japanese.

Note: You can change the language support choice after installation, by editing the **central-wrapper.conf** file, located in the installation directory under **central/conf**.



[Back to the flowchart](#)

Review Settings and Install

1. The **Summary** page displays the installation and configuration settings that you selected and entered in the wizard. Check that the settings are correct. If you want to correct one of the items, click **Back**.
2. Click **Install**. The installation begins, and the wizard displays a check mark next to each successfully installed item on the **Progress** page. When the installation is complete, click **Next**.

Note: If there is a problem with one of the installation or configured items, the installation attempts to continue with the rest of the items regardless of that error. Check the **installer.log** file (the default located is **C:\HP\oo** for Windows or in **/HP/oo** for Linux), to check for errors.

3. (Optional) In the **Finish** page, select **Open Welcome Page** to display the HP OO Welcome page in your default web browser, in the language that was selected on the **Language** page.
4. Click **Finish** to close the Installation and Configuration wizard.

Installation is Complete

Central is installed and menu shortcuts are created on your system.

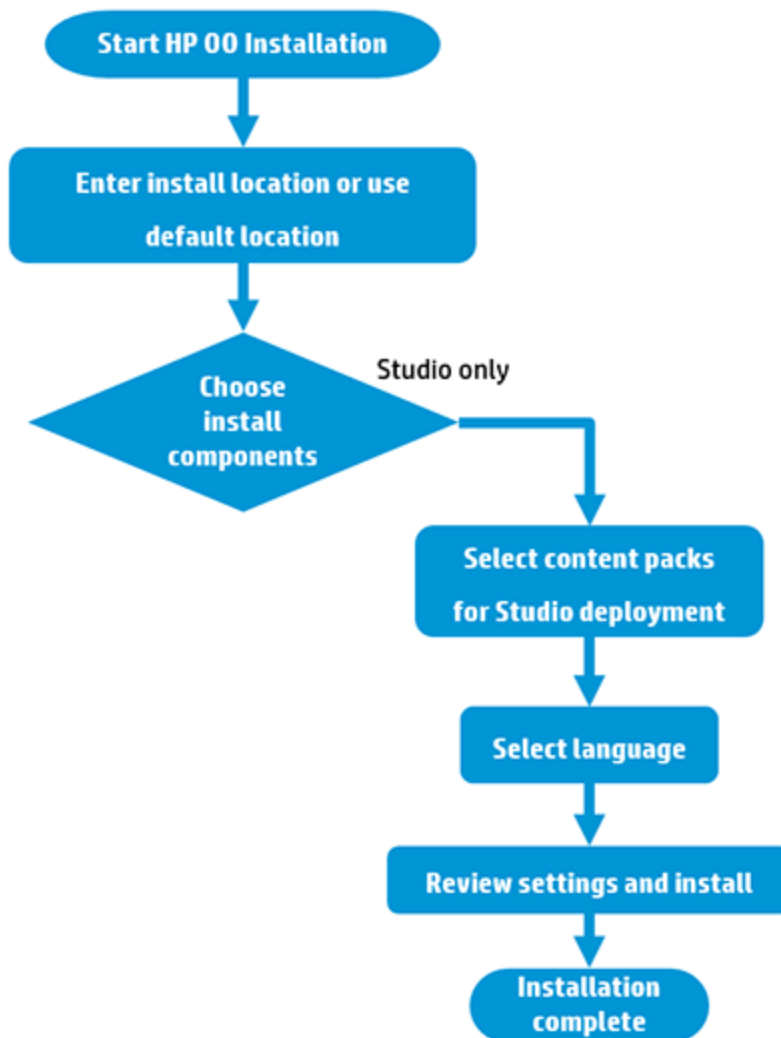
The installation is of the Trial version of HP OO. As a result, you will need to install the Enterprise Edition license within 90 days. You will need to generate the license with the IP of the Central server.

For more information about licensing, see "Setting Up Licensing" in the *HP OO Central User Guide*.

Installing HP OO Studio Using the Installation Wizard

This section describes how to perform a clean installation of HP OO Studio.

Note: Studio only works on Windows or Mac, so it cannot be installed on Linux.

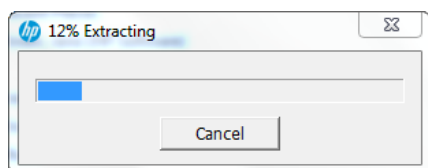


Links to Steps

Start the HP OO Installation
Enter the Installation Location or Use the Default Location
Choose the Installation Components
Select Content Packs for Studio Deployment
Select Language
Review Settings and Install
Installation Complete

Start the HP OO Installation

1. Download the ZIP file from the HP SSO Portal and extract it into a local drive on your computer.
2. To start the installer, double-click the **installer-win64.exe** installation file.
3. After you start the installer, the installation package is extracted, and the **HP Operations Orchestration Installation and Configuration Wizard** automatically opens. Click **Next**.



4. In the **License** page, select **I Agree**, and then click **Next**.


[Back to the flowchart](#)

Enter the Installation Location or Use the Default Location

1. In the **Location** step, select the location for the installation root directory, and then click **Next**.

The default path is C:\Program Files\Hewlett-Packard\HP Operations Orchestration. Valid characters for the installation path include English letters, digits, spaces, hyphens (-) and underscores (_).

If the directory does not exist, the directory will be created automatically. You are prompted to confirm the creation of the new location.



Root Directory Location

In this step, select the installation root directory

Welcome

License

Location

Options

Central Cluster

Connectivity

Database Connection

Register RAS

Content Packs

Upgrade

Language

Summary

Installation Progress

Finish

Installation root directory

Select the installation root directory

Root directory

Disk space requirements

Available disk space: 70.39 GB

Installation may require up to 4 GB.

2. Click **Next**.

[Back to the flowchart](#)

Choose All the Installation Components

1. In the **Options** page, select the **Studio** check box.



Option Selection
In this step, select the HP Operations Orchestration components

Options

Select components to install and configure

- ☐ Central
- ☒ Studio
- ☐ Remote Action Server (RAS)
- ☒ Documentation
- ☒ Java Runtime

Description

< Back Next > Cancel

2. Click **Next**.

[Back to the flowchart](#)

Select Content Packs for Studio Deployment

In the **Content Packs** page, you can import one or more content packs.

1. Browse to the location where the content packs are located, and then click **OK**.

The available content packs located in the selected folder appear in the list.

Note: The installation folder includes the released content packs.

2. Select the content pack (or packs) that you want to import, and then click **Next**.



Studio Content Packs

Welcome

License

Location

Options

Central Cluster

Connectivity

Database Connection

Register RAS

Content Packs

Upgrade

Language

Summary

Installation Progress

Finish

Content Packs Source Directory

C:\MyDownloads\10.20\content

Browse...

Select Content Packs to deploy in Studio

Base (1.3.0)

Business Applications (1.1.0)

Cloud (1.3.0)

Cloud Orchestration (1.1.0)

Databases (1.1.0)

HP Solutions (1.3.0)

Infrastructure Orchestration (1.1.0)

IT Operations (1.1.0)

Middleware (1.1.0)

Operating Systems (1.2.0)

Third-party (1.1.0)

Utility Orchestration (1.1.0)

Virtualization (1.3.0)

Find more content packs at <https://hpln.hp.com/group/operations-orchestration-content-packs>.

< Back

Next >

Cancel

Note: The content packs in the image above are just an example. Select the appropriate content packs.

You can download additional and updated content packs on HPLN, using the link in the lower part of the wizard.

[Back to the flowchart](#)

Select Language

In the **Language** step, select a supported language for HP Operations Orchestration, in addition to English, and then click **Next**. This language support will be used for the Studio UI.

You can change the language support choice after installation, by editing the **Studio.properties** file, located in the installation directory under and **studio/conf**.



Language Selection

In this step, select a supported language for HP Operations Orchestration, in addition to English.

[Back to the flowchart](#)

Review Settings and Install

1. The **Summary** page displays the installation and configuration settings that you selected and entered in the wizard. Check that the settings are correct. If you want to correct one of the items, click **Back**.
2. Click **Install**. The installation begins, and the wizard displays a check mark next to each successfully installed item on the **Progress** page. When the installation is complete, click **Next**.

Note: If there is a problem with one of the installation or configured items, the installation attempts to continue with the rest of the items regardless of that error. Check the **installer.log** file (the default location is **C:\HP\oo**) to check for errors.

3. (Optional) In the **Finish** page, select **Launch Studio** to start Studio.
4. Click **Finish** to close the Installation and Configuration wizard.

[Back to the flowchart](#)

Installation is Complete

Studio is now installed and menu shortcuts are created on your system.

You can also start **Studio** from the Windows **Start** menu:

From the Windows **Start** menu, select **All Programs > HP Operations Orchestration > Studio**.

Note: The minimum screen resolution for Studio is 1280x1024.

If you want to store your flows in a source control repository such as SVN or Git, see the *HP OO Studio Authoring Guide* for instructions about how to set up the repository.

After installing Studio, in order to use the Studio Git integration feature, you must install the Git client version **git-1.9.5-preview20150319**.

1. Download the Git client from the following URL:
<https://github.com/msysgit/msysgit/releases/download/Git-1.9.5-preview20150319/Git-1.9.5-preview20150319.exe>.
2. Save the Git client to **<oo_installation_folder>/studio/Git**, so that the **bin** folder is directly under **<oo_installation_folder>/studio/Git**. In the Git installation wizard, use the default options.

Alternatively, if you already have a Git client installation with version **git-1.9.5-preview20150319** on your local disk, point Studio to use that Git installation by performing the following steps:

1. Close Studio.
2. Go to the user home folder **C:\Users\<user>\.oo** (the Studio workspace location) and locate the **Studio.properties** file.
3. Modify the **Studio.properties** file by adding the following property at the end of the file:

```
studio.git.installation.location=<git-1.9.5-preview20150319_installation_folder>
```

For example:

```
studio.git.installation.location=C:/Program Files (x86)/Git
```

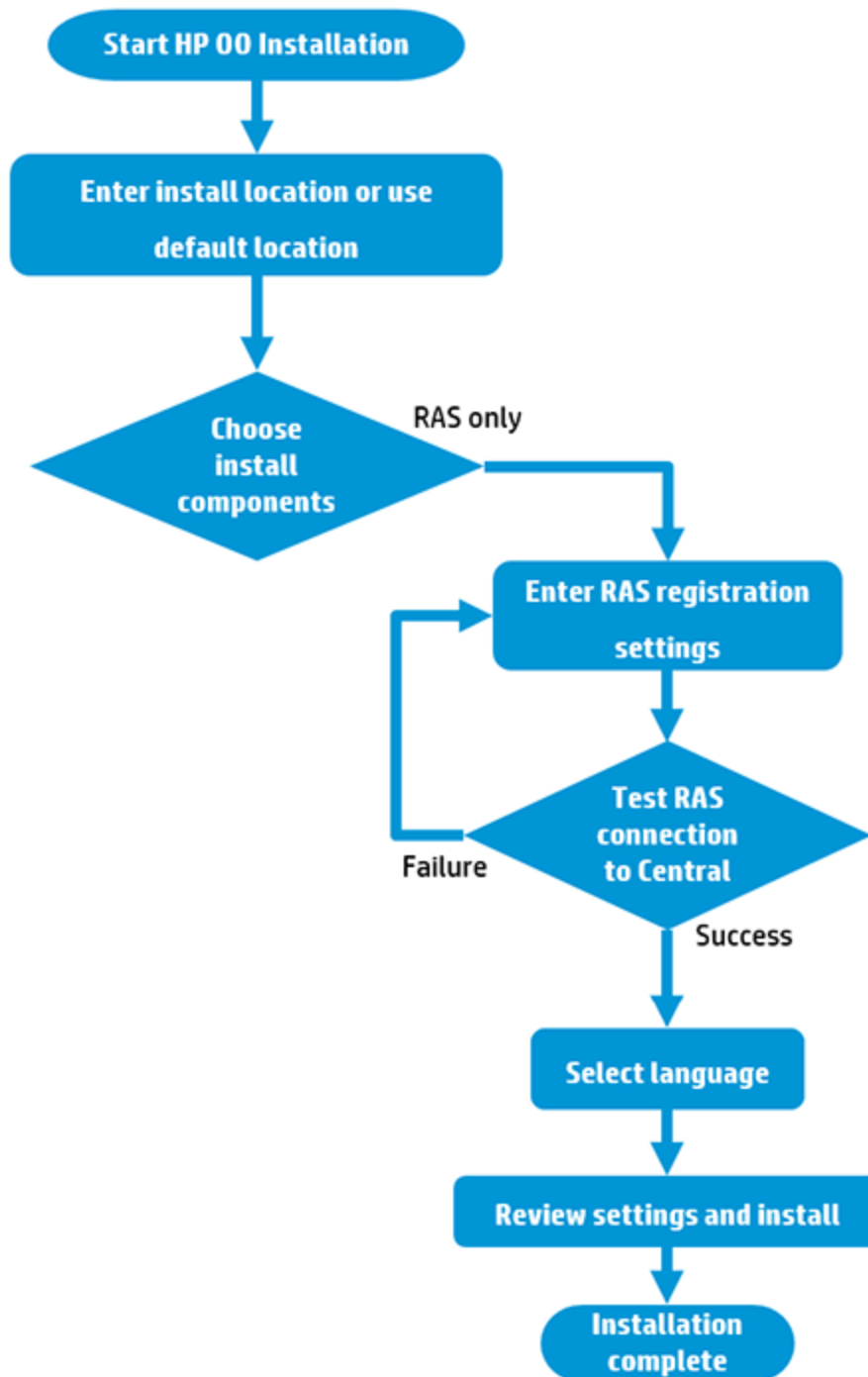
The **bin** folder should be directly under **C:/Program Files (x86)/Git**. Note that **/** should be used as a path separator.

4. Save the **Studio.properties** file and start Studio.

If you have another version of the Git client installed, note that you must use the **git-1.9.5-preview20150319** version with Studio.

Installing HP OO RAS Using the Installation Wizard

This section describes how to perform a clean installation of an HP OO RAS.



Links to Steps

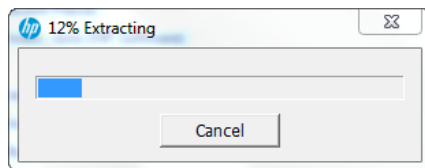
Start the HP OO Installation
Enter the Installation Location or Use the Default Location
Choose the Installation Components
Enter the RAS Registration Settings
Test RAS Connection to Central
Select Language
Review Settings and Install
Installation Complete

Start the HP OO Installation

1. Download the ZIP file from the HP SSO Portal and extract it into a local drive on your computer.
2. To start the installer:
 - On Windows: Double-click the **installer-win64.exe** installation file.
 - On Linux: Run this command from an X Window terminal:


```
bash installer-linux64.bin
```

 To start the installer, double-click the **installer-linux64.bin** file.
3. After you start the installer, the installation package is extracted, and the **HP Operations Orchestration Installation and Configuration Wizard** automatically opens. Click **Next**.



4. In the **License** page, select **I Agree**, and then click **Next**.

[Back to the flowchart](#)

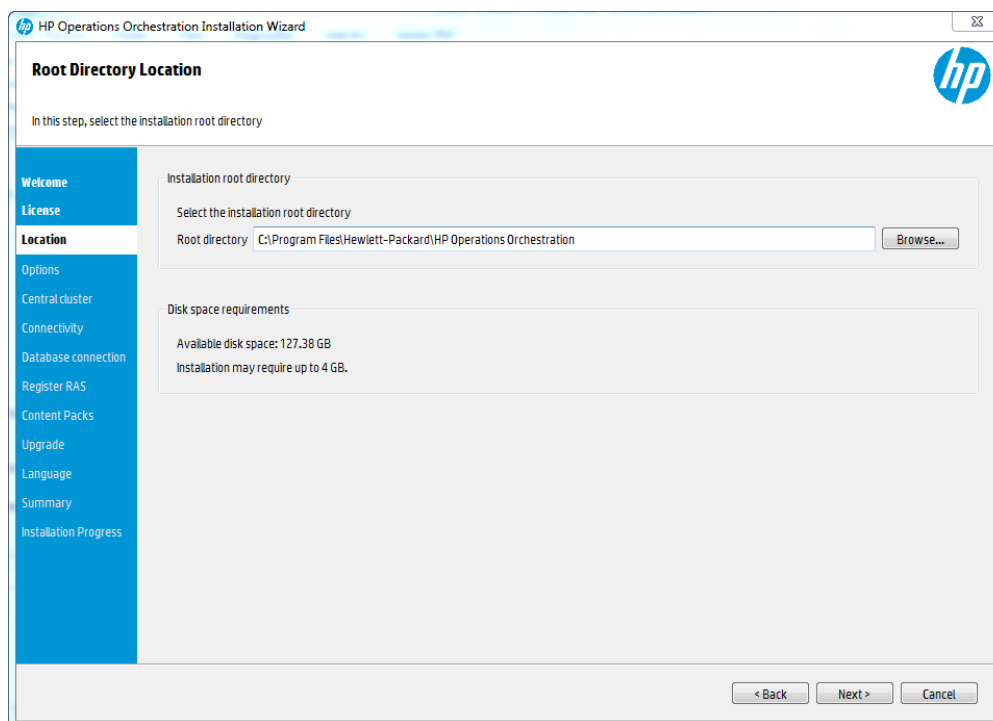
Enter the Installation Location or Use the Default Location

1. In the **Location** page, select the location for the installation root directory.

If the directory does not exist, the directory is created automatically. You are prompted to confirm the creation of the new location.

Note: Valid characters for the installation path are English letters, digits, spaces, hyphens (-) and underscores (_).

The default path is C:\Program Files\Hewlett-Packard\HP Operations Orchestration for Windows and is /opt/hp/oo for Linux.

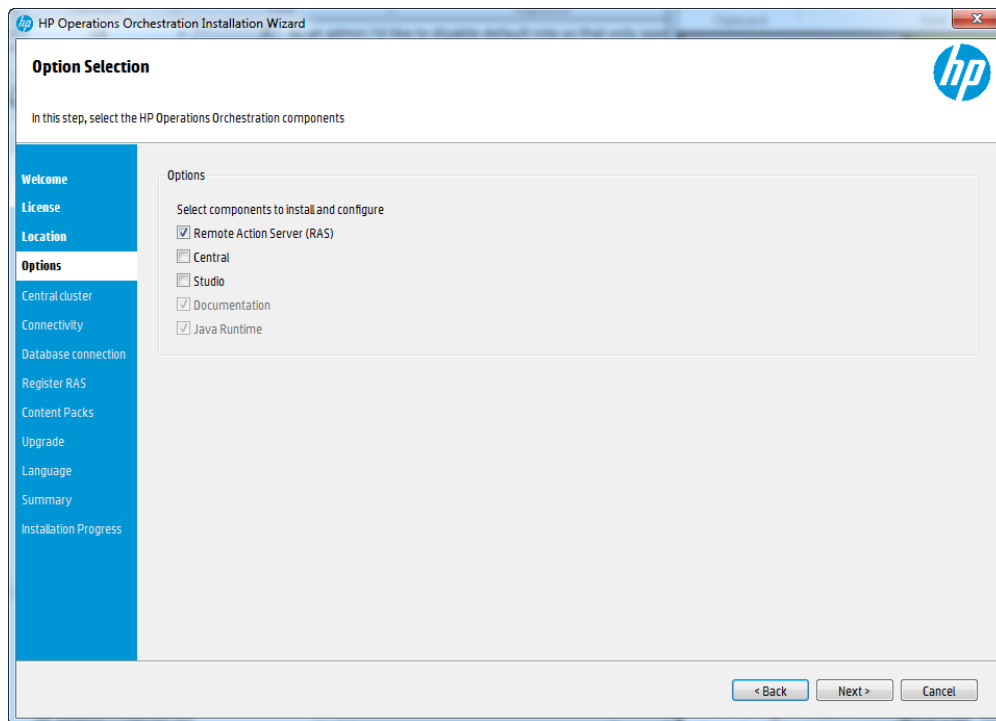


2. Click **Next**.

[Back to the flowchart](#)

Choose the Installation Components

1. In the **Options** page, select the **Remote Access Server (RAS)** check box.



2. Click **Next**.

[Back to the flowchart](#)

Enter the RAS Registration Settings

If you are installing RAS and Central at the same time, the **Register RAS** page does not appear, because the RAS is automatically registered to the Central that it is being installed at the same time.

1. In the **Register RAS** page, in the **Central URL** box, enter the properties and location of the Central.

Make sure to use the FQDN (Fully Qualified Domain Name) for the Central URL.

If you want to use IPv6, put the IPv6 address in brackets, for example, [3fff::20]. Otherwise, errors will occur.

Note: If Central is set up with HTTPS, make sure to enter the hostname *exactly* as specified in Central's TLS certificate.

2. (Optional) Select the **Central user capable of registering a RAS** check box and enter the user name and password of this user.

If relevant, add the LDAP domain using the following conventions:

- domain\username
- username@domain

For more information about LDAP, see "Setting Up Security – LDAP Authentication" in the *HP OO Central User Guide*.

3. (Optional) Select the **HTTP proxy definition for connecting to the Central** and enter the HTTP proxy definition.
4. Click **Test Connection**.
5. When you installed Central, if you provided a CA certificate for Central, you must provide the root CA certificate for the RAS. This certificate will be imported to the RAS TrustStore:
 - a. Select the **Provide the CA root certificate of Central** check box.
 - b. Click **Browse** to select the relevant CA root certificate.

If the default certificates were used in Central, you should leave this check box cleared, to automatically use the self-signed certificate.

For more information about using TLS certificates, see the *HP OO Security and Hardening Guide*.

6. If Central requires an X.509 certificate from the client, follow these steps (you may need to scroll down to see all the fields):

- a. Click the **Provide an X.509 client certificate of the RAS** check box.

A UUID for the RAS is automatically generated.

- b. Create the client certificate using this RAS UUID. The client certificate must be in PKCS format and must be with a **.pfx** or **.p12** extension.
- c. Click **Browse** to select the X.509 client certificate that you created.
- d. Enter the password of the X.509 client certificate that you created.
- e. Click **Browse** to select the client certificate of a user capable of registering a RAS.
- f. Enter the password for the user capable of registering a RAS.

[Back to the flowchart](#)

Test the RAS Connection to Central

Click **Test Connection**.

Note: If you test the connection to a Central with a custom CA certificate without providing the certificate to the RAS, a `java.lang.RuntimeException` error message will appear.

- If the connection test is successful, click **Next**.
- If the connection test is not successful, go back to the [Enter the RAS Registration Settings](#) step and try again.

[Back to the flowchart](#)

Select Language

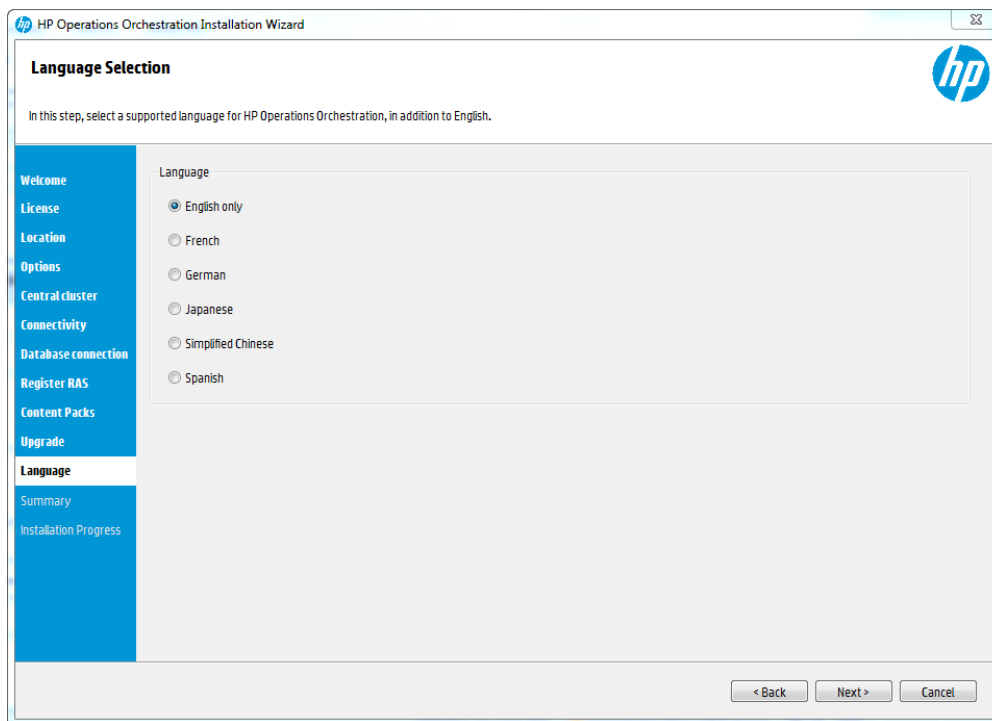
In the **Language** page, select a supported language for HP Operations Orchestration, in addition to

English, and then click **Next**.

This language support will be used for:

- The MS SQL collation language, if relevant
- The **central-wrapper.conf** language for content. This language support may be required if, for example, you need to ping a server that is configured in Japanese.

Note: You can change the language support choice after installation, by editing the **central-wrapper.conf** file, located in the installation directory under **central/conf**.



[Back to the flowchart](#)

Review Settings and Install

A summary of the installation is displayed.

Review the settings and click **Install**.

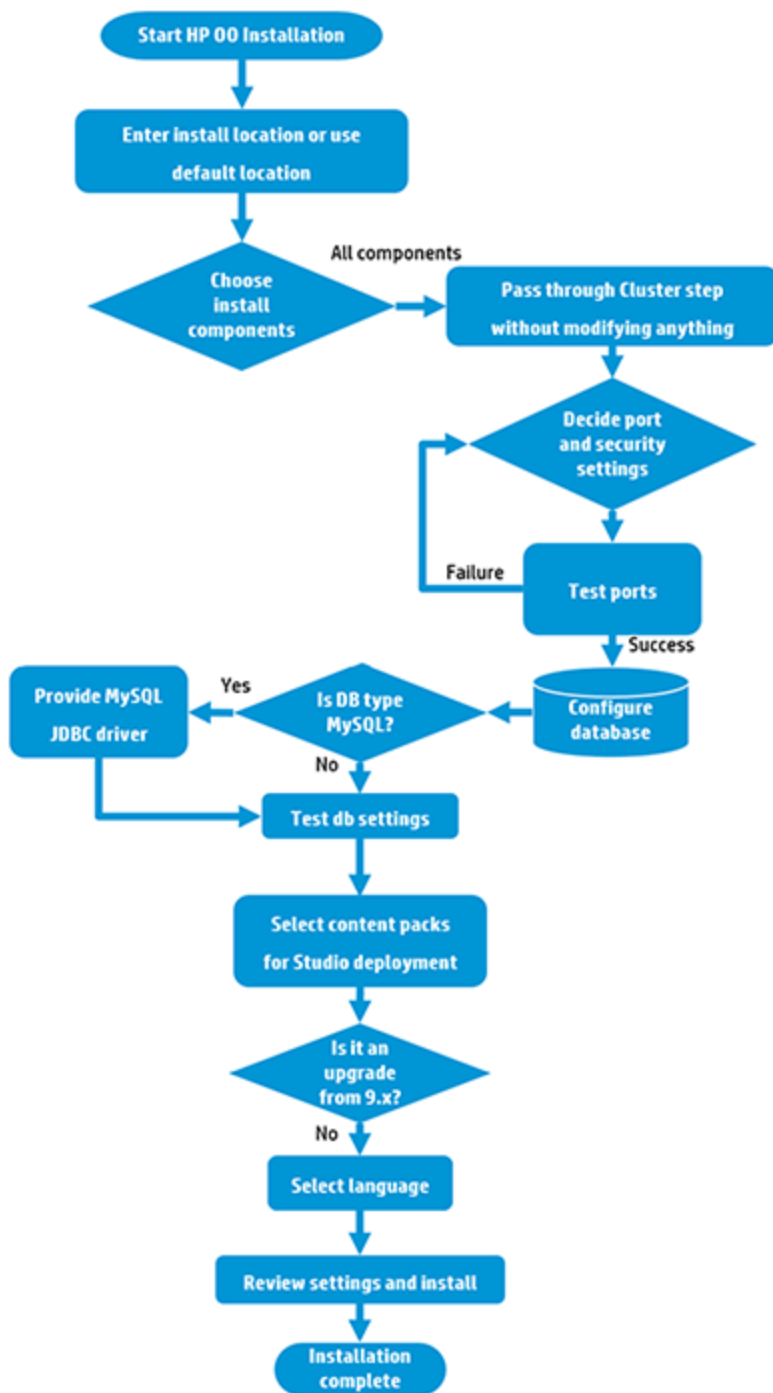
[Back to the flowchart](#)

Installation is Complete

Click **Finish** to complete the installation.

Installing All HP OO Components Using the Installation Wizard

This section describes how to perform a clean installation of HP OO, including all components: Central, RAS, and Studio.



Note: Studio (the flow authoring tool) only works on Windows. So if you are installing HP OO on Linux, note that you will have to run the installer separately on Windows, in order to install Studio.

Links to Steps

Start the HP OO Installation
Enter the Installation Location or Use the Default Location
Choose the Installation Components
Pass Through the Cluster Step Without Modifying Anything
Decide Port and Security Settings
Test the Ports
Configure the Database
Is the Database Type MySQL? <ul style="list-style-type: none"> • Yes: Provide MySQL JDBC Driver • No: Go to the next step
Test Database Settings
Select Content Packs for Studio Deployment
Is it an Upgrade from 9.x?
Select Language
Review Settings and Install
Installation Complete

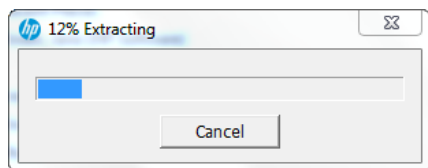
Start the HP OO Installation

1. Download the ZIP file from the HP SSO Portal and extract it into a local drive on your computer.
2. To start the installer:
 - On Windows: Double-click the **installer-win64.exe** installation file.
 - On Linux: Run this command from an X Window terminal:

```
bash installer-linux64.bin
```

To start the installer, double-click the **installer-linux64.bin** file.

3. After you start the installer, the installation package is extracted, and the **HP Operations Orchestration Installation and Configuration Wizard** automatically opens. Click **Next**.



4. In the **License** page, select **I Agree**, and then click **Next**.

[Back to the flowchart](#)

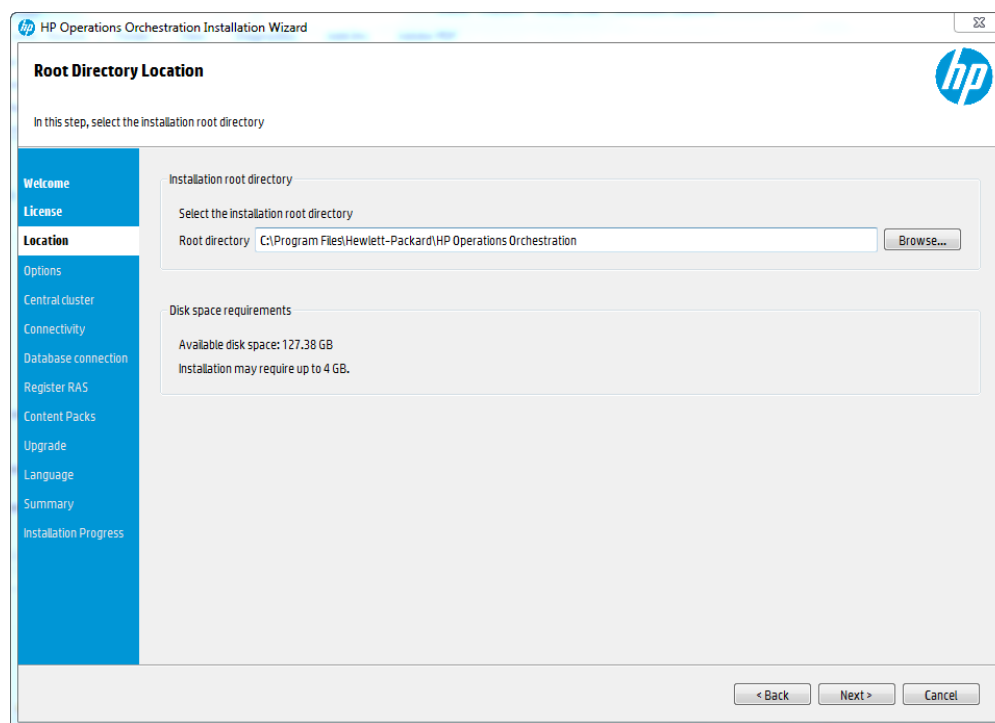
Enter the Installation Location or Use the Default Location

1. In the **Location** page, select the location for the installation root directory.

If the directory does not exist, the directory is created automatically. You are prompted to confirm the creation of the new location.

Note: Valid characters for the installation path are English letters, digits, spaces, hyphens (-) and underscores (_).

The default path is C:\Program Files\Hewlett-Packard\HP Operations Orchestration for Windows and is /opt/hp/oo for Linux.

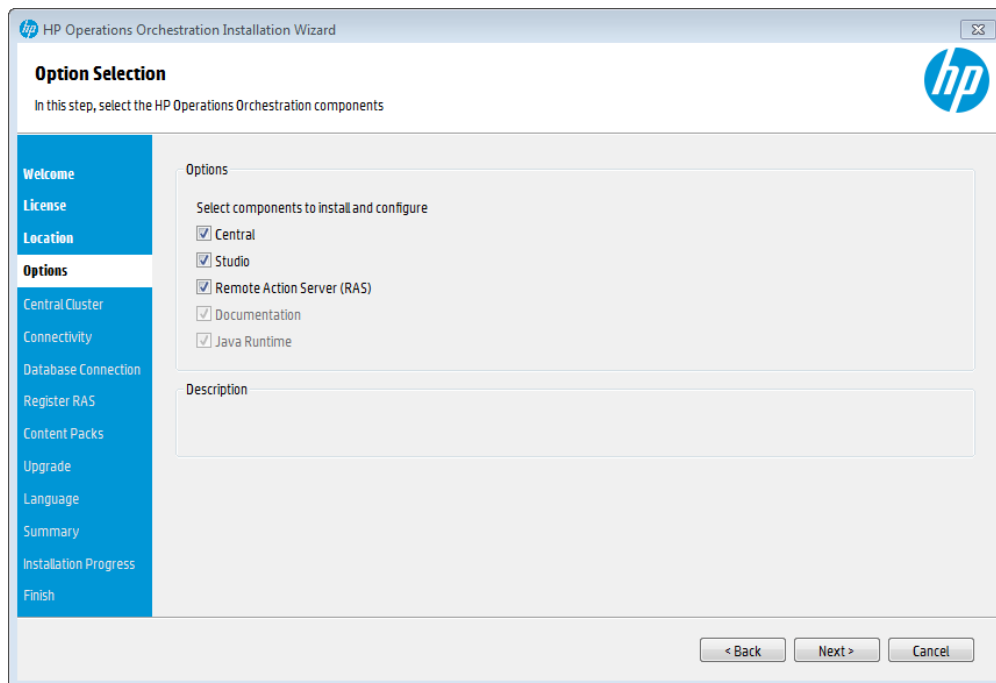


2. Click **Next**.

[Back to the flowchart](#)

Choose All the Installation Components

1. In the **Options** page, select all the check boxes.



2. Click **Next**.

[Back to the flowchart](#)

Pass Through the Cluster Step Without Modifying Anything

In the **Central Cluster** page, click **Next**.

For information about how to install a node in a cluster, see "[Installing an HP OO Central Cluster](#)" on page 57.

[Back to the flowchart](#)

Decide Port and Security Settings

In the **Connectivity** page, configure the Central Server ports and TLS:

1. Configure available ports for the Central Server. Default values (8080 and 8443) appear for each port, but you can change these. Choose one of the following options:

HP Operations Orchestration Installation Wizard

Central Server Connectivity

In this step, configure the Central Server ports and TLS

Connectivity

Configure the Central Server port numbers and TLS properties

☒ **Disable HTTP port** (HP recommends to disable the HTTP port and to use a TLS CA certificate for security reasons)

☐ **Allow HTTP access** (not recommended, but can be undone after the installation)

HTTP: 8080

HTTPS: 8443

☒ **Provide a secure TLS certificate** (when not provided, a self-signed certificate is used, which is not secured)

Central TLS certificate: [Browse...]

The TLS certificate should be in PKCS12.

Central TLS certificate password: []

Confirm password: []

CA root certificate location (.crt or .cer file): [Browse...]

The CA root certificate of the Central TLS certificate.
The CA root certificate will be imported into the Central/RAS truststore.

☐ Do not start Central server after installation
(Must be checked when you want to configure HP OO to be compliant with FIPS 140-2.)
This option is ignored when choosing to upgrade from 9.x.

[Test ports availability]

Provide an TLS certificate

< Back Next > Cancel

- (Recommended) Select **Disable HTTP Port** and configure a port in the **HTTPS** field.

This option is recommended for security reasons, so that the communication channel is encrypted.

- (Not recommended) Select **Allow HTTP access** and configure two ports in the **HTTP** and **HTTPS** fields.

Note: Configuring at least one port is mandatory. If a port is not defined, or if the ports are occupied by other applications, you will not be able to complete the installation.

2. (Recommended) Select **Provide a secure TLS certificate**, and then click **Browse** to select the certificate.

This step is recommended, for security reasons. If you do not select a Central TLS certificate, HP OO uses a self-signed certificate.

Note: Do not use a network path for the location of the Central TLS certificate.

3. If you selected a Central TLS certificate, enter its password, and enter it again for confirmation.

4. Click **Browse** to specify the location of the CA root certificate, which will be imported into the TrustStore for Central/RAS.

Note: Do not use a network path for the location of the CA root certificate.

For more information about installing HP OO on a secured environment, see the *HP OO Security and Hardening Guide*.

Note: Because you are installing Central and RAS together, the **Do not start Central server after installation** option is not available. This is because the RAS server needs to connect to the Central server. If Central is not started, the installation of the RAS will fail.

[Back to the flowchart](#)

Test Ports

Click **Test ports availability**. If the ports are available, a **Success** check mark appears.

- If you encounter an error, adjust the ports accordingly and try again.
- If the **Success** check mark appears, click **Next**.

[Back to the flowchart](#)

Configure Database

In the **Database Connection** page, you configure and create the database schema.

Note: If you have user input in two languages apart from English (for example, German and Chinese) then MS SQL should not be used. You should use an alternative database such as Oracle, MySQL, or Postgres with the recommended Unicode configuration for HP OO.

1. From the **Database Type** list, select the database vendor, and then enter the connection properties.

Note: When the **Connect to existing database/schema** option is selected, do not use administrative user accounts in the **Username** and **Password** fields, because this will install HP OO under the administrative account.

When the **Create the database/schema** option is used, provide a user with the relevant privileges in the **Admin username** and **Admin password** fields.

You can select from the following database types:

- **Oracle:** Do not use **SYS**, **SYSTEM**, or other administrative accounts credentials in the **Username** and **Password** fields.

Note: If you are using Oracle 11g R2 or 11g R2 RAC, it is recommended to apply patch 20299013 before installing HP OO.

- **Microsoft SQL Server:** Do not use **sa** or other administrative account credentials in the **Username** and **Password** fields.
- **Oracle MySQL:** Do not use the **root** credential in the **Username** and **Password** fields.

If you are installing HP OO with Oracle RAC (Real Application Cluster), you must choose **Other database** and provide the URL. For more information, see "Appendix B: Additional Guidelines for Oracle > Oracle Real Application Cluster (RAC)" in the *HP OO Database Guide*.

- **PostgreSQL**: Do not use the **postgres** credential in the **Username** and **Password** fields.

Note: PostgreSQL database names are case-sensitive.

- **Internal database**: This uses an H2 local database. This should not be used for production.
- **Other database**: (use to enable advanced features in supported databases). If you select **Other database**, you can only use a database type that is supported for use with HP OO. See "Appendix C: Installation Wizard 'Other Database' Option" in the *HP OO Database Guide* for more information.

Note: The **Other database** option also supports any valid JDBC URL.

2. After selecting the database type, select one of the following:

- **Connect to existing database/schema**: Connect to an existing schema, user, or database. The installer verifies that the schema/database and user exist.
- **Create the database/schema**: Enables you to create a new database or schema. Information in the **Database**, **Username** and **Password** fields will be used in order to create the new schema, user, or database for HP OO.

Confirm the password by typing it again in the **Confirm Password** field.

Important! Make sure to use a strong password, in accordance with your organization's security policy. If the password is not strong enough, an error message will appear.

Provide existing database user credentials in the **Admin username** and **Admin password** fields. This elevated-privileges user must be able to connect to the database and create the new schema, user, or database for HP OO.

3. Enter the hostname or IP address and other connection details.

Make sure to use the FQDN (Fully Qualified Domain Name).

If you want to use IPv6, put the IPv6 address in brackets, for example, [3fff::20]. Otherwise, errors will occur.

4. (For Oracle) Select either **SID** or **Service Name**, and enter the SID or service name of the

database.

It is recommended to use Oracle database's service name rather than using the SID.

Note: If you are upgrading from a 9.x version that is installed on Oracle, you must enter the SID of this database in the **SID** field, and not the database name.

For more information about setting up the database schema, see the *HP OO Database Guide*.

[Back to the flowchart](#)

Is the Database MySQL?

Yes: Go to [Provide the JDBC Driver for MySQL](#)

No: Go to [Test Database Settings](#)

Provide the JDBC Driver for MySQL

Complete this step if the database is MySQL:

In the **Database Connection** page, click **Browse** and select the location of the JDBC driver.

[Back to the flowchart](#)

Test Database Settings

Click **Test Connection**. If you are unable to connect to the database, you will not be able to proceed to the next steps in the wizard.

If your password is not strong enough, a warning is displayed. You will still be able to proceed with the installation, but it is strongly recommended to replace it with a stronger password.

The installer checks for non-empty schemas/databases, and shows a warning message if the schema or database is not empty. If the installation fails during schema validation, the installation process is stopped.

Note: This test only verifies the connection between HP OO and the selected database, and does not verify the conditions required by the database, like the user's read/write permissions on the provided schema.

Note: For all the database vendors, if you select to create a new database, the created database uses **case-sensitive** collation as follows:

- MySQL: **utf8_bin collation** is used for the new database.
- Postgres: Case-sensitive by design. No need for specific settings. **UTF-8** encoding is supported

- Oracle: Case-sensitive by default. No need for specific settings. **UTF-8** encoding is supported.
- MS SQL: Use only the following database collations per your required language:
 - English: `SQL_Latin1_General_CP1_CS_AS`
 - Japanese: `Japanese_Unicode_CS_AS`
 - Simplified Chinese: `Chinese_Simplified_Stroke_Order_100_CS_AS`
 - German: `SQL_Latin1_General_CP1_CS_AS`
 - French: `French_100_CS_AS`
 - Spanish: `SQL_Latin1_General_CP1_CS_AS`

However, if you already have a database installed, HP OO creates the tables using the database specific collation. It is important to note that using other collations can cause characters to appear in gibberish in the user interface for localized installations. In addition, other collations are not officially supported in Microsoft SQL Server for localized installations.

If the installer is used in order to create a new SQL Server database, selecting your language in the language selection page sets the correct collation for the new database.

Using one of the above collations enables using the **varchar** datatype for textual columns instead of the **nvarchar** data type. Using the **varchar** data type is more efficient and reduces overall database size.

Selecting a specific language also means that an HP OO system that uses SQL Server is limited to the set of languages supported by that specific collation. For example, if the **SQL_Latin1_General_CP1_CS_AS** collation is used, English, German, and Spanish characters may be used, but Japanese characters may not. If **Japanese_Unicode_CS_AS** is used, French accent characters will not be presented properly. For the complete specification of each collation, see the Microsoft SQL Server documentation.

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Select Content Packs for Studio Deployment

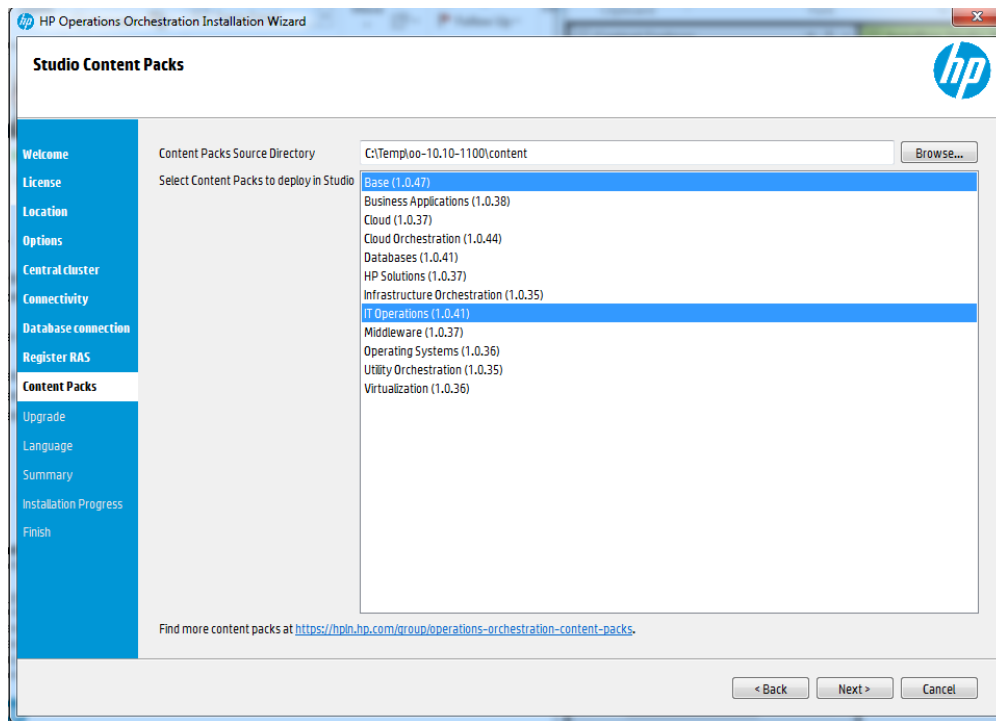
In the **Content Packs** page, you can import one or more existing content packs.

1. Browse to the location where the content packs are located, and then click **OK**.

The available content packs located in the selected folder appear in the list.

Note: The installation folder includes the released content packs.

2. Select the content pack (or packs) that you want to import, and then click **Next**.



Note: You can download additional and updated content packs on HPLN, using the link in the lower part of the wizard.

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Is it an Upgrade from 9.x?

In the **Upgrade** page, click **Next** without modifying anything.

This procedure describes how to perform a clean installation of HP OO 10.x. For information about upgrading from 9.x, see the document *Upgrading to HP OO 10.x from HP OO 9.x*.

[Back to the flowchart](#)

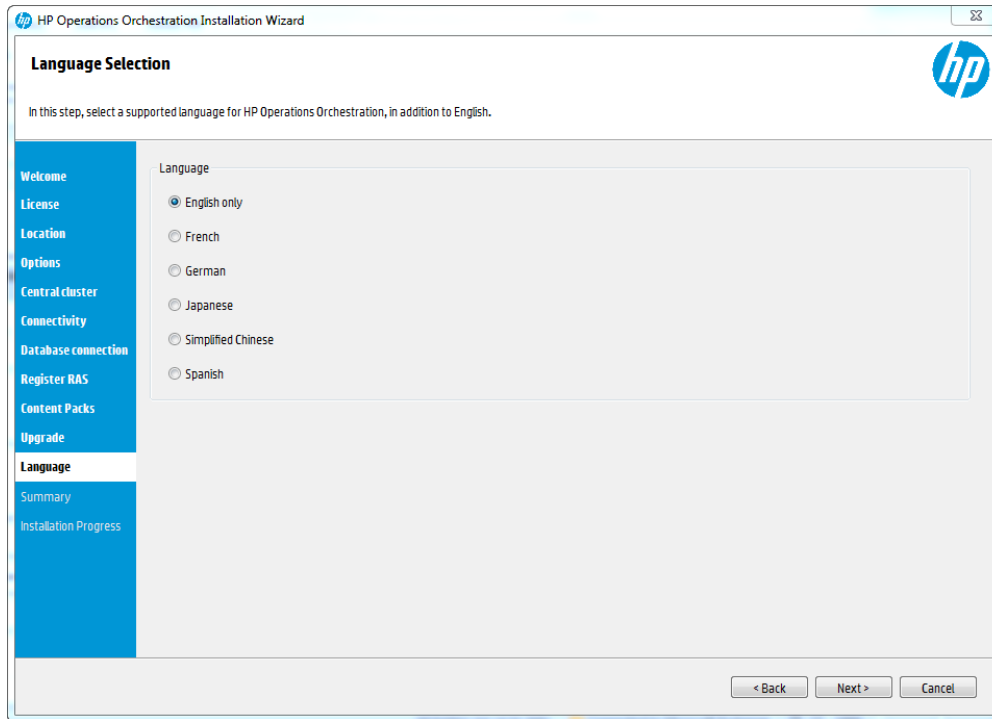
Select Language

In the **Language** page, select a supported language for HP Operations Orchestration, in addition to English, and then click **Next**.

This language support will be used for:

- The MS SQL collation language, if relevant
- The **central-wrapper.conf** language for content. This language support may be required if, for example, you need to ping a server that is configured in Japanese.

Note: You can change the language support choice after installation, by editing the **central-wrapper.conf** file, located in the installation directory under **central/conf**.



[Back to the flowchart](#)

Review Settings and Install

1. The **Summary** page displays the installation and configuration settings that you selected and entered in the wizard. Check that the settings are correct. If you want to correct one of the items, click **Back**.
2. Click **Install**. The installation begins, and the wizard displays a check mark next to each successfully installed item on the **Progress** page. When the installation is complete, click **Next**.

Note: If there is a problem with one of the installation or configured items, the installation attempts to continue with the rest of the items regardless of that error. Check the **installer.log** file (the default located is **C:\HP\oo** for Windows or in **/HP/oo** for Linux), to check for errors.

3. (Optional) In the **Finish** page, select **Open Welcome Page** to display the HP OO Welcome page in your default web browser, in the language that was selected on the **Language** page.
4. Click **Finish** to close the Installation and Configuration wizard.

[Back to the flowchart](#)

Installation is Complete

Central, Studio, and RAS are installed and menu shortcuts are created on your system.

The installation is of the Trial version of HP OO. You will need to install the Enterprise Edition license within 90 days. For more information, see "Setting Up Licensing" in the *HP OO Central User Guide*.

After installing Studio, in order to use the Studio Git integration feature, you must install the Git client version **git-1.9.5-preview20150319**. For more information, see ["Installing HP OO Studio Using the Installation Wizard" on page 30](#).

Installing an HP OO Central Cluster

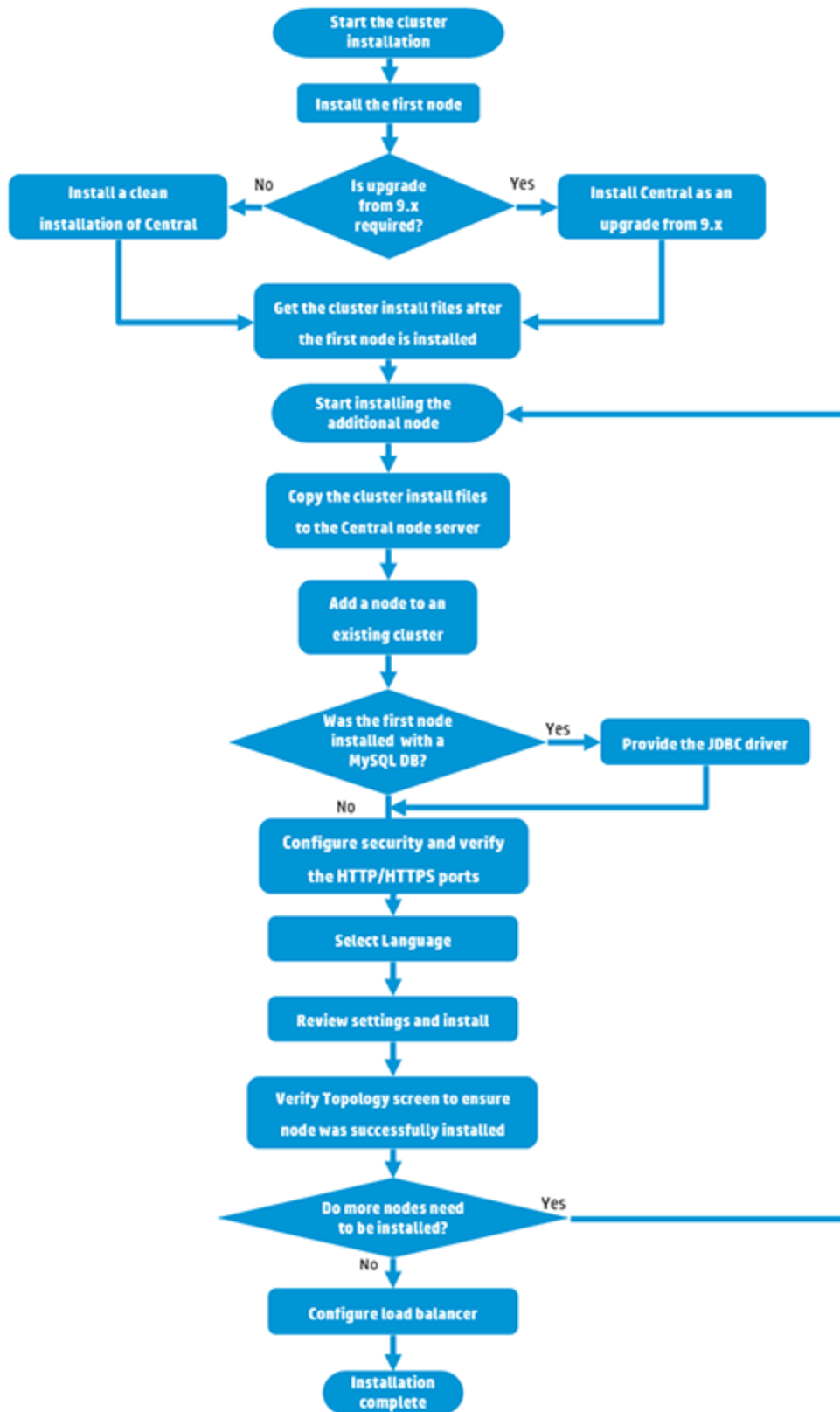
Clustering provides high availability and scalability to enhance throughput. In previous versions of HP OO, a clustering solution called Terracotta was provided as part of the application. In HP OO 10.x, this is no longer the case - there is no need for external clustering software, nor is there a requirement for a shared file system.

To create a cluster, you run the Installation wizard to create the first Central. Then, you run it again on the other machine to create the next node and, during this second installation, make it point to the same database schema.

In a clustered environment, you need to synchronize the clock times on all computers, to the second. It is recommended to use NTP sync to regularly maintain an accurate system time between all nodes (Central and RASes).

For more information about different architecture models including clustering, see the *HP OO Architecture Guide*.

Note: This section covers how to install a cluster using a clean installation of HP OO 10.x or while upgrading from HP OO 9.x. For information about installing a cluster while upgrading from an earlier version of HP OO 10.x, see ["Upgrading to HP OO 10.5x from an Earlier Version of HP OO 10.x" on page 70](#)



Links to Steps

Start the 10.x Cluster Installation
Start the Installation of the First Central Node
<p>Is Upgrade from 9.x Required?</p> <ul style="list-style-type: none"> • Yes: Install Central as an Upgrade from 9.x, as described in <i>Upgrading to HP OO 10.x from HP OO 9.x</i>. • No: Install a Clean installation of Central, as described in "Installing HP OO Central Using the Installation Wizard" on page 18
Get the Cluster Install Files from Central
Start the Installation of the Cluster Node
Copy the Cluster Install Nodes to the Central Node Server
Add a Node to an Existing Cluster
<p>Was the First Node Installed with a MySQL Database?</p> <ul style="list-style-type: none"> • Yes: Go to the Provide JDBC Driver step. • No: Go to the Configure Security and Verify the HTTP/HTTPS Ports step.
Provide JDBC Driver
Configure Security and Verify the HTTP/HTTPS Ports
Select Language
Review Settings and Install
Installation Complete

Start the 10.x Cluster Installation

Download the ZIP file from the HP SSO Portal and extract it into a local drive on your computer.

1. To start the installer:

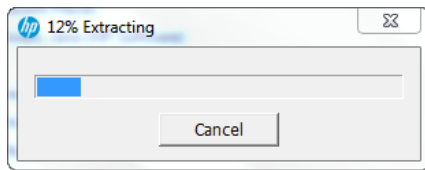
- On Windows: Double-click the **installer-win64.exe** installation file.
- On Linux: Run this command from an X Window terminal:

```
bash installer-linux64.bin
```

To start the installer, double-click the **installer-linux64.bin** file.

2. After you start the installer, the installation package is extracted, and the **HP Operations**

Orchestration Installation and Configuration Wizard automatically opens. Click **Next**.



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Start the Installation of the First Central Node

Install the first Central mode as a stand-alone Central.

Complete the following pages in the Installation wizard. For more details, see ["Installing HP OO Central Using the Installation Wizard" on page 18](#).

1. In the **License** page, select **I Agree**, and then click **Next**.
2. In the **Location** page, select the location for the installation root directory.
3. In the **Options** page, select **Central** and click **Next**.
4. In the **Central Cluster** page, click **Next**, without selecting any options.

You will select the clustering options when you install the other nodes.

5. In the **Connectivity** page, configure available ports for the Central Server. Default values (8080 and 8443) appear for each port, but you can change these. Choose one of the following options:

- (Recommended) Select **Disable HTTP Port** and configure a port in the **HTTPS** field.

This option is recommended for security reasons, so that the communication channel is encrypted.
 - (Not recommended) Select **Allow HTTP access** and configure two ports in the **HTTP** and **HTTPS** fields.
6. (Recommended) Select **Provide a secure TLS certificate**, and then click **Browse** to select the certificate.

This step is recommended, for security reasons. If you do not select a Central TLS certificate, HP OO uses the default self-signed certificate.
 7. Enter the Central TLS certificate password, and enter it again for confirmation.
 8. Click **Browse** to specify the location of the CA root certificate, which will be imported into the TrustStore for Central/RAS.

Note: Do not use a network path for the location of the certificates.

For more information about installing HP OO on a secured environment, see the *HP OO Security and Hardening Guide*.

9. Select **Do not start Central server after installation** if either of the following is true:

- You are configuring HP OO to be compliant with FIPS 140-2

For more information, see "Configuring HP OO for FIPS 140-2 Level 1 Compliance" in the *HP OO Security and Hardening Guide*.

- You are installing a new Central in cluster mode and the installer version is older than the current Central.

Note: If you are installing Central and RAS together, or upgrading from 9.x, this option is not available.

10. Click **Test ports availability**. If the ports are available, a **Success** check mark appears. If you encounter an error, adjust the ports accordingly.

11. Click **Next**.

12. In the **Database Connection** page, configure and create the database schema.

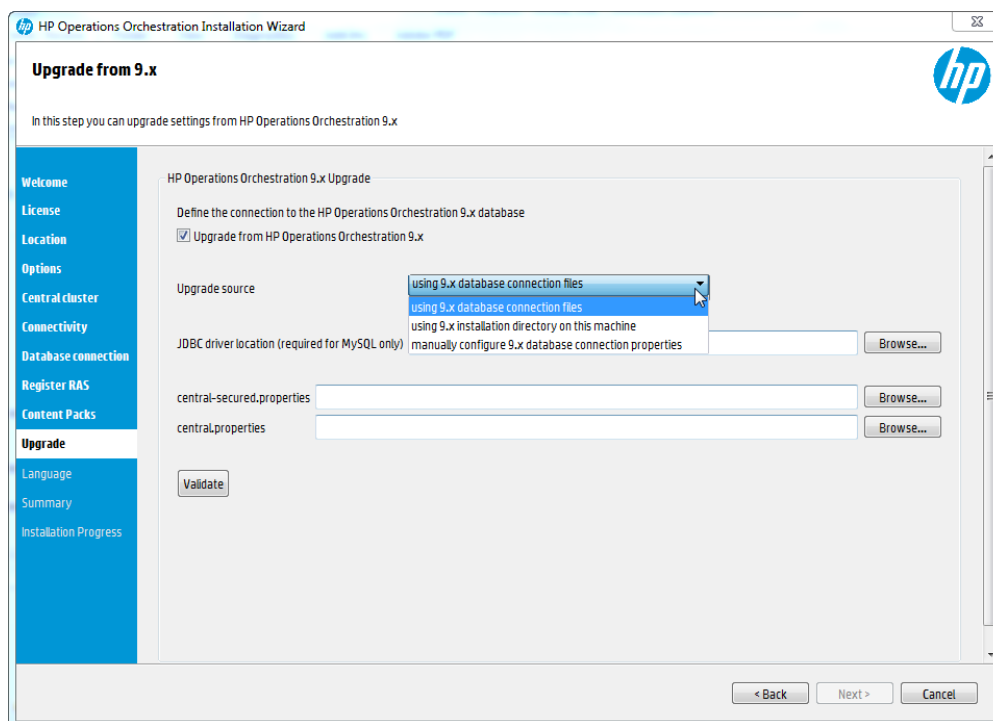
If the first node is an upgrade from 9.x, go to [Yes, it is an Upgrade from HP OO 9.x](#).

If the first node is a clean installation of 10.x, go to [No, it is a Clean Installation of HP OO 10.x](#).

[Back to the flowchart](#)

Yes, it is an Upgrade from HP OO 9.x

On the **Upgrade** page, select the **Upgrade from HP Operations Orchestration 9.x** check box in order to clone the database data.



Note: You only need to do this for the first Central; it is not required for other nodes.

Upgrading from 9.x to 10.x (including upgrading the 9.x content) is covered in detail in a separate document: *Upgrading to HP OO 10.x from HP OO 9.x*. If your cluster includes an upgrade from 9.x, see *Upgrading to HP OO 10.x from HP OO 9.x* and complete the upgrade.

When the first node has been upgraded from 9.x, continue to the next step, [Get the Cluster Install Files from Central](#).

[Back to the flowchart](#)

No, it is a Clean Installation of HP OO 10.x

In the **Upgrade** page, click **Next** without modifying anything.

Complete the installation of the first node. For more details, see ["Installing HP OO Central Using the Installation Wizard" on page 18](#).

When the first node has been installed, continue to the next step, [Get the Cluster Install Files from Central](#).

Get the Cluster Install Files from Central

After the first Central has been installed, collect the following files.

File	Description	Location
database.properties	Defines the properties of the database.	<installation dir>/central/conf/database.properties
encryption properties	Defines how the database is encrypted.	<installation dir>/central/var/security/encryption properties
encryption_repository	Used to store the database encryption details.	<installation dir>/central/var/security/encryption_repository
JDBC driver	This is needed only if you are using a MySQL database.	The location will vary

Start the Installation of the Cluster Node

1. Start the Installer and install the next Central node in the cluster.
2. Complete the first four pages in the Installation wizard: **Welcome**, **License**, **Location**, and **Options**.

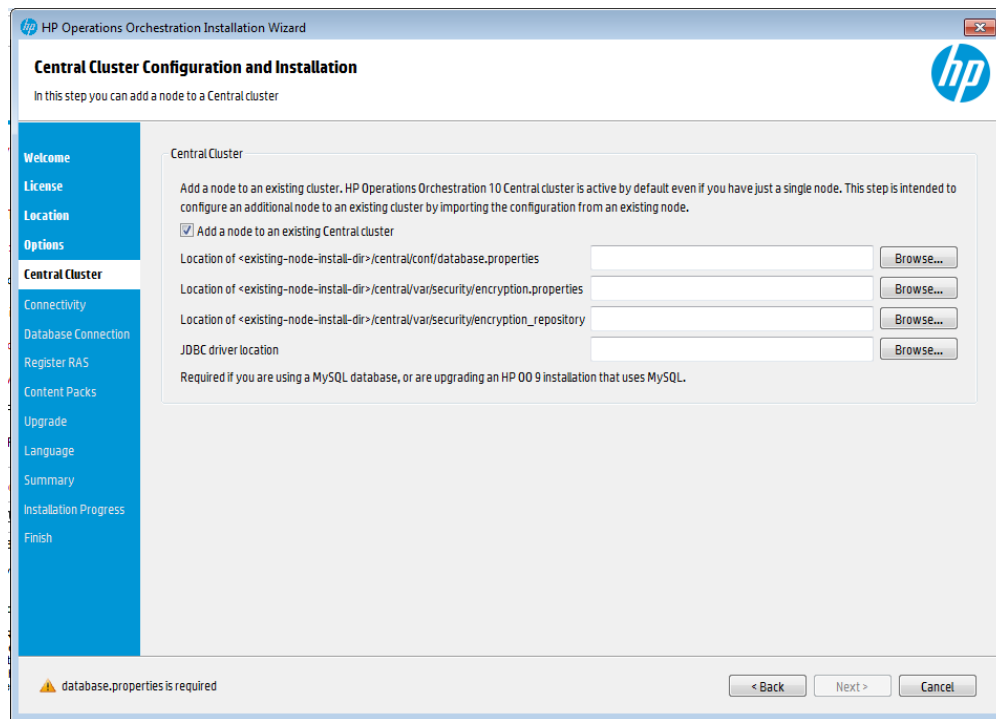
[Back to the flowchart](#)

Copy the Cluster Install Nodes to the Central Node Server

Copy the cluster install files to the server on which you are installing this Central node.

Add a Node to an Existing Cluster

1. In the **Central Cluster** page, select **Add a node to the existing Central cluster**.



2. Click **Browse** and select the cluster files from the location where you copied them:

- **database.properties**
- **encryption properties**
- **encryption_repository**

Note: Once you have installed two nodes, and are installing a third, you can copy the cluster files from either server, because they contain the same data.

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Was the First Node Installed with a MySQL Database?

Yes: Go to the [Provide JDBC Driver](#) step.

No: Go to the Go to the [Configure Security and Verify the HTTP/HTTPS Ports](#) step.

Provide the JDBC Driver

If you are using a MySQL database, enter the location of the JDBC driver in the **Central Cluster** page.

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Configure Security and Verify the HTTP/HTTPS Ports

1. In the **Connectivity** page, configure available ports for the Central Server. Choose one of the following options:
 - (Recommended) Select **Disable HTTP Port** and configure a port in the **HTTPS** field.

This option is recommended for security reasons, so that the communication channel is encrypted.
 - (Not recommended) Select **Allow HTTP access** and configure two ports in the **HTTP** and **HTTPS** fields.
2. Select **Provide a secure TLS certificate**, and then click **Browse** to select the certificate.
3. Enter the Central TLS certificate password, and enter it again for confirmation.
4. Click **Browse** to specify the location of the CA root certificate, which will be imported into the TrustStore for Central/RAS.

Note: Do not use a network path for the location of the certificates.

For more information about installing HP OO on a secured environment, see the *HP OO Security and Hardening Guide*.

5. Select **Do not start Central server after installation** if either of the following is true:
 - You are configuring HP OO to be compliant with FIPS 140-2

For more information, see "Configuring HP OO for FIPS 140-2 Level 1 Compliance" in the *HP OO Security and Hardening Guide*.
 - You are installing a new Central in cluster mode and the installer version is older than the current Central.
6. Click **Test ports availability**. If the ports are available, a **Success** check mark appears. If you encounter an error, adjust the ports accordingly.
7. Click **Next**.

[Back to the flowchart](#)

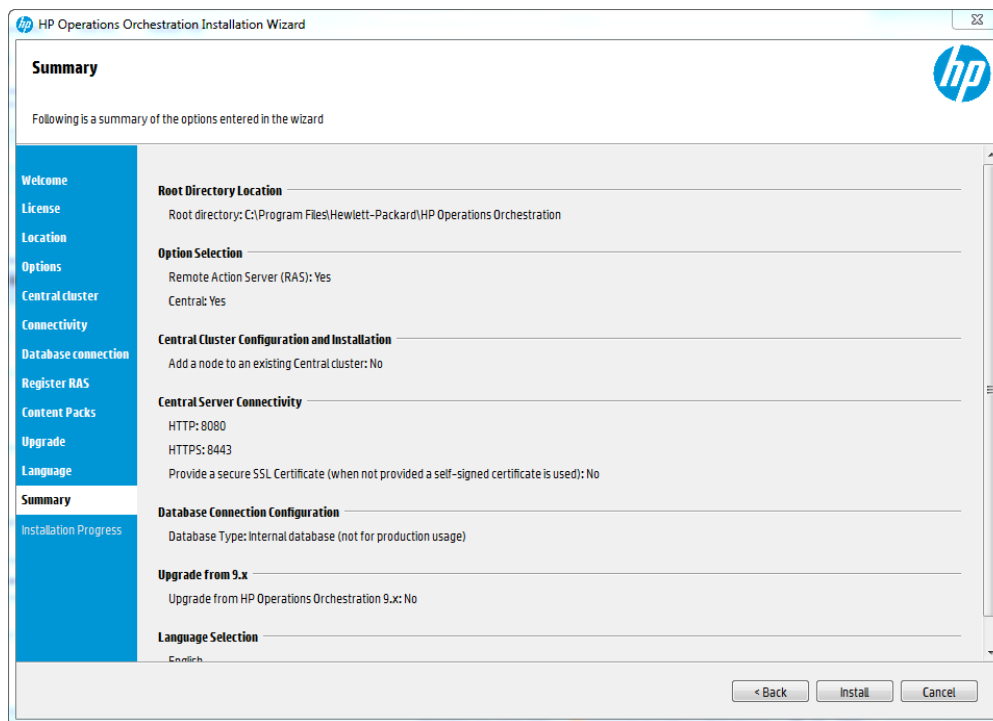
Select Language

In the **Language** page, you can select a supported language for HP Operations Orchestration, in addition to English.

[Back to the flowchart](#)

Review Settings and Install

1. The **Summary** page displays the installation and configuration settings that you selected and entered in the wizard. Check that the settings are correct. If you want to correct one of the items, click **Back**.



2. Click **Install**. The installation begins, and the wizard displays a check mark next to each successfully installed item on the **Progress** page. When the installation is complete, click **Next**.

Note: If there is a problem with one of the installation or configured items, the installation attempts to continue with the rest of the items regardless of that error. Check the **installer.log** file, located in **C:\HP\oo** (or selected installation folder), to check for errors.

3. (Optional) In the **Finish** page, select **Open Welcome Page** to display the HP OO Welcome page in your default web browser, in the language that was selected on the **Language** page.
4. Click **Finish** to close the Installation and Configuration wizard.

Central is installed and menu shortcuts are created on your system.

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Verify Central Topology Screen to Ensure the Node was Successfully Installed

To verify that the node was successfully installed, you can check the **Topology/Workers** tab in

Central.



1. In Central, click the **System Configuration Workspace** button.
2. Select the **Topology/Workers** tab and check that the node was successfully installed.
 - If a new component for Central was installed successfully (RAS or cluster node) it will appear on the screen. If there is no addition on the **Topology/Workers** screen after the component was installed, this means that there was a problem and you should inspect the logs.
 - The **Topology/Workers** screen displays the status of the worker, so you can see if the new component is viable.

For example, the status will be red (unusable) if there are problems with certificates, failures in the operation of the worker unrelated to the initial installation, or loss of network connectivity with the component.

- All workers display their host name and type. So the **Topology/Workers** screen can be used to verify any load balancer configuration issues.

For example, if there are three Centrals in the topology and only two in the load balancer, there is a clear configuration issue within the environment.

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Install Another Node

Repeat the process as often as required.

To install the next node, go back to [Add a Node to an Existing Cluster](#).

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Configure the Load Balancer

If you are using a load balancer, reverse proxy, or DNS load balancer, configure it according to your policies. This step will vary depending on which load balancer or reverse proxy you are using. Contact your vendor for more information.

If you are using a load balancer, reverse proxy, or DNS load balancer, tell HP OO where the relevant external URL is located.



1. In Central, click the **System Configuration Workspace** button.
2. Select **Topology > Configuration**.

3. In the **URL** box, enter the URL of the load balancer, reverse proxy, or DNS load balancer.
4. Click **Save**.

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Installation Complete

The installation of the cluster is now complete.

After the installation of the cluster, nothing needs to be disabled. The start point and destination point of the cluster are the same. The difference between a 10.x cluster and a 9.x cluster is that you have more internal workers and you can see all Central nodes in your load balancer.

The installation is of the Trial version of HP OO. You will need to install the Enterprise Edition license within 90 days.

1. Choose one of the nodes and issue a license for the IP address of this node with the HP License Management system.
2. Open the Central UI of the specific node (and not via the Load Balancer IP) and install the license.

For more information about licensing, see "Setting Up Licensing" in the *HP OO Central User Guide*.

Upgrading to HP OO 10.5x from an Earlier Version of HP OO 10.x

You can upgrade to 10.5x from any version of 10.x, including the Community Edition. It is not necessary to upgrade to the interim versions.

When you upgrade to HP OO 10.5x, this installs the Trial version. You will need to install the Enterprise Edition license within 90 days. For more information, see "Setting Up Licensing" in the *HP OO Central User Guide*.

Upgrading to HP OO 10.5x is done using a command line script. The relevant scripts are contained in a zip file. The scripts are:

- **apply-upgrade(.bat)** – for upgrading to the new 10.x version
- **rollback(.bat)** – for rolling back to the previously installed 10.x version
- **generate-sql(.bat)** – if your company does not allow HP OO to change the database schema, this is used in addition to **apply-upgrade(.bat)** or **rollback(.bat)**

Note: There are two versions of each script file: with a **.bat** suffix for Windows and with no suffix for Linux.

Note: Before starting the installation, see the *HP OO System Requirements* to verify that your system meets the minimum system requirements.

The upgrade process replaces most files, but preserves logs, security data and user settings defined in the following locations:

Central:

- Anything under **<installation>/central/conf**
- **<installation>/central/tomcat/conf/server.xml**
- **<installation>/central/tomcat/conf/web.xml**

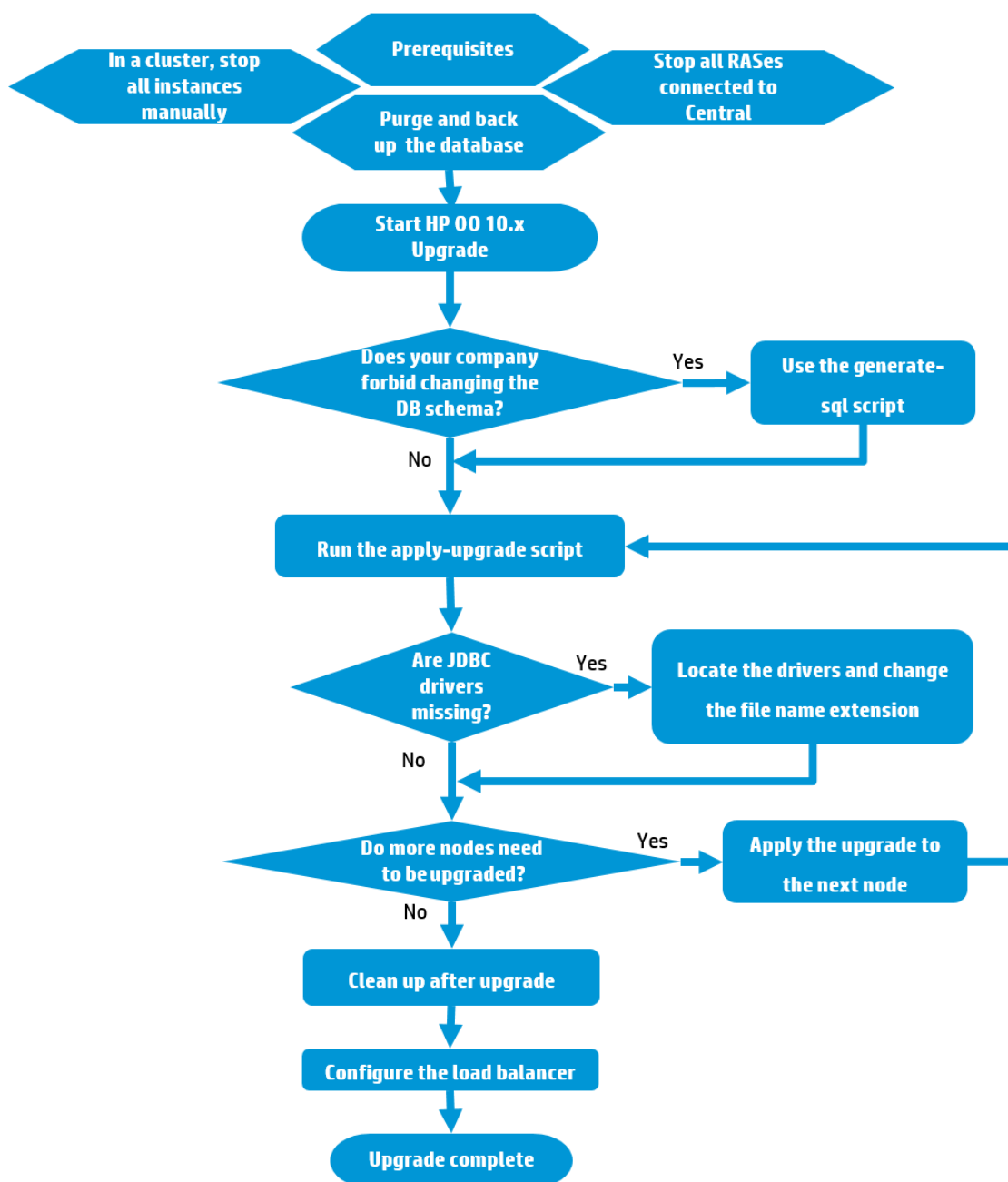
RAS: Anything under **<installation>/ras/conf**

Studio: Any file with a **.properties** extension under **<installation>/studio/conf**

Note: During the upgrade to version 10.5x, earlier versions of SVN are upgraded to version 1.8. In order to benefit from the enhancements offered with the SVN 1.8 server, it is recommended to manually upgrade your SVN server as well.

Note: If the last deployment action prior to an upgrade was the deletion of a content pack, then it won't be possible to roll back this deletion.

IMPORTANT NOTE for users of Microsoft SQL Server: The upgrade from version 10.02 (or older) will convert some Unicode text to the language of the database collation. As a result, text that does not match the collation (and is non-English) may be corrupted in the upgrade process (foreign characters will be converted to question marks). Make sure your collation is correct .



Links to Steps

Prerequisites
Purge and Back Up the Database
Stop all RASes
Stop Cluster Instances Manually
Start the 10.x Upgrade
Does your company forbid changing the database schema? <ul style="list-style-type: none"> • Yes: Use the Generate-sql(.bat) Script • No: Go to Run the apply-upgrade Script
Run the apply-upgrade Script.
Are user-supplied JDBC drivers missing? <ul style="list-style-type: none"> • Yes: Locate the Drivers and Change the File Name Extension • No: Go to Do more nodes need to be installed?
Do more nodes need to be upgraded? <ul style="list-style-type: none"> • Yes: Apply the Upgrade to the Next Node • No: Go to Clean Up After Upgrade
Clean Up After Upgrade
Configure the Load Balancer
Finished

Prerequisites

- Back up your Studio workspace from the home folder (**<user_home>/l.oo**) before applying the upgrade.

Important! Note that the workspace format in HP OO 10.10 and later is different from earlier versions. If you decide to roll back to a previous version, the converted workspace will not be compatible with the previous workspace versions.

- Before upgrading to HP OO 10.5x, you must download and install Microsoft Visual C++ 2010 Redistributable Package (x86). You need to install the version for the x86 platform, regardless of

your Windows version.

This package can be downloaded from: <http://www.microsoft.com/en-us/download/confirmation.aspx?id=5555>.

- Make sure that the old version of Central has started successfully at least once. Otherwise, you may not be able to roll back the upgrade, if you decide to do so.
- Cancel or finish all paused or running flows and disable existing schedules before applying the upgrade. If there are flows running or paused when you perform the upgrade, it will not be possible to resume them, their status will be "Canceled" and the duration will be "0 seconds".
- The upgrade process backs up the installation files. If you have a number of hprof files and a lot of log files, this can slow down the process. It is recommended to clean out these files before starting the upgrade.

Make sure that there is sufficient disk space for this backup; otherwise, the upgrade will fail. You may wish to archive the backup, to save space. See [Clean Up After Upgrade](#).

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Purge and Back Up the Database

Due to database structure optimizations, upgrading from a previous HP OO version to 10.5x may involve moving considerable amounts of data inside the database.

To allow the upgrade operation to complete quickly and successfully, perform the following steps before upgrading to HPOO 10.5x:

1. Purge your old data.

This can be achieved using stored procedures that are available on HPLN.

Keep only the data you really need to be available on the new version.

2. Back up your database.

Keep a copy of your database (preferably after the old data was purged) in order to protect your data.

3. Depending on the amount and type of your data, the upgrade may generate a considerable amount of database transaction logs ("redo logs"). Make sure you have sufficient space allocated.

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Stop all RASes

Make sure to stop all RASes that are connected to Central before you upgrade it.

This step is important to make the process "clean", and prevent damage that could occur due to the yet-to-be-upgraded nodes, which could have execution leftovers from the previous version.

[Back to the flowchart](#)

Stop Cluster Instances Manually

In a cluster setup, stop all Central and RAS instances manually.

This step is crucial. It will make the process "clean", and prevent damage that could occur due to the yet-to-be-upgraded nodes running against the upgraded database.

Note: For Central and RAS, the upgrade process shuts down the server automatically. However, on a cluster, the upgrade stops the node being upgraded, but does not shut down the entire cluster.

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Start the 10.5x Upgrade

1. Download the upgrade zip file from the HP SSO Portal and save it into a local drive on your computer.
2. Expand the upgrade zip file in the root folder of the installation.

Note: The root folder is the installation folder that you chose in the installer, when you installed the earlier version of HP OO 10.x, for example, **C:\Program Files\Hewlett-Packard\HP Operations Orchestration**.

This creates an **upgrade** folder containing a **<new-version>** folder (for example, **10.50**).

Important! Make sure you extract the zip file directly into the main installation folder, and not into a sub-folder. The **apply-upgrade(.bat)** script will only work if the **upgrade** folder is directly under the main installation folder.

3. For Linux, use the following command inside the **<new-version>** folder, to change file permissions:

```
chmod 755 bin/* java/*/bin/*
```

[Back to the flowchart](#)

Does Your Company Forbid Changing the Database Schema?

If your company does not allow the HP OO application to change the database schema, you will need to use the **generate-sql(.bat)** script, which is also included in the upgrade zip file.

The **generate-sql(.bat)** script is used to generate the **upgrade.sql** file in the unzipped upgrade folder. This file contains the SQL for applying all of the upgrade's database changes.

- If your company does not allow changing the database schema, go to [Use the Generate-sql\(.bat\) Script](#)

- If your company allows changing the database schema, go to [Run the apply-upgrade Script](#)

[Back to the flowchart](#)

Use the Generate-sql(.bat) Script

1. In the **bin** sub-folder, open a command line and run the **generate-sql(.bat)** script.

The command line options for **generate-sql(.bat)** are:

-h, --help	Display help on the available parameters.
-r, --rollback	Generate the SQL for rollback. Use only after the database has been upgraded.

The **upgrade.sql** file is created in the **<installation>/upgrade/<new-version>** folder.

2. Stop Central/RAS.
3. Apply the database changes by running **upgrade.sql** against the database with the required credentials.
4. Go to [Run the apply-upgrade Script](#).

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Run the apply-upgrade Script

1. In the **bin** sub-folder, open a command line and run the **apply-upgrade(.bat)** script.

(Optional) If required, use the following command line options:

-f, --force	Force-start the upgrade. This command upgrades the installation, without prompting.
-h, --help	Display help on the available parameters.
-n, --norestart	Do not restart Central/RAS after the upgrade.

2. Type **y** to apply the upgrade.

The progress of the upgrade is displayed. For example:

```
- Central is upgrading Run Log data, please wait...
  4 executions done (44%)
  6 executions done (66%)
  9 executions done (100%)
  Summary: total executions: 9, succeeded: 9, failed: 0
```

An **upgrade.log** file is created under **<installation>/upgrade/<new-version>**.

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Are User-Supplied JDBC Drivers Missing?

If you originally installed HP OO 10.00, it was possible to provide the installer with JDBC drivers (JAR files used to connect to the database) on two occasions:

- When configuring the database connection for HP OO, and using a database of the type MySQL (or selecting **Other database**, which enables advanced database configuration).
- When setting up an upgrade from HP OO 9.x, which itself runs with MySQL.

The installer stores user-supplied drivers in two directories:

- **<installation>/central/lib**
- **<installation>/central/tomcat/lib**

When you run the **apply-upgrade** script, it attempts to locate these files in order to exclude them from deletion. Specifically, it looks for files whose names match either ***mysql*.jar** or ***.userjdbc.jar**, and lists the search results.

If you supplied any drivers during installation, you must make sure that they are listed. Note that each driver must show up twice—once for each of the two directories mentioned above.

- If a driver is missing, go to [Locate the Drivers and Change the File Name Extension](#)
- If there are no missing drivers, go to [Do More Nodes Need to be Installed?](#)

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Locate the Drivers and Change the File Name Extension

If any driver is missing, complete the following steps:

1. Cancel the upgrade.
2. Stop Central.
3. Locate the driver file in **<installation>/central/lib**, and change its file name extension from **.jar** to **.userjdbc.jar**.
4. Repeat the previous step for **<installation>/central/tomcat/lib**.
5. Run **apply-upgrade** again, and make sure you see the driver file listed under both directories.

If you accidentally let **apply-upgrade** delete your driver, you can manually place the driver in the two directories, this time with a **.userjdbc.jar** extension, and then re-run **apply-upgrade**.

Note: If you are upgrading a cluster, the instructions above apply to all Central nodes.

[Back to the flowchart](#)

Do More Nodes Need to be Upgraded?

- If yes - go to [Apply the Upgrade to the Next Node](#)
- If no - go to [Clean Up After Upgrade](#)

Apply the Upgrade to the Next Node

Apply the upgrade to all the Central/RAS instances. Repeat the process as often as required.

To upgrade the next node, go back to [Run the apply-upgrade Script](#).

Caution: Once you have upgraded one Central node to the new 10.x version, you must upgrade all additional nodes to the same version. Restarting a non-upgraded node may cause permanent issues in the cluster (to the database schema changes).

[Back to the flowchart](#)

Clean Up After Upgrade

Once the upgrade is complete:

- You can delete the java and packages directories under **<installation>/upgrade/<new-version>**, but note that this will make the included scripts non-functional. You can always restore the scripts by re-extracting the upgrade zip.
- You can move the backup directory (created at **<installation>/upgrade/<new-version>/backup**) elsewhere for archival. However, if you later wish to roll back the upgrade, you must move the backup directory back to the original location.
- If you have upgraded from 10.02 to 10.5x, and if you have configured a remote connection for debugging, it will be migrated with the name **Migrated – remoteConnectionHostname**, where **remoteConnectionHostname** is the 10.02 configured **hostname** field. You can rename the migrated connection in the Edit Connections dialog box in Studio.

[Back to the flowchart](#)

Configure the Load Balancer

If you are using a load balancer, reverse proxy, or DNS load balancer, configure it according to your policies. This step will vary depending on which load balancer or reverse proxy you are using. Contact your vendor for more information.

If you are using a load balancer, reverse proxy, or DNS load balancer, tell HP OO where the relevant external URL is located.



1. In Central, click the **System Configuration Workspace** button.
2. Select **Topology > Configuration**.
3. In the **URL** box, enter the URL of the load balancer, reverse proxy, or DNS load balancer.
4. Click **Save**.

[Back to the flowchart](#)

Finished

The upgrade is complete.

Note:

The upgrade installs the Trial version of HP OO. You will need to install the Enterprise Edition license within 90 days of the upgrade. For more information, see "Setting Up Licensing" in the *HP OO Central User Guide*.

After upgrading to 10.5x, in order to use the Studio Git integration feature, you must install the Git client with version **git-1.9.5-preview20150319**.

1. Download the Git client from the following URL:
<https://github.com/msysgit/msysgit/releases/download/Git-1.9.5-preview20150319/Git-1.9.5-preview20150319.exe>.
2. Save the Git client to **<oo_installation_folder>/studio/Git**, so that the **bin** folder is directly under **<oo_installation_folder>/studio/Git**. In the Git installation wizard, use the default options.

Alternatively, if you already have a Git client installation with version **git-1.9.5-preview20150319** on your local disk, point Studio to use that Git installation by performing the following steps:

1. Close Studio.
2. Go to the user home folder **C:\Users\<user>\.oo** (the Studio workspace location) and locate the **Studio.properties** file.
3. Modify the **Studio.properties** file by adding the following property at the end of the file:

```
studio.git.installation.location=<git-1.9.5-preview20150319_installation_folder>
```

For example:

```
studio.git.installation.location=C:/Program Files (x86)/Git
```

The **bin** folder should be directly under **C:/Program Files (x86)/Git**. Note that **/** should be used as a path separator.

4. Save the **Studio.properties** file and start Studio.

If you have another version of the Git client installed, note that you must use the **git-1.9.5-preview20150319** version with Studio.

Installing HP OO Silently

A silent installation is one that is started from the command line and completes without any input from the person who started it. There is no need to provide input through a wizard or dialog boxes. The silent installation receives its input from a text input file.

You can install and configure HP Operations Orchestration silently from a command line.

To install HP Operations Orchestration silently:

1. Open the **sample-silent.properties** text file (located in the **docs** folder, under the HP OO installation folder and in the **docs** folder on the ZIP file), with the required installation and configuration settings.

For more details about these settings, see the descriptions in the **sample-silent.properties** text file.

2. Save a copy of the text file as **silent.properties**.
3. Remove the comment sign (#) from the properties that you need, and add the value for each of these properties.
4. From a command line, type the following:

```
installer-win64.exe -gm2 -s c:\\temp\\my-silent.properties
```

To disable the extracting installation files progress bar, add to the command line `-gm2` before `-s`.

Use the `-n` option if you don't want to start Central after the installation has completed.

Note: `gm2` is not supported with Linux.

Note: The `-s` property accepts either a full or relative path depending on the operating system:

- Windows: Relative to the location of the `.exe` file.

For example: `dirA`, is the current directory, and `dirB`, is located under `dirA` and contains the installer and the **silent.properties** file. Open a Command window in `dirA` and enter the following:

```
dirB\\installer.exe -s silent.properties
```

Important: Make sure you add two backslashes `\\` and not one backslash `\`. The installation folder to which you download the installation file must not contain any

spaces in the name.

- Linux: Relative to the location of the directory where the installer is launched.

Important Notes About Silent Installation

- Be careful not to put trailing spaces in your property values (especially when pasting). Otherwise, values that contain spaces at the end will not be read correctly and installation might fail.
- **Oracle:** Do not use `SYS`, `SYSTEM`, or other administrative account credentials in the `db.username/db.password` properties.
- **PostgreSQL:** Do not use `postgres` credentials in the `db.username/db.password` properties.

Note: PostgreSQL database names are case-sensitive.

- `db.type=H2`: This uses an H2 local database. This should not be used for production.
- `db.type=other`: Use to enable advanced features in supported databases. If you select **other**, you can only use a database type that is supported for use with HP OO. See the *System Requirements* for more information.
- Special characters, except the underscore (`_`), cannot be used for the database name or SID. In addition, you can enter up to 30 characters for the database name or SID.
- When you are upgrading from a remote 9.x Central that has localhost as the database in the **Central.properties** file using a silent installation, installation and upgrade do not complete successfully. This problem does not exist for wizard installations.
- All property values that contain a backslash (`\`) in the **silent.properties** file need to be escaped (with a double-backslash instead of a single one).

Places where this might be needed:

- On Japanese environments, in all the paths given. In Japanese environments, the path separator is the Yen sign and it needs to be escaped. For example, `C:¥¥folder`
- For RAS installations with a LDAP user given in form of 'domain\user'.
- For a database user, if the database is set up with Windows system account authentication
- For any other user that contains a backslash in the name

Note: There are some instances where the default values are different in a silent installation.

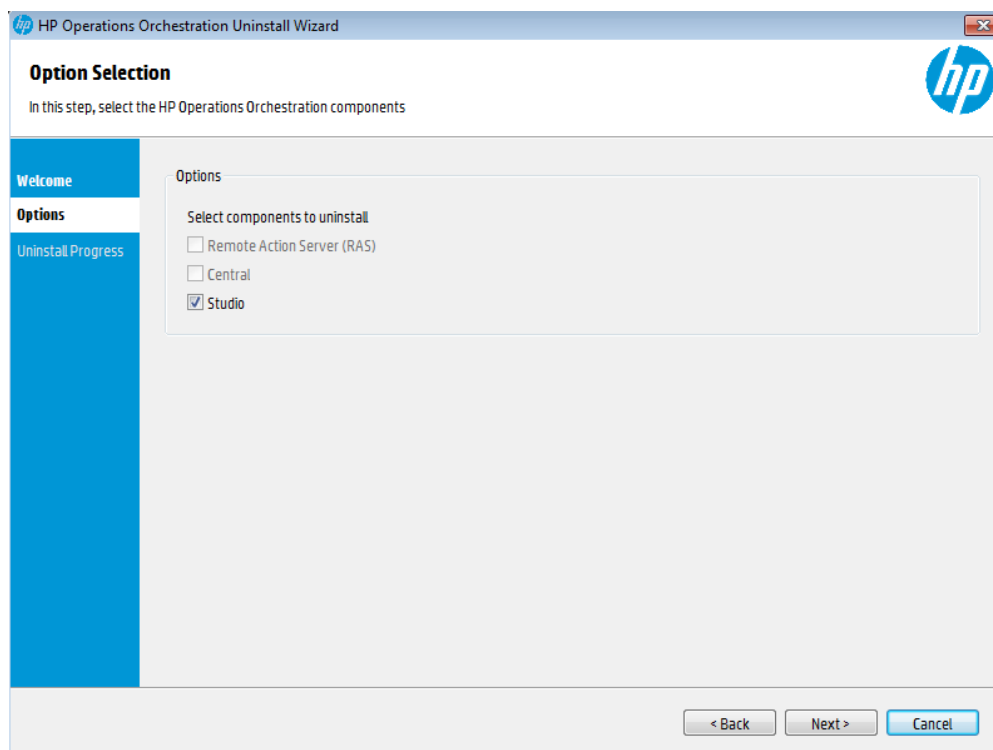
For example, when installing with the wizard, by default the certificate type is set to CA (user provided), while in a silent installation, this defaults to self signed. When installing with the wizard, by default the HTTP port is disabled, while in a silent installation, it defaults to enabled.

Uninstalling HP Operations Orchestration

Before uninstalling HP OO, make sure to back up your version of HP OO.

Uninstalling HP OO on Windows

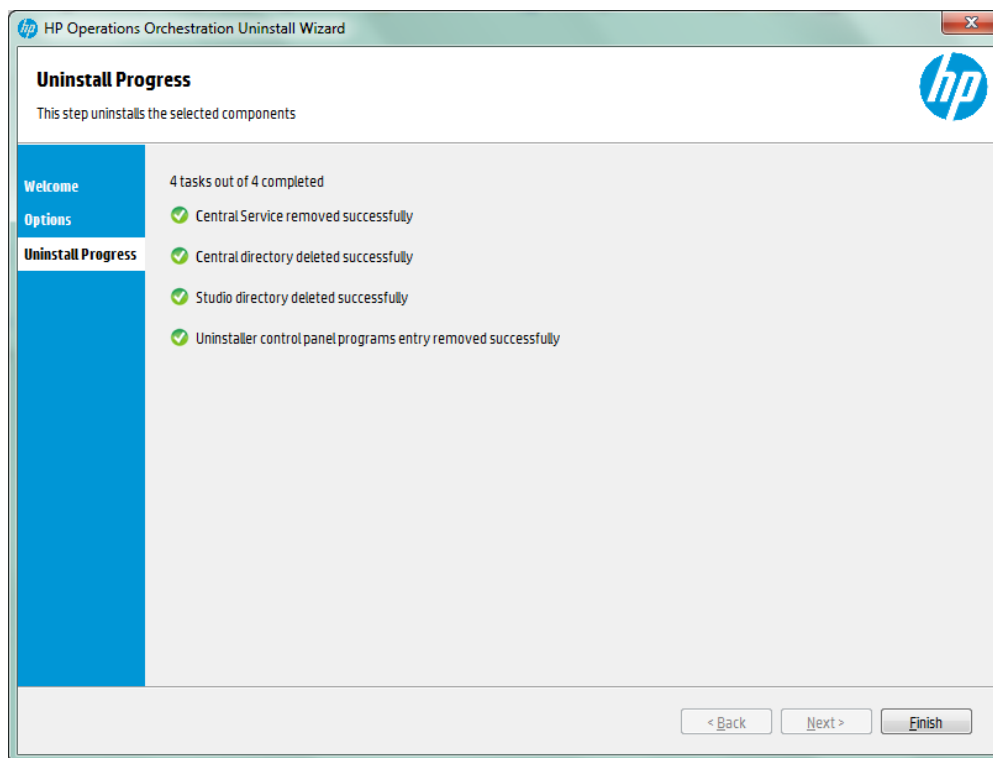
1. In the HP OO installation directory, for example, **C:\Program Files\Hewlett-Packard\HP Operations Orchestration**, double-click **uninstall.exe**, and then click **Next**.
2. Select the HP OO components that you want to uninstall, and then click **Next**. When prompted whether to continue, click **Yes**.



3. The Uninstall Progress screen displays the progress of the uninstall process, and displays the items that were deleted and removed. For example:
 - Central Service
 - Central directory

- Studio directory
- Uninstaller control panel programs

Note: The database and database user are not removed or dropped.



4. Click **Finish**.

The selected components of HP Operations Orchestration are removed from your computer.

Note: Uninstalling a RAS/remote worker does not remove the entry from the database. You need to also remove the RAS from Central UI, by selecting the worker in the **Topology > Workers** tab and using the **Delete** button. For more information, see "Setting Up Topology – Workers" in the *HP OO Central User Guide*.

Uninstalling HP OO on Linux

To uninstall HP Operations Orchestration in Linux, enter the following:

```
export DISPLAY=<ip address>
./uninstall
```

After the uninstall completes successfully, you can delete the installation directory.

Uninstalling HP OO Silently

A silent uninstallation is one that is started from the command line and completes without any input from the person who started it. You can uninstall silently from either Windows or Linux.

To uninstall HP Operations Orchestration silently, type the following from a command line:

```
uninstall -s <components>
```

In the <components> placeholder, enter a comma-separated list of components to remove.

Possible components are: all, central, ras, and studio.

For example: `uninstall -s central,ras`

Note: When you uninstall a RAS silently, if Central authentication is enabled, the RAS is not removed from the Central topology. In Central, go to **System Configuration > Topology > Workers**, and remove the RAS from the topology manually.

Rolling Back an Upgrade to an Earlier Version of HP OO 10.x

You can roll back an upgrade to the previous version of 10.x using the rollback script. This restores the installation to the state it was before the upgrade, but without losing database data.

The rollback restores the installation to the previous version, including patches. For example, if you have upgraded from version 10.20 to 10.5x, the rollback will restore version 10.20. If you upgraded from 10.00 to 10.5x, the rollback will restore 10.00.

The rollback process can only remove the latest patch that you installed. This means that if you installed 10.00 and then upgraded to 10.20, and then to 10.5x, you will only be able to roll back to 10.20.

Caution: It is not possible to roll back twice. You can only roll back the last upgrade that you successfully applied. Attempting to run the rollback twice will make the system unusable.

Important! When rolling back to an earlier version of 10.x, you must cancel or finish all paused or running flows and disable existing schedules before applying the rollback. If there are flows running or paused when you perform the rollback, it will not be possible to resume them, their status will be "Canceled" and the duration will be "0 seconds".

A component (Central, RAS, Studio) will only be rolled back if:

- The component is backed up under **<installation>/upgrade/<new-version>/backup/<component>**.
- The installed version is identical to the upgrade script's **<new-version>**.

If Central is being rolled back, the script rolls back the database schema changes and preserves data that was added after the upgrade. However, in some cases, data may still be lost due to the schema changes.

Notes:

- Any changes that were made in the file system since the upgrade will be lost, including changes to configuration files and log files.
- If you are rolling back from 10.5x to an earlier 10.x version, some types of configuration items located under sub-folders will be deleted. This occurs when you have multiple configuration items with the same type and name (in different folders).
- The rollback might be faulty if the old (pre-upgrade) version of Central was never started prior to the upgrade.

- HP OO 10.5x uses a different version of Quartz for scheduling. Therefore, if you roll back from 10.5x to an earlier version, you will need to delete all schedules that were created or updated in 10.5x.
- HP OO 10.5x uses Microsoft Visual C++ 2010 Redistributable Package (x86), while earlier versions do not. If you roll back to 10.2x, you will need to install Microsoft Visual C++ 2008.

To roll back to an earlier version of 10.x:

1. Open a command line.
2. Run the **rollback(.bat)** script, which is included in the upgrade zip file.

(Optional) If required, use the following command line options:

-f, --force	Force-start the rollback. This command rolls back the installation, without prompting.
-h, --help	Display help on the available parameters.
-n, --norestart	Do not restart Central/RAS after the rollback.
-o, --filesonly	<p>Do not roll back the database schema. Note that this option refers to the structure of database tables, not to the stored data.</p> <p>You only need to use this option if you have manually restored a backup of the database, which you created before the upgrade. For more information, see "Restoring a Database Backup Created Before the Upgrade" on page 89.</p> <div> <p>Warning! Do not use this option unless you have already taken care of downgrading the schema. Otherwise, the rollback will fail!</p> </div>

The rollback script uses the same **upgrade.log** file as the upgrade script.

Note: After you roll back, it is advised to move or delete the backup directory (created at **<installation>/upgrade/<new-version>/backup**). Otherwise, if you re-upgrade later, no fresh backup will be created, so any file changes that you made since the rollback will not be backed up.

Rolling Back When Your Company Does Not Allow Changing the Database Schema

If your company does not allow the HP OO application to change the database schema, the rollback procedure is different. You will need to use the **generate-sql(.bat)** script with the **-r** option, which generates a **rollback.sql** file in the unzipped upgrade folder.

1. Open a command line and run the **generate-sql(.bat)** script with the **-r** option.

The command line options for **generate-sql(.bat)** are:

-h, --help	Display help on the available parameters.
-r, --rollback	Generate the SQL for rollback. Use only after the database has been upgraded.

For example:

```
generate-sql -r
```

The **rollback.sql** file is created in the unzipped **<installation>/upgrade/<new-version>** folder.

2. Stop Central/RAS.
3. Apply the database changes by running **rollback.sql** against the database with the required credentials.
4. Roll back HP OO 10.x using **rollback(.bat)**.

Central/RAS restarts automatically after the rollback.

Rolling Back Studio

Important notes!

- The workspace format in 10.10 and later is different from prior versions. If you decide to roll back to a previous version, the converted workspace will not be compatible with the previous version.
- If you have a 10.5x workspace with folders inside the **Configuration** sections, you will not be able to launch Studio versions prior to 10.20. You will need to open the workspace in HP OO 10.5x and flatten the configuration items (move all items to the root section and delete the folders) before you can open the workspace in a previous Studio version.

- If you are rolling back to a previous version, you will need to manually delete the **.svn** folder in the **workspace** folder before rolling back, because HP OO 10.5x works with SVN 1.8 and previous versions work with SVN 1.7.

If you roll back to a previous revision you have two options to preserve your workspace:

- If you performed a workspace backup, you can replace your current workspace (**<user_home>.oo**) with the backed up version.

If you use this approach you will lose all changes made after the workspace backup.

If you want to keep the changes you made after the workspace backup, we recommend using the second approach.

- Create content packs from the projects, before rolling back:
 - a. Create content packs from all your 10.5x format projects.
 - b. Delete all the 10.5x format projects from your **<user_home>.oo/Workspace**, and also delete them from SCM.
 - c. Roll back HP OO to the previous version.
 - d. Unzip the content pack jar in the **<user_home>/.oo/Workspace** folder, keeping the name without the **-cp-version** suffix.

For example, **test1-cp-1.0.0.jar** will be unzipped to the **<user_home>/.oo/Workspace/test1** folder.

- e. Delete the **Lib** and **META-INF** folders.
- f. Open Studio and import the projects again.

Rolling Back a Cluster

In a cluster setup, it is recommended to stop all Central/RAS instances manually before rolling back.

Important! If you have added new cluster nodes since the most recent upgrade (of the existing nodes), rolling back the new nodes may cause problems. You should re-install such nodes instead of rolling them back. Only roll back the older nodes. If unsure, consider rolling back the oldest Central only, and then re-installing the rest.

Restoring a Database Backup Created Before the Upgrade

If the database schema rollback fails, and you have created a backup of the database prior to the upgrade, you can restore the backup as follows.

1. Stop Central/RAS.
2. Manually restore the database backup.
3. Open a command line and run the **rollback(.bat)** script with the **-o** option.

For example:

```
rollback -o
```

Central/RAS restarts automatically after the rollback.

This restores the files only and does not roll back the database schema.

Documentation Revision Changes

Revision B

- Corrected a typing error in the "Installing HP OO RAS Using the Installation Wizard" section.

