

Operations Orchestration Software

Software Version: 7.60

*Installing or Upgrading HP Operations Orchestration
Windows, Linux, and Solaris Operating Systems*

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On the Web: Finding OO support and documentation

There are two web sites where you can find support and documentation, including updates to OO Help systems, guides, and tutorials:

- The OO Support site
- BSA Essentials Network

Support

Documentation enhancements are a continual project at Hewlett-Packard Software. You can obtain or update the HP OO documentation set and tutorials at any time from the HP Software Product Manuals web site. You will need an HP Passport to log in to the web site.

To obtain HP OO documentation and tutorials

1. Go to the HP Software Product Manuals web site (<http://support.openview.hp.com/selfsolve/manuals>).
2. Log in with your HP Passport user name and password.
OR

If you do not have an HP Passport, click **New users – please register** to create an HP Passport, then return to this page and log in.

If you need help getting an HP Passport, see your HP OO contact.

3. In the **Product** list box, scroll down to and select **Operations Orchestration**.
4. In the **Product Version** list, click the version of the manuals that you're interested in.
5. In the **Operating System** list, click the relevant operating system.
6. Click the **Search** button.
7. In the **Results** list, click the link for the file that you want.

BSA Essentials Network

For support information, including patches, troubleshooting aids, support contract management, product manuals and more, visit the following site: <http://www.hp.com/go/bsaessentialsnetwork>

This is the **BSA Essentials Network** Web page. To sign in:

1. Click **Login Now**.
2. On the **HP Passport sign-in** page, enter your HP Passport user ID and password and then click **Sign-in**.
3. If you do not already have an HP Passport account, do the following:
 - a. On the **HP Passport sign-in** page, click **New user registration**.
 - b. On the **HP Passport new user registration** page, *enter the required information and then click **Continue***.
 - c. On the confirmation page that opens, check your information and then click **Register**.
 - d. On the **Terms of Service** page, read the Terms of use and legal restrictions, select the **Agree** button, and then click **Submit**.

4. On the **BSA Essentials Network** page, click **Operations Orchestration Community**.
The Operations Orchestration Community page contains links to announcements, discussions, downloads, documentation, help, and support.

Note: Contact your OO contact if you have any difficulties with this process.

In OO: How to find Help, PDFs, and tutorials

The HP Operations Orchestration Software (HP OO) documentation set is made up of:

- Help for Central
Central Help provides information to the following:
 - Finding and running flows
 - For HP OO administrators, configuring the functioning of HP OO
 - Generating and viewing the information available from the outcomes of flow runsThe Central Help system is also available as a PDF document in the HP OO home directory, in \Central\docs.
- Help for Studio
Studio Help instructs flow authors at varying levels of programming ability.
The Studio Help system is also available as a PDF document in the HP OO home directory, in \Studio\docs directory.
- Animated tutorials for Central and Studio
HP OO tutorials can each be completed in less than half an hour and provide basic instruction on the following:
 - In Central, finding, running, and viewing information from flows
 - In Studio, modifying flowsThe tutorials are available in the Central and Studio subdirectories of the HP OO home directory.
- Self-documentation for HP OO operations, flows, and Accelerator Packs
Self-documentation is available in the descriptions of the operations and steps that are included in the flows.

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Fresh installation or upgrade? Roadmap to this Guide

Are you performing a fresh installation of HP Operations Orchestration (OO)? That is, are you installing Central in the following cases?

- OO Central hasn't been installed on the system before.
- You removed an existing version of Central and do not wish to preserve the flows you've created or the run histories of the earlier version.

Or are you upgrading OO from an earlier version to OO 7.60?

This guide provides a single set of procedures, whether you are doing a fresh installation or upgrading.

Do you want the short version of an installation or upgrade, which is limited to the actions you take, or the full version, which discusses planning considerations and explains each step in detail and the meaning of the installation wizard pages' options?

Note on clustering and load balancing: You can create a high-availability cluster for your Central server or load balance requests from the Central Web application or Studios to Central. You do so after installing Central, Studio, and any standalone RAS installations. For information on creating failover clusters and enabling load-balancing of Central Web application requests and Studio requests, see *Clustering and Load Balancing for HP Operations Orchestration 7.60* (ClusteringGuide.pdf, which is available on the BSA Essentials Network site described in [BSA Essentials Network](#), above).

Short versions or long versions of install/upgrade instructions?

This Guide provides short versions of upgrading and installing as well longer versions that include planning information and supplementary information such as explanations of the choices that you make in dialog boxes in the Windows version of an installation program or, in the Linux version of an installation program, the meaning of parameter values that you can or must set.

If you have performed a number of installations or upgrades before and prefer a minimum of guidance, you might want to check out the short version of installing and upgrading. However, the short versions of the installation instructions also refer you to the sections that explain crucial information, such as database and database user configuration or Linux installation-configuration parameter values.

Which sections do you want to work with?

All of this document's procedural sections for installing have the steps and variations for upgrading folded into the procedures. The steps that are specific to upgrading are called out with the following format:

-  **If you are upgrading ...**

Short versions of fresh installations and upgrades

For the short version of upgrading or performing a fresh installation, see one of the following:

- [Short version of installing or upgrading Central on a Windows system](#)
- [Short version of installing or upgrading Central on a Linux system](#)
- To install or upgrade RAS on a different server from the Central server:

- [Installing or upgrading standalone RAS on Windows](#)
- [Installing or upgrading standalone RAS on Linux or Solaris](#)
- To install or upgrade Studio, see [Short version of installing or upgrading Studio](#)

Full explanations of planning and full versions of fresh installations and upgrades

For full explanations of OO, of planning considerations, and of the options available in the installation:

- For a very brief, high-level overview of what OO Central and Studio are, see the following section, [OO components](#).
- For a full explanation and procedure for the installation process, see [The full version of a fresh install](#).

This section includes:

- [Planning the installation](#), which includes various planning considerations (such as server configuration) and best-practice recommendations.
- [High-level view of installing HP OO](#)
- The full versions of installing or upgrading Central on both Windows and Linux systems.
- To install or upgrade RAS on a different server from the Central server:
 - [Installing or upgrading standalone RAS on Windows](#)
 - [Installing or upgrading standalone RAS on Linux or Solaris](#)
- To install or upgrade Studio, see [Full version of installing or upgrading Studio](#).

OO components

Hewlett-Packard Software Operations Orchestration (HP OO) is a system for creating automated procedures (called *Ops flows* or *flows*) and making them available to IT personnel. Ops flows are made up of operations that each perform a specific action to maintain, diagnose, and/or repair a system.

Operations Orchestration is made up of:

- The Central Web application, which provides the business-logic tier between the OO Repository database and both the Central Web client and Studio.
- The Central Web client, which is the browser-based tool that IT personnel use to execute Ops flows.
- The Remote Action Service (RAS), a service that enables you to run operations outside Central and the domain in which Central resides. With RAS, you can run operations on any system, anywhere.
- OO Studio, a standalone application in which you create new Ops flows.

Upgrading

Important: Note particularly two aspects of upgrading: upgrading the repository and upgrading the database.

- When you upgrade OO Central to 7.60, the shared Central repository is upgraded.
 - Where the repository is located affects whether it is backed up or not.

- If in the version from which you are upgrading the repository resides in the Central home directory (by default, C:\Program Files\Hewlett-Packard\Operations Orchestration), the old repository is upgraded and then backed up within the same directory.
- If the repository is located elsewhere (say, C:\myrepo\), then the upgrade upgrades the repository at that location, without creating a backup of the upgraded repository. You must create a backup of the repository yourself.
- Upgrading the repository takes a significant amount of time and continues after the Central installation program has otherwise completed the upgrade of Central. You cannot start Central until the upgrade of the repository has completed. You can monitor the progress of the repository upgrade in the Central_wrapper.log file. For more information on viewing Central_wrapper.log, see the relevant procedure for installing or upgrading OO Central.
- The upgrade process discards any flow runs that were stopped, paused, handed off, or orphaned when the upgrade is begun. It is recommended that you complete or delete these runs before you start upgrading Central.

Upgrade path

If you are upgrading from a version of Operations Orchestration (HP OO) earlier than version 2.2, you must upgrade one release at a time. The upgrade path is:

- 1.0
Upgrade to 1.1.
- 1.1
Upgrade to 2.0.
- 2.0
Upgrade to 2.1.
- 2.1
Upgrade to 2.2.
- 2.2
Upgrade to either 7.0 or 7.10.
- 7.0
Upgrade to 7.10, 7.20, or 7.50.
- 7.10
Upgrade to 7.20, 7.50, or 7.51.
- 7.20
Upgrade to 7.50, 7.51, or 7.60.
- 7.50
Upgrade to either 7.51 or 7.60.
- 7.51
Upgrade to 7.60.

Preparing to upgrade

The following pre-upgrade tasks apply to installations of Central, RAS (JRAS or NRAS), and the Load Balancer on both Windows and Linux systems, except where noted.

HP OO system configurations that are carried over from version 7.50 are those that were specified on the **Administration\System Configuration** tab of Central. These include the following:

- Active Directory (AD), Lightweight Directory Access Protocol (LDAP), or Kerberos authentication enablement and settings
- HP OO users, groups, and capabilities
- How Scheduler functions
- A few general settings for Central

Other system configurations you must reapply manually. Preserving the settings and configuration files for those configurations is covered in step 2 of the following procedure.

Important: In the following procedure, references to your current version or installation of HP OO refer only to 7.20, 7.50, or 7.51. If you are upgrading from an earlier version of PAS or Repair System, see [Upgrade Path](#) for the upgrade path to follow.

To prepare for upgrading

1. If you are upgrading to 7.60 directly from 7.20 and have an OO group named PROMOTER, delete it.

By default, Central 7.60 creates an internal OO group named PROMOTER. A PROMOTER group that was not created by installing or upgrading to 7.50 or 7.51 prevents the upgrade from creating the PROMOTER group, and does not update the existing PROMOTER group with the PROMOTER capabilities of 7.51 or 7.60.

2. Make sure that:

- The machines on which you upgrade HP OO meet the requirements for version 7.60, as described in *OO System Requirements (Sysreqs.pdf)*.
- You have applied all hot fixes for your current version.

3. Make backups of:

- The Central shared repository.
- The following files, which contain system configurations:
 - applicationContext.xml
 - jaasLogin.conf
 - wrapper.conf
 - Central.properties
- Any custom IActions that you wrote or generated from a WSDL.

Important: After upgrading, you will have to recompile any custom .NET-based IActions, using Microsoft Visual Studio 2005 SP1 and the HP OO 7.60 SDK dynamic-link libraries.

- The pas.conf file (if you use the HP OO Load Balancer).

The pas.conf file specifies which Central server cluster nodes and RAS installations the load balancer distributes requests to.

4. If you use a krb5.conf file for Kerberos authentication, make a copy of it.
5. In Studio, export the public repository and any local repositories for a Studio installation each to a new repository, storing each export in a safe place.

Important: When you export, be sure to export only flows and operations that have been created in your organization. Be sure not to export any of the default content in the Library.

You will import these repositories later. When you do, these two measures will make the importing of these repositories into the 7.60 system much easier.

6. If Studio is installed on the same machine as the copy of Central that you are upgrading, uninstall Studio (using **Add/Remove Programs** in Control Panel).

7. On each of the staging and production Central servers, back up the Central database and store the backup in a secure location.
Dashboard charts, schedules, users, groups, and system-configuration settings are stored in the Central database, so the database backup includes those components of OO.
Note: If the production Central server is clustered, back up the database in accordance with best practices for your clustering solution.
8. If you are upgrading on a **Linux** system, unset the ICONCLUDE_HOME variable using the command
`unset ICONCLUDE_HOME`
9. If you are upgrading on a **Windows** system, close all windows to the HP OO home directory and any of its subdirectories.
The upgrade application cannot write into these directories if they are open.
10. If you are upgrading a cluster, then on each node of the cluster, stop the Clustering Service (RSGridServer).
11. On the Central server, close Central and make sure that the services for your current installations of Central, JRAS, and Scheduler (RSCentral, RSJRAS, and RSScheduler) are stopped. If you have installed the OO Load Balancer, also stop the RSCLUSTER service.

The short version of an upgrade

1. After completing the tasks in [Preparing to upgrade](#), review your system to see whether there are any changes you need to make in your installation or in supporting configurations.
2. Make sure that your database and database user are configured as described in [Configuring the database and database user](#).
3. Complete one of the following:
 - [The short version of installing or upgrading Central on a Windows system](#)
 - [The short version of installing or upgrading Central on a Linux system](#)
4. Complete [The short version of installing or upgrading Studio](#).
5. Complete one of the following:
 - [Installing or upgrading standalone RAS on Windows](#)
 - [Installing or upgrading standalone RAS on Linux or Solaris](#)
6. Reinstall the HP OO Load Balancer, specify which Central nodes and standalone RAS installations will be load-balanced, and create a failover and run recovery in cluster for Central, as described in [Clustering and Load Balancing for HP Operations Orchestration 7.60](#) (ClusteringGuide.pdf, which is available on the BSA Essentials Network site described in [On the Web: Finding OO support and documentation](#), above).

The full version of an upgrade

1. After completing the tasks in [Preparing to upgrade](#), review your system to see whether there are any changes you need to make in your installation or in supporting configurations.
2. Work through the following sections of this manual:
 - [Planning the installation](#)

This section discusses considerations regarding server distribution and HP OO extensibility.

Important: To run the Windows Accelerator Pack operations and flows against a remote machine, you must install the Remote Action Service on the a Windows machine in the same domain as the remote machine.

- [Basic HP OO installation](#)
 - Information on configuring the database and database user that Central will use.
 - Procedures for installing Central on either Windows or Linux systems.
 - The procedure for installing Studio.
- [Making HP OO available to users](#)

What you need to provide to Central users and Studio authors for them to get started.

For information on providing a high-availability cluster and/or load balancing of Studio, RAS, and Web requests for Central, see *Clustering and Load Balancing for HP Operations Orchestration 7.60* (ClusteringGuide.pdf, which is available on the BSA Essentials Network site described in [On the Web: Finding OO support and documentation](#), above).



For information on ongoing administrative tasks and on configuring HP OO for extended functionality, see the *HP OO Administration Guide* (AdminGuide.pdf).


Your roadmap to a fresh installation or an upgrade




The short version of instructions for a fresh installation briefly tells you what to do to install Central . Alternatively, the full version explains in detail planning considerations and the meaning of the installation wizard pages' options or (in a Linux installation) installation-configuration options?

Short version of installing or upgrading Central on a Windows system

Important: If Central's database server is an Oracle RAC, incorporate the Guide to Installing HP OO with Oracle Real Application Clusters (InstallingHPOO_RACGuide.pdf) into the following procedure.

1. Make sure that the machine on which you are installing Central meets the hardware and software requirements listed in *OO System Requirements* (Sysreqs.pdf).
2. Create and configure a database or database schema.
For more information, see [Configuring the database and database user](#).
3. Create a database user with the necessary permissions for the database or schema.
4.  **If you are upgrading** from Central 7.20, 7.50, or 7.51, complete the tasks in [Preparing to upgrade](#).
5. Before starting the installation, make sure that you are connected to the database that you're using for Central.
6. Navigate to and double-click one of the following:
 - If you are installing on a 32-bit server, **Centrallnstaller-7.60.exe**.
 - If you are installing on a 64-bit server, **Centrallnstaller64-7.60.exe**.
7.  **If you are upgrading**, click **Yes** in the prompt that appears, to agree to upgrading to 7.60.
8. On the **Welcome** page of the Central Setup Wizard, click **Next**.
9. On the **License Agreement** page, read the agreement, select **I accept the agreement**, and then click **Next**.
10. On the **Language Selection** page, from the drop-down list, select either **English** or **Japanese**, and then click **Next**.

Note: If you are reinstalling Central on this machine or  **if you are upgrading**, Central is automatically installed in the Central subfolder of the OO home directory, and the next page in the installation wizard is the **Network Settings** page. Skip to the next step (which describes the **Network Settings** page).



11. On the **Select Destination Location** page, click **Next** to accept the default installation path.
OR
Click **Browse**, specify a different location where you want the Central Web application installed, and then click **Next**.
12. On the **Network Settings** page, in the either accept the default values or, in the text boxes, type the port numbers that you want to use for network connections.
13. Record the HTTPS port number, for reference during the Studio installation.
Note: The HTTP port makes it possible for client users to type their customary HTTP protocol in their browser address box and be redirected to the secure connection. If you have users who will specify the HTTP protocol and port when opening Central, you can provide them with this number.
14. Still on the **Network Settings** page, in the **Broadcast Address** box, either accept the default broadcast IP address or type a different one, and then click **Next**.
Note:  **If you are upgrading**, the **Database Information** and **Administrator Account** pages do not appear. Skip to the step that describes the **Ready to Install** page.
15. On the first **Database Information** page, select the type of database that Central will access, and then click **Next**.
16. On the second **Database Information** page, fill in:
 - **DB Host or IP Address**
 - **DB Port Number**
 - **DB Name**
 - **DB User Name**
 - **Password**
17. To create a new database, select the **Create (or recreate, if it exists) the database schema** check box, and then click **Next**.
Note: This page does not appear if you are upgrading.
18. On the **Administrator Account** page, create a password for the OO Administrator account, and then click **Next**.
Note: This page does not appear if you are upgrading.
19. On the **Ready to Install** page, click **Install**.
20. When the installation completes, click **Finish**.
Important:  **If you are upgrading**, the upgrade of the repository continues in the background after the Central installation is complete. Be aware that the repository upgrade may require a significant amount of time, and that you cannot start Central until after it has finished. For information on monitoring progress of the repository upgrade, see the following step.
21.  **If you are upgrading**, you can follow the repository upgrade's progress by monitoring the Central_wrapper.log file, using a tool that displays Central_wrapper.log as it runs. When you see both of the following strings, which occur in the following order but in separate entries, the repository upgrade is complete:



```
Commit successful
.
.
.
done upgrading the repository to 7.60n
```

 where n is a string of numbers

OR

You can discover whether the repository upgrade has completed by attempting to connect to Central (such as by accessing it with a web browser). You will not be able to connect to Central until the repository upgrade is complete.

22.  **If you are upgrading** and run flows on a RAS installed on a Windows machine:
 - a. Recompile any custom .NET-based IActions, using Microsoft Visual Studio 2005 SP1 and the HP OO 7.60 SDK dynamic-link libraries.
 - b. Copy any custom IActions, including any that you recompiled, to the location of the 7.60 RAS installation.
23.  **If you are upgrading:**
 - a. Open the upgraded Central.properties file in a text editor and copy into it any custom properties from your backup of the previous Central.properties file.
 - b. Restart the Central service.
24. Install Studio.

 **If you are upgrading**, you must install Studio before you import the public repository that you exported earlier in the procedure.

For the Studio installation procedure, see [Installing Studio](#).

For creating or upgrading load-balancing for Central servers and/or standalone RAS installations, see [Clustering and Load Balancing for HP Operations Orchestration 7.60](#) (ClusteringGuide.pdf, which is available on the BSA Essentials Network site described in [On the Web: Finding OO support and documentation](#), above).

The full version of installing or upgrading Central on a Windows system

Installing HP OO for importing, creating, and running basic Ops flows involves installing Central, Studio, and perhaps RAS on a server that is separate from the Central server. The following sections describe these tasks in detail and provide background information:


- [Planning the installation](#)

This section discusses considerations regarding server distribution and HP OO extensibility.

Important: To run the Windows Accelerator Pack flows against a remote machine, you must install the Remote Action Service (RAS) on a Windows machine in the same domain as the remote machine.
- [Basic HP OO installation](#)

This section includes:

 - Information on configuring the database and database user that Central will use.
 - Procedures for installing Central on either Windows or Linux systems.

The procedures cover upgrading as well as fresh installs. The portions of the procedure that are specific to upgrades are called out as such (with " **If you are upgrading...**"). If you are not upgrading, you can ignore these parts of the procedure.
 - The procedure for installing Studio.
- [Making HP OO available to users](#)

This section talks about what you need to provide to Central users and Studio authors for them to get started.

- [Installing RAS on standalone servers](#)

This section covers standalone installations of RAS on Windows, Linux, and Solaris systems. It also describes how to create a reference to the RAS installation from Studio.

- If you are creating a Central database cluster, see *Clustering and Load Balancing for HP Operations Orchestration 7.50* (ClusteringGuide.pdf, which is available on the BSA Essentials Network site described in [On the Web: Finding OO support and documentation](#), above).

For information on ongoing administrative tasks and on configuring HP OO for extended functionality, see the *OO Administration Guide* (AdminGuide.pdf).

Important: If Central's database server is an Oracle RAC, incorporate the *Guide to Installing HP OO with RAC* (InstallingHPOO_RACGuide.pdf) into the following planning, configurations, and procedures.

Planning the installation

Planning issues include the following:

- Central server and Studio distribution

Creating a staging version of the Central server is strongly recommended. Authors should test flows on the staging Central server. Then, when the flows are ready for use in a production environment, publish the flows from the staging Central repository to the production environment's Central repository. For more information on distribution of OO components, see [Server and Studio Distribution](#).



Tip: You can put your development/staging of Central on a virtual machine. To access such an installation of Central, you identify the server by the virtual machine's bridge IP address, which you can obtain by running the ip configuration command on the virtual machine.

- Ports for crossing firewalls
- Extensibility
- Clustering for scalability and high availability:
- Whether to cluster Central servers for load-balancing and/or failover support



Best Practice: It is strongly recommended that you create a Central server (load-balancing) cluster and a cluster for the Central database.

- If you create a load-balancing cluster for Central servers, whether you will use HP OO Load-Balancer or a third-party load-balancer.
- If you create a failover/run recovery cluster of Central servers, whether your Central servers can use IP multicasting (the alternative for multicasting is TCP ping).
- Whether to cluster Central database servers
- Whether to cluster computers on which RAS is installed
- Whether the Central server nodes support IP multicasting
If not, then the Central nodes use TCP Ping.

- Language version

HP OO supports any language that your database and operating systems support. International language support means that with proper configuration, you can enter and obtain data in the language of your choice. To do so, all the items in the following list must be configured for the same language and character set:

- HP OO Central: The operating system of the server on which it is installed.
- The database that Central uses.
For information on how to configure your database to take advantage of this for MySQL, Oracle, or SQL Server databases, see [Configuring the database and database user](#).
- HP OO Studio: The operating system of the machine on which it is installed.
- Remote Action Service: If installed standalone, the operating system of machine on which it is installed.
- Data sources on any machine that a flow exchanges data with. Data sources might be operating systems, databases, files, among other sources.

Useful information

The following information is useful for planning your installation and for various other uses, such as installing or configuring HP OO components and creating URLs that launch flows.

Upgrading OO Central to 7.60 on Linux: Install standalone RAS on Windows machine

Starting with 7.10, Central runs operations outside of Central using a single RAS that is enabled for both Java and .NET. If the OO Central installation that you are upgrading to 7.60 runs on a Linux system and you use operations that interact with .NET, your deployment must include a standalone RAS installed on a Windows system and the necessary RAS reference specified in Studio to point to that RAS. You can implement this in one of two ways:

- To use a RAS to run both operations that interact with .NET and those that interact with Java:
 - a. After upgrading OO, install a standalone RAS on a machine whose operating system is Windows.
 - b. In Studio, update the RAS_Operator_Path RAS reference to point to the new standalone RAS. All operations that run outside Central will run through the RAS on the Windows system, whether they are Java and .Net)
- To use a RAS to run only operations that interact with .NET:
 - a. After upgrading OO, install a standalone RAS on a machine whose operating system is Windows.
 - b. Create a new RAS reference in Studio that points to the new standalone RAS.
 - c. Create a system property, name it "overrideNRAS", and set its property to whatever you named the NRAS entry (i.e. NRAS_Operator_Path).

Operations that have override RAS settings have the `${overrideNRAS}` flow variable reference. Because a system property is always present during flow execution, any NRAS operation will use the RAS specified in the System Property.

Ports of importance to HP OO components

By default, HP OO components use the following ports for communication:

- Central: 8443
- Between HP OO components, such as Central, Scheduler, and RAS: 18443
- RAS: 9004
- Scheduler: 19443
- SMTP server: 25

Crossing firewalls

When you install RAS on the other side of a firewall from Central, you must specify a port in the firewall through which Central can communicate with the remote RAS. For a standalone RAS, this is 9004.

Also, in order to use operations that send email, your firewall must allow outbound communication over the default port used by your email server. For an SMTP server, this is port 25.

Server and Studio distribution

Factors that can influence your server distribution include whether you want to:

- Enable Ops flow authors to edit an Ops flow while users are running the previous version of the Ops flow. This requires installing Central on a staging server as well as on a production server.
- Install RAS on a standalone server. You cannot install a standalone RAS on the Central Web server; the Central installation program includes installation of RAS.



Best Practice: On your production (“real world”) installation of Central, only the account with the ADMINISTRATOR capability should be able to direct-connect to the production installation of Central. (For information on allowing only the administrator to direct-connect to Central, see the HP OO Administrator’s Guide (AdminGuide.pdf).

To facilitate authors’ teamwork in creating flows on the development/testing installation of Central, you can either give all your authors the ADMINISTRATOR capability on the development/testing installation of Central or enable users other than the administrator to direct-connect to the development/testing Central.



Best Practice for system design: It is strongly recommended, no matter how large or small your authoring team, that in addition to a Central server in your production (“real world”) environment, you also install a Central server in your testing environment for developing and testing flows.

Following are some scenarios and the server and client distribution that would support them.

Important: It is best practice, particularly when you have multiple authors, to create a staging HP OO environment, from which an HP OO administrator then publishes to the production HP OO environment.

One author one staging Central server, one production Central server

This scenario is the minimum recommended best practice. Even if the Ops flows author and the Central user are a single person, there should be a staging server for testing and a production server that the repository is published to after testing on the staging server.

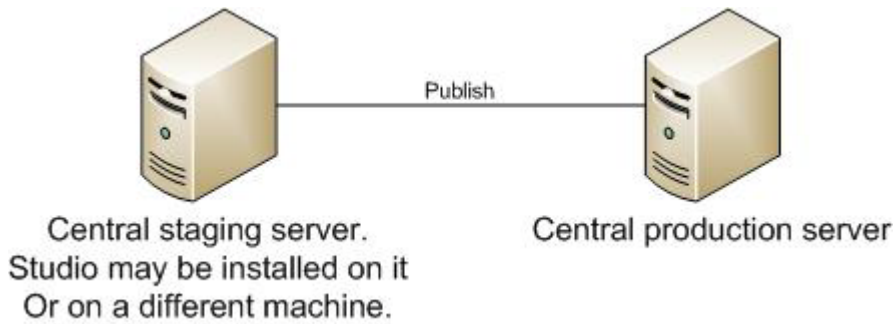


Figure 1 - Minimum recommended configuration

The Central staging server and the Central production server each have Central installed. Studio can be installed on either server. Whether Studio is installed on the Central production or staging server, the author publishes to the repository that the staging server's installation of Central uses.

Multiple authors

Multiple authors can exchange work by publishing and updating from the Central staging server. When either author publishes to the staging server, his or her work is copied there. When either author updates from the staging server, his or her local repository is updated with any work that the other author has published to the staging server.

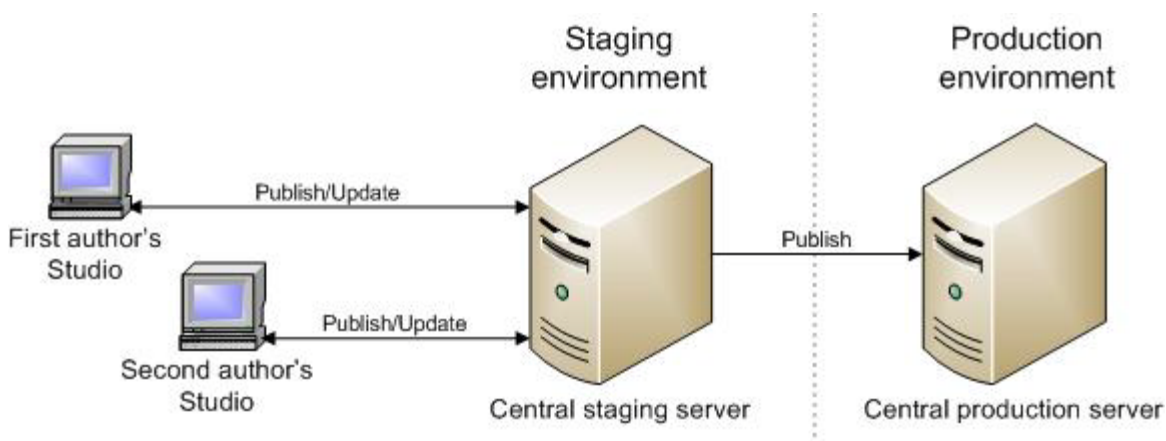


Figure 2 – Server/client distribution for multiple authors

Extensibility

When you install OO Central, an OO Remote Action Service (RAS) is installed on the OO Central Web server. However, if you also install a standalone RAS (a RAS that is installed on a different machine from the Central server), you can also run flows containing operations that carry out actions in the following settings:

- On machines that are on the other side of a firewall or in a different domain from the Central Web server.
- Accessing applications whose application programming interface (API) cannot be accessed from a computer that is remote to the application's server. In this case, you will install the RAS on the application's server.

For information on installing a standalone RAS, see [Installing RAS on standalone servers](#).

Creating a security certificate

By default, Central is configured to communicate using the HTTPS protocol. When Central communicates using HTTPS, Web browsers show security violation errors or messages unless you create a valid security certificate for delivering the Central Web pages. If you see such a browser warning, it is because OO includes, by default, an unsigned certificate that serves as a placeholder for a valid customer-obtained certificate. If you choose not to create a security certificate, you can safely ignore the warning.

Basic OO installation

Installing Central and Studio provides everything you need to create and run flows. The Central installation includes automatic installation of the Remote Action Service (RAS), which enables you to run flows that operate remotely from HP OO or interact with other programs.

High-level view of installing HP OO

The following list of tasks assumes that you want to have the following, but without load-balancing or failover clustering support:

- Multiple authors publishing to a Central installation in a testing (or staging) environment.
- A remote RAS installation.

If you are only installing Central on a single server, you only need to complete steps 1 and 3.

Install and configure OO components in the following order:

1. Make sure that the machines on which you install the OO components meet hardware and software requirements described in:
 - The *OO System Requirements* document (Sysreqs.pdf)
 - Requirements for all the required software programs.
2. Create a testing/staging OO environment, which we will assume has the following configuration:
 - Database server
 - Central server
 - Optional: installation of RAS on its own computer

The high-level steps to create this testing or staging environment are:

- a. Install the database management system on the database server.
 - b. Create a database for Central and configure the database and database user as necessary. For information, see [Configuring the database and database user](#).
 - c. Install Central.
For information on and procedures for installing on either a Windows or a Linux system, see [Installing or upgrading Central](#).
 - d. Install Studio.
For information, see [Installing or upgrading Studio](#).
 - e. If necessary, install standalone RAS.
For information on and procedures for installing on either a Windows or a Linux system, see [Installing RAS on standalone servers](#).
3. To create the production OO environment, repeat the above steps in this procedure in the production environment.

4. For more information on creating a failover and/or enabling load-balancing of Central Web application requests and Studio requests, see *Clustering and Load Balancing for HP Operations Orchestration 7.60* (ClusteringGuide.pdf, which is available on the BSA Essentials Network site described [On the Web: Finding OO support and documentation](#), above).

Configuring the database and database user

You must create and configure a database and database user before installing Central because Central does not create the database, but the schema for the database.

Important: The schema and user must always be dedicated to HP OO. Do not adapt the schema to support any other applications. If you do, you can lose data in the other applications when you install HP OO.

The Central database size and collation depend on your business needs.

As you install or configure your database management system and create a database and database login and user, make sure that among your tasks you complete the tasks in one of the following sections, depending on which database management system you use.

Oracle 10g Enterprise: schema and schema user configuration

Multiple language support

To enter data in Central and obtain data from the schema in a language other than English

- Configure the database server with UTF-8.

Privileges for the database user

When creating a user for the schema, grant CONNECT and RESOURCE privileges to the user. The Central installer makes all the necessary changes to the schema that Central will use.

MySQL: database and database user configuration

Multiple language support

To enter data in Central and obtain data from the database in a language other than English

- Configure the database server with UTF-8.

Privileges for the database user

When you create a database and a user for the database, grant all privileges for that database to the database user.

SQL Server: database and database user configuration

Multiple language support

To enter data in Central and obtain data from the database in a language for which SQL Server supports localization, configure the database with the appropriate language collation.

Following are the required collations in SQL Server for the listed languages:

SQL Server version	Language	Required collation
SQL Server 2005 or 2008		
	Japanese	Japanese_Unicode_CS_AS
	German	German_PhoneBook_CS_AS & Latin1_General_CS_AS
	Korean	Korean_90_CS_AS
SQL Server 2000 SP3a and above		
	Japanese	Japanese_Unicode_CS_AS
	German	German_PhoneBook_CS_AS & Latin1_General_CS_AS
	Korean	Korean_Wansung_Unicode_CS_AS

For example, to enter Japanese characters in Central and receive data in Japanese from the database, configure the database with an appropriate Japanese collation.

Database information that the person who installs Central needs

If another person installs Central, you must provide him or her with the following information about the database and the database server:

- Database name
- Server location and name or IP address
- Port number
- Database user name and password

SQL Server 2000, SP 3a or later

- When you create the login for the new database user, among the new login's properties:
 - Specify either kind of authentication.
 - Select the database that you have created as the default database for this login.

Note: If this is not acceptable for your organization, the database administrator can modify the .ddl file appropriately. The .ddl file is located in the HP OO home directory, in the \Central\db subdirectory.

- When creating the database user:
 - For the default schema, specify "dbo".
 - For role membership, select the db_owner database role.

SQL Server 2005 or SQL Server 2008

1. When configuring SQL Server configuration, enable TCP/IP as a network protocol.
 2. Enable TCP/IP as a network protocol for SQL Server.
 - a. Within the SQL Server Configuration Manager program, expand **SQL Server Network Configuration**.
 - b. Select **Protocols for MSSQLSERVER**, right-click **TCP/IP**, and in the context menu that appears, click **Enable**.
 3. When creating the database login:
 - Specify either kind of authentication.
 - Select the database that you have created as the default database for this login.

Note: If this is not acceptable for your organization, the database administrator can modify the .ddl file appropriately. The .ddl file is located in the HP OO home directory, in the \Central\db subdirectory.
 - In **Server Roles**, select all the roles.
 4. When creating the database user:
 - For the default schema, specify "dbo".
 - For role membership, select the db_owner database role.
- Next, you install the Central Web application and Studio.

Installing or upgrading Central


In the course of the installation, the program:

- Checks connectivity with the database, using the database connection information that has been provided.
- Configures the database schema that has been created.
- Installs the Central server files.
- Installs RAS on the Central server.



Note: By default, Central is configured to communicate with standalone installations of RAS over port 9004 (which the standalone RAS installation configures on the remote machines for communication with Central).

At any point in the following procedure, you can stop the installation by clicking **Cancel**. The installation stops gracefully.


The short version of installing or upgrading Central on a Windows operating system

Important:  **If you are upgrading**, the upgrade of the repository continues in the background after the Central installation is complete. Be aware that the repository upgrade may require a significant amount of time, and that you cannot start Central until after it has finished.

To install or upgrade Central on a Windows operating system

-  **If you are upgrading** from Central 7.20, 7.50, or 7.51, complete the tasks in [Preparing to upgrade](#).
- Before starting the installation, make sure that you are connected to the database that you're using for Central.
- Navigate to and double-click one of the following:
 - If you are installing on a 32-bit server, **Centrallnstaller-7.60.exe**.
 - If you are installing on a 64-bit server, **Centrallnstaller64-7.60.exe**.
-  **If you are upgrading**, click **Yes** in the prompt that appears, to agree to upgrading to 7.60.
- On the **Welcome** page of the Central Setup Wizard, click **Next**.
- On the **License Agreement** page, read the agreement, select **I accept the agreement**, and then click **Next**.
- On the **Language Selection** page, from the drop-down list, select either **English** or **Japanese**, and then click **Next**.

The **Select Destination Location** page appears, unless you are upgrading or reinstalling the Central or have already installed Studio on this machine, in which case Central is automatically installed in the Central subfolder of the OO home directory.

-  **If you are upgrading** or reinstalling Central or have already installed Studio on this machine, skip the following step and resume this procedure where the **Network Settings** page appears (the step following the next).
- On the **Select Destination Location** page, click **Next** to accept the default installation path.
OR
Click **Browse**, specify a different location where you want Central installed, and then click **Next**.
The **Network Settings** page appears, on which you configure the ports and IP address that Central uses.
(For 64-bit installations, the appearance of this and the other installation wizard pages may be slightly different, but the fields are the same.)

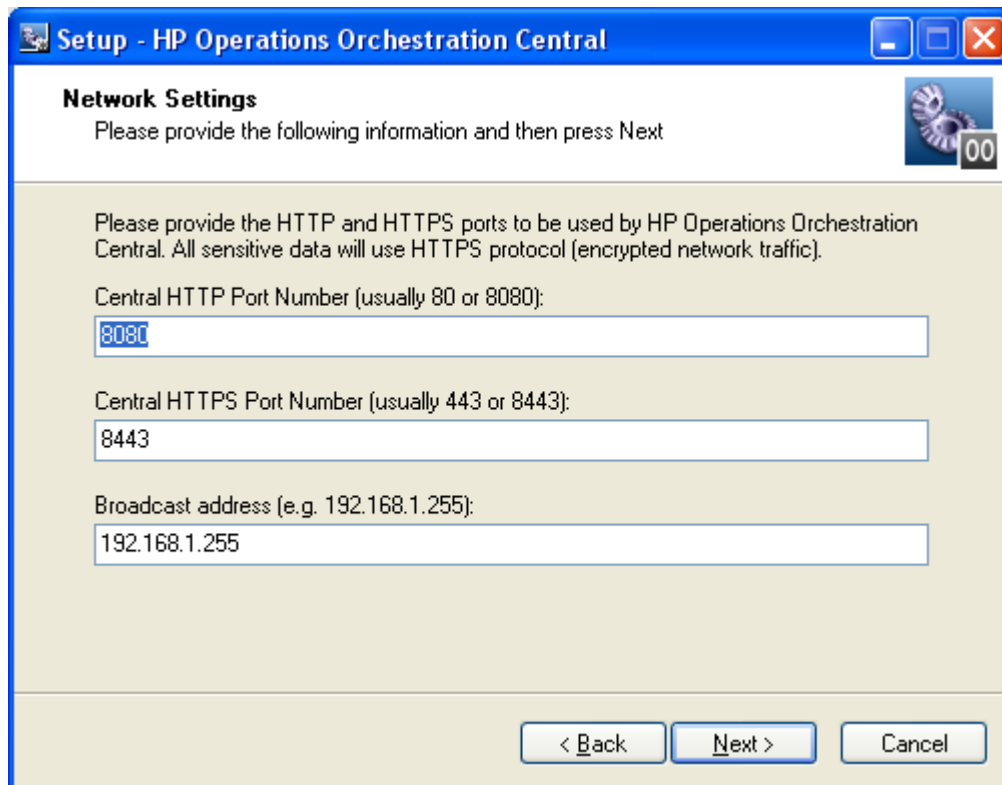


Figure 3 – Network Settings page

Communications between the Central Web application, Studio, and the Central Web client are over secure connections, using the HTTPS protocol. The HTTP port makes it possible for client users to type their customary HTTP protocol in their browser address box and be redirected to the secure connection.

The broadcast address is the address that RASs will use to broadcast their availability to Studio and Central. (For more on RASs and checking their availability, see the HP OO *Concepts Guide* (ConceptsGuide.pdf) and Help for Studio.

9. Either accept the default values or, in the text boxes, type the port numbers that you want to use for network connections.
10. Record the HTTPS port number, for reference during the Studio installation and, if you have users who will use the HTTP protocol in the address they use for opening Central, the HTTP port number.

Note:  If you are upgrading, the **Database Information** and **Administrator Account** pages do not appear. Skip to the step that describes the **Ready to Install** page.

11. Either accept the default broadcast IP address or type a different one, and then click **Next**. The first **Database Information** page appears.

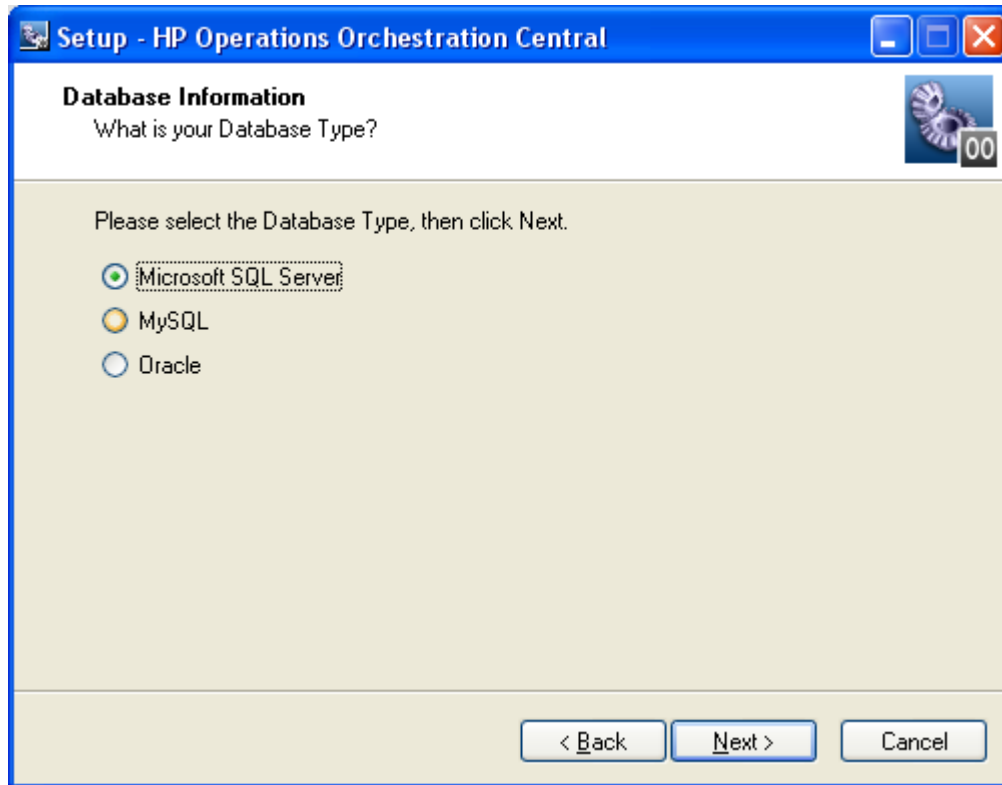


Figure 4 – Choosing a database management system

12. Select the type of database that Central will access, and then click **Next**. The second **Database Information** page appears.

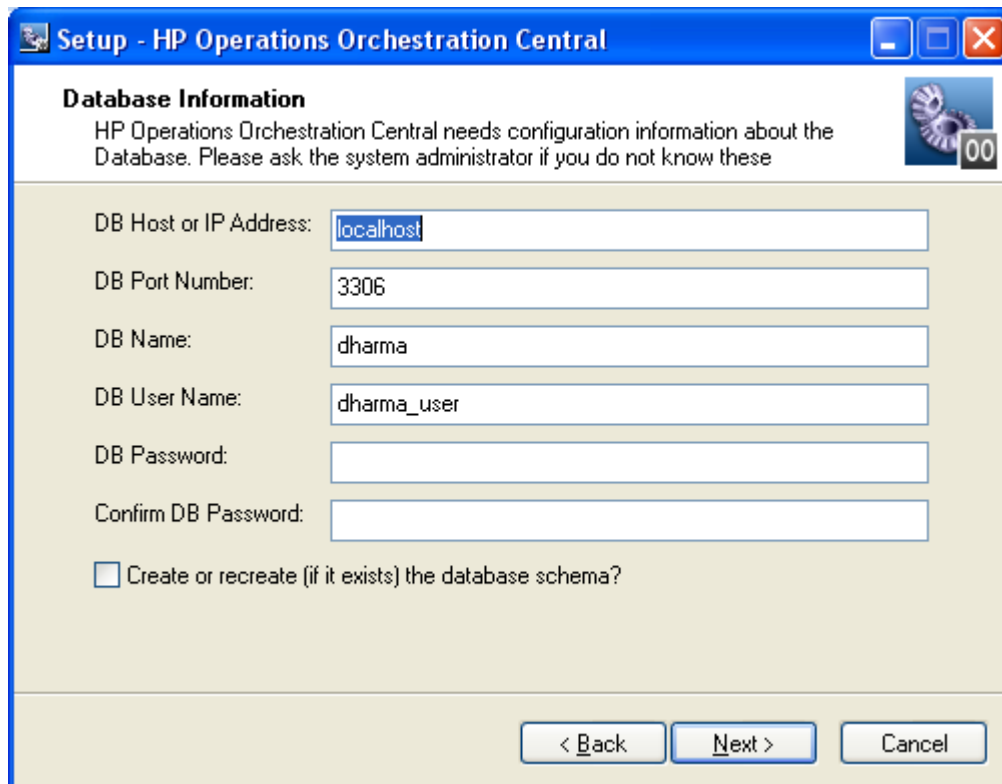


Figure 3 - Setting database connection information

Warning: If you choose to create a new database with the name of an existing database, all the data in the previously installed database is overwritten.

13. Fill in the information as your configuration dictates.

Use the following formats. In these formats, angle brackets (<>) contain strings that you replace with your particulars, and square brackets ([]) indicate optional material.

- **DB Name**

<db_name>[;instance=<instance_name>]

The instance name is necessary only if the database is an instance.

- **DB User Name**

[<domain_name>\] <db_user_name>

The domain name is necessary only if the database authentication is Windows, using a domain account.

You can get this information from your database administrator.

- **Password and Confirm Password**

The database name (**DB Name**) and password are the name and password that the Central Web application uses to access the database.

14. To create a new database, select the **Create (or recreate, if it exists) the database schema** checkbox, and then click **Next**.

The installation program tests the database connection using the information that you provided. The **Test Database Connection** progress page appears and shows progress of the database connection test.

If the database connection fails, the dbConnect.log appears, providing more information on the cause of the failure of the database-connection failure.

15. If the database connection test fails, return to the **Database Information** page and correct the information.

After the database connection test succeeds, if you have chosen to create or recreate the database, the **Create HP Operations Orchestration Administrator Account** page appears. The administrator account, which you will use to log in to Central, is always named "admin."

OR

If you are reinstalling Central and have not chosen to create or recreate the database, then this page does not appear. (Once you have created the OO Administrator account and its password, you cannot change the password.) Instead, the installation program goes directly to the **Ready to Install** page. In this case, skip the following step.


16. In the **Password** and **Confirm Password** text boxes, create a password for the OO Administrator account, and then click **Next**.

The **Ready to Install** page appears, displaying the information that you specified in the rest of the setup.

17. To proceed, click **Install**.

The installation program begins installing, tracking its progress on the **Installing** page.

18. When the installation completes, click **Finish**.

Important:  **If you are upgrading**, the upgrade of the repository continues in the background after the Central installation is complete. Be aware that the repository upgrade may not be complete for quite some time. For information on monitoring progress of the repository upgrade, see the following step.

19.  **If you are upgrading**, you can follow the repository upgrade's progress by monitoring the Central_wrapper.log file, using a tool that displays Central_wrapper.log as it runs.


When you see both of the following strings, which occur in the following order but in separate entries, the repository upgrade is complete:

```
Commit successful
.
.
.
done upgrading the repository to 7.60n
```

where n is a string of numbers

OR

You can discover whether the repository upgrade has completed by trying to connect to Central. You will not be able to connect to Central until the repository upgrade is complete.


20.  **If you are upgrading**, recompile any custom .NET-based IActions, using Microsoft Visual Studio 2005 SP1 and the HP OO 7.60 SDK dynamic-link libraries.
21. Copy any custom IActions, including any that you recompiled, to the location of the 7.60 RAS installation.

22.  **If you are upgrading:**

- a. Open the upgraded Central.properties file in a text editor and copy into it any custom properties from your backup of the previous Central.properties file.
- b. Restart the Central service.

23. Install Studio.



For the Studio installation procedure, see [Installing Studio](#).

Note:  **If you are upgrading**, you must install Studio before you import the public repository that you exported earlier in the procedure.

If Studio is on the same machine as Central, make sure that the subdirectory to which Studio is installed is under the same directory as that under which Central is installed. By default the Studio installation program tries to install in C:\Program Files\Hewlett-Packard\Operations Orchestration.


Short version of Installing or upgrading Central on a Linux system


Important Notes:

- If Central's database server is an Oracle RAC, incorporate the *Guide to Installing HP OO with RAC* (InstallingHPOO_RACGuide.pdf) into the following procedure.
 -  **If you are upgrading**, the upgrade of the repository continues in the background after the Central installation is complete. Be aware that the repository upgrade may require a significant amount of time, and that you cannot connect to Central until after it has finished.
 - The new setting, OO_LANGUAGE=, specifies an English- or Japanese-language installation.
1.  **If you are upgrading** from Central 7.20, 7.50, or 7.51, complete the tasks in [Preparing to upgrade](#).
 2. From the installation files, unzip the appropriate one of the following .zip files:
 - **Central-7.60-linux.zip** for 32-bit systems
 - **Central-7.60-linux64.zip** for 64-bit systems

In the directory where the zip file resides, unzipping the file by default creates a subdirectory named Central-7.60, which will be the home directory for OO Central (\$ICONCLUDE_HOME).

To unzip to a different location, add -d and an existing directory name to the unzip command.

3. Open the new Central home directory.
4. Edit the install.config file, changing the values for the parameters as appropriate to your environment.
For guidance on setting values for the parameters, see [The full version of installing or upgrading Central on Linux](#).
5. Still in the new Central home directory, run the script ./configure.sh.
6. When prompted for the password for the database user for Central, type, and then (when prompted) retype the database user password.
7. When prompted to create a password for the iconclude user (the user specified in install.config in `ICONCLUDE_USER=<iconclude_user_name>`, as described above in this procedure), type, and then (when prompted) retype a password for the user.
8. Source the file .iconcluderc using the command:
`source ./iconcluderc`
9. Verify that the environment variable \$ICONCLUDE_HOME is properly set.
10.  **If you are upgrading** and run flows on a RAS installed on a Windows machine:
 - a. Recompile any custom .NET-based IActions, using Microsoft Visual Studio 2005 SP1 and the HP OO 7.60 SDK dynamic-link libraries.
 - b. Copy any custom IActions, including any that you recompiled, to the location of the 7.60 RAS installation.

11.  **If you are upgrading**, open the upgraded Central.properties file in a text editor and copy into it any custom properties from your backup of the previous Central.properties file.

12. Start the Central service:

```
$> $ICONCLUDE_HOME/bin/Central.sh start
```


13. Start the RAS service (optional):


```
$> $ICONCLUDE_HOME/bin/JRAS.sh start
```

The options for Central.sh can also be used with this command.

14. Start the Scheduler service:

```
$> $ICONCLUDE_HOME/bin/Scheduler.sh start
```

Important:  **If you are upgrading**, the upgrade of the repository continues in the background after the Central installation is complete. Be aware that the repository upgrade may not be complete for quite some time. For information on monitoring progress of the repository upgrade, see the following step.

15.  **If you are upgrading**, you can follow the repository upgrade's progress by monitoring the Central_wrapper.log file, using the following command, which displays the Central_wrapper.log file as it is written during the repository upgrade.

```
tail -f Central_wrapper.log
```

When you see both of the following strings, which occur in the following order but in separate entries, the repository upgrade is complete:

```
Commit successful
```

```
.  
. .  
. .
```

done upgrading the repository to 7.60n

where n is a string of numbers.

OR

You can discover whether the repository upgrade has completed by attempting to connect to Central. You will not be able to connect to Central until the repository upgrade is complete.

16. If you wish to increase the capacity of the system:

a. Increase the fd limit for the user under which Central runs, by adding the following two lines to the user's file /etc/security/limits.conf:

```
myuser soft nofile 65536
```

```
myuser hard nofile 65536
```

b. Log in as "myuser" and check the value by issuing the `ulimit -n` command.

For instance, if the user is named "user1", add these two lines to the file /etc/security/limits.conf:

```
user1 soft nofile 65536
```

```
user1 hard nofile 65536
```

Then log into the box as user1 and check the value by issuing the "ulimit -n" command.

Full version of Installing or upgrading Central on a Linux operating system

You can run as many installations of the OO Central Web application as you wish on the same host; these installations can be of the same version or different versions. When installing multiple copies of Central on one host, edit the install.config file for each installation to make sure that there are no port conflicts and no database conflicts among the installations of Central.


Important: If Central's database server is an Oracle RAC, incorporate the *Guide to Installing HP OO with RAC* (InstallingHPOO_RACGuide.pdf) into the following planning, configurations, and procedures.

There are two versions of the installation package for each database management system, one for the 64-bit version of Linux and one for the 32-bit version:

- On a 64-bit version of Linux, it is recommended that you use the 64-bit version (Central-7.60-linux64.zip).
- On a 32-bit version of Linux, be sure to use the 32-bit version (Central-7.60-linux.zip).

This package includes Java Runtime Environment (JRE), version 1.6.

To install or upgrade Central on a Linux operating system

1.  **If you are upgrading** from Central 7.20, 7.50, or 7.51, complete the tasks in [Preparing to upgrade](#).
2. From the installation files, unzip the appropriate one of the following .zip files:
 - **Central-7.60-linux.zip** for 32-bit systems
 - **Central-7.60-linux64.zip** for 64-bit systemsIn the directory where the zip file resides, unzipping the file by default creates a subdirectory named Central-7.60, which will be the home directory for OO Central (\$ICONCLUDE_HOME).
To unzip to a different location, add -d and an existing directory name to the unzip command.
3. Open the new Central home directory.
4. Edit the install.config file, changing the values for the following parameters as appropriate to your environment.

Note particularly the new setting, `OO_LANGUAGE=`, for specifying an English-language or Japanese-language installation.

- `HTTP_PORT` and `HTTPS_PORT`

These are the ports that the OO components use for communication. `HTTPS_PORT` is the port used for SSL (Secure Sockets Layer) communication.

By default, the value for `HTTP_PORT` is 8080 and the value for `HTTPS_PORT` is 8443.

- `MAX_HEAP_SIZE`

The amount of memory (RAM), in megabytes, that the Java process has available for running Central. The default value is 768.

- `MAX_PERM_SIZE`

The amount of memory (RAM), in megabytes, that the Java process has available for running Central. The default value is 64.

- Following are the database settings:

- `RECREATE_DB_SCHEMA`



If you are upgrading, leave this value as `false`.

If you are doing a fresh installation, set this to `"true"`.

- `DB_HOST`

The name or IP address of the machine on which the Central database runs.

- `DB_TYPE`

The database management system of the Central database, either `mysql`, `oracle`, or `sqlserver`.

- `DB_PORT`

The port that the database uses for communication. The comment in `install.config` provides the default port used by each of the database types.

Important: Do not provide a value if you are using Oracle RAC. For more information, see the **Important** note below.

- `DB_NAME`

The name of the database that Central uses.

- `DB_USER`

The name of the database user account under which Central accesses the database.

- `DB_CONN_POOL_SIZE`

The number of database connections that are available.

Important: If the database used is an Oracle RAC configuration, the settings for `DB_HOST` and `DB_PORT` are not used. This is because a cluster usually involves two or more hosts with possibly different ports. Thus, the settings for `ORACLE_RAC_NODES` and `ORACLE_RAC_ONS_CONFIG` must be uncommented and populated accordingly. If by mistake both `DB_HOST/DB_PORT` and `ORACLE_RAC_NODES/ORACLE_RAC_ONS_CONFIG` are populated, the RAC settings will take precedence, whereas the other settings will be ignored. See the *Guide to Installing HP OO with RAC* (`InstallingHPOO_RACGuide.pdf`) for more information.

- `ICONCLUDE_USER`

The linux user account under which the Central services run. If you do not specify a user account, the user is the account under which you are installing Central. You might specify a

different account if, for instance, the account that you specify as the `ICONCLUDE_USER` has different privileges from the account that is installing Central.

- `JRAS_HOST`

The machine on which the Remote Action Service (RAS) service runs. If RAS is installed on the same machine as Central, you can leave the value blank.

- `JRAS_PORT`

The port that RAS uses to communicate.

- `JRAS_MAX_HEAP_SIZE`

The amount of RAM, in megabytes, that the Java process has available for running RAS.

- `CENTRAL_BROADCAST`

The IP address for Central to which RAS sends messages to let Central know that RAS is still running.

- `STUDIO_BROADCAST`

The IP address for Studio to which RAS and Central each sends messages to let Studio know that they are still running.

- `JAVA_HOME`

The home for the Java Runtime Environment (JRE) that Central uses. By default (which is used if you leave the value empty), the JRE home is `$ICONCLUDE_HOME/jre1.6`.

- `SCHEDULER_ACCOUNT`


An internal OO account (that is, a user account created within OO) that is used to run flows that are run automatically. By default, this is the "admin" account, which is automatically created in the course of installing Central. This value cannot be blank. If you specify a different account from "admin," then after installing Central, you must be sure to create the account that you specify, and provide the account with the capabilities and permissions necessary for running flows automatically.

- `SCHEDULER_PORT`

The port that the Scheduler feature in Central uses to communicate.

- `SCHEDULER_MAX_HEAP_SIZE`

The amount of RAM, in megabytes, that the Java process has available for running the Scheduler feature in Central.

-  **If you are upgrading**, the following parameters specify which upgrade the installation program will perform and where the existing version of Central is located:

- Change the value for `UPGRADE_PREVIOUS_VERSION` to "true".
- Change `PREVIOUS_ICONCLUDE_HOME=""` to include, between the quotation marks, the location of the previous installation from which you are upgrading.


Best practice is to specify the absolute path rather than the relative path. For example, if you are upgrading from 7.50 and that installation is in the `/home/htudor/Central-7.50` directory, you would provide the value:

```
/home/htudor/Central-7.50
```

- `OO_LANGUAGE="English"`

The language version of Central that is installed.

There are two possible values: "English" and "Japanese"

5.  **If you are upgrading**, stop the Central, RAS, and Scheduler services, using the following commands:

```
$> $ICONCLUDE_HOME/bin/Central.sh stop
$> $ICONCLUDE_HOME/bin/JRAS.sh stop
$> $ICONCLUDE_HOME/bin/Scheduler.sh stop
```


6. Run the script `./configure.sh`.

This script applies the configuration parameters to the appropriate files and either creates, recreates, or modifies the database schema (depending on whether you are performing a new installation or upgrading). It also produces `.iconcluderc`, a hidden file, in the current directory.


Note:  **If you are upgrading**, the prompts in the following two steps do not appear.

7. When prompted for the password for the database user for Central, type, and then (when prompted) retype the database user password.
8. When prompted to create a password for the iconclude user (the user specified in `install.config` in `ICONCLUDE_USER=<iconclude_user_name>`, as described above in this procedure), type, and then (when prompted) retype a password for the user.

The `configure.sh` does the following:

-  **If you are upgrading**, copies the following settings from the version you are upgrading to the 7.60 `install.config` file:

```
HTTP_PORT
HTTPS_PORT
DB_HOST
DB_PORT
DB_NAME
DB_USER
CONFIGURE_JRAS
JRAS_HOST
JRAS_PORT
JRAS_MAX_HEAP_SIZE
CENTRAL_BROADCAST
STUDIO_BROADCAST
SCHEDULER_ENABLED
SCHEDULER_HOST
SCHEDULER_PORT
SCHEDULER_PROTO
```


-  **If you are upgrading**, writes the following log file:

- `./configure.log`

If you are performing a new installation, also writes the following file:

- `./recreate-db.log`

9. Source the file `.iconcluderc`, and then verify that the environment variable `$ICONCLUDE_HOME` is properly set.

10.  **If you are upgrading**, you can follow the repository upgrade's progress by monitoring the `Central_wrapper.log` file, using the following command, which displays the `Central_wrapper.log` file as it is written during the repository upgrade.

```
tail -f Central_wrapper.log
```

When you see both of the following strings, which occur in the following order but in separate entries, the repository upgrade is complete:

```
Commit successful
```


.
.
.


done upgrading the repository to 7.60n

where n is a string of numbers.

OR

You can discover whether the repository upgrade has completed by attempting to connect to Central. You will not be able to connect to Central until the repository upgrade is complete.

- 11.  **If you are upgrading** and run flows on a RAS installed on a Windows machine:
 - c. Recompile any custom .NET-based IActions, using Microsoft Visual Studio 2005 SP1 and the HP OO 7.60 SDK dynamic-link libraries.
 - d. Copy any custom IActions, including any that you recompiled, to the location of the 7.60 RAS installation.

- 12.  **If you are upgrading**, open the upgraded Central.properties file in a text editor and copy into it any custom properties from your backup of the previous Central.properties file.

- 13. Use the following command to confirm that the Central service is started:

```
$> $ICONCLUDE_HOME/bin/Central.sh start
```

Note: the options for all the startup scripts are:

- console
Runs the program in console mode (non-daemon, has controlling tty).
- start
Starts as daemon.
- stop
Stops program.
- restart
Stops, then starts as daemon.
- status
Shows status and PID.
- dump
Sends a SIGQUIT to the java process, forcing it to do a thread dump.

- 14. Use the following command to confirm that the RAS service is started (optional):

```
$> $ICONCLUDE_HOME/bin/JRAS.sh start
```

The options for Central.sh and Scheduler.sh can also be used with this command.

- 15. If you wish to increase the capacity of the system:

- a. Increase the fd limit for the user under which Central runs, by adding the following two lines to the user's file /etc/security/limits.conf:

```
myuser soft nofile 65536
myuser hard nofile 65536
```

- b. Log in as "myuser" and check the value by issuing the ulimit -n command.

For instance, if the user is named "user1", add these two lines to the file /etc/security/limits.conf:

```
user1 soft nofile 65536
user1 hard nofile 65536
```

Then log into the box as user1 and check the value by issuing the "ulimit -n" command.

The following are useful log files to monitor:

- \$ICONCLUDE_HOME/Central/logs/Central_wrapper.log
- \$ICONCLUDE_HOME/RAS/Java/Default/webapp/logs/wrapper.log

Other useful locations are:

- \$ICONCLUDE_HOME/bin has symbolic links to startup files for Central and RAS.
- \$ICONCLUDE_HOME/conf has symbolic links to wrapper.conf files for Central and RAS.

To upgrade a standalone RAS installation, perform a normal standalone RAS installation. For the standalone RAS installation, see [Installing RAS on standalone servers](#).

Your current-version AD or Kerberos settings have migrated into 7.60.

Next, you install Studio. For the Studio installation procedure, see [Installing or upgrading Studio](#).

Installing or upgrading Studio

After you have installed Studio, in general, you should start and log in to a given instance of Studio as a single user, on a single computer. Make sure you understand the following discussion of this stricture:



Key information:

- **Do not** start multiple instances of Studio on the same computer, using multiple remote desktop programs from other computers, whether you log in as the same user or as different users. Doing so can result in data corruption and/or loss, or can cause unexpected behavior in Studio, including crashes.
- **Do not** connect to the public repository for the same installation of Central when logged in to two different instances of Studio as the same user. If you do, the user's workspace in the repository can become corrupted. This can also occur when Central is clustered.

Short version of installing or upgrading Studio



If you are upgrading, references in the following procedure to your current version of Studio refer only to Studio 7.20, 7.50, or 7.51. If you are upgrading from an earlier version of PAS or Repair System, see [Upgrade Path](#) for the upgrade path to follow.




If you are upgrading: If your old installation of Studio is the 32-bit version, the 64-bit version of Studio will be installed in the same location as the version from which you are upgrading. This does not cause any problems. Although you may have the impression that you installed the 32-bit version, the 64-bit version was in fact installed and will operate normally as a 64-bit version of Studio.

To install Studio (short version of installation)

1. Make sure that users who will author flows in Studio have full control permission for the OO home directory, recursively.

Without such permission, a user cannot start Studio.

By default, the OO home directory is ..\Program Files\Hewlett-Packard\Operations Orchestration\.

2.  **If you are upgrading:**
 - If you have not already exported the public repository and any local repositories, storing each export in a safe place, then do so now.
You will import the repositories later.
 - If you have not already uninstalled your current Studio, do so now.
 - Whether the installation of Studio that you are installing is on its own machine or is on the Central server, in the OO home directory, delete the contents of the Studio subdirectory.
3. To start the Studio Setup Wizard, navigate to and double-click the appropriate one of the following files:
 - **StudioInstaller-7.60.exe** for a 32-bit system
 - **StudioInstaller64-7.60.exe** for a 64-bit system
4. On the **Welcome** page, click **Next**.
5. On the **License Agreement** page, read the agreement, select **I accept the agreement**, and then click **Next**.

The **Select Destination Location** page appears, unless you have already installed Central on this machine or are upgrading.



If you are upgrading

OR

If you have already installed Central on this machine, the **Select Destination Location** page does not appear. Rather, Studio is automatically installed in the Studio subfolder of the OO home directory. If this is the case, skip the following step and resume this procedure where the **Language Selection** page appears.

6. On the **Select Destination Location** page, type the location where you want the Studio files installed.

OR

Click **Browse**, navigate to the location where you want Studio installed, and then click **Next**.

Important: If you install the OO Load Balancer, then in the following step, do not enter the URL for the Load Balancer in the **Host Name or IP Address** box. Enter the information for the actual Central server. Studio cannot access the Central server through the Load Balancer URL.

The **Language Selection** page appears.

7. On the **Language Selection** page, from the drop-down list, select either **English** or **Japanese**, and then click **Next**.

The **HP Operations Orchestration Information** page appears.

8. On the **HP Operations Orchestration Information** page, to specify the server on which the Web application is installed, type the server name in the text box beside **Host Name or IP Address**.

OR

If you are installing the Studio on the same machine on which the Web application is installed, leave **localhost** in the text box.

9. Make sure the HTTPS and HTTP port numbers match the HTTPS and HTTP port numbers, respectively, that the administrator specified when installing Central, and then click **Next**.

The **Select Additional Tasks** page appears.

10. To create a desktop icon for Studio, select the **Create a desktop icon** checkbox, and then click **Next**.

11. On the **Ready to Install** page, click **Install**.

After a few minutes, the **Completing the...Setup** page appears.

12. On the **Completing the...Setup** page, click **Finish**.

13. To test the installation, start Studio, logging in with the username (**admin**) and password that were created in the Central installation.

If you did not install Central, get the username and password from the person who did.

Full version of installing or upgrading Studio

To install Studio, you must be logged in with an account that is either a Power User or a local Administrator.

Important: The installation requires a port number for communications using the HTTPS protocol. This port number was specified during installation of the Central Web application. Before starting installation of Studio, obtain this port number from the person who installed Central.



If you are upgrading, references in the following procedure to your current version or installation of Studio refer only to Studio 7.20, 7.50, or 7.51. If you are upgrading from an earlier version of PAS or Repair System, see [Upgrade Path](#) for the upgrade path to follow.



If you are upgrading: If your old installation of Studio is the 32-bit version, the 64-bit version of Studio will be installed in the same location as the version from which you are upgrading. This does not cause any problems. Although you may have the impression that you installed the 32-bit version, the 64-bit version was in fact installed and will operate normally as a 64-bit version of Studio.

To install Studio (full version of installation)

1. Make sure that users who will author flows in Studio have full control permission for the OO home directory, recursively.

Without such permission, a user cannot start Studio.

By default, the OO home directory is `..\Program Files\Hewlett-Packard\Operations Orchestration\`.



2. **If you are upgrading:**

- If you have not already exported the public repository and any local repositories, storing each export in a safe place, then do so now.

You will import the repositories later.

- If you have not already uninstalled your current Studio, do so now.
- Whether the installation of Studio that you are installing is on its own machine or is on the Central server, in the OO home directory, delete the contents of the Studio subdirectory.

3. To start the Studio Setup Wizard, navigate to and double-click the appropriate one of the following files:

- **StudioInstaller-7.60.exe** for a 32-bit system
- **StudioInstaller64-7.60.exe** for a 64-bit system

4. On the **Welcome** page, click **Next**.

5. On the **License Agreement** page, accept the terms of the license agreement, and then click **Next**.

The **Select Destination Location** page appears, unless you have already installed Central on this machine or are upgrading Studio.



If you are upgrading

OR

If you have already installed Central on this machine, the **Select Destination Location** page does not appear. Rather, Studio is automatically installed in the Studio subfolder of the OO home directory. If this is the case, skip the following step and resume this procedure where the **Language Selection** page appears.

6. On the **Select Destination Location** page, type the location where you want the Studio files installed.

OR

Click **Browse**, navigate to the location where you want Studio installed, and then click **Next**.

Important: If you install Studio on a Windows Vista operating system, do not select **C:/Program Files** as the location. If you do, an error will prevent the installation from going further, and you will be prompted to change the installation location.

The **Language Selection** page appears.

7. On the **Language Selection** page, from the drop-down list, select either **English** or **Japanese**, and then click **Next**.

The **HP Operations Orchestration Information** page appears.

Setup - HP Operations Orchestration Studio

HP Operations Orchestration Information

HP Operations Orchestration Studio communicates with HP Operations Orchestration using HTTPS protocol and it needs the following information.

Please specify HP Operations Orchestration host information, then click Next. NOTE: This should be a specific Central node and not the OO LoadBalancer host information.

Host Name or IP Address:
localhost

HTTP Port Number (usually 80 or 8080):
8080

HTTPS Port Number (usually 443 or 8443):
8443

< Back Next > Cancel

Figure 6 – HP OO Information page

Important: If you install the OO Load Balancer, then in the following step, do not enter the URL for the Load Balancer in the **Host Name or IP Address** box. Enter the information for the actual Central server. Studio cannot access the Central server through the Load Balancer URL.

8. To specify the server on which the Web application is installed, type the server name in the text box beside **Host Name or IP Address**.

OR

If you are installing the Studio on the same machine on which the Web application is installed, leave **localhost** in the text box.

9. Make sure the HTTPS port number matches the HTTPS port number that the administrator specified when installing Central, and then click **Next**.
The **Select Additional Tasks** page appears.
10. To create a desktop icon for Studio, select the **Create a desktop icon** checkbox, and then click **Next**.
The **Ready to Install** page appears, displaying the location where Central will be installed and other information on the choices you have made.
11. To proceed, click **Install**.
OR
Click **Back** until you reach the installation wizard page on which you want to make changes, make your changes, and then return to this point in the installation.
The Setup Wizard tracks progress on the **Installing** page.
12. After the installation completes, on the **Completing the...Setup** page, click **Finish**.
13. To test the installation, start Studio, logging in with the username (**admin**) and password that were created in the Central installation.
If you did not install Central, get the username and password from the person who did.

Further installation testing

Testing the installation involves the following high-level steps. For information on performing the necessary tasks in Studio and Central, see Help for Studio and Help for Central.

1. After logging in to Studio, in the Library pane, open the **Library** folder and open some operations or flows in a folder such as **Accelerator Packs** or **Utility Operations**.
2. In your Web browser, access and log in to Central.
3. In Central, click the **Flow Library** tab, and, to preview a flow in the Library, open a folder in, say, **Accelerator Packs**, and click the flow name.

Note: Unless you can provide the information that a flow needs, you will not be able to run the flow to successful completion. For the reassurance of running a flow to success, you might try running a Health Check flow on the Central server (the server on which Central is installed). Health Check flows are in **Accelerator Packs\Operating Systems**, in the folder appropriate to the Central server's operating system. The Health Check flows are named **<operating_system> Health Check**. For the **host** input, type **localhost**.

Making OO available to users

For HP OO users to log in to Central or start Studio on their desktop:

- The Central Web server must be started.
- Central users need the URL and login information for the Central Web site.
- Studio users (authors) need the login information and, if Studio is not already installed on their machine, the installation files.

Before you provide users with the URL and login information for accessing the Central Web site or the installation file for Studio, make sure that client machines meet hardware and software requirements for Central or Studio, as described in the *OO System Requirements* document, *Sysreqs.pdf*, and requirements for any required software.

To deploy Central and Studio to users

1. To start the Web server that contains the Central Web application, make sure that the RSCentral Windows service is started.
2. Send each Central user the following:
 - The URL for the Central Web site.
This URL has the format:
`http://<servername>:<portnumber>/PAS/`
where <servername> is the name of the server on which the application is configured and <portnumber> is the port number that you specified when creating the application. By default, this port number is 8080 for HTTP or 8443 for HTTPS.
 - The administrator login credentials (user name and password) that you created when installing the Central Web application.
Each user must log in with these credentials until you add his or her HP OO user account or map the user's external user account to an internal HP OO group.
3. Send each Studio user (flow author) the following:
 - If you have not installed the author's copy of Studio, StudioInstaller.exe
 - The administrator login credentials (user name and password) that you created when installing the Central Web application
Each user must log in with these credentials until you add or map his or her user account to the OO ADMINISTRATOR or a group with the "Author" capability.



Best Practice: Mapping multiple users to the ADMINISTRATOR role should only take place on the development/testing/staging installation of Central. It is very important that in the production environment, there be only one Central user with ADMINISTRATOR capabilities.

Installing RAS on standalone servers

You can install a Remote Action Service (RAS) on a computer that is remote from the Central server. The RAS is enabled for running operations that need either the Java Runtime Environment (version 1.6) or the .NET framework.


Note: By default, the standalone RAS installation configures it to communicate over port 9004, which is also configured on the Central server for communicating with RAS.

Because RAS is installed as part of the Central install, this installation can only be done on machines on which Central has not been installed. This installation includes the installation of any HP OO content included in this release.

Upgrading RAS requires that you uninstall the previous version of RAS before installing the new version.

Installing or upgrading standalone RAS on Windows

Note that:

- When installed on Windows, RAS is enabled for both Java-based and .NET-based operations.
-  **Upgrading** RAS to 7.60 involves uninstalling your previous version of RAS and reinstalling using the 7.60 RAS installation program.

To install or upgrade the RAS server on a Windows operating system

1. Make sure that the server where you are going to install RAS:
 - Meets the system requirements for installing RAS. For the system requirements, see HP OO System Requirements (Sysreqs.pdf).
 - Does not have either RAS or Central installed.



If you are upgrading and Central or a RAS is installed on the server, uninstall it.

2. On the OO installation CD, in the RAS folder, copy the appropriate one of the two following RAS installation executable files to the machine on which you're going to install RAS.

- **RASInstaller-7.60.exe** for installing on 32-bit systems
- **RASInstaller64-7.60.exe** for installing on 64-bit systems

3. To start the installation program, double-click the appropriate file.

4. On the OO RAS Setup Wizard's **Welcome** page, click **Next**.

5. On the **License Agreement** page, read the agreement, click **I accept the agreement**, and then click **Next**.

The **Network Settings** page appears. On the page, the **Broadcast address** box shows a default IP address for OO to use to communicate with other machines.


6. In the **Broadcast Address** box, accept the default IP address, and then click **Next**.

OR

Type a different IP address, and then click **Next**.


If you are installing on a machine on which folders remain from a previous RAS installation, the Setup program informs you that it will install RAS using that folder structure, and that you will not be prompted for a destination location.

If there are not folders left over from an earlier installation, the **Select Destination Location** page appears.

7.  **If you are upgrading** and folders remain from an earlier installation, skip the next step.
8. To accept the default path for RAS, click **Next** (and skip the next step).

OR

To choose a new folder, click **Browse**, navigate to and select the folder, click **OK** to return to this page, and then click **Next** (and skip the next step).

9.  **If you are upgrading**, then when you are informed that folders remain from an earlier installation and the Setup program will install RAS using the existing directory, click **Next**.

The **Select Start Menu Folder** page prompts you to create or select the folder to hold the RAS program's shortcuts.

10. To accept the default folder, click **Next**.

OR

To choose a new folder, click **Browse**, navigate to and select the folder, click **OK** to return to this page, and then click **Next**.

The **Ready to Install** page appears, displaying the location where RAS will be installed and other information on the choices you have made.

11. To proceed, click **Install**.

The installation program tracks progress on the installation progress page.


12. When the installation completes, click **Finish**.

Installing or upgrading standalone RAS on Linux or Solaris

With the exceptions noted in the following procedure, installing or upgrading RAS standalone is the same on a Linux system or a Solaris system.

Note: When installed on Linux or Solaris, RAS is enabled only for Java-based operations.

To install a standalone RAS on a Linux or Solaris operating system

1. Make sure that the server where you are going to install RAS:
 - Meets the system requirements for installing RAS. For the system requirements, see HP OO System Requirements (Sysreqs.pdf).
 - Does not have either RAS (JRAS or NRAS) or Central installed.
Note: RAS is installed as part of Central. A standalone RAS must be installed on a different machine from the Central server (the machine on which Central is installed).
2.  **If you are upgrading** and RAS is already installed, stop the RAS service, using the following command:

```
$> $ICONCLUDE_HOME/bin/JRAS.sh stop
```
3. On the OO CD, in the RAS folder, locate the appropriate one of the following RAS installation zip files:
 - **RAS-7.60-linux.zip** for installing on 32-bit Linux systems
 - **RAS-7.60-linux64.zip** for installing on 64-bit Linux systems
 - **RAS-7.60-solaris-32.zip** for installing on 32-bit Solaris systems
4. Copy the file to the directory within which you want the installation to create the RAS home directory.
5. Unzip the file.
In the directory where the zip file resides, unzipping the file by default creates a subdirectory named RAS-7.60, which will be the RAS home directory (\$ICONCLUDE_JRAS_HOME).
To unzip to a different location, add -d and an existing directory name to the unzip command.
6. Open the new RAS home directory.
Note: This package includes Java Runtime Environment (JRE), version 1.6.
7. Edit the install.config file and change the parameter values to fit your environment.
 - **For a Linux system**, the install.config contains the following parameters.

Parameter	Description
<code>ICONCLUDE_USER</code>	The user account under which RAS runs. If you leave this blank, RAS runs under the ICONCLUDE user used by Central.
<code>JRAS_PORT</code>	The port that RAS uses to communicate.
<code>CENTRAL_BROADCAST</code>	The IP address of Central to which RAS sends signals so that Central knows that this RAS installation is still running.
<code>STUDIO_BROADCAST</code>	The IP address of Studio to which RAS sends signals so that Studio knows that this RAS installation is still running.
<code>JAVA_HOME</code>	The home directory for Java. If you do not specify a location, the default home directory

Parameter	Description
	for Java is the jre1.6 subdirectory of the Central home directory (\$ICONCLUDE_HOME/jre1.6).
MAX_HEAP_SIZE	The amount of memory that the Java process makes available for RAS.

- For a Solaris system, the install.config contains the following parameters.

Parameter	Description
ICONCLUDE_USER	The user account under which RAS runs. If you leave this blank, RAS runs under the ICONCLUDE user used by Central.
JRAS_PORT	The port that RAS uses to communicate.
JAVA_HOME	The home directory for Java. If you do not specify a location, the default home directory for Java is the jre1.6 subdirectory of the Central home directory (\$ICONCLUDE_HOME/jre1.6).
MAX_HEAP_SIZE	The amount of memory that the Java process makes available for RAS.

8. Run the script ./configure.sh in this directory.

This script:

- Applies the configuration parameters to the appropriate files.
 - Creates a hidden file called .iconcluderc in the current directory.
 - Writes the ./configure.log file.
 - Starts the JRAS service.
9. Source the file .iconcluderc and then open it to verify that the environment variable \$ICONCLUDE_JRAS_HOME is properly set.
Note that .iconcluderc is a hidden file.

10. Start the service:

```
$> $ICONCLUDE_JRAS_HOME/bin/JRAS.sh start
```

Or, if you are in the \$ICONCLUDE_JRAS_HOME directory,

```
$> ./bin/JRAS.sh start
```

Note: The options for all the startup scripts are:

- console
Runs the program in console mode (non-daemon, has controlling tty).
- start
Starts as daemon.
- stop
Stops program.
- restart

Stops, then starts as daemon.

- `Run` (Solaris RAS service only)
Runs the program in console mode.
- `status`
Show status and PID.
- `check` (Solaris RAS service only)
Prints all of the configuration parameters.
- `supervise` (Solaris RAS service only)
Runs the program in console mode with additional debugging information.
- `dump`
Sends a SIGQUIT to the java process, forcing it to do a thread dump.

11. If you wish to increase the capacity of the system:

- a. Increase the fd limit for the user under which JRAS runs, by adding the following two lines to the user's file `/etc/security/limits.conf`:

```
myuser soft nofile 65536
```

```
myuser hard nofile 65536
```

- b. Log in as "iconclude" and check the value by issuing the `ulimit -n` command.

The following are useful log files to monitor:

- `$ICONCLUDE_JRAS_HOME/jetty/extras/linux/iConclude.log`
- `$ICONCLUDE_JRAS_HOME/jetty/extras/linux/wrapper.log`
- `$ICONCLUDE_JRAS_HOME/RAS/Java/Default/webapp/logs/wrapper.log`
- `$ICONCLUDE_JRAS_HOME/RAS/Java/Default/webapp/logs/iConcludeJRAS.log`

Other useful locations are:

- `$ICONCLUDE_JRAS_HOME/SDK` contains files supporting RAS development.
- `$ICONCLUDE_JRAS_HOME/bin` has symbolic links to the startup file
- `$ICONCLUDE_JRAS_HOME/conf` has symbolic links to the `wrapper.conf` file

Accessing your standalone RAS from Studio

To obtain access to the RAS interface within Studio

- Open Studio and configure a RAS reference.
For information on configuring a RAS reference, see Help for Studio.

Uninstalling OO programs

Before uninstalling OO programs, be sure to back up your installation and repository. For information on backing up HP Central and Studio, see the *OO Administrator's Guide* (AdminGuide.pdf).

When you remove OO Central, the RAS is also uninstalled. If you have a standalone RAS, you must uninstall it.

Note: It is recommended that, before uninstalling Central and RAS, you manually stop the OO Windows services (RSCentral, RSJRAS, and RSScheduler). The uninstall programs try to shut down the OO Windows services, but if the system is in heavy use when you uninstall, they may not be able to shut the services down and so may leave files and directories remaining after the

uninstallation has finished. If this happens, you can manually delete the files. However, you can also facilitate a clean uninstallation by manually stopping the OO services before uninstalling.

To uninstall Studio

1. Make sure Studio is shut down.
2. Open **Control Panel**, then **Add/Remove Programs**.
3. Scroll down to and highlight **HP Operations Orchestration Studio 7.60**, and then click **Remove**.
4. When you are prompted to confirm whether you want to remove Studio and its components, click **Yes**.

The **Uninstall Status** box appears, in which progress of the removal is tracked on a progress bar.

When Studio is completely removed, a message box appears, telling you so.

If you have relevant directories open, the message box might tell you that some components could not be removed. This is not significant.

5. Click **OK**.

To uninstall Central

1. Close any open instances of the Central web application.
2. Open **Control Panel**, then **Add/Remove Programs**.
3. Scroll down to and highlight **HP Operations Orchestration Central 7.60**, and then click **Remove**.
4. When you are prompted to confirm whether you want to remove Central and its components, click **Yes**.

The **Uninstall Status** box appears, in which progress of the removal is tracked on a progress bar.

When Central is completely removed, a message box appears, telling you so.

To uninstall a standalone RAS

1. Open **Control Panel**, then **Add/Remove Programs**.
2. Scroll down to and highlight **HP Operations Orchestration RAS 7.60**, and then click **Remove**.
3. When you are prompted to confirm whether you want to remove Central and its components, click **Yes**.

The **Uninstall Status** box appears, in which progress of the removal is tracked on a progress bar.

When the RAS is completely removed, a message box appears, telling you so.

Troubleshooting

Users get "There is a problem with this website's security certificate" error when they access the URL for the OO Central web application.

This occurs because OO includes, by default, an unsigned certificate that serves as a placeholder for a valid customer-obtained certificate. You can create your own security certificate or, if you choose not to create one, you can safely ignore the warning.

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