



**Hewlett Packard**  
Enterprise

# Operations Orchestration

Software Version: 10.70

Windows and Linux Operating Systems

# Administration Guide

Document Release Date: November 2016

Software Release Date: November 2016

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# Administering HPE OO

This document is for the HPE OO system administrator and deals with advanced configuration tasks that take place externally from the Central UI.

For administrative tasks that are performed in the Central UI, see the *HPE OO Central User Guide*. For example, for instructions on how to set up the system configuration under the Central **System Configuration** tab.

# Initial Administration Tasks

This section includes administration tasks that you will generally perform once, while setting up HPE OO after installation.

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## Configuring and Enabling Authentication

After installing HPE OO, you must configure the authentication mechanism and enable authentication.

### Configuring Authentication

Select the authentication mechanism to be used in OO, for example, LDAP, SSO, internal users, etc.

For more information on how to configure the authentication mechanism, see "Setting up the System Configuration" in the *HPE OO Central User Guide*.

## Enable Authentication

This is done in Central by marking the **Enable Authentication** check box.

**Note:** The **Enable Authentication** check box is only available if there are existing internal or LDAP users with permission to disable the authentication in the future.

For information about how to enable authentication, see "Enabling Authentication" in the *HPE OO Central User Guide*.

## Setting the System Locale in central-wrapper.conf

If your HPE OO system is localized, you will need to set the properties to reflect the system locale, in the **central-wrapper.conf** file.

1. Open the **central-wrapper.conf** file in a text editor (located under **<installation\_folder>/central/conf**).
2. Edit the following properties:

```
set.LANG=  
set.LC_ALL=  
set.LANGUAGE=  
wrapper.java.additional.<x>=-Duser.language=  
wrapper.java.additional.<x>=-Duser.country=
```

For example, for Japanese:

```
set.LANG=ja_JP  
set.LC_ALL=ja_JP
```

3. Save the **central-wrapper.conf** file.


# Managing HPE OO Licenses

When HPE OO is first installed, this installs the Trial version license. You will need to install an Enterprise Edition license within 90 days.

HPE OO offers the following options for licensing:

- **HPE OO Enterprise Edition Trial:** A temporary license that runs for 90 days, and includes all out-of-the-box content packs. After the trial license is expired, you will need to purchase the HPE OO Enterprise Edition license to use the content packs. This is the default license that comes with the HPE OO installer.
- **HPE OO Enterprise Edition:** A full license, unlimited in time, which includes all out-of-the-box content packs. This license unlocks the HPE OO Community Edition and HPE OO Enterprise Edition Trial licenses.
- **HPE OO Community Edition:** A partial license, which includes the Base content pack and the CE content packs, and enables 500 runs per month.

## Viewing License Information

You can view the license information by clicking the **Info**  button in the top right corner in Central, to display the **About** popup window. This window displays the current status of the license: if the license is limited in time or number of runs, it shows how much is left.




**About HPE Operations Orchestration**×

**OPERATIONS ORCHESTRATION**

**Version:**  
10.70 - Trial Edition

**Build Number:**  
1368

**Licensing:**  
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## Installing a New License

To install a new license, go to the Central **License** tab under **System Configuration > System Settings**.

For more information about setting up the license, see "Setting Up the System Settings - Licensing" in the *Central User Guide*.

## Purchasing a License

### Option 1

Download the license from the HPE OO web site at:

<http://enterpriselicense.hpe.com/redirector/home>

Alternatively, you can go to:

<https://h30580.www3.HPE.COM/poeticWeb/portalintegration/hppWelcome.htm>

After logging in, enter the EON (Entitlement Order Number) in the Welcome page to see your license.

### Option 2

Issue a license using the HPE License Management system:

- For a standalone Central installation, issue the license with the IP address of the Central server.
- If you have CSA and HPE OO installed on the same machine, issue one license for that IP address.
- If you have CSA and HPE OO installed on separate machines, issue two licenses for the two IP addresses.
- For a cluster, choose one of the nodes and issue a license for the IP address of this node.

**Note:** Make sure to open the Central UI of the selected node (and not via the Load Balancer IP) when you install the license.

- If you have CSA and an HPE OO cluster, issue two licenses: one for CSA and one for a selected node.

**Note:** Make sure to open the Central UI of the selected node (and not via the Load Balancer IP) when you install the license for HPE OO.

For more information about licensing details, contact your HPE Sales team or HPE Account Manager.

## Licensing a Cluster

For a cluster, make sure that you issue the license on one of the cluster IPs (and not on the load balancer IP). Apply it directly on the specific node. This sets the license for the entire cluster.

## Change the MS SQL Collation Language or the central-wrapper.conf Language for Content

When HPE OO Central was installed, there was an option to select a supported language in addition to English. This language is used as the MS SQL collation language, if relevant, and for content. This language support is required if, for example, you need to ping a server that is configured in Japanese. You can change this language by editing the **central-wrapper.conf** file.

1. Open the **central-wrapper.conf** file in a text editor (located under **<installation\_folder>/central/conf**).

2. Edit the language property. For example, change `wrapper.lang=en_US` to `wrapper.lang=ja_JP`.
3. Save the **central-wrapper.conf** file.

For more information about selecting the MS SQL Server database collation language, see "Language Support" in the *Operations Orchestration Database Guide*.

## Adjusting the Logging Levels

Because logging activity can slow the performance of HPE OO and create very large log files, it is important for HPE OO to run with appropriate logging levels. The default logging level is set to INFO. This level provides the necessary information without impacting performance.

In addition, you can adjust the granularity of the information in the log, separately for regular logging, deployment, and execution.

The granularity options are:

- INFO - Default logging information
- DEBUG - More logging information
- WARN - Less logging information
- ERROR - Less logging information

To adjust the granularity in the logging:

1. Open the **log4j.properties** file (under `/<installation_folder>/central/conf/log4j.properties`).

Replace INFO with DEBUG, WARN or ERROR in the relevant places in the **log4j.properties** file.

For example:

```
log.level=INFO
execution.log.level=DEBUG
deployment.log.level=DEBUG
```

**Note:** The Tomcat server keeps access logs under `/<installation_folder>/central/var/logs`. To prevent these log files from growing in size, it is recommended that you monitor the size of the files named **localhost\_access\_log.yyyy-mm-dd.txt**, and delete old files as necessary. Use established best practices for your operating system, whether Windows or Linux.

For example, to delete files older than 10 days:

### Unix

```
find <OO_HOME>/central/var/logs/ -name " localhost_access*.txt"
-type f -mtime +10 -exec rm -f {} \;
```

### Windows

```
C:\Users\Administrator>forfiles /p "<OO_HOME>\central\var\logs" /s /m
localhost_access*.txt /d -10 /c "cmd /c del @PATH"
```

where <OO\_HOME> refers to the location of the HPE OO installation folder

You can set this up using a schedule in HPE OO or use Cron or Windows Scheduler to run these commands the background.

## Configuring LWSSO Settings

When you install HPE OO10.10 or later, if you choose to upgrade the LWSSO settings from version 9.x, these LWSSO settings will be migrated, but LWSSO will be disabled in HPE OO 10.x, even if it was previously enabled in version 9.x.

When you enable LWSSO afterward, you may receive warnings under certain scenarios. To clear the warnings from the log, follow the steps below to set the management URL property using the fully qualified domain name.

### Central and RAS Installed on the Same Machine

When Central and a RAS are installed on the same machine, and the LWSSO settings are enabled, you must set the management URL property using the fully qualified domain name.

1. Stop the RAS process.
2. In the **ras/conf/ras-wrapper.conf** file, change

```
wrapper.java.additional.<x>=-Dmgmt.url=<protocol>://localhost:<port>/oo
```

to

```
wrapper.java.additional.<x>=-
Dmgmt.url=<protocol>://<FullyQualifiedDomainName>:<port>/oo
```

3. Start the RAS process.

### RAS Installed on a Different Machine

When the RAS is installed on a different machine from the Central and LWSSO settings are enabled, you must specify the management URL of the Central with the fully qualified domain name during the RAS installation, instead of the IP address.

### Connecting Another Application to Central Through LWSSO

When connecting another application to Central through LWSSO, you must specify the management URL of the Central with the fully qualified domain name.

1. Stop the Central process.
2. In the **central/conf/central-wrapper.conf** file, change

```
wrapper.java.additional.<x>=-Dmgmt.url=<protocol>://localhost:<port>/oo
```

to

```
wrapper.java.additional.<x>=-  
Dmgmt.url=<protocol>://<FullyQualifiedDomainName>:<port>/oo
```

3. Start the Central process.

For information about setting up LWSSO in Central, see "Setting Up Security – LWSSO" in the Operations Orchestration *Central User Guide*.

## Changing the Service Name and Description

If you want to change the service name and description from the default values, you can edit these in the **central-wrapper.conf** file.

**Note:** This procedure can be applied to a RAS as well. Just replace the word "Central" with "RAS". For example, use **ras-wrapper.conf**, **ras\conf**, and so on.

1. Stop the Central service.
2. Navigate to the **central\bin** directory. The default is **C:\Program Files\Hewlett-Packard Enterprise\HPE Operations Orchestration**.
3. Run **uninstall-central-service.bat**.
4. Verify that the service is uninstalled.
5. Navigate to the **central\conf** directory.
6. Make a copy of the **central-wrapper.conf** file.

**Note:** This step is an optional step used for saving the original configuration, so that you have a backup if a rollback is required or if the modified file becomes unusable in any way.

7. Edit the **central-wrapper.conf** file, by modifying the following lines to suit your needs:

`wrapper.name`

`wrapper.displayname`

`wrapper.description`

For example:

```
# Name of the service
wrapper.name=HPE00Central

# Display name of the service
wrapper.displayname=HPE Operations Orchestration Central

# Description of the service
wrapper.description=HPE OO Central is the run time environment of HPE OO. It
is used for running flows, monitoring the various runs, and generating
reports.
```

8. Run **install-central-as-service.bat**.
9. Verify that the service is installed with the new names and description.
10. Start the new Central service.

## Changing the Timeout Limit for the HPE OOWeb Interface

You can change the default session timeout (30 minutes) of the Central server by configuring the **tomcat web.xml** file.

1. Open the **<installation\_folder>/central/tomcat/conf/web.xml** file with any XML editor.
2. Search for the following:

```

<!-- ===== Default Session Configuration ===== -->
<!-- You can set the default session timeout (in minutes) for all newly -->
<!-- created sessions by modifying the value below. -->

<session-config>
  <session-timeout>30</session-timeout>
</session-config>

```

3. Change the **session-timeout** value (in minutes).
4. Restart the Central server.

## Scheduling Database Purging

In order to keep the HPE OO database size under control, it is important to schedule database purging operations from day one.

## Purging Flows

The purging flows are available in the **HPE Solutions** content pack (available on HPE Live Network at <https://hpln.hpe.com/product/operations-orchestration/content>). It is recommended to deploy this content pack, configure the flows with your required settings, and schedule them in Central.

The following purging flows are located under **Library > Integrations > Hewlett-Packard Enterprise > Operations Orchestration > 10.x > Database**:

- **Purge Execution Summary** - Purges run data.  
It is recommended to schedule this flow as soon as you start to run flows.
- **Purge Debug Events** - Purges Studio Remote Debugger event data.  
If you use the Studio Remote Debugger, schedule this flow.
- **Purge Audit Records** - Purges old auditing records if auditing is enabled.  
If you have enabled security auditing, schedule this flow.
- **Purge Rerun Info** - Purges rerun data.  
If you have defined rerun points in your flows, schedule this flow.

For more information about these purging flows, see the flow descriptions in Central.

## Purging APIs

As an alternative to using the purging flows, you can perform purging functions via API.

The following APIs are available:

- **DELETE /audit/records:** Purges old auditing records if auditing is enabled.
- **DELETE /debugger-events:** Purges Studio Remote Debugger event data.
- **DELETE /executions:** Purges run data such as bound inputs, outputs and step log events. This run data needs to be purged regularly, because running large numbers of runs can cause the database to reach the maximum table size.

**Note:** This only affects the data of completed runs.

- **DELETE/executions/rerun:** Purges the rerun data from the database.
- **DELETE /steps-log:** Purges step data according to time and number of executions to purge.

By using the purge APIs, you can purge the data manually as required, or by scheduling recurrent flows that incorporate these APIs.

For more information about purging APIs, see the Operations Orchestration *API Guide*.

For more information about purge operations, see the Operations Orchestration *Database Guide*.



# Recurring Administration Tasks

This section includes administration tasks that you may need to perform periodically or in response to a situation that occurs.

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## Encrypting and Obfuscating Passwords

You can encrypt or obfuscate a password using the `encrypt-password` script, which is located in `<installation_folder>/central/bin`.

Our recommendation is to use encryption.

**Important!** After using the `encrypt-password` script, clear the command history.

This is because, on a Linux OS, the password parameter will be stored in cleartext under `/$USER/.bash_history` and accessible by the `history` command.

## Encrypting Passwords

1. Locate the encrypt-password script, in **<installation\_folder>/central/bin**.
2. Run the script with the **-e -p <password>** option, where password is the password you want to encrypt.

**Note:** You can either use **-p** as the flag to encrypt the password or **--password**.

The encrypted password should appear as follows:

```
{ENCRYPTED}<some_chars>.
```

## Obfuscating Passwords

1. Locate the encrypt-password script, in **<installation\_folder>/central/bin**.
2. Run the script with the **-o <password>** option, where password is the password that you want to obfuscate.

The obfuscated password should appear as follows:

```
{OBFUSCATED}<some_chars>.
```

## Creating a Prompt for the Password

It is recommended to run the encrypt-password script without providing the **-p** argument. For example:

```
C:\Program Files\Hewlett-Packard\HP Operations Orchestration\central\bin>encrypt-password.bat
Password <typing will be hidden>:
Confirm password <typing will be hidden>:
{ENCRYPTED}gAkPCLQsYDhoR1Y2q9BjCQ==
C:\Program Files\Hewlett-Packard\HP Operations Orchestration\central\bin>
```

This will create a prompt for the hidden password inputs.

## Changing the Database Password

1. If Central is up and running, stop the Central Service.
2. Run the encrypt-password script with the `--password <password>` option, where `<password>` is the database password.

**Note:** You can either use `-p` as the flag to encrypt the password or `--password`.

For example:

```
<install-dir>/central/bin/encrypt-password --password <plain-text-pass>
```

3. Copy the result. It should appear as follows:

```
${ENCRYPTED}<some_chars>.
```

4. Go to the folder `<installation_folder>/central/conf`, and open the `database.properties` file.

Change the `db.password` value to the one that you copied. In a cluster, make sure to do this on each node.

**Note:** The password is stored encrypted, so make sure you include the `{ENCRYPTED}` prefix. The `=` character needs to be escaped. For eg, `db.password=GFDGDS12\=\=`.

## Changing the Database IP

This section is relevant when you need to configure HPE OO to work with another database instance. All the database parameters, such as database credentials, schema name, tables, and so on, should be identical.

1. Edit the file `<installation_folder>/central/conf/database.properties`.
2. Look for the `jdbc.url` parameter. For example:

```
jdbc.url=jdbc\:jtds\:sqlserver\://16.60.185.109\:1433/schemaName;sendStringParametersAsUnicode\=true
```

3. Change the IP address\FQDN of the database server.
4. Save the file.
5. Restart Central.

# Changing the Hostname/IP of Central or RAS

## If the Central hostname or IP has changed:

If the hostname/IP has changed in a Central, you will need to manually update this hostname/IP address in a number of places.

1. Edit the file **<installation\_folder>/central/conf/central-wrapper.conf**.
2. Look for the `-Dmgmt.url` parameter and update it with the correct hostname or IP address. For example:

```
-Dmgmt.url=http://[machine_name or IP]:8080/oo
```

3. Update the same `-Dmgmt.url` parameter in the file **<installation\_folder>/ras/conf/ras-wrapper.conf**.

You need to perform this step for each RAS that communicates with the Central.

4. If you are using a Central certificate, generate a new Central certificate with the new FQDN.

It is not recommended to use the IP.

You will also need to replace the certificate in the Central keystore. See "Replacing the Central TLS Server Certificate" in the *HPE OO Security and Hardening Guide*.

5. If there is a load balancer link configured, update this link in Central.

### External URL

URL:

`https://my.server.com:443/oo`

URL of the load balancer, reverse proxy, or DNS load balancer

For more information, see "Setting Up the System Settings - General Settings" in the *Central User Guide*.

6. Restart Central and all affected RASes.
7. If you have configured a remote debugging session that uses the Central hostname or IP address, you will need to modify the connection URL accordingly in Studio.

For more information, see "Debugging a Remote Central with Studio" in the *Studio Authoring Guide*.

#### If the RAS IP has changed:

If the RAS IP is changed, this change affects the presentation in the Central URL, under **System Configuration > Topology > Workers**.

- If the RAS is a "reverse RAS", it will become disabled in the **Topology > Workers** tab. You need to edit the row, and replace the previous IP with the new one.
- If the RAS is a "standard RAS", the change will not affect functionality, because it is the RAS that connects to the Central.

For more information, see "Setting Up Topology – Workers and RASes" in the *Central User Guide*.

## Adjusting the Timing of Quartz Jobs

In the HPE OO system, quartz jobs run periodically for maintenance of the system.

Each job runs for a set amount of time, and is repeated at set intervals. The following are examples of job triggers:

Trigger Name	Current Repeat Interval	What Happens
<b>onRolling:OO_EXECUTION_STATES_Trigger</b>	4.5 minutes	Rolling the state tables for purging
<b>queueCleanerTrigger</b>	1 minute	Purging the queue tables
<b>queueRecoveryTrigger</b>	2 minutes	Checks if the system needs recovery
<b>recoveryVersionTrigger</b>	0.5 minute	Version counter to be used for the recovery
<b>splitJoinTrigger</b>	1 second	Joins finished splits
<b>onRolling:OO_EXECUTION_EVENTS_Trigger</b>	12 hours	Rolling the events table for purging
<b>Note:</b> This trigger is deprecated.		

If you want to tweak these job timings in order to improve performance, perform the following:

**Note:** Any change to the timings can have a major effect on the system. Consult with your HPE service representative before making any changes to these triggers.

1. Open the **OO** tab. Under **MBeans**, there is an operation named **jobTriggersMBean**.
2. Use this operation, and enter the values on the right tab, using the name of the trigger you want to change. Use the exact same name as the table, with a new value for the repeat interval.

This changes the triggering times of the job.

**Note:** The events persistency mechanism is deprecated (see **onRolling:OO\_EXECUTION\_EVENTS\_Trigger**). You can configure this job if you use the Remote Debugger.

## Changing the URL of a Central/Load Balancer on the RAS Side

While the best practice is to configure the URL of a Central/load balancer via the installer, if you need to make changes to the URL after the RAS was already installed, you can do this by editing the **ras-wrapper.conf** file.

For example, this would be needed if you installed a RAS against a Central/load balancer and the Central/load balancer's FQDN changed. You will need to change Central/load balancer's URL stored at the RAS level, so that the RAS is able to communicate again with the Central/load balancer.

1. Stop the RAS.
2. Open the **ras-wrapper.conf** file, located under **<installation folder>/ras/conf**.
3. Edit the URL in the following line:

```
wrapper.java.additional.<x>=-Dmgmt.url=<http or https>://<FQDN>:<port>/oo
```

4. Restart the RAS.

# Backing Up HPE OO

## Backing Up

Back up the entire content of the `<installation_folder>central\var\security` folder and the `<installation_folder>central\conf\database.properties` file.

## Recovery

1. Install a new Central with an existing schema. The installation will fail on the **Start Central** step.
2. Stop the Central service and verify that Central is not running.
3. Open the `central/var/security` folder.
4. Delete the `credentials.store` file, if it exists.
5. Override the `encryption_repository` and `encryption.properties` files with the backed up versions.
6. Override the `central/conf/database.properties` file with the backed up file.
7. Start the Central service.

# Setting up Disaster Recovery

## Planning for Disaster Recovery

To enable disaster recovery, create a secondary datacenter by replicating the following:

- Database configuration
- Schema

- HPE OO configuration and security files: `<installation_folder>\central\var\security` and `<installation_folder>\central\conf`

The replication can be ongoing, using whatever means you choose, for example, disk replication or database replication.

## Performing Disaster Recovery

HPE OO supports cold disaster recovery, which requires a manual process to switch over from the primary datacenter to the secondary datacenter. This may be required in the case of a full or partial failure in the primary datacenter.

1. Restore the HPE OO server(s) by reinstalling all nodes (Central and RAS). Use the database configuration, schema, and HPE OO configuration and security files that you replicated for the secondary datacenter.

**Note:** You can configure the database (by editing the **database.properties** file). See the *HPE OO Security and Hardening Guide* for more information about configuring the database connection details.

2. Delete the old worker nodes in the database, which no longer exist.
3. Turn off HPE OO in the primary datacenter.
4. Switch over to the secondary datacenter.

## System Tuning

If you encounter a performance issue on your HPE OO system, we recommend using the *HPE OO Monitoring Guide* to verify the possible root-cause of the performance issue you have encountered.

In addition, you can configure one or more of the following parameters for each Central node. The JVM and worker threads are also applicable to each RAS node.

**Note:** Changing any of the parameters below requires a restart of the configured node.

- **JVM heap size** - You can increase the initial and maximum size of the Central/RAS heap by configuring the **central-wrapper.conf** and **ras-wrapper.conf** files (located under `<installation_folder>/<central or ras>/conf/`).



```
wrapper.java.initmemory=<value in MB>
```

```
wrapper.java.maxmemory=<value in MB>
```

We recommend configuring Central to 4GB and RAS to 2GB.

- **Worker threads** - By default, each node has 20 worker threads. If your flows have a large number of parallel or multi-instance lanes, we recommend gradually increasing this number, over several iterations.

You can configure the number of worker threads in the **central-wrapper.conf** and **ras-wrapper.conf** files (located under **<installation\_folder>/<central or ras>/conf/**).

Open the file and edit the `-Dcloudslang.worker.numberOfExecutionThreads` property.

This is a new property, which was not supported in versions earlier than 10.22. Therefore, it should be added, if it doesn't exist, as follows:

```
wrapper.java.additional.<next available number>=
```

```
-Dcloudslang.worker.numberOfExecutionThreads=<new value>
```

- **Database connections** - You can increase the number of database connections in the **database.properties** file (located under **<installation\_folder>/central/conf/**).

Edit the `db.pool.maxPoolSize` property. We recommend changing it to 100 connections.

For more information about system tuning, see the *HPE OO Tuning Guide*.

## Database Maintenance

Database maintenance is important in order to maintain the efficiency and throughput of HPE OO.

For detailed information on database housekeeping (index rebuilding, table statistics updated, and so on ), see the *HPE OO Database Guide*.

