

HP Operations Orchestration

Software Version: 10.51

Windows and Linux Operating Systems

Administration Guide

Document Release Date: December 2015
Software Release Date: December 2015



Legal Notices

Warranty

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

The information contained herein is subject to change without notice.

Restricted Rights Legend

Confidential computer software. Valid license from HP required for possession, use or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

Copyright Notice

© Copyright 2015 Hewlett Packard Enterprise Development LP

Trademark Notices

Adobe™ is a trademark of Adobe Systems Incorporated.

Microsoft® and Windows® are U.S. registered trademarks of Microsoft Corporation.

UNIX® is a registered trademark of The Open Group.

This product includes an interface of the 'zlib' general purpose compression library, which is Copyright © 1995-2002 Jean-loup Gailly and Mark Adler.

Documentation Updates

The title page of this document contains the following identifying information:

- Software Version number, which indicates the software version.
- Document Release Date, which changes each time the document is updated.
- Software Release Date, which indicates the release date of this version of the software.

To check for recent updates or to verify that you are using the most recent edition of a document, go to: **<https://softwaresupport.hp.com>**

This site requires that you register for an HP Passport and sign in. To register for an HP Passport ID, go to: **<https://hpp12.passport.hp.com/hppcf/createuser.do>**

Or click the **the Register** link at the top of the HP Software Support page.

You will also receive updated or new editions if you subscribe to the appropriate product support service. Contact your HP sales representative for details.

Support

Visit the HP Software Support Online web site at: <https://softwaresupport.hp.com>

This web site provides contact information and details about the products, services, and support that HP Software offers.

HP Software online support provides customer self-solve capabilities. It provides a fast and efficient way to access interactive technical support tools needed to manage your business. As a valued support customer, you can benefit by using the support web site to:

- Search for knowledge documents of interest
- Submit and track support cases and enhancement requests
- Download software patches
- Manage support contracts
- Look up HP support contacts
- Review information about available services
- Enter into discussions with other software customers
- Research and register for software training

Most of the support areas require that you register as an HP Passport user and sign in. Many also require a support contract. To register for an HP Passport ID, go to:

<https://hpp12.passport.hp.com/hppcf/createuser.do>

To find more information about access levels, go to:

<https://softwaresupport.hp.com/web/softwaresupport/access-levels>

HP Software Solutions Now accesses the HPSW Solution and Integration Portal Web site. This site enables you to explore HP Product Solutions to meet your business needs, includes a full list of Integrations between HP Products, as well as a listing of ITIL Processes. The URL for this Web site is <http://h20230.www2.hp.com/sc/solutions/index.jsp>

Contents

Legal Notices	2
Warranty	2
Restricted Rights Legend	2
Copyright Notice	2
Trademark Notices	2
Documentation Updates	3
Support	4
Administrating HP OO	7
Initial Administration Tasks	7
Setting the System Locale in central-wrapper.conf	7
Change the MS SQL Collation Language or the central-wrapper.conf Language for Content	8
Adjusting the Logging Levels	8
Configuring LWSSO Settings	9
Changing the Service Name and Description	10
Changing the Timeout Limit for the HP OO Web Interface	11
Scheduling Database Purging	11
Purging Flows	12
Purging APIs	12
Recurring Administration Tasks	13
Encrypting and Obfuscating Passwords	13
Changing the Database Password	14
Changing the Database IP	15
Changing the Hostname/IP of Central or RAS	15
Adjusting the Timing of Quartz Jobs	16
Changing the URL of a Central/Load Balancer on the RAS Side	17
Backing Up HP OO	18
Backing Up	18
Recovery	18

Setting up Disaster Recovery	18
Planning for Disaster Recovery	18
Performing Disaster Recovery	19
System Tuning	19
Database Maintenance	20

Administering HP OO

This section is for the HP 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 *HP OO Central User Guide*.

For example, for instructions on how to set up the system configuration under the Central **System Configuration** tab, see the *HP OO Central User Guide*.

Initial Administration Tasks

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

Setting the System Locale in central-wrapper.conf	7
Change the MS SQL Collation Language or the central-wrapper.conf Language for Content ...	8
Adjusting the Logging Levels	8
Configuring LWSSO Settings	9
Changing the Service Name and Description	10
Changing the Timeout Limit for the HP OO Web Interface	11
Scheduling Database Purging	11
Purging Flows	12
Purging APIs	12

Setting the System Locale in central-wrapper.conf

If your HP 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.

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

When HP 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.

Adjusting the Logging Levels

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

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`).
2. 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
```

Configuring LWSSO Settings

When you install HP OO 10.10 or later, if you choose to upgrade the LWSSO settings from HP OO 9.x, these LWSSO settings will be migrated, but LWSSO will be disabled in HP OO 10.x, even if it was previously enabled in HP OO 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 *HP OO 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\HP 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=HPOOCentral

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

# Description of the service
wrapper.description=HP OO Central is the run time environment of HP 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 HP OO Web 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 HP 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 **HP Solutions** content pack (available on HPLN at <https://hpln.hp.com/group/operations-orchestration>). 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 > 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.

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 /steps-log**: Purge 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 *HP OO API Guide*.

For more information about purge operations, see the *HP OO 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.

Encrypting and Obfuscating Passwords	13
Changing the Database Password	14
Changing the Database IP	15
Changing the Hostname/IP of Central or RAS	15
Adjusting the Timing of Quartz Jobs	16
Changing the URL of a Central/Load Balancer on the RAS Side	17
Backing Up HP OO	18
Backing Up	18
Recovery	18
Setting up Disaster Recovery	18
Planning for Disaster Recovery	18
Performing Disaster Recovery	19
System Tuning	19
Database Maintenance	20

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>gAkPCLQsVDhoR1Y2q9BjCQ==
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.
5. 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.

Changing the Database IP

This section is relevant when you need to configure HP 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 *HP OO Security and Hardening Guide*.

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

The screenshot shows a web interface with a navigation bar at the top containing 'Security', 'Topology', 'System Settings', and 'Database Health'. Below this is a sub-navigation bar with 'Workers' and 'Configuration'. The 'Configuration' section is active, showing a form titled 'External URL'. Inside the form, there is a label 'URL:' followed by an empty text input field. Below the input field is a tooltip that reads 'URL of the load balancer, reverse proxy, or DNS load balancer'. A 'Save' button is located at the bottom right of the form.

For more information, see "Setting Up Topology – Configuration" 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**.

However, it does not affect functionality, because it is the RAS that connects to the Central in HP OO 10.x.

Adjusting the Timing of Quartz Jobs

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

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 HP service representative before making any changes to these triggers.

1. Enter the Jminix page using the URL: **{OO_HOST}:{OO_PORT}/oo/jminix/**

Note: You need **Manage System Settings** permission in order to enter **jminix**.

2. Open the **OO** tab. Under **MBeans**, there is an operation named **jobTriggersMBean**.
3. 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 HP 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
- HP 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

HP 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 HP OO server(s) by reinstalling all nodes (Central and RAS). Use the database configuration, schema, and HP 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 *HP 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 HP OO in the primary datacenter.
4. Switch over to the secondary datacenter.

System Tuning

If you encounter a performance issue on your HP OO system, we recommend using the *HP 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 *HP OO Tuning Guide*.

Database Maintenance

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

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

