Operations Agent and Infrastructure SPIs

Software Version: 12.05

For Windows®, Linux, HP-UX, Solaris, and AIX operating systems

Installation Guide

Document Release Date: December 2017
Software Release Date: December 2017

Hewlett Packard Enterprise

Legal Notices

Warranty

The only warranties for Seattle SpinCo, Inc and its subsidiaries (“Seattle”) 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. Seattle 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. Except as specifically indicated, valid license from Seattle 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

© 2015-2017 EntIT Software LLC, a Micro Focus company

Trademark Notices

Adobe ® is a trademark of Adobe Systems Incorporated.

Microsoft® and Windows® are U.S. registered trademarks of the Microsoft group of companies.

UNIX® is a registered trademark of The Open Group.

Acknowledgements

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/).

This product includes software written by Tim Hudson (tjh@cryptsoft.com).

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

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

This site requires that you register for an HPE Passport and to sign in. To register for an HPE Passport ID, click **Register** on the HPE Software Support site or click **Create an Account** on the HPE Passport login page.

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

Support

Visit the HPE Software Support site at: https://softwaresupport.hpe.com/.

Most of the support areas require that you register as an HPE Passport user and to sign in. Many also require a support contract. To register for an HPE Passport ID, click **Register** on the HPE Support site or click **Create an Account** on the HPE Passport login page.

To find more information about access levels, go to: https://softwaresupport.hpe.com/web/softwaresupport/access-levels.

HPE Software Solutions Now accesses the HPE Software Solution and Integration Portal website. This site enables you to explore HPE Product Solutions to meet your business needs, includes a full list of Integrations between HPE Products, as well as a listing of ITIL Processes. The URL for this website is https://softwaresupport.hpe.com/km/KM01702731.

Contents

Chapter 1: Introduction 9
Conventions Used in this Document 9
Best Practices for Installing the Operations Agent 10
Deploying the Operations Agent 10
Installing the Operations Agent in a Single Step 11
Single Depot for HP-UX Installation 13
Co-existence of Operations Agent with other HPE products 14
Installing the Operations Agent on Platforms with Limitation 14
Enabling Secure Communication 14
Planning the Installation of Operations Agent 16
Chapter 2: Connecting the Operations Agent to OMi 19
Connecting a New Operations Agent Installation to OMi 19
Connecting an Existing Operations Agent to OMi 20
Updating the Operations Agent Installation from OMi 20
opr-package-manager Command-Line Interface 21
Auto-Registration of Operations Agent with OMi 25
Chapter 3: Registering the Operations Agent and Infrastructure SPIs on the OM Management Server (and Installing the Infrastructure SPIs) 27
Registering the OM for Windows Management Server 27
Registering the OM on UNIX/Linux Management Server 33
Uninstalling the Operations Agent and Infrastructure SPIs Deployment Package 40
Chapter 4: Prerequisites for Installing the Operations Agent on a Node 42
For Windows 42
For Linux 44
For HP-UX 46
For Solaris 48
For AIX 49
For Debian and Ubuntu 50
Upgrade Notes 52
Data Collection and Storage with the Operations Agent 12.05 54

Metric Data Store 55
Preinstallation Task: Installing the Operations Agent and Infrastructure SPIs on OM in Cluster 56
Chapter 5: Installing the Operations Agent from OM or OMi Console 58
Chapter 6: Installing the Operations Agent in a Single Step 59
Installing the Operations Agent using Single Step 60
Deploying Patches and Hotfixes using Single Step Installer 61
Verifying the Installation 62
Chapter 7: Installing Operations Agent using Profile File 63
Installing Operations Agent using a Profile File 71
Installing Operations Agent and Enabling Health Monitoring using Profile File 72
Chapter 8: Configuring the Agent User 74
Requirements for Using a Non-Default User 74
Limitations of Using a Non-Default User 75
Configure the Agent User during Installation 76
Configuring the Agent User after Installation 80
Changing the Default User on Windows 80
Alternative Method: Use the ovswitchuser Command 80
Changing the Default User on UNIX/Linux 83
Use a Profile File 84
Alternative Method: Use the ovswitchuser Command 85
Chapter 9: Reducing the Installation Time 88
Using the removesign option with the zip media 88
Using the Profile file 89
Using the removesign option while deploying Operations Agent from OM and OMi 90
Chapter 10: Installing the Operations Agent using Agent Installation Repository 91
Standalone Agent Installation Repository 91
Agent Installation Repository as a Virtual Appliance 94
Deploying Operations Agent Using the Agent Installation Repository 95
Chapter 11: Installing the Operations Agent using the Puppet Environment 101
Data Flow in a Puppet Environment 101

Installing and Configuring the Operations Agent on Linux Using YUM ..102
Installing and Configuring Operations Agent on Linux Using oarepo.sh 105
Installing and Configuring Operations Agent on Windows Using oarepo.ps1 ..107
Enabling Operations Agent Installation Using Profile File with Puppet ..109
Configuring Operations Agent Using Puppet Module to Set the XPL Parameters for the Nodes ..111
Chapter 12: Installing the Operations Agent Using Server Automation ..114
Importing the Operations Agent Software ..115
Creating a Software Policy ..116
Attaching the Software Policy to a Device or Server ..117
Verifying the Installation ..118
Chapter 13: Installing the Operations Agent using Microsoft System Center 2012 Configuration Manager ..120
Creating the Operations Agent Package ..120
Deploying the Operations Agent Package ..122
Verifying the Installation ..122
Chapter 14: Installing the Operations Agent Using Red Hat Network Satellite Server ..124
Downloading and Storing the Operations Agent Depot Files (RPMs) ..125
Creating the Setup on the Target Node ..125
Deploying the Packages on the Target Node ..126
Removing the Packages from the Target Node ..127
Chapter 15: Installing the Operations Agent RPM based Hotfix Package ..129
Chapter 16: Installing the Operations Agent on Platforms with Limitations ..131
Installing the Operations Agent on Platforms with Limitation Remotely from the OM for Windows Console ..131
Installing the Operations Agent on Platforms with Limitation Remotely from the OM for UNIX Console ..132
Installing the Operations Agent on Platforms with Limitation Remotely Using Command Line ..133
Chapter 17: Installing the Operations Agent Manually on the Node ..134
Post-Installation Task in a NAT Environment ..139
Chapter 18: Deploying Streaming Edition of Operations Agent ..140
Verifying the Installation ..145
Configuring streaming agent ..145

Uninstalling or Removing streaming agent 147
Limitations of Streaming Edition of Operations Agent 148
Chapter 19: Installing the Infrastructure SPIs on the OM Management Server 149
Components of the Infrastructure SPI on OM for Windows 154
Components of the Infrastructure SPIs on OM for UNIX 157
Chapter 20: Installing the Operations Agent in the Inactive Mode 159
Chapter 21: Monitoring the Operations Agent in High Availability Clusters 164
Chapter 22: Configuring the Operations Agent in a Secure Environment ..171
Configuring Proxies 172
Organizing the Proxy Configuration File 176
Configuring the Communication Broker Port 179
Configuring Local Communication Ports 182
Configuring Nodes with Multiple IP Addresses 183
Configuring HTTPS Communication through Proxies 184
Communication in a Highly Secure Environment 185
Introduction to the Reverse Channel Proxy 187
Secure Communication in an Outbound-Only Environment 189
Specifying the RCP Details with a Configuration File 192
Configuring a RCP for Multiple Systems 193
Verifying the Communication through the RCPs 194
Communication through Two Firewalls 196
Configuring Amazon Linux VM Outbound Communication with OM 197
Proxy Configuration and Setup Details 198
Troubleshooting 201
Chapter 23: Configuring Certificates for Operations Agent and Infrastructure SPIs 205
Requesting Certificates Automatically 205
Requesting Certificates with an Installation Key 206
Deploying Certificates Manually 207
Restoring the Certificates 209
Configuring SSL Certificates for the Agent Install Repository Virtual Appliance 211
Creating a Certificate 211
Creating a Self-Signed Certificate 211

Sending a Certificate Signing Request 213
Configuring SSL Certificate on the Lighttpd Server 213
Importing the SSL Certificate on a Node 214
Installing Operations Agent on a Trusted Machine 215
Chapter 24: Upgrading to Operations Agent version 12.xx from Earlier Versions 217
Comparing Operations Agent 12.xx with Earlier Versions 219
Performance Collection Component 222
parm file 222
Utility Program 225
Utility Scan Report 226
Initial parm file global information 227
Initial parm file application definitions 228
parm file global change notifications 229
parm file application changes 229
scope off-time notifications 230
Application-specific summary reports 230
Process summary report 231
Scan start and stop report 232
Application Overall Summary 232
Collector coverage summary 233
Class Summary and Log file Contents Summary 233
Log file empty space summary 234
Extract 235
Metrics 236
SNMP Trap Interceptor 240
Data Source Integration 241
Frequently Asked Questions 244
Chapter 25: Uninstalling the Operations Agent and Infrastructure SPIs 246
Removing the Agent with the oacleanall Script 247
Chapter 26: Uninstalling the Infrastructure SPIs 249
Chapter 27: Troubleshooting 251
Installation 251
Certificates 258
Coexistence of Computesensor Standalone Packages (shippped with 260

vPV) and Operations Agent 12.05 .....
Other 262
Send documentation feedback 263

Chapter 1: Introduction

The Operations Agent helps you to monitor a system by collecting metrics that indicate the health, performance, and availability of essential elements of the system. While Operations Manager (OM) presents you with the framework to monitor and manage multiple systems through a single, interactive console, the Operations Agent deployed on individual nodes helps you gather vital information to facilitate the monitoring process.

The Operations Agent and Infrastructure SPIs media provides you with the Operations Smart Plug-ins for Infrastructure (Infrastructure SPIs). If you want to install the Infrastructure SPIs with the electronic media, make sure to download the media for *all* node platforms (and not a platform-specific ISO file). Platform-specific ISO files do not contain the Infrastructure SPIs.

Conventions Used in this Document

The following conventions are used in this document.

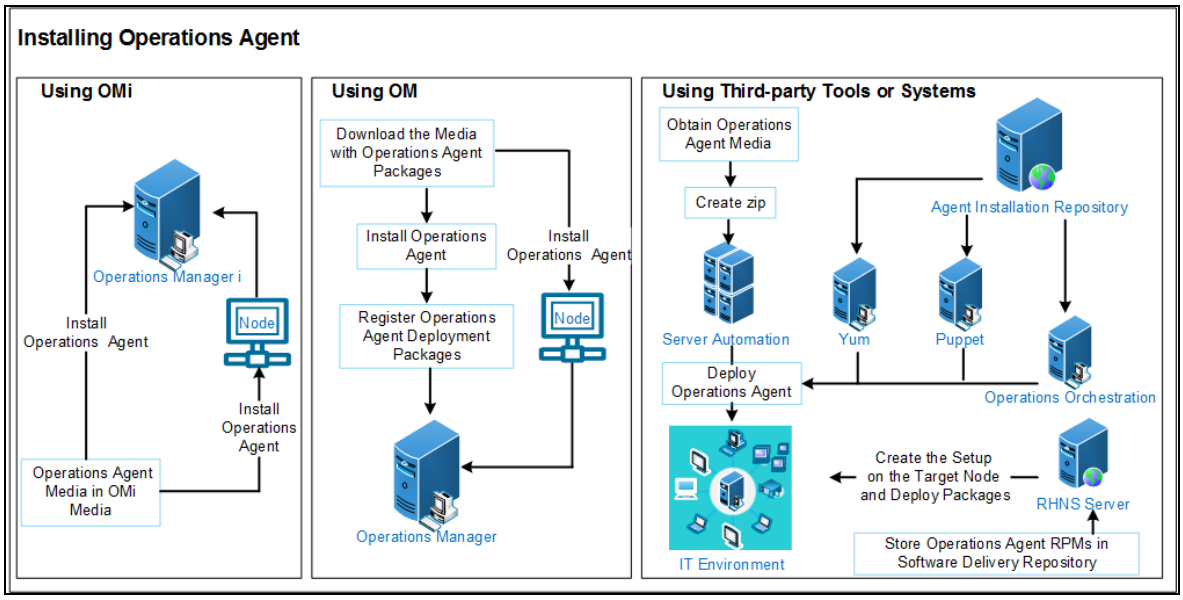
Convention	Description
`<OvInstallDir>` The installation directory for the Operations Agent.	**<OvInstallDir>** is used in this document to denote the following location: • *On Windows*: `%ovinstalldir%` • *On HP-UX/Linux/Solaris*: `/opt/OV/` • *On AIX*: `/usr/lpp/OV/`
`<OvDataDir>` The directory for Operations Agent configuration and runtime data files.	**<OvDataDir>** is used in this document to denote the following location: • *On Windows*: `%ovdatadir%` • *On HP-UX/Linux/Solaris*: `/var/opt/OV/` • *On AIX*: `/var/opt/OV/`
`<OvInstallBinDir>` The bin directory contains all the binaries (executables) of Operations Agent.	**<OvInstallBinDir>** is used in this document to denote the following location: • *On Windows x64*: `%ovinstalldir%\bin\win64\` • *On Windows x32*: `%ovinstalldir%\bin\win32\` • *On HP-UX/Linux/Solaris*: `/opt/OV/bin/`

	• *On AIX*: `/usr/lpp/OV/bin/`

Best Practices for Installing the Operations Agent

Deploying the Operations Agent

You can use one of the following methods to simplify the deployment of Operations Agent in large environments:



For more information see:

1. Installing the Operations Agent Manually on the Node.
2. Installing from the OM Console and Installing Operations Agent in a Single Step.
3. Installing Operations Agent from OMi. For more information, see the section *Connecting Operations Agents to OMi* in the chapter *Monitored Nodes* in the *OMi Administration Guide*.
4. Installing Operations Agent using Agent Installation Repository.
5. Installing Operations Agent using the Puppet Environment
6. Installing and configuring Operations Agent on Linux using YUM

7. Installing Operations Agent Using Red Hat Network Satellite Server
8. Installing Operations Agent Using Server Automation

Installing the Operations Agent in a Single Step

The single step installer enables you to install the base version of Operations Agent along with patches and hotfixes. The prerequisites check occurs only once before the installation.

You can use the `oainstall` script to install the Operations Agent locally on a managed node or use the OM console to install Operations Agent remotely.

Using oainstall Script to Install the Operations Agent

1. Log on to the node as a root user or an administrator.
2. Download and extract the media, patches, and hotfix packages to the same directory.
3. Go to the directory where you extracted the bits.
4. Run the following command:

   On Windows

   ```
   cscript oainstall.vbs –i -a
   ```

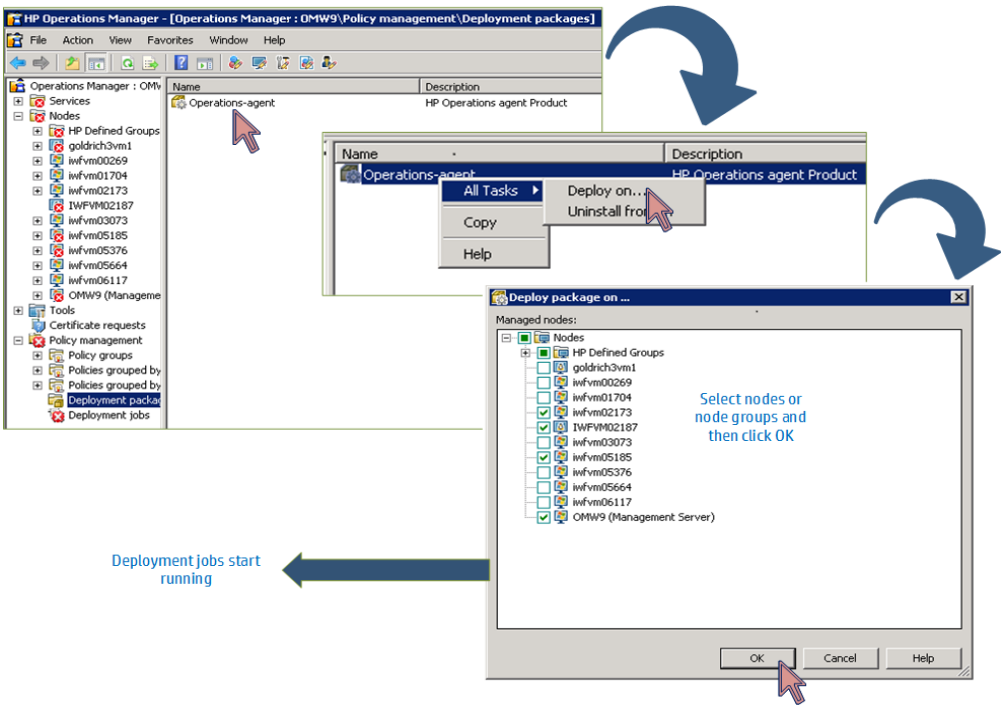
   On HP-UX/Linux/Solaris

   ```
   ./oainstall.sh –i –a
   ```

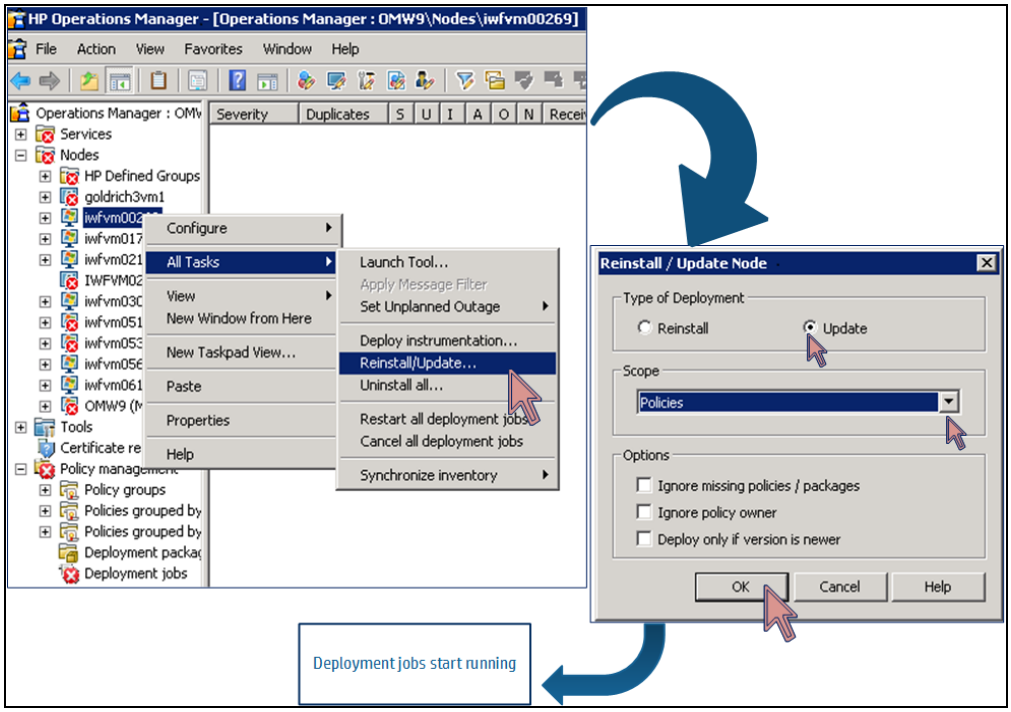
Base version of the Operations Agent along with patches and hotfixes are installed.

Installing the Operations Agent from OM for Windows Management Server

Scenario 1: If the Operations Agent 12.05 is not installed on a node, follow the steps to install base version, patches, and hotfixes:

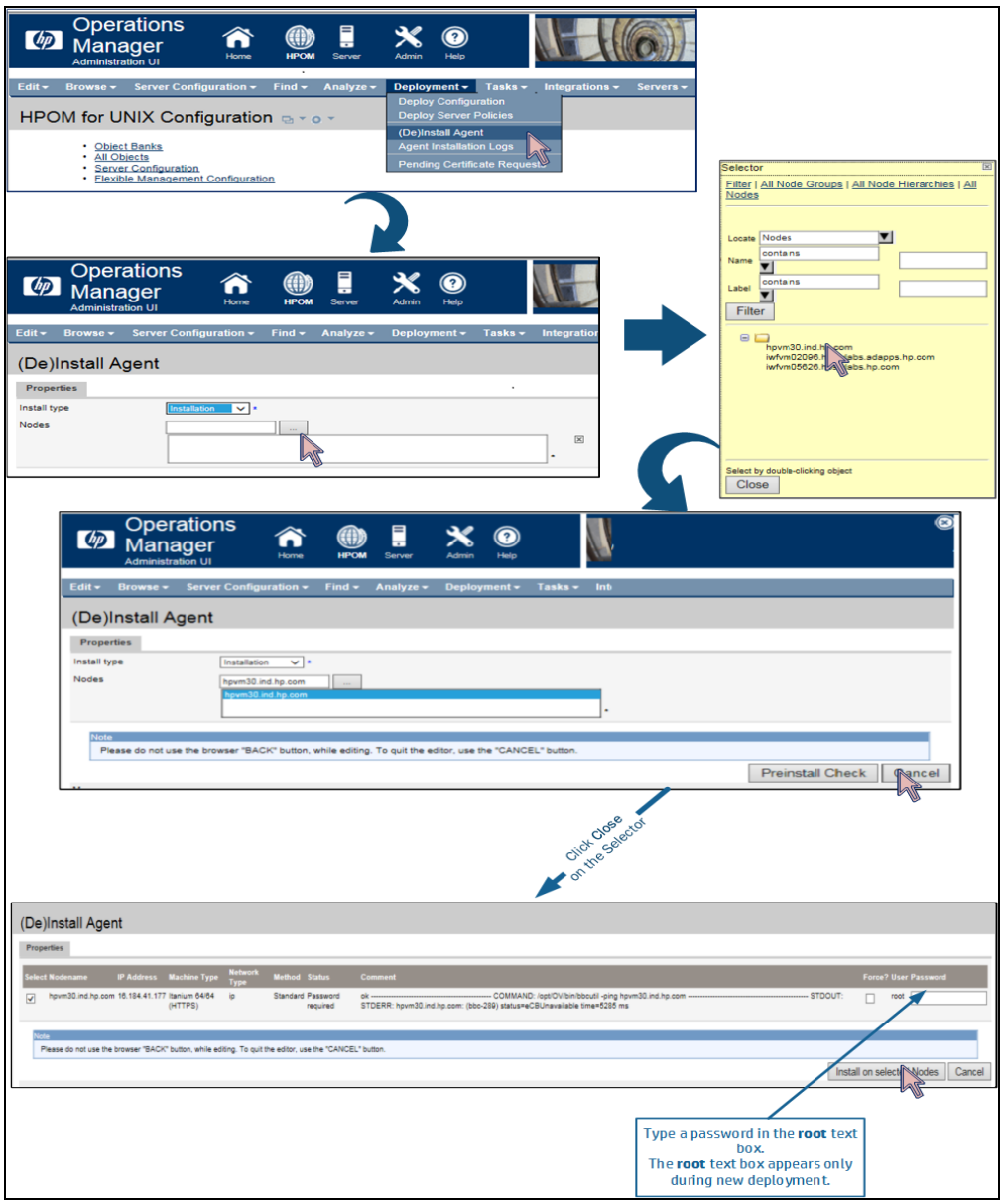


Scenario 2: If the Operations Agent 12.05 is already installed on a node, follow the steps to install patches and hotfixes:



Installing the Operations Agent from OM for UNIX Management Server

Scenario: If the Operations Agent 12.05 is not installed on a node, follow the steps to install base version, patches and hotfixes:



Single Depot for HP-UX Installation

With Operations Agent 12.01 you can use single depot package to install the Operations Agent on HP-UX nodes. Follow the steps:

Prerequisite

For HP-UX IA, install the following patch on the node: qpkbase for HP-UX B.11.31.1309.397 (or superseding patch). See the Prerequisites for HP-UX section for more information.

1. Download the single depot package **HPOAConsolidatedpkg.depot** from the media.
2. Use the `swinstall` command to install the Operations Agent.

   For example:

   ```
   swinstall -x mount_all_filesystems=false -x write_remote_files=true -s
   <single depot directory path>/HPOAConsolidatedpkg.depot
   ```

Co-existence of Operations Agent with other HPE products

If you want to install or upgrade Operations Agent on a system where other HPE products are running, make sure you stop all the processes of HPE products before you install or upgrade Operations Agent. Restart the processes only after installation or upgrade is complete.

Installing the Operations Agent on Platforms with Limitation

To install the Operations Agent 12.05 remotely from the OM for Windows or UNIX console on platforms with limitation, you must set the variable `MINPRECHECK` to True in the profile file. Add the following content in the profile file:

set nonXPL.config:MINPRECHECK=True

For more information, see Installing the Operations Agent on Platforms with Limitation.

For more details on platforms with limitation, see the Operations Agent *Support Matrix* .

Enabling Secure Communication

To enable secure communication without allowing inbound traffic to the Communication Broker port, you must configure a reverse channel proxy (RCP).

Follow the steps to configure a RCP:

1. On a RCP node set the following configurations to enable RCP on a specific port number:

   ```
   [bbc.rcp]
   SERVER_PORT=<port number>
   ```

2. On the OM Management Server present in the trusted zone, set the following configurations to open an Reverse Admin Channel (RAC):

   ```
   [bbc.cb]
   RC_CHANNELS=<RCP node name>:<port number>
   ENABLE_REVERSE_ADMIN_CHANNELS=True
   ```

3. On a RCP node, set the following to enable RCP on a specific port number:

   ```
   [bbc.rcp]
   SERVER_PORT=<port number>
   ```

4. On the Operations Agent nodes present in the untrusted zone, set the following configurations to enable communication through RCP:

   ```
   [bbc.http]
   PROXY=<RCP node name>:<port number>+(<nodes to be included>)-(<Nodes to be excluded>)
   ```

For example:

1. On myserver.serverdomain.com set the following configurations:

   ```
   [bbc.cb]
   RC_CHANNELS=myrcp.mydomain.com:1025
   ENABLE_REVERSE_ADMIN_CHANNELS=True
   ```

2. On myrcp.mydomain.com set the following:

   ```
   [bbc.rcp]
   SERVER_PORT=1025
   ```

3. On myagent.mydomain.com set the following:

   ```
   [bbc.http]
   PROXY=myrcp.mydomain.com:1025+(*)-
   (myrcp.mydomain.com,myrcp,myagent.mydomain.com,myagent)
   ```

   In this instance:

- myserver.serverdomain.com is the OM Management server
- myrcp.mydomain.com is the Reverse Channel Proxy node
- myagent.mydomain.com is the Operations Agent node
- * specifies that all nodes must be included

For more information, see Introduction to the Reverse Channel Proxy.

On the RCP system, register `ovbbcrcp` with `ovc` so that this process is started, stopped, and monitored by `ovc`.

For example:

On Windows

```
cd "c:\program files\hp openview\newconfig\datadir\conf\bbc"
"c:\program files\hp openview\bin\ovcreg" -add ovbbcrcp.xml
```

On HP-UX/Linux/Solaris

```
/opt/OV/bin/ovcreg –add \ /opt/OV/newconfig/DataDir/conf/bbc/ovbbcrcp.xml
```

Planning the Installation of Operations Agent

Installing the Operations Agent Remotely from the Management Server

In a centralized monitoring environment with OM, you can register the deployment packages for the Operations Agent 12.05 on the Management Server, and then centrally deploy the agent packages on different nodes from the OM console.

This process involves:

1. Install the Operations Agent 12.05 on the OM management server.
2. Registering the Operations Agent 12.05 deployment packages on the OM management server.

> **Tip:** A registration process ensures that the Operations Agent deployment package is placed in the appropriate location on the deployment server (a server from which you can deploy the agent on nodes).

The process of registering the Operations Agent deployment packages automatically installs the Infrastructure SPIs on the OM server. You can configure the installer to skip the installation of the Infrastructure SPIs.

3. Installing the Operations Agent centrally from the OM console.

Installing the Operations Agent Manually on the Node

You can install the Operations Agent from the *Operations Agent and Infrastructure SPIs* media by manually logging on to the managed node.

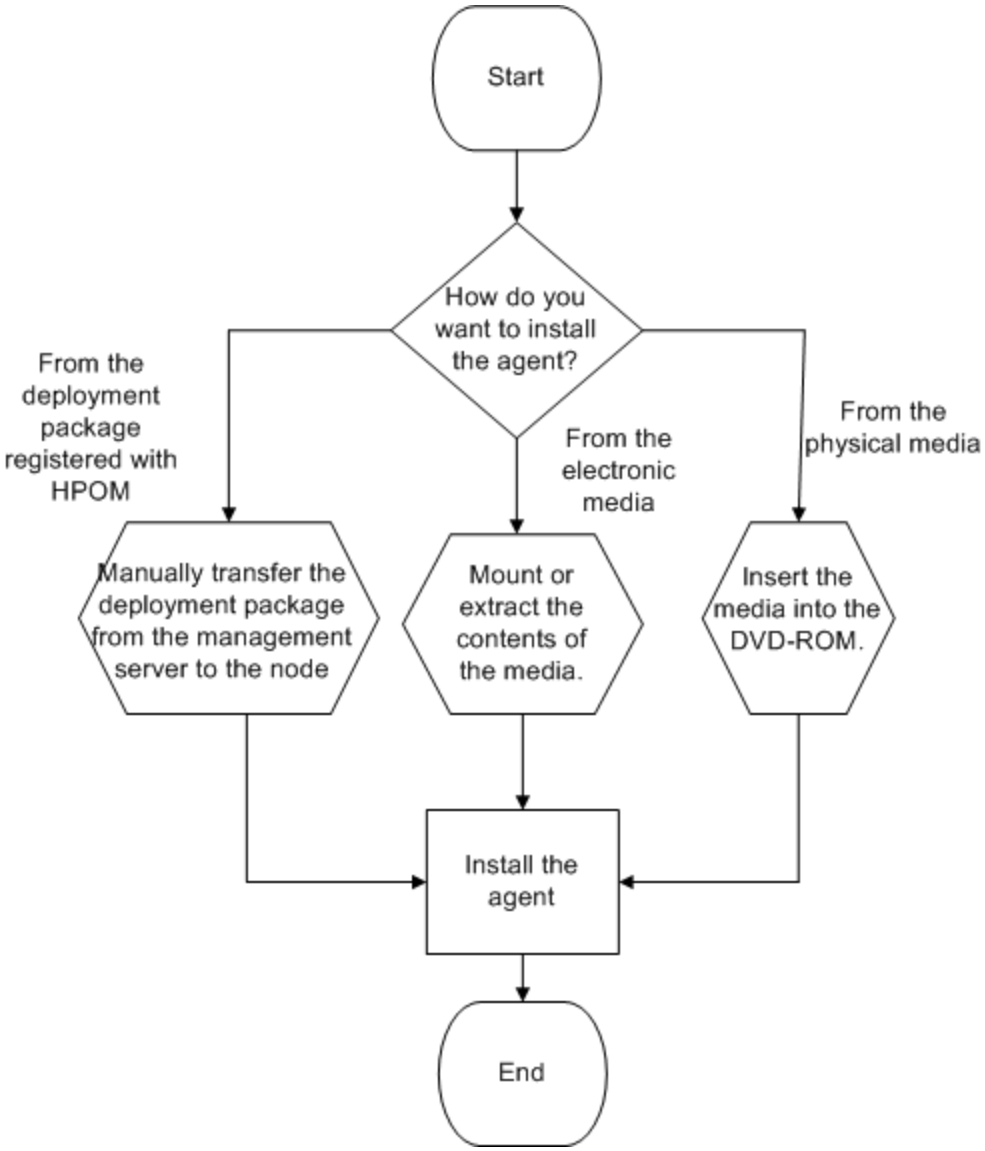
This process involves:

1. Preparing the node

   You can prepare a managed node for the agent installation by doing one of the following:

   - Insert the *Operations Agent and Infrastructure SPIs* physical media to the DVD drive.
   - Extract the contents of the *Operations Agent and Infrastructure SPIs* electronic media into a local directory.
   - Mount the *Operations Agent and Infrastructure SPIs* physical media.
   - Transfer the deployment package manually from the OM management server.

2. Install the agent with the installer program (`oainstall` or `oasetup`) available with the *Operations Agent and Infrastructure SPIs* media or the deployment package.



Installing the Infrastructure SPIs

You can install only the Infrastructure SPIs on the OM management server by using the *Operations Agent and Infrastructure SPIs*.

This process involves:

1. Preparing a configuration file on the OM management server.
2. Installing the Infrastructure SPIs with the installer program (`oainstall` or `oasetup`) available with the *Operations Agent and Infrastructure SPIs* media.

Chapter 2: Connecting the Operations Agent to OMi

Operations Manager i (OMi) is the event management foundation for a complete Business Service Management (BSM) monitoring solution. You can integrate Operations Agent with OMi. Operations Agent can send alerts or events to OMi.

Connecting a New Operations Agent Installation to OMi

Operations Agent is available on the Operations Agent media DVD, which is included in the OMi media kit. The latest Operations Agent updates can be downloaded from Software Support http://h20230.www2.hp.com/selfsolve/patches.

After the installation of the Operations Agent software on the system to be monitored, you must connect the agent to OMi and then grant the agent's certificate request in OMi.

To connect Operations Agent to OMi, follow these steps:

1. Install the Operations Agent on the system that you want to monitor.
2. Run the following command:

   On Windows: `<OvInstallBinDir>OpC\install cscript opcactivate.vbs -srv <BGateway_Server>`

   On Unix: `<OvInstallBinDir>OpC/install opcactivate -srv <Gateway_Server>`
3. Log on to OMi server, open the Certificate Requests manager and accept the new certificate request:

   Administration > Setup and Maintenance > Certificate Requests
4. To verify, check the HTTPS communication in both directions using the following command:

   `bbcutil -ping https://<FQDN>`

   If the connection is successful, the command returns `status=eServiceOK`.

Once the communication between the Operations Agent and the OMi server is established and the Operations Agent processes are running, Operations Agent sends alerts or events to OMi, which you can view in the **Event Browser** of OMi server.

For more information, see *Connecting a New Operations Agent Installation* in the *OMi Administration Guide*.

Connecting an Existing Operations Agent to OMi

Operations Agents that are already connected to Operations Manager (OM) can be configured to send events to OMi, run actions, and accept policies from OMi if OM is integrated with OMi.

OM management server forwards all events (referred to as messages in OM) to OMi based on a flexible management policy. Instruction and action execution requests sent from the OMi server are executed on the OM server.

You can also connect OM managed nodes directly to OMi and configure the agents to accept policies and action execution requests from OMi.

> **Note:** You can also switch the Operations Agent management from the OMi server to the OM management server.

For more information, see *Connecting an Existing Operations Agent Installation* in the *OMi Administration Guide*.

Updating the Operations Agent Installation from OMi

You can update the Operations Agent that is currently installed on a monitored node to a hotfix, patch or new base version remotely from the Operations Manager i (OMi) server.

> **Note:** After you have updated an Operations Agent, it cannot be reverted to the previous version.

Before you can update the Operations Agent software, you must obtain the updated agent packages and upload them to the OMi database using the `opr-package-manager` command-line interface.

To update the Operations Agent installed on a monitored node from OMi server, follow these steps:

1. Log on to the Operations Manager i (OMi) server.
2. Open the **Monitored Nodes** page on the OMi UI:

   Administration > Setup and Maintenance > Monitored Nodes.
3. In the **Node Views** browser in the **Monitored Nodes** page, select the required node.
4. Refresh the agent version of the node by **Synchronizing** the installed packages information with the server to determine whether an update is necessary.
5. Select the node you want to install the update and click **Update Operations Agent** icon. To update multiple nodes in parallel, hold down the `Ctrl` or `Shift` key while selecting them. Then click **Update Operations Agent** icon.

   The **Update Operations Agent** dialog box opens.
6. Select the version to which you want to update the agent installation:
   - **Update to Latest Hotfixes** installs the hotfixes that are available on the server and that apply to the agent version installed on the monitored node.
   - **Update to Latest Version** installs the latest patch or base version on the monitored node.
   - **Update to Specific Version** enables you to select the version to install on the monitored node.

     If you select the current version, then the hotfixes for that version are installed. This option is only available when the selected monitored nodes can be updated to a common version. If a node already has a later version than the target version, the option is disabled.

   OMi creates a deployment job for each update task.
7. You can track the progress of the update by monitoring the corresponding deployment job:

   Administration > Monitoring > Deployment Jobs
8. In the **Monitored Nodes** page, click **Refresh** to update the information displayed.

For more information, see *Updating Operations Agent Installation* in the *OMi Administration Guide*.

opr-package-manager Command-Line Interface

You can use the **`opr-package-manager`** command-line interface (CLI) to upload Operations Agent deployment packages to OMi database.

Prerequisites

- Obtain the Operations Agent deployment packages.
- To run the `opr-package-manager` successfully, the OMi server processes must be running.

A deployment package usually contains a number of subpackages that make up the agent software. A package is defined by a descriptor file. The descriptor file contains the following information:

- Descriptive information about the package.
- Name of the installer.
- List of files and packages included in the package.

Location

<OMi_HOME>/opr/bin/opr-package-manager[.bat|.sh]

You can run **opr-package-manager** on a gateway or a data processing server. The server processes must be running.

Synopsis

opr-package-manager [*<authentication>*] {*<operation>* | *<target>*}

- *Syntax for <authentication>*

  {-username *<userName>* -password *<password>*}

Option	Description
{-username|-user *<username>*}	Sets the username to be used to execute the CLI operations on the target gateway server to *<username>*.
{-password|-pw <password>}	Uses the password *<password>* for user *<username>*, which is used to execute the CLI operations on the target gateway server. Default value of *<password>*: empty string

- *Syntax for <operation>*

  {-list_packages [*<package_name>*] [-format|-f [xml|json]]}

  {-upload_packages [*<descriptor_ file>*] [-input *<package_directory>*] [-platform [*<HP-UX|SOL|AIX|LIN|WIN|ALL>*]}

  {-deploy_package *<package_name>* -deploy_mode [NEWEST|CURRENT|VERSION -package_ID *<package_ID>*|PACKAGE -package_ID *<package_ID>*]}

  {-delete_package *<package_name>*}

{-delete_package_version *<package_name> <package_version>*}

Option	Description
-list_ packages	Lists details of all deployment packages that exist in the OMi database. To list details of a specific package, specify the package name. The output can be in XML or JSON format. The default is XML. To view the output more easily, redirect it to a file and then view the XML content in any of the major browsers.
-upload_ packages	Uploads the deployment package specified by the descriptor file. If you do not specify a package, **opr-package- manager** uploads the default package Operations-agent. The -input option specifies a directory of deployment packages. The tool processes all directories and sub-directories and uploads all deployment packages that contain the specified descriptor file. The -platform option defines a filter to upload deployment packages for a specific platform only (for example, WIN uploads deployment packages for Windows only. Possible values are: HP-UX, SOL, AIX, LIN, WIN, ALL.
-deploy_ package	Deploys the deployment package with the specified name. The -deploy_mode option defines how the installed packages are updated; for example, NEWEST deploys the newest version that is available on the server. Possible values are: ◦ NEWEST updates to latest available version. ◦ CURRENT updates to the latest hotfix version of the currently installed version. ◦ VERSION updates to the given version. ◦ PACKAGE updates to the given package ID. The -package_ID option is required for the VERSION and PACKAGE deployment modes. It specifies the package identifier. This can be the deployment binary ID or the package version, for example 11.14.005. **Tip:** Use the -list_packages option to retrieve the deployment binary ID.
-delete_ package	Deletes the deployment package. The package is only deleted from the OMi database, not from any monitored nodes. The package can no longer be deployed after it has been removed.
-delete_ package_ version	Deletes the deployment package with the specified version. The package is only deleted from the OMi database, not from any monitored nodes. The package can no longer be deployed after it is removed.

- *Syntax for <target>*

```
-query_name <query_name> | -view_name <view_name> | -filter_name <filter_name> |
- node_list <node_list> [-dont_check_database] | -node_group <node_group> | -all
```

Option	Description
`-query_name <query_name>`	Performs the operation on monitored nodes selected by the specified TQL query.
`-view_name <view_name>`	Performs the operation on monitored nodes selected by the specified view.
`-filter_name <filter_name>`	Performs the operation on a list of monitored nodes with the Operations Agent installed that was obtained by applying the node filter.
`- node_list <node_list> [-dont_check_database]`	Performs the operation on a list of one or more monitored nodes. The nodes must exist in the RTSM and must be associated with a CI of the type `om_operations_agent`. Separate multiple nodes with commas (for example, `node1.example.com,node2.example.com`). If used with the `-dont_check_database` option, the operation on the nodes is performed without checking if the nodes exist in the RTSM.
`-node_group <node_group>`	Performs the operation on a group of monitored nodes. A node groups is a CI collection containing hosts. Node groups can be maintained in the Monitoring Automation Node Editor or they can be imported through topology synchronization from OM to OMi. The nodes must exist in the RTSM and be associated with a CI of the type `om_operations_agent`. Specify node groups by their names or their paths (the latter applies to hierarchical node groups imported from OM for Windows).
`-all`	Performs the operation on all monitored nodes that have the Operations Agent installed (that is, nodes that are associated with a CI of the type `om_operations_agent`).

Examples

This section shows a number of examples you can use as a starting point for developing your own **`opr-package-manager`** commands.

- List all available deployment packages:

  ```
  opr-package-manager -username myU -password myPwd -list_packages > allpkg.xml
  ```

- Recursively upload the Operations Agent deployment packages for all platforms (starting from the current working directory):

```
opr-package-manager -username myU -password myPwd -upload_packages
```

- Upload the Operations Agent deployment packages for Windows monitored nodes from the file system:

  ```
  opr-package-manager -username myU -password myPwd -upload_packages
  c:\Agent\OVOAgent.xml -input c:\Agent\packages\ -platform WIN
  ```

- Deploy the Operations Agent deployment package version 12.00.078 to the nodes node1.example.com and node2.example.com:

  ```
  opr-package-manager -username myU -password myPwd -deploy_package
  Operationsagent -deploy_mode VERSION -package_ID 12.00.078 -node_list
  "node1.example.com,node2.example.com"
  ```

- Deploy the latest hotfix for the Operations Agent to all nodes selected by the TQL query All_CIs_ with_OM_Agents_Unix:

  ```
  opr-package-manager -username myU -password myPwd -deploy_package
  Operationsagent -deploy_mode CURRENT -query_name All_CIs_with_OM_Agents_Unix
  ```

- Delete the Operations Agent deployment package from the database:

  ```
  opr-package-manager -username myU -password myPwd -delete_package
  Operationsagent
  ```

- Delete the Operations Agent deployment package version 12.00.078 from the database:

  ```
  opr-package-manager -username myU -password myPwd -delete_package_version
  Operationsagent 12.00.078
  ```

opr-package-manager Log File

`opr-package-manager` logs information to the following log file:

<OMi_HOME>`/log/opr-clis.log`

For more information on using the **`opr-package-manager`** command-line interface and uploading the Operations Agent deployment packages to OMi, see the *OMi Administration Guide*.

Auto-Registration of Operations Agent with OMi

Operations Agent sends registration request to OMi during configuration. This request is agent capability push including version and is scheduled every 24 hours by default. Also, the request is sent after every restart.

For auto-registration of Operations Agent with OMi during installation, you can provide the Tenant and Agent Group information. This information is required to create CI collection and can be provided using the profile file.

To create or update the profile file with the Tenant and Agent Group information, follow the steps:

1. On the system where you want to install Operations Agent, create a new file and open the file with a text editor.
2. Add the following text to configure the Tenant and Agent Group information:

   ```
   set eaagt.sysdata:tenant=<value>
   ```

   ```
   set eaagt.sysdata:agentgroup=<value>
   ```

   - Tenant value provided should exist in UCMDB of OMi for Operations Agent CI to be created.
   - For using Streaming Edition of Operations Agent, the default Agent Group is `'Operations Agent (Streaming Edition)'`.
3. Save the file into a local directory.
4. Use the file to install or configure Operations Agent.

> **Note:** For more information on using the profile file option, see Installing Operations Agent using Profile File.

Chapter 3: Registering the Operations Agent and Infrastructure SPIs on the OM Management Server (and Installing the Infrastructure SPIs)

Registering the OM for Windows Management Server

Prerequisites

No deployment jobs must run at the time of registering the deployment package.

Follow the steps to view the active deployment jobs:

1. In the console tree, expand the Policy Management.
2. Click **Deployment Jobs**. The details pane shows the list of active deployment jobs. You must make sure that none of the deployment jobs are active at the time of installing the agent deployment packages. You must not start any deployment jobs until the agent deployment package registration is complete.

- If the Performance Agent 4.70 deployable for Windows or UNIX/Linux is available on the management server, you must either install the Performance Agent 4.72 deployable or remove the Performance Agent 4.70 deployable completely before registering the deployment packages for the Operations Agent 12.05. You can remove the deployable packages using the **Control Panel**.
- Disk space: 1 GB
- The `oainstall` program installs the Infrastructure SPIs on the management server while registering the deployment package. If you want to install the Infrastructure SPIs, make sure the system meets the following additional requirements:

  Hardware and Software Requirements

  For a list of supported hardware, operating systems, 12.05 version, and agent version, see the *Support Matrix*.

  Disk Space Requirements

Temporary Directory[a]	Total Disk Space
%tmp% - 15 MB	90 MB

[a]The disk space for the temporary directory/drive is required only during installation. These are approximate values.

Upgrade Requirements

You can directly upgrade the Infrastructure SPIs version 2.00 or later to the version 12.05.

You must install the Operations Agent 12.05 on the Management Server to be able to register the deployment packages. For more information about upgrading the Operations Agent, see "Upgrade Notes".

Register the Deployment Package

In addition to registering the deployment package for the Operations Agent, the `oainstall` script can install the Infrastructure SPIs on the Management Server.

However, the capability to install the Infrastructure SPIs is available only with the physical DVD or the electronic media that contains agent packages for all node platforms. Platform-specific media does not include the Infrastructure SPIs.

Choose one of the following tasks based on your requirement:

- "Register the Operations Agent deployment packages for all platforms and install the Infrastructure SPIs." below
- "Register the Operations Agent deployment package for a specific node platform by using a platform-specific ISO file." on the next page
- "Register the Operations Agent deployment packages for all platforms, and install the Infrastructure SPIs, but do not install the graph or report package." on the next page
- "Register the Operations Agent deployment packages for all platforms, but do not install the Infrastructure SPIs." on page 30
- "Register the Operations Agent deployment packages for selected platforms and install the Infrastructure SPIs" on page 30

Registering the Deployment Package

Task	Follow these steps
Register the Operations Agent deployment packages for all platforms and install the Infrastructure SPIs.	1. Make sure that you have downloaded the ISO file for all platforms or obtained the physical DVD. 2. Log on to the management server as administrator.

Registering the Deployment Package, continued

Task	Follow these steps
	3. Go to the media root. 4. Run the following command: **cscript oainstall.vbs -i -m** 5. Verify the registration process.
Register the Operations Agent deployment package for a specific node platform by using a platform-specific ISO file.	1. Make sure that you downloaded the .ISO file for the node platform of your choice. 2. Log on to the Management Server as administrator. 3. Go to the media root. 4. Run the following command: **cscript oainstall.vbs -i -m** 5. Verify the registration process.

Register the Operations Agent deployment packages for all platforms, and install the Infrastructure SPIs, but do not install the graph or report package.	1. Make sure that you downloaded the .ISO file for all platforms or obtained the physical DVD.
	2. Log on to the management server as administrator.
	3. Create a new file using a text editor.
	4. Add the following content:
	`[agent.parameter]`
	`REGISTER_AGENT=YES`
	`[hpinfraspi.parameter]`
	`InfraSPI=YES`
	`InfraSPI_With_Graphs=NO`
	`InfraSPI_With_Reports=NO`
	> **Note:** If you want to install the graph package and report package, set the `InfraSPI_With_Graphs` and `InfraSPI_With_Reports` properties to `YES` else set it to `NO`.
	5. Save the file.
	6. Go to the media root.
	7. From the media root, run the following command:
	cscript oainstall.vbs -i -m -spiconfig <*file_name*>
	In this instance, <*file_name*> is the name of the file that

Registering the Deployment Package, continued

Task	Follow these steps
	you created in step 3 (with complete path). The command registers the agent deployment packages for all platforms on the management server and installs the Infrastructure SPIs, but skips the installation of the graphs and reports packages for the Infrastructure SPIs.

Register the Operations Agent deployment packages for all platforms, but do not install the Infrastructure SPIs.	1. Make sure that you downloaded the .ISO file for all platforms or obtained the physical DVD.
	2. Log on to the management server as administrator.
	3. Create a new file with a text editor.
	4. Add the following content:
	
	`[agent.parameter]`
	
	`REGISTER_AGENT=YES`
	
	`[hpinfraspi.parameter]`
	
	`InfraSPI=NO`
	
	`InfraSPI_With_Graphs=NO`
	
	`InfraSPI_With_Reports=NO`
	5. Save the file.
	6. Go to the media root.
	7. From the media root, run the following command:
	
	cscript oainstall.vbs -i -m -spiconfig <*file_name with complete path*>
	
	In this instance, <*file_name*> is the name of the file that you created in step 3 (with complete path).
	
	The command registers the agent deployment packages for all platforms on the management server, but skips the installation of the Infrastructure SPIs.

Register the Operations Agent deployment packages for selected platforms and install the Infrastructure SPIs	1. Make sure that you downloaded the .ISO file for all platforms or obtained the physical DVD. 2. Log on to the management server as administrator. 3. Create a new file with a text editor. 4. Add the following content: `[agent.parameter]`

Registering the Deployment Package, continued

Task	Follow these steps

	`REGISTER_AGENT=YES`
	`[hpinfraspi.parameter]`
	`InfraSPI=YES`
	`InfraSPI_With_Graphs=`
	`InfraSPI_With_Reports=`
	Note: Depending on whether you want to skip the installation of the graph or report packages, set the `InfraSPI_With_Graphs` and `InfraSPI_With_Reports` properties to `YES` or `NO`.
	5. Save the file.
	6. Go to the media root.
	7. From the media root, run the following command:
	cscript oainstall.vbs -i -m -p <*platform*> **-spiconfig** <*file_name*>
	In this instance, <*file_name*> is the name of the file that you created in step 3 (with complete path); <*platform*> is the node platform for which you want to register the deployment package.
	Use the following values for <*platform*>:
	For Windows: WIN
	For HP-UX: HP-UX
	For Linux: LIN
	For Solaris: SOL
	For AIX: AIX
	The command registers the agent deployment packages for the specific platforms on the management server and installs the Infrastructure SPIs.
	You can specify multiple platforms in a single command line. For example, to install deployment packages for AIX and Solaris:
	cscript oainstall.vbs -i -m -p AIX -p SOL

Note: After installation, see Install Report and Graph Packages on a Remote Server if you want to

> install report or graph packages on a remote server.

When OM is in a High-Availability (HA) Cluster

Follow the above steps on the active node in the OM High-Availability (HA) cluster:

After completing the steps, perform the following steps:

1. Fail over to the active node.
2. Go to the `%OvShareDir%server\installation` directory.
3. Run the following command:

   cscript oainstall_sync.vbs

After you run the installation command, the registration procedure begins. Depending on number of selected packages, the registration process may take up to 20 minutes to complete.

Verification

1. On the Management Server, go to the following location:

   On OM for Windows Management Server version 8.xx:

   `%ovinstalldir%bin\OpC\agtinstall`

   On OM for Windows Management Server version 9.xx:

   `%ovinstalldir%bin\win64\OpC\agtinstall`
2. Run the following command:

   cscript oainstall.vbs -inv -listall

   The command shows the list of available (active) deployment packages on the management server.

   To check that the Infrastructure SPIs are installed, run the command with the `-includespi` option.

   cscript oainstall.vbs -inv -includespi -listall
3. Locate the platform for which you installed the deployment package. If the active version is displayed as 12.05, as in the following figure, the registration is successful.

Log File

The registration log file (`oainstall.log`) is available in the following directory:

`%OvDataDir%shared\server\log`

Placement of Packages

When you register the Operations Agent packages on the management server, the `oainstall` program places all necessary deployment packages into the following directory:

`%OvDataDir%shared\Packages\HTTPS`

Backup of Deployment Packages

When you register the deployment packages on the management server, the `oainstall` script saves a copy of the older deployment packages into the following local directory:

`%OvShareDir%server\installation\backup\HPOpsAgt\`*<OS>*`\`*<OA_Version>*`\`*<ARCH>*

To view the active deployment packages, run the following command:

cscript oainstall.vbs -inv

To view all deployment packages (active and backed-up) on the system, run the following command:

cscript oainstall.vbs -inv -listall

To check that the Infrastructure SPIs are installed, run the command with the **-includespi** option.

cscript oainstall.vbs -inv -includespi -listall

Alternate Backup Location

When the default backup location does not have sufficient space to accommodate the backed up deployment packages, you can configure the system to use an alternate backup location.

Run the following command on the management server to use a non-default location to back up the old deployment package:

ovconfchg -ovrg server -ns eaagt.server -set OPC_BACKUP_DIR <*directory*>

In this instance, <*directory*> is the location on your system where you can back up the old deployment packages.

The log file (oainstall.log) created during the installation of deployment packages, is placed inside the backup directory.

Registering the OM on UNIX/Linux Management Server

Register the Deployment Package on the OM Management Server

Prerequisites

- Disk space: 1 GB
- The `oainstall` program installs the Infrastructure SPIs on the management server while registering the deployment package. If you want to install the Infrastructure SPIs, make sure the system meets the following additional requirements:

  Hardware and Software Requirements

  For a list of supported hardware, operating systems, OM version, and agent version, see the *Support Matrix*.

  Disk Space Requirements

Operating System on the Management Server	Temporary Directory[a]	Total Disk Space
Linux	/tmp - 35 MB	90 MB
HP-UX	/tmp - 17 MB	240 MB
Solaris	/tmp - 35 MB	80 MB

  [a]The disk space for the temporary directory/drive is required only during installation. These are approximate values.

  Upgrade Requirements

  You can directly upgrade the Infrastructure SPIs version 2.00 or above to the version 12.05.

  You must install the Operations Agent 12.05 on the management server to be able to register the deployment packages.

Register the Deployment Package

In addition to registering the deployment package for the Operations Agent, the `oainstall` script can install the Infrastructure SPIs on the management server.

However, the capability to install the Infrastructure SPIs is available only with the physical DVD or the electronic media that contains agent packages for all node platforms. Platform-specific media does not include the Infrastructure SPIs.

Choose one of the following tasks based on your requirement:

- Register deployment packages for all platforms and install the Infrastructure SPIs
- Register the deployment package for a specific node platform by using a platform-specific .ISO file
- Register deployment packages for all platforms and install the Infrastructure SPIs without the graph or report package
- Register deployment packages for all platforms, but do not install the Infrastructure SPIs

- Register the Operations Agent deployment packages for select platforms and install the Infrastructure SPIs
- "Register the deployment packages and install the health view package."

Registering the Deployment Package

Task	Follow these steps
Register the Operations Agent deployment packages for all platforms and install the Infrastructure SPIs.	1. Make sure that you downloaded the .ISO file for all platforms or obtained the physical DVD. 2. Log on to the management server as root. 3. Go to the media root. 4. Run the following command: `./oainstall.sh -i -m` 5. Verify the registration process.
Register the Operations Agent deployment package for a specific node platform by using a platform-specific ISO file.	1. Make sure that you downloaded the .ISO file for the node platform of your choice. 2. Log on to the management server as root. 3. Go to the media root. 4. Run the following command: `./oainstall.sh -i -m` 5. Verify the registration process.

Register the Operations Agent deployment packages for all platforms, and install the Infrastructure SPIs, but do not install the graph package.	1. Make sure that you downloaded the .ISO file for all platforms or obtained the physical DVD.
	2. Log on to the management server as root.
	3. Create a new file with a text editor.
	4. Add the following content:
	`[agent.parameter]`
	`REGISTER_AGENT=YES`
	`[hpinfraspi.parameter]`
	`InfraSPI=Yes`
	`InfraSPI_With_Graphs=NO`
	5. Save the file.
	6. Go to the media root.
	7. From the media root, run the following command:

Registering the Deployment Package, continued

Task	Follow these steps
	`./oainstall.sh -i -m -spiconfig <file_name>` In this instance, *<file_name>* is the name of the file that you created in step 3 (with complete path). The command registers the agent deployment packages for all platforms on the management server and installs the Infrastructure SPIs, but skips the installation of the graph package for Infrastructure SPIs.

Register the Operations Agent deployment packages for all platforms, but do not install the Infrastructure SPIs.	1. Make sure that you downloaded the .ISO file for all platforms or obtained the physical DVD.
	2. Log on to the management server as root.
	3. Create a new file with a text editor.
	4. Add the following content:
	`[agent.parameter]`
	`REGISTER_AGENT=YES`
	`[hpinfraspi.parameter]`
	`InfraSPI=NO`
	`InfraSPI_With_Reports=NO`
	`InfraSPI_With_Graphs=NO`
	5. Save the file.
	6. Go to the media root.
	7. From the media root, run the following command:
	`./oainstall.sh -i -m -spiconfig <file_name with complete path>`
	In this instance, *<file_name>* is the name of the file that you created in step 3 (with complete path).
	The command registers the agent deployment packages for all platforms on the management server, but skips the installation of the Infrastructure SPIs.

Register the Operations Agent deployment packages for select platforms and install the Infrastructure SPIs	1. Make sure that you downloaded the .ISO file for all platforms or obtained the physical DVD. 2. Log on to the management server as root. 3. Create a new file with a text editor.

Registering the Deployment Package, continued

Task	Follow these steps

	4. Add the following content:
	`[agent.parameter]`
	
	`REGISTER_AGENT=YES`
	`[hpinfraspi.parameter]`
	`InfraSPI=YES`
	`InfraSPI_With_Graphs=`
	
	Note: If you want to skip the installation of the graph packages, set the `InfraSPI_With_Graphs` property to `NO` else set it to `YES`.
	5. Set the `InfraSPI_With_Graphs` property to `YES` or `NO` depending on whether you want to skip the installation of the graph packages.
	6. Save the file.
	7. Go to the media root.
	8. From the media root, run the following command:
	`./oainstall.sh -i -m -p <platform> -spiconfig <file_name>`
	In this instance, *<file_name>* is the name of the file that you created in step 3 (with complete path); *<platform>* is the node platform for which you want to register the deployment package.
	Use the following values for *<platform>*:
	For Windows: WIN
	For HP-UX: HP-UX
	For Linux: LIN
	For Solaris: SOL
	For AIX: AIX
	The command registers the agent deployment packages for specified platforms on the management server and installs the Infrastructure SPIs.
	You can specify multiple platforms in a single command line. For example, to install deployment packages for AIX and Solaris:

Registering the Deployment Package, continued

Task	Follow these steps
	`./oainstall.sh -i -m -p AIX -p SOL`
Register the Operations Agent deployment packages and install the health view package.	1. Make sure that you have downloaded the .ISO file or obtained the physical DVD of the Operations Agent 12.05. 2. Log on to the server as an administrator. 3. Extract the contents of the .ISO file into a local directory on the server or mount the .ISO file. 4. Go to the media root and run the following command to register the agent deployment packages and install the health view package: `./oainstall.sh –i –m -hv|-healthview` For more information on Health View, see *Operations Agent User Guide: Health View*. To install Operations Agent and enable health monitoring using profile file see *profile file*.

> **Note:** Since Reporter is not supported on UNIX/Linux, you cannot install report packages on the management server and you must set the `InfraSPI_With_Reports` property to `NO`.
>
> After installation, see Install Report and Graph Packages on a Remote Server to install report or graph packages on a remote server.

When OM is in a High-Availability (HA) Cluster

Follow the above steps on the active node in the OM High-Availability (HA) cluster:

After completing the steps, fail over to the passive node, go to the `/var/opt/OV/shared/server/installation` directory on the passive node, and then run the following command:

```
./oainstall_sync.sh
```

After you run the command with necessary options and arguments, the registration procedure begins. Depending on number of selected packages, the registration process may take up to 20 minutes to complete.

Verification

1. On the management server, go to the following location:

   `/opt/OV/bin/OpC/agtinstall`

2. Run the following command:

   ```
   ./oainstall.sh -inv -listall
   ```

   The command shows the list of available (active and backed-up) deployment packages on the management server.

   To check if the Infrastructure SPIs are installed, run the command with the `-includespi` option.

   ```
   ./oainstall.sh -inv -includespi -listall
   ```

3. Locate the platform for which you installed the deployment package. If the active version is displayed as 12.05, the registration is successful.

Log File

The registration log file (`oainstall.log`) is available in the following directory:

```
/var/opt/OV/shared/server/log
```

Placement of Packages

When you register the Operations Agent packages on the management server, the `oainstall` program places all necessary deployment packages into the following directory:

```
/var/opt/OV/share/databases/OpC/mgd_node/vendor
```

Backup of Deployment Packages

When you register the deployment packages on the management server, the `oainstall` script saves a copy of the older deployment packages into the following local directory:

`/var/opt/OV/shared/server/installation/backup/HPOpsAgt/`*<OS>*`/`*<OA_Version>*`/`*<ARCH>*

To view the active deployment packages, run the following command:

```
./oainstall.sh -inv
```

Alternate Backup Location

When the default backup location does not have sufficient space to accommodate the backed up deployment packages, you can configure the system to use an alternate backup location.

Run the following command on the management server to use a non-default location to back up the old deployment package:

```
ovconfchg -ovrg server -ns eaagt.server -set OPC_BACKUP_DIR <directory>
```

In this instance, *<directory>* is the location on your system where you can back up the old deployment packages.

The log file (oainstall.log) created during the installation of deployment packages, is placed inside the backup directory.

Uninstalling the Operations Agent and Infrastructure SPIs Deployment Package

1. On Windows: Log on to the Management Server as an administrator and go to the `%ovinstalldir%bin\OpC\agtinstall` directory.

   On UNIX/Linux: Log on to the Management Server as root and go to the `/opt/OV/bin/OpC/agtinstall` directory.

2. Run the following command to note down the correct version number of the deployment package that you want to remove.

   On Windows

   ```
   cscript oainstall.vbs -inv -listall
   ```

   On UNIX/Linux

   ```
   ./oainstall.sh -inv -listall
   ```

3. Run the following command:

   On Windows

   ```
   cscript oainstall.vbs -r -m -v <version> -p <platform>
   ```

   On UNIX/Linux

   ```
   ./oainstall.sh -r -m -v <version> -p <platform>
   ```

   In this instance, `<version>` the version of the agent deployment package that you want to remove.

   The **-p** option specifies the platform-specific package of the Operations Agent that you want to remove from the management server. Use the following list to specify the platform information in the form of arguments to this option:

   - Linux: LIN
   - Solaris: SOL
   - HP-UX: HP-UX

- AIX: AIX
- Windows: WIN
- All platforms: ALL

For example, to remove a Solaris Operations Agent package, use the command:

```
./oainstall.sh -r -m -v 12.01.XXX -p SOL
```

The options and arguments are case-sensitive.

To remove the Infrastructure SPIs along with deployment packages, run the following command:

On Windows

```
cscript oainstall.vbs -r -m -v <version> -p <platform> -spiconfig
```

On UNIX/Linux

```
./oainstall.sh -r -m -v <version> -p <platform> -spiconfig
```

When you remove the Operations Agent 12.05 deployment packages, the installer program reinstates the highest backed-up version of deployment packages (if available) on the Management Server.

Chapter 4: Prerequisites for Installing the Operations Agent on a Node

For Windows

User

To install the Operations Agent on a Windows node remotely, you must use a user with the administrative privileges. The user must have access to the default system share (the disk on which the **Programs Files** folder is configured) with the following additional privileges:

- Membership of the Local Administrators group
- <*only for remote deployment*> Write access to the admin$ share
- Read and write access to the registry
- <*only for remote deployment*> Permission to log on as a service
- Permission to start and stop services

Necessary Software

Windows Installer 4.5 or later: The Windows Installer software is packaged with the Microsoft Windows operating system. The installer program of the Operations Agent requires the version 4.5 of this software component to be present on the system. To check if the Windows Installer 4.5 or later is present, follow these steps:

1. Log on to the Windows system.
2. From the **Start** menu, open the **Run** prompt.
3. At the **Run** prompt, type **regedit** and then press **Enter**. The Registry Editor window opens.
4. In the Registry Editor window, expand **HKEY_LOCAL_MACHINE > SOFTWARE > Microsoft**, and then click **DataAccess**.
5. In the right pane, double-click **FullInstallVer**. The **Edit String** dialog box opens.
6. In the **Edit String** dialog box, check if the version string is set to 4.5 or higher.

Windows Script Host: The Windows Script Host must be enabled on the system. The installer program of the Operations Agent requires the Windows Script Host to be enabled. To check if the Windows Script Host is enabled, follow these steps:

1. Log on to the Windows system.
2. From the **Start** menu, open the **Run** prompt.
3. At the Run prompt, type **regedit** and then press **Enter**. The Registry Editor window opens.
4. In the **Registry Editor** window, expand **HKEY_LOCAL_MACHINE > SOFTWARE > Microsoft**, and then click **Windows Script Host**.
5. In the right pane, search for the key **Enabled**:
6. If the key **Enabled** is present, double-click the key and make sure the Value Data is set to 1. The **Windows Script Host** is disabled if the Value Data for the **Enabled** key is set to 0.
7. If the key **Enabled** is not present, you can assume that the **Windows Script Host** is enabled.

Necessary Services

Before installing the agent, make sure the following services are running:

- Event Log
- Remote Procedure Call
- Plug and Play
- Security Accounts Manager
- Net Logon
- <only for remote deployment> Remote Registry
- Server
- Workstation

To verify that the above services are running, follow these steps:

1. Log on to the system as an administrator.
2. From the **Start** menu, open the **Run** prompt.
3. At the **Run** prompt, type **services.msc**, and then press **Enter**. The **Services** window opens.
4. Check if the status of each of the above services is ***Started***. If the status of one of the services is other than ***Started***, right-click the service, and then click **Start**.

Disk Space

For new installation

For the installation directory: 350 MB

For the data directory: 50 MB

For upgrade from old agent software

For the installation directory: 100 MB

For the data directory: 50 MB

Recommended Software and Services

For WMI Interceptor policies: The Windows Management Instrumentation service must be available on the system if you want to:

- Deploy the WMI Interceptor policies or measurement threshold policies to monitor WMI events and classes.
- Perform automatic service discovery on the node.

For SNMP MIB monitoring: If you want to monitor objects in an SNMP Management Information Base (MIB) on the agent system, make sure the SNMP agent (compliant with MIB-I and MIB-II) is installed on the system.

For OM actions and tools: For launching OM actions and tools on the node, the NT LM Security Support Provider service must be running.

For Linux

User

To install the Operations Agent on a Linux node, you must be a user with root privileges.

Necessary Software

To install the Operations Agent, the following runtime libraries and packages are required:

- On x64 systems:
  - To check for the packages, use the following command:

    ```
    rpm -qa | grep -i <packagename>
    ```

    In this instance, `<packagename>` is the name of the package to be checked.
  - libstdc++33-32bit-3.3.3-7.8.1.x86_64.rpm and above

    > **Note:** Make sure that libstdc++33-32bit-3.3.3-7.8.1.x86_64.rpm is installed before you install Operations Agent 12.05 on SLES10 SP4 x64 system. This rpm is applicable only for SUSE Linux Enterprise Server 10 and later.

- C++ runtime:
  - For systems with kernel version 2.6:
    `libstdc++.so.5`
- Only required for Glance- Curses runtime library:
  `libncurses.so.5`

  > **Note:** Make sure that the `libncurses.so.5` library is present at the following path:
  >
  > **On Linux (64-bit systems)**
  >
  > `/usr/lib64/libncurses.so.5` or `/lib64/libncurses.so.5`
  >
  > **On Linux (32-bit systems)**
  >
  > `/usr/lib/libncurses.so.5 or /lib/libncurses.so.5`
- Make sure that the m4 utility is installed at the path `/usr/bin/m4.`

If you want to remotely install the agent from the OM for Windows console, make sure OpenSSH 5.2 or later is installed on the system.

Disk Space

For new installation

For the installation directories (`/opt/OV` and `/opt/perf`): 350 MB

For the data directories (`/var/opt/OV` and `/var/opt/perf`): 350 MB

For upgrade

For the installation directories (`/opt/OV` and `/opt/perf`): 100 MB

For the data directories (`/var/opt/OV` and `/var/opt/perf`): 350 MB

> **Note:** If you do not have sufficient space in the installation or data directory, you can symbolically link the install or data directory to another location on the same system by using the `ln -s` command.
> For example, to symbolically link the `/opt/OV` directory to the `/new` directory, run the following command:
> `ln -s /new /opt/OV`

Recommended Software and Services

For SNMP MIB monitoring: If you want to monitor objects in an SNMP Management Information Base (MIB) on the agent system, make sure the SNMP agent (compliant with MIB-I and MIB-II) is installed on the system.

For xglance: To use the **xglance** utility, make sure the following components are available on the system:
Open motif toolkit 2.2.3 (On Linux platforms other than Red Hat Enterprise Linux 5.x and SUSE Linux Enterprise Server 10.x on x86_64 and Itanium, the 32-bit version of the Open motif toolkit and associated libraries must be present.)

For HP-UX

User

To install the Operations Agent on an HP-UX node, you must be user with root privileges.

Necessary Software

On HP-UX, make sure that the following patches are installed:

- *For HP-UX 11.31.* qpkbase package September 2013 (or superseding patch)
- *For HP-UX 11.23.* PHKL_36853, PHCO_38149 (or superseding patch)
- *For HP-UX 11i v1.* PHNE_27063 (or superseding patch)
- *For HP-UX 11i v1.* PHCO_24400 s700_800 11.11 libc cumulative patch (or superseding patch)
- *For HP-UX 11.11 PA-RISC.* PHCO_38226 (or superseding patch)
- *For HP-UX 11i v1.* The following patches are required for the performance tools to function with VERITAS Volume Manager 3.2:
  - PHKL_26419 for HP-UX B.11.11 (11.11) (or superseding patch)
  - PHCO_26420 for HP-UX B.11.11 (11.11) (or superseding patch)

On HP-UX systems running on Itanium, the `libunwind` library must be available.

If multiple processor sets are configured on an HP-UX 11i v1 system and you are using the log application=prm switch in the parm file to log APP_ metrics by the PRM Group, you must install the following patch:

PHKL_28052 (or superseding patch)

On HP-UX 11i v1 and higher, the performance tools work with Instant Capacity on Demand (iCOD). The following kernel pstat patch should be installed to correctly report iCOD data (If iCOD is not installed on your system, do not install the kernel patch.):

PHKL_22987 for HP-UX B.11.11 (11.11) (or superseding patch)

Make sure that the m4 utility is installed at the path `/usr/bin/m4`.

GlancePlus, included in this version of the Operations Agent, works with Process Resource Manager (PRM) version C.03.02.

HP-UX 11.11 and higher running EMC PowerPath v2.1.2 or v3.0.0 must have the latest EMC patches installed.

- For the EMC PowerPath v2.1.2 release, use the following patch: EMCpower_patch213 HP.2.1.3_b002 (or superseding patch)
- For the EMC PowerPath v3.0.0 release, use the following patch: EMCpower_patch301 HP.3.0.1_b002 (or superseding patch)

To install Operations Agent using the single depot package on HP-UX IA nodes, you must install the following patch:

qpkbase for HP-UX B.11.31.1309.397 (or superseding patch)

> **Note:** To install Operations Agent 12.01 on HP-UX nodes from the Operations Manager for Linux or Operations Manager for Unix version 9.xx, you must install the following hotfix on the management server:
>
> **QCCR1A184835**
>
> Contact Support to obtain the hotfix.

Disk Space

For new installation

For the installation directories (`/opt/OV` and `/opt/perf`): 830 MB

For the data directories (`/var/opt/OV` and `/var/opt/perf`): 800 MB

For upgrade

For the installation directories (`/opt/OV` and `/opt/perf`): 830 MB

For the data directories (`/var/opt/OV` and `/var/opt/perf`): 800 MB

> **Note:** If you do not have sufficient space in the installation or data directory, you can symbolically link the install or data directory to another location on the same system by using the `ln -s`

> command.
> For example, to symbolically link the `/opt/OV` directory to the `/new` directory, run the following command:
> `ln -s /new /opt/OV`

Recommended Software and Services

For SNMP MIB monitoring: If you want to monitor objects in an SNMP Management Information Base (MIB) on the agent system, make sure the SNMP agent (compliant with MIB-I and MIB-II) is installed on the system.

For Solaris

User

To install the Operations Agent on a Solaris node, you must use a user with the root privileges.

Necessary Software

- *For all supported Solaris versions.* Make sure the following packages are available:
  - SUNWlibC
  - SUNWlibms

    To check for packages, use the following command:

    `pkginfo <packagename>`

    In this instance, `<packagename>` is the name of the package.
- Make sure that the m4 utility is installed at the path `/usr/xpg4/bin/m4` or `/usr/ccs/bin/m4`.

Disk Space

For new installation

For the installation directories (`/opt/OV` and `/opt/perf`): 350 MB

For the data directories (`/var/opt/OV` and `/var/opt/perf`): 350 MB

For upgrade

For the installation directories (`/opt/OV` and `/opt/perf`): 100 MB

For the data directories (`/var/opt/OV` and `/var/opt/perf`): 350 MB

> **Note:** If you do not have sufficient space in the installation or data directory, you can symbolically link the install or data directory to another location on the same system by using the `ln -s` command.
> For example, to symbolically link the `/opt/OV` directory to the `/new` directory, run the following command:
> `ln -s /new /opt/OV`

Recommended Software and Services

For SNMP MIB monitoring: If you want to monitor objects in an SNMP Management Information Base (MIB) on the agent system, make sure the SNMP agent (compliant with MIB-I and MIB-II) is installed on the system.

For xglance: To use the **xglance** utility, make sure the following components are available on the system:

- SUNWmfrun
- SUNWxwplt

For AIX

User

To install the Operations Agent on an AIX node, you must use a user with the root privileges.

To check for specific packages on the AIX node, use the following command:

`lslpp –l | grep –i <packagename>`

In this instance, `<packagename>` is the name of the package.

Necessary Software

- The `libC.a` library is required for the GlancePlus to function correctly. The library is bundled within the **xlC.rte** package, which is available from your AIX Operating System optical media.
- The `bos.perf.libperfstat` package is required for the communication daemon.
- If you want to remotely install the agent from the OM for Windows console, make sure OpenSSH 5.2 or higher is installed on the system.
- Make sure that the m4 utility is installed at the path `/usr/bin/m4`.

Disk Space

For new installation

For the installation directory (`/usr/lpp/OV` and `/usr/lpp/perf`): 350 MB

For the data directory (`/var/opt/OV` and `/var/opt/perf`): 350 MB

For upgrade

For the installation directory (`/usr/lpp/OV` and `/usr/lpp/perf`): 350 MB

For the data directory (`/var/opt/OV` and `/var/opt/perf`): 350 MB

> **Note:** If you do not have sufficient space in the installation or data directory, you can symbolically link the install or data directory to another location on the same system by using the `ln -s` command.
> For example, to symbolically link the `/usr/lpp/OV` directory to the `/new` directory, run the following command:
> `ln -s /new /usr/lpp/OV`

Recommended Software and Services

For SNMP MIB monitoring: If you want to monitor objects in an SNMP Management Information Base (MIB) on the agent system, make sure the SNMP agent (compliant with MIB-I and MIB-II) is installed on the system.

For xglance: To use the **xglance** utility, make sure the following components are available on the system:

- Open Motif 2.1 or higher
- X11 Revision 6 (X11R6)

To collect and log cross-partition metrics, the `xmservd` or `xmtopas` daemon must be available. `xmtopas` is a part of `perfagent.tools` file set and `xmservd` is bundled with the Performance Toolbox for AIX component (a licensed software program).

For Debian and Ubuntu

User

To install the Operations Agent on a Debian or Ubuntu node, you must log on with the root privileges.

Necessary Software

To install the Operations Agent, the following runtime libraries and packages are required. You can run the following command to list the packages:

```
dpkg –l | grep -i <package_name>
```

- C++ runtime:
  - For systems with kernel version 2.6: `/lib/libstdc++.so.5`
  - For systems with kernel version 2.6 on Itanium : `/lib/libstdc++.so.6`
- **Only required for Glance**- Curses runtime library: `/lib/libncurses.so.5`
- Make sure that the m4 utility is installed at the path `/usr/bin/m4.`
- Debian libraries:
  - libgcc 4.7.2 and above
  - libstdc++6 4.7.2 and above
  - libc 2.13 and above
  - libncurses5 5.9 and above
- Ubuntu libraries:
  - libc 2.19 and above
  - libstdc++6 4.8.2 and above
  - libgcc 4.8.2 and above
  - libncurses5 5.9 and above

Disk Space

For new installation

For the installation directories (`/opt/OV` and `/opt/perf`): 350 MB

For the data directories (`/var/opt/OV` and `/var/opt/perf`): 350 MB

For upgrade

For the installation directories (`/opt/OV` and `/opt/perf`): 100 MB

For the data directories (`/var/opt/OV` and `/var/opt/perf`): 350 MB

> **Note:** If you do not have sufficient space in the installation or data directory, you can symbolically link the install or data directory to another location on the same system by using the `ln -s` command.
> For example, to symbolically link the `/opt/OV` directory to the `/new` directory, run the following

> command:
> `ln -s /new /opt/OV`

To remotely install the Operations Agent from the OM for Windows console, make sure that the OpenSSH 5.2 or higher is installed on the system.

Upgrade Notes

You can upgrade an older version of the Operations Agent, Performance Agent or GlancePlus to the Operations Agent. The following version can be directly upgraded to the Operations Agent 12.05:

- Operations Agent 11.xx
- Performance Agent 11.xx
- GlancePlus 11.xx

The installation of the Operations Agent 12.05 fails if any agent software older than 11.xx is installed. Before installing the Operations Agent 12.05 on nodes with the Operations Agent older than 11.xx, the Performance Agent older than 11.xx or GlancePlus older than 11.xx, do one of the following:

- Upgrade the agent software to the version 11.xx and then upgrade to the Operations Agent 12.05.

  This is the preferred method of upgrade. This method ensures necessary packages and policies are retained on the node.

- Remove the agent software completely and then install the Operations Agent 12.05.

  This may result in removal of policies and instrumentation files from the node. After upgrading to the Operations Agent 12.05, make sure necessary policies and instrumentation files are deployed on the node again.

Check the Version of the Existing Agent

On Windows

1. Log on to the node as an administrator.
2. Open a command prompt.
3. Run the following command:

   ```
   opcagt -version
   ```

If the command output shows that the version of the existing Operations Agent is lower than 11.xx, you must do one of the following:

- Upgrade the Operations Agent to the version 11.xx and then upgrade to the Operations Agent 12.05.
- Remove the installed version of the Operations Agent completely and then install the Operations Agent 12.05.

4. Check the version of the Performance Agent:
   a. Open a command prompt.
   b. Run the following command:

      ```
      perfstat -v
      ```

      The command output shows the versions of different components of the Performance Agent. If the version of the component **ovpa.exe** is lower than 11.xx, you must upgrade to the version 11.xx or completely remove the installed version of the Performance Agent and then upgrade to the Operations Agent 12.05.

On UNIX/Linux

1. Log on to the node as an administrator.
2. Open a command prompt.
3. Run the following command:

   ```
   opcagt -version
   ```

   If the command output shows that the version of the existing Operations Agent is lower than 11.xx, you must do one of the following:

   - Upgrade the Operations Agent to the version 11.xx and then upgrade to the Operations Agent 12.05.
   - Remove the installed version of the Operations Agent completely and then install the Operations Agent 12.05.

4. Check the version of the Performance Agent:
   a. Open a command prompt.
   b. Run the following command:

      ```
      perfstat -v
      ```

      The command output shows the versions of different components of the Performance Agent. If the version of the component **ovpa** is lower than 11.xx, you must upgrade to the version

11.xx or completely remove the installed version of the Performance Agent and then upgrade to the Operations Agent 12.05.

5. Check the version of GlancePlus:
   a. Open a command prompt.
   b. Run the following command:

      ```
      perfstat -v
      ```

      The command output shows the versions of different components of the Performance Agent and GlancePlus. If the version of the component **glance** is lower than 11.xx, you must upgrade to the version 11.xx or completely remove the installed version of GlancePlus and then upgrade to the Operations Agent 12.05.

Data Collection and Storage with the Operations Agent 12.05

With the Operations Agent version 12.05, the CODA and scope processes (Scopeux on UNIX and Linux nodes and Scopent on Windows nodes) are consolidated into a single process called **oacore**. The **oacore** process provides both read and write interface for system performance and custom data.

The data collector –**oacore**–captures the following information:

- System-wide resource utilization information
- Process data
- Performance data for different devices
- Transaction data
- Logical systems data

The Collection Parameters file or the **parm** file contains the instructions for the data collector to collect specific types of data and defines the data collection interval. This is an ASCII file that you can use to customize the default data collection mechanism. For more information, see the *Operations Agent User Guide.*

The data collector gathers a large set of system performance metrics, which presents a wide view of the health and performance of the system. The collected information is stored in the **Metric Data Store**.

Metric Data Store

With the Operations Agent version 12.05, Metric Data Store replaces the log file based data store. Multiple data stores such as CODA, SCOPE, and DSI log files have been consolidated into a single Relational Database Management System (RDBMS) based data store. The RDBMS used is SQLite. Data stored in the Metric Data Store is available on the system for analysis and use with tools like **Performance Manager** and **Reporter**.

Old data stored in the CODA database files, SCOPE log files and the DSI log files are retained in read-only mode. You can access the old data through utilities such as `ovcodautil`, `extract`, or through reporting tools such as **Performance Manager** and **Reporter**.

Despite the change in the data collection and data storing mechanism, threshold comparison process through policies remains the same.

Upgrading on a Solaris SPARC Management Server with Solaris SPARC Managed Nodes

If you are using a Solaris SPARC management server with Operations Agent 8.60; follow the steps to ensure the SPARC nodes communicate with SPARC management server:

1. Log on to the Management Server as an administrator.
2. Run the following command to check the version of the Software Security Core (OvSecCo) component:

   ```
   strings /opt/OV/lib/libOvSecCore.so | grep FileV
   ```

   - If the version of the Software Security Core (OvSecCo) component is 06.20.077 (or higher), then upgrade the Operations Agent to the version 12.05 on the Solaris SPARC management server.
   - If the version of the Software Security Core (OvSecCo) component is 06.20.050 then follow the steps:
     i. On the Solaris SPARC node, upgrade to the Operations Agent version 12.05.
     ii. Apply the hotfix QCCR1A97520 on the Management Server (contact Support to obtain this hotfix).

     > **Note:** Run the following command on the management server to verify if the version of the HPOvSecCo component is upgraded to 06.20.077
     >
     > ```
     > strings /opt/OV/lib/libOvSecCore.so | grep FileV
     > ```

iii. On the Solaris SPARC OM management server, upgrade the Operations Agent to version 12.05.

This hotfix ensures that the SPARC nodes with the Operations Agent 12.05 can communicate with the SPARC management server that includes the HPOvSecCo component, version 06.20.050. If you do not install this hotfix on the SPARC management server, the SPARC nodes with the Operations Agent 12.05 cannot communicate with the SPARC management server.

Preinstallation Task: Installing the Operations Agent and Infrastructure SPIs on OM in Cluster

If installed in a high-availability (HA) cluster environment, the Operations Agent does not fail over when the active system in the cluster fails over to another system. However, the Operations Agent can help you monitor cluster-aware applications running in a cluster.

You must install the Operations Agent on every node that belongs to the cluster. Installing the agent in a cluster does not involve any additional steps or any special configuration. However, to install the agent on an OM management server that runs in a cluster requires additional configuration steps.

For OM for Windows

1. Make sure the OM database is up and running.
2. Log on to the active management server as an administrator.
3. Set the active node to the maintenance outage mode by running the following command:

   ```
   ovownodeutil -outage_node -unplanned -node_name <FQDN_of_node> -on
   ```

4. Install the agent on the active server by following instructions in "Installing from the OM Console" or "Installing the Operations Agent and Infrastructure SPIs Manually on the Node".
5. Perform step 3 and 4 on each node in the cluster.

In this instance:

`<FQDN_of_node>` is the fully-qualified domain name of the active node.

For OM on UNIX/Linux

1. Log on to the active management server as an administrator.
2. Disable monitoring of the HA resource group on the active node by setting the maintenance mode for the node:

   Run the following command on the active node:

   ```
   /opt/OV/lbin/ovharg -monitor <HA_resource_group_name> disable
   ```

   In this instance:

   `<HA_resource_group_name>` is the HA resource group for OM on the management server.
3. Install the agent on the active server by following instructions in "Installing from the OM Console" or "Installing the Operations Agent and Infrastructure SPIs Manually on the Node".

   Make sure the shared disk is mounted at the time of installation.
4. Perform step 3 on each node in the cluster.
5. Once installation is completed, server resource group monitoring should be enabled again.

Chapter 5: Installing the Operations Agent from OM or OMi Console

> **Note:** If the node hosts another HPE Software product, make sure to stop all the processes of the product prior to the agent installation. You can start the processes after the agent installation is complete.

From OM for Windows

To install the Operations Agent on managed nodes from the OM console, follow the *Remote agent installation* section in the *Operations Manager for Windows Online Help*.

For information on installing agent from the management server to a remote node, see "Configure the Agent Remotely from an OM for Windows Management Server" on page 160.

From OM on UNIX/Linux

To install the Operations Agent on managed nodes from the OM on UNIX/Linux console, follow the *OM for UNIX: New Agent Installation* topic in the *OM on UNIX/Linux Online Help*.

> **Note:** When you are installing Operations Agent for the first time, remotely from the OM UNIX/Linux console on the Linux (Debian) Operating system, do not select the `force` option. This installs the Operations Agent twice.

> **Note:** You can install the Operations Agent 12.01 only on HP-UX IA64 systems with the patch level qpkbase package September 2013 or superseding patches. Remote installation of Operations Agent 12.01 from the OM management server to a HP-UX IPF32 node will fail as the required agent binary format for Operations Agent 12.01 is HP-UX IPF64.

From OMi

Operations Manager i (OMi) is the event management foundation for a complete Business Service Management (BSM) monitoring solution. You can integrate Operations Agent with OMi. After the installation of the Operations Agent on a node, you must connect the Operations Agent to OMi and then grant the agent's certificate request in OMi.

For more information about integrating Operations Agent with OMi, see the section *Connecting Operations Agents to OMi* in the chapter *Monitored Nodes* in the *OMi Administration Guide*.

Chapter 6: Installing the Operations Agent in a Single Step

The Operations Agent 12.05 single step installer enables you to install the base version of Operations Agent along with patches and hotfixes. The installer first installs the base version of the Operations Agent on the system, and then installs any updates if available with the patches, followed by any available hotfix.

You can use the `oainstall` script to install Operations Agent locally on a managed node or you can use the `ovdeploy` command to remotely install the Operations Agent on a managed node from the management server.

If you use the single step installer to install the Operations Agent, the time taken for installation is reduced on all platforms. The following table lists all the changes in the installation process for Operations Agent 12.05:

Comparing previous versions of Operations Agent with version 12.05

Previous versions of Operations agent	Operations Agent 12.05
The pre-requisite check occurs thrice during the installation process of Operations Agent. Each before installation of the base version of agent, patch, and hotfix. INFO: Validating pre-requisites for installation on <system_name> ..... STATUS: All checked prerequisites are OK. INFO: <system_name> meets all pre-requisites	The pre-requisites check occurs only once before the installation of the Operations Agent 12.05 along with the patch and hotfix in a single step. INFO: Operations-agent install options are: -install INFO: Validating pre-requisites for installation on <system_name> Requirements:
INFO: Operations agent installation started ========== INFO: Validating pre-requisites for installation on <system_name> ..... STATUS: All checked prerequisites are OK. INFO: <system_name> meets all pre-requisites	[PASS] Is user root ..... [PASS] Check if m4 is installed STATUS: All checked prerequisites are OK. INFO: <system_name> meets all pre-requisites

Comparing previous versions of Operations Agent with version 12.05, continued

INFO: Operations agent Patch: OAHPUX_00031 installation started ========== INFO: Validating pre-requisites for installation on <system_name> ..... STATUS: All checked prerequisites are OK. INFO: <system_name> meets all pre-requisites INFO: Operations agent Hotfix: HFHPUX_13018 installation started ==========	========== INFO: Operations agent installation started ==========
Configuration of the Operations Agent occurs multiple times during the installation process.	Configuration of the Operations Agent occurs only once during the installation process of Operations Agent 12.05, patch, and hotfix in a single step.
The activation of the Operations Agent occurs thrice during the installation process. Each after the installation of the base version of agent, patch, and hotfix.	The activation of the Operations Agent occurs only once at the end of the installation of Operations Agent 12.05, patch, and hotfix.
The installer pauses the installation process of the Operations Agent if the certificate is not auto granted.	The installer does not pause the installation of the Operations Agent 12.05 in case the certificate is not auto granted.

Installing the Operations Agent using Single Step

Follow the steps:

1. Log on to the node as an administrator.
2. Download and extract the media, patches, and hotfix packages to the same directory.
3. Go to the directory where you extracted the bits.
4. Run the following command:

   On Windows

   ```
   cscript oainstall.vbs –i -a
   ```

On UNIX

```
./oainstall.sh -i -a
```

Deploying Patches and Hotfixes using Single Step Installer

From OM for Windows Management Server

If the Operations Agent 12.05 is already installed on a node, follow the steps to install patches and hotfixes:

> **Note:** Before installing patches and hotfixes, you must apply the hotfix QCCR1A174773. Contact Support to obtain the hotfix.

1. In the console tree, right-click the node (where you want to install the patches and hotfixes), and then click **All Tasks > Reinstall/Update**. The **Reinstall/Update Node** dialog box appears.
2. Select **Update**, select **Packages** in the **Scope** section, clear the **Deploy only if version is newer** check box, and then click **OK**.
3. After the installation is complete, go to the console tree on the OM console, right-click the node, and then click **All Tasks > Synchronize inventory> Packages**.

All available patches and hotfixes are installed on the node.

> **Note:** On a node with Operations Agent 12.05, if you upgrade a patch or hotfix, only those patches and hotfixes that are not available on the node are transferred and installed. Thus the installation time is reduced.

For more information, see Installing from the OM Console.

From OM for Linux Management Server

Follow the steps to install patches and hotfixes:

1. On the console, select the option **(De) Install Agent** from the **Deployment** drop-down.
2. From the **Install Type** drop-down, select **Installation**.
3. Select a node and then click the **Preinstall Check** button. The **Install Agent** window appears.
4. In the **Install Agent** window, ensure that the node is selected. Depending on the original state of

the node, perform one of the following:

- If the node does not have any version of the Operations Agent installed, select the **Force** check box in the **Install Agent** window and then click the **Install On Selected Nodes** button. OM installs the Operations Agent versions 12.05, patch and hotfix.
- If the Operations Agent 12.05 is already installed on the node, select the **Force** check box in the **Install Agent** window and then click the **Install On Selected Nodes** button. All available patches and hotfixes are installed on the node.

> **Note:** If the node has older version of Operations Agent that cannot be upgraded to the version 12.05 then the installation fails.
>
> If the node has a version of Operations Agent that can be upgraded to the version 12.05, the existing Operations Agent is upgraded to the version 12.05, and then the patches and hotfixes are installed (this two-step upgrade takes place automatically and no additional steps are involved).

For more information, see Installing from the OM Console.

Verifying the Installation

Run the following command:

```
ovdeploy –inv –includeupdates.
```

The command lists the version of the base, patch, and hotfix components.

Chapter 7: Installing Operations Agent using Profile File

You can use a *profile* file during the installation (manual installation) to program the agent to run with non-default configuration settings (such as the communication port, event interceptor port or the license type).

> **Note:**
> - With Operations Agent version 12.05, all install time configurable values must be added in the profile file under the new namespace `nonXPL.config`. The configurable values added under the namespace `nonXPL.config` will not be uploaded on the `xpl.config` settings.
> - Operations Agent does not support comments in profile file.

You can modify the default profile file available on the Operations Manager or manually create a profile file on the Operations Agent node.

Modifying the Default Profile file on the OM for Windows Console

Follow the steps:

1. Log on to the Management Server as an administrator.
2. Go to the directory `%ovdatadir%shared\conf\PMAD`.
3. Rename the `agent_install_defaults.cfg. sample` file to `agent_install_defaults.cfg`.

   > **Tip:** Take a backup of the `agent_install_defaults.cfg.sample` file.

4. Open the `agent_install_defaults.cfg` file with a text editor and use the following syntax to configure non-default values for agent variables:

   ```
   [<namespace>]
   <variable>=<value>
   ```

   In this instance:

   <*namespace*> is the configuration variable namespace.

   <*variable*> is the variable that you want to configure.

   <*value*> is the value you want to assign to the variable.

5. Save the file and then follow the steps to install the Operations Agent using a Profile File.

Modifying the Default Profile file on the OM for UNIX Console

Follow the steps:

1. Log on to the management server with the root privileges.
2. Go to the directory `/etc/opt/OV/share/conf/OpC/mgmt_sv.`
3. Rename the file `bbc_inst_defaults.sample` to `bbc_inst_defaults`.
4. Open the file `bbc_inst_defaults` with a text editor and use the following syntax to configure non-default values for agent variables:

   `[<namespace>]`

   `<variable>=<value>`

   In this instance:

   <*namespace*> is the configuration variable namespace

   <*variable*> is the variable that you want to configure

   <*value*> is the value you want to assign to the variable
5. Save the file and then follow the steps to install the Operations Agent using a Profile File.

Creating the Profile File Manually on the Node:

Follow the steps :

1. On the system where you want to install the agent, create a new file and open the file with a text editor.
2. Type the following syntax to configure agent variables to use a non-default value:

   `set<namespace>:<variable>=<value>`

   In this instance:

   `<namespace>` is the configuration variable namespace

   `<variable>` is the variable that you want to configure

   `<value>` is the value you want to assign to the variable
3. Save the file into a local directory.

Key features that you can configure during installation

Feature	Modifying Profile File on OM	Creating Profile File Manually
MODE: At the time of installation, you can configure the user that the agent runs under. The `MODE` variable enables to choose a non-default user that can be used by the agent while running on the system.	To configure the agent to run under a non-root/non-privileged user, add the following content: **[eaagt]** **MODE=NPU** **SNMP_TRAP_PORT=1162** **OPC_RPC_ONLY=TRUE** **[bbc.cb]** **SERVER_PORT=<Port number >** **[ctrl.sudo]** **OV_SUDO_USER=<NPU user name>** **OV_SUDO_GROUP=<NPU group name>** To configure the agent to run only the Operations Monitoring Component under a non-root/non-privileged user, add the following content (the rest of the agent runs with root/Local System): **[eaagt]** **MODE=MIXED** **NPU_TASK_SET=EVENT_ACTION** **[bbc.cb]** **SERVER_PORT=<Port number > 1024 >** **[ctrl.sudo]** **OV_SUDO_USER=<NPU user name>** **OV_SUDO_GROUP=<NPU**	To configure the agent to run under a non-root/non-privileged user, add the following content: **set eaagt:MODE=NPU** **set eaagt:SNMP_TRAP_PORT=1162** **set eaagt:OPC_RPC_ONLY=TRUE** **set bbc.cb:SERVER_PORT=<Port number >** **set ctrl.sudo:OV_SUDO_USER=<NPU user name>** **set ctrl.sudo:OV_SUDO_GROUP=<NPU group name>** To configure the agent to run only the Operations Monitoring Component under a non-root/non-privileged user, add the following content (the rest of the agent runs with root/Local System): **set eaagt:MODE=MIXED** **set eaagt:NPU_TASK_SET=EVENT_ACTION** **set bbc.cb:SERVER_PORT=<Port number > 1024 >** **set ctrl.sudo:OV_SUDO_USER=<NPU user name>** **set ctrl.sudo:OV_SUDO_GROUP=<NPU group name>** In addition, you must configure a set of variables in the similar fashion to enable the agent to run under a non-default user. See the *Configure the Agent User During Installation* section in the *Operations Agent User Guide* for detailed information. > **Note:** On a windows system, to install Operations Agent in NPU mode you must run the following command: > `%OvInstallDir%bin\win64\OpC\install\cscript oainstall.vbs -i -a -agent_profile <path>\<profile_file> -npu_`

Key features that you can configure during installation, continued

Feature	Modifying Profile File on OM	Creating Profile File Manually

	group name>
	In addition, you must configure a set of variables in the similar fashion to enable the agent to run under a non-default user. See the *Configure the Agent User During Installation* section in the *Operations Agent User Guide* for detailed information.
		`password <password>`
		On a windows system if the Operations Agent is in NPU mode, you must provide the NPU password in the command line to remove patches or hotfixes.
		`%OvInstallDir%bin\win64\OpC\install\ cscript oainstall.vbs -r -a -npu_ password <password>`

CREATE_ DEFAULT_ USER: At the time of installation, the *opc_op* user is created as a default behavior. You can disable the option by using CREATE_ DEFAULT_ USER variable.	Add the following content in the profile file to disable the creation of `opc_op` user: **[nonXPL.config]** **CREATE_DEFAULT_ USER=FALSE**	Add the following content in the profile file to disable the creation of `opc_op` user: **set nonXPL.config:CREATE_DEFAULT_ USER=FALSE**
DISBALE_ REALTIME: At the time of installation, use the DISBALE_ REALTIME variable to disable the real-time monitoring component .	Add the following content in the profile file to disable the real-time monitoring component: **[nonXPL.config]** **DISABLE_ REALTIME=TRUE**	Add the following content in the profile file to disable the real-time monitoring component: **set install.config:DISABLE_ REALTIME=TRUE**
ENABLE_ DNSCHK and ENABLE_ PORTCHK: *Only for UNIX machines:* At the time of	Add the following content in the profile file to enable the pre-requisite check for DNS validation: **[nonXPL.config]** **ENABLE_DNSCHK=TRUE**	Add the following content in the profile file to enable the pre-requisite check for DNS validation: **set nonXPL.config:ENABLE_ DNSCHK=TRUE** Add the following content in the profile file to enable the pre-requisite check for port validation:

Key features that you can configure during installation, continued

Feature	Modifying Profile File on OM	Creating Profile File Manually
installation, you can enable or disable the pre-requisite check for DNS validation and availability of port 383 of the management and certificate server by using ENABLE_ DNSCHK variable and ENABLE_ PORTCHK variable respectively.	Add the following content in the profile file to enable the pre-requisite check for port validation: **[nonXPL.config]** **ENABLE_ PORTCHK=TRUE** These prerequisite checks are only enabled if the values are set as TRUE in the profile file.	**set nonXPL.config:ENABLE_ PORTCHK=TRUE** These prerequisite checks are only enabled if the values are set as TRUE in the profile file.
INSTALL_ REMOVESIGN You can disable the signature checks to reduce the installation time in Windows. You can disable the option by using INSTALL_ REMOVESIGN variable.	Add the following content in the profile file to disable the signature checks at the installation time: **[nonXPL.config]** **INSTALL_ REMOVESIGN=True**	Add the following content in the profile file to disable the signature checks at the installation time: **set nonXPL.config:INSTALL_ REMOVESIGN=True**
Licensing: If you install the agent manually on a node (that is, without using the OM console), no evaluation licenses are enabled automatically after installation.	For example, if you want to apply the HP Operations OS Inst Adv SW LTU permanently, add the following content: **[eaagt.license]** **HP_Operations_OS_Inst_ Adv_SW_ LTU=PERMANENT**	For example, if you want to apply the HP Operations OS Inst Adv SW LTU permanently, add the following content: **set eaagt.license:HP_Operations_OS_Inst_ Adv_SW_LTU=PERMANENT**

Key features that you can configure during installation, continued

Feature	Modifying Profile File on OM	Creating Profile File Manually
You can configure license-specific variable in the profile file to apply a license-to-use (LTU) of your choice at the time of installation. For detailed information on applying licenses at the time of installation with a profile file, see the *Operations Agent License Guide*.		
Perfd and ttd variables At the time of installation, you can set the options for **perfd** and **ttd** component.	Add the following content in the profile file for **perfd** component: **[nonXPL.config.perfd]** **interval=value** Set the interval to any value. **[nonXPL.config.perfd]** **ipv4=TRUE** Set the IPv4 connection. **[nonXPL.config.perfd]** **add="gbl,fs,dsk"** - Add the data formats and file extensions. Add the following content in the profile file for **ttd** component: **[nonXPL.config.ttd]**	Add the following content in the profile file for **perfd** component: **set nonXPL.config.perfd:interval=value**- set the interval to any value. **set nonXPL.config.perfd:ipv4=TRUE** - set the IPv4 connection. **set nonXPL.config.perfd:add="gbl,fs,dsk"** - add the data formats and file extensions. Add the following content in the profile file for **ttd** component: **set nonXPL.config.ttd:SEM_KEY_ PATH=/var/opt/perf/datafiles** **set nonXPL.config.ttd:tran=* range=1,2,3,5,10,30,120,300 slo=15.0** **set nonXPL.config.ttd:app=[HP Perf Tools] tran=Scope_Get_Global_Metrics range=0.5,1.0,1.5,2,3,5,8,10,15 slo=5** **set nonXPL.config.ttd:app=[<user_defined name> Perf Tools] tran=Get_Process_Metrics**

Key features that you can configure during installation, continued

Feature	Modifying Profile File on OM	Creating Profile File Manually
	SEM_KEY_ PATH=/var/opt/perf/datafiles **tran=* range=1,2,3,5,10,30,120,300 slo=15.0** **app=[HP Perf Tools] tran=Scope_Get_Global_ Metrics range=0.5,1.0,1.5,2,3,5,8,10 ,15 slo=5** **app=[<user_defined name> Perf Tools] tran=Get_ Process_Metrics range=0.5,1.0,1.5,2,3,5,8,10 ,15 slo=10** **app=[HP Perf Tools1] tran=Scope_Get_Process_ Metrics range=0.5,1.0,1.5,2,3,5,8,10 ,15 slo=25** **app=[HP Perf Tools] tran=Get_Process_Metrics range=0.5,1.0,1.5,2,3,5,8,10 ,15 slo=10**	**range=0.5,1.0,1.5,2,3,5,8,10,15 slo=10** **set nonXPL.config.ttd:app=[HP Perf Tools1] tran=Scope_Get_Process_Metrics range=0.5,1.0,1.5,2,3,5,8,10,15 slo=25** **set nonXPL.config.ttd:app=[HP Perf Tools] tran=Get_Process_Metrics range=0.5,1.0,1.5,2,3,5,8,10,15 slo=10**
IGNORE_ LOCALE: At the time of installation, all localization packages (Japanese, Korean, Spanish, and Chinese) are installed along with English. You can set the user interface to English using IGNORE_	Add the following content in the profile file to set the user interface to English: **[xpl.locale]** **IGNORE_LOCALE=True** Once the configuration variable is set to True, the user interface appears in English but the node communicates with the OM server with the set system locale language.	Add the following content in the profile file to set the user interface to English: **set xpl.locale:IGNORE_LOCALE=True** Once the configuration variable is set to True, the user interface appears in English but the node communicates with the OM server with the set system locale language.

Key features that you can configure during installation, continued

Feature	Modifying Profile File on OM	Creating Profile File Manually
LOCALE variable.		
ENABLE_ PERFALARM: On fresh installation of Operations Agent 12.05, the alarm generator server (`perfalarm`) is disabled by default. To enable `perfalarm`, set the variable ENABLE_ PERFALARM to True in the profile file. You can also enable perfalarm after installing Operations Agent. For more information see the section *Enabling perfalarm* in the chapter *Performance Alarms* in the *Operations Agent User Guide.*	Add the following content in the profile file to enable `perfalarm`: **[nonXPL.config]** **ENABLE_ PERFALARM=TRUE**	Add the following content in the profile file to enable `perfalarm`: **set nonXPL.config:ENABLE_ PERFALARM=TRUE**
MINPRECHECK: To install the Operations Agent 12.05 remotely from the OM for Windows or	Add the following content in the profile file: **[nonXPL.config]** **MINPRECHECK=true**	Add the following content in the profile file: **set nonXPL.config:MINPRECHECK=true**

Key features that you can configure during installation, continued

Feature	Modifying Profile File on OM	Creating Profile File Manually
UNIX console on platforms supported with limitation, you must set the variable MINPRECHECK to True in the profile file.		
ENABLE_HPSENSOR: On a system with only Glance license, **hpsensor** is not started automatically. You can use the ENABLE_HPSENSOR option to start **hpsensor** on a system where only Glance license is installed. This variable is not applicable on Windows systems as there is no Glance on Windows systems.	Add the following content in the profile file: **[nonXPL.config] ENABLE_HPSENSOR=True**	Add the following content in the profile file: **set nonXPL.config:ENABLE_HPSENSOR=True**

Installing Operations Agent using a Profile File

After creating the profile file, run the following command to install the Operations Agent with a profile file:

On Windows

```
cscript oainstall.vbs -i -a -agent_profile <path>\<profile_file> -s <management_
server> [-cs <certificate_server>] [-install_dir <install_directory> -data_dir
<data_directory>]
```

On UNIX/Linux

```
./oainstall.sh -i -a -agent_profile <path>/<profile_file> -s <management_server> [-
cs <certificate_server>]
```

In this instance:

<path> is the path to the profile file.

<profile_file> is the name of the profile file.

<management_server>: FQDN of the management server

<certificate_server>: FQDN of the certificate server

<install_directory>: Path to place all packages and binary files on the node.

<data_directory>: Path to place all data and configuration files on the node.

Installing Operations Agent and Enabling Health Monitoring using Profile File

Operations Agent Health View is a health monitoring tool that provides a overview of the health of the Operations Agent. Follow these steps to update default configuration settings for the Operations Agent health monitoring on the node using the profile file during installation:

1. Log on to the node as an administrator where you want to install the Operations Agent 12.05.
2. Open the profile file with a text editor.
3. You can edit the following variables:

   set agent.health:OPC_SELFMON_ENABLE=<*TRUE/FALSE*>

   set agent.health:OPC_SELFMON_SERVER=<*health view server IP address*>

   set agent.health:OPC_SELFMON_INTERVAL=<*time_interval*>

   set agent.health:OPC_SELFMON_HBP=<*TRUE/FALSE*>

   In this instance,

<health view server IP address> is the IP address or the host name of the Health View Server. By default, the Operations Manager Management Server is configured as the Health View Server.

<time_interval> defines the frequency at which the system health information is collected. The default value is 300 seconds and the minimum value recommended is 60 seconds.

4. Install Operations Agent 12.05 and include the agent profile file. Run the following command to install Operations Agent 12.05 with a profile file:

   On Windows

   ```
   cscript oainstall.vbs -i -a -agent_profile <path>\<profile_file> -s <health view server IP address>
   ```

   On UNIX/Linux

   ```
   ./oainstall.sh -i -a -agent_profile <path>/<profile_file> -s <health view server IP address>
   ```

   In this instance,

   <health view server IP address> is the IP address or the host name of the Health View Server. By default, the OM Management Server is configured as the Health View Server.

Chapter 8: Configuring the Agent User

Operations Agent, after installation, starts running with the Local System account on Windows nodes and with the root account on the UNIX/Linux nodes. You can, however, configure the Operations Agent to run with a non-default user that has fewer privileges than the root or Local System user.

You can run only the Operations Monitoring Component with a non-root/non-Local System user and the remaining components with the default root/Local System user.

Based on the user account used, you can configure the following modes of operation of the agent:

- **Non-privileged:** All components of the Operations Agent run with a non-default user account that has fewer privileges than root or Local System.

  > **Note:** You cannot run the Operations Agent in the non-privileged mode on HP-UX.
  >
  > You must not run Operations Agent in a non-privileged user mode when both the Operations Agent and NNMi coexist on a system.

- **Root:** All components of the Operations Agent run with the default user (root or Local System). This is the default mode of operation of the agent.
- **Mixed:** The Performance Collection Component runs with the root user and the Operations Monitoring Component runs with the local user account.

  > **Note:** While running in the mixed mode, it is recommended that the root or privileged user start the agent processes.

When the agent is configured to run under a non-default user on a system where the Performance Manager is installed, the `OvTomCatB` service of Performance Manager starts running under the non-default agent user.

In an OM-managed environment, you can also configure the agent to perform automatic or operator-initiated commands with a user different from the user it runs under.

Requirements for Using a Non-Default User

The non-default agent user that you want to use must satisfy the following requirements:

- **Windows-only requirements:**
  - The user must have full control of the registry key `HKEY_LOCAL_MACHINE/Software/Hewlett-Packard/OpenView`
  - The user must have read access to the registry key `HKEY_LOCAL_MACHINE/Software/Microsoft/WindowsNT/CurrentVersion/Perflib`
  - The user must have rights to:
    - Log on as service — To start and stop the Performance Collection Component services.
    - Manage auditing and security logs — The user can view audited events in the security log of the event viewer. A user with this privilege can view and clear the security log.
    - Act as part of the operating system — To control the agent processes
    - Replace a process-level token — To create the agent processes as the non-root user.
- To monitor a log file using a policy, the agent user must have the permission to read that log file.

  > **Note:** On Windows, the agent user cannot read the log file since the user does not have permission.
- To start a program using an automatic command, operator-initiated command, tool, or scheduled task, the agent user must have permission to start that program.
- Some Smart Plug-ins may require additional configuration or user rights when the agent runs under an alternative user. For more details, see the documentation for individual Smart Plug-ins.

Limitations of Using a Non-Default User

The non-default (non-root or non-privileged) agent user that you want to use has the following limitations:

- The non-privileged user mode is not supported on HP-UX platforms.
- The non-privileged user mode is not supported on the OM management server but mixed user mode is supported on the Operations Manager for UNIX, Linux and Solaris from version 9.20.
- The non-privileged user and mixed modes are not supported on AIX WPAR.
- The BYLS metrics data cannot be collected for Xen, KVM, VMware vSphere, Hyper-V and other virtualization domains.
- By default, the agent user with non-privileged and mixed user modes will not have permission to read the monitored log file.

- By default, the agent user with non-privileged and mixed user modes will not have permission to start a program using an automatic command, operator-initiated command, tool, or scheduled task.
- Operations Smart Plug-ins may require additional configuration or user rights if the agent user with non-privileged and mixed modes does not have administrative rights.
- The Operations Agent cannot collect metrics starting with `PROC_REGION_*` or `PROC_FILE_*` for all instances of processes owned by non-privileged users. Also, depending on the operating system, processes running with higher privileges such as **ovbbccb** and `sshd` will be either available or unavailable in the non-privileged mode.
- On Windows, the metric `PROC_USER_NAME` is displayed as `Unknown` for processes owned by users other than the agent user.
- On AIX, you may see the following error message in the command line console (or in the `oainstall.log` file in the`/var/opt/OV/log` directory) after you configure the agent to use the non-default user:

  ```
  Product activation failure. Refer to the log file for moredetails.
  ```

  Ignore this error.
- On Solaris, Operations Agent gets the process details only up to 80 characters, which is a limitation of Solaris. **opcmona** reads the `/proc/pid/psinfo` file and stores the results in a structure. If extended information is required later, the system reads `/proc/pid/as` file. If the agent is running as a non-root user and does not have permission to open `/proc/pid/as` file, then it compares the process details with the limited information available in `psinfo`.
- By default, the non-privileged user mode does not have access to `/proc/pid/io` metrics.
- On Linux, the non-privileged user mode does not have access to LVM metrics.

Configure the Agent User during Installation

At the time of installation, you can configure the Operations Agent to run under a non-default user (other than root or Local System) on the system. For this purpose, you must install the agent with the help of the profile file for manual installation or the defaults file for OM-assisted remote installation. If you cannot configure this at the time of installation, perform the post-installation configuration steps to change the default agent user (see "Configuring the Agent User after Installation" on page 80).

> **Note:** You cannot use this procedure if you want to install the agent on Windows nodes remotely from the OM console. While installing the agent on Windows nodes from the OM console, install the agent in the *inactive* mode, and then use one of the post-installation configuration procedures

to configure the agent to run with a non-default user.

To configure the agent during installation to run under a non-default user, follow these steps:

1. Make sure the user is created on the system and the user meets all the requirements.
2. If you want to install the Operations Agent manually on the node, create a **profile** file.
   a. On the system where you want to install the agent, create a new file and open the file with a text editor.
   b. Type one of the following statements to specify the mode of agent's mode of operation:

      To run the agent under a non-root or non-Local System account, type:

      set eaagt:MODE= NPU

      set eaagt:OPC_RPC_ONLY=TRUE

      To run only the Operations Monitoring Component with a non-root or non-Local System account, type:

      set eaagt:MODE= MIXED

      set eaagt:NPU_TASK_SET=EVENT_ACTION

   c. *On Windows only.* Type the following statement:

      set eaagt:OPC_PROC_ALWAYS_INTERACTIVE=NEVER

      > **Note:** This step is required to successfully run automatic and operator-initiated actions on the node from OM when the agent runs in the NPU or MIXED mode.

   d. Type the following statement:

      > **Note:** This is a mandatory step for UNIX/Linux nodes. You can skip this step for Windows nodes, but it is recommended that you configure these settings for Windows nodes as well.

      set bbc.cb:SERVER_PORT=<*Comm_Port*>

      set eaagt:SNMP_TRAP_PORT=<*SNMP_Port*>

      > **Note:** Since the default communication port for the agent is 383 and the non-root user on UNIX/Linux does not have the permission to access ports below 1024, you must perform this step to assign a non-default communication port to the agent.

      In this instance,

<*Comm_Port*> is the communication port number of your choice.

<*SNMP_Port*> is the port at which the Operations Agent receives SNMP traps.

These ports must be higher than 1024 since a non-root user on UNIX/Linux cannot access ports below 1024.

e. Type the following statements:

set ctrl.sudo:OV_SUDO_USER=<*User_Name*>

set ctrl.sudo:OV_SUDO_GROUP=<*User_Group*>

In this instance, <*User_Name*> is the name of the non-default user; <*User_Group*> is the group where the non-default user belongs.

If you want to install the agent remotely from the OM console, configure installation defaults:

> **Note:** You cannot use this procedure if you want to install the agent on Windows nodes. For Windows nodes, configure the agent user by manually installing the agent on the node or by performing the post-installation configuration.

a. Go to the following directory:

On OM for Windows:

<*share_dir*>`\conf\PMAD`

On OM for HP-UX/Linux/Solaris:

`/etc/opt/OV/share/conf/OpC/mgmt_sv`

b. Save the following file:

On OM for Windows:

Save the `agent_install_defaults.cfg.sample` file as `agent_install_defaults.cfg`.

On OM for HP-UX/Linux/Solaris:

Save the `bbc_inst_defaults.sample` file as the `bbc_inst_defaults` file.

c. Open the file with a text editor.

d. Add the following content:

```
[eaagt]
<node_details> : MODE=<MODE>
<node_details> : OPC_RPC_ONLY=TRUE
```

```
<node_details>: NPU_TASK_SET=EVENT_ACTION

<node_details>: SNMP_TRAP_PORT=<SNMP_Port>

[ctrl.sudo]

<node_details> : OV_SUDO_USER=<User_Name>

<node_details> : OV_SUDO_GROUP=<User_Group>

[bbc.cb]

<node_details>: SERVER_PORT=<Comm_Port>
```

In this instance:

<*node_details*> is a pattern that matches one or more node names or IP addresses. Use standard OM pattern syntax. For example:

- node1.example.com matches any node with a name that contains the string node1.example.com
- example.com$ matches any node with a name that ends with example.com
- ^192.168.<<#> -lt 10> matches any node with an IP address in the range 192.168.0.0 to 192.168.9.255

<*MODE*> is the mode of operation of the agent (NPU or MIXED)

<*User_Name*>is the name of the non-default user

<*User_Group*>is the group where the non-default user belongs

<*Comm_Port*> is the communication port number of your choice. This must be higher than 1024. You must also configure the management server so that it connects to <*Comm_Port*> when it communicates with this node. For more information, see *Configuring the Communication Broker Port* in the *HPE Operations Agent and HPE Operations Smart Plug-ins for Infrastructure Installation Guide.*

<*SNMP_Port*> is the port at which the Operations Agent receives SNMP traps. This must be higher than 1024 so that all the SNMP traps from various sources can be sent to the <*SNMP_Port*>.

e. Save the file.

3. If you want to configure the agent during installation to run under NPU to root mode, then add the following text in the profile file:

   set eaagt:MODE=

For example:

```
set eaagt:MODE=
set eaagt:SNMP_TRAP_PORT=<SNMP_Port>
set eaagt:OPC_RPC_ONLY=TRUE
set bbc.cb:SERVER_PORT=<Comm_Port>
set ctrl.sudo:OV_SUDO_USER=root
set ctrl.sudo:OV_SUDO_GROUP=root
```

4. Install the Operations Agent.

Configuring the Agent User after Installation

If you are not able to configure the Operations Agent to use a non-default user at the time of installation, you can use the `-configure` option of the `oainstall` script (which is available on the agent node) or the `ovswitchuser` command after installation to complete this configuration.

Changing the Default User on Windows

If you are not able to configure the agent to run with a non-default user at the time of installation, it is recommended that you install the Operations Agent in the *inactive* mode. For more information, see the *HPE Operations Agent and HPE Operations Smart Plug-ins for Infrastructure Installation Guide*.

You can use one of the following methods to configure the agent to use a non-default user:

- Use a Profile File
- Use the ovswitchuser Command

Alternative Method: Use the ovswitchuser Command

> **Note:** Make sure to stop all the Operations Agent processes before you start using the `ovswitchuser.vbs` command.

If you do not want to use a profile file, follow these steps:

Note: Configuration with the profile file is the recommended configuration procedure.

1. Stop the agent:

   On Windows 64-bit nodes:

   ```
   %ovinstalldir%bin\win64\opcagt -kill
   ```

   On other Windows nodes:

   ```
   %ovinstalldir%bin\opcagt -kill
   ```

2. Run the following command to configure the agent to run with a non-default user:

   ```
   cscript "%ovinstalldir%bin\ovswitchuser.vbs" -existinguser<DOMAIN\USER>-
   existinggroup<GROUP>-passwd<PASSWORD>
   ```

   In this instance:

   <*DOMAIN\USER*> is the domain and user name.

   <*GROUP*> is the name of the group that the user belongs to, for example AgentGroup.

   <*PASSWORD*> is the user's password.

   Note: The command assigns the user rights required for basic agent functionality at group level, not to the individual user. Therefore, take care when you select the group to use. It is advisable to create a new group specifically for the agent user, and add the agent user as a member.

3. Run the following command to set necessary permissions to the non-default user:

   ```
   cscript %ovinstalldir%lbin\xpl\ovsetscmpermissions.vbs -user<User_Name> -f
   ```

   In this instance, <*User_Name*>is the name of the non-default user.

4. Run one of the following commands:

   To run all components of the agent under a non-Local System account:

   On Windows 64-bit nodes:

   ```
   %OvInstallDir%bin\win64\ovconfchg -ns eaagt -set MODE NPU
   ```

   On all other Windows nodes:

   ```
   %OvInstallDir%bin\ovconfchg -ns eaagt -set MODE NPU
   ```

   To run only the Operations Monitoring Component with a non-Local System account:

   On Windows 64-bit nodes:

```
%OvInstallDir%bin\win64\ovconfchg -ns eaagt -set MODE MIXED
```

On all other Windows nodes:

```
%OvInstallDir%bin\ovconfchg -ns eaagt -set MODE MIXED
```

5. Run the following commands:

   On Windows 64-bit nodes:

   ```
   %OvInstallDir%bin\win64\ovconfchg -ns ctrl.sudo -set OV_SUDO_USER<User_Name>
   %OvInstallDir%bin\win64\ovconfchg -ns ctrl.sudo -set OV_SUDO_GROUP<Group_Name>
   %OvInstallDir%bin\win64\ovconfchg -ns eaagt -set OPC_PROC_ALWAYS_INTERACTIVE
   NEVER
   ```

   On all other Windows nodes:

   ```
   %OvInstallDir%bin\ovconfchg -ns ctrl.sudo -set OV_SUDO_USER<User_Name>
   %OvInstallDir%bin\ovconfchg -ns ctrl.sudo -set OV_SUDO_GROUP<Group_Name>
   %OvInstallDir%bin\ovconfchg -ns eaagt -set OPC_PROC_ALWAYS_INTERACTIVE NEVER
   ```

   In this instance, <*User_Name*>is the name of the non-default user; <*Group_Name*>is the group where the non-default user belongs.

6. If you have chosen the non-privileged mode of operation, run the following command:

   On Windows 64-bit nodes:

   ```
   %OvInstallDir%bin\win64\ovconfchg -ns eaagt -set OPC_RPC_ONLY TRUE
   ```

   On all other Windows nodes:

   ```
   %OvInstallDir%bin\ovconfchg -ns eaagt -set OPC_RPC_ONLY TRUE
   ```

7. If you have chosen the mixed mode of operation, run the following command:

   On Windows 64-bit nodes:

   ```
   %OvInstallDir%bin\win64\ovconfchg -ns eaagt -set NPU_TASK_SET EVENT_ACTION
   ```

   On all other Windows nodes:

   ```
   %OvInstallDir%bin\ovconfchg -ns eaagt -set NPU_TASK_SET EVENT_ACTION
   ```

8. Run the following command:

   > **Note:** This is a requirement for UNIX/Linux nodes and not a mandatory step on Windows

> nodes. However, it is recommended that you complete this step on Windows nodes as well.

On Windows 64-bit nodes:

```
%OvInstallDir%bin\win64\ovconfchg -ns eaagt -set SNMP_TRAP_PORT <SNMP_Port>
%OvInstallDir%bin\win64\ovconfchg -ns bbc.cb -set SERVER_PORT<Comm_Port>
```

On all other Windows nodes:

```
%OvInstallDir%bin\ovconfchg -ns eaagt -set SNMP_TRAP_PORT <SNMP_Port>
%OvInstallDir%bin\ovconfchg -ns bbc.cb -set SERVER_PORT<Comm_Port>
```

In this instance,

<Comm_Port> is the communication port number of your choice. If you set SERVER_PORT to 383, no additional configuration is required. If you do not set the port value to 383, make sure to configure the port on the OM management server.

<SNMP_Port> is the port at which the Operations Agent receives SNMP traps.

These ports must be higher than 1024.

9. Restart the agent:

   On Windows 64-bit nodes:

   ```
   %ovinstalldir%bin\win64\opcagt -start
   ```

   On all other Windows nodes:

   ```
   %ovinstalldir%bin\opcagt -start
   ```

Changing the Default User on UNIX/Linux

If you are not able to configure the agent to run with a non-default user at the time of installation, it is recommended that you install the Operations Agent in the *inactive* mode. For more information, see the *HPE Operations Agent and HPE Operations Smart Plug-ins for Infrastructure Installation Guide*.

You can use one of the following methods to configure the agent to use a non-default user:

- Use a Profile File
- Use the ovswitchuser Command

Use a Profile File

To change the default agent user with the help of a profile file, follow these steps:

1. On the system where you want to install the agent, create a new file and open the file with a text editor.
2. Type one of the following statements to specify the mode of agent's mode of operation:

   To run the agent under a non-Local System account, type:

   set eaagt:MODE=NPU

   To run only the Operations Monitoring Component with a non-Local System account, type:

   set eaagt:MODE=MIXED
3. If you have selected the non-privileged mode (that is, if you typed `set eaagt:MODE=NPU` in the previous step), type the following statement:

   set eaagt:OPC_RPC_ONLY=TRUE
4. If you have selected the non-privileged mode (that is, if you typed `set eaagt:MODE=NPU` in the previous step), type the following statements:

   set eaagt:SNMP_TRAP_PORT=<*SNMP_port_number*>

   set bbc.cb:SERVER_PORT=<*Comm_port_number*>

   > **Note:** This is a requirement for UNIX/Linux nodes since the non-root user on UNIX/Linux does not have the permission to access ports below 1024.

   In this instance,

   <*Comm_Port*> is the communication port number of your choice.

   <*SNMP_Port*> is the port at which the Operations Agent receives SNMP traps.

   These ports must be higher than 1024.
5. If you have selected the mixed mode (that is, if you typed `set eaagt:MODE=MIXED` in step 2), type the following statement:

   set eaagt:NPU_TASK_SET=EVENT_ACTION
6. Type the following statements:

   set ctrl.sudo:OV_SUDO_USER=<*User_Name*>

set ctrl.sudo:OV_SUDO_GROUP=<*Group_Name*>

In this instance, <*User_Name*>is the name of the non-default user; <*Group_Name*>is the group where the non-default user belongs.

7. Save the file into a local directory on the system.
8. Reconfigure the agent to run with the user specified in the profile file:
   a. Go to the following location on the node:

      ```
      /opt/OV/bin/OpC/install
      ```

   b. Run the following command:

      ```
      ./oainstall.sh -a -configure -agent_profile<path>/<profile_file>
      ```

      or

      ```
      ./oainstall.sh -a -c -agent_profile<path>/<profile_file>
      ```

      In this instance, <*profile_file*> is the name of the profile file; <*path*> is the complete path to the profile file.

Alternative Method: Use the ovswitchuser Command

> **Note:** Make sure to stop all the Operations agent processes before you start using **ovswitchuser.sh** command.

If you do not want to use a profile file, follow these steps:

> **Note:** Configuring with the profile file is the recommended configuration procedure.

1. Go to the following directory:

   On HP-UX/Linux/Solaris:

   ```
   /opt/OV/bin
   ```

   On AIX:

   ```
   /usr/lpp/OV/bin
   ```

2. Run the following command to stop the agent:

   ```
   ./opcagt -kill
   ```

3. Run the following command to configure the agent to run with a non-default user:

```
./ovswitchuser.sh -existinguser<User_Name>-existinggroup<Group_Name>
```

In this instance:

<*User_Name*> is the name of the user that the agent runs under.

<*Group_Name*> is the name of the group that the user belongs to, for example AgentGroup. The command gives this group full control of all files in the agent data directory, and also full control of all installed packages. If you previously started the command and specified a different group, the command removes control of the files for the previous group.

The group ID flag is set on the agent's data directories. This flag means that the group that you specify will also own any new files and subdirectories in the agent's base directories.

> **Note:** The command assigns the user rights required for basic agent functionality at group level, not to the individual user. Therefore, take care when you select the group to use. It is advisable to create a new group specifically for the agent user, and add the agent user as a member.

4. Run one of the following commands:

   To run all components of the agent under a non-root user:

   ```
   ./ovconfchg -ns eaagt -set MODE NPU
   ```

   To run only the Operations Monitoring Component with a non-root user:

   ```
   ./ovconfchg -ns eaagt -set MODE MIXED
   ```

5. Run the following command:

   > **Note:** This is a requirement for UNIX/Linux nodes since the non-root user on UNIX/Linux does not have the permission to access ports below 1024.

   ```
   ./ovconfchg -ns eaagt -set SNMP_TRAP_PORT <SNMP_Port>
   ```

   ```
   ./ovconfchg -ns bbc.cb -set SERVER_PORT<Comm_Port>
   ```

   In this instance,

   <*Comm_Port*> is the communication port number of your choice. If you set SERVER_PORT to 383, no additional configuration is required. If you do not set the port value to 383, make sure to configure the port on the OM management server.

   <*SNMP_Port*> is the port at which the Operations Agent receives SNMP traps.

   These ports must be higher than 1024.

6. Run the following commands to start the agent:

```
./opcagt -start
```

After you configure agent to run as a non-root user, following error message may appear in **System.txt** file:

```
ovbbccb (22461/1): (bbc-188) Cannot change root directory for current process.
```

Ignore this error.

Chapter 9: Reducing the Installation Time

In previous versions of the Operations Agent, the installer program used to take a significant time to validate the signatures when installing Operations Agent media on Windows nodes without internet due to Certificate Revocation List (CRL) checks.

With Operations Agent 12.05, you can reduce the installation time on Windows node by removing the signatures from the packages and MSI scripts. Use one of the following methods to remove the signatures:

- Use the `removesign` option with the zip media
- Use the Profile File

Using the `removesign` option with the zip media

> **Note:** The `removesign` option will work with MSI package only and is not supported with hotfix or patch installation.

To create a ZIP of the product media without the digital signatures from msi packages and vbscripts, follow the steps:

1. Log on to the node as an administrator.
2. Go to the media root.
3. Run the following command:

   On Windows

   ```
   cscript oainstall.vbs -createzip -p WIN -removesign
   ```

After the command is executed, a zip file containing the updated media (without signatures) is available at the location -`%TEMP%/OA_ZIP_MEDIA` folder.

Copy the zip media to another folder. To use the zip media, unzip the media at the location where the agent must be installed and then start installing the Operations Agent.

Installation time is significantly reduced to less than 4 minutes when you use the `removesign` option.

Using the Profile file

You can use the profile file option to remove the digital signatures from vbscripts while installing the Operations Agent.

Follow the steps:

1. On the system where you want to install the agent, create a new file and open the file using a text editor.
2. Add the following content in the profile file to disable the signature checks at the time of installation: **set eaagt:INSTALL_REMOVESIGN=True**
3. Save the file in a local directory.
4. Run the following command to install the Operations Agent with a profile file:

   On Windows

   ```
   cscript oainstall.vbs -i -a -agent_profile <path>\<profile_file> -s
   <management_server> [-cs <certificate_server>] [-install_dir <install_
   directory> -data_dir <data_directory>]
   ```

   In this instance:

   `<path>` is the path to the profile file.

   `<profile_file>` is the name of the profile file.

   `<management_server>`: FQDN of the management server.

   `<certificate_server>`: FQDN of the certificate server.

   `<install_directory>`: Path to place all packages and binary files on the node.

   `<data_directory>`: Path to place all data and configuration files on the node.

For more information, see Installing Operations Agent using Profile File.

Installation time is significantly reduced to less than 8 minutes when you use the profile file option to install the Operations Agent.

Using the removesign option while deploying Operations Agent from OM and OMi

Use one of the following methods:

Method 1

1. Create zip media on any Windows system. For more information, see Using the removesign option with the zip media.
2. Copy the zip media to another folder on the management server. To use the zip media, unzip the media at the location from where the Agent is registered.
3. Use the unzipped folder location to register the Operations Agent on OM or OMi.

   To register Operations Agent on OM, see Registering the Operations Agent and Infrastructure SPIs on the Management Server.

   To register the Operations Agent on OMi, see the section opr-package-manager Command-Line Interface in the chapter *Command-Line Interfaces* in the *OMi Administration Guide*.

> **Note:** If you use this method to remove signatures, then the Agents without signatures are deployed on all the nodes.

Method 2

You can also use the **removesign** option with the profile file to deploy Operations Agent from OM or OMi. For more information, see Installing Operations Agent using Profile File.

Chapter 10: Installing the Operations Agent using Agent Installation Repository

In a typical environment, there are multiple versions of Operations Agent deployed in a combination of different operating systems. You can install the **Agent Installation Repository** on a Linux operating system and deploy different versions of Operations Agent available in the repository on Windows and Linux operating systems.

The Agent Installation Repository can be hosted in your environment by using any one of the following:

- Standalone Agent Installation Repository
- Agent Installation Repository as a Virtual Appliance

Standalone Agent Installation Repository

Agent Installation Repository can be installed on a Linux machine using the standalone TAR file provided to set up standalone repository. The same repository can act as a **Yum repository** for the Operations Agent and LCore packages. For more information about Yum repository, see Data Flow in Yum Repository.

> **Note:** The Standalone Agent Installation Repository is supported *only* on Linux x64 and x86 architecture.

Prerequisites

1. The **createrepo** utility should be available and running on the system.

   > **Note: createrepo** is a OS utility. If it is not installed, then you can install it using the following command:
   >
   > ```
   > yum install createrepo
   > ```

2. Make sure that a web server is running on the system.

   For example: For RHEL machine, you can deploy on Apache Web Server.

- To start the web service, run the following command:

  ```
  service httpd start
  ```

Installing the Standalone Agent Installation Repository on a Linux server or on the Operations Manager for Linux 9.x

Follow the steps:

1. Log on to the server where you want to install the repository.
2. Open the Standalone Agent Installation Repository (**HPOvOpsAgt-12.xx.xxx-AIR.tar**) media and extract the contents.

   The **HPOvOpsAgt-12.xx.xxx-AIR.tar** file contains the **RPMs** and a wrapper script (**oainstall_air.sh**) to install the RPMs.
3. You can install the Standalone Agent Installation Repository on a Linux server or on the Operations Manager for Linux 9.x.
   a. Run the following command to install the Standalone Agent Installation Repository on a Linux server:

      ```
      ./oainstall_air.sh -i -wu <webURL> -wr <web root path>
      ```

      For Example: `./oainstall_air.sh -i -wu https://hostname:portnumber -wr /var/www/html`

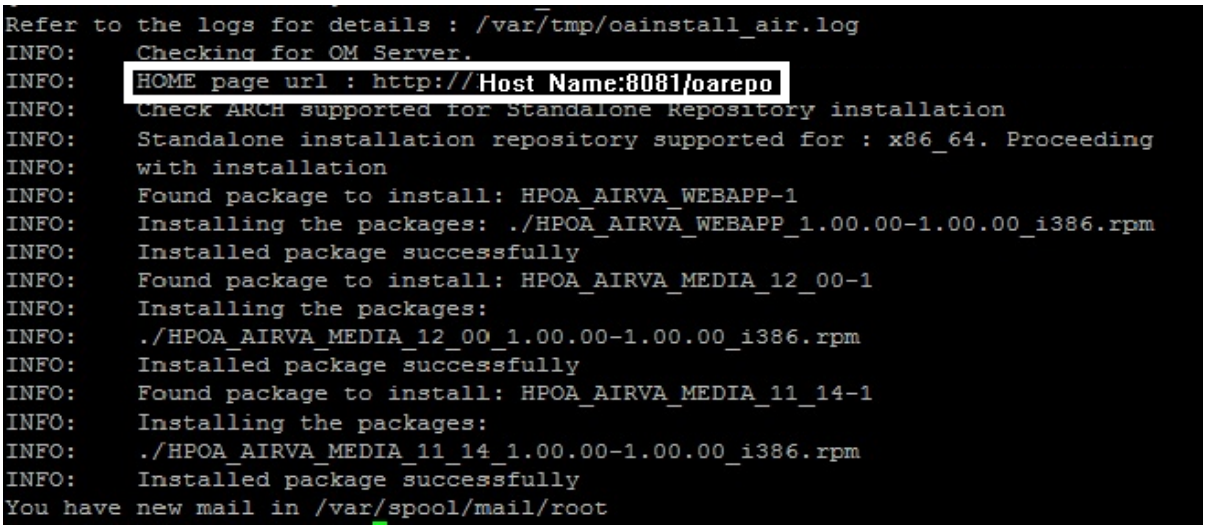
      In this instance,

`<wu>`	specifies the webURL of the web server
`<https://hostname:portnumber>`	specifies the URL of the web server where `portnumber` is the port on which this instance of the web server is running.
`<wr>`	specifies the web root path on the system. For Example: `/var/www/html` in RHEL for Apache web server.

   b. Run the following command to install the Standalone Agent Installation Repository on the Operations Manager for Linux 9.x:

      ```
      oainstall_air.sh -i
      ```

      This command helps you install the Standalone Agent Installation Repository on the OVtomcat web server. The console displays the home page URL for the Agent Installation Repository after installation.



> **Note:** On the Operations Manager for Linux, `oainstall_air.sh` runs without parameters (webURL and web root path). The media on the Operations Manager for Linux is available in the following location for Agent Installation Repository:
>
> `/opt/OV/nonOV/tomcat/b/www/webapps/AIRVA/media`

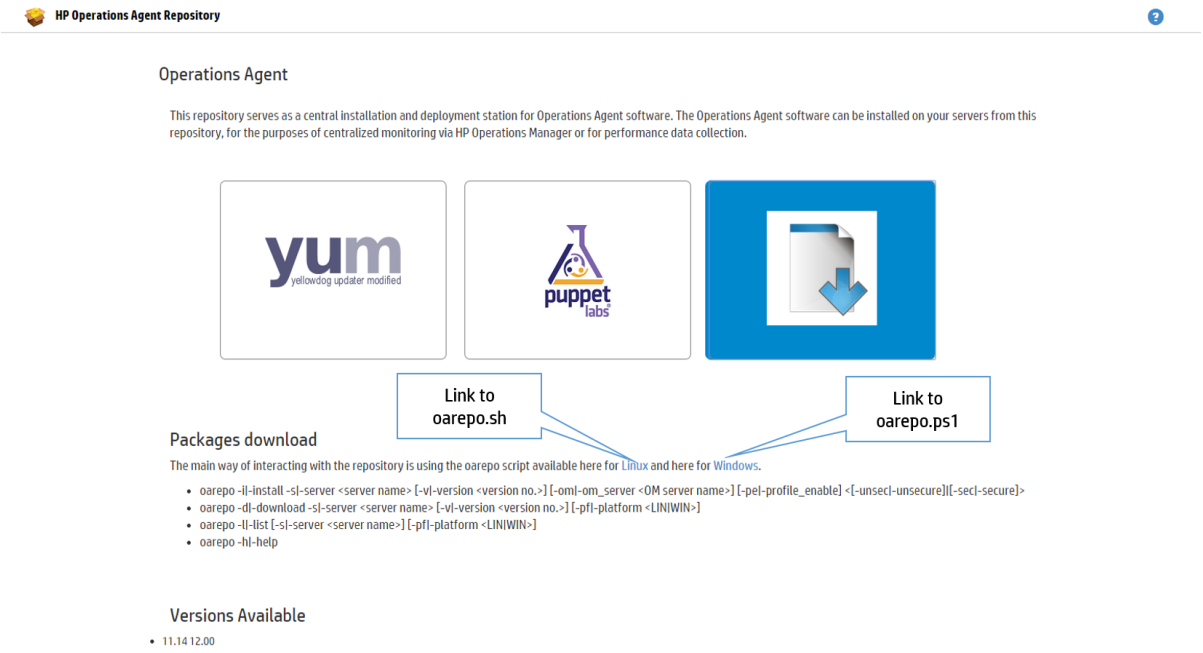
Verification

Follow the steps:

1. Restart the web server using the following command:

   ```
   service httpd restart
   ```

2. Go to the browser and type `https://hostname:portnumber/oarepo/` to open the Agent Installation Repository home page.



3. Check the log file: `/var/tmp/oainstall_air.log`
4. Run the following command to check the list of RPMs installed or removed:

   ```
   rpm –qa | grep –i hpoa*
   ```

   In this instance,

   * displays the list of RPMs starting with **hpoa**.

Removing the Standalone Agent Installation Repository

To remove the standalone repository, follow the steps:

1. Log on to the node.
2. Run the following command:

   ```
   ./oainstall_air.sh –r
   ```

Agent Installation Repository as a Virtual Appliance

Agent Installation repository is available as a Virtual Appliance and can be deployed in VMware environment.

Prerequisite

Agent Installation Repository Virtual Appliance for VMware vSphere 4.x and 5.x.

Deploying Agent Installation Repository Virtual Appliance

To deploy the virtual appliance with the Operations Agent from the vSphere console:

1. Log on to vCenter using vSphere client.
2. Click **File > Deploy OVF Template**. The **Deploy OVF Template** window opens.
3. Provide the source location to download and install the **OVF Package** and then click **Next**.
4. Verify the **OVF Template** details and click **Next**.
5. Accept the end user license agreement and click **Next**.
6. Specify a name and location for the deployed template and click **Next**.
7. Select a destination storage for the virtual machine files and click **Next**.
8. Provide the details of network properties such as **Default Gateway**, **DNS**, **Interface IP Address**, and the **Netmask** and then click **Next**.
9. Click **Finish** to start the deployment.

Verifying the Deployment

1. Go to the repository home page URL using the IP or FQDN of the VA instance that is deployed:

   ```
   https://<system_name or ip>:5480/oarepo/
   ```

   > **Note:** The Default login credentials are:
   >
   > User name: *root*
   >
   > Password: *password*

2. Go to the browser and use the repository home page URL to open the Agent Installation Repository.

Deploying Operations Agent Using the Agent Installation Repository

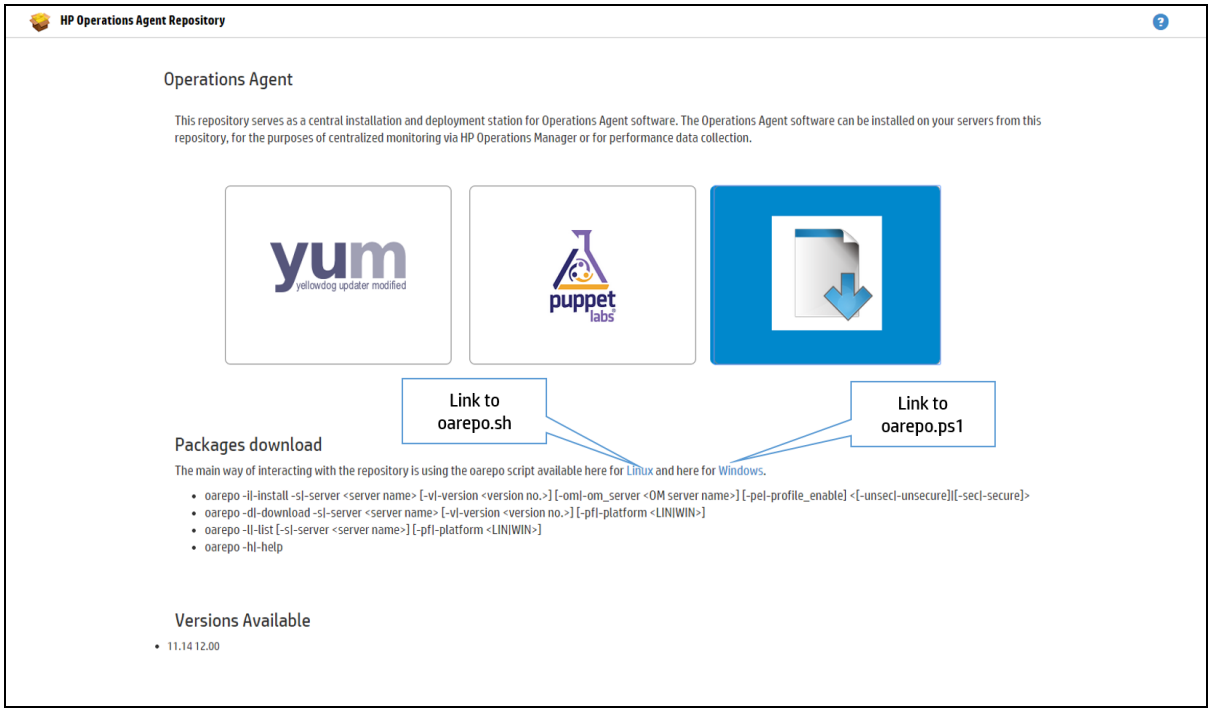
Operations Agent can be installed using the Agent Installation Repository using any of the following options:

- Using the **oarepo** scripts
- Using the Yum repository
- Using the Puppet modules

Installing the Operations Agent using the oarepo scripts

To install the Operations Agent using the oarepo scripts, follow the steps:

1. Log on to the node where you want to install the Operations Agent.
2. Download the **oarepo.sh** or **oarepo.ps1** script for Linux or Windows respectively on the systems where you need the Operations Agent to be installed using the Agent Installation Repository landing page.



3. Install the Operations Agent on the server. Run the following command:

   ```
   oarepo -i|-install -s|-server <server url> [-v|-version <"version no.">] [-om|-om_server <OM server name>] [-pe|-profile_enable] <[-unsec|-unsecure]|[-sec|-secure]>
   ```

   For example:

   On Windows

   ```
   ./oarepo.ps1 -i -s https://myhostname:5480 -v "12.01" -om <omservername> -sec
   ```

On Linux

```
./oarepo.sh -i -s https://myhostname:5480 -v "12.01" -om <omservername> -unsec
```

In this instance,

`-i` Is used to install and download the Operations Agent packages.

`-s` Specifies the server URL along with the port number where the agent installation repository is hosted.

`-v` Specifies the version of the Operations Agent.

For example: "12.01"

You can get the version from the Agent Installation Repository page.

`-om` Specifies the OM server name to which the Operations Agent has to be activated.

`-pe` If you specify `-pe`, then the default profile file settings are applied. If you don't specify `-pe`, then none of the profile file settings are applied. The profile file is available in the following location:

<web root path>`/AIRVA/media`

The file name is: **profile_file_default**

> **Note:** All profile file options are applicable. For more information, see Installing Operations Agent using Profile File.

`-sec` Is used if SSL certificate is imported and installed on the client.

`-unsec` Is used if SSL certificate is not imported.

> **Note:** If the version is not mentioned in the command, then by default latest version of Operations Agent is downloaded. Also, option `-d` can be used *only* to download the Operations Agent packages.

Verifying the Version of the Operations Agent

To check the version of Operations Agent installed, run the following command:

On Windows: `%ovinstalldir%/bin/opcagt -version`

On Linux: `/opt/OV/bin/opcagt –version`

Installing the Operations Agent using the Yum Repository

Yum is a utility which checks for the repository details mentioned in the configuration file and installs the Operations Agent packages on those nodes. The Yum repository for the Operations Agent is provided along with the Agent Installation Repository.

You can access the Yum repository on the Virtual Appliance using the following URL:

`https://hostname:portnumber/oa/yum_oa_all.repo`

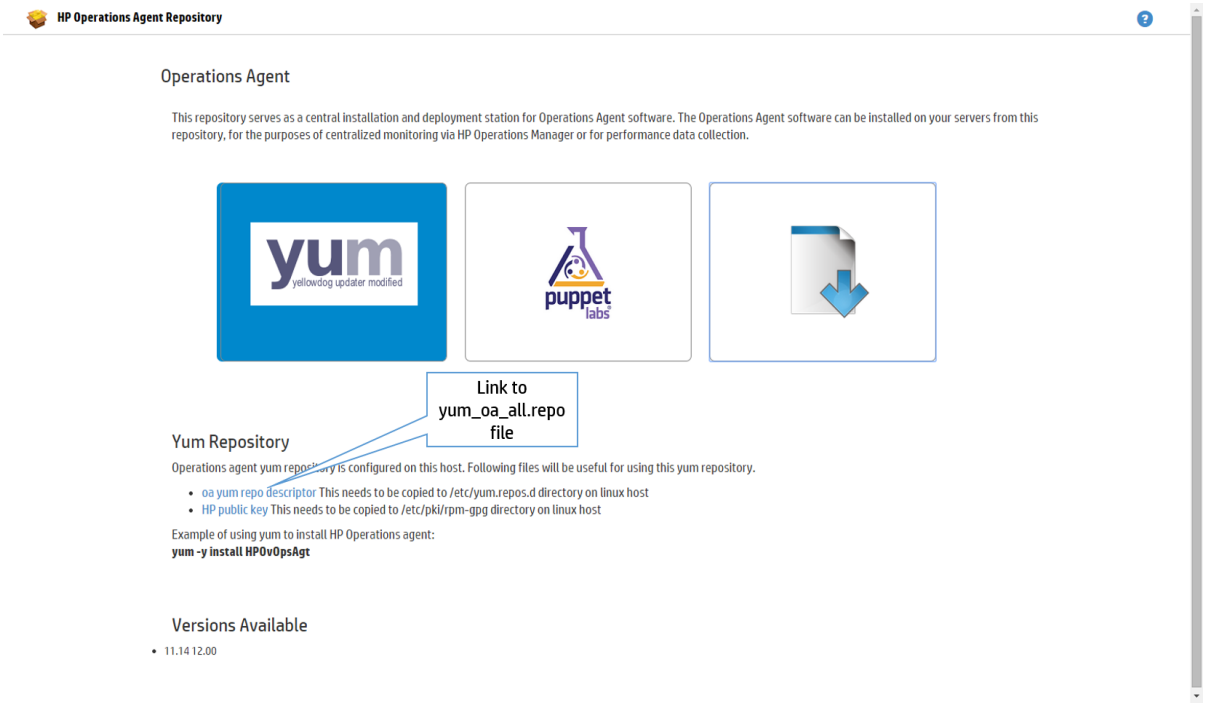
In this instance,

`hostname`	is the IP address of the VM.
`portnumber`	is the default port of the VM or it can be any other port if set.

To install the Operations Agent using Yum repository, follow the steps:

> **Note:** For information on prerequisites to install the Operations Agent, see the chapter *Prerequisites to Install the Operations Agent on a Node*.

1. Log on to the target node.
2. Download and copy the **`yum_oa_all.repo`** file from `https://hostname:portnumber/oa/yum_oa_all.repo` to `/etc/yum.repos.d/`.

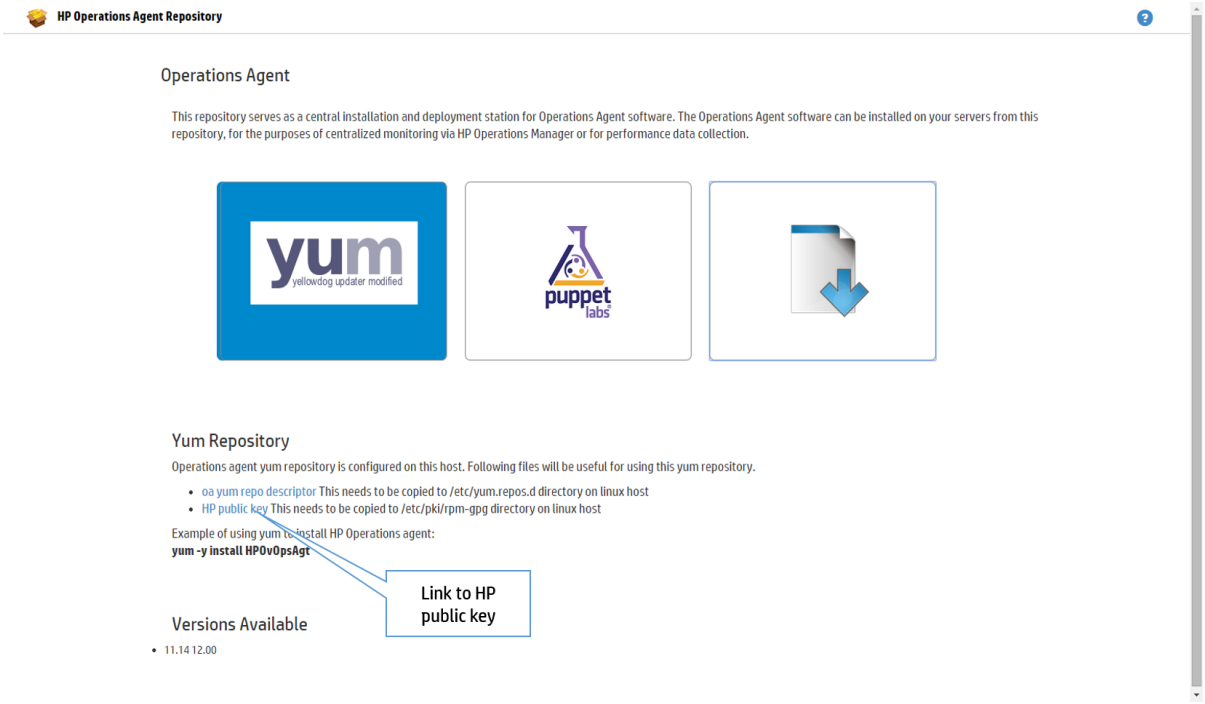


   In this instance,

`hostname`	is the IP address of the VM.
`portnumber`	is the default port of the VM or it can be any other port if set.

3. Download and copy the **`HP public key`** from

`https://hostname:portnumber/oarepo/hpPublicKey2048.pub` to `/etc/pki/rpm-gpg/hpPublicKey2048`.



4. Run the following command to install specific versions of the Operations Agent:

   To install the latest version:

   `yum install HPOvOpsAgt`

   To install previous versions 11.11 and 11.14 together:

   `yum --disablerepo=oa_12.01 install HPOvOpsAgt`

   In this instance,

   `disablerepo` is used to disable the Operations Agent version you do not want to install.

5. Configure the management server by performing the following steps:

   a. Go to the following directory on the Linux node: `/opt/OV/bin/OpC/install`

   b. Run the following command: `opcactivate -srv` <management_server> `-cert_srv` <management_server> `-f`

      In this instance,

      <*management_server*> is the FQDN of the OM management server.

Verification

- To verify if Operations Agent packages are installed, run the following command:

  `rpm -qa | grep <packagename>`

  In this instance,

  `<packagename>` is the name of the Operations Agent package.

  For Example: `rpm -qa | grep <HPOvBbc>`

- To check the version of Operations Agent on the node, run the following command:

  On Linux: `/opt/OV/bin/opcagt –version`

- To check the inventory, run the following command:

  On Linux: `/opt/OV/bin/ovdeploy –inv –includeupdates`

To remove the packages from the Target Node, see "Removing the Packages from the Target Node " on page 127.

Chapter 11: Installing the Operations Agent using the Puppet Environment

You can install the Operations Agent using **Puppet** in an environment where **Puppet Master** and **Puppet Clients** are configured.

Operations Agent packages are stored in the Agent Installation Repository. The puppet module available on the puppet master fetches the Operations Agent packages or zip file from Agent Installation Repository and deploys the Operations Agent packages on the puppet client (Linux nodes).

You can use puppet open source or puppet enterprise to deploy Operations Agent on the node. For the puppet open source, you can use the `OA` modules and install Operations Agent by using the following options:

On Linux

- Using Yum

  Or

- Using **oarepo.sh**

On Windows

- Using **oarepo.ps1**

You can also configure the XPL parameters by using the puppet module.

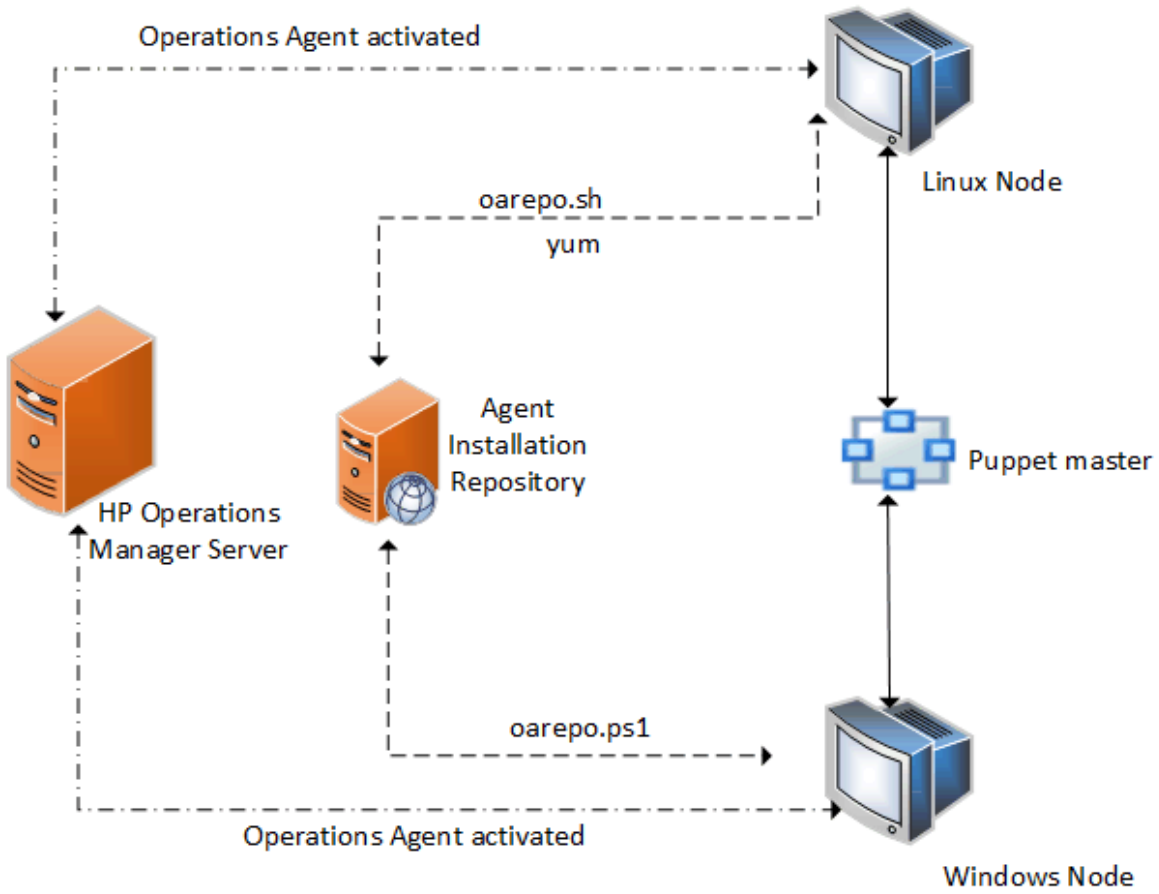
> **Note:** Operations Agent supports Puppet Enterprise 3.8 and 3.9 versions.

Prerequisites

- Enable PowerShell (version 2.0 and later) on Windows
- Configure Puppet environment: puppet master and puppet clients

Data Flow in a Puppet Environment

The following illustration shows the data flow in a puppet environment for deployment.

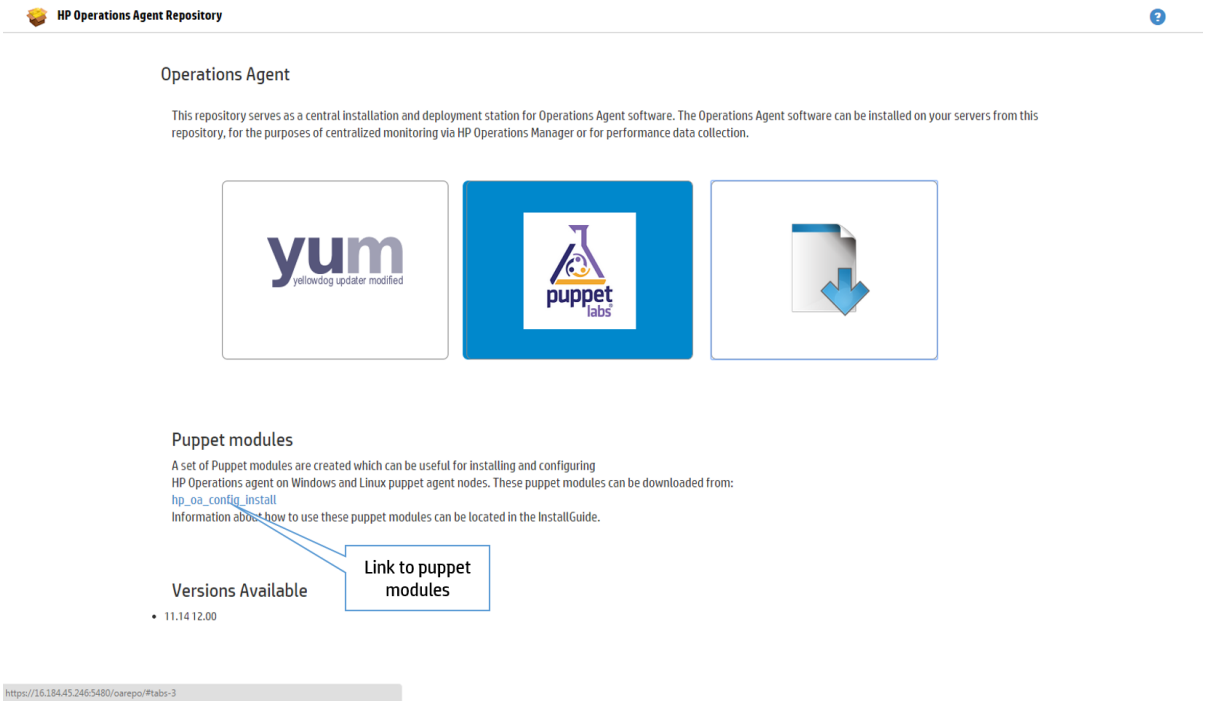


Installing and Configuring the Operations Agent on Linux Using YUM

To deploy the Operations Agent, follow the steps:

> **Note:** For information about prerequisites required to install the Operations Agent, see the chapter *Prerequisites to Install the Operations Agent on a Node*.

1. Log on to the puppet master.
2. The **puppet_modules.tar** is available on the Agent Installation Repository landing page `https://hostname:portnumber/oarepo/puppet_modules.tar`. Download, copy and untar the **puppet_modules.tar** file in the puppet modules directory.



For Example: You can download the **puppet_modules.tar** file from `/etc/puppet/modules/` on puppet master.

3. For configuring the Operations Agent deployment using YUM, open the **`init.pp`** class file from **`hpoa_install_config/manifests/init.pp`** on puppet module and define the modules to be deployed on the puppet client:

```
class { 'hpoa_install_config::pkginstall':
reposerver => "$repo_server",
version    => "$version_yum",
}
class { 'hpoa_install_config::activate':
om_server => "$om_server",
profile_enable => $profile_enable,
require   => Class['hpoa_install_config::pkginstall']
}
service { 'OVCtrl':
ensure  => running,
enable  => true,
```

```
require => Class['hpoa_install_config::activate']

}
```

4. Open the **site.pp** class file from **/<*puppet modules directory*>/manifests/site.pp** on puppet master and define the modules to be deployed on the puppet client:

   Example: For Linux nodes:

   ```
   class { 'hpoa_install_config':

   om_server => "om_server",

   profile_enable => "yes",

   repo_server => "repo_server",

   secured => "-unsec",

   version    => "version",

   }
   ```

   In this instance,

`version`	specifies the Operations Agent version. For example, version can be 11.14.014.
`repo_server`	specifies the system name where Agent Installation Repository (VA or Standalone) is available.
`om_server`	specifies the server name to which the Operations Agent has to be activated.

   > **Note:** Profile file based installation is enabled by default. To disable profile file based installation, set `profile_enable => "no"`. To enable profile file based installation, set `profile_enable => "yes" or ""`. Make sure that profile file configuration settings are updated as mentioned in "Enabling Operations Agent Installation Using Profile File with Puppet" on page 109.

5. To test the deployment, log on to the puppet client and run the following command:

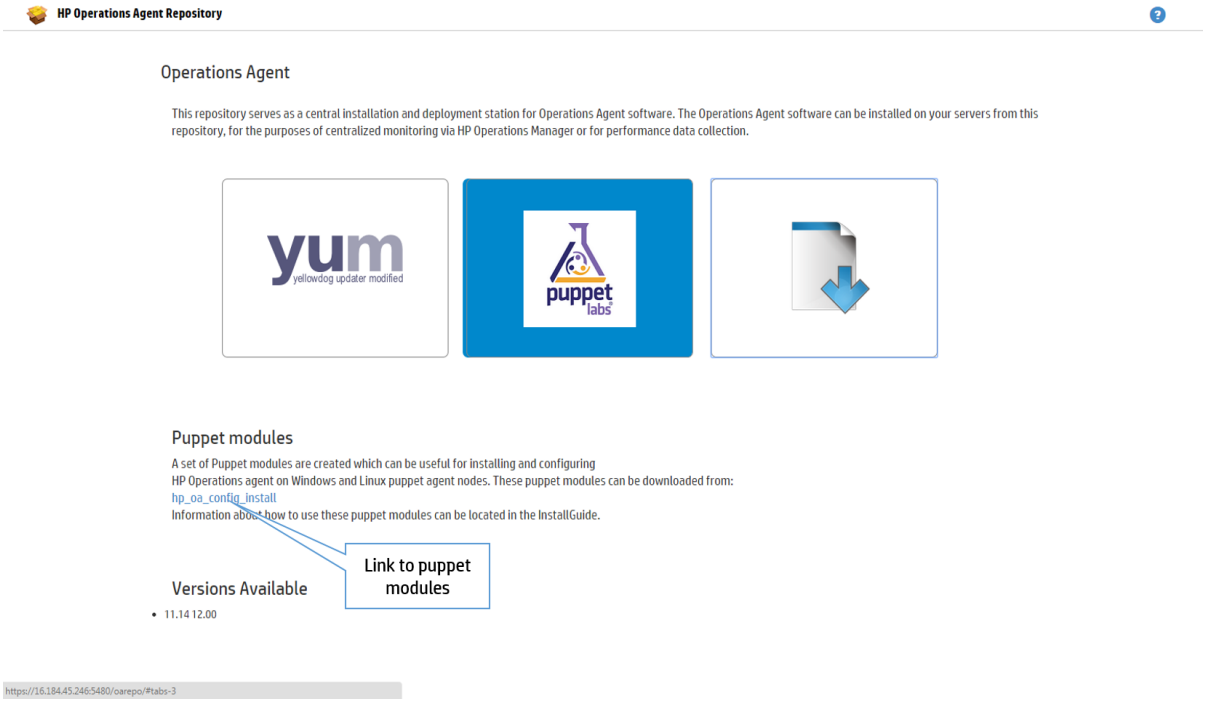
   ```
   puppet agent --test
   ```

> **Note:** You can verify the Operations Agent version installed by using the command: `/opt/OV/bin/opcagt –version`

Installing and Configuring Operations Agent on Linux Using **oarepo.sh**

To deploy Operations Agent, follow the steps:

1. Log on to the puppet master.
2. The **puppet_modules.tar** is available on the Agent Installation Repository landing page `https://hostname:portnumber/oarepo/puppet_modules.tar`. Download, copy and untar the **puppet_modules.tar** file in the puppet modules directory.



   For Example: You can download the **puppet_modules.tar** file at `/etc/puppet/modules/` on puppet master.

3. Open the **`init.pp`** class file from **`hpoa_install_config/manifests/init.pp`** on puppet module. The **hpoa_install_config** puppet module uses the **oarepo.sh** script to download, install or configure the Operations Agent from the Agent Installation Repository server. Check the **version**, **repo_server**, and the **om_server** details.

   ```
   class {'hpoa_install_config':air_linux'
   ```

```
repo_server => $repo_server,
version     => $oarepo_version,
om_server   => $om_server
profile_enable => $profile_enable
}
```

4. Open the **site.pp** class file from **/<*puppet modules directory*>/manifests/site.pp** on puppet master and define the modules to be deployed on the puppet client:

```
class { 'hpoa_install_config' :
repo_server => $repo_server,
version     => $oarepo_version,
om_server   => $om_server
profile_file => "yes"
secured => "-sec"
}
```

In this instance,

`version`	specifies the Operations Agent version. For example, version can be 11.14.014.
`repo_server`	specifies the system name where Agent Installation Repository (VA or Standalone) is available.
`om_server`	specifies the server name to which the Operations Agent has to be activated.
`secured`	use `-sec` if SSL certificate is imported and installed on the client. If SSL certificate is not imported, use `-unsec`.

> **Note:** Profile file based installation is enabled by default. To disable profile file based installation, set `profile_enable => "no"`. To enable profile file based installation, set `profile_enable => "yes" or ""`. Make sure that profile file configuration settings are updated as mentioned in "Enabling Operations Agent Installation Using Profile File with Puppet" on page 109.

5. To test the deployment, log on to the puppet client and run the following command:

```
puppet agent --test
```

> **Note:** You can verify the Operations Agent version installed by using the command: `/opt/OV/bin/opcagt –version`

Installing and Configuring Operations Agent on Windows Using **oarepo.ps1**

Prerequisite

Enable PowerShell (version 2.0 and above) script execution by setting the remote signed policy. To check the policy, run the following command in PowerShell:

```
PS C:\> Get-ExecutionPolicy
```

If the policy is not specified as `RemoteSigned`, set it to `RemoteSigned` by running the following command in PowerShell:

```
PS C:\> Set-ExecutionPolicy RemoteSigned
```

In this instance,

`RemoteSigned` specifies that downloaded scripts must be signed by a trusted publisher before they can be run.

> **Note:** `RemoteSigned` is the threshold level of permission required, you can also set policy as `AllSigned` or `Unrestricted`.
>
> In this instance,
>
> `AllSigned` specifies that scripts signed by a trusted publisher *only* can be run.
>
> `Unrestricted` means all Windows PowerShell scripts can be run.

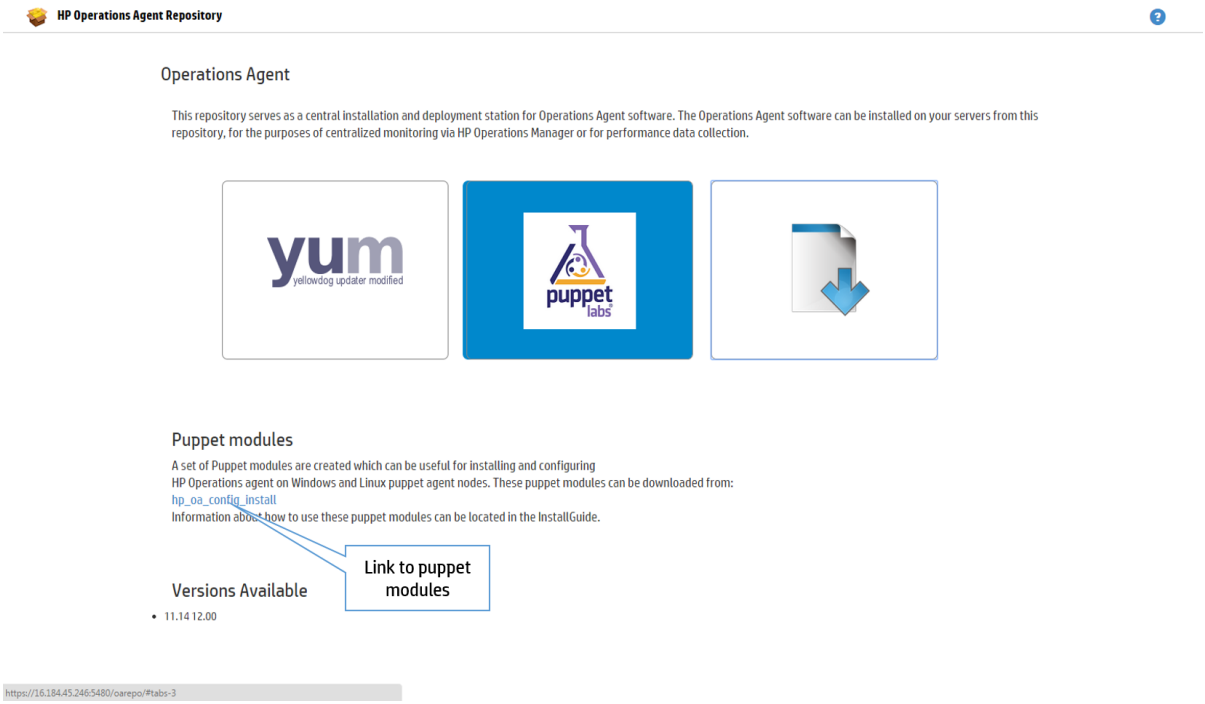
Installation

To install Operations Agent on Windows using `oarepo.ps1`, follow the steps:

1. Log on to the puppet master.

   The **puppet_modules.tar** is available on the Agent Installation Repository landing page `https://hostname:portnumber/oarepo/puppet_modules.tar`.

2. Download, copy and untar the **puppet_modules.tar** file in the puppet modules directory.



For example: You can download the **puppet_modules.tar** file at `/etc/puppet/modules/` on puppet master.

3. Open the **init.pp** class file from `hpoa_install_config/manifests/init.pp` on puppet module. The **hpoa_install_config** puppet module uses the **oarepo.ps1** script to download, install or configure the Operations Agent from the Agent Installation Repository server. Check the **version**, **repo_server**, and the **om_server** details.

```
class { 'hpoa_install_config::air_windows':
repo_server => $repo_server,
version => $oarepo_version,
om_server => $om_server,
profile_enable => $profile_enable
}
```

4. Open the **site.pp** class file from `/<puppet modules directory>/manifests/site.pp` on puppet master and define the modules to be deployed on the puppet client:

```
class { 'hpoa_install_config' :
repo_server => $repo_server,
version     => $oarepo_version,
```

```
om_server   => $om_server

profile_file => "yes"

secured => "-sec"

}
```

In this instance,

`version`	specifies the Operations Agent version. For example, version can be 11.14.014.
`repo_server`	specifies the system name where Agent Installation Repository (VA or Standalone) is available.
`om_server`	specifies the server name to which the Operations Agent has to be activated.
`secured`	use `-sec` if SSL certificate is imported and installed on the client. If SSL certificate is not imported, use `-unsec`.

> **Note:** Profile file based installation is enabled by default. To disable profile file based installation, set `profile_enable => "no"`. To enable profile file based installation, set `profile_enable => "yes" or ""`. Make sure that profile file configuration settings are updated as mentioned in "Enabling Operations Agent Installation Using Profile File with Puppet" below.

5. To test the deployment, log on to the puppet client and run the following command:

   ```
   puppet agent --test
   ```

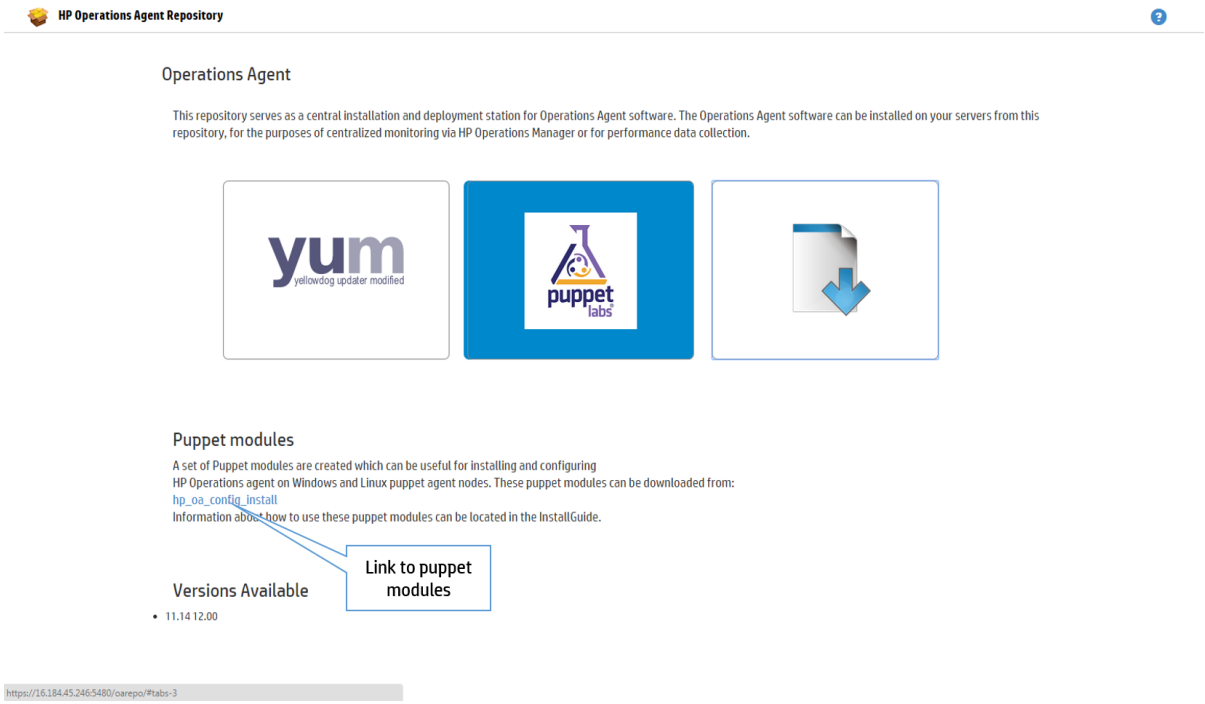
> **Note:** You can verify the Operations Agent version installed by using the command: `<OvInstallDir>/opcagt –version`

Enabling Operations Agent Installation Using Profile File with Puppet

You can use the profile file option during installation to enable Operations Agent to run with non-default configuration settings. For example, you can update the configuration settings such as the communication port, event interceptor port, or the license type using the profile file.

In the puppet environment, profile file is available as a template **`profile_file_default.erb`** with the default configuration settings for MANAGER, CERTIFICATE_SERVER and INSTALL_OPCAUTH.

The template is available in the **puppet_modules.tar** on the Agent Installation Repository landing page. You can download the **puppet_modules.tar** from `https://hostname:portnumber/oarepo/puppet_modules.tar`



The profile file is available under `hpoa_install_config/templates`.

You can configure the profile file in the following ways:

- Define the required configuration settings in the template **`profile_file_default.erb`**.

  For example:

  To set the custom Health View Server using the profile file during installation:

  Add the following in the template `profile_file_default.erb`:

  `set agent.health:OPC_SELFMON_SERVER=hostname`

  In this instance,

  agent.health is the configuration variable namespace.

  OPC_SELFMON_SERVER is the configuration variable.

  hostname is the value for the configuration variable. This value will be fetched during the run-time from the puppet module.

> **Note:** All profile file options are applicable. For more information see, Installing Operations Agent using Profile File.

- Set the configuration variable in the template **profile_file_default.erb** and define the value in the **profile.pp** class file which is available under `/hpoa_install_config/manifests/profile.pp` in the puppet modules directory.

  For example:

  To set custom Health View Server using profile file during installation:

  Configure the profile file, follow the steps:

  a. Set the configuration variable in the template **profile_file_default.erb** as:

  ```
  set agent.health:OPC_SELFMON_SERVER=<%=@selfmonserver%>
  ```

  b. Define the value in **profile.pp** class file as:

  ```
  $selfmonserver = "hostname"
  ```

  In this instance,

  agent.health is the configuration variable namespace

  OPC_SELFMON_SERVER is the configuration variable

  <%=@selfmonserver%> is the representation for the value

  hostname is the value for the configuration variable. This value is fetched during run-time from the puppet module.

Profile file configuration for YUM and **oarepo** is provided in their respective sections.

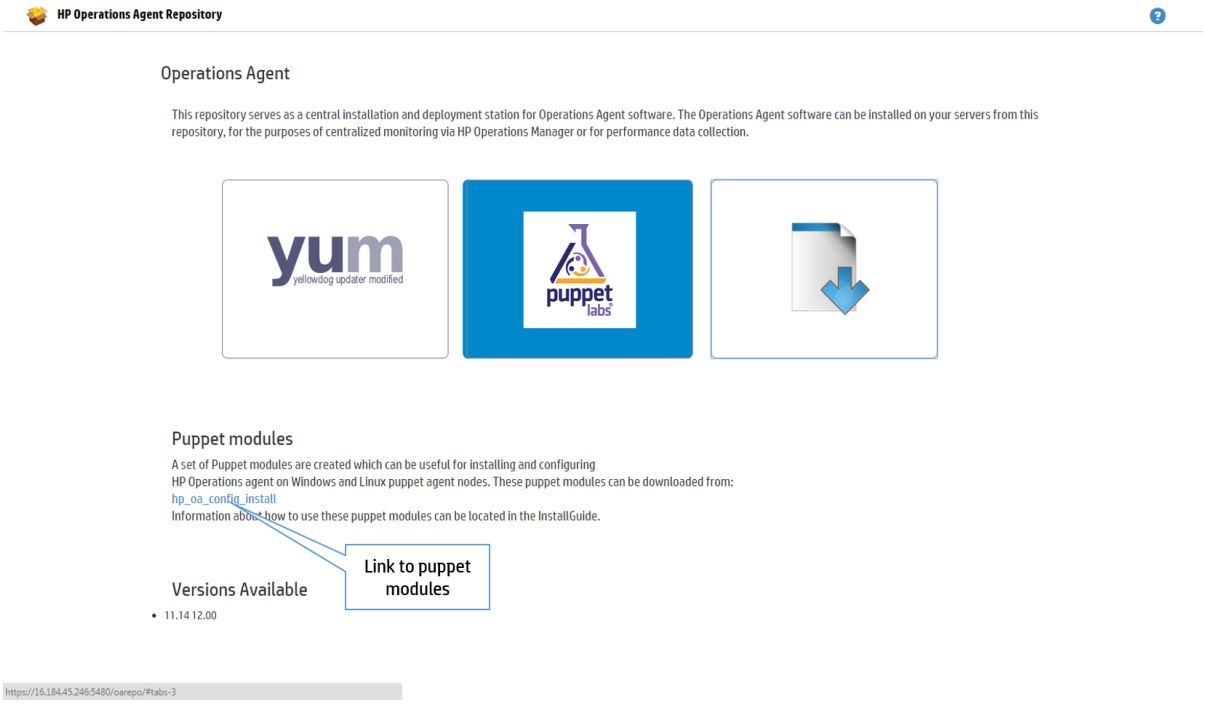
Configuring Operations Agent Using Puppet Module to Set the XPL Parameters for the Nodes

The puppet module uses the **oa_config** custom resource to set the xpl parameters.

Follow these steps:

1. Log on to the puppet master.
2. The **puppet_modules.tar** is available on the Agent Installation Repository landing page

`https://hostname:portnumber/oarepo/puppet_modules.tar`. Download, copy, and untar the **puppet_modules.tar** file in the puppet modules directory.



For Example: You can download the **puppet_modules.tar** file at `/etc/puppet/modules` on puppet master.

3. The puppet module uses the **oa_config** custom resource to complete the configuration. Edit the **init.pp** class file for XPL parameters:

```
oa_config
{
ensure => present,
notify => Service['OVCtrl'],
}
oa_config { 'coda.comm/SERVER_BIND_ADDR': value => 'localhost6', }
oa_config { 'eaagt/Dummy12': value => '12', }
oa_config { 'new_namespace/Dummy2': value => '12', }
```

In this instance,

`coda.comm` is the namespace.

`SERVER_BIND_ADDR`	is the configuration variable.
`value`	specifies the configuration variable value you want to update.

> **Note:** The `ensure` parameter is used to set or clear the variable. By default **present** is used to set and **clear** is used to clear the configuration variable

Verification

Run the following command to verify the configuration changes made through puppet provider:

On Linux: `/opt/OV/ovconfget <namespace>`

On Windows: `%ovinstalldir%bin\ovconfget <namespace>`

Chapter 12: Installing the Operations Agent Using Server Automation

Server Automation (SA) helps in automated application deployment. You can use Server Automation to deploy Operations Agent. For more information on the prerequisites for installing the Operations Agent, see Prerequisites for Installing the Operations Agent. The target where you are installing the Operations Agent must always have SA agent installed on it.

To obtain the platform-specific media zip from the Operations Agent media, run the following command. The command creates zip media that can be imported into Server Automation.

```
cscript oainstall.vbs -createzip
```

or

```
./oainstall.sh -createzip
```

This creates a `.zip` file for each platform package in the media. To download a platform-specific **.zip** file from a specific location, run the following command:

```
cscript oainstall.vbs -createzip -out_dir c:\temp -p <OS name>
```

In this instance:

<*OS name*> is the name of the operating system

Use the following values for <OS name>:

For Windows: WIN

For Linux: LIN

For example:

To obtain a `.zip` file for Windows operating system from a specific location, run the following command:

```
cscript oainstall.vbs -createzip -out_dir c:\temp -p win
```

To install Operations Agent using the SA console, perform the following tasks:

- "Importing the Operations Agent Software" on the next page
- "Creating a Software Policy " on page 116

- "Attaching the Software Policy to a Device or Server" on page 117

Before starting the tasks to install Operations Agent using the SA console, make sure that SA agent is installed on the node. For more information, see *Installing Server Agent* section in the *Server Automation User Guide*.

Importing the Operations Agent Software

To import the Operations Agent software, follow these steps:

1. Download the Operations Agent media.

   The Operations Agent media is in the **.tar** file format. To extract the contents of the **.tar** file containing the Operations Agent media, use the command `tar -xvf <filename>.tar` on the UNIX/Linux systems.

2. After you untar the Operations Agent media, run the following command to create the zip media:

   `cscript oainstall.vbs -createzip -p <OS name>`

3. Log on to the Server Automation Client console.
4. In the navigation pane, select **Library**.
5. Select the **By Folder** tab, and the required folder.
6. Click **Actions > Import Software**. The **Import Software** dialog box opens.
7. Browse and select the zip file that you created and select **ZIP Archive (.zip)** as the package type.
8. Browse and select the appropriate folder and platform.
9. Click **Import**.
10. Click **Close** when the import is successful. Double click the uploaded package to change the following properties:

    On Windows:

    - Default install path:

      `%temp%\oa_media_Windows_X64`

    - Install Scripts - Post-install script:

      `%temp%\oa_media_Windows_X64\oainstall.bat`

- Uninstall Scripts - Pre-uninstall script:

  ```
  %temp%\oa_media_Windows_X64\oaremove.bat
  ```

On Linux:

- Default install path:

  ```
  /usr/local/oa_media_Linux2.6_X64
  ```

- Install Scripts - Post-install script:

  ```
  cd /usr/local/oa_media_Linux2.6_X64

  find . -print | xargs chmod +x

  /usr/local/oa_media_Linux2.6_X64/oainstall.sh -i -a
  ```

- Uninstall Scripts - Pre-uninstall script:

  ```
  /usr/local/oa_media_Linux2.6_X64/oainstall.sh -r –a
  ```

The package appears in the contents pane.

You can also install the imported software without creating and attaching a software policy by performing the following tasks:

1. In the navigation pane, select **Library**, expand **Packages**, and select the platform on which you imported the software **zip** file. The contents pane displays the imported software package.
2. Select **Actions > Install Software...**. The **Install Software** window opens.
3. Click and select the required device or server from the list and click **Select**.
4. Click **Start Job**.
5. Click **Close** when the processes are successfully completed. To verify if the package is successfully installed, see "Verifying the Installation" on page 118.

Creating a Software Policy

To create a software policy, follow these steps:

1. In the navigation pane, select **Library**.
2. In the **By Type** tab, expand **Software Policies** and select the required platform from the list. The

Contents pane displays the existing software policies for the selected platform.

3. Click **Actions > New...**.

   The **Software Policy** window opens.

4. Type a name for the policy in the **Name** field.
5. Click **Select** to select the appropriate folder.
6. Click **Policy Items** in the **Views** pane.
7. Click in the **Policy Items** pane. The Select Library Item window opens.
8. Select **Package** from the **Browse Types** tab. The right pane displays all the available packages.

   Alternatively, you can also select **Browse Folders**, and select the folder where you imported the package.

9. Select the required package to attach the software policy.
10. Click **Select**. The package details appear in the Software Policy window.
11. In the left pane, click **Contents** to view the contents of the package.
12. Click **File > Save**. Close the window. The policy details appear on the contents pane.

Attaching the Software Policy to a Device or Server

To attach a Software Policy, do one of the following:

- "Attaching the Software Policy from the Software Policy list" below
- "Attaching the Software Policy from the Devices list" on the next page

Attaching the Software Policy from the Software Policy list

1. In the navigation pane, select **Library**.
2. In the **By Type** tab, expand **Software Policies** and select the required platform from the list. The contents pane displays the existing software policies for the selected platform.
3. Select the required software policy. Click **Actions > Attach**. The **Attach Server** window opens.
4. Select the required device from the **Devices** list and click **Attach**. The **Remediate** window opens.

5. Click **Start Job**. Wait till the installation process is complete.
6. Click **Close** after all requests are successfully completed.

Attaching the Software Policy from the Devices list

1. In the navigation pane, select **Devices**.
2. Select the required device or server from the **Devices** list. The contents pane displays the associated devices or servers.
3. Select the required device or server. Click **Actions > Attach > Software Policy**. The **Attach Software Policy** window opens.
4. Select the software policy and click **Attach**. The **Remediate** window opens.
5. Click **Start Job**. Wait till the installation process is complete.
6. Click **Close** after all requests are successfully completed.

   To verify that the policy is attached to the device or server successfully, select the device or server from the devices list and select **Software Policies** from the **View** drop down list. The policies attached to the device or server are listed at the bottom of the contents pane.

Verifying the Installation

To verify that Operations Agent is successfully installed, follow these steps:

1. In the navigation pane, select **Devices**.
2. Select the required device or server from the **Devices** list. The contents pane displays the associated devices or servers.
3. Select the required device or server.
4. Select **Installed Packages** from the **Views** drop down list in the contents pane. The list of packages installed on the selected server or devices appears at the bottom of the pane.
5. Check if the Operations Agent package is available.

> **Note:** You can also check the contents of the *oainstall.log* file on the target system and verify that Operations agent is installed.

Uninstalling Operations Agent using SA console

To uninstall Operations Agent using the SA console, follow these steps:

1. In the navigation pane, select **Devices**.
2. Select the required device or server from the **Devices** list. The contents pane displays the associated devices or servers.
3. Select the required device or server. Click **Actions > Uninstall > Software**. The **Uninstall Software** window opens and the contents pane displays the selected device or server.
4. Click **Software** from the list on the left pane.
5. Click to specify the software policy. The **Select Library Item** window opens.
6. Select the required software policy attached to the Operations Agent package to be uninstalled.
7. Click **Select** and then **Start Job**. The Job Status appears and uninstalls the Operations Agent package.
8. Click **Close** after the job is completed.

   To verify that package is uninstalled from the device or server successfully, select the device or server from the devices list and select **Software Policies** from the **View** drop down list. The policies attached to the device or server are listed at the bottom of the contents pane. The list does not contain the Operations Agent package after successful uninstallation.

Chapter 13: Installing the Operations Agent using Microsoft System Center 2012 Configuration Manager

The Microsoft System Center 2012 Configuration Manager is a systems management software product. You can use Microsoft System Center 2012 Configuration Manager to install Operations Agent on the required Windows nodes and servers. For more information on the prerequisites for installing Operations Agent, see "Prerequisites for Installing the Operations Agent on a Node" on page 42.

For more information, see the *Microsoft System Center documentation*. After adding the node or server, navigate to **Assets and Compliance > Overview > Devices** and check if the details appear in the devices list.

To install the Microsoft System Center 2012 Configuration Manager client on the required node, select the node from the devices list and click **Install Client** .

To install Operations Agent using the Microsoft System Center 2012 Configuration Manager console, perform the following tasks:

1. "Creating the Operations Agent Package" below
2. "Deploying the Operations Agent Package" on page 122

Creating the Operations Agent Package

To create an Operations Agent deployment package, follow these steps:

1. Download the Operations Agent media.
2. Browse to the **packages** folder and select the required Operating System.

   For example, to obtain the Windows 64-bit packages, browse to **packages > WIN > Windows_X64**.
3. Extract the contents of the media.
4. Log on to the Microsoft System Center 2012 Configuration Manager console.

5. In the left Navigation Pane, select **Software Library**.
6. Expand **Overview > Application Management** and select **Packages**.
7. Click **Create Package** to create the Operations Agent deployment package.

   The **Create Package and Program Wizard** window opens.
8. Type a name for the package in the **Name** field.
9. Type a description in the **Description** field.
10. Select the **This package contains source files** checkbox and click **Browse**.

    The **Set Source Folder** dialog box opens.
11. Select **Network path (UNC name)**.
12. Click **Browse** and navigate to the location where the Operations Agent package is available.
13. Click **OK** and then click **Next**.
14. Select the program type you want to create and click **Next**.
15. Type a name for the program in the **Name** field.
16. Click **Browse** corresponding to the **Command line** field and navigate to the folder where the **oasetup.exe** is available.

    To start the installation on the node automatically with **oasetup.exe**, type

    `oasetup.exe -install`.

    For example, you can also type `cscript.exe oainstall.vbs –i –a -agent_profile <absolute path of profile text file>`, if you want to specify an agent profile. Make sure that the .txt file is placed at the same location where the **oainstall.vbs** file is present.

    For example, you can also use the command `cscript.exe oainstall.vbs -i -a -srv <management_server_hostname> -cert_srv <management_server_hostname> -f`

    You can mention any agent installation command to perform an appropriate action during deployment.
17. Select and provide values in the required fields.
18. Click **Next** until the completion status window appears.
19. Click **Close** to close the dialog box.

    The created package appears in the right pane of the console.

Deploying the Operations Agent Package

To deploy the Operations Agent package on the node or server, follow the steps:

1. Select the Operations Agent package.
2. Click **Deploy** .

   The Deploy Software Wizard window opens.
3. Verify that the **Software** field contains the package name.

   If you need to select a different package, click the corresponding **Browse** button and select the required package.
4. Click **Browse** corresponding to the **Collection** field.

   The Select Collection window opens.
5. Select the required node or server on which you want to deploy the Operations Agent. Click **OK**.
6. Click **Next**.
7. Click **Add**. Select **Distribution Point** or **Distribution Point Group**.

   A window opens that displays the distribution points or the distribution point groups.
8. Select the required value and click **OK**.
9. Click **Next**. Specify the required Deployment Settings in the settings screen.
10. In the Summary screen, click **Next**. The window shows the progress of the deployment.
11. Click **Close** in the Completion screen after the wizard displays the message that the software is successfully deployed.

Verifying the Installation

To verify if the Operations Agent is successfully installed, follow the steps:

1. In the left navigation pane, select **Monitoring**.
2. Navigate to **Overview > Deployments**. The right pane displays all the deployments with the

name of the package.

3. Select the appropriate deployment and click **View Status** ( ).

   Alternatively, you can also double-click the deployment to view the status.

   The right pane displays the deployment status. You can check the different tabs to view the status of the deployment.

Chapter 14: Installing the Operations Agent Using Red Hat Network Satellite Server

You can use the Red Hat Network Satellite server to deploy the Operations Agent on all the Linux nodes. For more information about the prerequisites for installing Operations Agent, see "Prerequisites for Installing the Operations Agent on a Node" on page 42. The target node where you are installing Operations Agent must always be added to communicate with Red Hat Network Satellite (RHNS) server.

> **Note:** When you upgrade from Operations Agent 8.60 to Operations Agent 12.05, ensure that you uninstall Operations Agent 8.60 using the `opc_inst.sh -r` command and then install the Operations Agent 12.05 using the Red Hat Network Satellite server.

To download platform specific packages from the Operations Agent media, browse the media to the specific package location. The following table lists the platform-specific packages to be obtained from the media.

Operating System	Architecture	Packages
Linux	Linux2.6 x64	packages/LIN/Linux2.6_X64
	Linux2.6 x86	packages/LIN/Linux2.6_X86
	Linux2.6 PPC64	packages/LIN/Linux2.6_PPC64

To install Operations Agent using RHNS server, perform the following tasks:

1. "Downloading and Storing the Operations Agent Depot Files (RPMs) " on the next page
2. "Creating the Setup on the Target Node " on the next page
3. "Deploying the Packages on the Target Node" on page 126

To remove the packages from the target node, see "Removing the Packages from the Target Node " on page 127

Downloading and Storing the Operations Agent Depot Files (RPMs)

To download and store the Operations Agent software in Software Delivery Repository, follow these steps:

1. Obtain the Operations Agent media and mount it to your desired location.
2. To obtain the Linux packages, browse to the **packages** folder and select **Lin**.
3. Select and unzip all the **gzip** files from the media using the `-N` option.
4. Upload the Operations Agent RPMs to Software Delivery Repository location of the RHNS server.

Creating the Setup on the Target Node

To create the setup on the target node, follow these steps:

1. Add the node to RHNS server. The node is known as the target node.
2. On the target node, create a file and provide the location on the system where Operations Agent package must create the **Default Agent File (oa.repo)**.

   For example, create a file `/etc/yum.repos.d/`<oa.repo>.

   > **Note:** The agent depot files must be available in the **repos.d** location.

3. Update the contents of the file and specify the location (*baseurl*) where Operations Agent depot files are available.

   > **Note:** The content of the file:
   >
   > [oa]
   >
   > Name=**Operations Agent**
   >
   > baseurl=System_name`/SDR/downloads/Extras/RedHat/6Server/x86_64/current/operation-agent/`<*Agent RPMs location*>
   >
   > gpgcheck=0

In this instance:

<*Name*> is the product name.

<*baseurl*> is the location where Operations Agent package is available.

gpgcheck is the additional check to verify the RPMs. To disable this additional check, set the value as 0.

OR

Use the content to verify the RPMs with the public key.

[oa]

Name=**Operations Agent**

baseurl=System_name`/SDR/downloads/Extras/RedHat/6Server/x86_64/current/operation-agent/`<*Agent RPMs location*>

gpgcheck=1

gpgkey=`file://<path of hpPublicKey.pub>`

In this instance:

<*Name*> is the product name.

<*baseurl*> is the location where agent package is available.

gpgcheck is the additional check to verify the RPMs. To enable this additional check, set the value as **1**.

gpgkey is the path to get the HP public key. This key is only required if you need additional security.

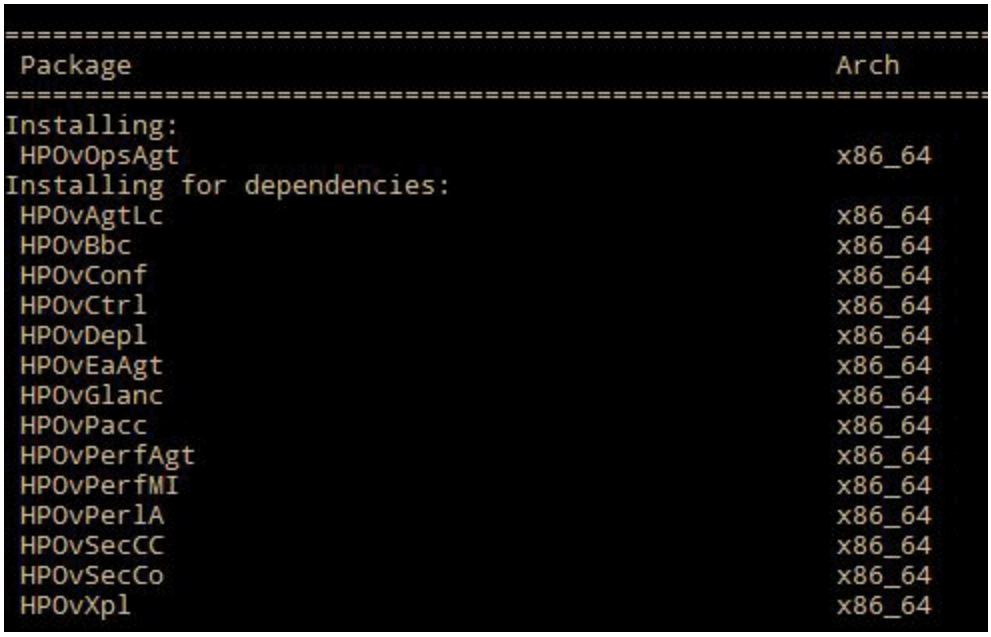
Deploying the Packages on the Target Node

To deploy the packages on the target node, follow these steps:

1. Run the command to install the required RPMs:

   `# yum install` <**HPOvOpsAgt**>

   Note: All the dependent Operations Agent RPMs are installed.



2. Run the following command to verify if Operations Agent packages are installed:
   `rpm -qa | grep <packagename>`

   In this instance, <`packagename`> is name of the agent package.

   For example, `rpm -qa | grep <HPOvBbc>`

After performing all the steps, Operations Agent RPMs are available on the node. Configure the management server by performing the following steps:

1. Go to the following directory on the Linux node:

   `/opt/OV/bin/OpC/install`

2. Run the following command:

   `opcactivate -srv` <management_server> `-cert_srv` <management_server> `-f`

   In this instance:

   <*management_server*> is the FQDN of the OM management server.

Removing the Packages from the Target Node

You can remove the packages by using either the *YUM* command or *oainstall.sh* program.

Using YUM Commands to remove the packages

- Run the following command to remove the package or *only* the specific RPMs:

  ```
  yum remove <package name>
  ```

  > **Note:** Make sure that you install *yum-plugin-remove-with-leaves* to remove all the Operations agent packages by using a single command.

- Run the following command to remove the Operations Agent completely:

  ```
  yum remove --remove-leaves HPOvOpsAgt HPOvSecCo
  ```

Using oainstall.sh program to remove the packages

To remove the packages, run the following command:

```
/opt/OV/bin/OpC/install/oainstall.sh -r -a
```

Chapter 15: Installing the Operations Agent RPM based Hotfix Package

The Operations Agent 12.05 enables you to install RPM based hotfix package on a Linux system. This RPM hotfix packages are placed in the hotfix media.

The RPM hotfix package is available at the following folder location:

`hotfixes/<hotfixID>/<platform>/`

For example, in this hotfix, the XPL hotfix RPM package is available at the following location:

`hotfixes/HFLIN_xxxxx/Linux2.6_X64/HPOvXpl-12.01.xxx.rpm.gz`

> **Note:** During the registration and deployment of OM or OMi the RPM based hotfixes are not deployed instead only the tar based hotfix packages are deployed. Hence, there is no change in the existing behavior of the deployment scenarios.

To install RPM hotfix package on the Linux system, follow these steps:

1. Go to the directory:

   `<root directory>/hotfixes/<hotfixID>/<platform>/`

   For example, `<root directory>/hotfixes/HFLIN_xxxxx/Linux2.6_X64/`
2. Run the following command to unzip the RPM hotfix package:

   `gzip –d <rpm package>.gz`

   For example, `gzip –d HPOvXpl-12.01.xxx.rpm.gz`
3. Run the following command to install the RPM package:

   `rpm –U <rpm package>`

   For example, `rpm –U HPOvXpl-12.01.xxx.rpm`

To install the RPM hotfix package using YUM:

1. Perform step 1 and 2.
2. Run the following command to install the RPM package:

   `yum install <rpm package>`

> **Note:** Once the RPM based hotfixes are installed, it cannot be removed. The command to remove the hotfix (for example, `oainstall.sh –r –a –pn <hotfixID>` command) does not work.

For RPM based hotfix installation, run the `ovdeploy -inv` command to verify the installation. In the output, the version of the individual components are updated but the version of the product bundle does not change as the RPM hotfixes are installed.

For example:

Run the following command:

```
ovdeploy -inv
```

The command generates the following output:

NAME	DESCRIPTION	VERSION	TYPE	OSTYPE
HPOvAgtLc	Operations agent L10NPackage	12.01.010	pkg	Linux
HPOvBbc	HTTP Communication	12.01.010	pkg	Linux
HPOvConf	Configuration	12.01.010	pkg	Linux
HPOvCtrl	Process Control	12.01.010	pkg	Linux
HPOvDepl	Deployment	12.01.010	pkg	Linux
HPOvEaAgt	**E/A Agent**	**12.01.011**	**pkg**	**Linux**
HPOvGlanc	Performance Glance	12.01.010	pkg	Linux
HPOvPacc	Performance Access	12.01.010	pkg	Linux
HPOvPerfAgt	Performance Agent	12.01.010	pkg	Linux
HPOvPerfMI	Measurement Interface	12.01.010	pkg	Linux
HPOvPerlA	Perl	05.16.013	pkg	Linux
HPOvSecCC	Certificate Management Client	12.01.010	pkg	Linux
HPOvSecCo	Security Core	12.01.010	pkg	Linux
HPOvXpl	**Cross Platform Component**	**12.01.011**	**pkg**	**Linux**
Operations-agent	**Operations Agent Product**	**12.01.010**	**bdl**	**linux**

The output shows that the version of the individual components - **HPOvEaAgt** and **HPOvXpl** are updated but the version of the **Operations-agent** product bundle does not change.

Chapter 16: Installing the Operations Agent on Platforms with Limitations

The installer may fail to install the Operations Agent on platforms with limitations. For example, you may see the following error when you try to install the agent on such a platform:

```
The product bundle selected may not yet be supported on this node
```

To install the Operations Agent on such a node, run the installer with the `-minprecheck` option along with the `-i` and `-a` options.

Examples

To install the Operations Agent 12.05 on a Windows system, run the following command:

```
cscript oainstall.vbs -i -a -minprecheck
```

To install the Operations Agent 12.05 on a UNIX/Linux system, run the following command:

```
./oainstall.sh -i -a -minprecheck
```

See the *Operation Agent Support Matrix* for more details on platforms with limitations.

Installing the Operations Agent on Platforms with Limitation Remotely from the OM for Windows Console

To install the Operations Agent 12.05 remotely from the OM for Windows console on platforms supported with limitation, you must perform the following pre-installation tasks on the management server:

1. Log on to the Management Server as an administrator.
2. Go to the `%ovdatadir%shared\conf\PMAD` directory .
3. Rename the `agent_install_defaults.cfg.sample` file as `agent_install_defaults.cfg`.

   > **Tip:** Take a backup of the `agent_install_defaults.cfg.sample` file.

4. Open the `agent_install_defaults.cfg` file with a text editor and add the following line:

   ```
   [nonXPL.config]

   MINPRECHECK=True
   ```

5. Save the file.

For more information on installing the Operations Agent 12.05 remotely from the OM console, see *Configure the Agent Remotely from an OM for Windows Management Server Online Help*.

Installing the Operations Agent on Platforms with Limitation Remotely from the OM for UNIX Console

To install the Operations Agent 12.05 remotely from the OM for UNIX console on platforms with limitation, you must perform the following pre-installation tasks on the management server:

1. Log on to the Management Server as an administrator.
2. Go to the directory `/etc/opt/OV/share/conf/OpC/mgmt_sv`.
3. Rename the file **bbc_inst_defaults.sample** as **bbc_inst_defaults**.
4. Open the file **bbc_inst_defaults** with a text editor and add the following line:

   ```
   [nonXPL.config]

   MINPRECHECK=true
   ```

5. Save the file.

For more information on installing the Operations Agent 12.05 remotely from the OM console, see *OM for UNIX: New Agent Installation section in the OM on UNIX/Linux Online Help*.

> **Note:** After installing the Operations Agent 12.05 using `MINPRECHECK`, the changes done in the profile file must be reverted. When you install using `MINPRECHECK`, the version check for the Operating System and Architecture is skipped.

Installing the Operations Agent on Platforms with Limitation Remotely Using Command Line

To install the Operations Agent 12.05 remotely on platforms supported with limitation:

1. Log on to the management server as an administrator.
2. Go to the following directory on the Management Server:

   On Windows:

   `%ovinstalldir%bin`

   On UNIX/Linux:

   `/opt/OV/bin`
3. Add the following line in a text file:

   `[nonXPL.config]`

   `MINPRECHECK=true`
4. Run the following command:

   `ovdeploy –install –bundle <path_to_OVO-Agent.xml> –node <node name> -f -sp –af <path_of_profile _file>\<profile_file_name> –ovrgserver -1 –configure <profile_file_name>`

The command installs the Operations Agent 12.05 on the node.

Chapter 17: Installing the Operations Agent Manually on the Node

Task 1: Prepare for Installation

Before installing the Operations Agent, you must extract or mount the *Operations Agent and Infrastructure SPIs* media on the node.

Alternatively, you can manually transfer the agent deployment package from the OM management server.

To transfer the deployment package from a Windows management server:

1. Make sure the node is added as a managed node on the OM console.
   a. Create a directory on the management server and then go to the directory.
2. Run the following command:

   `ovpmutil dnl pkg Operations-agent /pnn <node_FQDN>`

   In this instance, *<node_FQDN>* is the fully-qualified domain name of the node.

   The deployment package for the node is downloaded into the current directory.
3. Transfer the directory from the management server into a temporary directory on the node.

To transfer the deployment package from a UNIX/Linux management server:

1. Log on to the management server and then go to the following directory:

   `/var/opt/OV/share/databases/OpC/mgd_node/vendor/<vendor>/<arch>/<ostype>/A.12.01.000`

   In this instance:

   <*vendor*>: Name of the operating system vendor.

   <*arch*>: Architecture of the node.

   <*ostype*>: Operating system of the node.

   The following table provides a list of *<vendor>/<arch>/<ostype>* combinations that you can use:

Operating System	Architecture	Select this combination..
Windows	x86_64	ms/x64/win2k3
Windows	x86	ms/x86/winnt
Linux	x86_64	linux/x64/linux26
Linux	x86	linux/x86/linux26
Linux	PowerPC (64-bit)	linux/powerpc/linux26
Linux (Debian)	x64	linux_deb/x64/linux26
HP-UX	Itanium	hp/ipf32/hpux1122
HP-UX	PA-RISC	hp/pa-risc/hpux1100
Solaris	SPARC	sun/sparc/solaris7
Solaris	x86	sun/x86/solaris10
AIX	PowerPC (64-bit)	ibm/rs6k64/aix5

2. Transfer the contents of the `RPC_BBC` directory (available inside the `A.12.01.000` directory) to a temporary directory on the node.

Optional. **Installing Operations Agent using Profile File**

Task 2: Install the Operations Agent and Infrastructure SPIs

In the following section:

<*management_server*>: FQDN of the management server

<*certificate_server*>: FQDN of the certificate server

<*install_directory*>: Path to place all packages and binary files on the node.

<*data_directory*>: Path to place all data and configuration files on the node.

<*path*> is the path to the profile file.

<*profile_file*> is the name of the profile file.

1. Log on to the node as root or administrator.
2. If you want to install from the *Operations Agent and Infrastructure SPIs* media, follow these steps:
   a. Go to the media root.
   b. Run the following command to install without a profile file:

On Windows:

```
cscript oainstall.vbs -i -a -s <management_server> [-cs <certificate_
server>][-install_dir <install_directory> -data_dir <data_directory>]
```

On UNIX/Linux:

```
./oainstall.sh -i -a -s <management_server> [-cs <certificate_server>]
```

c. Run the following command to install with a profile file:

On Windows:

```
cscript oainstall.vbs -i -a -agent_profile <path>\<profile_file> -s
<management_server> [-cs <certificate_server>] [-install_dir <install_
directory> -data_dir <data_directory>]
```

On UNIX/Linux:

```
./oainstall.sh -i -a -agent_profile <path>/<profile_file> -s <management_
server> [-cs <certificate_server>]
```

> **Tip:** On Windows, you can use the **oasetup** program instead of the **oainstall.vbs** script.
>
> *To install the agent with the **oasetup** program:*
>
> i. Make sure that the Microsoft Visual C++ Redistributable Package is installed on the system.
>
> If it is not installed on the system, follow these steps:
>
> - Go to the `packages\WIN` directory from the media root.
>
> - Go to the appropriate directory based on the architecture of the node (Windows_X64 for x64 platforms and Windows_X86 for x86 platforms).
>
> - Run the following executable files:
>
> **On Windows x86:** `vcredist_x86.exe` and `vcredist2k5_x86.exe`
>
> **On Windows x64:** `vcredist_x64.exe` and `vcredist2k5_x64.exe`
>
> ii. Run the following command to install the agent:
>
> ```
> oasetup -install -management_server <management_server> [-certificate_
> server <certificate_server>] [-install_dir <install_directory> -data_dir
> <data_directory>]
> ```
>
> or
>
> ```
> oasetup -install -management_server <management_server> [-certificate_
> ```

```
server <certificate_server>] -agent_profile <path>\<profile_file> [-
install_dir <install_directory> -data_dir <data_directory>]
```

3. If you manually transferred the agent deployment package from the OM management server, follow these steps:

   a. Go to the directory on the node where you stored the deployment package.

   b. Run the following command:

   On Windows:

   ```
   oasetup -install -management_server <management_server> [-certificate_server
   <certificate_server>][-install_dir <install_directory> -data_dir <data_
   directory>]
   ```

   On UNIX/Linux:

   a. `chmod u+x oasetup.sh`

   b. `./oasetup.sh -install -management_server <management_server> [-certificate_server <certificate_server>]`

   To install with a profile file, add **-agent_profile** <*path*>\<*profile_file*> after **-install**.

Tip: The Operations agent provides you with an option to trace the agent processes. You can run the tracing option with the `oainstall` program, which generates trace files by using the following command:

```
-enabletrace <application name>
```

Run the following command to get the list of applications: `ovtrccfg -vc`

For example:

```
-enabletrace ovconfget
```

To trace all the agent processes, run the command with the following additional option:

```
-enabletrace ALL
```

For example:

```
./oainstall.sh -i -a -agent_profile /root/profile/profile_file -s test_
system1.domain.com -enabletrace ALL
```

The trace file (with the extension .trc) is available in the following location:

On Windows

> `%ovdatadir%Temp`
>
> **On UNIX/Linux**
>
> `/var/opt/OV/tmp`

If you install the agent on an OM management server, you must restart all OM processes after installation.

Placement of Packages

When you install the Operations Agent on the standalone server, the installer program places all necessary packages and files into the following locations:

- **On Windows:**
  - `%ovinstalldir%`
  - `%ovdatadir%`

    The preceding files are placed at the location `C:\Program Files\HP\HP BTO Software`, by default. You can change the location as required.
- **On HP-UX, Linux, and Solaris:**
  - `/opt/OV`
  - `/opt/perf`
  - `/var/opt/OV`
  - `/var/opt/perf`
- **On AIX**
  - `/usr/lpp/OV`
  - `/usr/lpp/perf`
  - `/var/opt/OV`
  - `/var/opt/perf`

Installation Log Files

The installer places the installation log file (`oainstall.log`) into the following directory:

- **On Windows:** `%ovdatadir%\log`
- **On UNIX/Linux:** `/var/opt/OV/log`

Verifying the Installation

After installing the Operations Agent, review the contents of the installation log file (**oainstall.log**). If the installation is successful, the following message appears:

```
Operations Agent installation completed successfully
```

Post-Installation Task in a NAT Environment

If you install the agent on nodes in the Network Address Translation (NAT) environment, you must configure the agent on the node to use the IP address that was used with OM while adding the node.

To configure the agent to use the IP address set with OM, follow these steps:

1. Log on to the node with the root or administrative privileges.
2. Go to the following directory:

   On Windows

   `%ovinstalldir%bin`

   On HP-UX, Linux, or Solaris

   `/opt/OV/bin`

   On AIX

   `/usr/lpp/OV/bin`
3. Run the following command:

   `ovconfchg -ns eaagt -set OPC_IP_ADDRESS <IP_Address>`

   In this instance, *<IP_Address>* is the IP address of the node that was configured with OM while adding the node to the list of managed nodes.
4. Restart the agent by running the following commands:
   a. `ovc -kill`
   b. `ovc -start`

Chapter 18: Deploying Streaming Edition of Operations Agent

Streaming Edition of Operations Agent is a light weight variant of Operations Agent that allows us to stream logs and metrics to configurable destinations.

The Operations Agent media provides you with the streaming agent package. You can install streaming agent on Linux x64 and Windows x64 nodes. If you want to install the streaming agent, download the Operations Agent media for the required platform.

You can use one of the following methods to install streaming agent:

- Installing streaming agent from the Operations Agent media
- Installing streaming agent using createzip option

> **Note:** Remote deployment of streaming agent from management server is not supported. Also, streaming agent is supported only with OMi.

Installing streaming agent from the Operations Agent media

You can use the `-stream` option to install streaming agent locally on a node. `-stream` option requires either `–install_dir` or `–agent_profile` (provided `install_dir` is defined in the profile file). `–install_dir` is the directory path to install the Streaming Edition of Operations Agent.

You can also use only the `–agent_profile` option to install streaming agent provided `STREAM=TRUE` and `install_directory` is defined in the profile file. For more information on using the profile file option, see Installing Operations Agent using Profile File.

To install streaming agent locally on a node from the Operations Agent media, follow the steps:

1. Log on to the node as a root user or an administrator.
2. Download and extract the Operations Agent media.

3. Go to the directory where you extracted the media.
4. Run the following command:

Install Scenario	Command

Using `precheckonly` before installation	**On Windows**
	`cscript oainstall.vbs –i|-install -a|-agent -stream -precheckonly`
	On Linux
	`./oainstall.sh –i|-install –a|-agent -stream -precheckonly`

Install using `-stream` and `-install_dir`	**On Windows**
	`cscript oainstall.vbs –i|-install -a|-agent -stream -install_dir <install_directory> [-s|-srv <management_server> [-cs|-cert_srv <certificate_server>]] [-data_dir <data_directory>]`
	On Linux
	`./oainstall.sh –i|-install –a|-agent -stream -install_dir <install_directory> [-s|-srv <management_server> [-cs|-cert_srv <certificate_server>]] [-data_dir <data_directory>]`

Install using `-stream` and `-agent_profile`
Caution: Provided `<install_dir>` is defined in the profile file.
	On Windows
	`cscript oainstall.vbs –i|-install -a|-agent -stream -agent_profile <path>\<profile file name> [-s|-srv <management_server> [-cs|-cert_srv <certificate_server>]] [-data_dir <data_directory>]`
	On Linux
	`./oainstall.sh –i|-install –a|-agent -stream -agent_profile <path>/<profile file name> [-s|-srv <management_server> [-cs|-cert_srv <certificate_server>]] -data_dir <data_directory>]`

Install using `-agent_profile` only
Caution: Provided `STREAM=TRUE` and `<install_dir>` is defined in the profile file.
	On Windows
	`cscript oainstall.vbs –i|-install -a|-agent -agent_profile <path>\<profile file name> [-s|-srv <management_server> [-cs|-cert_srv <certificate_server>]] [-data_dir <data_directory>]`
	On Linux
	`./oainstall.sh –i|-install –a|-agent -agent_profile`

	<path>/<profile file name> [-s|-srv *<management_server>* [-cs|-cert_srv *<certificate_server>*]] [-data_dir *<data_directory>*]

In this instance,

<install_directory>: Path to install the package and place all configuration and binary files on the node.

> **Caution:** *install_directory* does not support space and special characters.

<management_server>: FQDN of the management server (optional parameter during install and can be configured later).

<certificate_server>: FQDN of the certificate server (optional parameter during install and can be configured later).

<data_directory>: Path to place all data and configuration files on the node (optional parameter, required only if a custom data directory is needed). On Linux, it must be a second level directory e.g. /root/sa_data/data.

Installing streaming agent using createzip option

The `-createzip` option with the `-stream` option creates a zip file with the streaming agent media in the temp directory.

To obtain the streaming agent media zip from the Operations Agent media, follow the steps:

1. Log on to the node as a root user or an administrator.
2. Download and extract the Operations Agent media.
3. Go to the directory where you extracted the media.
4. Run the following command:

   On Linux:

   ```
   ./oainstall.sh -createzip -stream [-out_dir <output_directory>]
   ```

   > **Important:** On Linux, for verifying the signature after using the `createzip` option, copy the `SA.tar.gz.sig` file from `<oa_media_dir>/packages/LIN/Linux2.6_X64/` directory and follow the steps:

a. Go the following location:

   `<output_directory>/<oa_zip_media>/oa_media_Linux2.6_X64.zip`

b. Unzip the `oa_media_Linux2.6_X64.zip` file

c. Go to `/packages/LIN/Linux2.6_X64/` folder

d. Place the `SA.tar.gz.sig` file

e. Run the following command to zip the media:

   ```
   zip -r oa_media_Linux2.6_X64.zip packages/ scripts/ oainstall.sh
   ```

On Windows

`cscript oainstall.vbs -createzip -stream -install_dir <install_directory> [-out_dir <output_directory>]`

On Windows, to create an unsigned zip of streaming agent media, follow the steps:

a. Download and extract the Operations Agent media.

b. Go to the directory where you extracted the media.

c. Run the following command:

   `cscript oainstall.vbs -i|-install -a|-agent -stream -install_dir <install_directory>`

d. From the directory where you extracted the media, run the following command:

   `cscript oainstall.vbs -createzip -removesign -stream -install_dir <install_directory> [-out_dir <output_directory>]`

In this instance,

<install_directory>: Path to install the package and place all configuration and binary files on the node.

<output_directory>: Path to place streaming agent zip media on the node. Optional parameter, if not provided, zip media is placed in the `temp` directory.

This creates a streaming agent zip media.

To install streaming agent using the streaming agent zip media, follow the steps:

1. Log on to the node as a root user or an administrator.
2. Go to the streaming agent media directory.
3. Run the following command:

Install Scenario	Command

Using `precheckonly` before installation	**On Windows**
	`cscript oainstall.vbs –i|-install -a|-agent -stream -precheckonly`
	On Linux
	`./oainstall.sh –i|-install –a|-agent -stream -precheckonly`

Install using `-stream` and `-install_dir`	**On Windows**
	`cscript oainstall.vbs –i|-install -a|-agent -stream -install_dir <install_directory> [-s|-srv <management_server> [-cs|-cert_srv <certificate_server>]] [-data_dir <data_directory>]`
	On Linux
	`./oainstall.sh –i|-install –a|-agent -stream -install_dir <install_directory> [-s|-srv <management_server> [-cs|-cert_srv <certificate_server>]] [-data_dir <data_directory>]`

Install using `-stream` and `-agent_profile`
Caution: Provided `<install_directory>` is defined in the profile file.
	On Windows
	`cscript oainstall.vbs –i|-install -a|-agent -stream -agent_profile <path>\<profile file name> [-s|-srv <management_server> [-cs|-cert_srv <certificate_server>]] [-data_dir <data_directory>]`
	On Linux
	`./oainstall.sh –i|-install –a|-agent -stream -agent_profile <path>/<profile file name> [-s|-srv <management_server> [-cs|-cert_srv <certificate_server>]] [-data_dir <data_directory>]`

Install using `-agent_profile` only
Caution: Provided `STREAM=TRUE` and `<install_directory>` is defined in the profile file.
	On Windows
	`cscript oainstall.vbs –i|-install -a|-agent -agent_profile <path>\<profile file name> [-s|-srv <management_server> [-cs|-cert_srv <certificate_server>]] [-data_dir <data_directory>]`
	On Linux
	`./oainstall.sh –i|-install –a|-agent -agent_profile <path>/<profile file name> [-s|-srv <management_server> [-cs|-cert_srv <certificate_server>]] [-data_dir <data_directory>]`

In this instance,

<install_directory>: Path to install the package and place all configuration and binary files on the node.

> **Caution:** *install_directory* does not support space and special characters.

<management_server>: FQDN of the management server (optional parameter during install and can be configured later).

<certificate_server>: FQDN of the certificate server (optional parameter during install and can be configured later).

<data_directory>: Path to place all data and configuration files on the node (optional parameter, required only if a custom data directory is needed). On Linux, it must be a second level directory e.g. /root/sa_data/data.

Verifying the Installation

To verify streaming agent installation, run the following command:

```
ovc -version
```

The command lists the version of the installed component.

Configuring streaming agent

You must activate and configure the streaming agent with the necessary configuration details including the information about the management server (OMi), certificate server and deploy the necessary streaming policy on the node to start using the streaming agent. The `-c|-configure` option enables you to perform this task.

To configure streaming agent, follow the steps:

1. Log on to the node as a root user or an administrator.
2. Go to the following location on the node:

   <install_directory>`/newconfig/scripts`
3. Run the following command:

Task	Command

Activate streaming agent	**On Windows**
	`cscript oainstall.vbs –c|-configure -a|-agent -stream -install_dir <install_directory> -activateonly -s|-srv <management_server> -cs|-cert_srv <certificate_server>`
	On Linux
	`./oainstall.sh –c|-configure -a|-agent -stream -install_dir <install_directory> -activateonly -s|-srv <management_server> -cs|-cert_srv <certificate_server>`

Configure the management server (OMi) and certificate server
Note: Perform this task only if the management server (OMi) and certificate server are not configured during installation.
	On Windows
	`cscript oainstall.vbs –c|-configure -a|-agent -stream -install_dir <install_directory> -s|-srv <management_server> -cs|-cert_srv <certificate_server>`
	On Linux
	`./oainstall.sh –c|-configure -a|-agent -stream -install_dir <install_directory> -s|-srv <management_server> -cs|-cert_srv <certificate_server>`

Switch the management server and certificate server	**On Windows**
	`cscript oainstall.vbs –c|-configure -f|-force_config_mode -a|-agent -stream -install_dir <install_directory> -s|-srv <management_server> -cs|-cert_srv <certificate_server>`
	On Linux
	`./oainstall.sh –c|-configure -f|-force_config_mode -a|-agent -stream -install_dir <install_directory> -s|-srv <management_server> -cs|-cert_srv <certificate_server>`

Configure the profile file	You can use a profile file during installation to program streaming agent to run with non-default configuration settings. For streaming agent, the following non-default configuration parameters are supported in the profile file during installation:
	`STREAM=TRUE`
	`INSTALL_DIR=<install_directory>`

	DATA_DIR=*<data_directory>* set eaagt.sysdata:agentgroup=*<value>* set eaagt.sysdata:tenant=*<value>* set bbc.cb:server_port=*<value>* **Note:** For more information on the Tenant and Agent Group, see Auto-Registration of Operations Agent with OMi.

In this instance,

<install_directory>: Path to install the package and place all configuration and binary files on the node.

Caution: *install_directory* does not support space and special characters.

<data_directory>: Path to place all data and configuration files on the node (optional parameter, required only if a custom data directory is needed). On Linux, it must be a second level directory e.g. /root/sa_data/data.

<management_server>: FQDN of the management server (OMi).

<certificate_server>: FQDN of the certificate server.

4. Make sure the management server grants the certificate request from the node.
5. Deploy the required streaming policy from OMi.

Important: For auto-registration of streaming agent with OMi, see Auto-Registration of Operations Agent with OMi.

Uninstalling or Removing streaming agent

To uninstall streaming agent, follow the steps:

1. Log on to the node as a root user or an administrator.
2. Go to the following location on the node:

   <install_directory>/newconfig/scripts
3. Run the following command:

On Windows

```
cscript oainstall.vbs –r|-remove -a|-agent -stream -install_dir <install_
directory>
```

On Linux

```
./oainstall.sh –r|-remove –a|-agent -stream -install_dir <install_directory>
```

4. To uninstall streaming agent and clean the corresponding configuration and binary files from the node, run the following command:

   On Windows

   ```
   cscript oainstall.vbs –r|-remove -a|-agent -stream -clean -install_dir
   <install_directory>
   ```

   On Linux

   ```
   ./oainstall.sh –r|-remove –a|-agent -stream -clean -install_dir <install_
   directory>
   ```

   In this instance,

   <install_directory>: Path to install directory.

Limitations of Streaming Edition of Operations Agent

- Co-existence of streaming agent and Operations Agent on a node is not supported.
- Co-existence of streaming agent with any other product (that co-exists with Operations Agent) is not supported.
- The non-default (non-root or non-privileged) user profile is not supported with Streaming Edition of Operations Agent.
- Multi-instance of streaming agent on the same node is not supported.

Chapter 19: Installing the Infrastructure SPIs on the OM Management Server

The Prerequisites for Installing the Infrastructure SPIs

Hardware and Software Requirements

For a list of supported hardware, operating systems, OM version, and agent version, see the *Support Matrix*.

Disk Space Requirements

Operating System on the OM Management Server	Temporary Directory[a]	Total Disk Space
Windows	%tmp% - 15 MB	90 MB
Linux	/tmp - 35 MB	90 MB
HP-UX	/tmp - 17 MB	240 MB
Solaris	/tmp - 35 MB	80 MB

[a]The disk space for the temporary directory/drive is required only during installation. These are approximate values.

Upgrade Requirements

The Installation of Infrastructure SPI version 12.05 is supported only on the following Management Servers:

- OM for Windows Management server version 8.x and 9.x
- OM for Linux Management server version 9.1 and 9.2
- OM for HP-UX Management server and
- OM for Solaris Management server

> **Note:** Before upgrading from the Infrastructure SPI version 11.1x to 12.05, make sure that the Auto Deployment option is disabled on all the nodes.
>
> Follow the steps to ensure that the Auto Deployment option is disabled:
>
> 1. On the OM console, select a node, right click and select **Properties**.
> 2. In the **Properties** window, select the **Network** tab.

3. Ensure that the **Enable Auto Deployment** option is unchecked.

You can upgrade from the Infrastructure SPIs version 11.1x to 12.05. After you upgrade from Infrastructure SPI version 11.1x to 12.05, Infrastructure SPI 11.1x policies are available in the v11.1x folder and Infrastructure SPI 12.05 policies are available in the v12.0 folder.

On the OM console, select **Policy management→Policy groups → Infrastructure Management → v11.1x and v12.0**

Note: After you upgrade from Infrastructure SPI version 11.1x to 12.05, the Infrastructure SPI 12.05 policies are available under the **Infrastructure Management → v12.0** policy group.

You can either deploy Infrastructure SPI 11.1x or 12.05 policies on a node.

Note: Deployment of both Infrastructure SPI 11.1x and 12.05 policies on the same node is not supported.

Upgrading from Infrastructure SPIs 2.xx or earlier versions to Infrastructure SPI version 12.05

You must upgrade Infrastructure SPIs 2.xx or earlier versions to Infrastructure SPIs 11.1x and then upgrade to Infrastructure SPI 12.05.

Install the Infrastructure SPIs

To install the Infrastructure SPIs, follow these steps:

1. Log on to the management server.
2. Perform one of the following tasks:
   - If you want to install the Infrastructure SPIs from the physical media, insert the *Operations Agent and Infrastructure SPIs* DVD into the DVD-ROM drive.
   - Download the installation media (.iso file) from one of HPE's websites.

     Use the physical DVD or the .iso file that includes deployment packages for all platforms. Platform-specific .iso files do not contain the Infrastructure SPIs.
3. The **oainstall** program installs the Infrastructure SPIs on the management server while registering the deployment package. This installation includes necessary report (to be used with Reporter) and graph (to be used with Performance Manager) packages for the Infrastructure SPIs. To skip the registration of the Operations Agent packages, follow these steps:
   a. Open the **default_config** file. You will find the following default selection:

```
[agent.parameter]
```

```
REGISTER_AGENT=NO
[hpinfraspi.parameter]
InfraSPI= NO
InfraSPI_With_Graphs= YES
InfraSPI_With_Reports= YES
```

b. Under the **[hpinfraspi.parameter]** section, you can set the following:

- Do not make any changes to the file that is, do not set any values for the properties under the `[hpinfraspi.parameter]` section if you want to install the Infrastructure SPIs with reports (for Windows only) and graphs.
- Set **InfraSPI** to **YES** and the rest of the properties to **NO** if you want to install only the Infrastructure SPIs without reports (for Windows only) and graphs.
- Set `InfraSPI_With_Graphs` to **YES** and the rest of the properties to NO if you want to install only the Infrastructure SPIs and graphs.

> **Note:** Do not install the graph packages if Performance Manager is not installed on the management server. If Performance Manager is installed on a remote server, you must install graph packages separately on that server.
>
> If you use OM on UNIX/Linux and want to see graphs with Performance Manager, you must integrate Performance Manager with OM on UNIX/Linux (see Integrate Performance Manager with OM on UNIX/Linux).

- Set **InfraSPI_With_Reports** to **YES** and the rest of the properties to NO if you want to install only the Infrastructure SPIs and reports (and no graphs).

> **Note:** Since Reporter is not supported on UNIX/Linux, Reporter needs to be available on a remote server. To install report packages for the Infrastructure SPIs on the remote Reporter server, see Install Report and Graph Packages on a Remote Server.

c. Save the file.

4. Run the following command:

On Windows

```
cscript oainstall.vbs -i -m -spiconfig <config_file>
```

On UNIX/Linux

```
./oainstall.sh -i -m -spiconfig <config_file>
```

In this instance, <*config_file*> is the name of the configuration file (with the complete path to the file).

> **Note:** If OM is in an HA cluster, follow the above steps on the active node in the cluster, and then perform step 1 through step 4 on all nodes in the HA cluster.

Example

i. Create a configuration file with the following content:

```
[agent.parameter]
REGISTER_AGENT=NO
[hpinfraspi.parameter]
InfraSPI=YES
InfraSPI_With_Graphs=NO
InfraSPI_With_Reports=NO
```

ii. Save the file as **config_file** in the following directory:

```
C:\temp
```

iii. Run the following command to install the Infrastructure SPIs.

```
cscript oainstall.vbs -i -m -spiconfig C:\temp\config_file
```

The command uses the **config_file** to install the Infrastructure SPIs without installing the agent, report package, and graph package.

Install Report and Graph Packages on a Remote Server

When the Reporter and the Performance Manager are installed on a server other than the OM management server, you must follow this procedure to install report and graph packages for the Infrastructure SPIs.

To install report packages:

1. Log on to the Reporter server as administrator.
2. Place or mount the *Operations Agent and Infrastructure SPIs* media on the system.
3. Go to the following directory:

   For a Windows x64 system

   <*media_root*>\integration\infraspi\WIN\Windows_X64

For a Windows x86 system

<*media_root*>\integration\infraspi\WIN\Windows_X86

4. Double click to install HPSpiInfR.msi.

To install graph packages:

1. Log on to the Performance Manager server as administrator or root.
2. Place or mount the *Operations Agent and Infrastructure SPIs* media on the system.
3. Go to the following directory:

   For a Linux system

   <*media_root*>\integration\infraspi\LIN\Linux2.6_X64

   For an HP-UX system

   <*media_root*>\integration\infraspi\HP-UX\HP-UX_IA32

   For a Solaris system

   <*media_root*>\integration\infraspi\SOL\Solaris_SPARC32

   For a Windows x64 system

   <*media_root*>\integration\infraspi\WIN\Windows_X64

   For a Windows x86 system

   <*media_root*>\integration\infraspi\WIN\Windows_X86

4. **On Linux**

   Extract the contents of the **HPSpiInfG.rpm.gz** file, and then install the **HPSpiInfG.rpm** file.

   On HP-UX

   Extract the contents of the **HPSpiInfG.depot.gz** file, and then install the **HPSpiInfG.depot** file.

   On Solaris

   Extract the contents of the **HPSpiInfG.sparc.gz** file, and then install the **HPSpiInfG.sparc** file.

   On Windows

   Double click to install the **HPSpiInfG.msi** file.

5. Integrate Performance Manager with OM on UNIX/Linux (see Integrate Performance Manager with OM on UNIX/Linux).

Log File

The registration log file (**oainstall.log**) is available in the following directory:

On Windows

`/var/opt/OV/shared/server/log`

On UNIX/Linux

`%OvDataDir%shared\server\log`

Verifying the Installation

After installing the Infrastructure SPIs, review the contents of the installation log file `oainstall.log`. If the installation is successful, the following message appears:

```
HPSpiSysI installation completed successfully

HPSpiVmI installation completed successfully

HPSpiClI installation completed successfully
```

In this instance:

- HPSpiSysI denotes Operations Smart Plug-in for System Infrastructure
- HPSpiVmI denotes Operations Smart Plug-in for Virtualization Infrastructure
- HPSpiCII denotes Operations Smart Plug-in for Cluster Infrastructure.

Integrate Performance Manager with OM on UNIX/Linux

1. On the OM management server, go to the directory `/opt/OV/contrib/OpC/OVPM`.
2. Run the following command:

   `./install.sh <hostname>:<port>`

   In this instance, <*hostname*> is the FQDN of the Performance Manager server and <*port*> is the port used by the Performance Manager. Use the same command with the same options even if the Performance Manager is installed on the OM management server.

Components of the Infrastructure SPI on OM for Windows

The following Infrastructure SPI components are available on the OM for Windows console.

Services

When you add a node to the OM for Windows node group, the SI SPI service discovery policy is automatically deployed.

This service discovery policy discovers the systems infrastructure and services on the node, and adds this information to the OM Services area.

To view the SI SPI service map, select **Services > Systems Infrastructure**. The SI SPI service map graphically represents the discovered systems and instances.

> **Note:** The SI SPI discovery policy and QuickStart policies are autodeployed on the new nodes (if auto-deployment is enabled) added to the OM for Windows server. On the existing nodes, you must manually deploy the SI SPI discovery policy. For more information on automatic deployment of policies on the nodes, see the *HPE Operations Smart Plug-in for System Infrastructure User Guide*.

Discovery of Virtual Infrastructure

After the SI SPI discovery policy identifies a node as a virtualization node, the VI SPI discovery is auto-deployed. The virtual machines running on those nodes are added under the respective Virtualization Infrastructure node group and the vendor specific QuickStart policies are auto-deployed on those nodes.

The VI SPI discovery policy adds the discovered elements to the OM service map. To view the VI SPI service map, select **Services > Virtualization Infrastructure.** The VI SPI service map graphically represents the discovered virtual systems.

Discovery of Cluster Infrastructure

On OM for Windows, if the SI SPI discovery policy identifies the node as a cluster node, it initiates CISPI discovery policy on the node. The CI SPI discovery discovers the clusters, cluster nodes, and resource groups. To view the Cluster Infrastructure SPI service map, select **Services > Cluster Infrastructure**.

Service Type Models

The service type models display the service type categories that the nodes from node bank are logically assigned to. You can view the service type model in OM for Windows.

Node Groups

After installing Systems Infrastructure SPI 11.xx, the node groups are added under the console tree **Nodes** folder.

> **Note:** The node group names appear in English even in the non-English locales.

Policy Management

Under the Infrastructure Management group, the policies are grouped according to language. For example, English policies are grouped under **en**, Japanese polices are grouped under **ja**, and Simplified Chinese policies are grouped under **zh**. The language groups appear according to the language selected at the time of installation.

> **Note:** The ConfigFile policies SI-ConfigureDiscovery and VI-VMwareEventTypes do not have a localized name. The policy names are same as the English name even in non-English locales.

There is also a vendor based policy group. Under this group, the policies are re-grouped based on different operating systems or vendors. The policies grouped by vendor include QuickStart policies and Advanced policies. The QuickStart policies are automatically deployed on the supported managed nodes once they are added to the respective node groups. You can choose to turn off automatic deployment of policies when services are discovered. In addition, you can modify and save preconfigured policies with new names to create custom policies for your own purposes.

To view and access the Systems Infrastructure SPI policies, select **Policy management→ Policy groups → Infrastructure Management → v12.0 or v11.1x → *<language>* → Systems Infrastructure**.

To view and access the Virtualization Infrastructure SPI policies, select **Policy management→Policy groups → Infrastructure Management> → v12.0 or v11.1x → *<language>* →Virtualization Infrastructure**.

To view and access the Cluster Infrastructure SPI policies, select **Policy management→ Policy groups → Infrastructure Management → v12.0 or v11.1x → *<language>* → Cluster Infrastructure**.

Tools

Tools are provided for the Systems Infrastructure SPI and Virtualization Infrastructure SPI. You can access the Systems Infrastructure SPI tool group by selecting **Tools** > **Systems Infrastructure**, and the VI SPI tools group by selecting **Tools**> **Virtualization Infrastructure**.

Reports

If Reporter is installed on the OM for Windows management server, you can view the Reports group from the OM for Windows console.

Graphs

A set of preconfigured graphs is provided with the SI SPI and the VI SPI. To access the graphs from the OM console, you must install Performance Manager on the OM management server prior to the installation of the Infrastructure SPI graphs package.

You can access the SI SPI graphs by selecting **Graphs** > **Infrastructure Performance**, and the VI SPI graphs by selecting **Graphs** > **Infrastructure Performance** > **Virtualization**.

Alternatively, if Performance Manager is installed on a separate (stand-alone) system connected to the OM management server, you can view the graphs on the Performance Manager stand-alone system.

Components of the Infrastructure SPIs on OM for UNIX

The following Infrastructure SPIs components are available on the OM for UNIX (HP-UX, Linux, and Solaris) Admin UI.

Services

The SI-service discovery policy discovers the systems infrastructure and services on the node and adds this information to the OM Services area. Use Java GUI to view the service map and the Operator's console. You must install Java GUI on a separate system.

Discovery of Virtual Infrastructure

After the Systems discovery has identified a node as a virtualization node, the VI SPI discovery is auto-deployed. The virtual machines running on those nodes are added under the respective Virtualization Infrastructure node group and the vendor specific QuickStart policies are auto-assigned on those nodes.

The VI SPI discovery policy discovers the virtual machines (guest machines) hosted on the managed nodes (host machines), and adds this information to the OM Services area. Select **Services**> **Virtualization Infrastructure** > **Show Graph** to view the VI SPI service map. The service map graphically represents the discovered virtual systems.

Discovery of Cluster Infrastructure

For the cluster nodes that are added to the OM for HP-UX, Linux, or Solaris node bank, manually deploy the CI SPI service discovery. The CI SPI discovery discovers the clusters, cluster nodes, and resource groups. Select **Services**> **Cluster Infrastructure** > **Show Graph**, to view the CI SPI service map.

Policy Management

Under the Infrastructure Management group, the policies are grouped according to the language. For example, English policies are grouped under **en**, Japanese polices and grouped under **ja**, and Simplified Chinese policies are grouped under **zh**. The language groups appear according to the language selected at installation time.

There is also a vendor based policy group. Under this group, the policies are re-grouped based on different operating systems or vendors. The policies grouped by vendor include QuickStart policies and Advanced policies. The QuickStart policies are automatically assigned to the managed nodes after they are added to the respective node groups. You can manually deploy these policies on the nodes.

You can also modify and save preconfigured policies with new names to create custom policies for your own specialized purposes.

To view and access the SI SPI policies, select **Policy Bank** → **Infrastructure Management** → v12.0 or v11.1x →***<language>*** → **Systems Infrastructure**.

To view and access the VI SPI policies, select **Policy Bank** → **Infrastructure Management** → v12.0 or v11.1x →***<language>*** → **Virtualization Infrastructure**.

To view and access the CI SPI policies, select **Policy Bank** → **Infrastructure Management** → v12.0 or v11.1x → ***<language>*** → **Cluster Infrastructure**.

Tools

The Infrastructure SPIs provides tools for the SI SPI and the VISPI. You can access the SI SPI tool group by selecting the **Tool Bank** > **Systems Infrastructure**, and the VI SPI tools group by selecting **Tool Bank** > **Virtualization Infrastructure**.

Reports

If you use OM for HP-UX, Linux, and Solaris operating systems, Reporter is installed on a separate (stand-alone) system connected to the management server. You can view the reports on the Reporter stand-alone system.

For more information about the integration of Reporter with OM, see the *Reporter Installation and Special Configuration Guide*.

Graphs

The Infrastructure SPIs provide graphs for the SI SPI and the VI SPI. To generate and view graphs from data collected, you must use Performance Manager in conjunction with OM.

To access the graphs, select the active message, open the Message Properties window, and click **Actions.** Under the Operator initiated action section, click **Perform**. Alternatively you can, right-click active message, select **Perform/Stop Action** and click **Perform Operator-Initiated Action**.

If Performance Manager is installed on the management server, you can launch and view graphs on the management server. If Performance Manager is installed on a separate (stand-alone) system connected to the OM management server, you can view the graphs on the Performance Manager stand-alone system.

Chapter 20: Installing the Operations Agent in the Inactive Mode

About the Inactive Mode

While installing locally on the managed node, you can choose to program the agent installer to only place the necessary files and packages on the node without configuring any components. As a result, the agent does not start running automatically and remains *inactive*. At a later time, you must use the installer program again to configure and start the agent.

The advantage of using this mechanism is the ability to clone the image of a system where the Operations Agent is installed in the inactive mode. Cloning a system with preinstalled Operations Agent eliminates the requirement to install the agent on the system after adding the system to the list of managed nodes.

Installing the Operations Agent in the Inactive Mode

The inactive mode of installation ensures that the agent does not start its operation after installation.

To install the Operations Agent:

1. Log on to the node as root or administrator.
2. If you want to install from the *Operations Agent and Infrastructure SPIs* media, follow these steps:
   a. Go to the media root.
   b. Run the following command:

      On Windows:

      ```
      cscript oainstall.vbs -i -a -defer_configure [-install_dir <install_
      directory> -data_dir <data_directory>]
      ```

      On UNIX/Linux:

      ```
      ./oainstall.sh -i -a-defer_configure
      ```

   In this instance:

   <*install_directory*>: Path to place all packages and binary files on the node.

   <*data_directory*>: Path to place all data and configuration files on the node.

Configure the Agent at a Later Time

You must configure the Operations Agent with configuration details (including the information about the OM management server and certificate server) to set the agent in the active mode. The `-configuration` option of the `oainstall` program enables you to perform this task.

When you want to start the operation of the agent, follow these steps:

1. Go to the following directory:

   On Windows 64-bit nodes:

   `%ovinstalldir%bin\win64\OpC\install`

   On other Windows nodes:

   `%ovinstalldir%bin\OpC\install`

   On HP-UX, Linux, or Solaris nodes:

   `/opt/OV/bin/OpC/install`

   On AIX nodes:

   `/usr/lpp/OV/bin/OpC/install`

2. Run the following command:

   On Windows

   `cscript oainstall.vbs -a -configure -s <management_server> [-cs <certificate_server>]`

   Or

   `oasetup -configure -management_server <management_server> [-certificate_server <certificate_server>]`

   On UNIX/Linux

   `./oainstall.sh -a -configure -s <management_server> [-cs <certificate_server>]`

Configure the Agent Remotely from an OM for Windows Management Server

If you install the Operations Agent with the **-defer_configure** option, you must configure the agent to work with the OM management server - at a later time. You can either configure the agent locally on the node or remotely from the OM for Windows management server.

To configure the agent remotely:

Skip steps 1 and 2 if you are configuring agent for Windows.

1. Configure an SSH Client.

   > **Note:** OM for Windows provides you with the third-party SSH client software PuTTY. This procedure guides you to set up the PuTTY SSH client. PuTTY is not HPE software. It is provided as is for your convenience. You assume the entire risk relating to the use or performance of PuTTY.

2. On the `%ovinstalldir%contrib\OVOW\PuTTY` directory, copy the files **PLINK.EXE**, **PSCP.EXE**, and **runplink.cmd** to any directory that is included in your PATH environment variable. For example, if you installed the management server in `C:\Program Files\HP\HP BTO Software`, copy the files into the following directory: `C:\Program Files\HP\HP BTO Software\bin`.

3. Create a user. To remotely install agents, OM requires the credentials of a user who has administrative access to the node. The following list shows the specific permissions required, according to the node's operating system:

   - **On Windows:**
     - Write access to the admin$ share. The user must be part of the local administrators group
     - Read access to the registry
     - Permission to log on as a service. This is only required if you select User/Password in the Set Credentials list.
   - **On UNIX/Linux:**
     - Permission to log in to SSH on the node for file transfers and to execute installation commands.

4. Configure the agent using the following commands:

   For Windows 64-bit nodes

   ```
   ovdeploy -cmd "%ovinstalldir%bin\win64\OpC\install\oasetup -configure -management_server <management_server> -certificate_server <certificate_server>" -node <node_name> -fem winservice -ostype Windows -user <node_user> -pw <node_passwd>
   ```

   Or

   ```
   ovdeploy -cmd "%ovinstalldir%bin\win64\OpC\install\oasetup -configure -management_server <management_server> -certificate_server <certificate_server>" -node <node_name> -fem winservice -ostype Windows -user <node_user> -pw_prompt
   ```

   For other Windows nodes

```
ovdeploy -cmd "%ovinstalldir%bin\OpC\install\oasetup -configure -management_
server <management_server> -certificate_server <certificate_server>" -node
<node_name> -fem winservice -ostype Windows -user <node_user> -pw <node_passwd>
```

Or

```
ovdeploy -cmd "%ovinstalldir%bin\OpC\install\oasetup -configure -management_
server <management_server> -certificate_server <certificate_server>" -node
<node_name> -fem winservice -ostype Windows -user <node_user> -pw_prompt
```

For an HP-UX, Linux, or Solaris node

```
ovdeploy -cmd "/opt/OV/bin/OpC/install/oainstall.sh -a -configure -srv
<management_server> -cs <certificate_server>" -node <node_name> -fem ssh -
ostype UNIX -user <node_user> -pw <node_passwd>
```

Or

```
ovdeploy -cmd "/opt/OV/bin/OpC/install/oainstall.sh -a -configure -srv
<management_server> -cs <certificate_server>" -node <node_name> -fem ssh -
ostype UNIX -user <node_user> -pw_prompt
```

For an AIX node

```
ovdeploy -cmd "/usr/lpp/OV/bin/OpC/install/oainstall.sh -a -configure -srv
<management_server> -cs <certificate_server>" -node <node_name> -fem ssh -
ostype UNIX -user <node_user> -pw <node_passwd>
```

Or

```
ovdeploy -cmd "/usr/lpp/OV/bin/OpC/install/oainstall.sh -a -configure -srv
<management_server> -cs <certificate_server>" -node <node_name> -fem ssh -
ostype UNIX -user <node_user> -pw_prompt
```

In this instance:

<management_server>: Fully-qualified domain name of the management server.

<certificate_server>: Fully-qualified domain name of the certificate server. This parameter is optional. If you do not specify the `-cs` option, the management server becomes the certificate server for the node.

<node_name>: Fully-qualified domain name of the node.

<node_user>: User with which you can configure agent on the node; user that was created.

<node_passwd>: Password of the above user.

> **Note:** Use the option `-pw_prompt` to prompt for a password. This password is not saved in history.

Chapter 21: Monitoring the Operations Agent in High Availability Clusters

You can use the Operations Agent to monitor nodes in a High Availability (HA) cluster. To be able to monitor cluster-aware applications in an HA cluster, you must deploy the agent with the following guidelines:

- All the nodes in a cluster must be present in the list of managed nodes in the OM console.

  The Operations Agent must be installed on each of the nodes in the HA cluster.

- It is necessary that you set the MAX_RETRIES_FOR_CLUSTERUP variable (under the conf.cluster namespace) on the node to an integer value. The profile file-based installation ensures that the variable is set to an appropriate value on every node at the time of installation. An appropriate value depends on the system restart sequence and the time it takes for the cluster to be initialized during restart.

Virtual Nodes

If you are using the node with the OM 9.x, you can take advantage of the concept of virtual nodes. A virtual node is a group of physical nodes linked by a common resource group. Based on the changes in the resource group, the agent can automatically enable or disable policies on the physical nodes.

To monitor nodes in a HA Cluster:

- Deploy the monitoring policies on virtual nodes if you want the policies to monitor a cluster aware application.

  > **Note:** If you deploy policies on virtual nodes, you will not receive alerts from these nodes if the resource group fails.

- Deploy the monitoring policies on physical nodes if you want the policies to monitor the cluster regardless of the state of the cluster.

Following are the guidelines for creating virtual nodes in the OM console:

- A virtual node must not itself be a physical node.
- Virtual nodes do not support DHCP, auto-deployment, and certificates.
- You must not install an agent on a virtual node.

Monitoring Nodes in HA Clusters

If you want the messages to be coming from a virtual node, then you can configure the Operations Agent to monitor cluster-aware applications that run on the nodes in an HA cluster. This procedure is mandatory if you have not created a virtual node.

If you are using OM for Windows 8.1x (lower than patch OMW_00090), deploy the policies that you identified for monitoring the cluster-aware application (in "Monitoring the Operations Agent in High Availability Clusters" on the previous page) on all physical nodes in the HA cluster.

For all other types of management servers, deploy the policies that you identified for monitoring the cluster-aware application (in "Monitoring the Operations Agent in High Availability Clusters" on the previous page) on the virtual node created for the cluster.

To monitor cluster-aware applications on the nodes in an HA cluster, follow these steps:

1. *Microsoft Cluster Server clusters only.* Make sure that the resource group, which contains the resource being monitored, contains both a network name and an IP address resource.
2. Identify the policies that you will require to monitor the cluster-aware application.
3. Create an XML file that describes the cluster-aware application, and name it **apminfo.xml**.
4. This file is used to define the resource groups that will be monitored and to map the resource groups to application instances.
5. The **apminfo.xml** file has the following format:

   > **Note:** New lines are not allowed between package tags in the **apminfo.xml** file.

```
<?xml version="1.0" ?>

 <APMClusterConfiguration>

 <Application>

 <Name>Name of the cluster-aware application.</Name>

 <Instance>

 <Name>Application's name for the first instance. The instance name is
used for start and stop commands and corresponds to the name used to
designate this instance in messages.</Name>

 <Package>Resource group in which the application's first instance
runs.</Package>

 </Instance>
```

```
 <Instance>
 <Name>Application's name for the second instance.</Name>
 <Package>Resource group in which the application's second instance
runs.</Package>
 </Instance>
 </Application>
 </APMClusterConfiguration>
```

DTD for apminfo.xml

The following Document Type Definition (DTD) specifies the structure of `apminfo.xml`:

```
<!ELEMENT APMClusterConfiguration (Application+)>
<!ELEMENT Application (Name, Instance+)>
<!ELEMENT Name (#PCDATA)>
<!ELEMENT Instance (Name, Package)>
<!ELEMENT Package (#PCDATA)>
```

EXAMPLE

In the example below, the name of the resource group is SQL-Server, and the network (or instance) name is CLUSTER04:

```
<?xml version="1.0" ?>
<APMClusterConfiguration>
 <Application>
 <Name>dbspi_mssqlserver</Name>
 <Instance>
 <Name>CLUSTER04</Name>
 <Package>SQL-Server</Package>
 </Instance>
 </Application>
</APMClusterConfiguration>
```

6. Save the completed **apminfo.xml** file on each node in the cluster in the following directory:

On Windows:

```
%OvDataDir%conf\conf\
```

On UNIX/Linux:

```
/var/opt/OV/conf/conf/
```

7. Create an XML file that describes the policies to be cluster-aware. The file name must have the format <*appl_name*>**.apm.xml**. <*appl_name*> must be identical to the content of the <Application><Name> tag in the **apminfo.xml** file. The <*appl_name*>**.apm.xml** file includes the names of the policies that you identified in "Monitoring the Operations Agent in High Availability Clusters" on page 164.
8. Use the following format while creating the <*appl_name*>**.apm.xml** file:

```
<?xml version="1.0" ?>

 <APMApplicationConfiguration>

 <Application>

 <Name>Name of the cluster-aware application (must match the content of <Application><Name> in the apminfo.xml file).</Name>

 <Template>First policy that should be cluster-aware.</Template>

 <Template>Second policy that should be cluster-aware.</Template>

 <startCommand>An optional command that the agent runs whenever an instance of the application starts.</startCommand>

 <stopCommand>An optional command that the agent runs whenever an instance of the application stops.</stopCommand>

 </Application>

 </APMApplicationConfiguration>
```

> **Note:** Within the startCommand and stopCommand tags, if you want to invoke a program that was not provided by the operating system, you must specify the file extension of the program.
>
> **For example:**
>
> ```
> <startCommand>test_command.sh</startCommand>
> ```
>
> ```
> <startCommand>dbspicol.exe ON $instanceName</startCommand>
> ```

The stop and start commands can use the following variables:

Variable	Description
$instanceName	Name (as listed in <Instance><Name>) of the instance that is starting or stopping.
$instancePackage	Name (as listed in <Instance><Package>) of the resource group that is starting or stopping.
$remainingInstances	Number of the remaining instances of this application.
$openViewDirectory	The commands directory on the agents.

For example:

The following example file called **dbspi_mssqlserver.apm.xml** shows how the Smart Plug-in for Databases configures the policies for the Microsoft SQL Server.

```
<?xml version="1.0"?>

<APMApplicationConfiguration>

 <Application>

 <Name>dbspi_mssqlserver</Name>

 <Template>DBSPI-MSS-05min-Reporter</Template>

 <Template>DBSPI-MSS-1d-Reporter</Template>

 <Template>DBSPI-MSS-05min</Template>

 <Template>DBSPI-MSS-15min</Template>

 <Template>DBSPI-MSS-1h</Template>

 <Template>DBSPI-MSS6-05min</Template>

 <Template>DBSPI-MSS6-15min</Template>

 <Template>DBSPI-MSS6-1h</Template>

 <Template>DBSPI Microsoft SQL Server</Template>

 <StartCommand>dbspicol.exe ON $instanceName</StartCommand>

 <StopCommand>dbspicol.exe OFF $instanceName</StopCommand>

 </Application>

</APMApplicationConfiguration>
```

9. Save the complete <*appl_name*>**.apm.xml** file on each node in the cluster in the following

directory:

On Windows :

```
%OvDataDir%bin\instrumentation\conf
```

On UNIX/Linux:

```
/var/opt/OV/bin/instrumentation/conf
```

10. Ensure that the physical nodes where the resource groups reside are all managed nodes.
11. Check the syntax of the XML files on all physical nodes by running the following command:

    On Windows:

    ```
    %OvInstallDir%\bin\ovappinstance -vc
    ```

    On HP-UX, Linux, or Solaris:

    ```
    /opt/OV/bin/ovappinstance -vc
    ```

    On AIX:

    ```
    /usr/lpp/OV/bin/ovappinstance -vc
    ```

Setting Cluster Local Node Name

For some physical nodes, for example for multihomed hosts, the standard hostname may be different from the name of the node in the cluster configuration. If this is the case, the agent cannot correctly determine the current state of the resource group. Follow the steps to configure the agent to use the hostname as it is known in the cluster configuration:

1. Run the `hostname` command to obtain the name of the physical node as it is known in the cluster configuration

   > **Note:** Run the following command to obtain the cluster details:
   >
   > `ovclusterinfo -a`

2. Configure the agent to use the name of the node as it is known in the cluster configuration:

   ```
   ovconfchg -ns conf.cluster -set CLUSTER_LOCAL_NODENAME <name>
   ```

   In this instance, <*name*> is the name of the node as reported in the output of **hostname** command and is case-sensitive.

3. Restart the agent on every physical node by running the following commands:

```
ovc -kill

ovc -start
```

Agent User

By default, the Operations Agent regularly checks the status of the resource group. On UNIX and Linux nodes, the agents use cluster application-specific commands, which can typically only be run by root users. On Windows nodes, the agents use APIs instead of running commands.

If you change the user of an agent, the agent may no longer have the permissions required to successfully run cluster commands. In this case, you must configure the agent to use a security program (for example, sudo or .do) when running cluster commands.

To configure the agent running with a non-root account to run cluster commands, follow these steps:

1. Log on to the node with the root privileges.
2. Go to the following directory:

   On HP-UX/ Linux/Solaris:

   `/opt/OV/bin`

   On AIX:

   `/usr/lpp/OV/bin`
3. Run the following command to stop the agent:

   ```
   ovc -kill
   ```
4. To configure the agent to use a security program, type the following command:

   `ovconfchg -ns ctrl.sudo -set OV_SUDO <`*security_program*`>`

   In this instance, <*security_program*> is the name of the program you want the agent to use, for example /usr/local/bin/.do.
5. Run the following command to start the agent:

   ```
   ovc -start
   ```

Chapter 22: Configuring the Operations Agent in a Secure Environment

The Operations Agent and the OM or the OMi management server communicate with each other over the network using the HTTPS protocol. The management server opens connections to the agent node to perform tasks, such as deploying policies and launching actions.

The Operations Agent node opens connections to the management server to send messages and responses.

By default, the operating systems of the agent node and management server assign local communication ports. However, both the agent and management server use the **communication broker** component for inbound communication. The communication broker component, by default, uses the port 383 to receive data. Therefore, in effect, the node and management server use two sets of ports:

- Port assigned by the operating system for outbound communication
- Port used by the communication broker for inbound communication

In a highly-secure, firewall-based network, the communication between the management server and agent node may fail due to restrictions in the firewall settings. In these scenarios, you can perform additional configuration tasks to configure a two-way communication between the management server and managed node.

Planning for Configuration

- If your network allows HTTPS connections through the firewall in both directions, but with certain restrictions, the configuration options are possible in OM or OMi to accommodate these restrictions.
- If your network allows outbound connections from only certain local ports, you can configure OM or OMi to use specific local ports.
- If your network allows inbound connections to only certain destination ports, but not to port 383, you can configure alternate communication broker ports.
- If your network allows only certain proxy systems to open connections through the firewall, you can redirect OM or OMi communication through these proxies.
- If your network allows only outbound HTTPS connections from the management server across the firewall, and blocks inbound connections from nodes, you can configure a Reverse Channel Proxy (RCP).

> **Note:** In an environment with multiple management servers, you can also configure the management servers to communicate with one another through firewalls. The configuration is the same as for communication between management servers and nodes.

Before You Begin

Skip this section if you are using the Operations Agent only on Windows nodes.

Most of the configuration tasks are performed through the ovconfchg utility, which resides in the following directory:

On HP-UX, Linux, and Solaris

```
/opt/OV/bin
```

On AIX

```
/usr/lpp/OV/bin
```

To run the **ovconfchg** command (and any other agent-specific command) from anywhere on the system, you must add the **bin** directory to the PATH variable of the system. On Windows systems, the **bin** directory is automatically added to the PATH variable. To add the **bin** directory to the PATH variable on UNIX/Linux systems, follow the below step:

Do one of the following:

On HP-UX, Solaris, or Linux nodes, run the following command:

```
export PATH=/opt/OV/bin:$PATH
```

On AIX nodes, run the following command:

```
export PATH=/usr/lpp/OV/bin:$PATH
```

The PATH variable of the system is now set to the specified location. You can now run agent-specific commands from any location on the system.

Configuring Proxies

You can redirect connections from management servers and nodes that are on different networks through an HTTP proxy.

The management server opens connections to the proxy server, for example to deploy policies and instrumentation, for heartbeat polling, or to launch actions. The proxy server opens connections to the node on behalf of the management server, and forwards communication between them.

The node opens connections to the proxy server, for example to send messages, and action responses. The proxy server opens connections to the management server on behalf of the node.

You can also redirect communication through proxies in more complex environments as follows:

- Each management server and node can use a different proxy server to communicate with each other.
- You can configure management servers and nodes to select the correct proxy according to the host they need to connect to.

The figure below shows connections between a management server and nodes through multiple proxies as follows:

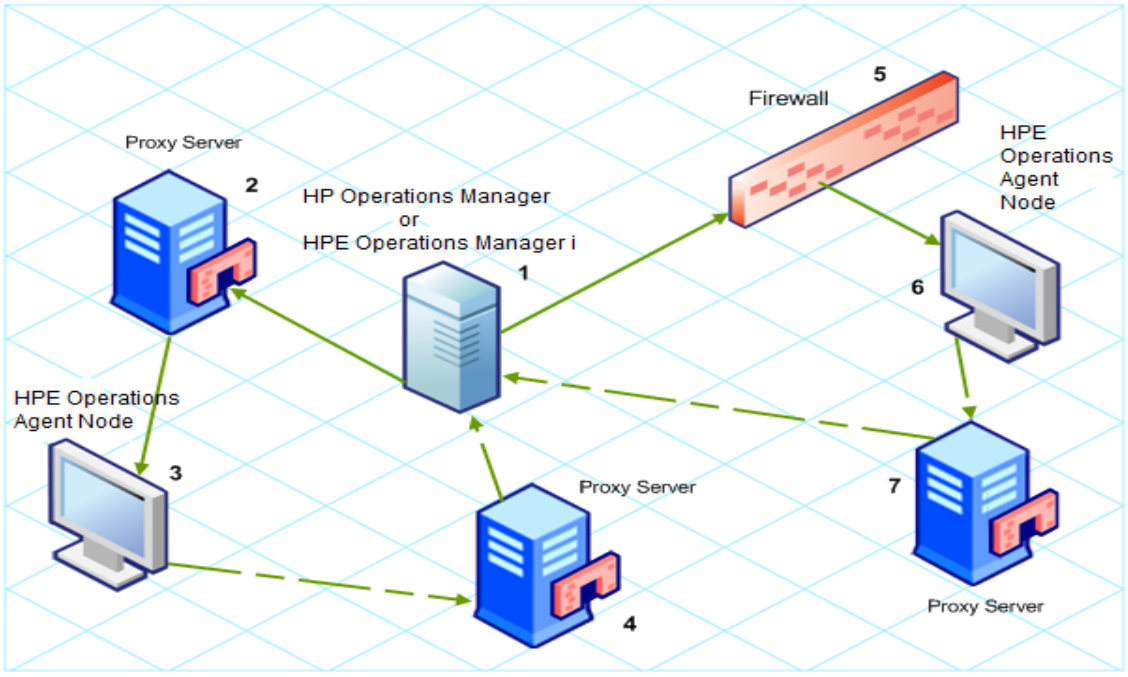
The management server (1) opens connections to a proxy (2). The proxy opens connections to the node (3) on behalf of the management server.

The node (3) opens connections to a different proxy (4). The proxy opens connections to the management server (1) on behalf of the node.

The network allows management server (1) to make outbound HTTP connections directly through the firewall (5) to another node (6). (The nodes (3, 6) are on different networks.)

The firewall (5) does not allow inbound HTTP connections. Therefore, node (6) opens connections to the management server through a proxy (7).

Communication Using Proxies



PROXY Parameter Syntax

You can redirect outbound HTTPS communication through proxies by setting the PROXY parameter in the bbc.http name space on the management servers and nodes. You can configure this parameter in the following ways:

- Configure the values in the Operations Agent installation defaults. For more information on the profile file, see Installing Operations Agent using Profile File. This is recommended if you need to configure proxies for large numbers of nodes. You must plan and configure the installation defaults before you create or migrate your nodes.
- Use `ovconfchg` at the command prompt.

The value of the PROXY parameter can contain one or more proxy definitions. Specify each proxy in the following format:

<proxy_hostname>:*<proxy_port>*+(*<included hosts>*)-(*<excluded hosts>*)

Replace *<included_hosts>* with a comma-separated list of hostnames or IP addresses to which the proxy enables communication. Replace *<excluded hosts>* with a comma-separated list of hostnames or IP addresses to which the proxy cannot connect. Asterisks (*) are wild cards in hostnames and IP addresses. Both *<included_hosts>* and *<excluded hosts>* are optional.

To specify multiple proxies, separate each proxy with a semicolon (;). The first suitable proxy in the list takes precedence.

Example PROXY Parameter Values

To configure a node to use proxy1.example.com port 8080 for all outbound connections, you would use the following value:

```
proxy1.example.com:8080
```

To configure a management server to use proxy2.example.com:8080 to connect to any host with a hostname that matches *.example.com or *example.org except hosts with an IP address in the range 192.168.0.0 to 192.168.255.255, you would use the following value:

```
proxy2.example.com:8080+(*.example.com,*.example.org)-(192.168.*.*)
```

To extend the above example to use proxy3.example.com to connect to backup.example.com only, you would use the following value:

```
proxy3.example.com:8080+(backup.example.com); proxy2.example.com:8080+
(*.example.com,*.example.org)-(192.168.*.*)
```

In the above example, proxy3.example.com:8080+(backup.example.com) must be first, because the include list for proxy2.example.com contains *.example.com.

To redirect HTTPS communication through proxies:

1. Log on to the management server or node as an administrator or root and open a command prompt or shell.
2. Specify the proxies that the node should use. You can specify different proxies to use depending on the host that the agent wants to connect to. Run the following command:

   ```
   ovconfchg -ns bbc.http -set PROXY <proxy>
   ```

   > **Note:** When you use the command **ovconfchg** on a management server that runs in a cluster, add the parameter **-ovrg *<server>***.

PROXY_CFG_FILE Parameter Syntax

Instead of specifying the details of the proxy server with the **PROXY** configuration variable, you can use an external configuration file to specify the list of proxy servers and configure the Operations Agent to read the proxy server data from the configuration file.

Before configuring the **PROXY_CFG_FILE** variable, you must create the external configuration file. The proxy configuration file is an XML file that enables you to specify proxy server details within XML elements. Use a text editor to create the file; save the file under the following directory:

On Windows

```
%ovdatadir%conf\bbc
```

On UNIX/Linux

```
/var/opt/OV/conf/bbc
```

Configuring backup proxies

The proxy configuration entry in the `bbc.http` namespace supports backup proxies. If the connection from the host to a proxy server fails, backup proxy servers can be configured for that host using the following format:

```
[bbc.http]
```

```
PROXY=<proxy1>:<port>|<proxy2>:<port>|<proxy3>:<port>+(hostname)
```

where <proxy1>, <proxy2> and <proxy3> are the IP addresses of the proxy server.

For example:

```
PROXY=<IP1>:<port>|<IP2>:<port>|<IP3>:<port>+(hostname.domain.com)
```

In this instance:

<IP1>, <IP2> and <IP3> are the proxy IP addresses.

<IP2> and <IP3> are the backup proxy servers for <IP1>.

If there is a failure to connect to <IP1> then <IP2> is used. If <IP2> also fails, <IP3> is used.

Organizing the Proxy Configuration File

The proxy configuration XML file includes different XML elements for specifying proxy server, agent node, and management server details. You can provide the configuration data of multiple proxy servers in the configuration file.

Structure of the Proxy Configuration XML File

```
<?xml version='1.0' encoding='UTF-8' standalone='yes'?>
<proxies>
  <proxy>
    <server>proxy_server.domain.example.com:8080</server>
    <for>
      <target>*.domain.example.com</target>
      <target>*.domain2.example.com</target>
      <target>*.domain3.example.com</target>
    </for>
  </proxy>
</proxies>
```

- proxies: The proxies element enables you to add details of proxy servers that you want to use in your OM or OMi managed environment. All the contents of this XML file are enclosed within the proxies element.
- proxy: This element captures the details of the proxy server and systems that communicate with the local node through the proxy server. You can configure multiple proxy elements in this XML file.
- server: Use this element to specify the FQDN (or IP address) of the proxy server that you want to use in your monitoring environment.
- for: Within the `for` element, include the FQDNs or IP addresses of all other agent nodes or management servers that must communicate the local node only through the proxy server that you specified within the server element. You must add each FQDN or IP address within the target element.

For example:

```
<for>
```

```
      <target>system3.domain.example.com</target>
      <target>system3.domain.example.com</target>
</for>
```

You can use the wildcard (*) character to configure multiple system within a single target element. You can also specify an IP address range.

For example:

```
<for>
       <target>*.domain2.example.com</target>
       <target>172.16.5.*</target>
       <target>192.168.3.50-85</target>
</for>
```

- except: Use this element to create an exclusion list of systems that must *not* communicate with the local node through the configured proxy server (specified in the server element). Include the FQDNs or IP addresses of all such systems within the target element.

For example:

```
<except>
       <target>*.domain3.example.com</target>
       <target>172.16.10.*</target>
       <target>192.168.9.5-25</target>
</except>
```

Examples of the Proxy Configuration File

Syntax	Description
<proxies> <proxy> <server> server1.domain.example.com:8080 </server> <for> <target>*.domain2.example.com</target> </for>	The server server1.domain.example.com is configured as the proxy server and all systems that belong to the domain domain2.example.com must communicate with the node or management server only through server1.domain.example.com.

Examples of the Proxy Configuration File, continued

Syntax	Description
</proxy> </proxies>	
<proxies> <proxy> <server> server2.domain.example.com:8080 </server> <for> <target>*.domain2.example.com</target> <target>192.168.2.*/target> </for> </proxy> <proxy> <server> server3.domain.example.com:8080 </server> <for> <target>192.168.3.*</target> </for> <except> <target>192.168.3.10-20</target> </except> </proxy> </proxies>	The server server2.domain.example.com is configured as the proxy server and all systems that belong to the domain domain2.example.com or with the IP addresses that start with 192.168.2 must communicate with the node or management server only through server2.domain.example.com. The server server3.domain.example.com is configured as the second proxy server and all systems with the IP addresses that start with 192.168.3 must communicate with the node or management server only through server3.domain.example.com. In addition, systems within the IP address range 192.168.3.10-20 will not be able to use the proxy server server3.domain.example.

Configure the PROXY_CFG_FILE Variable

1. Log on to the node as an administrator or root.
2. Create a new XML file with a text editor.

3. Add the following line at the beginning of the file:

   ```
   <?xml version='1.0' encoding='UTF-8' standalone='yes'?>
   ```

4. Add content to the file.
5. Save the file under the following directory:

   On Windows

   ```
   %ovdatadir%conf\bbc
   ```

   On UNIX/Linux

   ```
   /var/opt/OV/conf/bbc
   ```

6. Run the following command:

   On Windows

   ```
   %ovinstalldir%bin\ovconfchg -ns bbc.http -set PROXY_CFG_FILE <filename>.xml
   ```

   On HP-UX, Linux, or Solaris

   ```
   /opt/OV/bin/ovconfchg -ns bbc.http -set PROXY_CFG_FILE <filename>.xml
   ```

   On AIX

   ```
   /usr/lpp/OV/bin/ovconfchg -ns bbc.http -set PROXY_CFG_FILE <filename>.xml
   ```

> **Note:** You can verify the configuration using `bbcutil -gettarget <host name or IP address of the node>`.

Configuring the Communication Broker Port

By default, the Operations Agent nodes use the port 383 for inbound communication. The Communication Broker component facilitates the inbound communication on every Operations Agent server or node through the port 383.

You can configure a communication broker to listen on a port other than 383. If you do this, you must also configure the other management servers and nodes in the environment, so that their outbound connections are destined for the correct port. For example, if you configure a node's communication broker to listen on port 5000, you must also configure the management server so that it connects to port 5000 when it communicates with this node.

PORTS Parameter Syntax

You configure communication broker ports by setting the PORTS parameter in the `bbc.cb.ports` name space on all management servers and nodes that communicate with each other.

You can configure this parameter in the following ways:

- Configure the values in the Operations Agent installation defaults in a profile file during installation. This is recommended if you need to configure communication broker ports for large numbers of nodes. You must plan and configure the installation defaults before you create or migrate your nodes.
- Use **ovconfchg** at the command prompt.

The values must contain one or more host names or IP addresses and have the following format:

`<host>:<port>[,<host>:<port>] ...`

The *<host>* can be either a domain name or IP address. For example, if the communication broker port is configured to run on port 5000 on a management server with the host name manager1.domain.example.com, use the following command on the management server itself, and also on any other management servers and nodes that open connections to it:

```
ovconfchg -ns bbc.cb.ports -set PORTS manager1.domain.example.com:5000
```

If you need to configure communication broker ports on multiple systems, you can use wildcards and ranges, as follows:

You use a wildcard at the start of a domain name by adding an asterisk (*). For example:

*.test.example.com:5000

*.test.com:5001

*:5002

You can use wildcards at the end of an IP address by adding up to three asterisks (*). For example:

192.168.1.*:5003

192.168.*.*:5004

10.*.*.*:5005

You can replace one octet in an IP address with a range. The range must be before any wildcards. For example:

192.168.1.0-127:5006

172.16-31.*.*:5007

If you specify multiple values for the PORTS parameter, separate each with a comma (,). For example:

```
ovconfchg -ns bbc.cb.ports -set PORTS *.test.example.com:5000,10.*.*.*:5005
```

When you specify multiple values using wildcards and ranges that overlap, the management server or node selects the port to use in the following order:

- Fully qualified domain names
- Domain names with wildcards
- Complete IP addresses
- IP addresses with ranges
- IP addresses with wildcards

For example:

You must configure the OM or the OMi management environment for the following specification:

Configure all the systems within the domain *.test2.example.com to use the port 6000 for the communication broker.

Configure all the systems with 10 as the first octet of the IP address (10.*.*.*) to use the port 6001 for the communication broker with the following exception:

Configure all the systems where the second octet of the IP address is between 0 and 127 (10.0-127.*.*) to use the port 6003 for the communication broker.

Configure the system manager1.test2.example.com to use the port 6002 for the communication broker.

To configure the OM or the OMi monitoring environment with the above specification, run the following command:

```
ovconfchg -ns bbc.cb.ports -set PORTS
*.test2.example.com:6000,10.*.*.*:6001,manager1.test2.example.com:6002,10
.0-127.*.*:6003
```

The changes will take effect only if you run this command on *all* the agent nodes and *all* the OM or the OMi management servers in the monitoring environment.

To find out which port is currently configured, run the following command:

```
bbcutil -getcbport <host>
```

To configure the Communication Broker to use a non-default port

> **Note:** Make sure to configure the Communication Broker on all OM or OMi servers and Operations Agent nodes in your environment to use the same port.

1. Log on to the Operations Agent node.
2. Open a command prompt or shell.
3. Run the following command to set the Communication Broker port to a non-default value:

   `ovconfchg -ns bbc.cb.ports -set PORTS <host>:<port>[,<host>:<port>] ..`

   When you use the command **ovconfchg** on an Operations Agent node that runs in a cluster, add the parameter **-ovrg**<*server*>, where <*server*> is the resource group.
4. Run the above command on all agent nodes and all management servers.

Follow these steps to configure the communication broker:

`ovconfchg -ns bbc.cb.ports -set PORTS host1:483[,host2:583]`, where port 1 value is **483** and port 2 is **583**.

To update the port2 value from 583 to 683, run the following command:

`ovconfchg -ns bbc.cb.ports -set PORTS host1:583[,host2:683]`

To configure the communication broker to listen on a non-default port, change the SERVER_PORT variable value in the `bbc.cb` namespace.

Run the following command to set different values to the SERVER_PORT variable:

`ovconfchg -ns bbc.cb -set SERVER_PORT <value>`

In this instance, `<value>` is the value you want to assign to the SERVER_PORT variable.

> **Note:** When you change the value of the SERVER_PORT variable, the communication broker restarts automatically and listens on the specified new port value.

Configuring Local Communication Ports

By default, management servers and nodes use local port 0 for outbound connections, which means that the operating system allocates the local port for each connection. Typically, the operating system will allocate local ports sequentially. For example, if the operating system allocated local port 5055 to an Internet browser, and then the HTTPS agent opens a connection, the HTTPS agent receives local port 5056.

However, if a firewall restricts the ports that you can use, you can configure management servers and nodes to use a specific range of local ports instead.

CLIENT_PORT Parameter Syntax

You configure local communication ports by setting the CLIENT_PORT parameter in the bbc.http name space on the management server or node. You can configure this parameter in the following ways:

- Configure the values in the Operations Agent installation defaults. For more information on the profile file, see Installing Operations Agent using Profile File. This is recommended if you need to configure local communication ports for large numbers of nodes. You must plan and configure the installation defaults before you create or migrate your nodes.
- Use `ovconfchg` at the command prompt.

The value must be a range of ports in the following format:

<lower port number>-<higher port number>

There is no range defined for the port numbers. The range must support the number of outbound connections at a given point of time.

For example, if the firewall only allows outbound connections that originate from ports 5000 to 6000 you would use the following value:

```
5000-6000
```

To configure local communication ports:

1. Log on to the Operations Agent node.
2. Open a command prompt or shell.
3. Specify the range of local ports that the management server or node can use for outbound connections by typing the following command:

   ```
   ovconfchg -ns bbc.http -set CLIENT_PORT 5000 - 6000
   ```

   When you use the command ovconfchg on a management server that runs in a cluster, add the parameter -ovrg <*server*>.

Configuring Nodes with Multiple IP Addresses

If the node has multiple IP addresses, the agent uses the following addresses for communication:

- The communication broker accepts incoming connections on all IP addresses.
- The agent opens connections to the management server using the first network interface that it finds through the OS provided libraries.

- To communicate with Reporter or Performance Manager, the communication daemon (CODA) accepts incoming connections on all IP addresses.

Follow the steps below to configure the Operations Agent to use a specific IP address:

1. Log on to the Operations Agent node.
2. Open a command prompt or shell.
3. Run the following command to set the IP address for the Communication Broker:

   ```
   ovconfchg -ns bbc.cb SERVER_BIND_ADDR <ip_address>
   ```

4. Run the following command to set the IP address that you want the agent to use while opening outbound connections to the management server:

   ```
   ovconfchg -ns bbc.http CLIENT_BIND_ADDR <ip_address>
   ```

5. Run the following command to set the IP address that you want to use for incoming connections from Performance Manager or Reporter:

   ```
   ovconfchg -ns coda.comm SERVER_BIND_ADDR <ip_address>
   ```

> **Note:** See *"Overview of Node Resolution"* in the *Operations Agent User Guide* for more information on node name resolution.

Configuring HTTPS Communication through Proxies

If your network allows only certain proxy systems to open connections through the firewall, you can redirect OM or OMi communication through these proxies. The following list presents the workflow of the management server and agent communication with this configuration:

1. The management server opens connections to the proxy.
2. The proxy opens connections to the node on behalf of the management server, and forwards communication between them.
3. The node opens connections to the proxy.
4. The proxy opens connections to the management server on behalf of the node.

To redirect the communication through proxies:

1. Log on to the management server or node with the root or administrative privileges.
2. Run the following command at the command prompt:

```
ovconfchg -ns bbc.http -set PROXY <proxy>:<port>
```

In this instance, `<proxy>` is the IP address or FQDN of the proxy server; `<port>` is the communication port of the proxy server.

> **Note:** When you use the command `ovconfchg` on a management server that runs in a cluster, add the parameter `-ovrg <server>`.

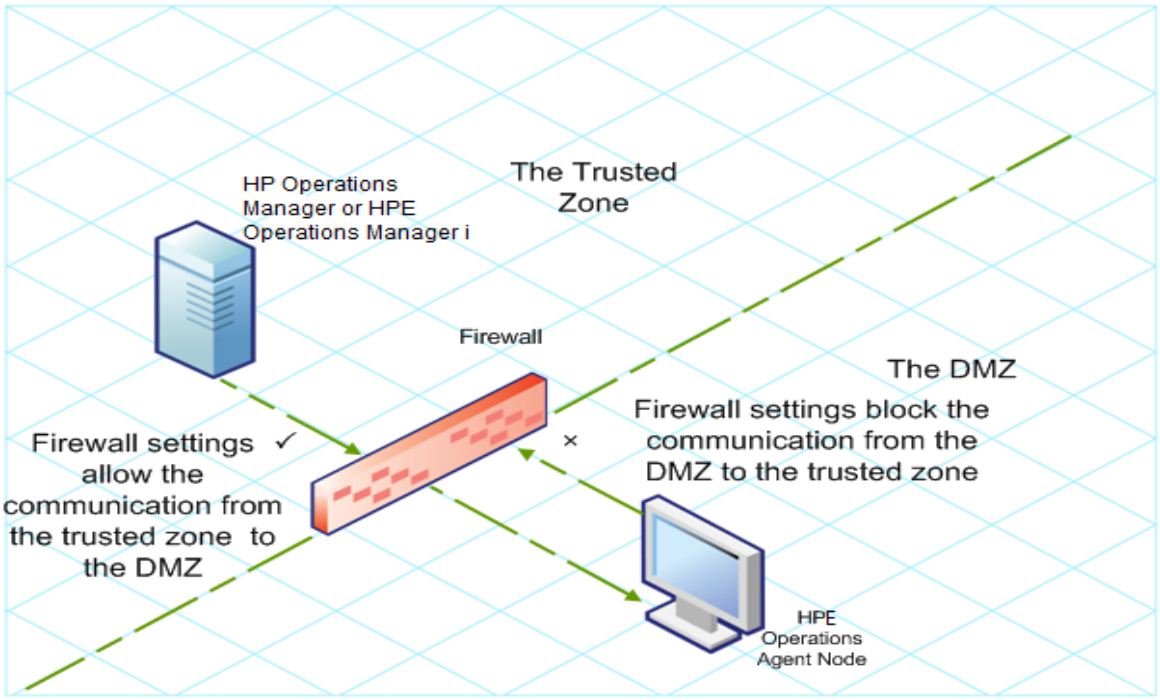
Communication in a Highly Secure Environment

In a firewall-controlled, secure environment, systems that are present within the trusted zone can freely communicate and exchange information with one another. However, specific firewall settings can restrict communication with the systems that belong outside the trusted zone. The untrusted network, also known as the demilitarized zone (**DMZ**), may not send data to the trusted zone due to restrictions in firewall settings.

In many deployment scenarios, the OM or the OMi management server may reside in the trusted zone and managed nodes may reside in the DMZ. If the firewall is configured to prevent the systems in the DMZ from communicating with the systems in the trusted zone, server-agent communication will become impossible.

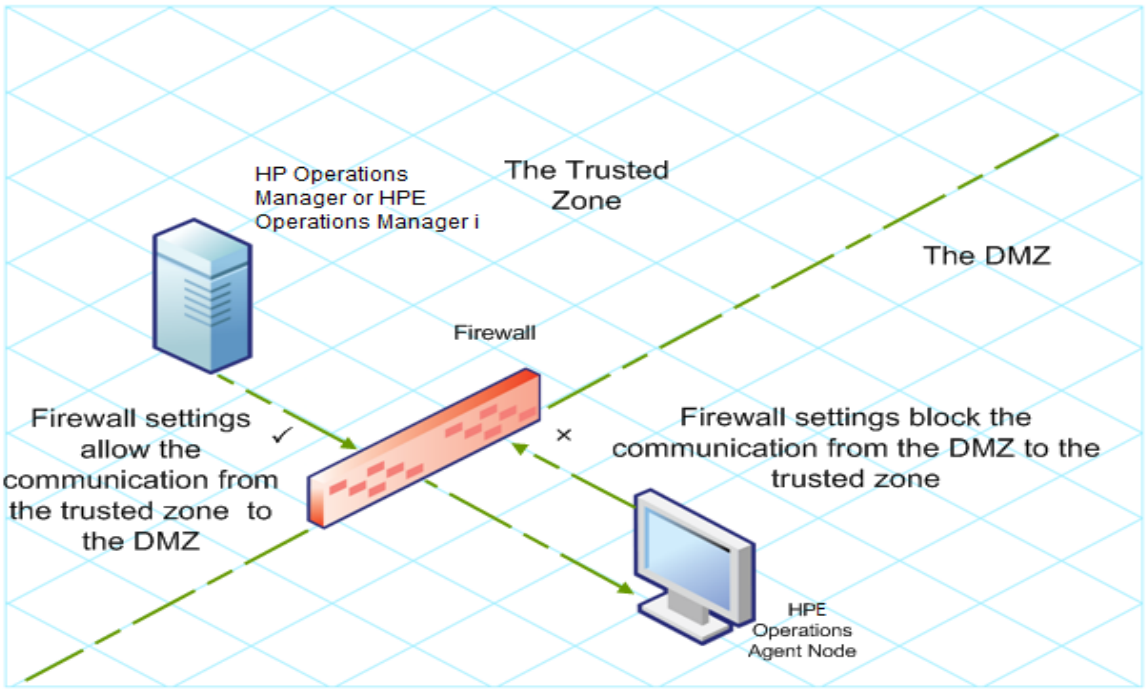
In the following scenario, managed nodes are located in the DMZ while the management server belongs to the trusted zone. The firewall settings in this example allow outbound-only communication. Therefore, inbound communication to the management server is blocked by the firewall.

Managed Nodes in the DMZ



In the following scenario, managed nodes are located in the trusted zone while the management server belongs to the DMZ. The firewall settings in this example allow outbound-only communication from the node to the OM or the OMi management server, but block the inbound communication to node.

OM or OMi Management Server in the DMZ



Introduction to the Reverse Channel Proxy

One simple solution to enable bidirectional communication is to configure the firewall settings to allow inbound traffic to the port 383 (the Communication Broker port). However, this can make your system vulnerable to external attacks. To enable secure communication without allowing inbound traffic to the Communication Broker port, you must configure a Reverse Channel Proxy (**RCP**).

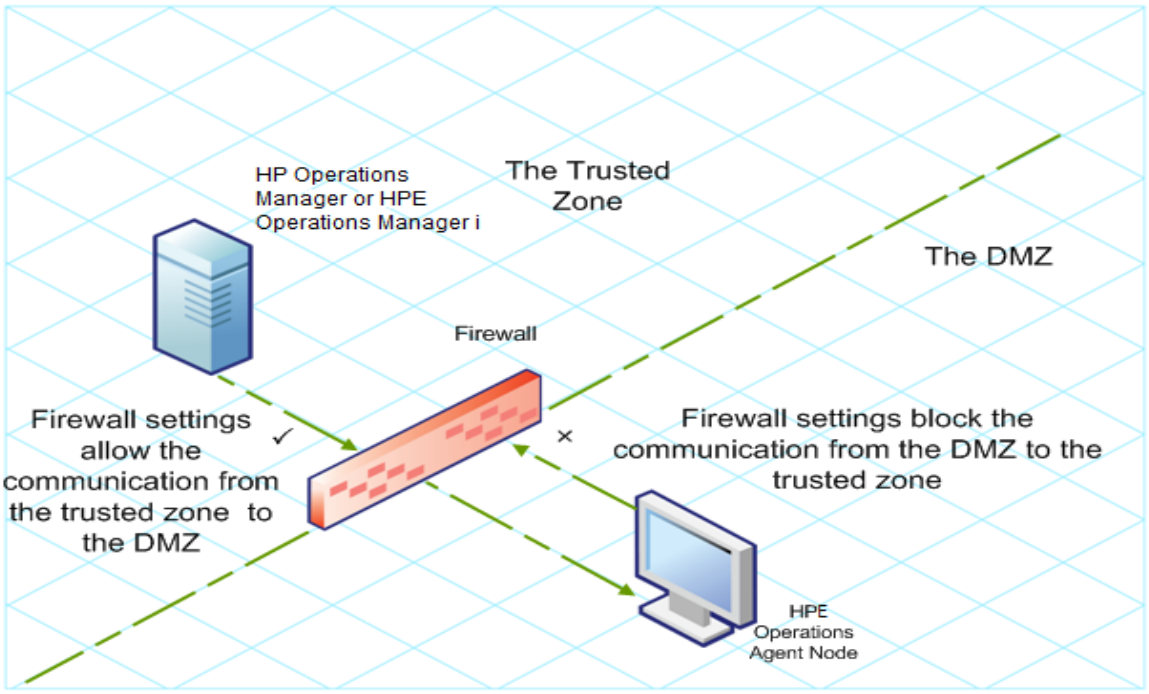
> **Note:** On Windows, after agent installation, the firewall configuration changes when **HTTP Communication Broker** is added to the firewall inbound rules.

Systems belonging to the DMZ open connection to the RCP instead of the system inside the trusted zone. You can configure the system in the trusted zone to open an outbound communication channel—the reverse administration channel—to the RCP. The system in the trusted zone maintains the outbound channel; systems in the DMZ uses the reverse administration channel to send details to the trusted zone by using the RCP.

When the nodes are located in the DMZ and the management server in the trusted zone, the OM or the OMi setup uses the following workflow:

1. The RCP is configured on a node in the DMZ.
2. All the nodes in the DMZ open connections to the RCP.
3. The management server opens an outbound connection to the RCP and establishes a reverse administration channel. The reverse administration channel allows the management server to accept inbound data originating from the RCP without any involvement of additional ports.
4. All nodes from the DMZ communicate to the OM or the OMi management server through the reverse administration channel.

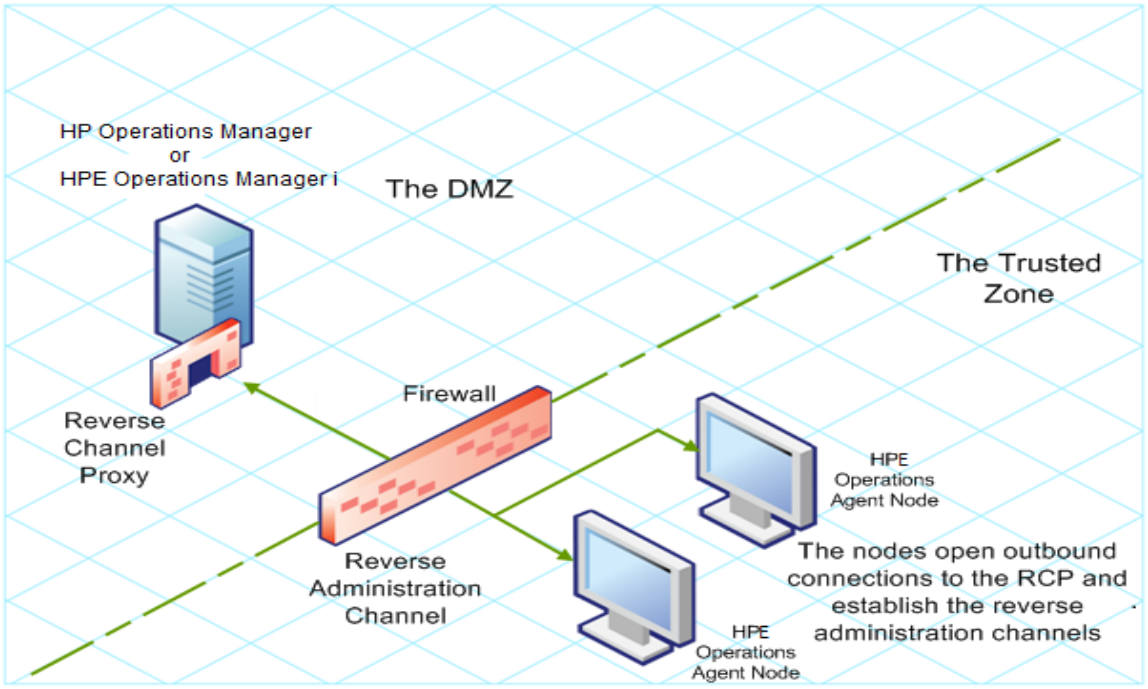
Secure Communication through the RCP with Nodes in the DMZ



When the nodes are located in the trusted zone and the management server in the DMZ, the OM or the OMi setup uses the following workflow:

1. The RCP is configured on the management server in the DMZ.
2. The nodes opens outbound connections to the RCP and establishes reverse administration channels. The reverse administration channels allow the nodes to accept inbound data originating from the RCP without any involvement of additional ports.
3. The management server in the DMZ communicates to the nodes through the reverse administration channel.

Secure Communication through the RCP with the Management Server in the DMZ



Secure Communication in an Outbound-Only Environment

To configure secure communication with the help of the RCP and reverse administration channel in an outbound-only environment, perform the following tasks:

Configure an RCP

Before you configure RCP, you must configure the node's certificate.

To configure an RCP:

1. Log on to the node or the management server (depending on their location on the network) as a user with the administrative or root privileges.
2. Open a command prompt or shell.
3. Run the following command:

   ```
   ovconfchg -ns bbc.rcp -set SERVER_PORT <port_number>
   ```

   In this instance, *<port_number>* is the port that will be used by the RCP. Make sure the specified port is not used by another application.

4. *On UNIX/Linux only.* The Communication Broker (ovbbccb) runs with `/var/opt/OV` as the root directory. The configuration files that are necessary to open Transmission Control Protocol (TCP) connections are present in the `/etc` directory. This prevents **ovbbccb** from creating connections to the RCP. To resolve this problem, follow the steps:
   a. Create the directory named `etc` under `/var/opt/OV`
   b. Copy the relevant configuration files (for example, files such as **resolv.conf**, **hosts**, **nsswitch.conf**) from `/etc` to `/var/opt/OV/etc`.
   c. Alternatively, you can also disable the **ovbbccb chroot** feature by running the following command. This method resolves the problem of preventing `ovbbccb` from creating connections to the RCP.

      ```
      ovconfchg -ns bbc.cb -set CHROOT_PATH /
      ```

5. Register the RCP component so that ovc starts, stops and monitors it. Type the following commands:

   ```
   ovcreg -add <install_dir>/newconfig/DataDir/conf/bbc/ovbbcrcp.xml
   ```

   ```
   ovc -kill
   ```

   ```
   ovc -start
   ```

Configuring a Reverse Administration Channel

With the help of the RCPs that you created, you must configure a reverse administration channel to facilitate the inbound communication in an outbound-only firewall environment. To configure a reverse administration channel when OM or OMi is in HA cluster, follow these steps:

1. Log on to the node or the management server (depending on their location on the network) as a user with the administrative or root privileges.
2. Open a command prompt or shell.
3. Run the following command to create the reverse administration channel:

   ```
   ovconfchg [-ovrg<server>] -ns bbc.cb -set ENABLE_REVERSE_ADMIN_CHANNELS true
   ```

4. Run the following commands to specify the RCP details:

   ```
   ovconfchg [-ovrg<server>] -ns bbc.cb -set RC_CHANNELS <rcp>:<port>[,<OvCoreId>]
   [;<rcp2>...]
   ```

   ```
   ovconfchg [-ovrg<server>] -ns bbc.cb -set PROXY <rcp>:<port>[,<OvCoreId>]
   [;<rcp2>...]
   ```

   In this instance,

<*rcp*>: FQDN or IP address of the system where the RCP is configured.

<*port*>: The port number configured for the RCP (the port specified for the SERVER_PORT variable)

<*OvCoreID*>: The core ID of the system where you configured the RCP.

Alternatively, you can provide the RCP details by using a configuration file.

5. *Optional.* Configure the server to automatically restore failed reverse administration channel connections. By default, the server does not restore failed connections. To change the default, run the following command:

   ```
   ovconfchg [-ovrg<server>] -ns bbc.cb -set RETRY_RC_FAILED_CONNECTION TRUE
   ```

6. *Optional.* Set the maximum number of attempts that the server should make to connect to an RCP. By default, this is set to -1 (infinite). To change the default, run the following command:

   ```
   ovconfchg [-ovrg<server>] -ns bbc.cb -set MAX_RECONNECT_TRIES<number of tries>
   ```

7. *Optional.* Configure the management server to generate a warning message when a reverse administration channel connection fails. By default, the management server does not generate the failure message. To change the default, run the following command:

   ```
   ovconfchg [-ovrg <server>] -ns bbc.cb -set RC_ENABLE_FAILED_OVEVENT TRUE
   ```

   If you set RETRY_RC_FAILED_CONNECTION to TRUE, the management server does not generate the message.

8. *Optional.* To check that the reverse administration channel is open, run the following command:

   ```
   ovbbccb -status
   ```

   The output lists all open reverse administration channels.

9. *Optional.* To restore a failed reverse administration channel, run the following command:

   ```
   ovbbccb -retryfailedrcp [-ovrg<server>]
   ```

Performance Considerations for the Reverse Administration Channel

The performance of a reverse administration channel may depend on the number of nodes connected to the channel. The RC_MAX_WORKER_THREADS variable helps you tune the performance of a reverse administration channel.

To use the RC_MAX_WORKER_THREADS variable:

1. Log on to the node that establishes the reverse administration channel.
2. Note down the time taken by the agent to establish the channel. You can determine this by running the **ovbbccb -status** command. The **ovbbccb -status** command output shows the status of reverse administration channels originating from the system. By running the **ovbbccb -status** command repeatedly, you can determine the approximate time taken by the agent to establish the channel.
3. Calculate the ratio of the desired time to establish the channel and the approximate actual time taken by the agent to establish the channel.
4. Set the **RC_MAX_WORKER_THREADS** variable to the next higher integer to the ratio. Use the following command to set this variable:

```
ovconfchg -ns bbc.cb -set RC_MAX_WORKER_THREADS <Maximum_Threads>
```

For example:

The management server or agent node establishes a reverse administration channel to 20 RCP nodes. When the **ovbbccb -status** command is run, the approximate time is derived as 10 seconds (without any **RC_MAX_WORKER_THREADS** value set). If the required time is 5 seconds, then set **RC_MAX_WORKER_THREADS** to **actual_time/desired_time**.

In this scenario:

Actual Time/Desired Time = 10/5 = 2

Set the value for the command:

ovconfchg -ns bbc.cb -set RC_MAX_WORKER_THREADS *2*

If the RC_MAX_WORKER_THREADS value exceeds the number of RCP nodes, then there may not be any performance improvement.

Specifying the RCP Details with a Configuration File

With the help of a configuration file, you can specify the details of the RCPs. To use the configuration file, follow these steps:

1. Create a text file.
2. Specify the details of each RCP in a new line in the following format:

   ```
   <rcp>:<port>[,<OvCoreId>]
   ```

In this instance,

<*rcp*>: FQDN or IP address of the system where the RCP is configured.

<*port*>: The port number configured for the RCP (the port specified for the SERVER_PORT variable.

<*OvCoreID*>: The core ID of the system where you configured the RCP.

3. Save the file in the following location:

   `<data_dir>/conf/bbc`

   If you are performing this step on a management server in a high-availability cluster or in a server pooling setup, save the file in the following location:

   `<data_dir>/shared/<server>/conf/bbc`

4. Run the following command:

   `ovconfchg [-ovrg<server>] -ns bbc.cb -set RC_CHANNELS_CFG_FILES <file_name>`

In this instance,

<*file_name*>: Name of the file created.

<*server*>: Name of the resource group of the cluster or server pooling setup.

Configuring a RCP for Multiple Systems

You can configure only one RCP in the DMZ, and then configure other systems in the DMZ to use the RCP. To achieve this, you must set the PROXY variable of all the systems in the DMZ to the IP address (or FQDN) and port of the system that hosts the RCP. To configure multiple systems to use a single RCP, follow these steps:

1. Log on to the node with the root or administrative privileges.
2. Open a command prompt (shell).
3. Run the following command:

   `ovconfchg -ns bbc.http -set PROXY "<rcp>:<port>+<included_hosts>-<excluded_hosts>"`

   In this instance,

   <*rcp*>: FQDN or IP address of the system where the RCP is configured.

<*port*>: The port number configured for the RCP (the port specified for the SERVER_PORT variable

<*included_hosts*>: Specify the FQDN or IP address of the system that opens a reverse administration channel to the RCP. In this scenario, you must specify the FQDN or IP address of the management server that belongs to the trusted zone. If you want to use multiple management servers, you can specify multiple FQDNs separated by commas.

<*excluded_hosts*>: Specify the FQDN or IP address of the systems that need not be contacted through the RCP. You can specify multiple FQDNs separated by commas. You must, however, specify the local system's FQDN and hostname (separated by commas). For example,

```
ovconfchg -ns bbc.http -set PROXY "<rcp>:<port>-
<localhost>,<localhost>.domain.com"
```

4. If the system is an Operations Agent node, run the following command to restart the message agent:

   ```
   ovc -restart opcmsga
   ```

Repeat step 3 and 4 on all the systems in the DMZ.

Performance Considerations for the RCP

If you configure an RCP for only one system, meeting the minimum requirements for an agent system is sufficient.

If you configure an RCP that will be used by multiple agent nodes, you must make sure that the RCP system will be able to service all incoming requests without significant time delay.

Verifying the Communication through the RCPs

After configuring the RCPs and establishing a reverse administration channel, you can perform the following tasks to verify if the server-node communications is established successfully:

Verifying the Communication to the RCP

To verify that the system in the DMZ can communicate with the RCP, follow these steps:

1. Log on to the system in the DMZ with the root or administrative privileges.
2. Open a command prompt (shell).
3. Run the following command:

   ```
   bbcutil -gettarget <FQDN>
   ```

In this instance, *<FQDN>* is the FQDN of the system that establishes the reverse administration channel to the RCP. If the management server is located in the trusted zone, specify the FQDN of the management server.

If the RCP was successfully created, the output should display the following message:

HTTP Proxy: *<rcp>*:*<port>*

In this instance,

<rcp>: FQDN or IP address of the system where the RCP is configured.

<port>: The port number configured for the RCP (the port specified for the SERVER_PORT variable.

Check the Reverse Administration Channel

To verify that the reverse administration channel is correctly established, follow these steps:

1. Log on to the system in the trusted zone with the root or administrative privileges.
2. Open a command prompt (shell).
3. Run the following command:

   ovbbccb –status

If the channels are established correctly, the output should display the following message:

```
HTTP Communication Reverse Channel Connections

Opened:

system1.mydomain.com:1025 BBC 11.00.000; ovbbcrcp 11.00.000

system2.mydomain.com:1025 BBC 11.00.000; ovbbcrcp 11.00.000

system3.mydomain.com:1025 BBC 11.00.000; ovbbcrcp 11.00.000

system4.mydomain.com:1025 BBC 11.00.000; ovbbcrcp 11.00.000
```

In this example, the system has established reverse administration channels to the following RCP systems: system1, system2, system3, and system4.

If the reverse administration channel to an RCP fails, the **ovbbccb –status** command displays the status in the following format:

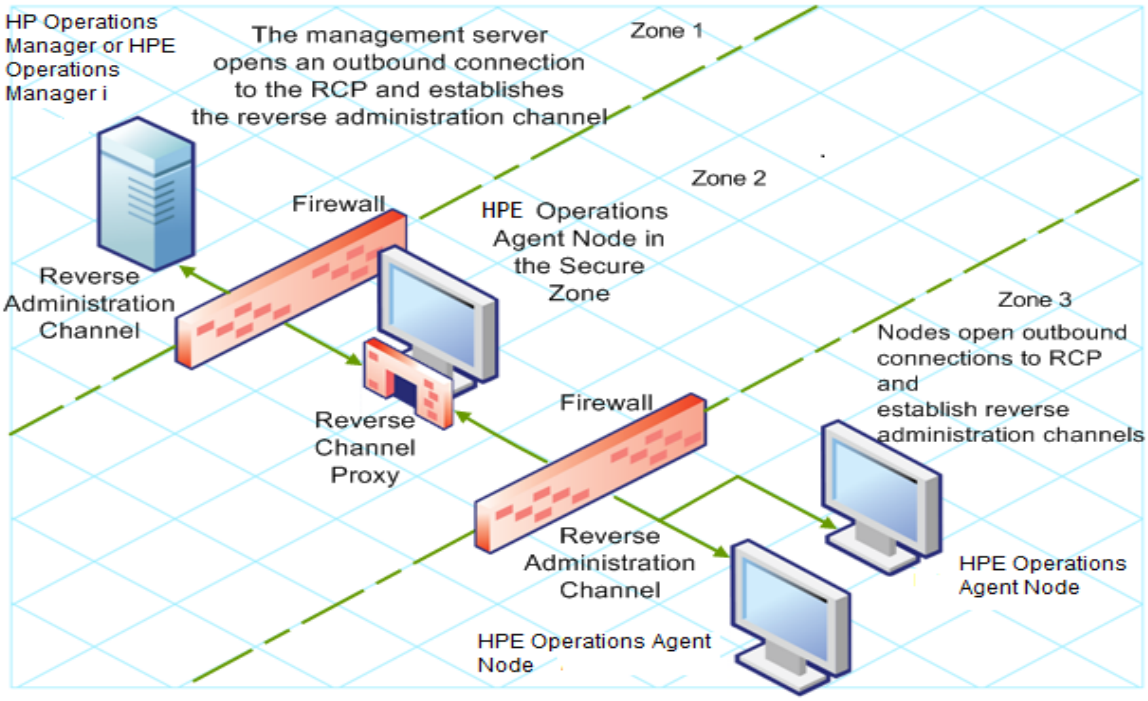
```
Pending:

system5.mydomain.com:1025 Connection To Host Failed
```

Communication through Two Firewalls

In certain cases, the management environment is set up with two different firewalls; the management server resides behind one firewall and the node group resides behind another firewall.

Secure Communication with Two Firewalls



In this scenario, you must install the agent on a system in the intermediate zone (zone 2) and configure the RCP on the system. After you configure the nodes in the zone 3 and the management server in the zone 1 to establish reverse administration channels to the RCP, server-node bidirectional communication takes place through the RCP.

To configure secure bidirectional communication in this scenario, follow these steps:

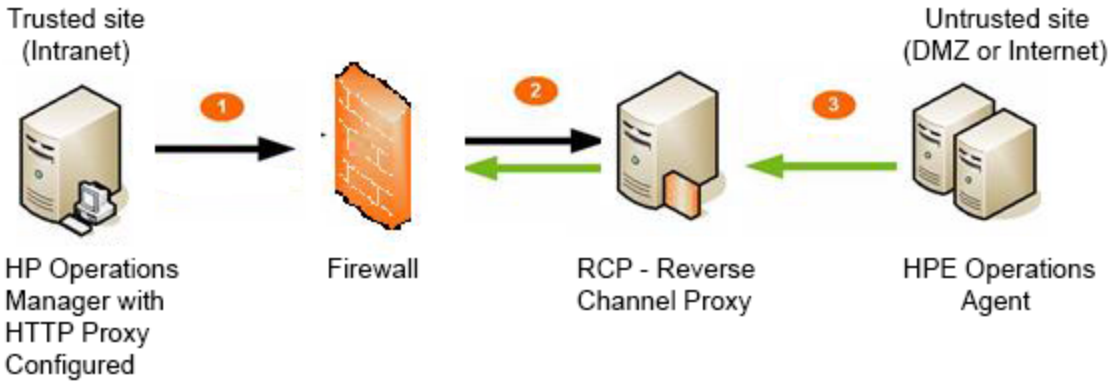
1. Install the agent on a node in the zone 2.
2. Configure an RCP on the node in the zone 2.
3. Configure the reverse administration channel from the management server to the RCP.
4. Configure reverse administration channels from the nodes in the zone 3 to the RCP.

Configuring Amazon Linux VM Outbound Communication with OM

The Amazon Linux VM which is a DMZ untrusted zone and the OM management server in a trusted zone communicate through SSH using key authentication. The HPE firewall restricts all the other communication channels. The communication between the HPE network and the Amazon Linux VM can be established through HTTP proxy.

Communication through a firewall

Secure unidirectional communication between the HPE network and the Amazon Linux VM can be established using the HTTP proxy and the RCP concept.



To establish secure communication between management server and Operations Agent on Amazon Linux RCP is used.

Reverse Channel Proxy (RCP)

An RCP is different from an HTTP proxy. A certificate is needed to set up an Admin Reverse Channel. A communication channel is established by management server to a Reverse Channel Proxy (RCP). The RCP uses the Admin Reverse Channel to establish data channels from client (Operations Agent) to a server on request.

How RCP works through firewall

1. Admin Reverse Channel.
    a. Server sends a request to the RCP for an Admin Reverse Channel.
    b. RCP confirms that an Admin Reverse Channel can be opened.
    c. Persistent Admin Reverse Channel is established between the server and the RCP.
    d. Operations Agent sends a request to the RCP for a data channel with the server.
2. Operations Agent sends data through the new data channel established by the RCP to the server.

In this secure server scenario, the RCP does the following:

- Runs on the agent system or on a dedicated system.
- Is configured using `ovconfchg`.
- Acts as a concentrator for multiple OVO HTTPS agents.

> **Note:** Outbound-only communication includes an OVO management solution that is compliant with network security policies. All communication between multiple trust zones is initiated only from a trusted zone to an untrusted zone (outbound only). Communication from an OVO management server to an OVO HTTPS agent through a single firewall (outbound) goes through the firewall directly to the Operations Agent. All communication from an Operations Agent to a server (inbound) as well as all communication between a server and an Operations Agent through multiple firewalls is conducted through an intermediary.

Proxy Configuration and Setup Details

Configuration is required on the following setups:

- Server
- Client
- RCP

Server:

1. Configure the **http** proxy:

```
[bbc.http]
PROXY=http-proxy:port1+(a)-(b)
TARGET_FOR_RC=<OV Core ID>
```

```
TARGET_FOR_RC_CMD=<script | command>
```

For example:

```
[bbc.http]
PROXY=<http-proxy>:8080+(*)-(localhost)
```

2. Establish the Admin Reverse Channels:

```
[bbc.cb]
ENABLE_REVERSE_ADMIN_CHANNELS=true/false //Default = false
RC_CHANNELS=<RCProxy1>:<RCP1_port>[,<RCP1_OvCoreID>][;<RCP2>...]
```

For example:

```
[bbc.cb]
CHROOT_PATH=/
ENABLE_REVERSE_ADMIN_CHANNELS=true
RC_CHANNELS=<RCProxy1>:9090
TARGET_FOR_RC=<OV Core ID>
```

Client:

1. Configure RCP proxy:

```
[bbc.http]
PROXY=rcp1:port1+(a)-(b)
TARGET_FOR_RC=<OV Core ID>
TARGET_FOR_RC_CMD=<script | command>
```

For example:

```
[bbc.http]
CHROOT_PATH=/
PROXY=<RCProxy1>:9090+(*)-(localhost)
TARGET_FOR_RC=<OV Core ID>
```

2. Set the following config variables:

```
[eaagt]
OPC_IP_ADDRESS=<Public IP>
OPC_NODENAME=<Public Hostname>
```

3. Configure the management server.

   ```
   [sec.core.auth]
   MANAGER=<Operations Manager IP or HOSTNAME>
   MANAGER_ID=<Operations Manager CoreID>
   [sec.cm.client]
   CERTIFICATE_SERVER=<Operations Manager IP or HOSTNAME>
   ```

RCP:

1. Install Operations Agent.
2. Set the oalicense.
3. Set the following config variables:

   ```
   [eaagt]
   OPC_IP_ADDRESS=<Public IP>
   OPC_NODENAME=<Public Hostname>
   ```

4. Configure the management server.

   ```
   [sec.core.auth]
   MANAGER=<Operations Manager IP or HOSTNAME>
   MANAGER_ID=<Operations Manager CoreID>
   [sec.cm.client]
   CERTIFICATE_SERVER=<Operations Manager IP or HOSTNAME>
   ```

5. Using the `ovcm` command issue the certificate from OM server in trusted zone. Transfer the file from the server and install the certificate manually using the `ovcert` command.

   For example:

   On OM server:

   ```
   [root@server ~]# ovcm -issue -file aws_<http-proxy>.pem -name <http-proxy> -
   pass test -coreid <OV Core ID>
   INFO: Issued certificate was written to file 'aws_<http-proxy>.pem'.
   ```

   On RCP node:

   ```
   [root@ip-rcp-node 12.02]# ovcert -importcert -file /tmp/aws_<http-proxy>.pem -
   pass test
   INFO: Import operation was successful.
   ```

6. Register ovbbcrcp (RCP process) with ovctrl.

   ```
   $OvInstallDir/bin/ovcreg -add \
   $OvInstallDir/newconfig/DataDir/conf/bbc/ovbbcrcp.xml
   ```

   For example:

   ```
   /opt/OV/bin/ovcreg -add \
   /opt/OV/newconfig/DataDir/conf/bbc/ovbbcrcp.xml
   ```

7. Start ovbbcrcp along with the other registered processes using the following command:

   ```
   ovc -start
   ```

8. Set RCP port :

   ```
   "ovconfchg –ns bbc.rcp –set SERVER_PORT <RCP_port>"
   By default port is set to 9090:
   [bbc.rcp]
   SERVER_PORT=0 //Default='9090'
   ```

> **Note:** AIRVA (Agent Installation Repository Virtual Appliance) has to be setup in the Amazon network for remote deployment of the Operations Agent. OM based remote deployment of the Operations Agent is not supported in the Amazon network. For more information on AIRVA, see Installing the Operations Agent using Agent Installation Repository.

Troubleshooting

1. Verifying RCP communication from an agent to the server

```
/opt/OV/bin/bbcutil -gettarget <management server>
```

2. Verifying RCP to server communication through a firewall

```
[root@server ~]# /opt/OV/bin/ovbbccb -status
Status: OK
(Namespace, Port, Bind Address, Open Sockets)
  <default> 383 ANY 4
OpenView HTTP Communication Incoming Connections
   To <server>:
      localhost:29013 <OV Core ID> BBC 12.01.020; ovbbccb 12.01.020
```

```
      localhost:46096 BBC 12.01.020; 18

      localhost:46997 <OV Core ID> BBC 12.01.020; <certificate_server> 00.00.000

OpenView HTTP Communication Reverse Channel Connections Opened from <server>:

<http-proxy>:9090 BBC 12.02.003; ovbbcrcp 12.02.003 23 Sep 2016 15:13:09 GMT 572 ms
```

3. Verifying the connection to the RCP

```
[root@ip-rcp-node]# ovbbcrcp -status

Status: OK

(Namespace, Port, Bind Address, Open Sockets)

   bbc.rcp 9090 ANY 1

Admin Reverse Channel Connections Accepted

   ip-rcp-node.ap-south-1.compute.internal:383 b8e025ca-dd79-758c-1eef-f96a5c11c719
BBC 12.02.003; ovbbccb 12.02.003

   <server>:383 <OV Core ID> BBC 12.01.020; ovbbccb 12.01.020

Admin Reverse Channel Connections Opened

Normal Connections

Incoming

localhost:34424 b8e025ca-dd79-758c-1eef-f96a5c11c719 BBC 12.02.003; ovbbcrcp
12.02.003

Outgoing

Queued CONNECT connections

+-----------------+----------------+

| Source Address  | Target Address

+-----------------+----------------+

HTTP Tunnelled Connections

+----------------+--------------------+----------------+

| Source Address | Destination Address | Target Address |

+----------------+--------------------+----------------+
```

4. Verifying the OV Core IDs for agent

The problem that causes communication between OVO management server and agent to fail is a null OV Core ID for the agent system in the OVO management server database. This null OV Core ID occurs when agent is installed manually or a node is added to the OVO Node Bank although it is

already configured. If the OV Core ID is all zeroes (000...), you must update the OV Core ID in the OVO management server database using the following command:

```
/opt/OV/bin/OpC/utils/opcnode -chg_id node_name=myrcp.mydomain.com id="mycoreid"
```

5. Verifying the status of installed certificates on agent

a. Check bbcutil –ping status

```
bbcutil -ping <management server>

<management server>: status=eServiceOK coreID=<OV Core ID>

bbcV=12.01.020 appN=ovbbccb appV=12.01.020 conn=8 time=3910 ms

bbcutil -ping https://<management server>

https://<management server>: status=eServiceOK  coreID=<OV Core ID>

bbcV=12.01.020 appN=ovbbccb appV=12.01.020 conn=7 time=3265 ms
```

b. Run opcactivate on node

```
/opt/OV/bin/OpC/install/opcactivate -srv <management server> -cert_srv <management
server>
```

c. Grant certificates from the server

```
ovcm -grant e7a130c6-2490-758d-0ea8-d1760965703b -host ec2-52-66-67-56.ap-south-
1.compute.amazonaws.com.
```

6. Policy deployment and message verification

a. Verify policy deployment

```
"/opt/OV/bin/OpC/utils/opcnode" -assign_pol pol_name="opcmsg(1|3)" pol_type=Open_
Message_Interface node_name=ec2-52-66-67-56.ap-south-1.compute.amazonaws.com net_
type=NETWORK_IP

"/opt/OV/bin/OpC/opcragt" -distrib -force ec2-52-66-67-56.apsouth-
1.compute.amazonaws.com
```

b. Verify message to the server

```
opcmsg a=a o=o msg_text=Hello
```

7. Adding Amazon Linux node to Operations Manager i (OMi)

To avoid duplication of Amazon Linux node entries with public IP and private IP in OMi, set the following XPL configuration:

```
set xpl.net:LOCAL_NODE_NAME=<public hostname of agent instance>
```

Or

You can also set the following configuration variable in the profile file during installation:

1. Create an agent profile `agent_profile.ini` with the following content:

   `set xpl.net:LOCAL_NODE_NAME=<public hostname of agent instance>`

2. Run the installation script

   On Windows: `cscript oainstall.vbs -i -a -agent_profile agent_profile.ini`

   On Linux: `./oainstall.sh -i -a -agent_profile agent_profile.ini`

8. Verifying connection with Operations Manager i (OMi)

a. Set the proxy configuration variable and restart the process on OMi server using the following command:

On Windows: `c:/hpbsm/opr/support/opr-support-utils -restart mercuryAS`

On Linux: `/opt/HP/BSM/opr/support/opr-support-utils.sh -restart mercuryAS`

b. Once the nodes are added to OMi, verify the communication from the server using the following command:

On Windows: `c:\hpbsm\opr\bin\opr-agt -user admin -pw admin -status -nl <public hostname of agent instance>`

On Linux: `/opt/HP/BSM/opr/bin/opr-agt -user admin -pw admin -status -nl <public hostname of agent instance>`

Chapter 23: Configuring Certificates for Operations Agent and Infrastructure SPIs

Certificates must be installed on all managed nodes to facilitate network communication using the Secure Socket Layer (SSL) protocol with encryption. Certificates enable the nodes to communicate securely with the management server and other nodes.

The management server issues certificates to nodes and acts as the certificate authority. Each managed node needs the following certificates from the management server:

A unique node certificate. The node can identify itself to its management server and other nodes by sending them its node certificate.

A copy of the management server's trusted certificate. A node only allows communication from a management server if it has the trusted certificate for that management server.

In an environment with multiple management servers, a copy of the trusted certificates for all other management servers must be present on the node.

To enable the nodes to communicate securely in a managed environment by using certificates, you must install certificates after you install the agent on the nodes.

Requesting Certificates Automatically

When you deploy the agent to a node from management server, the node requests certificates automatically from the management server. The node encrypts the certificate request with a key.

The management server then grants the certificate request. You can configure this to take place automatically. After granting the request, the management server sends the certificates to the node. If the management server denies the certificate request, you can send another request by running the following command on the managed node:

```
ovcert -certreq
```

After the management server grants the certificate request, run the following command on agent nodes that reside in high availability clusters:

```
ovc -restart ovconfd
```

In a highly secure environment, you can disable automatic certificate requests by setting the certificate deployment type to manual. You then must request the certificates with installation key or deploy the certificates manually.

Requesting Certificates with an Installation Key

To encrypt certificate requests, you can use installation keys. You can generate an installation key on the management server, and then transfer it to the node.

Before you request certificates with an installation key, make sure that the Operations Agent is running on the node. The agent sends a certificate request at the time of start. If you then request a certificate with an installation key, the new certificate request overwrites the original certificate request on the management server. You can suppress the first certificate request by setting the parameter CERTIFICATE_DEPLOYMENT_TYPE to manual in the sec.cm.client namespace by using the agent installation defaults in the profile file or by using the ovconfchg utility. For more information on the profile file, see Installing Operations Agent using Profile File.

To request certificates with an installation key:

1. Log on to the management server as an administrator.
2. Open a command prompt (shell).
3. Run the following command:

   From OM for Windows

   `ovowcsacm -genInstKey [-file <file_name>] [-pass <password>]`

   From OM for UNIX/Linux

   `opccsacm -genInstKey [-file <file_name>] [-pass <password>]`

   From OMi

   `ovcm -genInstKey -file <file_name> [-pass <password>]`

   In this instance:

   `<file_name>:` The name of the installation key file.

   `<password>:` You need this password when you later request the certificates from the node. You can omit this option.

   The command generates an installation key.

> **Note:** Specify the complete path with `<file_name>`; otherwise, the certificate is stored in the current working directory. If you do not specify the `-file` option, the certificate is stored in `<data_dir>\shared\server\certificates`.

4. Securely transfer the generated file to the node. The installation key is valid for any node.
5. Log on to the node with the account used to install the node.
6. Open a command prompt (shell).
7. On UNIX/Linux nodes, make sure that the `PATH` variable contains the path to the `<install_dir>/bin` directory.
8. Run the following command:

   ```
   ovcert -certreq -instkey <file_name>
   ```

The management server must grant the request. You can configure this to take place automatically or manually. After that, the management server sends the certificates to the node.

On agent nodes that reside in high availability clusters, run the following command:

```
ovc -restart ovconfd
```

Deploying Certificates Manually

The node can automatically send certificate requests to the management server. If you want to install the certificates on the node manually, you can set the `CERTIFICATE_DEPLOYMENT_TYPE` variable (in the `sec.cm.client` namespace) on the node to `MANUAL`.

To deploy certificates manually:

1. Log on to the management server as an administrator.
2. Open a command prompt (shell).
3. Make sure the node is added to the list of managed nodes.
4. Run the following command:

   On OM for Windows

   ```
   ovowcsacm -issue -name <node_name> [-file <file_name>] [-coreid <OvCoreId>] [-pass <password>]
   ```

   On OM for UNIX

```
opccsacm -issue -file <file_name> [-pass <password>] -name <node_name> [-coreid
<OvCoreId>]
```

> **Note:** Specify the complete path with `<file_name>`; otherwise, the certificate is stored in the current working directory. If you do not specify the `-file` option, the certificate is stored in `<data_dir>\shared\server\certificates`.

On OMi

```
ovcm -issue -file <file_name> [-pass <password>] -name <node_name> [-coreid
<OvCoreId>]
```

In this instance,

`<node_name>`: FQDN or IP address of the node.

`<OvCoreId>`: The core ID of the node. To retrieve the core ID of the node where the agent is already installed, perform the following step on the management server:

On OM for UNIX/Linux

Run the following command:

```
opcnode -list_id node_list=<node_name>
```

On OM for Windows

In the console tree, right-click the node, and then click **Properties**. The node properties dialog box opens. In the node properties dialog box, go to the General tab, click **Advanced Configuration**. The Advanced Configuration dialog box opens, which shows the core ID for the node.

OMi

Open the **OMi Deployment with Operations Agent** view, search the CI with label **Operations Agent on <*node*>**, the name property of this CI contains the core ID for the node.

<file_name>: The name of the certificate file generated by the command. If you do not specify this option, the command creates a file into the following directory with the default name *<node_name>-<OvCoreId>*.**p12**:

On OM for UNIX/Linux

```
/var/opt/OV/temp/OpC/certificates
```

On OM for Windows

```
%OvShareDir%server\certificates
```

5. Securely transfer the generated file to the node. The installation key is valid for any node.

6. Install the agent on the node if not already installed. Use a profile file-based installation and set the CERTIFICATE_DEPLOYMENT_TYPE variable to `manual`. For more information on the profile file, see Installing Operations Agent using Profile File. Also, use the same `OvCoreID` that was generated on the management server (set the CERTIFICATE_SERVER_ID in the `sec.cm.client` namespace to the ID generated on the management server). For more information about preparing a profile file, see Installing Operations Agent using Profile File.
7. Open a command prompt (shell) on the node.
8. If the agent is running on the node, run the following command:

   ```
   ovc -stop
   ```

9. To import the certificates from the generated file, run the following command:

   ```
   ovcert -importcert -file <file_name>
   ```

10. Run the following command on the node:

    ```
    ovc -start
    ```

After importing certificates, run the following command on agent nodes that reside in high availability clusters:

```
ovc -restart ovconfd
```

Restoring the Certificates

If you lose the certificates on a node, you will have to create them again. If you back up the existing certificates into a file, you can restore them in the event of certificate failure. To back up certificates, follow these steps:

1. Log on to the node with the root or administrative privileges.
2. Open a command prompt (shell).
3. Run the following command:

   ```
   ovcm -exportcacert -file <file_name> [-pass <password>]
   ```

   The command backs up the management server certificate in the file specified with the -file option.

4. Run the following command:

   ```
   ovcert -exporttrusted [-ovrg <server>] -file <file_name>
   ```

In this instance, `<server>` is the HA resource group name if the management server is installed in an HA cluster.

The command backs up the management server's trusted certificate in the file specified with the `-file` option.

5. Determine the alias of the node certificate by running the following command:

   ```
   ovcert -list [-ovrg <server>]
   ```

   The alias of the node certificate is the long sequence of characters, which appears under the Certificates section of the output. For example:

   ```
   +-------------------------------------------------+
   | Keystore Content | +-------------------------------------------------
   ------+
   | Certificates: | cdc7b5a2-9dd6-751a-1450-eb556a844b55 (*) | +-----------
   ---------------------------------------------+
   | Trusted Certificates: |
   | CA_cdc7b5a2-9dd6-751a-1450-eb556a844b55 | +---------------------------
   ----------------------------+
   ```

6. Run the following command:

   ```
   ovcert -exportcert -file <file_name> -alias <alias> [-pass <password>]
   ```

   The command backs up the node certificate in the file specified with the -file option.

To restore the certificates on the node, follow these steps:

1. Log on to the node with the root or administrative privileges.
2. Open a command prompt (shell).
3. To restore the management server certificate, run the following command:

   ```
   ovcm -importcacert -file <file_name> [-pass<password>]
   ```

4. To restore the trusted certificate, run the following command:

   ```
   ovcert -importtrusted -file<file_name>
   ```

5. To restore the node certificate, run the following command:

   ```
   ovcert -importcert -file <file_name> [-pass <password>]
   ```

Configuring SSL Certificates for the Agent Install Repository Virtual Appliance

To secure the Agent Install Repository Virtual Appliance with self-signed certificates or certificates signed by CA (Certificate Authority), you must configure the Secure Socket Layer (SSL) certificate.

Create a SSL certificate and copy it on to the Agent Install Repository Virtual Appliance. Configure the SSL certificate on the Lighttpd server.

> **Note:** Lighttpd is a web server component present in Agent Install Repository.

After the Agent Install Repository is configured, install corresponding certificates on the nodes. You can then download the `oarepo.ps1` or `oarepo.sh` scripts for Windows and LINUX systems respectively to install Operations Agent.

Follow the steps:

1. "Creating a Certificate" below
2. "Configuring SSL Certificate on the Lighttpd Server " on page 213
3. "Importing the SSL Certificate on a Node" on page 214

Creating a Certificate

You can either create a self-signed certificate or send a certificate signing request to a Certificate Authority.

Creating a Self-Signed Certificate

Follow the steps:

1. Create a certificate store on the Lighttpd server to save certificates and key files.
2. Log on to a node and then run the command:

```
openssl req -x509 -nodes -days <n> -newkey rsa: <nbits> -keyout <your_domain_
name>.key -out <your_domain_name.>crt
```

In this instance:

Command	Description
days	Specifies the number of days to certify the certificate.
newkey rsa :nbits	Newkey option creates a new certificate request and a new private key. The newkey rsa :nbits option generates an RSA key with the specified size.
keyout	Specifies the file name to write the newly created key.
out	Specifies the output file name.

For example:

```
# openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout primary.key
    -out cert.crt
Generating a 2048 bit RSA private key
.....................................................+++
.....................................................+++
writing new private key to 'primary.key'
-----
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a
DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.

-----

Country Name (2 letter code) [XX]:in
State or Province Name (full name) []:ka
Locality Name (eg, city) [Default City]:bangalore
Organization Name (eg, company) [Default Company Ltd]:HP
Organizational Unit Name (eg, section) []:SM
Common Name (eg, your name or your server's hostname) []:16.184.47.108
```

3. A primary certificate (your_domain_name.crt) and private key (your_domain_name.key) is generated.
4. Use the primary certificate and private key to configure the SSL certificate on the Lighttpd Server.

Sending a Certificate Signing Request

1. Create a certificate store on the Lighttpd server to save certificates and key files.
2. Log on to a node and then run the following command:

   ```
   openssl req -new -key <filename>.pem -out <filename>.csr
   ```

   For example:

   ```
   openssl req -new -key privkey.pem -out cert.csr
   ```

   In this instance:

Command	Description
new	This command generates a new certificate request. It prompts users for the relevant field values and creates a certificate after accepting relevant information.
key	Specifies the file to read the private key.
out	Specifies the output file to output certificates.

3. Send the generated `.csr` file to the CA authority.
4. After you receive the signed certificate from the CA use the Intermediate (CA_issuing.crt), primary certificate (your_domain_name.crt) and private key (your_domain_name.key) to configure SSL certificate on the Lighttpd Server.

Configuring SSL Certificate on the Lighttpd Server

Follow the steps to configure SSL certificate on the Lighttpd server:

1. Copy the Intermediate certificate (`CA_issuing.crt`), primary certificate (`your_domain_name.crt`) and private key (`your_domain_name.key`) to the certificate store.

   > **Note:**
   >
   > A primary certificate (`your_domain_name.crt`) and private key (`your_domain_name.key`) is generated when you create self-signed certificate.

> When you request for a CA certificate, the certificate authority provides you the intermediate (`CA_issuing.crt`), primary certificate (`your_domain_name.crt`) and private key (`your_domain_name.key`).

2. Run the following command to combine the private key file and the primary certificate file into a single `.pem` file:

   ```
   cat <your_domain_name.crt > <your_domain_name.key>> <your_domain_name>.pem
   ```

   For example:

   ```
   cat sitename.crt sitename.key > iwf0041067.pem
   ```

3. Open `lighttpd.conf` file located at `/opt/vmware/etc/lighttpd/lighttpd.conf` and change the following:

   ```
   ssl.pemfile = "/cert_path/ <your_domain_name.pem>"
   ```

   > **Note:** Add the following to the `lighttpd.conf` file only if the certificate is issued by a certificate authority:
   >
   > ```
   > ssl.ca-file = ""/cert_path/CA_issuing.crt"
   > ```

4. Run the following commands to restart Lighttpd server:

   ```
   /etc/init.d/vami-sfcb restart
   ```

   ```
   /etc/init.d/vami-lighttp restart
   ```

Importing the SSL Certificate on a Node

Follow the steps:

On Linux

1. Copy the SSL certificate to a file in the directory `/etc/pki/tls/certs`.
2. Run the following command to compute a hash code for the certificate:

   ```
   openssl x509 -noout -hash -in /etc/pki/tls/certs/<filename.pem>
   ```

3. Use the hash code to create a symbolic link in the `certs` directory. Run the following command to create a symbolic link:

   ```
   ln -s /etc/pki/tls/certs/<filename.pem> /etc/pki/tls/certs/<hash code>
   ```

For example:

1. Copy the SSL certificate to a file - `myserver.pem` in the directory `/etc/pki/tls/certs`.
2. Run the following command to compute a hash code for the certificate:

   ```
   openssl x509 -noout -hash -in /etc/pki/tls/certs/myserver.pem
   ```

   Let us assume the hash code generated is 1a2b3c4d.
3. Use the hash code to create a symbolic link in the `certs` directory. Run the following command to create a symbolic link:

   ```
   ln -s /etc/pki/tls/certs/myserver.pem /etc/pki/tls/certs/1a2b3c4d.0
   ```

> **Note:** If there are other certificates in the `certs` directory that hash to the same hash code (1a2b3c4d.0), then change the hash code to 1a2b3c4d.1 or 1a2b3c4d.2 and the like.

After the certificate is installed, the node is recognized as a trusted machine.

On Windows:

Copy the SSL certificate to the node and then import the certificate to the **Trusted Root Certification Authorities** folder. After the certificate is installed, the node is recognized as a trusted machine.

> **Note:** To verify if the certificate is installed correctly, double-click to open the **Trusted Root Certification Authorities** folder > **Certificate** folder and then check if the certificate is installed.

> **Note:** A signed certificate is valid only if you have the HP public key installed on your system.
>
> Download the HP public key either from
>
> Agent Install Repository Virtual Appliance - https://<IP address of your system>/oarepo/hpPubKey2018.Pub
>
> or from the following link:
>
> https://h20392.www2.hp.com/portal/swdepot/displayProductInfo.do?productNumber=HPLinuxCodeSigning
>
> Copy the HP public key to the following location: `/etc/pki/rpm-gpg/hppubkey2048.pub`

Installing Operations Agent on a Trusted Machine

After you import and install SSL certificate, the node is recognized as a trusted machine. Ensure that you use the option `-sec | -secured` with `oarepo` to allow only secured connection with Agent Install

Repository Virtual Appliance (or standalone Agent Install Repository) to download and install Operations Agent.

Run the following command to install Operations Agent:

```
oarepo -i|-install -s|-server <server url> [-v|-version <version no.>] [-om|-om_
server <OM server name>] <[-unsec|-unsecure]|[-sec|-secure]>
```

On Windows

```
./oarepo.ps1 -i -s <server url> -v <version no.> -sec
```

On Linux

```
./oarepo.sh -i -s <server url> -v <version no.> -sec
```

In this instance:

`<server url>` URL of the Standalone Agent Install Repository or Agent Install Repository Virtual Appliance

`<version no.>` version number of the Operations Agent

`<OM server name>` IP address or host name of the Operations Manager.

For example:

```
oarepo -i -s https://myhostname:5480/ -v 12.01 -sec
```

Chapter 24: Upgrading to Operations Agent version 12.xx from Earlier Versions

With the Operations Agent version 12.00, Metrics Datastore replaces the log file based datastore. The CODA and scope processes (scopeux on UNIX and Linux nodes and scopent on Windows nodes) are consolidated into a single process called **oacore** process. The **oacore** process provides both read and write interface for system performance and custom data.

The old data stored in the CODA database files, SCOPE log files, and DSI log files is retained in read-only mode. You can access old data through utilities such as ovcodautil, extract, or with the reporting tools such as the Performance Manager and the Reporter.

Note:

- Old data from the Operations Agent 11.xx will not be migrated to the Metrics Datastore.
- On a HPUX IA system, when you upgrade from Operations Agent 11.xx to 12.xx, the older database files are backed-up and saved at :

  `/var/opt/OV/tmp/BackUp`

  You cannot access this data with tools like `Extract`, `Utility` or `ovcodautil`.
- On Linux or Windows system, after you upgrade to the Operations Agent 12.xx, you cannot access old logical system data (saved in logfiles) through tools such as **Performance Manager** or **Reporter**.
- After upgrading Operations Agent, custom logging scripts such as `dsilog` must be restarted.
- Configuration files like `reptfile`, `reptall`, and `parm` are retained during an upgrade. Update the configuration files after an upgrade for `extract` to find the metric list for the new metric classes. **For example**: BYCORE, LVOLUME.

During an upgrade to the Operations Agent 12.xx from earlier versions, all existing data from the DSI log files and the Smart Plug-in (SPI) data logged in CODA datastore along with all classes, and metrics are automatically created in the Metrics Datastore.

DSI Datasource

Before upgrading from Operations Agent 11.xx to 12.xx, ensure that the DSI datasource is added to the `datasources file` located at:

On HP-UX/Linux/Solaris:

`var/opt/OV/conf/perf`

On Windows:

`%ovdatadir%\conf\perf`

Run the following command to add the DSI datasource to the datasources file.

`DATASOURCE=<Datasource Name>LOGFILE=<DSI Logfile Path>`

Make sure that logfile name and data source names are same.

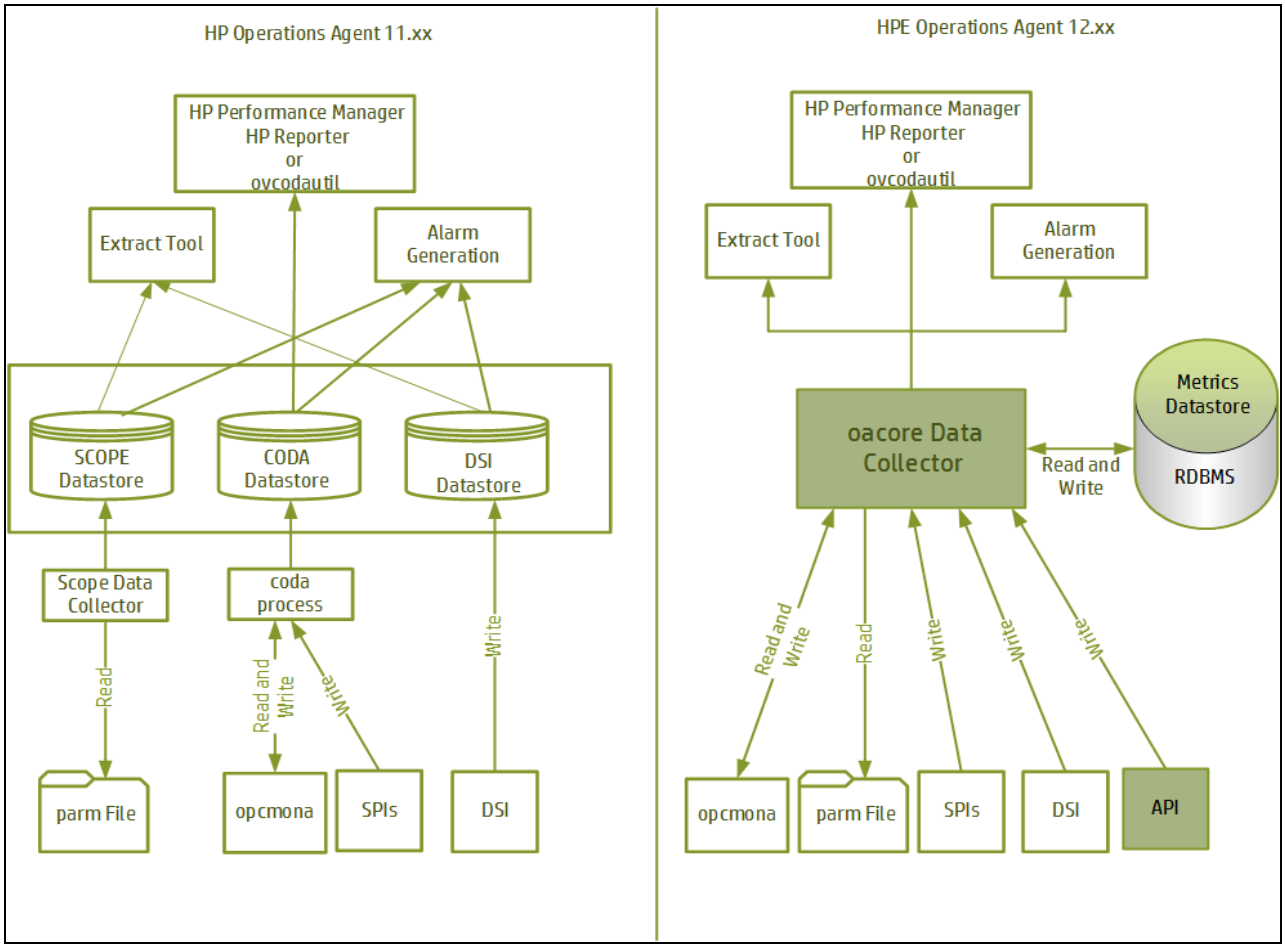
For example:

`DATASOURCE=`**`VMSTAT`** `LOGFILE=/root/dsi/`**`VMSTAT`**

The model to log DSI data is created in the Metrics Datastore only if the DSI datasource is added to the `datasources` file.

> **Note:** When DSI data is logged using the `-timestamp` option in Operations Agent version 11.xx, the timestamp is in UTC format. In Operations Agent version 12.xx, the timestamp of the DSI data logged with the `-timestamp` option is in local time zone format.
>
> After an upgrade from Operations Agent 11.xx to 12.xx, if you export the DSI data using extract, the timestamp of the legacy data (11.xx) will be in UTC format and the timestamp of the new data (12.xx) will be in local time zone format.

Comparing Operations Agent 12.xx with Earlier Versions



Comparing Operations Agent 12.xx with Earlier Versions

What's New	Operations Agent 11.xx	Operations Agent 12.xx
Data collector	The **scope** data collector (scopeux on UNIX and Linux nodes; scopent on Windows nodes) collects and summarizes performance measurements of system-resource utilization and records the data in the log file based datastore.	The **oacore** data collector continuously collects performance and health data across your system and stores the collected data in the Metrics Datastore. **Note:** The CODA and **scope** processes (Scopeux and Scopent) are consolidated

Comparing Operations Agent 12.xx with Earlier Versions, continued

What's New	Operations Agent 11.xx	Operations Agent 12.xx
	The collected data is recorded in the following log files, depending on the data classes specified in the **parm** file: logglob, logappl, logproc, logpcmd, logdev, logtran, logls and logindx,	into a single process called **oacore**. The **oacore** process provides both read and write interface for system performance and custom data.
scope `RUN` file	The **scope** `RUN` file located at `/var/opt/perf/datafiles/RUN` indicates if **scope** is running. This file exists only when **scope** (scopent and scopeux) is running. If **scope** terminates abnormally, then this file is not removed. To restart **scope**, you must delete the **scope** `RUN` file and then start **scope**.	This file is not present. To verify the status of the **oacore** data collector, see Verifying the Status of the oacore Process.
Datastore	Metrics data collected from the monitored system is stored in the log file based datastore.	System performance and health data collected from monitored systems is stored in the Metrics Datastore. The Metrics Datastore is a single Relational Database Management System (RDBMS) based datastore. Metrics data is collected based on the data classes specified in the **parm** file. For each class of data that is logged into the Metrics datastore, a specific database file is created.

Proxy data source	You can host multiple database files from different systems as datasources. Operations Agent 11.xx can simultaneously read from these datasources.	With the Operations Agent version 12.xx, you can host only one datasource at a time in the read only mode.
		
		Follow the steps to host database files from a different system as datasource:
		
		1. Run the following command to stop the **oacore** process:
		
		`ovc -stop oacore`
		
		2. Back up the existing database files
		
		3. Run the following command:
		
		`ovconfchg -ns oacore.dml -set READ_ONLY_MODE True`

Comparing Operations Agent 12.xx with Earlier Versions, continued

What's New	Operations Agent 11.xx	Operations Agent 12.xx

		4. Place the database files from the remote system at `datadir/databases/oa`.
		5. Run the following command to start the **oacore** process:
		`ovc -start oacore`
		Note: When proxy mode is set, data logging to the Metrics Datastore is completely disabled.
		Follow the steps to stop hosting database files from a different system as datasource:
		1. Run the following command to stop the **oacore** process:
		`ovc -stop oacore`
		2. Run the following command:
		`ovconfchg -ns oacore.dml -clear READ_ONLY_MODE`
		3. Run the following command to start the **oacore** process:
		`ovc -start oacore`

`rtmd` Process	The `rtmd` process, provided by the RTM component, helps in establishing a secure communication channel to access real-time data from the node.	The `rtmd` process is replaced with the `hpsensor` process. The XPL configurations for `rtmd` are not backward compatible and will not work after you upgrade from Operations Agent11.xx to 12.xx. The `hpsensor` process provides similar XPL configurations to enforce security (SSL). `hpsensor` process helps in accessing real time performance metrics, through a secure communication channel, locally or remotely.

Performance Collection Component

Comparing Operations Agent 12.xx with Earlier Versions

What's New	Operations Agent 11.xx	Operations Agent 12.xx
Performance Collection Component's graphical user interface	You can use the Performance Collection Component's graphical user interface to perform the following tasks: extract log file data, export log file data, archive log file data, resize of log file, scan a log file, analyze a log file, configure export templates, configure user options, configure collection parameters, configure alarm definitions and check status.	Performance Collection Component's graphical user interface is not supported.

`ovcodautil` is a command-line utility used to display logged metrics	`ovcodautil -ds SCOPE -o Global -m GBL_CPU_TOTAL_UTIL`
	`/opt/OV/bin/ovcodautil [options]`
	`-h`: Displays metric heading
		`ovcodautil -ds SCOPE -o Global -m GBL_CPU_TOTAL_UTIL`
		`/opt/OV/bin/ovcodautil [options]`
		`-header`: Displays metric heading
		`-h`: Displays help message

parm file

Comparing Operations Agent 12.xx with Earlier Versions

What's New	Operations Agent 11.xx	Operations Agent 12.xx
Scope transactions	The **scope** collector itself is instrumented with ARM (Application Response Measurement) API calls to log its own transactions. The scope transactions flag determines whether **scope** transactions will be logged. The default is scopetransactions=on; **scope** will log two transactions: Scope_Get_Process_Metrics and Scope_Get_Global_Metrics. If you do not want these scope transactions to be logged, specify scopetransactions=off. A third transaction, Scope_Log_ Headers, will always be logged; it is not affected by scopetransactions=off.	With the Operations Agent 12.xx, Scope_Get_Process_Metrics and Scope_Get_Global_Metrics are not logged.

Comparing Operations Agent 12.xx with Earlier Versions, continued

What's New	Operations Agent 11.xx	Operations Agent 12.xx
Mainttime	Log files are rolled back if necessary by **scope** only at a specific time each day. The default time can be changed using the `mainttime` parameter. For example, setting mainttime=8:30, causes log file maintenance to be done at 8:30 am each day. We suggest setting mainttime to a time when the system is at its lowest utilization. **Note:** Log file maintenance only rolls out data older than one day, so if a log file such as logproc grows very quickly and reaches its limit within 24 hours, its size can exceed the configured size limit.	`Mainttime` parameter is not supported with the Operations Agent version 12.xx. The *size* parameter is used to set the maximum size (in megabytes) of the database files. Database files that store the default performance metric classes are rolled over when the maximum size specified in the **parm** file is reached. If the size specification in the **parm** file is changed, **oacore** detects it during startup. If size is not specified in the **parm** file, database files are rolled over when the maximum size of 1GB is reached. During a roll over, twenty percent of oldest data is removed from the database files.
Days	The `days` parameter specifies the maximum number of days of data, any raw data log file can store at a given point of time. The value for this parameter must be in the range of 1 to 365. This parameter enables **scope** data collector to maintain log files. During data collection, if the number of days of data in the log file reaches the days specified in the days parameter, data collection will continue till the day specified in the `maintweekday` parameter is met. Once `maintweekday` is reached, the log file will be rolled back automatically at `mainttime`. During the roll back, data collected after days parameter reached its maximum value will be removed from the log file. **Note:** When the log files are rolled back during	*Days* parameter is not supported with the Operations Agent version 12.xx. The *size* parameter is used to set the maximum size (in megabytes) of the database files. Database files that store the default performance metric classes are rolled over when the maximum size specified in the **parm** file is reached. If the size specification in the **parm** file is changed, **oacore** detects it during startup.

Comparing Operations Agent 12.xx with Earlier Versions, continued

What's New	Operations Agent 11.xx	Operations Agent 12.xx
	data collection, if the value specified in the `size` parameter is reached on a specific day before the days parameter, then the `size` parameter overrides the days parameter. For example, if "size global=20" and "days global=40" is used in **parm** file, and if the log files reaches maximum size 20 MB before 40 days of data being logged in log file, then the log file roll back is done based on the size parameter.	If size is not specified in the **parm** file, database files are rolled over when the maximum size of 1GB is reached. During a roll over, 20 percent of oldest data is removed from the database files.
Maintweekday	The `maintweekday` parameter specifies the day of the week when the log file roll back happens if the `days` parameter is met. The roll back will happen at mainttime. For example, if “maintweekday=Mon” is used in **parm** file, the log file roll back is done once the value specified in the `days` parameter is met on “Monday” at `maintime`. It is recommended that the value for `maintweekday` should be set to a day in the week when the system utilization is low. **Note:** The `maintweekday` parameter is an optional parameter. If `maintweekday` parameter is specified in the **parm** file, it should be used along with the days parameter. This parameter will not be considered, if it is not used with days parameter in the parm file. If maintweekday is not specified in the parm file though days parameter is specified, then the default value is “maintweekday=Sun” Example, if “daysglobal=30”, “application=20”, “process=30”, “device=20”, “transaction=10”, “maintweekday=Wed” and if the log file reaches the number of days specified in the days parameter, data collection will continue till the day specified in the `maintweekday`. Once `maintweekday` is reached, log file roll back will happen removing the exceeded number of days of data from the start of the log file. This maintenance will be done at `maintime`.	*Maintweekday* parameter is not Supported with the Operations Agent version 12.xx. The *size* parameter is used to set the maximum size (in megabytes) of the database files. Database files that store the default performance metric classes are rolled over when the maximum size specified in the **parm** file is reached. If the size specification in the **parm** file is changed, **oacore** detects only it during startup. If size is not specified in the **parm** file, database files are rolled over when the maximum size of 1GB is reached. During a roll over, twenty percent of oldest data is removed from the database files.
javaarg	This parameter is valid only on UNIX/Linux.	This parameter is valid on Windows and UNIX platforms.

Comparing Operations Agent 12.xx with Earlier Versions, continued

What's New	Operations Agent 11.xx	Operations Agent 12.xx
proccmd	This parameter is valid only on UNIX/Linux. The `proccmd` parameter enables logging of process commands into Operations Agent datastore. You can specify the length of the process command as a numeric value in this parameter. The maximum numeric value is 1024. By default, the value for this parameter is set to 0 and the logging of process commands is disabled.	This parameter is supported on all platforms. The `proccmd` parameter enables logging of process commands to the datastore. By default, the value of this process is set to 0 and the logging of process commands is disabled. To enable logging of process commands, set the value of this parameter to 1. `proccmd` parameter logging is turned on when the value of this parameter is greater or equal to 1. The length of the process command logged is always 4096 irrespective of the value specified in this parameter.

Utility Program

Comparing Operations Agent 12.xx with Earlier Versions

What's New	Operations Agent 11.xx	Operations Agent 12.xx
Running the `utility` program	Operations Agent 11.xx supports batch mode, interactive mode and command line mode to run the `utility` program.	Operations Agent 12.xx supports only command line mode to run the `utility` program.
Resize command	Use the resize command `-xr` to manage space in your log file set. This is the only command you should use to resize the raw log files to preserve coordination between the files and their internal control structures.	Resize command is not Supported with the Operations Agent version 12.xx. The *size* parameter is used to set the maximum size (in megabytes) of the database files. Database files that store the default performance metric classes are rolled over when the maximum size specified in the **parm** file is reached. If the size specification in the **parm** file is

Comparing Operations Agent 12.xx with Earlier Versions, continued

What's New	Operations Agent 11.xx	Operations Agent 12.xx
		changed, **oacore** detects it during startup. During a roll over, twenty percent of oldest data is removed from the database file that exceeds the size specified in the **parm** file.

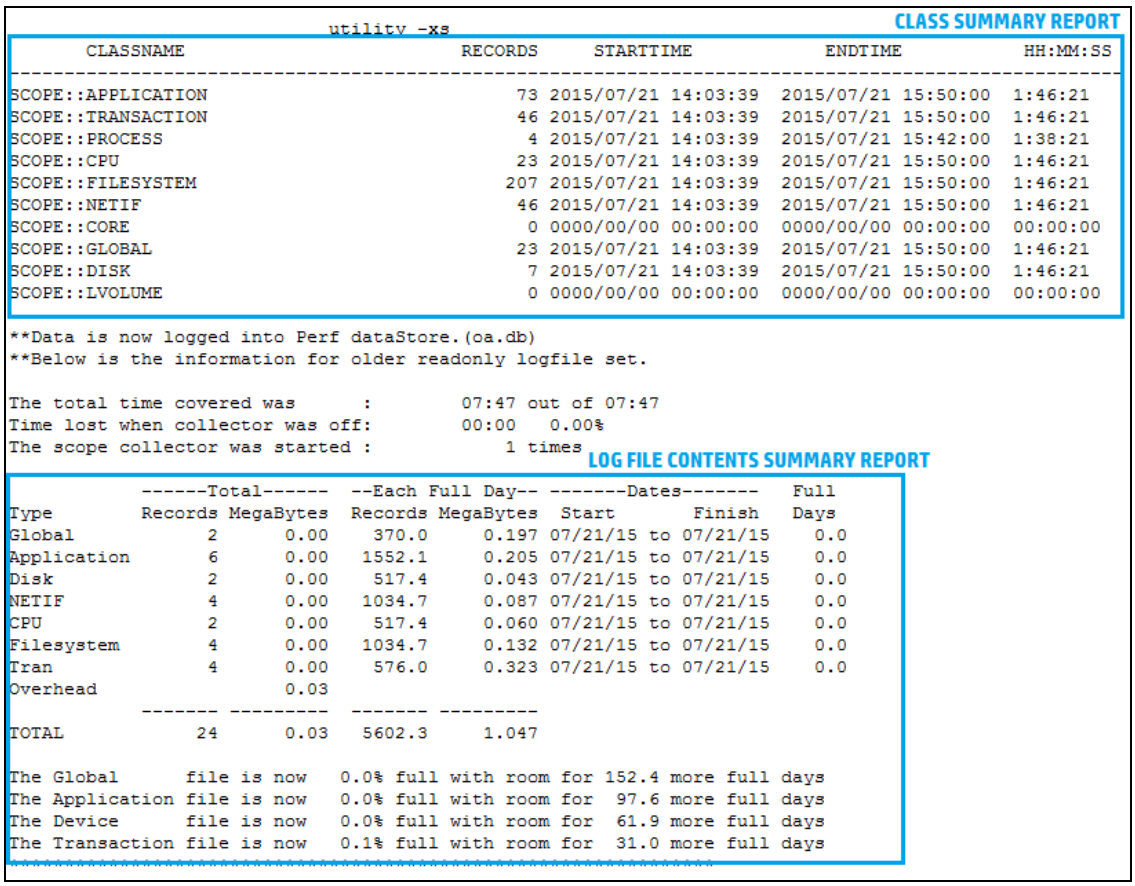
Utility Commands:
`start`
`stop`
`exit`
`guide`
`logfile`
`menu`
`sh`
`show`
	These commands are supported and you can use them as follows:
	• `start` - Specifies the start date and time for analyze or scan function
	• `stop` - Specifies the end date and time for analyze or scan function
	• `exit` - Use the `exit` command to terminate the **utility** program.
	• `guide`- Use the `guide` command to enter guided commands mode. The guided command interface leads you through the various utility commands and prompts you to perform the most common tasks that are available.
	• `logfile` - Use the `logfile` command to open a log file.
	• `menu` - Use the `menu` command to print a list of the available utility commands.
	• `sh` - Use `sh` to enter a shell command without exiting utility.
	• `show` - Use the `show` command to list the names of the files that are open and the status of the utility parameters that can be set.
		These commands are not supported.

Utility Scan Report

If you upgrade from the Operations Agent 11.xx to Operations Agent 12.xx, the utility scan report provides you the information about the disk space utilized by each class of data as well as information about the legacy data stored in the logfile set.

For example:

If you run the command `utiltiy -xs`, both the Class Summary report and the Log File Contents Summary report are generated, as shown in the following figure:



```
                              utility -xs                                                    CLASS SUMMARY REPORT
       CLASSNAME                          RECORDS     STARTTIME            ENDTIME            HH:MM:SS
-------------------------------------------------------------------------------------------------------------
SCOPE::APPLICATION                             73 2015/07/21 14:03:39  2015/07/21 15:50:00  1:46:21
SCOPE::TRANSACTION                             46 2015/07/21 14:03:39  2015/07/21 15:50:00  1:46:21
SCOPE::PROCESS                                  4 2015/07/21 14:03:39  2015/07/21 15:42:00  1:38:21
SCOPE::CPU                                     23 2015/07/21 14:03:39  2015/07/21 15:50:00  1:46:21
SCOPE::FILESYSTEM                             207 2015/07/21 14:03:39  2015/07/21 15:50:00  1:46:21
SCOPE::NETIF                                   46 2015/07/21 14:03:39  2015/07/21 15:50:00  1:46:21
SCOPE::CORE                                     0 0000/00/00 00:00:00  0000/00/00 00:00:00  00:00:00
SCOPE::GLOBAL                                  23 2015/07/21 14:03:39  2015/07/21 15:50:00  1:46:21
SCOPE::DISK                                     7 2015/07/21 14:03:39  2015/07/21 15:50:00  1:46:21
SCOPE::LVOLUME                                  0 0000/00/00 00:00:00  0000/00/00 00:00:00  00:00:00

**Data is now logged into Perf dataStore.(oa.db)
**Below is the information for older readonly logfile set.

The total time covered was      :        07:47 out of 07:47
Time lost when collector was off:        00:00   0.00%
The scope collector was started :            1 times
                                                                LOG FILE CONTENTS SUMMARY REPORT
            ------Total------  --Each Full Day-- -------Dates-------   Full
Type        Records MegaBytes  Records MegaBytes  Start       Finish   Days
Global            2      0.00    370.0     0.197 07/21/15 to 07/21/15    0.0
Application       6      0.00   1552.1     0.205 07/21/15 to 07/21/15    0.0
Disk              2      0.00    517.4     0.043 07/21/15 to 07/21/15    0.0
NETIF             4      0.00   1034.7     0.087 07/21/15 to 07/21/15    0.0
CPU               2      0.00    517.4     0.060 07/21/15 to 07/21/15    0.0
Filesystem        4      0.00   1034.7     0.132 07/21/15 to 07/21/15    0.0
Tran              4      0.00    576.0     0.323 07/21/15 to 07/21/15    0.0
Overhead                 0.03
            ------- ---------  ------- ---------
TOTAL            24      0.03   5602.3     1.047

The Global      file is now   0.0% full with room for 152.4 more full days
The Application file is now   0.0% full with room for  97.6 more full days
The Device      file is now   0.0% full with room for  61.9 more full days
The Transaction file is now   0.1% full with room for  31.0 more full days
*****************************************************************
```

Log File Contents Summary report lists information stored in older readonly logfile set.

For example: If you run the command `utiltiy -xs -D`, the following reports are generated:

Initial **parm** file global information

Operations Agent 11.xx

This report lists the configuration settings of the `parm` file at the time of the earliest global record in the log file. Later global information change notifications are based on the values in this report. If no change notification exists for a particular parameter, it means that the parameter kept its original setting for the duration of the scan.

The following example shows a section of the report listing the contents of the `parm` file.

```
04/01/2014 12:38 System ID="  "
```

```
SCOPE/UX C.05.00.100 COLLECTION INTERVALS: Process = 60, GLOBAL = 300 Seconds,
Log version=D
Configuration: ia64, O/S Linux 2.6.16.21-#1 SMP Monia64 #1 SMP Monia64 CPUs=1
Logging Global(NoDisk)(NoNETIF) Application Process Transaction
        Device = Disk NETIF FileSys CPU records

Thresholds: CPU=10.00%, Disk=n/a, ProcMem=900.0 MB
Nonew=TRUE, Nokilled=TRUE, Shortlived=FALSE (<1 sec)

Javaarg = true

Parms: Buffer Cache Size = 0KB, NPROC = 0

Memory:  Physical = 981 MB, Swap = 1286.4 MB,
Available to users = 853 MB

Application and device data flush frequency = 3600 seconds
01/02/2014 09:22 Data collected on 3 disk devices:
    Disk #0              = "sda"
    Disk #2              = "sdb"
    Disk #3              = "hda"
```

In this instance the date and time listed on the first line corresponds to the *first date and time* in the global log file and indicates when the data collector was started. Data records may have been rolled out of the global log file so the date and time on this report do not necessarily indicate the *first global record*.

Operations Agent and Infrastructure SPIs 12.xx

This report is generated only if you upgrade from Operations Agent 11.xx to 12.05.

Initial **parm** file application definitions

Operations Agent 11.xx

This report lists the name and definition of each application at the time the first application record is listed in the log file. Any application addition or deletion notifications you receive are based on this initial list of applications.

For example:

```
10/29/2013 15:25 Application(1) = "other"
Comment=all processes not in user-defined applications

10/29/2013 15:25 Application(2) = "network"
File=nfs*,biod,automount,amd,*inetd,snmp*,rpc*,llbd,netfmt,portmap
File=rbootd,telnet*,ftp*,*rlogin*,remsh*

File=rcp,nktl*,nvsisr,ttisr,lcsp,gcsp,strmen,strweld,vtdaemon
```

```
File=mib*,trapdest*,*web*,xntpd,yp*

File=hp_unixagt,ntl*,pty*

10/29/2013 15:25 Application(3) = "xwindows"
File=X*,xload,xclock,*term,grmd,softmsg*,vue*,ttsession,pexd
File=dt*,xfs,rpc.ttdbserver,Aserver,gdm*,kdm*

File=gnome*,kde*,soffice.bin,netscape*,mozilla*,realplay

10/29/2013 15:25 Application(4) = "memory_management"
File=swapper,vhand,syncer,pageout,fsflush,kswapd,kreclaimd,bdflush
```

> During the scan, you are notified of applications that were added or deleted. Additions and deletions are determined by comparing the spelling and case of the old application names to the new set of logged application names. No attempt is made to detect a change in the definition of an application. If an application with a new name is detected, it is listed along with its new definition.

Operations Agent 12.xx

The report is generated only if you upgrade from Operations Agent 11.xx to 12.05.

parm file global change notifications

Operations Agent 11.xx

This report is generated any time when a record is found that `scope` started. The following example shows the change notifications that occur when two new disk drives are added to the system.

```
03/13/99 17:30 The number of disk drives changed from 9 to 11
03/13/99 17:30 New disk device scsi-4 = "c4d0s*"
03/13/99 17:30 New disk device scsi-3 = "c3d0s*"
```

Operations Agent 12.xx

This report is not generated.

parm file application changes

Operations Agent 11.xx

To obtain the `parm` File Application Changes report, use the `scan` command with its default `detail on` and have application data in the datastore.

Any change made to the `parm` file requires **scope** to be restarted for logging the change in the datastore. If an application name is found that does not match the last set of applications, an application addition, deletion, or change notification is printed. If the name of an application has not changed, it is not printed. The following example shows that a new application was started:

```
03/13/99 17:30 Application 4 "Accounting_Users_1" was added
User=ted,rebecca,test*,mark,gene
```

> **Note:** Application definitions are not checked for changes. They are listed when an application name is changed, but any change to an existing application(s) definition without an accompanying name change is not detected.

Operations Agent 12.xx

This report is not generated.

`scope` off-time notifications

Operations Agent 11.xx

This report indicates when `scope` was restarted and when the last valid data was logged in the log file before scope was restarted

Operations Agent 12.xx

This report is not generated.

Application-specific summary reports

Operations Agent 11.xx

To obtain this report, use the `scan` command with its default `detail on` and have application data in the log file.

This report helps you to define applications. Use the report to identify applications that are accumulating either too many or too few system resources or those that can be consolidated with other applications. Applications that accumulate too many system resources can be split into multiple applications.

A application-specific summary report is generated whenever the application definitions change. This allows you to view the application definitions before and after the change. A final report is generated for all applications. This report covers only the time since the last report was generated and not the entire time covered by the log file.

For example:

```
 Percent of Total

Application          Records      CPU   Disk  Trans

-------------------- ---------- ------ ------ ------

other                    26258   3.7%   6.6% 100.0%
network                   4649   0.0%   0.4%   0.0%
xwindows                 34571  25.3%   1.9%   0.0%
memory_management         3797   0.0%   0.0%   0.0%
other_user_root          45504  71.0%  91.0%   0.0%

-------------------- ---------- ------ ------ ------

All user applications     77.1%  96.3%  93.4%   0.0%
```

Operations Agent 12.xx

This report is generated only if you upgrade from Operations Agent 11.xx to 12.05.

Process summary report

Operations Agent 11.xx

This report is always printed if process data is scanned. To obtain this report, you must have process data in the log file.

This report helps you to set the *interesting* process thresholds for `scope`.This report lists all the reasons for a process to be considered interesting along with the total number of processes logged that satisfied each condition. The following example shows a process log reason summary report:

```
Process Summary Report:  11/08/2013 10:18    to 05/05/2014 16:55
There were 3427.4 hours of process data
Process records were logged for the following reasons:

Log Reason      Records   Percent  Recs/hr
--------------- -------   -------  -------
New Processes         6      0.1%      0.0
Killed Processes      6      0.1%      0.0
CPU Threshold      6956    100.0%      2.0

NOTE: A process may be logged for more than one reason at a time.
Record counts and percentages will not add up to 100% of the process records.
```

If `detail on` command is issued, this report is generated each time a threshold value is changed so that you can evaluate the effects of that change. Each report covers the period since the last report was

generated. A final report, generated when the scan is finished, covers the time since the last report. If `detail off` command is issued, only one report is generated covering the entire scanned period.

To reduce the amount of process data logged by `scope`, modify the `parm` file's threshold parameters and raise the thresholds of the interest reasons that generate the most process log records. To increase the amount of data logged, lower the thresholds for the area of interest.

Operations Agent 12.xx

This report is not generated.

Scan start and stop report

Operations Agent 11.xx

The Scan start and stop report is printed if any valid data was scanned. It gives the actual date and time when scan was started and stopped.

For example:

```
Scan started on 11/08/2013 10:18
Scan stopped on 05/05/2014 16:55
```

Operations Agent 12.xx

This report is generated only if you upgrade from Operations Agent 11.xx to 12.05.

Application Overall Summary

Operations Agent 11.xx

To obtain this report, you must have application data in the Operations Agent datastore.

This report is an overall indicator of how much system activity is accumulated in user-defined applications, rather than in the other application. If a significant amount of a critical resource is not being captured by user applications, you might consider scanning the process data for processes that can be included in user applications.

For example:

```
Overall, user defined applications account for
88521 out of 114779 records ( 77.1%)
832.2 out of 863.9 CPU hours ( 96.3%)
819.2 out of 877.2 M disk IOs ( 93.4%)
 0.0 out of 0.0 M trans ( 0.0%)
```

Operations Agent 12.xx

The Application Overall Summary report is generated only if you upgrade from HP Operations Agent 11.xx to 12.05. This report contains only legacy data from the CODA database files, `scope` log files and the DSI log files.

Collector coverage summary

Operations Agent 11.xx

This report is printed if any valid global or application data was scanned. It indicates how well `scope` is being used to collect system activity. If the percentage of time `scope` was off is high, you should review your operational procedures for starting and stopping `scope`.

For example:

```
The total time covered was : 172/13:29:27 out of 178/06:37:00
Time lost when collector was off: 5/17:07:33 3.20%
The scope collector was started : 5 times
```

This report will be more complete if global detail data is included in the scan. If only summary data is available, you determine the time `scope` was stopped and started only to the nearest hour. (An appropriate warning message is printed with the report if this is the case.)

Operations Agent 12.xx

The report is generated only if you upgrade from Operations Agent 11.xx to 12.05

> **Note:** The start and stop details of the **oacore** process is listed in the `System.txt` file.

Class Summary and Log file Contents Summary

Operations Agent 11.xx

Class Summary report is not supported with Operations Agent 11.xx.

Log File Contents Summary report is printed *if any* valid data was scanned. It includes the log file space and the dates covered. This summary is helpful when you are resizing your log files with the `resize` command.

For example:

```
           ------Total------  --Each Full Day-- -------Dates-------   Full
Type       Records MegaBytes  Records MegaBytes  Start       Finish   Days
Global        7460      3.97   1440.1     0.766 07/03/2015 to 07/08/2015    5.2
Application   9161      1.21   1768.7     0.233 07/03/2015 to 07/08/2015    5.2
Process      14920      4.45   2880.5     0.858 07/03/2015 to 07/08/2015    5.2
Disk          7451      0.63   1438.5     0.121 07/03/2015 to 07/08/2015    5.2
NETIF        14920      1.25   2880.5     0.242 07/03/2015 to 07/08/2015    5.2
CPU          29840      3.46   5761.1     0.668 07/03/2015 to 07/08/2015    5.2
Filesystem   37300      4.77   7201.3     0.922 07/03/2015 to 07/08/2015    5.2
Tran         14921      8.36   2880.2     1.613 07/03/2015 to 07/08/2015    5.2
Overhead                0.58
           ------- ---------  ------- ---------
TOTAL       135973     28.67  26250.9     5.424

The Global      file is now  13.3% full with room for  33.9 more full days
The Application file is now   6.3% full with room for  80.3 more full days
The Process     file is now  15.0% full with room for  29.7 more full days
The Device      file is now  52.4% full with room for   4.9 more full days
The Transaction file is now  84.2% full with room for   1.0 more full days
```

Operations Agent 12.xx

Class Summary report is generated only on fresh installation of Operations Agent 12.05. It provides you the information about the disk space utilized by each class of data.

If you upgrade from Operations Agent 11.xx to 12.05 both the Class Summary report and the Log File Contents Summary report is generated.

Log file empty space summary

Operations Agent 11.xx

This summary is printed for each log file scanned.

For example:

```
The Global      file is now  73.9% full with room for   0.3 more full days
The Application file is now  78.2% full with room for  21.8 more full days
The Process     file is now   7.0% full with room for  93.0 more full days
The Device      file is now  96.4% full with room for   3.1 more full days
The Transaction file is now  90.4% full with room for   3.0 more full days
```

The amount of room available for more data is calculated based on the following factors:

- The amount of unused space in the file
- The scanned value for the number of megabytes of data being logged on each 24-hour day

If the megabytes-scanned-per-day values appear unrealistically low, they are replaced with default values for this calculation. If you scan an extracted file, you get a single report line because all data types share the same extracted file.

Operations Agent 12.xx

The Log File Empty Space Summary report is generated only if you upgrade from Operations Agent 11.xx to 12.05. This report contains only legacy data from the CODA database files, `scope` log files, and the DSI log files.

Extract

Comparing Operations Agent 12.xx with Earlier Versions

What's New	Operations Agent 11.xx	Operations Agent 12.xx
Running the `extract` program	Operations Agent 11.xx supports interactive mode and command line mode to run the `extract` program.	Operations Agent 12.xx supports only command line mode to run the `extract` program.
Output Files	The `extract` program performs the export function. It reads data from the log files and exports the results to output files in the ASCII, datafile, binary, and WK1 (spreadsheet) format.	The `Extract` program performs the export function. It reads data from datastore and exports the results to output files in the ASCII format.
Host Bus Adapter (HBA)	This metric class is not available with the Operations Agent 11.xx.	A new metric class, Host Bus Adapter (HBA) is added. Use the following commands to export the HBA data: • `-h` - Specifies HBA detail data to be exported. • `-H` - Specifies HBA summary data to be exported.

Extract Commands:
`-s`
`-k`
`-ut`
`-v`
`-we`
`-xt`
`-xw`
`-xm`
`-xy`
	These commands are supported and you can use them as follows:
	• `-s` - Specifies start and end time for specific periods excluding weekends.
	• `-k` - Exports killed processes only.
	• `-ut` - Shows date and time in UNIX format in exported log file data.
	• `-v` - Generates verbose output report formats.
	• `-we` - Specifies days to exclude from export; 1=Sunday.
	• `-xt` - Extracts data in system internal format.
	• `-xw` - Extracts a calendar week's data.
		These commands are not supported.

Comparing Operations Agent 12.xx with Earlier Versions, continued

What's New	Operations Agent 11.xx	Operations Agent 12.xx
	• `-xm` - Extracts a calendar month's data. • `-xy` - Extracts a calendar year's data.	
File options: Append, Purge,New	Are supported	Not Supported
Export options: TODAY, TOMORROW, TODAY-1 TOMORROW-1, Last, First	Are supported	Only Last and First options are supported when used with `-b` and `-e` command options.
Format of exported data: ASCII, DATAFILE, WK1 or SPREADSHEET, BINARY	Are supported	Only ASCII format is supported
Export template files: Repthist, Reptall	Are supported	Only Reptall template file is provided.
Layout : Single, Multiple	Are supported	Only single layout is supported.
Export File Title: !date, !time, !logfile, !class, !collector, !system_id	Are supported	Not Supported

Metrics

Comparing Operations Agent 12.xx with Earlier Versions

What's New	Operations Agent 11.xx	Operations Agent 12.xx

Comparing Operations Agent 12.xx with Earlier Versions, continued

BLANK RECORD_TYPE DATE TIME YEAR DAY DATE_SECONDS INTERVAL STATDATE STATTIME	These metrics are supported.	These metrics are not supported for any class of data.
Transaction tracking metrics	Transaction tracking metrics includes metrics related to all the system transactions performed on the monitored system. Metrics of this class are prefixed with TTBIN_ or TT_.	Transaction tracking metrics includes metrics related to all the system transactions performed on the monitored system. Metrics of this class are prefixed with TT_. The following metrics are not supported: TT_USER_MEASUREMENT_NAME TT_USER_MEASUREMENT_MAX TT_USER_MEASUREMENT_MIN TT_USER_MEASUREMENT_AVG TT_USER_MEASUREMENT_NAME_2 TT_USER_MEASUREMENT_MAX_2 TT_USER_MEASUREMENT_MIN_2 TT_USER_MEASUREMENT_AVG_2 TT_USER_MEASUREMENT_NAME_3 TT_USER_MEASUREMENT_MAX_3 TT_USER_MEASUREMENT_MIN_3 TT_USER_MEASUREMENT_AVG_3 TT_USER_MEASUREMENT_NAME_4 TT_USER_MEASUREMENT_MAX_4 TT_USER_MEASUREMENT_MIN_4

Comparing Operations Agent 12.xx with Earlier Versions, continued

		TT_USER_MEASUREMENT_AVG_4 TTBIN_UPPER_RANGE_10 TTBIN_UPPER_RANGE_1 TTBIN_UPPER_RANGE_2 TTBIN_UPPER_RANGE_3 TTBIN_UPPER_RANGE_4 TTBIN_UPPER_RANGE_5 TTBIN_UPPER_RANGE_6 TTBIN_UPPER_RANGE_7 TTBIN_UPPER_RANGE_8 TTBIN_UPPER_RANGE_9 TTBIN_TRANS_COUNT_10 TTBIN_TRANS_COUNT_1 TTBIN_TRANS_COUNT_2 TTBIN_TRANS_COUNT_3 TTBIN_TRANS_COUNT_4 TTBIN_TRANS_COUNT_5 TTBIN_TRANS_COUNT_6 TTBIN_TRANS_COUNT_7 TTBIN_TRANS_COUNT_8 TTBIN_TRANS_COUNT_9 TT_NUM_BINS
Host Bus Adapter (HBA)	This metric class is not available with the Operations Agent 11.xx.	HBA is a new class of metrics that is logged along with other metric classes. It includes the metrics related to all the host bus adapters running on the monitored system. Metrics of this class are prefixed with BYHBA_. The following metrics are logged: BYHBA_TIME BYHBA_INTERVAL BYHBA_ID

Comparing Operations Agent 12.xx with Earlier Versions, continued

		BYHBA_NAME BYHBA_DEVNAME BYHBA_DEVNO BYHBA_CLASS BYHBA_DRIVER BYHBA_STATE BYHBA_UTIL BYHBA_THROUGHPUT_UTIL BYHBA_IO BYHBA_READ BYHBA_WRITE BYHBA_IO_RATE BYHBA_READ_RATE BYHBA_WRITE_RATE BYHBA_BYTE_RATE BYHBA_READ_BYTE_RATE BYHBA_WRITE_BYTE_RATE BYHBA_REQUEST_QUEUE BYHBA_BUSY_TIME BYHBA_AVG_WAIT_TIME BYHBA_AVG_SERVICE_TIME BYHBA_TYPE
BYLS Metrics	This metrics is supported.	BYLS metrics is not supported on Windows and Linux platforms. Operations Agent 12.xx does not collect BYLS metrics from Xen, KVM, VMware vSphere, Hyper-V and other virtualization domains.
FS_FRAG_SIZE Metric	This metric is supported.	This metric is supported. **Note:** 11.xx data will not be available for this metric on Windows after upgrading to Operations Agent 12.xx.

SNMP Trap Interceptor

Comparing Operations Agent 12.xx with Earlier Versions

What's New	Operations Agent 11.xx	Operations Agent 12.xx
The **opctrapi** process	The **opctrapi** process is configured to intercept SNMPv1 and SNMPv2 traps.	The **opctrapi** process is configured to intercept SNMPv1, SNMPv2, SNMPv3 traps and inform messages.

SNMP_SESSION_MODE variable	The SNMP_SESSION_MODE variable enables you to configure the SNMP trap interceptor to use different mechanisms to bind to the port 162 to listen SNMP traps originating from external sources:
	• To configure the SNMP trap interceptor to bind to the port 162 by using the Net-SNMP API that listens to SNMP traps, run the following command:
	`ovconfchg -ns eaagt set SNMP_SESSION_MODE NETSNMP`
	• On Windows nodes only. To configure the SNMP trap interceptor to use Microsoft Trap Service to listen to SNMP traps, run the following command:
	`ovconfchg -ns eaagt set SNMP_SESSION_MODE WIN_SNMP`
	• On UNIX/Linux nodes only. To configure the SNMP trap interceptor to bind to the port 162 by using the OVSNMP API to listen to SNMP traps, run the following command:
	`ovconfchg -ns eaagt set SNMP_SESSION_MODE NO_TRAPD`
	• To configure the SNMP trap interceptor to bind to the port 162 by using the OVSNMP API to listen to SNMP traps, run the following command:
	`ovconfchg -ns eaagt set SNMP_SESSION_MODE NNM_LIBS`
	• To configure the SNMP trap interceptor to try to subscribe to the PMD daemon of NNM (7.5x) to listen to SNMP traps, run the following command:
		SNMP_SESSION_MODE variable is not supported.
		With Operations Agent 12.xx only NETSNMP mode is supported.

Comparing Operations Agent 12.xx with Earlier Versions, continued

What's New	Operations Agent 11.xx	Operations Agent 12.xx

	`ovconfchg -ns eaagt set SNMP_SESSION_MODE TRY_ BOTH`
	
	• On UNIX/Linux nodes only. To configure the SNMP trap interceptor to subscribe to the PMD daemon of NNM (7.5x) to listen to SNMP traps, run the following command:
	`ovconfchg -ns eaagt set SNMP_SESSION_MODE NNM_PMD`	

Data Source Integration

Comparing Operations Agent 12.xx with Earlier Versions

What's New	Operations Agent 11.xx	Operations Agent 12.xx
Data collection	Data collected by DSI is logged in to log files.	Data collected by DSI is logged into the Metrics Datastore. For each class of data that is logged into the datastore a specific database file is created. **Note:** For DSI to collect custom data, **oacore** should be running. However, to preserve backward compatibility, the command line continues to support the logfile argument. The logfile name is extracted from the path and it is considered as the data source name. `sdlcomp <class specication file> <logfile name>` When you upgrade from the Operations Agent 11.xx to 12.xx, meta data or the format for storing data is copied from the old log files to the Metrics Datastore. **Note:** • The DSI compiler **sdlcomp**

Comparing Operations Agent 12.xx with Earlier Versions, continued

What's New	Operations Agent 11.xx	Operations Agent 12.xx
		will not create files based on the logfile name; instead the logfile name is used as a datasource name. • `sdlcomp -u` option is not supported. To access old data logged in DSI log files, see "DSI Datasource".
Data roll over	`INDEX BY, MAX INDEXES`, and `ROLL BY` settings allow you to specify how to store data and when to discard it. With these settings you designate the blocks of data to store, the maximum number of blocks to store, and the size of the block of data to discard when data reaches its maximum index value.	`INDEX BY, MAX INDEXES`, and `ROLL BY` are not supported. The maximum size of the database files that store the *custom data* is set to 1 GB by default. The data stored in the Metrics Datastore is automatically rolled over when database files reach maximum size. During a rollover, twenty percent of oldest data is removed (oldest database file is deleted permanently).
ACTION	The command mentioned with the ACTION parameter would be executed before the roll over.	This parameter is not supported.
CAPACITY	CAPACITY is the number of records to be stored in the class.	Not supported
sdlutil syntax	`sdlutil logfile_set [option]` In this instance, logfile_set - is the name of a log file set created by compiling a class specification. Variable and Options: • -classes classlist Provides a class description of all classes listed. If none are listed, all are provided. Separate the Items in the classlist with spaces. • -stats classlist	`sdlutil <log file name>[option]` Variable and Options: • -rm all Removes data source, classes, metrics and data from the Metrics Datastore for the specified data source. • -vers Displays version information. • -?

Comparing Operations Agent 12.xx with Earlier Versions, continued

What's New	Operations Agent 11.xx	Operations Agent 12.xx
	Provides complete statistics for all classes listed. If none are listed, all are provided. Separate the Items in the classlist with spaces. • -metrics metriclist Provides metric descriptions for all metrics in the metriclist. If none are listed, all are provided. Separate the Items in the metriclist with spaces. • -id Displays the shared memory segment ID used by the log file. -files lists all the files in the log file set. • -rm all Removes all classes and data as well as their data and shared memory ID from the log file. • -decomp classlist Recreates a class specification from the information in the log file set. The results are written to stdout and should be redirected to a file if you plan to make changes to the file and reuse it. Separate the Items in the classlist with spaces. • -vers Displays version information. • -? Displays the syntax description.	Displays the syntax description.
PRECISION	`PRECISION` identifies the number of decimal places to be used for metric values.	Not supported
Testing the Logging Process with `sdlgendata`	Before you begin logging data, you can test the compiled log file set and the logging process using the `sdlgendata` program. `sdlgendata` discovers the metrics for a class (as described in the class specification) and generates data for each	Not supported

Comparing Operations Agent 12.xx with Earlier Versions, continued

What's New	Operations Agent 11.xx	Operations Agent 12.xx
	metric in a class.	
Datasource Addition	Datasource addition to `datasources file` is configured manually after the compilation of DSI spec file.	Datasource addition to `datasources file` is auto-configured during the compilation of DSI spec file.

Frequently Asked Questions

How do I verify that old data exists after an upgrade?

Follow the steps:

1. After upgrading to the Operations Agent 12.xx, log on with the root privileges.
2. Run the following command:

   ```
   <OvInstallBinDir>ovcodautil -obj
   ```

3. A list consisting of all datasources, classes and metrics is generated.

How do I remove old log files after an upgrade?

Follow the steps to remove old log files:

1. Log on to the Operations Agent 12.xx with the root privileges.
2. Run the following command to stop **oacore** process:

   ```
   ovc -stop oacore
   ```

3. Remove the following files:

   On Windows:

   ```
   <OvDataDir>/conf/perf/datasources
   <OvDataDir>/datafiles/coda*
   <OvDataDir>/datafiles/log*
   ```

   On HP-UX/Linux/Solaris:

   ```
   <OvDataDir>/conf/perf/datasources
   <OvDataDir>/datafiles/coda*
   /var/opt/perf/datafiles/log*
   ```

4. Run the following command to start oacore process:

   ```
   ovc -start oacore
   ```

How to recreate the Metrics Datastore?

Follow the steps to recreate the Metrics Datastore:

1. Run the following command to stop the **oacore** process:

   ```
   ovc -stop oacore
   ```

2. *Optional:* Back up the existing database directory `<OvDataDir>databases/oa/`
3. Run the following command to delete the datastore:

   On Windows:

   ```
   del /F "<OvDataDir>databases\oa\*"
   ```

   ```
   "<OvInstallBinDir>\sqlite3.exe" "%OvDataDir%databases\oa\oa.db"
   <"%OvDataDir%conf\oa\Model\DMLMetaMetaSchema"
   ```

   On HP-UX/Linux/Solaris/AIX:

   ```
   rm -f <OvDataDir>/databases/oa/*
   ```

   ```
   <OvInstallBinDir>/sqlite3 /var/opt/OV/databases/oa/oa.db <
   <OvDataDir>/conf/oa/Model/DMLMetaMetaSchema
   ```

4. Run the following command to set configuration variable UPDATED_MODEL_AVAILABLE to *True.*

   ovconfchg -ns oacore -set UPDATED_MODEL_AVAILABLE TRUE

5. Run the following command to start the **oacore** process:

   ```
   ovc -start oacore
   ```

> **Note:** A custom class (submitted through submit APIs, or DSI) is recreated automatically in subsequent submission.

Chapter 25: Uninstalling the Operations Agent and Infrastructure SPIs

> **Note:** If the node hosts another HPE Software product, make sure to stop all the processes of the product prior to the agent uninstallation. After the agent is completely uninstalled, you can start the processes of the HPE Software product

1. Log on to the node as a root or an administrator.
2. Stop all agent processes by running the following commands:

   ```
   opcagt -stop
   ```

   ```
   ttd -k
   ```

3. Run the following command:

   On Windows 64-bit

   ```
   cscript %OvInstallDir%bin\win64\OpC\install\oainstall.vbs -r -a
   ```

   On Windows x86

   ```
   cscript %OvInstallDir%bin\OpC\install\oainstall.vbs -r -a
   ```

   > **Note:** On a Windows system, if the Operations Agent is in NPU mode, you must provide the NPU password in the command line to remove patches or hotfixes.
   >
   > ```
   > cscript %OvInstallDir%bin\win64\OpC\install\oainstall.vbs -r -a -npu_
   > password <password>
   > ```

   On Linux/HP-UX/Solaris

   ```
   /opt/OV/bin/OpC/install/oainstall.sh -r -a
   ```

   On AIX

   ```
   /usr/lpp/OV/bin/OpC/install/oainstall.sh -r -a
   ```

4. Manually delete the following directories, if there are no other HPE Software products installed on the node:

   On Windows:

   ```
   %OvInstallDir%
   ```

`%OvDataDir%`

On Linux/HP-UX/Solaris

`/opt/OV`

`/var/opt/OV`

`/opt/perf`

`/var/opt/perf`

On AIX:

`/usr/lpp/OV`

`/var/opt/OV`

`/usr/lpp/perf`

`/var/opt/perf`

Alternatively, on a Windows node, you can remove the Operations Agent 12.05 with the Programs and Features (Add/Remove Programs) window by selecting **Operations-agent**.

Installation of the Operations Agent 12.05 adds the Operations-agent program to the Programs and Features window.

Many new items such as E/A Agent, Measurement Interface, Performance Core, and so on are also added to the Programs and Features window. While removing the Operations Agent, choose only **Operations-agent** (and no other entries) in the Programs and Features window.

Removing the Agent with the oacleanall Script

If the installation of the Operations Agent is incomplete or unsuccessful, you must always try reinstallation only after uninstalling the agent. If the uninstallation command (`oainstall.sh -r -a` or `cscript oainstall.vbs -r -a`) fails to remove the agent, use the `oacleanall` script.

The `scripts` directory (directory where ISO is extracted or mounted) includes a set of `oacleanall` scripts—one script for each platform. You must choose the appropriate script to bring the system back to its original state. The `oacleanall` script **removes** the agent from the system completely and irrecoverably. Use this script only to reverse the effect of an incomplete, unsuccessful, or incorrect installation of the Operations Agent.

> **Note:** The oacleanall script is *NOT* recommended to remove the Operations Agent on a system running other HPE Software products.

The following table lists the commands for all supported platforms.

Operating System	Architecture	Command
Windows	x86	`cscript oacleanall_Windows_X86.vbs`
	x64	`cscript oacleanall_Windows_X64.vbs`
Linux	x86	`./oacleanall_Linux2.6_X86.sh`
	x64	`./oacleanall_Linux2.6_X64.sh`
	power (64-bit)	`./oacleanall_Linux2.6_PPC64.sh`
HP-UX	PA-RISC	`./oacleanall_HP-UX_PA32.sh`
	Itanium	`./oacleanall_HP-UX_IA32.sh`
Solaris	SPARC	`./oacleanall_Solaris_SPARC32.sh`
	x86	`./oacleanall_Solaris_X86.sh`
AIX	power (64-bit)	`./oacleanall_AIX_powerpc64.sh`

Chapter 26: Uninstalling the Infrastructure SPIs

Remove the Infrastructure SPI Policies from Managed Nodes

From OM for Windows

1. In the OM console tree, expand the folders **Operations Manager > Policy Management > Policy groups > Infrastructure Management**.
2. Right-click **Infrastructure Management**, and then select **All Tasks > Uninstall from...**.
3. In the Uninstall Policies dialog box, select **All Nodes**, and then click **OK**.

From OM on UNIX/Linux

1. Log on to the OM console as an administrator.
2. Select **All Policy Assignments** from the Browse menu. The All Policy Assignments window opens.
3. Select the policy or policy groups you want to remove from a node or a node group by clicking the Assignment Mode check box against the policies.
4. Select **Delete Assignment...** from the **Choose an Action** box and click **Submit**. A message window appears specifying that the operation cannot be undone.
5. Click **OK**. The selected policy assignment is removed from the nodes.
6. From the OM Administration UI, click **Node Bank** under the **Object Banks** category. The **Node Bank** window opens.
7. Select the nodes or node groups from which you want to remove the policies.
8. Select **Deassign from this Group...** from the Choose an Action box and click **Submit**.

   The policies are removed from the selected nodes.

You must wait until all policies are uninstalled from all nodes. The status of policy uninstallation can be viewed in the Deployment jobs window.

Uninstall the Infrastructure SPIs

> **Note:** To remove the Infrastructure SPIs, make sure you have approximately 240 MB of total disk space and 35 MB of space in the temporary folders available on the management server.

1. Log on to the management server.
2. Go to the following directory:

   On Windows

   ```
   %ovinstalldir%bin\OpC\agtinstall
   ```

   On UNIX/Linux

   ```
   /opt/OV/bin/OpC/agtinstall
   ```

3. Run the following command:

   On Windows

   ```
   cscript oainstall.vbs -r -m -spiconfig
   ```

   On UNIX/Linux

   ```
   ./oainstall.sh -r -m -spiconfig
   ```

> **Note:** In an HA cluster, perform the above steps on the active node first, and then on all nodes in the cluster.

Chapter 27: Troubleshooting

This section helps you troubleshoot problems experienced during the installation and provides you with information to help you avoid problems.

Installation

Installation of the Infrastructure SPIs fails on the OM for Windows management server

The installation of the Infrastructure SPIs with the `cscript oainstall.vbs -i -m` command fails on the OM for Windows management server with the following error:

```
 - VBS message

******* ****  Error Number: 3000 - <date> - VBS message

******* ****  Error Source: CheckRequirements - <date> - VBS message

******* ****  Error Description: - general error checks.: ERRDESC -
Wrong number of arguments or invalid property assignment ; ERRNUM - 450
-<date> - VBS message

*******

- <date> - VBS message

******* !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!! - <date> - VBS message

Action ended <time>: VBSCheckRequirements. Return value 3.

Action ended <time>: INSTALL. Return value 3.

MSI (s) (CC:64) [<time>]: Product: Operations Smart Plug-in for
HA Cluster Infrastructure -- Installation operation failed.

MSI (s) (CC:64) [<time>]: Windows Installer installed the product.
Product Name: Operations Smart Plug-in for HA Cluster Infrastructure.
```

To resolve this issue, go to the `%ovdatadir%log` directory, remove the `oainstall.log` file (or save the file with a different name), and then start the installation process. It is recommended that you take a backup of the `oainstall.log` file before removing the file from the `%ovdatadir%log` directory.

Installation of Operations Agent remotely from OM for UNIX/Linux management server shows error message

When you are installing Operations Agent for the first time, remotely from the OM for UNIX/Linux management server, and select the `force` option, the system displays the following error message:

```
ERROR:   (depl-81) Unable to deploy 'OVO-Agent.xml' to node
'Management_server_name'.
(depl-153) Bundle is not installable on host.
ERROR:    Error occurred during transfer or upgrade of packages.
```

To stop seeing this error message, update the Operations Agent version on the management server to 12.05.

Performance Agent (PA) 5.0 packages on Windows nodes do not get replaced with Operations Agent deployment packages after upgrade

When upgrading the Windows nodes, where PA 5.0 is installed, to Operations Agent 12.05, the older PA packages are not replaced by the new packages. The PA packages still remain on the node. Even after applying the hotfix for the issue, the problem exists and you get the following error message:

Failed to deploy package 'Performance-agent' to node ‘xxxx'. Either the package itself or the requested package version was not found on the management server.
Because of this error, the following package(s) have not been deployed again.
All other packages which are also installed on the node have been successfully re-deployed.

Check the deployment packages and synchronize the Operations Agent packages to version 12.05 to resolve the issue. Perform the following tasks:

- "Deploy the Operations Agent 12.05 package" below
- "View the packages" below
- "Synchronize the deployment packages with the Operations Agent version 12.05 " on the next page

Deploy the Operations Agent 12.05 package

1. Click **Deployment packages** in the console tree.
2. Select the packages to deploy.
3. Right-click the selected packages and select **All Tasks > Deploy on...**
4. Select the managed nodes to which you want to deploy the packages.
5. Click **OK**.

> **Tip:** Alternatively, you can also drag-and-drop the packages to deploy.

View the packages

1. In the console tree, right-click the node where you want to check the installed packages.
2. Click **View > Package Inventory**. A list of installed packages appear in the Details pane. The package inventory must have 12.05 Operations agent package.

   If the older PA version and hotfix details are available in the package inventory, complete the task "Synchronize the deployment packages with the Operations Agent version 12.05 " below.

Synchronize the deployment packages with the Operations Agent version 12.05

1. From the console tree, right-click a node to open the context menu.
2. Select **All Tasks > Synchronize Inventory > packages**.

Installation of deployable packages fail on the OM for Windows server with the Error 103 - PMAD corruption error

Installation of Operations Agent fails if the undo log file is not present for a version (11.xx and 12.05) but the entry is present in the PMAD database. To resolve this issue, you have to clean the PMAD database. Use the **ovpmad_dbcleanup** script to remove the corrupted entries from the PMAD database. **ovpmad_dbcleanup** script is provided in the scripts folder in the media. The **ovpmad_dbcleanup** script is designed only for the OM for Windows server.

Removing Corrupted Entries with ovpmad_dbcleanup Script:

> **Caution:** Backup the PMAD database before you use the **ovpmad_dbcleanup** script.

Run the following command to remove corrupted entries:

```
cscript ovpmad_dbcleanup.vbs -p|-platform <OSname> -a|arch <arch> -v|-version <version>
```

In this instance;

- `<OSname>` specifies the platform-specific packages to be removed from the database and inventory on the management server.

  You can use the following values:

  - HP-UX
  - SOLARIS
  - AIX
  - LINUX

- LINUX_DEB
- WINDOWS

- <version> specifies the active versions of the platform-specific packages to be removed from the database entries on the management server.
- <arch> specifies the architecture for the platform-specific packages to be removed from the database entries on the management server.

For example:

```
cscript ovpmad_dbcleanup.vbs -p Linux -a X64 -v 11.00.044
```

> **Note:** From the PMAD corruption error message you can get the parameters to run the **ovpmad_dbcleanup** script .
>
> **For example:**
>
> ```
> server ERROR[103]: PMAD corruption C:\HPOM\data\shared\\Packages\undo\OA_
> Linux2.6_X86_Ver_11.11.025.log not found
>
> ERROR: PMAD corruption found for LINUX x86 11.11.025
> ```
>
> In this instance; you get the following parameters from the error message:
>
> - Operating System - LINUX
> - Architecture - x86
> - Version 11.11.025.
>
> You can use the parameters to run the **ovpmad_dbcleanup** script as follows:
>
> ```
> cscript ovpmad_dbcleanup.vbs -p Linux -a X86 -v 11.11.025
> ```

Registration of Operations Agent fails on the OM for Windows Server

Registration of Operations Agent fails on the OM for Windows server with the following error:

```
            Description: (PMD97)  Exception has been caught in method
            COvPmdPolicyManager::AddDeploymentPackage2
ERROR:      (NPREG1024) Cannot add deployment package (PD:  'E:\Agent
            Installer\OMWAgent_11_11\packages\WIN\Windows_X64\OVO-Agent.xml')
            to policy management server (PMAD)
Error during registration.
```

The error occurs if a directory or a file in the `%OvDataDir%\shared\Packages\HTTPS` directory has a long file name or path. To resolve this issue, delete the files or directories with long file names and then try to register Operations Agent on the OM for Windows server.

To prevent this issue from occurring, ensure that you do not have many nested folders or files with long file names.

> **Note:** On Windows, the maximum length for a path is defined as 260 characters.

IPV4/IPV6 configuration check fails during the installation of the Operations Agent

During the installation of the Operations Agent, IPV4/IPV6 configuration check fails with the following error:

```
[ FAIL  ] Check if IPV4/IPV6 configuration is fine

          IPV4/IPV6 configuration is not fine. Refer to oainstall.log at
/var/opt/OV/log location.
```

If the IPV4/IPV6 configuration check fails, Operations Agent is successfully installed but the agent processes fail to function.

To resolve this issue:

- Ensure that at least one IP address is configured
- Ensure that IP address and the host name is mapped correctly.

To configure the Operations Agent to use a specific IP address, see Configuring Nodes with Multiple IP Addresses

Remote deployment of Operations Agent 12.05 to a HP-UX IPF32 node fails

Remote deployment of Operations Agent 12.05 from the OM management server to a HP-UX IPF32 node fails as the desired agent binary format for the Operations Agent 12.05 is HP-UX IPF64.

For example:

You will get the following error message if you deploy Operations Agent 12.05 from a OM for Windows management server to a HP-UX IPF32 node:

```
(PMD936) The package 'Operations-agent' does not support the platform of node
'hpvm38'(OS type 'HP-UX', OS version '11.31', agent binary format 'IPF32', and
agent type 'HTTPS').
```

You can install the Operations Agent 12.05 only on HP-UX IA64 systems with the patch level qpkbase package September 2013 or superseding patches.

To prevent the error during deployment, ensure that the HP-UX node where you want to install Operations Agent 12.05 is a HP-UX IA64 systems with the patch level qpkbase package September 2013 or a superseding patch. Run the following command to check the patch level:

```
swlist | grep -i qpkbase
```

Note:

If you use the auto discovery option to add a HP-UX node, HP-UX IA64 node is added as HP-UX IPF32 node. This will cause the remote deployment of Operations Agent 12.05 to fail on such nodes. To prevent this, use the expert mode to manually add a HP-UX IA64 node.

Follow the steps:

1. Log on to the OM management server, select **Nodes -> Configure -> Nodes**
2. In the **Configure Managed Nodes** Window, select **Nodes** -> right click to select **New Node**
3. In the **Base Setting** Window;

   Enter the Fully Qualified Domain Name and Display Name

   Select Use discovery service and then click **Next**
4. In the **OS Setup** Window, select the following:
   - System Type - Itanium Compatible
   - Operating System - HP-UX
   - Bit Length - 64
   - Version - B.11.31

   and then click the **Expert Mode**
5. In the **Node Properties** Window -> Go to the **System** tab -> select **IPF64** from the **Agent Binary Format** drop-down.

Installation of the third-party rpm fails on SLES 11 SP2 after installing Operations Agent

The installation of the third-party RPM package fails after installing Operations Agent on SLES 11 SP2 with the following error:

```
insserv: warning: script '<Script_Name>' missing LSB tags and overrides
insserv: Default-Start undefined, assuming default start runlevel(s) for script
`<Script_Name>'
```

```
insserv: Stopping <Script_Name> depends on OVCtrl and therefore on system
facility

`$all' which cannot be true!

insserv: exiting now without changing boot order!

/sbin/insserv failed, exit code 1
```

Operations Agent 11.12 and above conform to the standard LSB tags. The LSB tags must be present in the init scripts on SLES 11 SP2 and above. During the installation of the third-party RPM package on SLES 11 SP2, the error occurs if the LSB tags are missing in the third-party application init scripts.

Solution:

The application vendors must add proper LSB tags in the third-party application scripts.

(or)

You must upgrade from SUSE Linux Enterprise Server 11 Service Pack 2 to SUSE Linux Enterprise Server 11 Service Pack 3. The Operations Agent 11.13 supports the SUSE Linux Enterprise Server 11 Service Pack 3.

Installation of the Infrastructure SPIs Fails on OM for Solaris Management Server with the Error "XMLin() requires either XML::SAX or XML::Parser"

Installation of the Infrastructure SPIs fails with the following message:

```
XMLin() requires either XML::SAX or XML::Parser at ./scripts/oaproductinstall.pl
line 402
```

Solution:

Ensure that the **libgcc_s.so.1** library is present on Solaris system while registering the Operations Agent on the Management Server.

Remote deployment of Operations Agent 8.60.501 downgrades Operations Agent installed on Windows systems.

Operations Agent 11.xx installed on Windows nodes are downgraded to Operations Agent 6.2 if you deploy Operations Agent 8.60.501 from OM for Windows Management Server.

Remote deployment of Operations Agent 8.60.501 triggers the installation of 8.60 bits with `-force` option. The `-force` option downgrades any available version of Operations Agent to 6.2.

The remote deployment of Operations Agent 8.60.501 from OM for Windows Management Server is not supported.

Creating a zip of the product media without the digital signatures fail

Creating a zip of the product media without the digital signatures from msi packages and vbscripts fails with the following error:

```
E:\scripts\oainstall_Windows_X64.vbs(13623, 9) Microsoft VBScript runtime error:
Permission denied
```

This error occurs only when you use the **removesign** option with the zip media.

If you get this error, copy the ISO media to a read-write location, and then run the following command:

```
cscript oainstall.vbs -createzip -p WIN -removesign
```

After the command is executed, a zip file containing the updated media (without signatures) is available at the location -%TEMP%/OA_ZIP_MEDIA folder.

OMi server does not get Operations Agent install notification if the server is not active during Operations Agent installation or upgrade.

Operations Agent sends install notification to the OMi server when the server is restored. OMi server creates the node for this Operations Agent automatically once the server is restored.

> **Note:** If install notification is required to be sent voluntarily, then follow the steps:
>
> - Create a empty `install_notif` file in the following location:
>
> **On Windows:**
>
> `%OvDataDir%\tmp\OpC`
>
> **On HP-UX/Linux/Solaris:**
>
> `/var/opt/OV/tmp/OpC`
> - Run the following command to restart the message agent:
>
> `ovc –restart opcmsga`

Certificates

Installation of the Operations Agent on Linux machines shows warning messages in the log files associated with rpm signatures

The `oainstall.log` or `oapatch.log` files associated with rpm signatures may show the following warning message during the installation of the Operations Agent on Linux machines:

<Header V3 RSA/SHA1 signature>: NOKEY, <key ID>

For example:

Warning: /var/opt/OV/installation/standalone/HPOvXpl.rpm: Header V3 RSA/SHA1 signature: NOKEY, key ID 5ce2d476

Warning: /var/opt/OV/installation/standalone/HPOvBbc.rpm: Header V3 RSA/SHA1 signature: NOKEY, key ID 5ce2d476

To resolve this issue, ensure that you import the HP public key before installing the Operations agent.

Follow the steps mentioned in the following link to import the HP public key:

https://h20392.www2.hp.com/portal/swdepot/displayProductInfo.do?productNumber=HPLinuxCodeSigning

The warning message does not affect installation of the Operations Agent. If you do not want to import the HP public key, ignore the warning messages appearing in the log files.

Signatures in vbs scripts are slow and causes delay when running some of the Operations Agent commands

Problem: Operations Agent contains digitally signed code. This is to protect the integrity of the software. Sometimes, when you run Operations Agent commands on the managed node, the response is very slow. The signatures in vbs scripts causes delay when running the commands such as `opcagt -type, status` and so on. The delay may occur due to Certificate Revocation List (CRL) check.

Solution 1:

On Windows

1. Log on to the Windows system.
2. From the Start menu, open the **Run** prompt.
3. Type **SecPol.msc**, end then press **Enter**. The **Local Security Policy** editor window opens.
4. Click to open the **Public Key Policies** folder.
5. In the right pane, double-click **Certificate Path Validation Settings**. The **Certificate Path Validation Settings Properties** dialog box opens.
6. Click to select the **Define these policy settings** checkbox.

   > **Note:** Select the timeout values less than the recommended setting. For example, the Default retrieval settings can be reduced from 15-20 seconds to 1 second or to any lower suitable values.

7. Click **OK**.

Solution 2:

Run the following command in the command prompt to set a proxy, which allows CRL validation with external site:

netsh winhttp set proxy localhost "<local>"

(or)

1. In the Run prompt, type **control inetcpl.cpl**, 4 and then press **Enter**. The **Internet Properties** window opens with the **Connections** tab enabled.
2. Click **Lan settings**. The **Local Area Network (LAN) Settings** window opens.
3. Select the **Use a proxy server for your LAN** checkbox.
4. In the **Address** box, type the address of your proxy server.
5. In the **Port** box, type the port number of the port you want to access.
6. Click **OK**.

> **Note:** You can set a proxy which allows CRL validation with external site only if you have environments with Internet access. A real proxy can be set if your environment allows, else set a dummy proxy.

Coexistence of Computesensor Standalone Packages (shippped with vPV) and Operations Agent 12.05

Scenario 1: On a VM, after you install Operations Agent 12.05, installation of HPComputesensor 2.01.004 (or earlier versions) is not supported.

Scenario 2: Installation of Operations Agent 12.05 is not supported on a machine where vPV (Virtualization Performance Viewer) 2.2 (or earlier versions) is installed.

Scenario 3: Computesensor process is in aborted state

On a VM running with HPComputesensor 2.01.004 (or earlier versions) and Operations Agent 12.05, if you uninstall HPComputesensor 2.01.004 (or earlier versions), the functionality of the hpsensor process is affected.

Workaround:

1. Go to the following directory:

   On 64-bit versions of Windows

   `%ovinstalldir%bin\win64\OpC\install`

   On 32-bit versions of Windows

   `%ovinstalldir%bin\OpC\install`

   On Linux/HP-UX/Solaris

   `/opt/OV/bin/OpC/install`

   On AIX

   `/usr/lpp/OV/bin/OpC/install`

2. Run the following command:

   On Windows

   `cscript oainstall.vbs –c –a`

   On Linux/HP-UX/Solaris/AIX

   `./oainstall.sh –c -a`

After Operations Agent 12.05 is reconfigured, the hpsensor process starts running.

> **Note:** Run the following command to check the status of the hpsensor process:
>
> `ovc –status`

Scenario 4: The communication between a VM (where Computesensor is installed) and the vPV machine is disconnected, after Operations Agent 12.05 is installed on the VM.

The issue occurs only with vPV 2.20 and earlier versions. To resolve this issue follow the steps:

1. Install Operations Agent certificate from a trusted CA onto the vPV machine.

   > **Note:** Run the `ovcert -list` command to ensure the certificate is installed.

2. vPV server reads the certificate from the `ovrg` namespace. Follow the steps to import the certificate into `ovrg` namespace:

   a. Log on to the vPV machine and export the certificate to the server resource group:

      - Run the following command to export the certificate to a file:

        `ovcert -exportcert -file -pass`

For example:

```
ovcert -exportcert -file C:\temp\cert -pass 123
```

- Run the following command to export the trusted certificate to a file:

  ```
  ovcert -exporttrusted -file
  ```

  For example:

  ```
  ovcert -exporttrusted -file C:\temp\cert1
  ```

b. Run the following command to import the certificate to the server resource group:

```
ovcert -importcert -file -ovrg server –pass
```

For example:

```
ovcert -importcert -file c:\temp\cert -ovrg server -pass 123
```

> **Note:** To import these certificates, use the same password that you used while exporting the certificate.

c. Run the following command to import the trusted certificate to the server resource group:

```
ovcert -importtrusted -file -ovrg server
```

For example:

```
ovcert -importtrusted -file C:\temp\cert1 -ovrg server
```

Other

On Solaris 10, the `ovc -status` command reports the adminui process as stopped

Although the adminui process with a longer path (which exceeds 80 characters) is running on Solaris 10, the ovc –status command reports the process as stopped. This is because on Solaris 10, the process details beyond 80 characters gets truncated, which is a limitation of Solaris 10.

Send documentation feedback

If you have comments about this document, you can contact the documentation team by email. If an email client is configured on this system, click the link above and an email window opens with the following information in the subject line:

Feedback on Installation Guide (Operations Agent and Infrastructure SPIs 12.05)

Just add your feedback to the email and click send.

If no email client is available, copy the information above to a new message in a web mail client, and send your feedback to docfeedback@hpe.com.

We appreciate your feedback!