

HP Operations Manager

Installation Guide

Software Version: 9.20

for Red Hat Enterprise Linux, Oracle Linux, and CentOS Linux



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Software Release Date: May 2014

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Documentation Updates

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

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

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HPOM Documentation Map

HP Operations Manager (HPOM) provides a set of manuals and online information designed to help you understand the concepts underlying the product and use the product efficiently. This preface describes what information is available and where you can find it.

Electronic Versions of Manuals

All HPOM manuals can be downloaded as Adobe Portable Document Format (PDF) files from the following web site:

<http://support.openview.hp.com/selfsolve/manuals>

Watch this web site regularly for the latest edition of the *HPOM Software Release Notes* document, which is updated every two to three months with the information such as additionally supported operating system versions and latest patches.

A limited selection of the HPOM product manuals is also available in the following web server directories:

- Standard Connection:
`http://<management_server>:8081/ITO_DOC/<lang>/manuals/`
- Secure Connection:
`https://<management_server>:8444/ITO_DOC/<lang>/manuals/`

In these instances, `<management_server>` is a fully qualified hostname of the HP Operations management server and `<lang>` is the system language set on the management server (for example, C for the English environment).

You can also find a selection of the product manuals on the HP Operations management server file system after the processes of installation and initial configuration are completed:

- *HP Operations Manager*:
`/opt/OV/www/htdocs/ito_doc/<lang>/manuals/`
- *HP Event Correlation Services (ECS)*:
`/opt/OV/doc/ecs/<lang>/`

- *HP OVprotect tool:*
/opt/OV/contrib/OpC/OvProtect/
- *HP SiteScope:*
/opt/OV/nonOV/tomcat/b/www/webapps/topaz/amdocs/eng/pdfs/
- *HP Business Availability Center (BAC):*
/opt/OV/install/OpC/
- *Tomcat:*
/opt/OV/nonOV/tomcat/b/www/webapps/docs/architecture/startup/
/opt/OV/nonOV/tomcat/b/www/webapps/docs/architecture/requestProcess/
- *Incident WebServices Perl libraries:*
/opt/OV/contrib/OprWsIncPerl/

HPOM Manuals and Online Information

This section provides an overview of the manuals provided with HPOM on UNIX and HPOM on Linux and the information that is available online (that is, on the HP Operations management server after the processes of installation and initial configuration are completed).

Table 1 lists the most important HPOM manuals, indicates who the target audience is, and briefly describes the scope and contents of the manuals.

Table 1 **HPOM Manuals**

Manual Title	Audience	Description
<i>HPOM Installation Guide for the Management Server</i>	Administrators	Explains how to install HPOM software on the management server and perform the initial configuration. This manual covers the following topics: <ul style="list-style-type: none"> • Software and hardware requirements • Software installation and removal instructions • Configuration defaults

Table 1 HPOM Manuals (Continued)

Manual Title	Audience	Description
<i>HPOM Concepts Guide</i>	Administrators Operators	Provides you with an understanding of HPOM on two levels. As an operator, you learn about the basic structure of HPOM. As an administrator, you gain an insight into the setup and configuration of HPOM in your own environment.
<i>HPOM Administrator's Reference</i>	Administrators	Explains how to install HPOM on managed nodes and helps with HPOM administration and troubleshooting. In addition, it provides information for those who are responsible for installing, configuring, maintaining, and troubleshooting Service Navigator.
<i>HPOM Reporting and Database Schema</i>	Administrators	Provides a detailed description of the HPOM database tables, as well as examples for generating reports from the HPOM database.
<i>HPOM Java GUI Operator's Guide</i>	Administrators Operators	Provides you with a detailed description of the Java GUI and Service Navigator. This manual contains detailed information about general HPOM and Service Navigator concepts and tasks for HPOM operators, as well as reference and troubleshooting information.
<i>HPOM Administration UI Help</i>	Administrators Operators	PDF version of the HPOM Administration UI Online Help.
<i>HPOM Software Release Notes</i>	Administrators	Lists new features and helps you with the following tasks: <ul style="list-style-type: none">• Comparing features of the current software with features of previous versions• Determining system and software compatibility• Solving known problems
<i>HPOM Firewall Concepts and Configuration Guide</i>	Administrators	Describes HPOM firewall concepts and provides instructions for configuring the secure environment.

Table 1 **HPOM Manuals (Continued)**

Manual Title	Audience	Description
<i>HPOM Web Services Integration Guide</i>	Administrators	Describes the HPOM Web Services integration.
<i>HPOM Server Configuration Variables</i>	Administrators	Lists and explains the variables that are available to configure the HP Operations management server.

Table 2 lists available HPOM online information and briefly describes its contents.

Table 2 **HPOM Online Information**

Online Information	Description and Access
<i>HPOM Java GUI Online Information</i>	<p>HTML-based help system for the Java GUI and Service Navigator. This help system contains detailed information about general HPOM and Service Navigator concepts and tasks for HPOM operators, as well as reference and troubleshooting information. Online help for the Java GUI includes the following information:</p> <ul style="list-style-type: none">• Concepts: Introduction to the key concepts and features underlying the product features and functionality.• Tasks: Step-by-step instructions to help you complete important procedures.• Troubleshooting: Tips, tricks, and solutions to common problems you might encounter while using the product. <p>To access Java GUI online help, follow these steps:</p> <ol style="list-style-type: none">1. Configure HPOM to use your preferred browser.2. Start the Java GUI, and then, in the Java GUI menu bar, select Help: Contents.3. In the web browser that opens, choose the topic you want to read about.

Table 2 HPOM Online Information (Continued)

Online Information	Description and Access
<p><i>HPOM Administration UI Online Information</i></p>	<p>HTML-based help system for the Administration UI. This help system provides information about individual pages, menus, and options displayed in the graphical user interface. Menus and menu options differ according to the data context in which you are working. Online help for the Administration UI provides information about the following data contexts:</p> <ul style="list-style-type: none"> • HPOM for UNIX: In this kind of context, you manage all HPOM on UNIX and HPOM on Linux-related objects (for example, nodes, policies, categories, applications, users, message groups, and so on). • Server: In this kind of context, you can add new jobs, manage tasks, and browse details of log files on the local or currently selected server. • Admin: In this kind of context, you configure and manage the administrator users who log on to the Administration UI, the servers that you manage with the Administration UI, and the licenses that the Administration UI requires to function. <p>To access Administration UI online help, follow these steps:</p> <ol style="list-style-type: none"> 1. Start the Administration UI by typing one of the following URLs in a supported web browser: <ul style="list-style-type: none"> • Standard Connection: <code>http://<management_server>:9662</code> • Secure Connection: <code>https://<management_server>:9663</code> <p>In these URLs, <management_server> is a fully qualified hostname of your HP Operations management server.</p> 2. Log on to the Administration UI. The default user name is <code>opc_adm</code> and the default password is <code>OpC_adm</code>. 3. In the Administration UI, click the Help icon in the title bar. In the web browser that opens, choose the topic you want to read about.

Table 2 **HPOM Online Information (Continued)**

Online Information	Description and Access
<i>HPOM manual pages</i>	<p>HPOM manual pages are available not only on the command line but also in HTML format. To access the HPOM manual pages in HTML format, type one of the following URLs in your web browser:</p> <ul style="list-style-type: none">• Standard Connection: <code>http://<management_server>:8081/ITO_MAN</code>• Secure Connection: <code>https://<management_server>:8444/ITO_MAN</code> <p>In these URLs, <management_server> is a fully qualified hostname of your HP Operations management server. Note that the manual pages for the HP Operations agents are installed on each managed node.</p>

1 Installation Requirements for the Management Server

In This Chapter

This chapter describes how to select the correct management server for HP Operations Manager (HPOM).

Check your system parameters before running the HPOM installation script. This chapter helps you to set the system parameters.

HPOM Installation and Upgrade Tasks

Before you start to install HPOM, you must decide whether you want to install a new version of HPOM or perform an upgrade from a previous version of HPOM. Depending on what you want to do, choose among the HPOM installation and upgrade tasks listed in Table 1-1. At this point, keep in mind that you can also install or upgrade HPOM in a cluster environment.

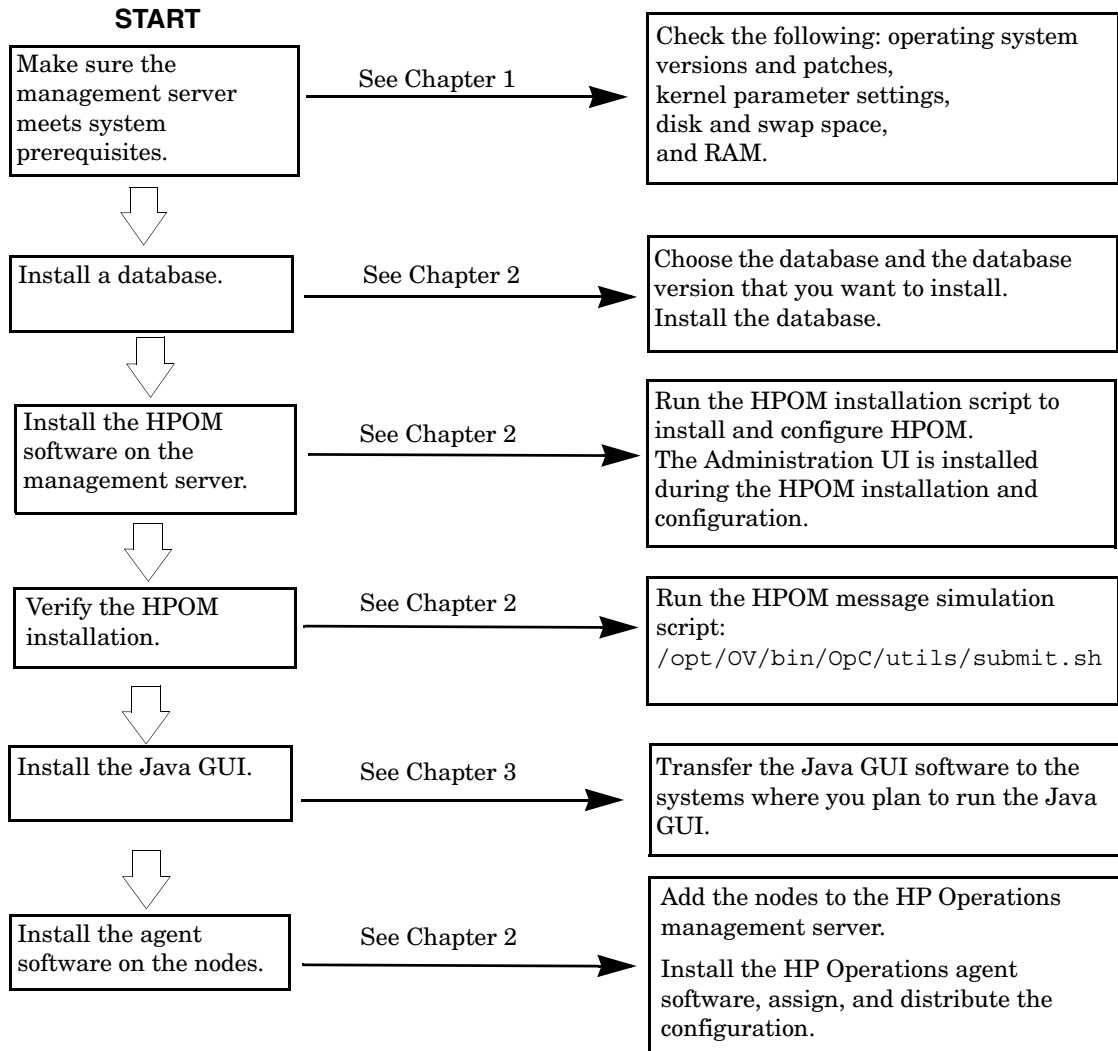
Table 1-1 HPOM Installation and Upgrade Tasks

Task	Requirement	Reference
1. Install HPOM on the management server. NOTE: The Administration UI is installed during the HPOM installation and configuration.	1. Minimum hardware and software requirements for the HP Operations management server must be met.	This chapter. Chapter 2, “Installing and Configuring HPOM on the Management Server.”
2. Install the Java GUI.	1. HPOM must be installed on the management server. 2. Install the Java GUI software on the systems where the Java GUI will be running.	Chapter 3, “Installing the Java GUI.”
3. Install HPOM in a cluster environment.	1. Install HPOM on the first cluster node. 2. Install HPOM on additional cluster nodes.	Chapter 9, “Installing HPOM in an HP ServiceGuard Environment.” Chapter 10, “Installing HPOM in a Red Hat Cluster Suite Environment.” Chapter 11, “Installing HPOM in a Veritas Cluster Environment.”

Table 1-1 HPOM Installation and Upgrade Tasks (Continued)

Task	Requirement	Reference
5. Upgrade HPOM.	<ol style="list-style-type: none">1. Minimum hardware and software requirements for the HP Operations management server must be met.2. Upgrade HPOM.	This chapter. Chapter 8, “Upgrading HPOM to Version 9.20.”
6. Install or update the HP Operations agent software on managed nodes.	<ol style="list-style-type: none">1. HPOM must be installed on the management server.2. Add the nodes to the HP Operations management server.3. Install the HP Operations agent software, and then assign and distribute the configuration.	<i>HPOM Administrator’s Reference.</i>

Figure 1-1 Summary of Standard HPOM Installation Tasks



Verifying Installation Requirements

The HP Operations management server is the controlling element of the entire HPOM system, so you should carefully select the right system to host the management server. Before selecting the system, calculate how many of the following it will have:

- ❑ Concurrent operators
- ❑ Messages processed
- ❑ Monitored nodes

Migrating the management server to a larger system at a later date requires considerable effort, particularly if your configuration is large and includes hundreds or thousands of managed nodes.

Before installing HPOM, see the following topics:

- ❑ “Hardware Requirements” on page 26
- ❑ “Software Requirements” on page 31
- ❑ “Administration UI Requirements” on page 34

Plan your HPOM installation carefully. If you have never used HPOM before, you may want to install and configure it in an isolated test environment before moving it into your production environment. This isolation enables you to gain experience with HPOM and design a configuration that represents a reasonable test of your use of HPOM.

Hardware Requirements

The system you select as the management server must meet the following hardware requirements:

- ❑ x86_64
- ❑ Additional disk space
- ❑ Additional RAM
- ❑ Swap space (see Table 1-3 on page 29)
- ❑ DVD-ROM drive (optional and can be mounted remotely)

NOTE

It is strongly recommended that you use a multiple-CPU system for the HP Operations management server, with the possibility to add additional CPUs, RAM, and disk space to the system at a later time if needed.

You can install an Oracle database or a PostgreSQL database on a dedicated system. For further information, see “Setting Up HPOM with a Remote/Manual Oracle Database” on page 130 or “Setting Up HPOM with a Remote/Manual PostgreSQL Database” on page 145.

Required Disk Space

Before selecting a system to host the management server, review the following questions:

1. How much disk space is available on the system?

The total recommended disk space for the HP Operations management server is approximately 20 GB. Table 1-2 on page 27 shows how much disk space is required for file systems.

Table 1-2

Disk Space Required for File Systems

File System	Required Disk Space (GB)
/etc/opt/OV	2
/var/opt/OV	5
/opt/OV	3.5

Review the disk requirements of any other applications, such as HP Performance Manager, that you want to install on the management server in the future.

If you do not have enough disk space in the file tree, you can use one of the following methods to solve the problem:

- Mount a dedicated volume for the directory.
- Make the directory a symbolic link to a file system with enough disk space.

For details about the HPOM directory structure, see Chapter 5, “Directory Structure on the Management Server.”

2. How fast is the average disk I/O time?

The disk I/O time affects the application start-up time and the swapping activities. It is recommended that you distribute the database, the HPOM binaries, and the runtime data over several disks. To maintain optimum performance, do not locate swap space on the same disks as the HPOM binaries and the database.

Required RAM and Swap Space

The amount of available RAM and swap space determines whether applications can run, and also how fast they can run. The more RAM you make available, the better application performance is achieved. The application performance improves because increased RAM reduces the swapping and paging activities of the system.

Before selecting a system to serve as your management server, review the following question:

1. How much memory (RAM) is installed on the system?

The HP Operations management server requires at least 2 GB of dedicated RAM. In addition, you will need approximately 16–20 MB of RAM, plus 6 MB per 1000 active messages for every HPOM Java GUI session, including Service Navigator.

The actual RAM requirements depend heavily on your production environment and mode of use. The factors that affect the RAM requirements include: the number and frequency of HPOM messages, the number of operators working in parallel, and the number of managed nodes.

Memory consumption of the Java GUI needed on the server and the display station may be approximately computed.

2. Does the system provide enough swap space?

In most cases, you need a total of 4 GB of swap space on the management server system.

NOTE

Use device swap space rather than file system swap space for improved system performance.

Individual requirements are listed in Table 1-3 on page 29.

Table 1-3

Minimum Swap Space Required for HPOM Installation on the Management Server

Product	Required Swap Space (MB)
RHEL, Oracle Linux, or CentOS Linux Operating System	1024
Oracle Database	2048 ^a
HP Operations Manager	1024 ^b
Approximate Total	4096

- a. The value recommended by Oracle is equal to the system physical memory (RAM) or 2 GB, whichever is greater. For the PostgreSQL database, swap space is not required.
- b. This value depends on the number of GUIs running in parallel, and on the number of active and acknowledged messages. For each additional operating Java GUI and Service Navigator, about 16-20 MB of RAM or swap space is required, plus 6 MB per 1000 active messages.

To check your currently available swap space, run the command:

```
/usr/bin/free
```

To achieve the best performance and to avoid a disk access bottleneck, *do not* locate the database and the swap space on the same physical disk.

3. How many HPOM users will work at the same time?

The number of users influences the number of parallel GUIs running on the management server. For each additional operating Java GUI and Service Navigator, about 16-20 MB of RAM or swap space is required, plus 6 MB per 1000 active messages.

Verifying Installation Requirements

4. How many background graphics are integrated into Service Navigator?

Background graphics can also slow down the system by using excessive amounts of RAM.

Reserve enough physical memory to accommodate all the virtual memory needs of HPOM. This extra memory will eliminate the need for process swapping, and will result in the best possible performance. The performance of HPOM can decrease if swapping becomes necessary.

Performance Requirements

The speed with which HPOM processes messages and the Java GUI performance both depend on the available CPU time as well as the overall CPU power. Therefore, consider the demands of other installed applications on CPU time, disk access, and RAM or swap space usage.

NOTE

It is strongly recommended that you use a multiple-CPU system for the management server system, especially if you plan to run multiple Java GUIs.

Because the throughput of LAN packets can affect the management server performance, you *should not* use the management server system for other purposes, such as NFS, NIS (YP), DNS, and so on. However, configuring the HP Operations management server system as a secondary Domain Name Server (DNS) can help to increase the speed of name lookups.

Table 1-4

Processor Requirements

Processor Model	Required CPU
x86-64 compatible	2 GHz+

Intersystem Connection Requirements

The connection between the managed nodes and the HP Operations management server affects the time HPOM needs to install the HPOM software, the time it takes to configure the software on the managed nodes, and the time needed to respond to problems.

Before setting up the connection between the managed nodes and the HP Operations management server, review the following questions:

1. Is the system accessible all the time (at least while HPOM operators are working)?

The management server should be accessible at least while the managed nodes are operating.

If it is *not*, the following inconveniences can occur:

- a. Automatic actions that do not run directly on the local managed node cannot be performed while the management server is down.
- b. When the management server is restarted, the managed nodes forward all locally buffered HPOM messages to the management server. If hundreds or thousands of messages need to be processed, this has a significant effect on the performance of HPOM.

2. Is the system located centrally as regards network connectivity and network speed?

To minimize the HPOM response time, a fast network (LAN) should be available between the management server system and its managed nodes. For example, the management server should not be connected by a serial line or X.25 with all the other systems networked in a LAN.

3. Are the display stations of the HPOM operators and the management server connected by fast lines?

Having fast lines between the management server and the operator workstations is strongly recommended.

Software Requirements

Before you install HPOM, the following software *must* be correctly installed on the management server.

Operating System

Table 1-5 shows on which operating system version the HP Operations management server is supported.

Table 1-5 Supported Operating System Version for the Management Server

Operating System	Platform	Supported Operating System Version
Red Hat Enterprise Linux	x86_64	5.x and 6.x
Oracle Linux ^a	x86_64	6.x
CentOS Linux	x86_64	6.x

a. Both Red Hat Compatible Kernel and Unbreakable Enterprise Kernel are supported.

NOTE

For the most up-to-date list of supported operating system versions, see the support matrix at the following location:

<http://support.openview.hp.com/selfsolve/document/KM323488>

HPOM on Red Hat Enterprise Linux is a 64-bit application. It supports integrations with 64-bit applications on the API level.

Kernel Parameters

Several of the kernel parameters must be increased on the HP Operations management server because the operating system default values are too small. The `ovoinstall` script checks your current settings.

Table 1-6 Minimum Kernel Settings Required for HPOM Installation on the Management Server

Kernel Parameter	Value
<code>kernel.shmall</code>	2097152
<code>kernel.shmmax</code>	536870912 ^a
<code>kernel.shmmni</code>	4096
<code>kernel.sem</code>	250 32000 100 128
<code>fs.file-max</code>	65536
<code>net.ipv4.ip_local_port_range</code>	1024 65000
<code>net.core.rmem_default</code>	4194304
<code>net.core.wmem_default</code>	262144
<code>net.core.rmem_max</code>	4194304
<code>net.core.wmem_max</code>	262144

- a. If you use the PostgreSQL database version 9.1 or 9.2, it is recommended to set this value to 4294967296 or higher.

IMPORTANT

On the HP Operations management server with a high number of RCP nodes, the `ovbbccb` process opens many connections and may therefore run out of the available file descriptors. As a result, the agents start buffering.

To avoid this problem, increase the number of file descriptors to 4096 on the management server. Increase the maximum number of open files by using the `limits.conf` file:

```
tail /etc/security/limits.conf
* soft nofile 4096
* hard nofile 4096
```

Operating System and Environment Patches

The `ovoinstall` script checks the operating system patches that are currently installed on the HP Operations management server.

IMPORTANT

Before you install any of the required operating system patches, read the README file supplied with the patch.

For latest information about the required patches, see the *HPOM Software Release Notes*. This document is available at the following location:

<http://support.openview.hp.com/selfsolve/manuals>

At the time of installation, the documented patches may be superseded. Use the latest patches from the following location:

<http://www.itrc.hp.com>

IMPORTANT

The HP Operations management server was tested with the patch revisions listed either in the latest *HPOM Software Release Notes* or on the <http://www.itrc.hp.com> web site. Patches with higher revisions should also be suitable, but they were not tested.

Administration UI Requirements

The Administration UI is installed during the installation and configuration of HPOM, so make sure that you also perform all the checks described in this section.

IMPORTANT

Make sure that you have at least 1.2 GB of free disk space in the `/tmp` directory. Otherwise, the installation of the Administration UI may fail.

Previous Configuration Value Pack (CVP) Version

An upgrade from CVP to the Administration UI is not supported. Instead, you need to remove the existing CVP software and install the Administration UI after that.

Passwords

Make sure that you have access to the HPOM database user password.

Any database user with read access to the HPOM database objects can be used. Both `opc_op` and `opc_report` users who are created during the HP Operations management server installation fulfill this requirement.

NOTE

Oracle only: Oracle 11g has password aging enabled by default. This means that passwords expire after 6 months.

If the password of the Oracle user that HPOM uses to connect to the database expires, HPOM cannot connect to the database.

For detailed information, see the *HPOM Administrator's Reference*.

HPOM Database Settings

Make sure you verify the database parameters of your HP Operations management server by using the `tnsping` and `lsnrctl status` commands for the Oracle database or checking the `ovdbconf` file for the PostgreSQL database.

Updating the Administration UI When Modifying the Database Path

When the database path is modified, follow these steps:

1. Stop the Administration UI as follows:

```
/opt/OV/OMU/adminUI/adminui stop
```

2. Set the correct path in the `/opt/OV/OMU/adminUI/midas_env.sh` file.

3. Change the URLs appropriately and update the following files with the correct values:

```
/opt/OV/OMU/adminUI/conf/ovoinstall.properties
```

```
/opt/OV/OMU/adminUI/conf/ovoconfig.properties
```

```
/opt/OV/OMU/adminUI/conf/opccfg.properties
```

```
/opt/OV/OMU/adminUI/conf/ovoappl.properties
```

4. Start the Administration UI as follows:

```
/opt/OV/OMU/adminUI/adminui start
```

Web Browser Support

The Administration UI uses a GUI that can be accessed by any standard web browser from the user's workstation.

The following web browsers are supported:

- ❑ Microsoft Internet Explorer 9 or higher

IMPORTANT

Internet Explorer on CITRIX is not supported.

- ❑ Mozilla Firefox 24 or higher
- ❑ Chrome 32 or higher
- ❑ Safari 6 or higher

For the most up-to-date list of supported web browser versions and architectures, see the support matrix at the following location:

<http://support.openview.hp.com/selfsolve/document/KM323488>

HPOM Database Configuration

HPOM uses a database instance to store its configuration data and the Administration UI obtains the HPOM data from that database instance.

IMPORTANT

Make sure to review and verify all connection parameters. The majority of configuration problems appear because of incorrect connection settings (for example, when non-standard ports or incorrect hostnames are used).

The Administration UI attempts to detect database settings by examining the `/etc/opt/OV/share/conf/ovdbconf` file. Keep in mind that some values such as the Oracle listener port are not stored in this file.

Oracle RAC environments only: The correct configuration setup must be performed after the Administration UI is installed.

HA cluster only: If you use the Oracle database that runs as an HA cluster package, provide the virtual cluster hostname of that HA cluster package.

Database Passwords The passwords for the database users are stored in an encrypted form inside the Administration UI configuration files.

If you need to change the passwords after installing the Administration UI, follow these steps:

1. Reconfigure the Administration UI by running the following command:

```
/opt/OV/OMU/adminUI/adminui password -u ovoidb -a -p \  
<new_password>
```

2. Restart the Administration UI by running the following commands:

```
/opt/OV/OMU/adminUI/adminui clean  
/opt/OV/OMU/adminUI/adminui start
```

For more information about configuring passwords later, see the *HPOM Administrator's Reference*.

Supported Agent Platforms

For a list of platforms and operating systems supported on HP Operations agents and the HP Performance Agent support on the managed nodes, see the *HPOM Software Release Notes*, which is available at the following location:

<http://support.openview.hp.com/selfsolve/manuals>

NOTE

HP Operations agents and the HP Performance Agent can also be installed on Storage Area Network (SAN) attached disks.

2

Installing and Configuring HPOM on the Management Server

In This Chapter

This chapter explains how to do the following:

- ❑ Install and configure HPOM for the first time on the management server.
- ❑ Set up a database for use with HPOM.
- ❑ Start HPOM and verify the installation.
- ❑ Create additional database users.
- ❑ Customize the Administration UI.
- ❑ Troubleshoot the Administration UI.
- ❑ Reconfigure HPOM.

NOTE

The HP Operations agent software is automatically installed during the installation of the HPOM software on the HP Operations management server.

Before Installing and Configuring HPOM

Before you install and configure HPOM, make sure that your system meets the following prerequisites:

- ❑ The Red Hat Enterprise Linux, Oracle Linux, or CentOS Linux operating system must be installed.
- ❑ Kernel parameters on the management server must be adapted.
For more information, see “Verifying Installation Requirements” on page 26.
- ❑ Red Hat Enterprise Linux, Oracle Linux, or CentOS Linux operating system patches must be installed.
- ❑ Sufficient disk space must be available in the right partitions of the file system.
For more information, see “Required Disk Space” on page 27.
- ❑ `xinetd` must be installed.
- ❑ Shared memory subsystem must be available. You can check whether this subsystem is available by mounting the `tmpfs` file system (`/dev/shm`).
- ❑ Input and output data for multiple language support must be configured if you use any non-ASCII character.
For more information, see “Configuring Input/Output for Multiple Language Support.”

Configuring Input/Output for Multiple Language Support

If you consider using any non-ASCII character, you must configure Input/Output for multiple language support to allow the use of UTF-8. However, this configuration is recommended even if you use only English characters.

Before Installing and Configuring HPOM

To configure Input/Output for multiple language support, follow these steps:

1. Depending on the language, set locales on the management server:

- For American English, the following variables can be used:

```
export LANG=en_US.UTF-8
export LC_ALL=en_US.UTF-8
```

- For other languages, make sure that you do the following:

— Choose a locale that uses the UTF-8 character set.

For example:

```
en_US.UTF-8
es_ES.UTF-8
ja_JP.UTF-8
sl_SI.UTF-8
```

— Ensure that this locale setting is applied system-wide. To do this, you can set the LANG and LC_ALL variables in the root user's .profile file, or edit the system environment files (for example, /etc/environment).

NOTE

The LANG variable determines the language of HPOM messages, templates, and uploaded configuration. If some of the contents are not available for the chosen locale, HPOM defaults to the English contents instead.

2. Set locales on the client system:

- Windows XP:

Navigate to the Regional and Language Options in the Control Panel.

Click the **Advanced** tab, and then select the **65001 (UTF-8)** check box in Code page conversion tables.

NOTE

For a detailed procedure, see the Microsoft documentation.

- Linux:

Make sure that you set locales to a UTF-8 version in the same way as for the management server. To find the appropriate UTF-8 suffix, use `locale -a`.

3. Set up the console or the terminal program to accept UTF-8.

Use only fonts that conform to the Unicode standard (for example, Lucida Console).

Installing and Configuring HPOM

Before installing and configuring HPOM, make sure that your system meets all the prerequisites detailed in Chapter 1, “Installation Requirements for the Management Server.”

To install and configure HPOM, complete these tasks:

- ❑ Task 1: “Installing an Oracle Database” on page 46 or “Installing a PostgreSQL Database” on page 58

IMPORTANT

Before installing a database, you should consider which database you want to use with HPOM, namely an Oracle database or a PostgreSQL database.

Keep in mind that installing the HP Operations management server in a cluster environment is not supported when using a PostgreSQL database.

-
- ❑ Task 2: “Installing and Configuring the HPOM Software on the Management Server System” on page 62

IMPORTANT

Keep in mind the following changes introduced with HPOM 9.20:

- HP Operations agent software is no longer shipped together with HPOM. To obtain the supported agent version, request the agent media 11.1x from HP.
- Standalone installation of the Administration UI is no longer supported. The Administration UI is installed and configured during the installation and configuration of HPOM. Attempting to install the Administration UI by using `install.bin` will result either in the failure of the Administration UI installation or the Administration UI being corrupted.

-
- ❑ Task 3: “Starting HPOM and Verifying the Installation” on page 82

NOTE

The Red Hat Enterprise Linux installation procedure provides an option to enable a basic firewall. The default settings of this firewall block all HPOM communications to other systems. If you choose to enable this firewall, you must configure it to allow HPOM communications. For detailed information about the ports that you need to open, see the *HP Operations Manager Firewall Concepts and Configuration Guide*.

Installing an Oracle Database

To use an Oracle database with HPOM, install one of the following:

- ❑ Oracle Database 11g Release 1 Enterprise Edition, Standard Edition, or Standard Edition One (with the 11.1.0.7 patch set)
- ❑ Oracle Database 11g Release 2 Enterprise Edition, Standard Edition, or Standard Edition One (versions 11.2.0.1–11.2.0.4)

For the latest Oracle system requirements (for example, system patches), more detailed instructions than those provided in this section, or non-standard installations, see the documentation supplied with the Oracle Database product.

For information about the support of later versions of Oracle, see the latest edition of the *HPOM Software Release Notes*.

NOTE

Oracle 11g is a product of the Oracle Corporation and cannot be purchased directly from Hewlett-Packard.

Required Oracle Products

A stand-alone HPOM system has the database and all management server processes, including user interface processes, running on the same system. However, if the database is installed on a different server than the HP Operations management server, you must additionally install the Oracle products on the management server as described in “Setting Up HPOM with a Remote/Manual Oracle Database” on page 130. These products enable remote access to the Oracle database.

Using an Existing Oracle Database

HPOM can be installed and configured by using an existing database, but it requires its own database instance.

If you have the existing Oracle database and want to verify which Oracle products are installed, use the Oracle Universal Installer to view the installed Oracle products:

1. Switch to the `oracle` user:

```
su - oracle
```

2. Run the Oracle Universal Installer:

```
$ORACLE_HOME/oui/bin/runInstaller
```

3. In the Oracle Universal Installer Welcome window, click `Installed Products...` to view the installed Oracle products.

If you want to use the existing Oracle database, do the following:

1. See the Oracle product documentation to make sure that the database is compatible with Oracle database version 11g (11.1 or 11.2).
2. Make sure Oracle environment variables are set as described in “Before Installing an Oracle Database” on page 47.
3. Continue with “Installing and Configuring the HPOM Software on the Management Server System” on page 62.

Before Installing an Oracle Database

Before you install an Oracle database on the management server, follow these steps:

1. Make sure that your system meets the hardware and software requirements listed in Chapter 1, “Installation Requirements for the Management Server.”

NOTE

Dynamically linked Oracle environments are not supported.

2. Run User Manager as the `root` user, and then create the `oracle` user with the following attributes:
 - a. Create UNIX groups named `oinstall`, `dba`, and `oper` (the ID of each group should be greater than 100).

- b. Create a UNIX user named `oracle` (the user ID should be greater than 100).

IMPORTANT

In a cluster environment, you must use the same IDs on all cluster nodes. Otherwise, the startup of the HA resource group on the second node fails.

- c. Make the `oracle` user a member of `oinstall` as the primary group and `dba` and `oper` as the secondary groups.
 - d. As the home directory of the `oracle` user, use the following:
`/home/oracle`
 - e. Make sure that a POSIX shell (for example, `sh`) is assigned as the default shell for the `oracle` user.
3. As the `root` user, set `umask` to allow users to access Oracle binaries by running the following command:

```
umask 022
```

4. Create the directories required by the Oracle installation, and then change the ownership and set correct permissions as follows:
 - a. Create the `ORACLE_HOME` directory by running the following command:

```
mkdir -p /opt/oracle/product/<version>
```

In this instance, `<version>` is the Oracle database version, 11.1.0 or 11.2.0.

NOTE

`/opt/oracle/product/<version>` is the value recommended by HPOM. This value meets the Optimal Flexible Architecture (OFA) directory structure recommended by Oracle.

You can also choose a different directory, but you must use it consistently in all subsequent steps.

- b. Create a base directory for the Oracle installation files by running the following command:

```
mkdir -p /opt/oracle/oraInventory
```

NOTE

You can also choose a different directory, but you must use it consistently in all subsequent steps.

- c. Change the ownership and set correct permissions by running the following commands:

```
chown -R oracle:oinstall /opt/oracle/oraInventory
chmod -R 770 /opt/oracle/oraInventory
```

5. Change the ownership of the directories to `oracle:oinstall` by typing the following command:

```
chown -R oracle:oinstall /opt/oracle \
/opt/oracle/product /opt/oracle/product/<version>
```

In this instance, `<version>` is the Oracle database version, 11.1.0 or 11.2.0.

6. Set the following Oracle environment variables in `/home/oracle/.profile` or `/home/oracle/.bash_profile` of the oracle user:

- `ORACLE_BASE=/opt/oracle`
`export ORACLE_BASE`

This variable determines the location of the Oracle installation. The default recommended setting is `/opt/oracle`, but you can use a different installation prefix if needed.

- `ORACLE_HOME=$ORACLE_BASE/product/<version>`
`export ORACLE_HOME`

In this instance, `<version>` is the Oracle database version, 11.1.0 or 11.2.0.

This variable determines the location and the version of the Oracle installation. This is the recommended setting, but you can use a different setting if needed.

NOTE

The `ORACLE_BASE` and `ORACLE_HOME` Oracle environment variables are not mandatory for the operation with HPOM.

Installing an Oracle Database

- `ORACLE_SID=openview`

```
export ORACLE_SID
```

This variable defines the name of the database you will create. The default setting is `openview`, but you can use a different setting if needed.

When using an existing database, use the name of this database for setting `ORACLE_SID`. When configuring the database, the `ovoconfigure` script detects that a database of this name exists and asks whether you want to use it for the HPOM database objects. If you choose this approach, the HPOM database objects are created within the existing database.

- `ORACLE_TERM=<terminal_type>`

```
export ORACLE_TERM
```

This variable defines the type of terminal (for example, `xterm`, `hp`, `ansi`) to be used with the Oracle installer and other Oracle tools.

Make sure to set this variable to the type of your terminal.

- `PATH=$PATH:$ORACLE_HOME/bin`

```
export PATH
```

This variable sets the directories through which the system searches to find and execute commands.

7. *If you want to use port 1521 for Oracle listener communication: Make sure that the `ncube` port is commented out in `/etc/services` (if this file exists on your system):*

```
#ncube-lm 1521/tcp # nCube License Manager  
#ncube-lm 1521/udp # nCube License Manager
```

Installing Oracle Database 11g Release 1 or Oracle Database 11g Release 2

This section describes how to install one of the following:

- Oracle Database 11g Release 1 (with the 11.1.0.7 patch set)
- Oracle Database 11g Release 2 (versions 11.2.0.1–11.2.0.4)

NOTE

Oracle Database 11g Release 1 Enterprise Edition (64-bit) and Oracle Database 11g Release 2 Enterprise Edition (64-bit) for Red Hat Enterprise Linux or Oracle Linux are available on DVD-ROMs. These products, as well as all required patch sets, can be downloaded from the Oracle web site.

Keep in mind that due to Oracle restrictions, HPOM does not support an Oracle database running on CentOS Linux.

When you choose the Oracle database version you want to install, complete the following tasks:

- ❑ Task 1: “Preparation Steps” on page 51
- ❑ Task 2: “Installing Oracle Database 11g Release 1” on page 52 or “Installing Oracle Database 11g Release 2” on page 54

Preparation Steps

To prepare for an Oracle database installation, follow these steps:

1. Open two terminal windows, and then log on as the `root` user in the first terminal window and as the `oracle` user in the second one.
2. As the `oracle` user, make sure that the `ORACLE_TERM` environment variable is set correctly.

To check the setting, type the following:

```
echo $ORACLE_TERM
```

3. Verify, and if necessary, set the `ORACLE_HOME` and `ORACLE_SID` variables.
4. Set the `DISPLAY` environment variable by typing the following:

```
DISPLAY=<nodename>:0.0
```

```
export DISPLAY
```

In this instance, `<nodename>` is the name of your system.

Installing an Oracle Database

5. On most systems, the disk is mounted automatically when you insert it into the disk drive. However, if the disk is not mounted automatically, create a mount point, and then, as the `root` user, run the following command to mount it:

```
/bin/mount -o ro -t iso9660 /dev/cdrom <mount_point>
```

In this instance, `<mount_point>` is the disk mount point directory.

NOTE

Before proceeding with the installation of the Oracle database, it is recommended that you copy the contents of installation media to a hard disk.

Installing Oracle Database 11g Release 1

To install Oracle Database 11g Release 1 from the DVD-ROM, follow these steps:

1. As the `oracle` user, start the Oracle Universal Installer by running the following command:

```
<path>/runInstaller
```

In this instance, `<path>` is the full path of the database directory on the installation media.

The Select Installation Method window opens.

2. In the Select Installation Method window, click **Advanced Installation**, and then **Next**.

The Specify Inventory directory and credentials window opens.

NOTE

If an error message appears indicating that the inventory location could not be created, you can safely ignore it.

3. Make sure that the `/opt/oracle/oraInventory` path is given in the Specify Inventory directory and credentials window, and then click **Next**.

The Select Installation Type window appears.

4. In the Select Installation Type window, click either **Enterprise Edition** or **Standard Edition** (according to your needs or your Oracle license agreement), and then click **Next**.

The Install Location window opens.

NOTE

If you plan to run an HP Operations management server in a language other than English, which is the default language, you can add languages by clicking the **Product Languages...** button and selecting languages from the list.

5. In the Install Location window, check that the Oracle variables are set correctly, and then click **Next**.

The Product-Specific Prerequisite Checks window appears.

6. In the Product-Specific Prerequisite Checks window, the result of checking requirements appears. If no problems are reported, click **Next**.

The Select Configuration Option window opens.

NOTE

If a problem report message appears, check all requirements and set them accordingly.

7. In the Select Configuration Option window, click **Install Software Only**, and then **Next**.

The Privileged Operating System Groups window appears.

8. In the Privileged Operating System Groups window, click **Next**.

The Summary window opens.

9. Review the information displayed in the Summary window, and then click **Install** to start the installation.

10. When the Execute Configuration scripts window appears, follow these steps:

- a. Open a terminal window, and then log on as the `root` user.

Installing an Oracle Database

- b. Run the following two scripts:

```
${ORACLE_HOME}/root.sh
```

```
/opt/oracle/oraInventory/orainstRoot.sh
```

- c. Return to the Execute Configuration scripts window, and then click **OK** to continue.

The End of Installation window opens.

11. In the End of Installation window, you can verify installed Oracle products.

Click **Exit** when you finish the verification.

12. Install the 11.1.0.7 patch set.

For detailed information about installing the patch set for the Oracle database server, see the Oracle product documentation.

Installing Oracle Database 11g Release 2

NOTE

Starting with the release of the 11.2.0.2 patch set for Oracle Database 11g Release 2, Oracle database patch sets are full installations of the Oracle Database software. Note the following changes with the new patch set packaging:

- ❑ Direct upgrades from previous releases to the most recent patch set are supported.
 - ❑ Out-of-place patch set upgrades, in which you install the patch set into a new, separate Oracle home, are the best practices recommendation. In-place upgrades are supported but are not recommended.
 - ❑ New installations consist of installing the most recent patch set, rather than installing a base release and then upgrading to a patch release.
-

To install Oracle Database 11g Release 2 from the DVD-ROM, follow these steps:

1. As the `oracle` user, start the Oracle Universal Installer by running the following command:

```
<path>/runInstaller
```

In this instance, `<path>` is the full path of the database directory on the installation media.

Depending on the version of the Oracle database you are installing, one of the following two windows opens:

- *11.2.0.1*: Select Installation Option window
 - *11.2.0.2 or higher*: Configure Security Updates window
2. *11.2.0.2 or higher installation only*: Use the Software Updates feature to dynamically download and apply latest updates.

To dynamically download and apply latest updates, in the Configure Security Updates window, do one of the following:

- If you want to receive information about security issues, follow these steps:
 - a. Either type your email address or select the I wish to receive security updates via My Oracle Support check box and type your Oracle support password. Then click **Next**.

The Download Software Updates window opens.

- b. In the Download Software Updates window, do one of the following:
 - Apply updates to the downloaded Oracle software, and then click **Next**.
 - Skip applying updates to the downloaded Oracle software by first clicking **Skip software updates**, and then **Next**.

In both cases, the Select Installation Option window opens.

- If you do not want to receive information about security issues, follow these steps:
 - a. Clear the I wish to receive security updates via My Oracle Support check box, and then click **Next**.

You are asked whether you are sure you do not want to receive information about security issues.

- b. Click **Yes**.

The Download Software Updates window opens.

- c. In the Download Software Updates window, skip applying updates to the downloaded Oracle software by first clicking **Skip software updates**, and then **Next**.

The Select Installation Option window opens.

3. In the Select Installation Option window, click the **Install database software only** radio button, and then click **Next**.

The Grid Installation Options window opens.

4. In the Grid Installation Options window, click **Single instance database installation**, and then click **Next**.

The Select Product Languages window opens.

5. In the Select Product Languages window, you can find a list of available languages that you can select according to your preferences (for example, if you plan to run an HP Operations management server in a language other than English, which is the default language, or if you want to receive Oracle messages in a different language).

After you select the languages you want, click **Next**.

The Select Database Edition window opens.

6. In the Select Database Edition window, click **Enterprise Edition** or **Standard Edition** (according to your needs or your Oracle license agreement), and then click **Next**.

The Specify Installation Location window opens.

7. In the Specify Installation Location window, check that the Oracle base and software location values correspond to the `ORACLE_BASE` and `ORACLE_HOME` values you created, and then click **Next**.

The Privileged Operating System Groups window opens.

8. In the Privileged Operating System Groups window, specify the group names for the Database Administrator group (OSDBA), for example, `dba`, and optionally, the Database Operator group (OSOPER), for example, `oper`. Click **Next**.

The Perform Prerequisite Checks window opens.

9. In the Perform Prerequisite Checks window, the result of checking requirements appears. If no problems are reported, click **Next**.

The Summary window opens.

NOTE

If a problem report message appears, check all requirements and set them accordingly.

10. Review the information displayed in the Summary window, and then click **Install** to start the installation.

The Install Product window opens.

11. When the Execute Configuration scripts window appears, follow these steps:

- a. Open a terminal window, and then log on as the `root` user.
- b. You are requested to run one or both of the following scripts:

```
${ORACLE_HOME}/root.sh
```

```
/opt/oracle/oraInventory/orainstRoot.sh
```

- c. Return to the Execute Configuration scripts window, and then click **OK** to continue.

The Finish window opens.

12. In the Finish window, click **Close** to finish the Oracle database installation.

Installing a PostgreSQL Database

PostgreSQL is an object-relational database management system (ORDBMS) that is released under the PostgreSQL License, a liberal Open Source license, and is therefore free and open source software. To use a PostgreSQL database with HPOM, install one of the following:

- ❑ PostgreSQL 9.1
- ❑ PostgreSQL 9.2
- ❑ PostgreSQL 9.3

For detailed information about installing a PostgreSQL database, see “Installing a PostgreSQL Database” on page 59. For the latest PostgreSQL system requirements or more detailed instructions than those provided in this section, see the PostgreSQL documentation that is available at the following location:

<http://www.postgresql.org/docs>

Required PostgreSQL Products

A stand-alone HPOM system has the database and all management server processes, including user interface processes, running on the same system. However, if the database is installed on a different server than the HP Operations management server, you must additionally install the PostgreSQL client on the management server as described in “Setting Up HPOM with a Remote/Manual PostgreSQL Database” on page 145. This client enables remote access to the PostgreSQL database.

IMPORTANT

The set of PostgreSQL server binaries you choose (for example, Open Source, EnterpriseDB, or compiled from source) must contain the server binaries that are built with enabled thread safety.

Before Installing a PostgreSQL Database

Make sure that your system meets the hardware and software requirements listed in Chapter 1, “Installation Requirements for the Management Server.”

Installing a PostgreSQL Database

This section describes how to install PostgreSQL version 9.1, 9.2, or 9.3.

NOTE

The PostgreSQL object-relational database management system can be downloaded from the PostgreSQL web site.

After you choose the PostgreSQL database version that you want to install, complete the following tasks:

- ❑ Task 1: “Installing PostgreSQL Server Binaries” on page 59
- ❑ Task 2: “Preparing HPOM to Use the PostgreSQL Database” on page 60
- ❑ Task 3: “Creating and Configuring a Database Cluster” on page 60

Installing PostgreSQL Server Binaries

To obtain and install server binaries for PostgreSQL version 9.1, 9.2, or 9.3, you can use your operating system package manager, compile the PostgreSQL server binaries from source, or download the PostgreSQL server binaries from one of the following locations:

- ❑ <http://www.postgresql.org/download>¹
- ❑ <http://enterprisedb.com/downloads/postgres-postgresql-downloads>²

When installing the PostgreSQL server binaries, keep in mind the following:

- ❑ The installation package may have dependencies. You can find the links to these dependencies on the same page as the PostgreSQL binary package. For details, see the corresponding package documentation.
- ❑ For the HP Operations management server, a 64-bit version of PostgreSQL is required.

1. Source code is also available for download from this location.
2. PostgreSQL Plus Advanced Server requires a license.

- ❑ If you use server binaries provided by OpenSGC, make sure that you always set the `LD_LIBRARY_PATH` variable to the directory where the PostgreSQL client libraries are stored. You must do this because the server binaries provided by OpenSGC are not built with the correct runtime path.

NOTE

It is strongly recommended that you do not use server binaries provided by OpenSGC.

- ❑ When building from source, thread safety must be enabled. Follow the instructions provided for each package. Depending on the package you choose, one or more subpackages for the server, the client, or the libraries are available. In a local scenario, all of them are needed for the HP Operations management server. In a remote scenario, you must install the packages for the server, the client, and the libraries on the PostgreSQL server, while the packages for the client and the libraries must be installed on the HP Operations management server.
- ❑ Add the directory where the PostgreSQL binaries are stored into `PATH`. Otherwise, the operating system may include a different and usually older version of PostgreSQL, which may create conflicts.

Preparing HPOM to Use the PostgreSQL Database

PostgreSQL requires an operating system user (usually named `postgres`) that controls database processes and has access to all PostgreSQL binaries and HPOM database directories. This user belongs to an operating system user group (usually named `postgres`). If the user is not created or you want to use another user, create it by using the operating system tools.

Creating and Configuring a Database Cluster

In PostgreSQL, a database cluster is a server instance that controls a group of databases. To create and configure a database cluster, choose one of the following three methods:

- ❑ *Automatically:*

During `ovoconfigure`. In this case, a database cluster is created locally on the HP Operations management server.

For details, see “Configuring a PostgreSQL Database” on page 76.

❑ *Semi-automatically:*

By running the `psqlcluster` tool on the database server system. In this case, a local or remote database cluster is created.

For details, see “Creating and Configuring a PostgreSQL Database Cluster by Using the `psqlcluster` Tool” on page 147.

❑ *Manually:*

This method enables additional customization of cluster parameters and a file location.

For details, see “Creating and Configuring a PostgreSQL Database Cluster Manually” on page 150.

Installing and Configuring the HPOM Software on the Management Server System

This section describes how to install and configure the HPOM software on the management server by using the HPOM installation and configuration scripts, `ovoinstall` and `ovoconfigure`.

To ensure that the HPOM installation runs smoothly, your system must meet all the prerequisites detailed in Chapter 1, “Installation Requirements for the Management Server.”

NOTE

SELinux running in the enforcing mode, which is the default mode that executes the SELinux security policy in a RHEL environment, is supported with HPOM.

Before running the `ovoinstall` script, decide whether you want to set the database to start automatically every time you restart your system.

Usage of the `ovoinstall` and `ovoconfigure` Scripts

This section contains the description of the `ovoinstall` and `ovoconfigure` scripts as well as options that can be used with these scripts. For detailed information about installation and configuration steps, see “Installing and Configuring the HPOM Software on the Management Server” on page 65.

After you install the HPOM software on the management server, the `ovoinstall` script asks you if you want to continue with the server software configuration. If you answer in the affirmative, the `ovoconfigure` script is started automatically.

IMPORTANT

Do not install HPOM product packages directly by using `rpm`. Use `ovoinstall` for the administration of the HPOM software on the HP Operations management server.

In addition, it is not possible to install HPOM from the software depot server.

The syntax of the `ovoinstall` and `ovoconfigure` scripts is the same and is as follows:

```
ovoinstall|ovoconfigure
    [-pkgdir <package_dir>] [-agtdir <software_dir>]
    [-adminUIdir <software_dir>]
    [-defaults <defaults_file>]
    [-no_clear_display] [-u|-unattended] [-check]
```

You can use the following options with the `ovoinstall` and `ovoconfigure` scripts:

<code>-pkgdir <package_dir></code>	Enables you to specify the location of HPOM packages.
<code>-agtdir <software_dir></code>	Enables you to specify the HP Operations agent software location.
<code>-adminUIdir <software_dir></code>	Enables you to specify the Administration UI software location.
<code>-defaults <defaults_file></code>	Enables you to specify the file containing the default answers to the <code>ovoconfigure</code> questions.
<code>-no_clear_display</code>	By specifying this option, you can stop the <code>ovoconfigure</code> script from cleaning the screen contents after each successfully finished step.
<code>-u -unattended</code>	By specifying this option, no questions are asked during the HPOM software installation and configuration procedures. Configuration values are taken from the defaults file.
<code>-check</code>	Enables you to check prerequisites without the need to install HPOM packages. The <code>ovoconfigure</code> script enables you to check kernel parameters, RAM and swap space, free disk space, operating system patches, installed software, running processes, and required files respectively.
<code>-h -? -help</code>	Shows the usage of the script.

Before Running `ovoinstall`

Before running `ovoinstall`, verify if you use Network Information Services (NIS) for user or group management. This information is available from the entries for `passwd` and the group in the `/etc/nsswitch.conf` file.

If you use NIS, keep the following in mind before running the `ovoinstall` script:

- ❑ If the `opc_op` user already exists in the NIS environment, it must belong to the `opcgrp` group. If it does not exist, the `opc_op` user will be created by the `ovoinstall` script.
- ❑ Home directories of the `opc_op` and `oracle` or `postgres` users must be accessible on the HP Operations management server as well as the same as on the NIS server.
- ❑ If you plan to use PostgreSQL as the database server, both the PostgreSQL OS `DBA` user and its group must be created.

If you do not use NIS for user or group management, `ovoinstall` automatically sets up both groups and users.

IMPORTANT

If you do not want your user account and group configuration to be modified during the installation and configuration of the HPOM software on the management server, make sure to configure the `opc_op` user and the `opcgrp` group before starting the installation.

Preparing for the HPOM Software Installation and Configuration from a DVD-ROM

To prepare for the HPOM software installation and configuration from a DVD-ROM, insert the HPOM server installation DVD into the DVD-ROM drive.

On most systems, the disk is mounted automatically. However, if the disk is not mounted automatically, follow these steps to mount it:

1. Create a directory to mount the DVD-ROM by running the following command:

```
mkdir /<mount_point>
```


For example:

```
mkdir /dvdrom
```

2. Mount the DVD-ROM by running the following command:

```
/bin/mount -o ro -t iso9660 /dev/cdrom <mount_point>
```

In this instance, <mount_point> is the disk mount point directory.

NOTE

Before proceeding with the installation and configuration of HPOM on the management server, it is recommended that you copy the contents of installation media to a hard disk, and then run the installation process directly from there.

Installing and Configuring the HPOM Software on the Management Server

Installing and configuring the HPOM software on the management server is a simple and fast procedure, partly owing to the list of possible options offered after each installation or configuration step (see Table 2-1).

Table 2-1 Installation and Configuration Procedure Options

Options	Description
back ^a	Enables you to return to the previous step.
exit	Enables you to stop the procedure.
y n ^b	Offers a possibility to answer in the affirmative or in the negative.
"default value"	Enables you to accept the default value.
?	Enables you to gain more information.

a. To correct any value, type **back**, and then set the value to match the required value.

b. This option is not available with all procedure steps.

NOTE

If at any point either `ovoinstall` or `ovoconfigure` returns a value with an error, type **back** and repeat the step, type **exit** and cancel the procedure, or type **?** and gain more information.

To install and configure the HPOM software on the management server, follow these steps:

1. Log on as the `root` user.
2. Make sure that the `LANG` environment variable is set to a UTF-8 locale.

For more information about setting the environment variable, see “Configuring Input/Output for Multiple Language Support” on page 41.

3. Start the HPOM installation:

- If you install HPOM from a DVD-ROM, type the following:

```
<mount_point>/ovoinstall
```

In this instance, `<mount_point>` is the location where the HPOM installation DVD is mounted.

- If you install HPOM using DVD content, type the following:

```
<master_directory>/HPOMDVD/ovoinstall
```

For example, if you created the `/tmp` directory as the master directory, you can start `ovoinstall` by typing the following:

```
/tmp/HPOMDVD/ovoinstall
```

The following text is displayed:

```
Welcome to the HP Operations Manager for UNIX
installation
```

4. Press **ENTER** to verify that you want the installation procedure to start.

You are prompted to enter the HPOM software package repository location where all server packages are located.

5. Press **ENTER** to accept the default repository location, or enter the desired location, and then press **ENTER**.

The `ovoinstall` script checks and installs the server setup package that contains the server installation infrastructure.

6. Press **ENTER** to continue with checking the system.

The following is checked:

- root user
- LANG
- NLS_LANG
- umask
- Language
- Kernel parameters
- RAM and swap space
- Free disk space
- Operating system patches
- Installed software
- Running processes
- Required files
- Required file systems

NOTE

If the system check returns a failed value, type **back** and repeat the step, type **exit** and cancel the procedure, or type **?** and gain more information.

In case of a minimum deviation from the requirements, you can safely continue with the installation.

-
7. After the system check is done, press **ENTER** to continue with the installation.

You are prompted to enter the HP Operations agent software location.

8. After you enter the HP Operations agent software location, press **ENTER**.

You are prompted to enter the HPOM Administration UI software location.

9. After you enter the HPOM Administration UI software location, press **ENTER**.

The `ovoinstall` script continues with installing the local agent.

IMPORTANT

If you already have the local agent installed, one of following actions takes place (depending on the installed local agent version):

- If the installed version is lower than the one specified in the HP Operations agent software location, the local agent is upgraded automatically.
- If the installed version is the same as the one specified in the HP Operations agent software location, the local agent is reinstalled.
- If the installed version is higher than the one specified in the HP Operations agent software location, the local agent is downgraded.

Keep in mind that downgrading may cause compatibility problems. To prevent this from happening, make sure that the HP Operations agent software location you specify contains the local agent version that is the same as or higher than the one that you have already installed.

-
10. After the process of installing the local agent returns the OK value, press **ENTER** to continue.

The `ovoinstall` script continues with checking core component packages, server packages, localization packages, and ECS Composer packages.

11. Press **ENTER** to continue with installing the packages.

After all the packages are installed, the `ovoinstall` script installs all updates and finishes the server software installation.

NOTE

Before continuing with the server software configuration, you can manually install available management server patches.

-
12. Press **ENTER** to continue with the server software configuration.

The following text is displayed:

```
Welcome to the HP Operations Manager for UNIX
configuration
```

13. Press **ENTER** to continue with checking the lock file and the system.
For system check details, see step 6 on page 67.

If a specific system check is skipped, it means that it is already checked and is OK.
14. After the system check is done, press **ENTER**.

The ovoconfigure script continues with detecting special environments.

When the detection procedure finishes, you are prompted to enter the certificate backup password—the password used for a certificate backup and restore (for example, cert_bkp).
15. Accept the default value by pressing **ENTER**, or type the desired value, and then press **ENTER**.

The ovoconfigure script asks you if you want to configure HP Performance Manager (OVPM).
16. Press **ENTER** to accept the default value and not to configure OVPM, or press **y** followed by **ENTER** to configure OVPM during the server configuration. In that case, specify OVPM's network node and port.

NOTE

OVPM can be configured after the server configuration.

The summary of the provided answer or answers appears.

17. Press **ENTER** to continue.

The ovoconfigure script continues with adding the opc_op user, creating the Instant-On license, and setting the embedded licensing configuration.
18. Press **ENTER** to continue.

The following question is displayed:

Configure the database?
19. Press **ENTER**.

IMPORTANT

At this point, you must decide which database you want to configure, an Oracle database or a PostgreSQL database.

The following question is displayed:

Will HPOM run on an Oracle instance (n for PostgreSQL)?

20. Press **ENTER** to accept the default value and continue with configuring an Oracle database, or press **n** followed by **ENTER** and continue with configuring a PostgreSQL database.

Depending on which database you choose to configure, make sure that you answer one of the following two sets of questions before continuing with the next step:

- *To configure an Oracle database:*
See “Configuring an Oracle Database” on page 74.
- *To configure a PostgreSQL database:*
See “Configuring a PostgreSQL Database” on page 76.

After you answer all the Oracle or PostgreSQL database-related questions, the `ovoconfigure` script checks the database configuration data and the summary of all provided answers appears.

21. Check the summary data, and then press **ENTER** to perform the database configuration.

IMPORTANT

If the database configuration fails, you can reconfigure the database by typing one of the following:

- | | |
|---------------|--|
| back | All the questions related to the database configuration must be answered once again. |
| repeat | Answers that you provided for the database configuration are reused. |

In this case, you may be asked the following questions:

- Do you want to clear DB tables?
Press **y** followed by **ENTER** if you want to clear all the tables, but not to drop the entire database.
- Do you want to completely drop the DB?
Press **y** followed by **ENTER** if you want to completely drop the database and reconfigure it.

It is recommended that you answer **n** to the above questions if the database is configured manually or as a remote database. Make sure that you solve the problems manually before starting the database reconfiguration.

The entire database configuration procedure is written in the log files, which you can view at any time during the database configuration. For more information, see “Viewing the Installation Log Files” on page 81.

22. Press **ENTER** to continue with the server initialization.

During the server initialization, the `ovoconfigure` script performs the integration into the start/stop sequence.

23. Press **ENTER** to continue with the server final configuration that consists of the following:

- Assigning the management server policy group
- Configuring subagents
- Configuring the Java GUI
- Configuring the web server
- Backing up certificates
- Starting the server
- Installing agent deployment packages
- Configuring the local agent
- Distributing configuration to the local agent

24. If you want to enable the Event Storm Filter component, press **ENTER**. Otherwise, press **n** followed by **ENTER**.

For detailed information about the Event Storm Filter component, see the *HPOM Administrator's Reference*.

25. If you want to enable the Health Check component, press **ENTER**. Otherwise, press **n** followed by **ENTER**.

For detailed information about the Health Check component, see the *HPOM Administrator's Reference*.

The ovoconfigure script continues with installing server add-on packages.

26. Press **ENTER** to confirm that you want to install the server add-on packages.

After the server add-on packages are installed, the ovoconfigure script starts the Administration UI installation and you are prompted to answer the questions listed in Table 2-2 by either accepting the default value and pressing **ENTER**, or typing the desired value followed by **ENTER**.

Table 2-2 Administration UI-related Questions

Question	Description and/or Default Value
Administration UI server ID	Unique identifier of the HP Operations management server.
Administration UI port	Web application port to which you connect with the web browser. The default value is 9662.
Administration UI secure port	Web application secure port to which you connect with the web browser. The default value is 9663. NOTE: It is not possible to disable either port. If you enter a non-default port number, you must also specify the alternate port number in the URL, which is used to invoke the Administration UI Web Application from the web browser.
Administration UI XML DB password	Password for the XML database. It stores the Administration UI users, user groups, user roles, and so on.
Database opc_op password	The password for the opc_op database user. The default value is opc_op.

After the Administration UI is successfully installed, the `ovoconfigure` script asks you if you want to switch HPOM to non-root operation.

27. If you want to switch HPOM to non-root operation¹, press **y** followed by **ENTER**. Otherwise, accept the default value **n** by pressing **ENTER**.

IMPORTANT

Keep in mind that switching HPOM to non-root operation may take some time to complete.

For detailed information about non-root operation, see the *HPOM Concepts Guide*.

28. *Optional*: Check if the installation of the HPOM software on the management server was successful.

For more information, see “Starting HPOM and Verifying the Installation” on page 82.

29. Unmount the DVD-ROM drive by running the following command:

```
umount /<mount_point>
```

30. Make the HPOM manual pages available for users by adding the `/opt/OV/man` directory to the `MANPATH` environment variable. To do so, run the following commands:

```
MANPATH=$MANPATH:/opt/OV/man
```

```
export MANPATH
```

The `MANPATH` environment variable must be set either for a particular user in the `.profile` or `.bash_profile` file, or for all users in the `/etc/profile` file.

NOTE

It is recommended to set the `PATH` variable to include the following HPOM directories on the management server: `/opt/OV/bin`, `/opt/OV/bin/OpC`, `/opt/OV/nonOV/perl/a/bin`, and `/opt/OV/bin/OpC/utills`.

1. Non-root operation is not supported on RHEL 5.x.

Configuring an Oracle Database

This section describes Oracle database-related questions that appear during the installation and configuration of the HPOM software.

IMPORTANT

After you answer all the Oracle database-related questions, continue with step 21 on page 70.

Table 2-3 shows which questions you must answer if you use the Oracle database with HPOM.

Table 2-3 Oracle Database-related Questions

Question	Description and/or Default Value
Enable automatic database startup?	y
Clear and re-initialize the tables if already exist?	y

Table 2-3 Oracle Database-related Questions (Continued)

Question	Description and/or Default Value
Set up the database manually (local/remote)?	<p>This question allows you to choose how to create the database, locally or remotely:</p> <ul style="list-style-type: none"> • If you want to create the database locally, press y followed by ENTER. In this case, the <code>ovoconfigure</code> script pauses instead of creating the database, allowing you to manually create the database and configure it by typing <code>opcdbsetup -p</code> in another window. • If you want to create the database remotely, press ENTER to accept the default answer. In this case, the following question is displayed: Configure the database automatically for remote login? The default answer to this question is <code>y</code>. If you choose the default answer, the database installation program creates an Oracle password file and gives proper rights to the <code>SYSTEM</code> database user so that the Oracle Remote Manager (RMAN) can access the database during the execution of backup or restore scripts. If you answer <code>n</code> to this question, you can grant these permissions manually. For detailed information about backing up data on the management server, see the <i>HPOM Administrator's Reference</i>.
Oracle Base	The Oracle database base directory, which is usually the same as the <code>ORACLE_BASE</code> variable. The default is <code>/opt/oracle</code> .
Oracle Home	The Oracle database home directory, which is usually the same as the <code>ORACLE_HOME</code> variable. The default is <code>/opt/oracle/product/11.1.0</code> .
Oracle User	The Oracle user for the HP Operations management server database. The default is <code>oracle</code> .

Table 2-3 Oracle Database-related Questions (Continued)

Question	Description and/or Default Value
Oracle SID	The Oracle SID of the HP Operations management server database. The default is openview. NOTE: The ovoidinstall script uses this value also as the database name if it is not created manually. Therefore, the SID value is limited to a maximum length of 8 characters.
Oracle Data Directory	The directory where the HP Operations management server database files are stored (for example, /opt/oracle/oradata).
Oracle Index Directory	The directory where the HP Operations management server database index files are stored. By default, this directory is the same as the Oracle data directory.
Oracle User opc_op Password	The password for the opc_op database user. The default is opc_op.
Oracle User opc_report Password	The password for the opc_report database user. The default is opc_report.
Oracle User system Password	The password for the system database user. The default is manager.
Database Character Set (NLS_LANG)	Type the desired NLS_LANG value in the <lang>_<region>.AL32UTF8 form. The default value is american_america.AL32UTF8.
Oracle Listener Name	LISTENER
Oracle Listener Port	1521
Oracle Net Service Name	ov_net

Configuring a PostgreSQL Database

This section describes PostgreSQL database-related questions that appear during the installation and configuration of the HPOM software.

IMPORTANT

After you answer all the PostgreSQL-database related questions, continue with step 21 on page 70.

To start configuring a PostgreSQL database, answer the following question:

Do you wish HPOM to manage the PSQL cluster?

Depending on whether you want to have *a managed database* (HPOM manages a local database that will be created from the beginning or was created by using the `psqlcluster` tool) or *an independent database* (HPOM connects to an independent local or remote database, but does not manage it), press one of the following two keys, and then carefully follow the instructions:

- y**: See “Managed PostgreSQL Database” on page 77.
- n**: See “Independent PostgreSQL Database” on page 80.

NOTE

If the independent database is not created, the `ovoconfigure` script pauses, allowing you to manually create the database.

Regardless of whether you choose `y` or `n`, the following question is displayed:

Clear and reinitialize the tables if they already exist?

The default answer is `y`.

Managed PostgreSQL Database

If the database is managed, you must choose a PostgreSQL cluster directory where you want the database to be created (it must be non-existing or empty) or where the database was created by using the `psqlcluster` tool. Answer the following question:

PSQL cluster directory?

After you choose the PostgreSQL cluster directory, the `ovoconfigure` script checks it. Depending on whether this directory is empty or non-existing, or it belongs to an HPOM-created cluster, you must answer either the questions described in Table 2-4 on page 78 or in Table 2-5 on page 79.

PostgreSQL Cluster Directory Is Empty or Non-Existing

Table 2-4 shows which questions you must answer if the PostgreSQL cluster directory is empty or non-existing.

Table 2-4

PostgreSQL Database-related Questions If the Cluster Directory Is Empty or Non-Existing

Question	Description
PSQL binary directory	The directory where the PostgreSQL binaries are stored. Keep in mind that the location of this directory varies depending on the distribution or the version.
PSQL library directory	The directory where the PostgreSQL client libraries are stored. Keep in mind that the location of this directory varies depending on the distribution or the version.
PSQL data directory	The directory where the data tablespaces are stored. This directory must be empty or non-existing. If you do not provide an answer to this question, <code><cluster_dir>/HPOM</code> is used.
PSQL index directory	The directory where the index tablespaces are stored. This directory must be empty or non-existing. If you do not provide an answer to this question, <code><cluster_dir>/HPOM</code> is used.
Do you wish to start the PSQL cluster automatically at boot time?	Press y if you want the database cluster to be started automatically each time the system is started. Otherwise, you must start the database cluster manually before you can start HPOM.
Hostname	The system on which the database cluster or server is installed.
Port	The port on which the database cluster or server listens. It is usually set to 5432 or 5444.

Table 2-4 PostgreSQL Database-related Questions If the Cluster Directory Is Empty or Non-Existing (Continued)

Question	Description
Database name	The name of the HPOM database. The default is openview.
OS DBA user	The operating system user that controls database processes and has access to all PostgreSQL binaries and HPOM database directories. This user is usually set to postgres.
DB DBA user	The name of the administrator user inside the database cluster or server, which is usually set to postgres.
DB DBA user password	The password of the administrator user inside the database cluster or server, which is usually set to postgres.
Database opc_op password	The password for the opc_op database user. The default is opc_op.
Database opc_report password	The password for the opc_report database user. The default is opc_report.

PostgreSQL Cluster Directory Belongs To an HPOM-created Cluster

Table 2-5 lists the questions that you must answer if the PostgreSQL cluster directory belongs to an HPOM-created cluster.

Table 2-5 PostgreSQL Database-related Questions If the Cluster Directory Belongs To an HPOM-created Cluster

Question	Description
PSQL library directory	The directory where the PostgreSQL client libraries are stored. Keep in mind that the location of this directory varies depending on the distribution or the version.
Hostname	The system on which the database cluster or server is installed.
Database name	The name of the HPOM database. The default is openview.

Table 2-5 PostgreSQL Database-related Questions If the Cluster Directory Belongs To an HPOM-created Cluster (Continued)

Question	Description
Database opc_op password	The password for the <code>opc_op</code> database user. The default is <code>opc_op</code> .
Database opc_report password	The password for the <code>opc_report</code> database user. The default is <code>opc_report</code> .

Independent PostgreSQL Database

Table 2-6 lists the questions that you must answer if the PostgreSQL database is independent.

Table 2-6 Independent PostgreSQL Database-related Questions

Question	Description
PSQL binary directory	The directory where the PostgreSQL binaries are stored. Keep in mind that the location of this directory varies depending on the distribution or the version.
PSQL library directory	The directory where the PostgreSQL client libraries are stored. Keep in mind that the location of this directory varies depending on the distribution or the version.
Hostname	The system on which the database cluster or server is installed.
Port	The port on which the database cluster or server listens. It is usually set to 5432 or 5444.
Database name	The name of the HPOM database. The default is <code>openview</code> .
DB DBA user	The name of the administrator user inside the database cluster or the server. It is usually set to <code>postgres</code> .
DB DBA user password	The password of the administrator user inside the database cluster or the server. It is usually set to <code>postgres</code> .

Table 2-6 Independent PostgreSQL Database-related Questions

Question	Description
Database opc_op password	The password for the opc_op database user. The default is opc_op.
Database opc_report password	The password for the opc_report database user. The default is opc_report.

Viewing the Installation Log Files

When you install the HPOM software, you can verify if the installation was successful by checking the end of the `/var/opt/OV/log/OpC/mgmt_sv/ovoinstall.log` log file. Either open the log file using a text editor or type the following:

```
more /var/opt/OV/log/OpC/mgmt_sv/installation.log
```

```
more /var/opt/OV/log/OpC/mgmt_sv/installation.log.verbose
```

Administration UI Installation Log File

If you want to view only the information about the Administration UI part of the installation process, you can check log files created in the `/opt/OV/OMU/adminUI/` directory. The format of these log files is as follows:

```
HPOM_Administration_UI_Install_<date_time>.log
```

For example:

```
HPOM_Administration_UI_Install_04_01_2014_16_00_23.log
```

Starting HPOM and Verifying the Installation

To verify the HPOM installation, follow these steps:

1. As the root user, verify that all HP Operations server services are running by entering the following:

```
/opt/OV/bin/OpC/opcsv
```

An output similar to the following one should appear:

```
HPOM Management Server status:
```

```
-----  
HPOM Administration UI Server      adminui      (29109) is running  
OMU Action Manager                 opcactm     (28339) is running  
OMU BBC Config Adapter              opcbbcdist  (28385) is running  
OMU Cert. Server Adapter            opccsad     (28431) is running  
OMU Display Manager                 opcdispm    (28249) is running  
OMU Event Storm Filter              opcesf      (29018) is running  
OMU Forward Manager                 opcforwm    (28476) is running  
OMU Health Check                    opchcd      (29069) is running  
OMU Health Monitoring Engine        opchealth   (28880) is running  
OMU Message Manager                 opcmmsgm    (28521) is running  
OMU Message Receiver (HTTPS)        opcmgrb     (28569) is running  
OMU Svc. Nav. Action Manager         opcsvcam    (28833) is running  
OMU Service Discovery Server         opcsvdisc   (28956) is running  
OMU Service Engine                   opcsvcm     (28613) is running  
OMU TT & Notify Manager              opcttnsm    (28658) is running  
OMU HTTPS Communication Proxy        opcuhttps   (28789) is running  
OMU Request Sender                  ovoareqsdr  (28293) is running
```

```
OV Control Core components status:
```

```
-----  
OV Communication Broker             ovbbccb     (25735) is running  
OV Control                           ovcd        (25734) is running  
OV Certificate Server                ovcs        (28203) is running  
OV Tomcat (B) Servlet Container      ovtomcatB   (26847) is running
```

If the HP Operations management server services are not running, you can start them with the following command:

```
/opt/OV/bin/OpC/opcsv -start
```

IMPORTANT

You must have a local agent installed to perform steps 2 and 3.

2. Verify that all the HP Operations agent services are running on the management server system by running the following command:

```
/opt/OV/bin/OpC/opcagt -status
```

An output similar to the following one should appear:

scopeux	Perf Agent data collector		(3937)	Running
midaemon	Measurement Interface daemon		(3854)	Running
ttd	ARM registration daemon		(3852)	Running
perfalarm	Alarm generator		(5947)	Running
perfd	real time server		(3823)	Running
coda	OV Performance Core	COREXT	(26444)	Running
opcacta	OVO Action Agent	AGENT,EA	(26462)	Running
opcmona	OVO Monitor Agent	AGENT,EA	(26467)	Running
opcmsga	OVO Message Agent	AGENT,EA	(26453)	Running
opcmsgi	OVO Message Interceptor	AGENT,EA	(26464)	Running
ovbbccb	OV Communication Broker	CORE	(25735)	Running
ovcd	OV Control	CORE	(25734)	Running
ovconfd	OV Config and Deploy	COREXT	(26430)	Running

If the HP Operations agent services are not running, you can start them with the following command:

```
/opt/OV/bin/OpC/opcagt -start
```

3. Submit test messages by typing the following:

```
/opt/OV/bin/OpC/utlis/submit.sh
```

This program sends simulated messages to the message browser. The number of messages received depends on the configuration of your system. Under normal conditions, you will usually receive at least two messages.

4. Complete one of the following tasks to be able to test and use an application configured as Window (Input/Output) from the HPOM User's Assigned Applications window:
 - As the `root` user, set the UNIX password for `opc_op` for each managed node where you want to use Input/Output applications.
To do this, type the following:

```
passwd opc_op
```

NOTE

By default, the `opc_op` user is not allowed to log on to the system (* entry in the password field of `/etc/passwd`).

- Make sure the `$HOME/.rhosts` file exists on the managed node (`$HOME` is the home directory of `opc_op` on the managed node). If it does not exist, create it.

Make an entry in `.rhosts` for the `opc_op` user on the managed node. For example:

```
<management_server>.<domain> opc_op
```

It is not recommended to keep the `.rhosts` entry in a production environment because it can represent a security risk.

- Make sure the `/etc/hosts.equiv` file exists on the managed node. If it does not exist, create it.

Add the hostname of your management server to this file. For example:

```
<management_server>.<domain>.com
```

It is not recommended to keep the `/etc/hosts.equiv` entry in a production environment because it can represent a security risk.

Creating Additional Database Users

After you complete the installation of HPOM, decide whether you want to create additional database users.

Oracle Database Users

During the initial configuration setup, Oracle creates the `sys`, `system`, `outln`, and `dbsnmp` default users and gives them default passwords. Depending on the installed Oracle components and the version, you can create additional database users. These Oracle users are not used by HPOM.

You can change the passwords of these Oracle users with the Oracle tool, SQL*Plus.

For example:

```
su - oracle
sqlplus /nolog
SQL> connect / as sysdba
SQL> alter user system identified by <new_password>
SQL> exit
exit
```

PostgreSQL Database Users

A PostgreSQL cluster is created with a database superuser, usually named `postgres`. During the HPOM configuration, two additional database users are created, namely `opc_op` and `opc_report`.

You can choose the names for all the database users during the database creation or configuration, or you can change these names later on by running the following commands:

```
su - postgres
psql -U <DB_DBA_user> -h <hostname> -p <port>
postgres=# alter user <user> with password '<password>';
postgres=# alter user <user> valid until 'infinity';
postgres=# \q
```

Creating Additional Database Users

exit

In this instance, *<DB_DBA_user>* is the name of the administrator user inside the database cluster or server, *<hostname>* is the system on which the database cluster or server is installed, and *<port>* is the port on which the database cluster or server listens.

IMPORTANT

Make sure that you change the password in the *~/ .pgpass* file of the operating system user. Otherwise, the HPOM scripts and programs may stop working.

Customizing the Administration UI

This section describes how to customize the Administration UI after installing HPOM (and consequently the Administration UI).

Java Memory Parameters

If the HP Operations management server is sufficiently powerful and has enough RAM, it is highly recommended to increase the maximum memory setting to 1024 or even higher.

To change the configuration setting that affects the RAM utilization of the JRE running the Administration UI, follow these steps:

1. In the `/opt/OV/OMU/adminUI/conf/servicemix/wrapper.conf` file, search for the following block:

```
[...]  
# Maximum Java Heap Size (in MB)  
wrapper.java.maxmemory=512
```

When you find the needed block, change it to the following:

```
# Maximum Java Heap Size (in MB)  
wrapper.java.maxmemory=1024
```

2. Restart the Administration UI by running the following command:

```
/opt/OV/OMU/adminUI/adminui restart
```

IMPORTANT

Do not decrease the value below the initial setting because this also decreases performance and the Administration UI may not function properly any longer.

Troubleshooting the Administration UI

This section contains the basic Administration UI troubleshooting information. It helps you to address the most common problems that may occur after installing HPOM, and consequently the Administration UI. The information in this section is covered within the following topics:

- ❑ “Web Interface Problems” on page 88
- ❑ “Menu Display Problem” on page 93

Web Interface Problems

This section contains troubleshooting tips for the most common web interface problems that are currently known.

Logon.xsp Error

Sometimes an error message appears after a new installation of the Administration UI, when you attempt to log on by entering the following URL:

```
http://<HPOM_management_server>:9662/
```

To solve this problem, follow these steps:

1. Run the following command:

```
/opt/OV/OMU/adminUI/adminui webassemblies
```

This command stops the Administration UI and recompiles all web assemblies that are needed for a correct display of the Administration UI web interface. The following BUILD SUCCESSFUL message should appear:

```
[war] Building war:  
/opt/OV/OMU/adminUI/work/tmp/webdeploy/midas.war  
  
[echo] copying war file to webapps  
  
[copy] Copying 1 file to /opt/OV/OMU/adminUI/webapps  
  
[delete] Deleting directory  
/opt/OV/OMU/adminUI/work/tmp/webdeploy  
  
[delete] Deleting directory /opt/OV/OMU/adminUI/webapps/midas  
  
[echo] done. restart server.
```



```
BUILD SUCCESSFUL
```

```
Total time: 1 minute 53 seconds
```

2. Restart the Administration UI by running the following command:

```
/opt/OV/OMU/adminUI/adminui restart
```

Logon Error 2 - Directory Listing

A listing of the directories and files is displayed instead of the web interface.

To solve this problem, follow these steps:

1. Run the following command:

```
/opt/OV/OMU/adminUI/adminui webassemblies
```

This command stops the Administration UI and recompiles all web assemblies that are needed for a correct display of the Administration UI web interface. The following BUILD SUCCESSFUL message should appear:

```
[war] Building war:  
/opt/OV/OMU/adminUI/work/tmp/webdeploy/midas.war  
  
[echo] copying war file to webapps  
  
[copy] Copying 1 file to /opt/OV/OMU/adminUI/webapps  
  
[delete] Deleting directory  
/opt/OV/OMU/adminUI/work/tmp/webdeploy  
  
[delete] Deleting directory /opt/OV/OMU/adminUI/webapps/midas  
  
[echo] done. restart server.  
  
BUILD SUCCESSFUL  
  
Total time: 1 minute 53 seconds
```

2. Restart the Administration UI by running the following command:

```
/opt/OV/OMU/adminUI/adminui restart
```

Web Interface - No Logon

If you cannot log on by using the default user name and password (that is, the interface informs you that the provided user name and password are incorrect), the reason might be one of the following:

- ❑ The Administration UI is not fully started. Wait until there is no logging activity inside
`/opt/OV/OMU/adminUI/logs/servicemix.log.`

If you try to log on while the Administration UI is not fully started, the following typical error codes can be found inside `servicemix.log`:

```
[...]
```

```
ERROR - 2009-08-06 08:17:38,825 |  
BaseLifeCycle.onMessageExchange(48) | Error processing exchange  
InOnly[
```

```
  id: ID:192.168.123.110-122ee5aef40-4:2  
  status: Active  
  role: provider  
  service: {http://hp.com/midas/  
           servicemix/1.0}audit-listeners  
  endpoint: backend
```

```
[...]
```

```
javax.jbi.messaging.MessagingException: Could not find route  
for exchange: InOnly[
```

```
  id: ID:192.168.123.110-122ee5aef40-4:6  
  status: Active  
  role: provider  
  service: {http://hp.com/midas/  
           servicemix/1.0}custom-audit-list
```

```
[...]
```

```
ERROR - 2009-08-06 08:17:38,932 |  
BaseLifeCycle.onMessageExchange(48) | Error processing exchange  
InOnly[
```

```
  id: ID:192.168.123.110-122ee5aef40-4:10  
  status: Active  
  role: provider
```

```
service: {http://hp.com/midas/\
        servicemix/1.0}global-list
endpoint: client
javax.jbi.messaging.MessagingException: Could not find route
for exchange: InOnly[
    id: ID:192.168.123.110-122ee5aef40-4:14
    status: Active
    role: provider
    service: {http://hp.com/midas/\
            servicemix/1.0}custom-list
[...]
```

These messages indicate that the users, user groups, and user roles that define the access rights could not be read yet.

NOTE

If waiting for the Administration UI to start does not help, run the following commands:

```
/opt/OV/OMU/adminUI/adminui clean
/opt/OV/OMU/adminUI/adminui start
```

These commands restart the application and perform a cleanup of all log and run-time files, forcing the application to unpack again all necessary run-time files. After running these commands you should receive the BUILD SUCCESSFUL message. Again, there should be no more logging activity to

```
/opt/OV/OMU/adminUI/logs/servicemix.log.
```

-
- ❑ If the XML database that stores the user database was not successfully initialized during the installation, all initial user data may be missing. Therefore, any log-on attempt fails.

In this case, it is recommended to perform a complete reset of the XML database. The reset completely reinitializes the XML database.

NOTE

The following command is recommended only after a new installation of the Administration UI:

```
/opt/OV/OMU/adminUI/adminui init force
```

Make sure that you do not perform the initialization before the Administration UI is started. Otherwise, the operation fails because there is no connection to the internal XML database.

In this case, no restart of the Administration UI is necessary. The BUILD SUCCESSFUL message should appear and you should be able to log on with the default user name and password.

Do not run this command later during normal operation unless you are advised to do so by Product Support because it will destroy and reinitialize all custom user configuration.

-
- ❑ If you have an expired HPOM license password, a warning message appears and the log-on fields are not shown.

To solve this problem, follow these steps:

1. Check the HPOM license password by running one of the following commands:

```
ovolicence -s -p HPOM
```

```
ovolicence -s -p HPOM | grep ovosv \  
| grep -i critical; /opt/OV/bin/ovolicence \  
-s -p HPOM | grep ovosv | grep -i locked
```

2. Install a valid HPOM license password.

For example, to install a new license:

```
JAVA_HOME=/opt/OV/nonOV/jre/b
```

```
export JAVA_HOME
```

```
/opt/OV/bin/ovolicence -gui -a HPOM
```

```
/opt/OV/bin/ovolicence -install -category OMU -file \  
lic.dat
```

3. After the license update, restart the Administration UI by running the following commands:

```
/opt/OV/OMU/adminUI/adminui stop
```

```
/opt/OV/OMU/adminUI/adminui clean  
/opt/OV/OMU/adminUI/adminui start
```

IMPORTANT

If you still receive the warning message, delete your browser cache or refresh a web page.

If none of the described solutions help, contact Product Support.

Menu Display Problem

If there is a problem with a menu display, it might be caused by the cache of the web browser. In this case, force a cache refresh in the browser.

Cache refresh command reloads the page without using the existing cached data. The menus are displayed horizontally instead of vertically.

After a successful logon, sometimes the Help page not found error message appears. The reason is a browser bookmark containing a URL from a previous Administration UI version. For example:

❑ *IPv4 address:*

```
http://192.168.10.88:9662/midas/<lang>/index.html
```

❑ *IPv6 address:*

```
http://[fec0::250:56ff:fea8:2ad2]:9662/midas/<lang>/index.html
```

In these instances, *<lang>* is *en* for English or *ja* for Japanese.

IMPORTANT

With an IPv6 address, you can open the Administration UI by using a browser only on systems where IPv6 is enabled. Make sure you use the square brackets ([]) as shown in the example.

To prevent this from happening, shorten the URL to `http://address:port` and update the bookmark in your browser. For example:

❑ *IPv4 address:*

```
http://192.168.10.88:9662
```

❑ *IPv6 address:*

`http://[fec0::250:56ff:fea8:2ad2]:9662`

Reconfiguring the HPOM Software

If you want to reconfigure the HPOM software, run the HPOM configuration utility `ovoconfigure` as the `root` user on the management server.

If you want to use a separate system as the database server, first configure the database server system as described in “Setting Up HPOM with a Remote/Manual Oracle Database” on page 130 or “Setting Up HPOM with a Remote/Manual PostgreSQL Database” on page 145.

To reconfigure the HPOM software, follow these steps:

1. Make sure that the `LANG` environment variable is set to a UTF-8 locale.

For more information, see “Configuring Input/Output for Multiple Language Support” on page 41.

To check the setting, type the following command:

```
echo $LANG
```

2. *For an Oracle database only:* Export all Oracle environment variables including `NLS_LANG`.

For instructions, see “Before Installing an Oracle Database” on page 47.

NOTE

Make sure that you set the same `ORACLE_SID` value as the one you specified before running the `ovoinstall` script.

3. To start `ovoconfigure`, type the following:

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

For details, see “Configuring an Oracle Database” on page 74 or “Configuring a PostgreSQL Database” on page 76.

3 **Installing the Java GUI**

In This Chapter

This chapter describes how to do the following:

- ❑ Install, configure, and start the Java GUI.
- ❑ Configure a web server to use customized icons and background graphics.

This chapter assumes that you already installed the HPOM software and that you have a supported web server, as described by the vendor of the server.

Supported Platforms

The Java GUI is tested only on the operating system platforms listed in Table 3-1, and is therefore supported only on these operating system platforms.

IMPORTANT

On all operating system platforms not listed in Table 3-1, you run the Java GUI at your own risk.

Running the Java GUI on a UNIX platform is not recommended because it can lead to performance problems.

Table 3-1 Supported Platforms of the Java GUI Client

Supported Platforms	Java Application	Java Applet ^a
HP-UX 11i v3 on HP Integrity	yes	yes
Mac OS X Mac OS X running on Intel processors	yes	yes
RHEL 5.x and 6.x Oracle Linux 6.x CentOS Linux 6.x	yes	yes
Solaris 10	yes	yes
Windows XP Windows 2003 Windows 2003 Server (64-bit) Windows Vista Windows 2008 R2 (64-bit) Windows 7	yes	yes

a. For the list of supported web browsers, see “Supported Web Browsers” on page 104.

NOTE

For the most up-to-date list of supported platforms, see the support matrix at the following location:

<http://support.openview.hp.com/selfsolve/document/KM323488>

Supported Languages

For a list of languages into which the Java GUI is translated, see Table 3-2.

Table 3-2 Supported Languages of the Java GUI Client

Supported Platforms	Language
HP-UX 11i v3 on HP Integrity	Japanese Korean Simplified Chinese Spanish
Mac OS X Mac OS X running on Intel processors	Japanese Korean Simplified Chinese Spanish
RHEL 5.x and 6.x Oracle Linux 6.x CentOS Linux 6.x	Japanese Korean Simplified Chinese Spanish
Solaris 10	Japanese Korean Simplified Chinese Spanish
Windows XP Windows 2003 Windows 2003 Server (64-bit) Windows Vista Windows 2008 R2 (64-bit) Windows 7	Japanese Korean Simplified Chinese Spanish

NOTE

For the most up-to-date list of supported platforms, see the support matrix at the following location:

<http://support.openview.hp.com/selfsolve/document/KM323488>

When starting the Java GUI, select the correct locale. The locale influences the sorting, the text display, and the representation of date and time. It also selects the localized files for your installation.

Installation Requirements

This section describes the hardware and software requirements for installing the Java GUI, as well as web browsers supported by the product.

Hardware Requirements

❑ UNIX or Linux

For more information, see Chapter 1, “Installation Requirements for the Management Server.”

❑ Windows

The best performance is achieved with an x86-based PC with a processor of at least 1 Ghz, a minimum of 256 MB RAM, and additional 30MB RAM per GUI session.

Software Requirements

Java Runtime Environment (JRE) version 1.7 or higher must be installed on the system where the Java GUI will be installed and running.

For the most up-to-date list of supported JRE versions, see the support matrix at the following location:

<http://support.openview.hp.com/selfsolve/document/KM323488>

Cockpit View Client Requirements

Make sure your cockpit view client meets the following requirements:

- Microsoft Windows XP
- Microsoft Internet Explorer 7
- Adobe Flash Player 10 with ActiveX
- Sun JRE 1.7 or higher

Supported Web Browsers

If you want to run the Java GUI as an applet from a web browser or if you want to use the online documentation supplied with the Java GUI, you should have one of the following web browsers installed:

- ❑ Microsoft Internet Explorer 9 or higher
- ❑ Mozilla Firefox 24 or higher
- ❑ Chrome 32 or higher
- ❑ Safari 6 or higher

For the most up-to-date list of supported web browser versions and architectures, see the support matrix at the following location:

<http://support.openview.hp.com/selfsolve/document/KM323488>

NOTE

The valid browsers are browsers with ActiveX and external browsers. On UNIX, only an external browser can be used. On Windows, a browser with ActiveX is the default browser.

Installing the Java GUI

You can either run the Java GUI directly on your management server system or use HTTP or FTP to transfer Java GUI binaries from the management server to the system where the Java GUI will be running.

The HP Operations management server installation automatically installs the Java GUI binaries into the `/opt/OV/www/htdocs/ito_op/` directory on the management server.

Installation Requirements

Before installing the Java GUI, make sure the following prerequisites are met:

- ❑ The management server system meets all the hardware and software requirements described in Chapter 1, “Installation Requirements for the Management Server.”

NOTE

The kernel parameter that defines the maximum number of file descriptors per process must be adjusted to ensure good performance.

- ❑ HPOM software for the management server is installed.
- ❑ JRE 1.7 or higher is installed on the system where the Java GUI will be installed and running.

For the most up-to-date list of supported JRE versions, see the support matrix at the following location:

<http://support.openview.hp.com/selfsolve/document/KM323488>

The HPOM installation automatically installs and configures Tomcat web server version 7 on the management server.

Installing the Java GUI Through HTTP

To install the Java GUI through HTTP, follow these steps:

1. Make sure that all the prerequisites are met as described in “Installation Requirements” on page 103.
2. Make sure that an HTTP server is installed and running.

If you are using the HPOM Tomcat server, the `ovtomcatB` process must be running. To check if the `ovtomcatB` process is running, type the following:

```
/opt/OV/bin/ovc -status WEB
```

If the `ovtomcatB` process is not running, you can start it by typing the following command:

```
/opt/OV/bin/ovc -start WEB
```

3. On the system where the Java GUI will be running, enter one of the following URLs in a web browser:

```
http://<management_server>:8081/ITO_OP
```

```
https://<management_server>:8444/ITO_OP
```

In these URLs, `<management_server>` is the fully qualified hostname of your management server.

4. Follow the instructions on the web page:

- *Installation on a Windows system:*
Download and execute the `ITO_JAVA.exe` file.
- *Installation on an HP-UX, Solaris, Linux, or Mac OS X system:*
Download and untar the `ito_op_install.tar` file.

Installing the Java GUI Through FTP

To install the Java GUI through FTP, follow these steps:

1. Make sure that all the prerequisites are met as described in “Installation Requirements” on page 103.

2. Transfer the files through FTP by following these steps:
 - a. Open a command prompt or a terminal window on the system where the Java GUI will be installed.
 - b. Start an FTP connection to the HP Operations management server by typing the following:

```
ftp <management_server>
```

In this instance, <management_server> is the hostname of your management server.
 - c. Make sure that the binary mode is used by typing the following:

```
bin
```
 - d. Move to the directory where the Java GUI software is located by running the following command:

```
cd /opt/OV/www/htdocs/ito_op
```

Obtain the Java GUI executable by running one of the following commands:
 - *For a Windows system:*

```
get ITO_JAVA.exe
```
 - *For a UNIX-based system:*

```
get ito_op_install.tar
```Close the FTP connection when the files are transferred.
3. Extract the software from the files by running one of the following commands:
 - *For a Windows system:*

```
<drive_letter>:ITO_JAVA.exe
```

This starts the installation wizard that guides you through the installation.
 - *For a UNIX-based system:*

```
tar xvf ito_op_install.tar
```

Installing the Java GUI from the Installation Media

On Linux systems other than HP Operations management servers, use the `rpm` tool to install the Java GUI client. The `rpm` tool is supplied with the operating system.

To install the Java GUI on Linux systems by using the `rpm` tool, follow these steps:

1. Make sure that all the prerequisites are met as described in “Installation Requirements” on page 103.

2. For all languages, run the following command:

```
rpm -i --nodeps \  
/<mount_point>/packages/HPOvOUWwwGui.rpm
```

3. For each language respectively, run the following command:

- *English:*

```
rpm -i --nodeps \  
/<mount_point>/packages/HPOvOUWwwEng.rpm
```

- *Spanish:*

```
rpm -i --nodeps \  
/<mount_point>/packages/HPOvOUWwwSpa.rpm
```

- *Japanese:*

```
rpm -i --nodeps \  
/<mount_point>/packages/HPOvOUWwwJpn.rpm
```

- *Korean:*

```
rpm -i --nodeps \  
/<mount_point>/packages/HPOvOUWwwKor.rpm
```

- *Simplified Chinese:*

```
rpm -i --nodeps \  
/<mount_point>/packages/HPOvOUWwwSch.rpm
```

In these instances, `<mount_point>` is the location where the HPOM installation DVD is mounted.

Starting the Java GUI

This section describes how to start the Java GUI (and consequently Service Navigator) on a Windows system, on a UNIX-based system, and from a web browser.

NOTE

To log on to the Java GUI for the first time, use default users and passwords. The default log-on passwords are as follows:

- ❑ For administrators: `OpC_adm`
- ❑ For operators: `OpC_op`

The next time you log on, you should change your default password for security reasons. You can change your password again later, but you will not be allowed to set the password back to the default one.

If you want to access web pages that start Java applets in a workspace, the Java GUI must be running as an applet. For more information about starting the Java GUI as an applet, see “Starting the Java GUI from a Web Browser” on page 111.

Make sure you use the proper `LANG` variable when starting the Java GUI in languages other than English. Starting the Java GUI by using the English locale `C` and then switching to the other language may result in incorrectly displayed accentuated characters in some dialog boxes and in displaying garbage characters in the window title.

ito_op Startup Script

The `ito_op` startup script first reads the environment variables, then evaluates the command line options, and finally the preferences listed in the `itooprc` file.

For more information about the `ito_op` script, see the *ito_op(1M)* manual page (UNIX), the *ito_op.bat* script (Windows), and the *HPOM Administrator's Reference*.

Starting the Java GUI on a Windows System

The install shield of the Java GUI client software installs a desktop shortcut for the GUI.

To start the Java GUI on a Windows system, follow these steps:

1. Do one of the following:
 - Use the installed desktop shortcut.
 - Enter the following:

```
<drive_letter>:<install_directory>\ito_op.bat
```

The Java GUI starts and displays a log-on screen.

2. Enter the HPOM user name and password.

NOTE

The user name can contain Unicode characters.

3. Enter the management server hostname.

Starting the Java GUI on a UNIX-based System

To start the Java GUI on a UNIX-based system, follow these steps:

1. Export the DISPLAY environment variable if needed.
2. Enter the following:

```
/opt/OV/www/htdocs/ito_op/ito_op &
```

The Java GUI starts and displays a log-on screen.

3. Enter the HPOM user name and password.

NOTE

The user name can contain Unicode characters.

Starting the Java GUI from a Web Browser

NOTE

You do not need to install the GUI if you want to start the Java GUI from a web browser. Simply download the Java applet provided with the GUI client software.

To start the Java GUI from a web browser, follow these steps:

1. Make sure that all the prerequisites are met as described in “Installation Requirements” on page 103.
2. On the system where the Java GUI will be running, open one of the following URLs in a web browser:

`http://<management_server>:8081/ITO_OP`

`https://<management_server>:8444/ITO_OP`

In these URLs, *<management_server>* is the fully qualified hostname of your management server.

3. Follow the instructions given on the web page for downloading the Java applet.

Connecting Through a Firewall

If you want to access the HP Operations management server with the Java GUI from outside a firewall, open port 35211. Port 35211 is the socket used by the Java GUI to connect to the management server.

Configuring the HTTP Server

Install your web server as described in the vendor's documentation and verify that the web server is running properly.

If you want to install and access the Java GUI, you must configure your HTTP server. The configuration varies depending on the type of HTTP server.

The following web servers are supported:

- ❑ Apache Tomcat (automatically installed and configured with the HPOM installation)
- ❑ Netscape
For details about configuring a Netscape web server, see “Configuring a Netscape Web Server.”
- ❑ W3C Jigsaw
For details about configuring a W3C Jigsaw web server, see “Configuring a W3C Jigsaw Web Server” on page 113.

Configuring a Netscape Web Server

To configure Netscape for installing and accessing the Java GUI, follow these steps:

1. Select the Netscape web server that you want to configure.
2. From Netscape Enterprise Configuration, do the following:
 - a. Click the **Content mgmt** button at the top of the window.
 - b. Select **Additional Document Directories** from the left side of the window.
 - c. For URL prefix, enter:
`ITO_OP/`
 - d. For Map To Directory, enter:
`/opt/OV/www/htdocs/ito_op`
 - e. Click **OK**.

f. Click **Save and Apply**.

Restart your web server, and then open one of the following URLs:

```
http://<server_hostname>:8081/ITO_OP/
```

```
https://<server_hostname>:8444/ITO_OP/
```

In these URLs, *<server_hostname>* is the hostname of your web server, including the domain.

3. Make sure the `.exe` extension is defined in the following file:

```
/opt/ns-fasttrack/httpd-<server_hostname>/config/  
mime.types
```

4. Add the following line to the file:

```
type=application/octet-stream exts=exe
```

Configuring a W3C Jigsaw Web Server

To configure a W3C Jigsaw web server for installing and accessing the Java GUI, follow these steps:

1. Add the following line to the `httpd.conf` file:

```
Pass /ITO_OP/* /opt/OV/www/htdocs/ito_op/*
```

2. Restart the web server.

3. Open the following URL:

```
http://<server_hostname>/ITO_OP/
```

In this instance, *<server_hostname>* is the hostname of your web server, including the domain.

4 Service Management and Database Configuration

In This Chapter

This chapter describes how to do the following:

- ❑ Set up startup and shutdown operations for the HP Operations management server services.
- ❑ Start and stop a database automatically.
- ❑ Start and stop a database manually.
- ❑ Replace an HPOM database.
- ❑ Set up HPOM with a remote/manual database.
- ❑ Set up HPOM in an Oracle Real Application Clusters (RAC) environment.

Starting and Stopping HPOM

When you configure HPOM, the startup of the HPOM processes is automatically integrated into the system boot sequence.

You can, however, start the HP Operations management server services by using the `opcsv -start` command. Similarly, you can stop the HP Operations management server services by using the `opcsv -stop` command.

The `opcsv` command is located in the `/opt/OV/bin/OpC` directory and has the following functions:

- `opcsv -start` Starts the HP Operations management server processes.
- `opcsv -stop` Stops the HP Operations management server processes.
- `opcsv -status` Displays detailed status information on the HP Operations management server processes.

The `opcsv` command does not start and stop the subagent processes. The subagent communication processes are managed by the `ovc` command, which is located at `/opt/OV/bin`. If you want to stop the HP Operations agent processes, use `ovc -stop AGENT`. If you want to start the HP Operations agent processes, use `ovc -start AGENT`.

For more information about the `opcsv` and `ovc` commands, see the *opcsv(1)* and *ovc(1M)* manual pages.

TIP

If you experience communication problems between the HP Operations server and agents, or if the server processes are not correctly informed about configuration changes, restart both the HP Operations management server and HP Operations agent processes:

```
/opt/OV/bin/ovc -stop SERVER AGENT  
  
/opt/OV/bin/ovc -start SERVER AGENT
```

Starting and Stopping a Database Automatically

HPOM can be configured to start or stop the database automatically whenever you start up and shut down the HP Operations management server.

Starting and Stopping an Oracle Database Automatically

To ensure an automatic startup and shutdown of the Oracle database whenever you start up and shut down the HP Operations management server, use the `/etc/init.d/ovoracle` script. If you choose to start the HP Operations management server processes automatically at startup, make sure that the Oracle database is started before HPOM.

The option for the automatic startup and shutdown of the database is set in the following file:

```
/etc/sysconfig/ovoracle
```

Change the `OVORACLE` and `OVORALISTENER` variables to 1, as shown in the following extract from the file:

```
# configure if oracle database should be started
# 0 - do not start
# 1 - start
# default is 0. This may be changed here manually
#
OVORACLE=1
OVORALISTENER=1
```

Starting and Stopping a PostgreSQL Database Automatically

To ensure an automatic startup and shutdown of the PostgreSQL database whenever you start up and shut down the HP Operations management server, use the `/etc/init.d/ovopsql` script. If you choose to start the HP Operations management server processes automatically at startup, make sure that the PostgreSQL database is started before HPOM.

The `ovopsql` script is configured to run at startup and it reads the `/etc/ovopsql` configuration file containing a list of database clusters that are started automatically. The configuration file is automatically updated when you create a database cluster by using `psqlcluster -ar`, but you can also customize it by editing the configuration file manually.

NOTE

If you want to start and stop a PostgreSQL database automatically with a remote PostgreSQL database, you must install the `HPovOUPSQLConf` package. For details, see “Installing and Configuring HPOM with a Remote/Manual Oracle Database” on page 141.

Starting and Stopping a Database Manually

If you choose not to incorporate the database startup and shutdown commands in the system boot sequence, you must start and stop the database manually.

IMPORTANT

Start the database before starting HPOM and stop the database after stopping HPOM.

Starting and Stopping an Oracle Database Manually

Depending on whether you want to start or stop an Oracle database manually, follow the steps described in one of the following two sections:

- ❑ “Starting an Oracle Database Manually” on page 120
- ❑ “Stopping an Oracle Database Manually” on page 121

Starting an Oracle Database Manually

To start an Oracle database manually, follow these steps:

1. Switch to the `oracle` user:

```
su - oracle
```

2. Set the `ORACLE_HOME` environment variable.

The default is as follows:

```
export ORACLE_HOME=/opt/oracle/product/<version>
```

In this instance, `<version>` is the Oracle database version 11g (11.1.0 or 11.2.0).

3. Set the `ORACLE_SID` environment variable.

The default is as follows:

```
export ORACLE_SID=openview
```

4. Run the SQL*Plus tool to administrate the database:

```
<ORACLE_HOME>/bin/sqlplus /nolog
```


5. Enter the following commands at the prompt to start the Oracle database:

```
connect / as sysdba
startup
exit
```

6. Switch back to the root user:

```
exit
```

Stopping an Oracle Database Manually

To stop an Oracle database manually, follow these steps:

1. Switch to the `oracle` user:

```
su - oracle
```

2. Set the `ORACLE_HOME` environment variable.

The default is as follows:

```
export ORACLE_HOME=/opt/oracle/product/<version>
```

In this instance, `<version>` is the Oracle database version 11g (11.1.0 or 11.2.0).

3. Set the `ORACLE_SID` environment variable.

The default is as follows:

```
export ORACLE_SID=openview
```

4. Run the SQL*Plus tool:

```
<ORACLE_HOME>/bin/sqlplus /nolog
```

5. Enter the following to stop the Oracle database:

```
connect / as sysdba
shutdown
exit
```

6. Switch back to the root user:

```
exit
```

Starting and Stopping a PostgreSQL Database Manually

Depending on whether you want to start or stop a PostgreSQL database manually, follow the steps described in one of the following two sections:

- ❑ “Starting a PostgreSQL Database Manually” on page 122
- ❑ “Stopping a PostgreSQL Database Manually” on page 122

Starting a PostgreSQL Database Manually

To start a PostgreSQL database manually, follow these steps:

1. Switch to the PostgreSQL operating system user:

```
su - <OS_DBA_user>
```

In this instance, `<OS_DBA_user>` is the operating system user that controls database processes and has access to all PostgreSQL binaries and HPOM database directories. The default is `postgres`.

2. Run the `pg_ctl` tool to start the database:

```
<PostgreSQL_binary_directory>/pg_ctl \  
-D <PostgreSQL_cluster_directory> start -l logfile
```

3. Switch back to the root user by running the following command:

```
exit
```

Stopping a PostgreSQL Database Manually

To stop a PostgreSQL database manually, follow these steps:

1. Switch to the PostgreSQL operating system user:

```
su - <OS_DBA_user>
```

In this instance, `<OS_DBA_user>` is the operating system user that controls database processes and has access to all PostgreSQL binaries and HPOM database directories. The default is `postgres`.

2. Run the `pg_ctl` tool to stop the database:

```
<PostgreSQL_binary_directory>/pg_ctl \  
-D <PostgreSQL_cluster_directory> stop [ -m [s|f|i] ]
```

You can specify how you want the PostgreSQL database server to be stopped. This means that you can choose among the following modes:

- m Shutdown mode.
- s Smart shutdown mode that waits for all users to disconnect.
- f Fast shutdown mode that rolls back all transactions and disconnects.
- i Immediate shutdown mode that aborts all sessions immediately.

NOTE

If you do not specify any mode, the smart shutdown mode is used.

3. Switch back to the `root` user by running the following command:

```
exit
```

Native Language Support in a Database

This section summarizes the Native Language Support (NLS) rules that are used by an installed database.

NOTE

To avoid unnecessary conversions taking place in the database, use the same character set for both the database and the environment of the HPOM user interface and server processes. After you install a database, you can no longer change the character set.

Oracle Database Character Set

The character set of the database is determined by the `CHARACTER SET` option of the `CREATE DATABASE` command. HPOM uses the `AL32UTF8` character set for all languages.

The NLS parameters are controlled by the Oracle environment variable `NLS_LANG` that has the following format:

```
<language>_<territory>.<character_set>
```

For example, HPOM uses the following `NLS_LANG` setting for the English language:

By default, HPOM uses the value of `NLS_LANG` set in the environment. If `NLS_LANG` is not set in the environment, HPOM uses the value specified in the following file:

```
/etc/opt/OV/share/conf/ovdbconf
```

If `NLS_LANG` is not present there, HPOM uses the `LANG` value to determine the value of `NLS_LANG`.

HPOM checks the character set of the Oracle database and stores this information as part of its configuration. Oracle provides the `v$nls_parameters` database table that contains the settings for the language and character set parameters.

PostgreSQL Database Character Set

Independently of whether you have control over the locale and encoding of a particular table or column, the default character set is specified when the database cluster is created. Because HPOM uses the UTF8 character set for the PostgreSQL database, the database is automatically created with this encoding.

Environment Variables in an Oracle Database

When starting the HPOM process with a database connection, the following steps are taken to determine the database variables:

1. The *ORACLE_HOME* variable is determined.

If *ORACLE_HOME* is set in the environment, this value is used.

If not, HPOM uses the value from the following configuration file:

```
/etc/opt/OV/share/conf/ovdbconf
```

2. The *ORACLE_SID* variable is determined.

If *ORACLE_SID* is set in the environment, this value is used.

If not, HPOM uses the value from the following configuration file:

```
/etc/opt/OV/share/conf/ovdbconf
```

3. The *NLS_LANG* variable is determined.

If *NLS_LANG* is set in the environment, this value is used.

If not, HPOM uses the value from the following configuration file:

```
/etc/opt/OV/share/conf/ovdbconf
```

4. It is determined whether the *DATABASE* <database> parameter is set by using the *ovconfchg* command line tool.

This parameter is used to establish a connection. If set, the *ORACLE_SID* variable is ignored.

For example, if the *DATABASE ov_net* line is set by using *ovconfchg*, the *opc_op/<password>@ov_net* string is used to connect to the *ov_net* identifier.

5. Connection to the database is established, as described in “Starting and Stopping a Database Automatically” on page 118.

If *DATABASE* is not used, the *opc_op/<passwd>* connect string is used.

Alternative Database Locations

Table 4-1 shows alternative database installations and describes the location of associated processes.

Table 4-1 **Alternative Database Locations**

| Database Scenario | Location of Processes |
|--------------------------------|--|
| Local and managed database | The following processes run on the management server: <ul style="list-style-type: none">• Database processes• HP Operations management server processes• GUI processes These processes connect to the database server. |
| Remote or independent database | The following processes run on the management server: <ul style="list-style-type: none">• HP Operations server processes• GUI processes The database processes run on the database server that can be on an external system or on the same system as the HP Operations management server. |

Replacing an HPOM Database

To replace an Oracle database with a PostgreSQL database and vice versa, follow these steps:

1. Download all configuration data by following these steps:
 - a. Create an empty download specification file:

```
mkdir /tmp/cfgdwn  
echo "*" ";" > /tmp/cfgdwn/download.dsf
```
 - b. Download the configuration:

```
/opt/OV/bin/OpC/opccfgdwn /tmp/cfgdwn/download.dsf \  
/tmp/cfgdwn
```
2. *Optional:* Download all messages by following these steps:
 - a. Perform a history download:

```
/opt/OV/bin/OpC/opchistdwn -older 0s -file \  
/tmp/history
```
 - b. Acknowledge all active messages:

```
/opt/OV/bin/OpC/opcack -u <user_for_all_msg_grps> \  
-a -f
```
 - c. Perform a second history download:

```
/opt/OV/bin/OpC/opchistdwn -older 0s -file /tmp/active
```
3. Stop HP Operations management server processes by running the following command:

```
/opt/OV/bin/ovc -kill
```
4. Stop the current database.
5. Install new database server binaries.

Depending on the type of database you want to use, see “Installing Oracle Database 11g Release 1 or Oracle Database 11g Release 2” on page 50 or “Installing PostgreSQL Server Binaries” on page 59.
6. *Recommended:* Back up old database directory and configuration files.

7. Remove the old database installation.
8. Create and configure a new database by using one of the following two methods:
 - ovoconfigure script
For details, see “Configuring an Oracle Database” on page 74 or “Configuring a PostgreSQL Database” on page 76.
 - opcdbsetup tool for the Oracle database or psqlcluster and psqlsetup tools for the PostgreSQL database
For details, see “Installing an Oracle Database” on page 46 or “Creating and Configuring a PostgreSQL Database Cluster” on page 146

NOTE

The new database must be created with new database server binaries (that is, the ones you installed in step 5).

9. Make sure that the new database server is up and running.
10. Upload the configuration data by running the following command:

```
/opt/OV/bin/OpC/opccfgupld -replace /tmp/cfgdwn
```
11. If you downloaded all the messages, upload them by following these steps:
 - a. Upload the active messages from your download:

```
/opt/OV/bin/OpC/opchistupl /tmp/active
```
 - b. Unacknowledge the active messages in the history message browser and disown them in the message browser by using the Java GUI.
For detailed information, see the *HPOM Java GUI Operator's Guide*.
 - c. Upload the history messages:

```
/opt/OV/bin/OpC/opchistupl /tmp/history
```
12. Restart HP Operations management server processes by running the following command:

```
/opt/OV/bin/ovc -start
```

Setting Up HPOM with a Remote/Manual Oracle Database

To set up HPOM with a remote/manual Oracle database, complete the following tasks:

- ❑ Task 1: “Checking System Requirements” on page 130
- ❑ Task 2: “Recognizing Limitations During the HPOM Runtime” on page 130
- ❑ Task 3: “Preparation Steps” on page 131
- ❑ Task 4: “Installing and Configuring HPOM with a Remote/Manual Oracle Database” on page 141

Checking System Requirements

Before you start setting up HPOM with a remote/manual Oracle database, make sure that the Oracle database server (which can be installed on any platform supported by Oracle) and the Oracle database client (which is installed on the HP Operations management server) are of the same version. You must select the Administrator installation type during the Oracle client installation.

Make sure that the previously created Oracle database for HPOM is used and that it is accessible through Oracle Net Services.

Recognizing Limitations During the HPOM Runtime

During the HPOM runtime, the following limitations apply:

- ❑ Removing the database or dropping the tablespaces by using `opcdbsetup` is not supported. You can remove the database or drop the tablespaces manually.

When removing the database manually, make sure to remove the following files from the HP Operations management server:

- `/etc/opt/OV/share/conf/ovdbconf`
- `/etc/opt/OV/share/conf/OpC/mgmt_sv/.opcdbpwd.sec`
- `/etc/opt/OV/share/conf/OpC/mgmt_sv/.opcdbrem.sec`

- ❑ The `mondbservice` policy can run only on the database server. Unassign the `mondbservice` policy from the HP Operations management server policy group and, if an HP Operations agent is running on the database server system, assign the `mondbservice` policy there.
- ❑ The `opcaddbf` tool is not supported.

NOTE

For the previously created Oracle database setup, the same limitations apply as for a remote/manual Oracle database setup.

Preparation Steps

Before installing and configuring HPOM with a remote/manual Oracle database, you must complete the following tasks:

- ❑ Task 1: “Creating and Configuring the HPOM Database on the Database Server” on page 132
- ❑ Task 2: “Configuring Users, Passwords, and Rights Manually” on page 136
- ❑ Task 3: “Configuring Access to the HPOM Database” on page 139

NOTE

Verify that your system meets the following Oracle 11g requirements:

- ❑ Oracle 11gR1 (11.1.0.7) or 11gR2 (11.2.0.1–11.2.0.4)
 - ❑ Oracle Net Services 11gR1 (11.1.0.7) or 11gR2 (11.2.0.1–11.2.0.4)
 - ❑ SQL*Plus 11gR1 (11.1.0.7) or 11gR2 (11.2.0.1–11.2.0.4)
-

Creating and Configuring the HPOM Database on the Database Server

To create and configure the HPOM database on the database server, follow these steps:

1. Depending on your system, choose one of the following to start the Database Configuration Assistant:

- *Unix and Linux systems:*

Log on to the database server as the `oracle` user, and then run the following command:

```
$ORACLE_HOME/bin/dbca
```

- *Windows systems:*

Move to the `<ORACLE_HOME>\bin` directory as the Oracle owner, and then run `dbca.bat`.

The Welcome window opens.

NOTE

In the process of creating the database by using the Oracle Database Creation Assistant, follow the wizard. Not all steps in the wizard are described in this procedure. In all the steps that are not described, leave default values or make custom selections that suit your needs.

2. In the Database Templates window, select **Custom Database**, and then click **Next**.
3. In the Database Identification window, enter the global database name and the Oracle System Identifier (for example, enter `openview` for the global database name). Click **Next**.
4. In the Management Options window, clear the **Configure Enterprise Manager** check box, and then click **Next**.

NOTE

If you leave the default value, the warning message appears informing you that you must either configure a listener before you can proceed or choose to continue without the Database Control configuration. In the latter case, which is recommended, you must clear the **Configure Enterprise Manager** check box.

5. In the Database Components tab of the Database Content window, clear all the components.
6. Click **Standard Database Components** in the Database Components window, and then clear all the features. Click **OK**.
7. In the Connection Mode tab of the Initialization Parameters window, select **Dedicated Server Mode**.
8. In the Character Sets tab of the Initialization Parameters window, select a supported character set and NLS_LANG values.
For example, select **AL32UTF8** for the English database.

NOTE

For more information about supported character sets and NLS_LANG values, see the *HPOM Administrator's Reference*.

9. In the Initialization Parameters window, click **All Initialization Parameters**, and then set initialization parameters using the recommended values (see Table 4-2).

IMPORTANT

Make sure that db_block_size is at least 16384 bytes. Otherwise, HPOM database creation fails and you must recreate the database from the beginning.

Table 4-2 Initialization Parameters

| Parameter | Value |
|------------------|---------------|
| db_block_size | 16384 |
| diagnostic_dest | <ORACLE_BASE> |

Table 4-2 Initialization Parameters (Continued)

| Parameter | Value |
|-------------------------------|--------------|
| db_files | 80 |
| db_file_multiblock_read_count | 16 |
| memory_target ^a | 500M |
| log_checkpoint_interval | 99999 |
| processes | 200 |
| dml_locks | 100 |
| log_buffer | 1572864 |
| max_dump_file_size | 10240 |
| open_cursors | 1024 |
| sort_area_size | 262144 |
| compatible | 11.1.0.0.0 |
| nls_length_semantics | BYTE |

a. The variable that controls the global memory usage of the HPOM instance. The other variable, `memory_max_target`, allows you to dynamically increase the value of `memory_target`. By default, the `memory_max_target` parameter takes the same value as `memory_target`. If you want to adjust the `memory_target` value without restarting the instance, manually specify a greater value for `memory_max_target`.

10. In the Database Storage window, create tablespaces and their datafiles by using the recommended initial sizes (see Table 4-3). Make sure to set `OPC_TEMP` as a default temporary tablespace.

IMPORTANT

Create the datafiles as autoextend files, so that the datafiles can grow as needed. The autoextend option can be enabled in the Datafiles list under the Storage tab.

Table 4-3 Size of Tablespaces and Their Datafiles

| Tablespace Name | Tablespace Type | Datafile | |
|-----------------|---------------------------|----------|------|
| | | Size | Next |
| SYSTEM | Locally managed/permanent | 250M | 1M |
| SYSAUX | Locally managed/permanent | 400M | 1M |
| TEMP | Locally managed/temporary | 20M | 5M |
| OPC_1 | Locally managed/permanent | 4M | 6M |
| OPC_2 | Locally managed/permanent | 5M | 6M |
| OPC_3 | Locally managed/permanent | 1M | 1M |
| OPC_4 | Locally managed/permanent | 26M | 2M |
| OPC_5 | Locally managed/permanent | 1M | 1M |
| OPC_6 | Locally managed/permanent | 4M | 2M |
| OPC_7 | Locally managed/permanent | 4M | 2M |
| OPC_8 | Locally managed/permanent | 4M | 2M |
| OPC_9 | Locally managed/permanent | 6M | 2M |
| OPC_10 | Locally managed/permanent | 6M | 6M |
| OPC_INDEX1 | Locally managed/permanent | 13M | 1M |
| OPC_INDEX2 | Locally managed/permanent | 10M | 1M |
| OPC_INDEX3 | Locally managed/permanent | 10M | 1M |
| OPC_TEMP | Locally managed/temporary | 4M | 1M |
| UNDOTBS1 | Undo | 200M | 5M |

NOTE

HPOM requires at least three redo logs with the size of 20M each. Having more and bigger redo logs may increase the performance. It is recommended that you create mirrored copies of the redo logs on another disk. For more information, see the *HPOM Administrator's Reference*.

11. In the Creation Options window, select **Create Database**, and then click **Finish**.

IMPORTANT

When the database is created, define the passwords for the SYSTEM and SYS users.

Do not forget the passwords you defined. You will need these passwords for HPOM configuration and database administration.

Configuring Users, Passwords, and Rights Manually

To configure users, passwords, and user rights on the database server manually, follow these steps:

1. Connect as sysdba as follows:
 - a. Depending on your system, choose one of the following:
 - *Unix and Linux systems:*
Log on as the oracle user by running the following command:

```
su - oracle
```
 - *Windows systems:*
Move to the <ORACLE_HOME>\bin directory as the Oracle owner.
 - b. Run the following command:

```
sqlplus "system as sysdba"
```
2. Enter the password for the system user.
This is the password you set when creating the database.

3. Enter the following command to create the `opc_op` user:

```
create user opc_op identified by <password>  
default tablespace OPC_5 temporary tablespace OPC_TEMP;
```

For example:

```
create user opc_op identified by pwd123  
default tablespace OPC_5 temporary tablespace OPC_TEMP;
```

4. Enter the following command to create the `opc_report` user:

```
create user opc_report identified by <password>  
default tablespace OPC_5 temporary tablespace OPC_TEMP;
```

5. Configure user rights for the users you created.

Enter the following commands:

```
create role opc_report_role;  
  
grant create session to opc_report_role;  
grant opc_report_role to opc_report;  
  
grant connect,  
resource,  
create public synonym,  
drop public synonym,  
alter tablespace  
to opc_op;  
  
grant create table , create view to opc_op;
```

IMPORTANT

The `opc_report_role` is required and must be created.

6. Prevent the `opc_op` password from expiring by running the following command:

```
SQL> alter profile default limit password_life_time  
unlimited;
```

7. *Optional:* Configure additional user rights on the database server.

If you want to use the `mondbfile` policy, the `opc_odc` tool, and the HPOM data backup on the management server, type the following:

```
create role opc_monitorer;

grant select on v_$datafile to opc_monitorer;
grant select on v_$log to opc_monitorer;
grant select on v_$logfile to opc_monitorer;
grant select on v_$database to opc_monitorer;
grant select on v_$controlfile to opc_monitorer;
grant select on dba_free_space to opc_monitorer;
grant select on dba_data_files to opc_monitorer;
grant select on dba_extents to opc_monitorer;
grant select on dba_tablespaces to opc_monitorer;
grant select on dba_tables to opc_monitorer;

grant select on dba_indexes to opc_op;
grant select on dba_ind_columns to opc_op;
grant select on dba_cons_columns to opc_op;
grant select on dba_constraints to opc_op;
grant select on v_$parameter to opc_op;
grant select on v_$sga to opc_op;

grant opc_monitorer to opc_op;
```

IMPORTANT

The `mondbfile` policy can run only on the database server. If the HP Operations agent is running on the database server, you can assign the `mondbfile` policy there.

8. Close `sqlplus` by running the following command:

```
exit
```

NOTE

During database creation, a window may pop up with the following error displayed:

```
ORA-29807: Specified operator does not exist
```

In that case, click **Ignore**, and continue with the database configuration.

Configuring Access to the HPOM Database

To configure access to the HPOM database, you must configure Net Services files on the database server either by using Oracle tools or manually. You can choose an Oracle Net alias (HPOM default is `ov_net`) and specify the used Net Services alias when configuring the HP Operations management server.

To create Net Services files manually, follow these steps:

1. Configure Net Services that are needed on the database server.

The `tnsnames.ora` and `listener.ora` Net files are required. Optionally, you can also configure the `tnsnsv.ora` and `sqlnet.ora` files. These files are located in the `$ORACLE_HOME/network/admin` directory. For syntax examples for the `.ora` files, see “Syntax Examples for the `.ora` Files” on page 140.

NOTE

The example files described in “Syntax Examples for the `.ora` Files” on page 140 must be thoroughly followed with new lines, spaces, and tabs.

In all example files, change the hostname and directory path information according to your system settings.

2. Depending on your system, choose one of the following to start the listener:

- *Unix and Linux systems:*

As the `oracle` user, run the following command:

```
lsnrctl start
```

- *Windows systems:*

Move to the `<ORACLE_HOME>\bin` directory as the Oracle owner, and then run the following command:

```
lsnrctl start
```

3. After creating Net Services files, run the following commands:

```
sqlplus /nolog
connect /as sysdba
alter system set local_listener = ov_net scope = both;
shutdown immediate
startup
```

4. If you are using a firewall on the database system, enable connections to the configured listener port.

Syntax Examples for the .ora Files When configuring Net Services, consider the following example files:

Example 4-1

Example Contents of the tnsnames.ora File

```
ov_net =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS =
        (COMMUNITY = OPENVIEW_COMMUNITY)
        (PROTOCOL = TCP)
        (HOST = hrabal)
        (PORT = 1521)
      )
    )
  (CONNECT_DATA =
    (SID = openview)
  )
)
```

Example 4-2

Example Contents of the listener.ora File

```
STARTUP_WAIT_TIME_LISTENER = 0
LOG_DIRECTORY_LISTENER = /opt/oracle/product/11.1.0/network/log
LISTENER =
  (ADDRESS_LIST =
    (ADDRESS = (PROTOCOL = TCP) (HOST = hrabal) (PORT = 1521))
  )
SID_LIST_LISTENER =
  (SID_LIST =
    (SID_DESC =
```

```
(SID_NAME = openview)
(ORACLE_HOME = /opt/oracle/product/11.1.0)
)
)
CONNECT_TIMEOUT_LISTENER = 10
TRACE_LEVEL_LISTENER = OFF
LOG_FILE_LISTENER = listener
```

Example 4-3 Example Contents of the `tnsnv.ora` File

```
LOCAL_COMMUNITIES =
  (COMMUNITY_LIST =
    (COMMUNITY = OPENVIEW_COMMUNITY)
  )
```

Example 4-4 Example Contents of the `sqlnet.ora` File

```
TRACE_LEVEL_CLIENT = OFF
TRACE_DIRECTORY_CLIENT = /opt/oracle/product/11.1.0/network/log
LOG_DIRECTORY_CLIENT = /opt/oracle/product/11.1.0/network/log
```

On Windows systems, the example contents of the `sqlnet.ora` file also includes the following line:

```
SQLNET.AUTHENTICATION_SERVICES = (NTS)
```

Installing and Configuring HPOM with a Remote/Manual Oracle Database

To install and configure HPOM with a remote/manual Oracle database, install and configure the HP Operations management server software as described in “Installing and Configuring the HPOM Software on the Management Server” on page 65 with regard to the following steps:

1. When the `ovoinstall` script asks you if you want to continue with the server configuration, leave the `ovoinstall` window open, and then open a new window.
2. In the new window, as the `root` user, install the latest HP Operations management server patch, and then type `y` followed by **ENTER** to continue with the server configuration.

The ovoconfigure script asks you if you want to configure the database.

3. Type **y** followed by **ENTER**.

When the ovoconfigure script asks you if you want to set up the database manually (local or remote), leave the ovoconfigure window open.

4. Open a new window (a terminal to the database server, either local or remote) and, as the root user, follow these steps:

- a. Export ORACLE_HOME, ORACLE_SID, LANG, and LC_ALL (for an appropriate LANG value, see the *HPOM Administrator's Reference*).

NOTE

Make sure that you use ORACLE_HOME of the database client installation, and not ORACLE_HOME of the database server.

- b. Copy the following Net files from the Oracle database server to the HP Operations management server:

- \$ORACLE_HOME/network/admin/sqlnet.ora
- \$ORACLE_HOME/network/admin/tnsnames.ora
- \$ORACLE_HOME/network/admin/tnsnsv.ora

These files are required on the database server and the HP Operations management server. When you copy the files to the HP Operations management server, check that the directory paths point to the correct locations and modify them if necessary.

NOTE

The tnsnav.ora and sqlnet.ora files are optional. If you configured these files on the database server, you should also configure them on the HP Operations management server.

If you copy the sqlnet.ora file from the Windows system, remove the following line from it on the HP Operations management server:

```
SQLNET.AUTHENTICATION_SERVICES = (NTS)
```

5. Log on as the oracle user and verify that you can connect to the database. Run the following commands:

```
su - oracle  
sqlplus opc_op@ov_net
```

6. Return to the ovoconfigure window. Type **y** followed by **ENTER** to configure the database.

NOTE

If the database configuration fails, you can perform the database configuration step manually by using `opcdbsetup -p`.

If you rerun `ovoconfigure` after successfully configuring the database with `opcdbsetup -p`, make sure that you type **n** when the following question appears:

```
Configure the database?
```

7. *Optional:* If you configured additional user rights on the database server during the process of configuring users, passwords, and rights manually, you can run `/opt/OV/contrib/OpC/opc_odc` to verify the database setup (the log file is in `/tmp/opc_odc.log`).

8. Configure the Administration UI database connection parameters:

- a. Add the major Oracle database release number (that is, 11) to the `ovodb.DBMajorVersion` property in the `ovoappl.properties`, `opccfg.properties`, and `ovoconfig.properties` files:

```
ovodb.DBMajorVersion=11
```

Make sure that you do not use blank spaces.

- b. Edit the `ovodb.url` property in the `ovoinstall.properties`, `ovoconfig.properties`, `opccfg.properties`, and `ovoappl.properties` as follows:

```
ovodb.url=jdbc:oracle:thin:@<db_server_hostname>:  
<db_port>:<db_name>
```

In this instance, `<db_server_hostname>` is the hostname of the system where the remote database is located, `<db_port>` is the database port, and `<db_name>` is the name of the database.

- c. Restart the Administration UI by running the following commands:

```
/opt/OV/OMU/adminUI/adminui clean
```

```
/opt/OV/OMU/adminUI/adminui start
```


Setting Up HPOM with a Remote/Manual PostgreSQL Database

To set up HPOM with a remote/manual PostgreSQL database, complete the following tasks:

- ❑ Task 1: “Checking System Requirements” on page 145
- ❑ Task 2: “Recognizing Limitations During the HPOM Runtime” on page 145
- ❑ Task 3: “Creating and Configuring a PostgreSQL Database Cluster” on page 146.
- ❑ Task 4: “Installing and Configuring HPOM with a Remote/Manual PostgreSQL Database” on page 153

Checking System Requirements

Before you start setting up HPOM with a remote/manual PostgreSQL database, make sure that the PostgreSQL database server (which can be installed on any platform supported by PostgreSQL) and the PostgreSQL database client (which is installed on the HP Operations management server) are of the same major version (for example, version 9.1.x must be compatible with version 9.1.y).

In a remote database scenario, you must make sure that the previously created PostgreSQL database for HPOM is accessible through the network.

Recognizing Limitations During the HPOM Runtime

During the HPOM runtime, the following limitations apply:

- ❑ For an independent PostgreSQL database setup, removing the database cluster or dropping the database by using `opcdbsetup` is not supported. You can remove the database cluster or drop the database manually.

When removing the database cluster manually, make sure to remove the following files from the HP Operations management server:

- `/etc/opt/OV/share/conf/ovdbconf`

- /etc/opt/OV/share/conf/OpC/mgmt_sv/.opcdbpwd.sec
 - /etc/opt/OV/share/conf/OpC/mgmt_sv/.opcdbrem.sec
- ❑ The `mondbfile` policy is not supported with PostgreSQL. The `mondbfile` policy can run only on the database server. Unassign the `mondbfile` policy from the HP Operations management server policy group and, if an HP Operations agent is running on the database server system, assign the `mondbfile` policy there.
- ❑ The `opcadddbf` tool is not used with PostgreSQL.

Creating and Configuring a PostgreSQL Database Cluster

Before installing HPOM, you must create and configure a PostgreSQL database cluster. The PostgreSQL database cluster can be created by using the `psqlcluster` tool or manually. Unless you have a specific reason to create the PostgreSQL database manually, it is strongly recommended that you use the `psqlcluster` tool.

NOTE

Before proceeding, verify that the PostgreSQL version is 9.1, 9.2, or 9.3. Open-source versions and commercial offerings from EnterpriseDB are supported.

Depending on whether you want to create and configure a PostgreSQL database cluster by using the `psqlcluster` tool or manually, follow the instructions described in one of the following two sections:

- ❑ “Creating and Configuring a PostgreSQL Database Cluster by Using the `psqlcluster` Tool” on page 147
- ❑ “Creating and Configuring a PostgreSQL Database Cluster Manually” on page 150

Creating and Configuring a PostgreSQL Database Cluster by Using the psqlcluster Tool

To create and configure a PostgreSQL database cluster by using the psqlcluster tool, follow these steps:

1. On the database server system, run the psqlcluster tool that you can find at the following location:

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

The syntax of the psqlcluster tool is as follows:

```
psqlcluster -d <cluster_dir>  
            -b <path_to_psql_binaries>  
            [-o <OS_DBA_user>]  
            [-dt <data_tablespace_dir>]  
            [-it <index_tablespace_dir>]  
            -p <db_port>  
            [-dbu <DB_DBA_user>]  
            [-dbp <DB_DBA_password>]  
            -ar  
            -u  
            -h
```

You can use the following options with the psqlcluster tool:

| | |
|----------------------------|---|
| -d <cluster_dir> | Specifies the PostgreSQL cluster directory where you want the database to be created. |
| -b <path_to_psql_binaries> | Specifies the path to the directory where the PostgreSQL binaries are stored. |
| -o <OS_DBA_user> | Specifies the operating system user that controls database processes and has access to all PostgreSQL binaries and HPOM database directories. |
| -dt <data_tablespace_dir> | Specifies the directory where the data tablespaces are stored. |
| -it <index_tablespace_dir> | Specifies the directory where the index tablespaces are stored. |

| | |
|---|--|
| <code>-p <db_port></code> | Specifies the port on which the database cluster or server listens. |
| <code>-dbu <DB_DBA_user></code> | Specifies the name of the administrator user inside the database cluster or server. |
| <code>-dbp <DB_DBA_password></code> | Specifies the password of the administrator user inside the database cluster or server. |
| <code>-ar</code> | (autorestart) If this option is specified, the database cluster is started automatically at startup. |
| <code>-u</code> | (unattended) If this option is specified, no questions are asked during the PostgreSQL database cluster creation and configuration procedures. |
| <code>-h</code> | Shows the usage. |

2. Set up the PostgreSQL database cluster to be used with HPOM by using the `psqlsetup` tool that you can find at the following location:

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

The syntax of the `psqlsetup` tool is as follows:

```
psqlsetup  -f <path_to_psql_cluster>
           -l <path_to_psql_libs>
           -h <hostname>
           [-d <database_name>]
           -dba_pass <DB_DBA_password>
           [-dbop_pass <DB_opc_op_password>]
           [-dbrep_pass <DB_opc_report_password>]
           [-u]
           [-ni]
           [-help]
```

You can use the following options with the `psqlsetup` tool:

| | |
|---|--|
| <code>-f <path_to_psql_cluster></code> | Specifies the path to the PostgreSQL cluster directory where the database was created. |
| <code>-l <path_to_psql_libs></code> | Specifies the path to the directory where the PostgreSQL client libraries are stored. |
| <code>-h <hostname></code> | Specifies the system on which the database cluster or server is installed. |
| <code>-d <database_name></code> | Specifies the name of the HPOM database. |
| <code>-dba_pass
<DB_DBA_password></code> | Specifies the password of the administrator user inside the database cluster or server. |
| <code>-dbop_pass
<DB_opc_op_password></code> | Specifies the password for the <code>opc_op</code> database user. |
| <code>-dbrep_pass
<DB_opc_report_password></code> | Specifies the password for the <code>opc_report</code> database user. |
| <code>-u</code> | (unattended) If this option is specified, no questions are asked during the PostgreSQL database cluster creation and configuration procedures. |
| <code>-ni</code> | (not initialized) If this option is specified, you choose not to initialize the database with the default data. |
| <code>-help</code> | Shows the usage. |

Creating and Configuring a PostgreSQL Database Cluster Manually

To create and configure a PostgreSQL database cluster manually, follow these steps:

1. Verify that the operating system user (OS DBA user) is already created by the installation program or packages. If the operating system user is not created or you want to use another user, make sure to create it at this point.
2. Create a cluster directory where the main PostgreSQL cluster files will be stored. To do this, run the following command:

```
mkdir -p <cluster_directory>
```

3. Apply proper permissions to the cluster directory by running the following commands:

```
chown <OS_DBA_user> <cluster_directory>
```

```
chmod 700 <cluster_directory>
```

4. Create a file containing the password of the administrator user inside the database cluster or server by running the following command:

```
echo "<DB_DBA_user_password>" > <password_file>
```

5. Create a database cluster by using the `initdb` script provided by PostgreSQL. To do this, run the following commands:

```
su - <OS_DBA_user>
```

```
<PSQL_bin_directory>/initdb -D <cluster_directory> \  
-A md5 -E UTF8 --locale=en_US.utf8 -U <DB_DBA_user> \  
--pwfile=<password_file>
```

By running the `initdb` script, the basic structure of the database cluster is created and initialized.

6. Configure the database cluster by following these steps:
 - a. Open the `<cluster_directory>/postgresql.conf` file, and then change the `port` and `listen_addresses` parameters according to your needs.

For example:

```
port = 5432  
listen_addresses = '*'
```

NOTE

You can also customize other parameters to adapt the database to the environment needs (for example, `shared_buffers` and `work_mem`). For details, see the PostgreSQL documentation.

- b. Edit the `<cluster_directory>/pg_hba.conf` file to give access to HPOM users.

For example:

```
local all <DB_DBA_user>,opc_op,opc_report md5  
host all <DB_DBA_user>,opc_op,opc_report 0.0.0.0/0 md5  
host all <DB_DBA_user>,opc_op,opc_report ::0/0 md5
```

IMPORTANT

Make sure that the HP Operations management server can access the PostgreSQL port on the database system by checking the configuration of firewalls, proxies, and Network Address Translation (NAT).

- c. Edit the `.pgpass` file under the `<OS_DBA_user>` home directory to add local access to the administrator user inside the database cluster or the server.

For example:

```
localhost:<Port>:*:<DB_DBA_user>:<DB_DBA_user_password>
```

7. Start the database by running the following commands:

```
su - <OS_DBA_user>  
  
<PSQL_bin_directory>/pg_ctl -D <cluster_directory> \  
start -l <cluster_directory>/logfile
```

8. Create the data tablespace and index tablespace directories. For each directory, perform as follows:

- a. Create a directory:

```
mkdir -p <directory>
```

- b. Apply proper permissions to the directory:

```
chown <OS_DBA_user> <directory>
chmod 700 <directory>
```

- 9. Create the tablespaces inside the database. To do this, follow these steps:

- a. Switch to the operating system user that controls database processes and has access to all PostgreSQL binaries and HPOM database directories:

```
su - <OS_DBA_user>
```

- b. Connect to the database:

```
<PSQL_bin_directory>/psql -p <Port> \
-U <DB_admin_USER> -h localhost
```

- c. Set the character set to UTF-8:

```
psql> SET client_encoding = 'UTF8';
```

- d. For each tablespace listed in Table 4-4, run the following command:

```
CREATE TABLESPACE <tablespace_name> \
OWNER <DB_DBA_user> LOCATION E'<directory>;
```

For example:

```
CREATE TABLESPACE OPC_9 OWNER <DB_DBA_user> \
LOCATION E'<directory>;
```

Table 4-4 **Types of Tablespaces**

| Tablespace Name | Tablespace Type |
|-----------------|----------------------|
| OPENVIEW | Main data tablespace |
| OPC_1 | Data tablespace |
| OPC_2 | Data tablespace |
| OPC_3 | Data tablespace |
| OPC_4 | Data tablespace |
| OPC_5 | Data tablespace |
| OPC_6 | Data tablespace |

Table 4-4 **Types of Tablespaces (Continued)**

| Tablespace Name | Tablespace Type |
|------------------------|---------------------------|
| OPC_7 | Data tablespace |
| OPC_8 | Data tablespace |
| OPC_9 | Data tablespace |
| OPC_10 | Data tablespace |
| OPC_INDEX1 | Index tablespace |
| OPC_INDEX2 | Index tablespace |
| OPC_INDEX3 | Index tablespace |
| OPC_TEMP | Temporary data tablespace |

- e. Quit the PostgreSQL session, and then go back to the terminal window:

`\q`

Installing and Configuring HPOM with a Remote/Manual PostgreSQL Database

To install and configure HPOM with a remote/manual PostgreSQL database, install and configure the HP Operations management server software as described in “Installing and Configuring the HPOM Software on the Management Server” on page 65 with regard to the following steps:

1. When the `ovoinstall` script asks you if you want to continue with the server configuration, leave the `ovoinstall` window open, and then open a new window.
2. In the new window, as the root user, install the latest HP Operations management server patches (if needed), and then type **y** followed by **ENTER** to continue with the server configuration.

The `ovoconfigure` script asks you if you want to configure the database.
3. Type **y** followed by **ENTER**.

The following question appears:

Will HPOM run on an Oracle instance (n for PostgreSQL)?

4. Type **n** followed by **ENTER**.

The `ovoconfigure` script asks you if you want HPOM to manage the PostgreSQL database cluster.

5. Type **n** followed by **ENTER**.

You are asked a series of questions about the database configuration. For detailed information about these questions, see “Configuring a PostgreSQL Database” on page 76.

After you answer all the database-related questions, the summary of all provided answers appears.

6. After you check the data, type **y** followed by **ENTER**.

When the `ovoconfigure` script asks you to perform the remote/manual database configuration, leave the `ovoconfigure` window open.

7. Open a new window (a terminal to the database server, either local or remote) and, as the `root` user, choose how to create a database cluster, manually or automatically.

IMPORTANT

Before choosing the way of creating the database cluster, make sure that you performed all the steps described in “Installing PostgreSQL Server Binaries” on page 59 and “Preparing HPOM to Use the PostgreSQL Database” on page 60.

- *Creating a database cluster manually:* To create a database cluster manually, follow the instructions described in “Creating and Configuring a PostgreSQL Database Cluster Manually” on page 150.
- *Creating a database cluster automatically:* To create a database cluster automatically, use the `psqlcluster` tool as described in “Creating and Configuring a PostgreSQL Database Cluster by Using the `psqlcluster` Tool” on page 147.

If you have a database on a local system (that is, a manual PostgreSQL database), the `psqlcluster` tool is already on the system. On the other hand, if you have a database on a remote

system (that is, a remote PostgreSQL database), you must obtain the HPOvOUPSQLConf package that is appropriate for the architecture of the database system, copy it to the database system, and then install it there according to the procedure indicated for your operating system. You can find the latest version of the HPOvOUPSQLConf package that installs a copy of the `psqlcluster` tool in the database system at the following location:

```
/var/opt/packages/PSQL
```

8. Log on as the operating system user (OS DBA user), and then verify that you can connect to the database.

Run the following commands:

```
su - postgresql  
  
<PSQL_bin_directory>/psql -p <Port> \  
-U <DB_admin_USER> -h localhost  
  
psql > \q
```

9. Return to the ovoconfigure window. Type **y** followed by **ENTER** to configure the database.

NOTE

If the database configuration fails, you can perform the database configuration step manually by using `psqlsetup`.

If you rerun ovoconfigure after successfully configuring the database with `psqlsetup`, make sure that you type **n** when the following question appears:

```
Configure the database?
```

10. *Optional:* If you configured additional user rights on the database server during the process of configuring users, passwords, and rights manually, you can run `/opt/OV/contrib/OpC/opc_odc` to verify the database setup (the log file is in `/tmp/opc_odc.log`).

11. Configure the Administration UI database connection parameters:

- a. Add the first digit group of the major PostgreSQL version to the `ovodb.DBMajorVersion` property in the `ovoappl.properties`, `opccfg.properties`, and `ovoconfig.properties` files. For example, for PostgreSQL version 9.1, add 9:

```
ovodb.DBMajorVersion=9
```

Make sure that you do not use blank spaces.

- b. Edit the `ovodb.url` property in the `ovoinstall.properties`, `ovoconfig.properties`, `opccfg.properties`, and `ovoappl.properties` as follows:

```
ovodb.url=jdbc:postgresql://<db_server_hostname>:  
<db_port>/<db_name>
```

In this instance, `<db_server_hostname>` is the hostname of the system where the remote database is located, `<db_port>` is the database port, and `<db_name>` is the name of the database.

- c. Restart the Administration UI by running the following commands:

```
/opt/OV/OMU/adminUI/adminui clean
```

```
/opt/OV/OMU/adminUI/adminui start
```

Setting Up HPOM in an Oracle Real Application Clusters (RAC) Environment

Oracle Real Application Clusters (RAC) represents a highly available, scalable, and manageable solution for sharing access to a single database among managed nodes in a cluster environment. This shared access makes possible that even during a system fault on one of the nodes, data can be accessed from any of the remaining nodes. Work on the failed node is recovered automatically without the administrator's intervention and the data loss.

Oracle RAC is an Oracle Corporation exclusive technology that enables building large systems from commodity components and is the foundation for Enterprise GRID computing.

To set up HPOM in an Oracle RAC environment, complete the following tasks:

- ❑ Task 1: “Checking System Requirements” on page 157
- ❑ Task 2: “Recognizing Limitations During the HPOM Runtime” on page 158
- ❑ Task 3: “Installing Oracle RAC” on page 158
- ❑ Task 4: “Preparation Steps” on page 159
- ❑ Task 5: “Installing and Configuring HPOM in an Oracle RAC Environment” on page 172

Checking System Requirements

Before you start setting up HPOM in an Oracle RAC environment, make sure that the Oracle database server (which can be installed and used with HPOM on any platform supported by Oracle) and the Oracle database client (which is installed on the HP Operations management server) must be of the same version.

For detailed information about Oracle RAC server requirements, see the Oracle RAC documentation at the following URL:

<http://www.oracle.com/technology/documentation/database.html>

Make sure that the previously created Oracle database for HPOM is used and that it is accessible through Oracle Net Services.

IMPORTANT

HPOM supports Oracle 11g Release 1 RAC (11.1.0.7) or Oracle 11g Release 2 RAC (11.2.0.1–11.2.0.4).

Recognizing Limitations During the HPOM Runtime

During the HPOM runtime, the following limitations apply:

- ❑ Removing the database or dropping the tablespaces by using `opcdbsetup` is not supported. You can remove the database or drop the tablespaces manually.

When removing the database manually, make sure to remove the following files from the HP Operations management server:

- `/etc/opt/OV/share/conf/ovdbconf`
 - `/etc/opt/OV/share/conf/OpC/mgmt_sv/.opcdbpwd.sec`
 - `/etc/opt/OV/share/conf/OpC/mgmt_sv/.opcdbrem.sec`
- ❑ The `mondbfile` policy is not supported.
 - ❑ The `opcaddbf` tool is not supported.

NOTE

For the previously created Oracle database setup, the same limitations apply as for a remote/manual Oracle database setup.

Installing Oracle RAC

The Oracle RAC installation instructions are provided in the Oracle RAC documentation at the following URL:

<http://www.oracle.com/technology/documentation/database.html>

Preparation Steps

Before installing and configuring HPOM in an Oracle RAC environment, you must complete the following tasks:

- ❑ Task 1: “Creating and Configuring the HPOM Database on Cluster Nodes” on page 159
- ❑ Task 2: “Configuring Users, Passwords, and User Rights Manually” on page 164
- ❑ Task 3: “Configuring Access to the HPOM Database” on page 167

NOTE

Before proceeding, verify that your system meets the following Oracle 11g requirements:

- ❑ Oracle 11gR1 (11.1.0.7) or 11gR2 (11.2.0.1–11.2.0.4)
 - ❑ Oracle Net Services 11gR1 (11.1.0.7) or 11gR2 (11.2.0.1–11.2.0.4)
 - ❑ SQL*Plus 11gR1 (11.1.0.7) or 11gR2 (11.2.0.1–11.2.0.4)
-

Creating and Configuring the HPOM Database on Cluster Nodes

To create and configure the HPOM database on all cluster nodes¹, follow these steps:

1. Log on to the database server as the `oracle` user, and start the Database Configuration Assistant. Run the following command:

```
$ORACLE_HOME/bin/dbca &
```

The Welcome window opens.

NOTE

In the process of creating the database by using the Oracle Database Creation Assistant, follow the wizard. Not all steps in the wizard are described in this procedure. In all steps that are not described, leave default values or make custom selections that suit your needs.

1. Database instances can be created automatically or manually on all cluster nodes.

2. In the Welcome window, select **Oracle Real Application Clusters database**, and then click **Next**.

NOTE

The Welcome window is used for creating the Oracle RAC Database and it is displayed only if the Oracle home from which it is invoked is on the cluster system. Otherwise, the generic Welcome window opens that offers only the Oracle single instance database option.

3. In the Operations window, select **Create a Database**, and then click **Next**.
4. *If you are using Oracle Database 11g Release 2, skip this step:*
In the Node Selection window, select all cluster nodes on which you want to create the cluster database, and then click **Next**.
5. In the Database Templates window, select **Custom Database**, and then click **Next**.
6. In the Database Identification window, type the global database name (for example, `openview`) and the Oracle system identifier prefix (for example, `GRID`) for your cluster database. Click **Next**.
7. In the Management Options window, select **Configure Enterprise Manager** and **Configure Database Control for local management**, and then click **Next**.
8. In the Database Credentials window, define the passwords for the `SYSTEM` and `SYS` users, and then click **Next**.

IMPORTANT

Do not forget the passwords you defined. You will need these passwords for HPOM configuration and database administration.

9. In the Storage Options window, select **Automatic Storage Management (ASM)**, and then click **Next**.

At this point, you may be asked to provide the ASMSNMP password. If you do not remember this password, you can do one of the following:

- Specify an incorrect password.

When you specify an incorrect password, the error message appears. You can simply ignore this message and continue by clicking **Continue**.

- Change the ASMSNMP password.

To change the ASMSNMP password, connect to the +ASM instance, and then follow these steps:

- a. Switch to the `oracle` user:

```
su - oracle
```

- b. Set the proper Oracle environment variables for the Oracle Grid infrastructure.

- c. Run the following commands:

```
sqlplus / nolog
```

```
SQL> conn / as sysasm
```

- d. You can do one of the following:

- Change the password of an existing ASMSNMP user:

```
SQL> alter user asmsnmp identified by  
<password>
```

- Create a new ASMSNMP user:

```
SQL> create user asmsnmp identified by  
<password>;
```

```
grant sysdba to asmsnmp;
```

- e. Switch back to the `oracle` user:

```
exit
```

NOTE

If specifying an incorrect password or changing the ASMSNMP password does not solve the issue, check it with your database administrator or see the Oracle product documentation.

10. *If you are using Oracle Database 11g Release 2, skip this step:*
Enter the `SYS` password for the ASM instance, and then click **Next**.

11. In the Database Components tab of the Database Content window, first clear all the components, and then click **Standard Database Components...**

The Standard Database Components window opens.

12. In the Standard Database Components window, clear all the features, and then click **OK**.

The Database Content window opens again. Click **Next** to continue.

13. In the Character Sets tab of the Initialization Parameters window, select **Choose from the list of character sets**.

NOTE

For more information on supported character sets and NLS_LANG values, see the *HPOM Administrator's Reference*.

14. In the Connection Mode tab of the Initialization Parameters window, select **Dedicated Server Mode**.
15. In the Initialization Parameters window, click **All Initialization Parameters**, and then set initialization parameters using the recommended values (see Table 4-5).

Table 4-5 Initialization Parameters

| Parameter | Value |
|-------------------------------|--------------|
| db_block_size | 16384 |
| diagnostic_dest | /opt/oracle |
| db_files | 80 |
| db_file_multiblock_read_count | 16 |
| memory_target ^a | 500M |
| log_checkpoint_interval | 99999 |
| processes | 200 |
| dml_locks | 100 |
| log_buffer | 1572864 |
| max_dump_file_size | 10240 |

Table 4-5 Initialization Parameters (Continued)

| Parameter | Value |
|----------------------|--------------|
| open_cursors | 1024 |
| sort_area_size | 262144 |
| compatible | 11.1.0.0.0 |
| nls_length_semantics | BYTE |

- a. The variable that controls the global memory usage of the HPOM instance. The other variable, `memory_max_target`, allows you to dynamically increase the value of `memory_target`. By default, the `memory_max_target` parameter takes the same value as `memory_target`. If you want to adjust the `memory_target` value without restarting the instance, manually specify a greater value for `memory_max_target`.

16. In the Database Storage window, create tablespaces and their datafiles using the recommended initial sizes (see Table 4-6). Make sure to set `OPC_TEMP` as a default temporary tablespace.

Additional tablespaces are required depending on whether you plan to use Undo Tablespace Management or Rollback Segments.

IMPORTANT

Create the datafiles as autoextend files, so that the datafiles can grow as needed. The autoextend option can be enabled in the Datafiles list under the Storage tab.

Table 4-6 Size of Tablespaces and Their Datafiles

| Tablespace Name | Tablespace Type | Datafile | |
|------------------------|---------------------------|-----------------|-------------|
| | | Size | Next |
| SYSTEM | Locally managed/permanent | 300M | 1M |
| SYSaux | Locally managed/permanent | 400M | 1M |
| TEMP | Locally managed/temporary | 20M | 5M |
| OPC_1 | Locally managed/permanent | 7M | 6M |

Table 4-6 Size of Tablespaces and Their Datafiles

| Tablespace Name | Tablespace Type | Datafile | |
|-----------------|---------------------------|----------|------|
| | | Size | Next |
| OPC_2 | Locally managed/permanent | 7M | 6M |
| OPC_3 | Locally managed/permanent | 1M | 1M |
| OPC_4 | Locally managed/permanent | 26M | 2M |
| OPC_5 | Locally managed/permanent | 1M | 1M |
| OPC_6 | Locally managed/permanent | 5M | 2M |
| OPC_7 | Locally managed/permanent | 4M | 2M |
| OPC_8 | Locally managed/permanent | 4M | 2M |
| OPC_9 | Locally managed/permanent | 6M | 2M |
| OPC_10 | Locally managed/permanent | 7M | 6M |
| OPC_INDEX1 | Locally managed/permanent | 13M | 1M |
| OPC_INDEX2 | Locally managed/permanent | 10M | 1M |
| OPC_INDEX3 | Locally managed/permanent | 10M | 1M |
| OPC_TEMP | Locally managed/temporary | 4M | 1M |

NOTE

HPOM requires at least 3 redo logs with a size of 20M each. Having more and bigger redo logs may increase the performance. It is recommended that you create mirrored copies of the redo logs on another disk. For more information, see the *HPOM Administrator's Reference*.

- In the Creation Options window, select the **Create Database** option, and then click **Finish**.

Configuring Users, Passwords, and User Rights Manually

To configure users, passwords, and user rights on the database server manually, follow these steps:

1. From one of the nodes, log on as the oracle user, and connect as sysdba.

Type the following commands:

```
su - oracle  
sqlplus "system as sysdba"
```

2. Type the password for the system user.

This is the password you set when creating the database.

3. To create the opc_op user, run the following command:

```
create user opc_op identified by <password> \  
default tablespace OPC_5 temporary tablespace OPC_TEMP;
```

For example:

```
create user opc_op identified by pwd123 \  
default tablespace OPC_5 temporary tablespace OPC_TEMP;
```

4. To create the opc_report user, run the following command:

```
create user opc_report identified by <password> \  
default tablespace OPC_5 temporary tablespace OPC_TEMP;
```

5. To configure user rights for the users you created, run the following commands:

```
create role opc_report_role;  
  
grant create session to opc_report_role;  
grant opc_report_role to opc_report;  
  
grant connect,  
resource,  
create public synonym,  
create table,  
create view,  
drop public synonym,  
alter tablespace  
to opc_op;
```

IMPORTANT

The `opc_report_role` is required and must be created.

6. To prevent the `opc_op` password from expiring, type the following:

```
su - oracle
sqlplus /nolog
SQL> conn / as sysdba;
SQL> alter profile default limit password_life_time
unlimited;
```

7. *Optional:* Configure additional user rights on the database server.

If you want to use the `opc_odc` tool, type the following:

```
create role opc_monitorer;

grant select on v_$datafile to opc_monitorer;
grant select on v_$log to opc_monitorer;
grant select on v_$logfile to opc_monitorer;
grant select on v_$database to opc_monitorer;
grant select on v_$controlfile to opc_monitorer;
grant select on dba_free_space to opc_monitorer;
grant select on dba_data_files to opc_monitorer;
grant select on dba_extents to opc_monitorer;
grant select on dba_tablespaces to opc_monitorer;
grant select on dba_tables to opc_monitorer;

grant select on dba_indexes to opc_op;
grant select on dba_ind_columns to opc_op;
grant select on dba_cons_columns to opc_op;
grant select on dba_constraints to opc_op;
grant select on v_$parameter to opc_op;
grant select on v_$sga to opc_op;

grant opc_monitorer to opc_op;
```

8. To close `sqlplus`, type `exit`.

NOTE

During database creation, a window may pop up with the following error displayed:

```
ORA-29807: Specified operator does not exist
```

In that case, click **Ignore**, and continue with the database configuration.

Configuring Access to the HPOM Database

To configure access to the HPOM database, you must configure Net Services files on all cluster nodes of the database server either by using Oracle tools or manually. You can choose an Oracle Net alias (HPOM default is `ov_net`) and specify the used Net Services alias when configuring the HP Operations management server.

To enable the connection from the HP Operations management server to the database instances on all Oracle RAC nodes, specify your configuration preferences in the following file:

```
§ORACLE_HOME/network/admin/tnsnames.ora
```

Figure 4-1

Example of RAC Configuration

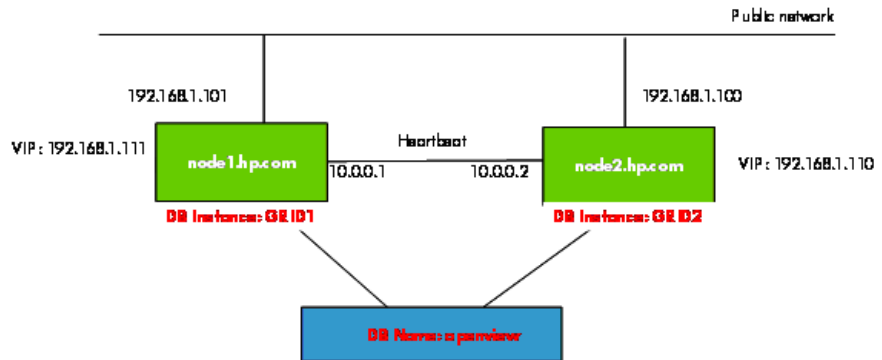


Figure 4-1 shows the example of the Oracle RAC configuration for the following managed nodes:

- ❑ node1.hp.com

With IP address 192.168.1.101, virtual node name node1-vip, and configured database instance GRID1

- ❑ node2.hp.com

With IP address 192.168.1.100, virtual node name node2-vip, and configured database instance GRID2

During the Oracle RAC configuration, the database name is specified (for example, `ov_net`). The database consists of both database instances, GRID1 and GRID2.

IMPORTANT

Make sure that the *ORACLE_SID* variable is always properly set. In the shown example, the *ORACLE_SID* variable is GRID1 on the first node and GRID2 on the second node.

The HP Operations management server uses the *ov_net* alias to connect to the HPOM database (service name *openview* in Figure 4-1). The Oracle RAC server handles the database connections as specified in the *tnsnames.ora* file by using load balancing and failover. For detailed information, see the Oracle RAC documentation.

Creating Net Services Manually

To create Net Services files manually, follow these steps:

1. Configure Net Services that are needed on all Oracle RAC cluster nodes.

The *tnsnames.ora* and *listener.ora* files are required. Optionally, you can also configure the *tnsnv.ora* and *sqlnet.ora* files. These files are located in the *\$ORACLE_HOME/network/admin* directory. You can find syntax examples for the *.ora* files in “Syntax Examples for the *.ora* Files” on page 169.

NOTE

The example files described in “Syntax Examples for the *.ora* Files” on page 169 must be thoroughly followed with new lines, spaces, and tabs.

In all example files, change hostnames, IPs, and directory paths according to your system settings.

2. Start the listener as the *oracle* user on each node by typing the following:

```
su - oracle  
  
lsnrctl start <listener_name>
```

NOTE

With some installations, it is possible that Oracle already created its own listener files. To stop the listeners, follow these steps:

- a. Log on as root.
- b. Export the `ORACLE_HOME`, `ORACLE_BASE`, and `ORACLE_SID` variables, and then add `$ORACLE_HOME/bin` to `PATH`.
- c. Stop the listener by running the following command:

```
lsnrctl stop <listener_name>
```
- d. Log on as the oracle user and start the correct listener.

Syntax Examples for the .ora Files When configuring Net Services, consider the following example files:

Example 4-5

Example Contents of the tnsnames.ora File

```
OPENVIEW =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = node1-vip) (PORT = 1521))
    (ADDRESS = (PROTOCOL = TCP) (HOST = node2-vip) (PORT = 1521))
    (LOAD_BALANCE = yes)
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = openview)
    )
  )

ov_net =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = node1-vip) (PORT = 1521))
    (ADDRESS = (PROTOCOL = TCP) (HOST = node2-vip) (PORT = 1521))
    (LOAD_BALANCE = yes)
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = openview)
      (FAILOVER_MODE =
        (TYPE = SELECT)
        (METHOD = BASIC)
        (RETRIES = 180)
      )
    )
  )
```

Service Management and Database Configuration

Setting Up HPOM in an Oracle Real Application Clusters (RAC) Environment

```
        (DELAY = 5)
    )
)
)

GRID1 =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = node1-vip) (PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = openview)
      (INSTANCE_NAME = GRID1)
    )
  )
)

GRID2 =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = node2-vip) (PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = openview)
      (INSTANCE_NAME = GRID2)
    )
  )
)

LISTENERS_OPENVIEW =
  (ADDRESS_LIST =
    (ADDRESS = (PROTOCOL = TCP) (HOST = node1-vip) (PORT = 1521))
    (ADDRESS = (PROTOCOL = TCP) (HOST = node2-vip) (PORT = 1521))
  )
)

NODE_1 =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = node1-vip) (PORT = 1521))
    (CONNECT_DATA =
      (SID = GRID1)
    )
  )
)

NODE_2 =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = node2-vip) (PORT = 1521))
    (CONNECT_DATA =
```

```
(SID = GRID2)  
)  
)
```

Example 4-6 Example Contents of the listener.ora File on node1.hp.com

```
LISTENER_NODE1 =  
(DESCRIPTION_LIST =  
(DESCRIPTION =  
(ADDRESS_LIST =  
(ADDRESS =  
(PROTOCOL = TCP) (HOST = node1-vip) (PORT = 1521) (IP = FIRST)  
)  
)  
(ADDRESS_LIST =  
(ADDRESS =  
(PROTOCOL = TCP) (HOST = node1) (PORT = 1521) (IP = FIRST)  
)  
)  
(ADDRESS_LIST =  
(ADDRESS = (PROTOCOL = IPC) (KEY = EXTPROC))  
)  
)  
)  
  
CONNECT_TIMEOUT_LISTENER_NODE1 = 10  
LOG_DIRECTORY_LISTENER_NODE1 = /opt/oracle/product/11.1.0/network/log  
LOG_FILE_LISTENER_NODE1 = LISTENER_NODE1  
  
SID_LIST_LISTENER_NODE1 =  
(SID_LIST =  
(SID_DESC =  
(SID_NAME=GRID1)  
(GLOBAL_DBNAME = openview)  
(ORACLE_HOME=/opt/oracle/product/11.1.0/)  
)  
)  
  
TRACE_LEVEL_LISTENER_NODE1 = OFF
```

Example 4-7 Example Contents of the tnsnav.ora File

```
LOCAL_COMMUNITIES =  
  (COMMUNITY_LIST =  
    (COMMUNITY = OPENVIEW_COMMUNITY)  
  )
```

Example 4-8 Example Contents of the sqlnet.ora File

```
TRACE_LEVEL_CLIENT = OFF  
TRACE_DIRECTORY_CLIENT = /opt/oracle/product/11.1.0/network/log  
LOG_DIRECTORY_CLIENT = /opt/oracle/product/11.1.0/network/log
```

Installing and Configuring HPOM in an Oracle RAC Environment

To set up HPOM in an Oracle RAC environment, install the HP Operations management server software either as described in “Installing and Configuring the HPOM Software on the Management Server” on page 65 or in the procedure for installing HPOM in a cluster environment, with regard to the following steps:

1. When the ovoidinstall script asks you if you want to continue with the server configuration, leave the ovoidinstall window open, and then open a new window.
2. In the new window, as the root user, install the latest HP Operations management server patch, and then type **y** followed by **ENTER** to continue with the server configuration.

IMPORTANT

If you install HPOM in a cluster environment, install the latest HP Operations management server patch for all cluster nodes.

The ovoconfigure script asks you if you want to configure the database.

3. Type **y** followed by **ENTER**.

When the ovoconfigure script asks you if you want to set up the database manually, leave the ovoconfigure window open.

IMPORTANT

If you are installing HPOM in a cluster environment, follow all the steps in the following procedure only for the first cluster node.

4. Open a new window, and, as the `root` user, follow these steps:
 - a. Export `ORACLE_HOME`, `ORACLE_SID`, and `LANG` (for an appropriate `LANG` value, see the *HPOM Administrator's Reference*).
 - b. Copy the following Net files from the Oracle database server to the HP Operations management server:
 - `$ORACLE_HOME/network/admin/sqlnet.ora`
 - `$ORACLE_HOME/network/admin/tnsnames.ora`
 - `$ORACLE_HOME/network/admin/tnsnv.ora`

These files are required on the database server and the HP Operations management server. When you copy the files to the HP Operations management server, check that the directory paths point to the correct locations, and modify them if necessary.

NOTE

The `tnsnv.ora` and `sqlnet.ora` files are optional. If you configured these files on the RAC cluster, you must also configure them on the HP Operations management server.

- c. If you are installing HPOM in a cluster environment, export the `OPC_HA TRUE` and `OPC_MGMT_SERVER` variables by running the following commands:

```
ovconfchg -ovrg server -ns opc -set OPC_HA TRUE
```

```
ovconfchg -ovrg server -ns opc -set OPC_MGMT_SERVER \  
<valid_virtual_host>
```

In this instance, `<valid_virtual_host>` is the long hostname of the virtual host that was previously selected during the installation procedure.

5. Return to the `ovoconfigure` window. Type `y` followed by **ENTER** to configure the database.

NOTE

The database configuration step can be done manually by using `opcdbsetup -p`.

6. *Optional:* If you configured additional user rights on the database server during the process of configuring users, passwords, and rights manually, you can run `/opt/OV/contrib/OpC/opc_odc` to verify the database setup (the log file is in `/tmp/opc_odc.log`).

Configuring the Administration UI for Oracle RAC

To configure the Administration UI for Oracle RAC, you must modify the Administration UI configuration files after the installation is complete. Otherwise, you will not be able to list or modify HPOM objects. In addition, a connection error message will appear.

Example 4-9

Oracle RAC Configuration

Assume that your Oracle RAC environment consists of the servers with physical hostnames `astrid14` and `astrid15`, and virtual hostnames `astrid14-vip` and `astrid15-vip`. The port is 1521 and the SID is `openview`.

In this case, the following configuration files must be modified:

```
/opt/OV/OMU/adminUI/conf/opccfg.properties  
/opt/OV/OMU/adminUI/conf/ovoappl.properties  
/opt/OV/OMU/adminUI/conf/ovoconfig.properties  
/opt/OV/OMU/adminUI/conf/ovoinstall.properties
```

Each of these configuration files contains a JDBC connection string that looks as follows:

```
ovodb.url=jdbc:oracle:thin:@astrid15:1521:openview
```

IMPORTANT

Use the virtual hostnames in the process of modifying the configuration files. In addition, use the proper port and SID data when required.

To configure Oracle RAC, follow these steps:

1. Modify the configuration files so that each of them contains the correct Oracle RAC JDBC connection string. To do this, choose one of the following ways:

- *By replacing the default JDBC connection string*

In this example, the string in each configuration file should look as follows:

```
ovodb.url=jdbc:oracle:thin:@(DESCRIPTION=(FAILOVER=ON
) (ADDRESS_LIST=(LOAD_BALANCE=ON) (ADDRESS=(PROTOCOL=TCP)
(HOST=astrid14-vip) (PORT=1521)) (ADDRESS=(PROTOCOL=TCP)
(HOST=astrid15-vip) (PORT=1521))) (CONNECT_DATA=(SERVICE_NAME=openview)))
```

- *Oracle 11g Release 2 or higher only: By using the SCAN listener*

When using a SCAN listener, you provide only a hostname. The Oracle client and the name service are responsible for modifying the configuration files.

For example, type the following:

```
ovodb.url=jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=omlrac-scan.hp.com) (PORT=1521)) (CONNECT_DATA=(SERVICE_NAME=oml)
(SERVER=DEDICATED)))
```

2. After the JDBC connection string is modified, add the following line to the `/opt/OV/OMU/adminUI/conf/servicemix/wrapper.conf` file:

```
wrapper.java.additional.17=-Duser.timezone=<time_zone>
```

For example, `<time_zone>` can be UTC.

3. Restart the Administration UI by running the following commands:

```
/opt/OV/OMU/adminUI/adminui stop  
/opt/OV/OMU/adminUI/adminui clean  
/opt/OV/OMU/adminUI/adminui start
```

5 **Directory Structure on the Management Server**

In This Chapter

This chapter provides file trees showing the hierarchy of HPOM directories on the management server.

HPOM File Tree on the Management Server

The layout of the HPOM file structure conforms to the standard structure of the UNIX system.

The major HPOM directories contain the following:

| | |
|--------------------------|--------------------|
| <code>/opt/OV</code> | All HPOM binaries |
| <code>/etc/opt/OV</code> | Configuration data |
| <code>/var/opt/OV</code> | Run-time data |

NOTE The file tree can include additional subdirectories if HP Operations agent software or other HP Operations software is installed.

Figure 5-1 File Tree on the Management Server (/opt/OV Branch)

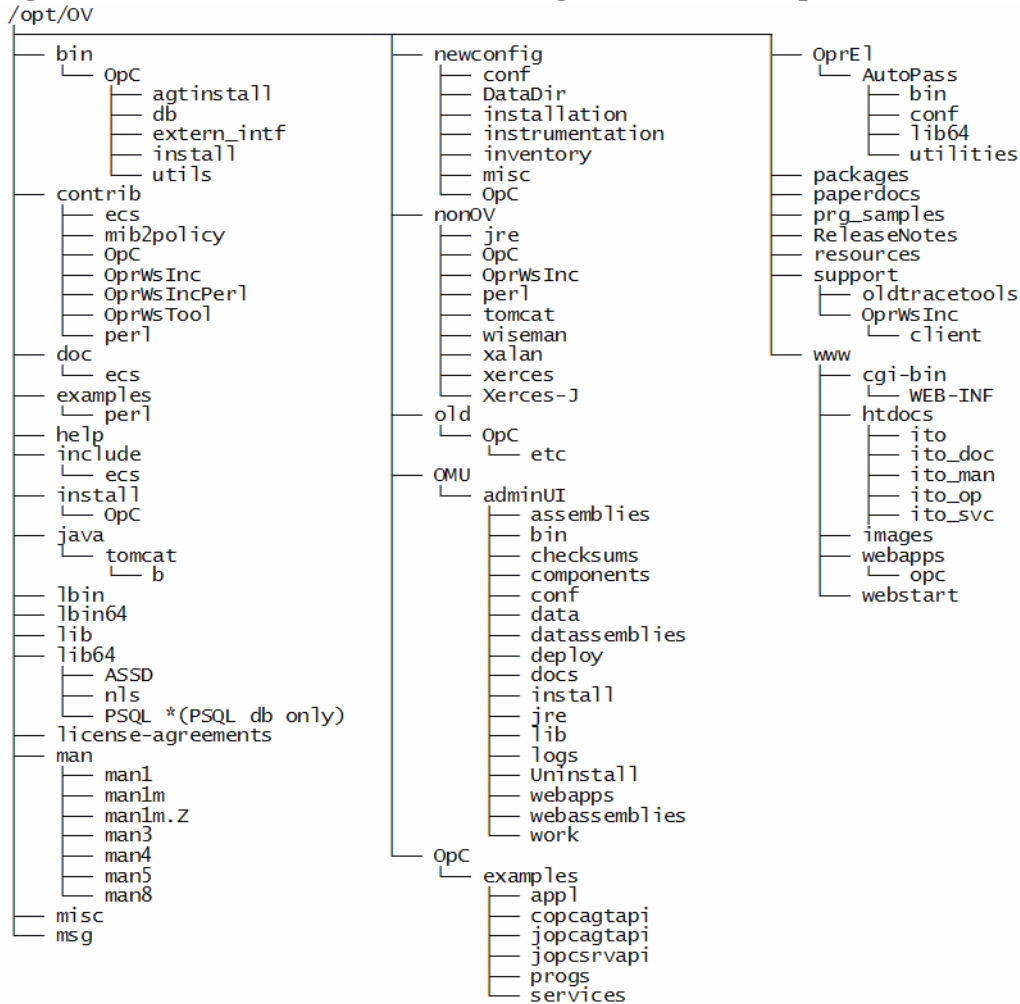
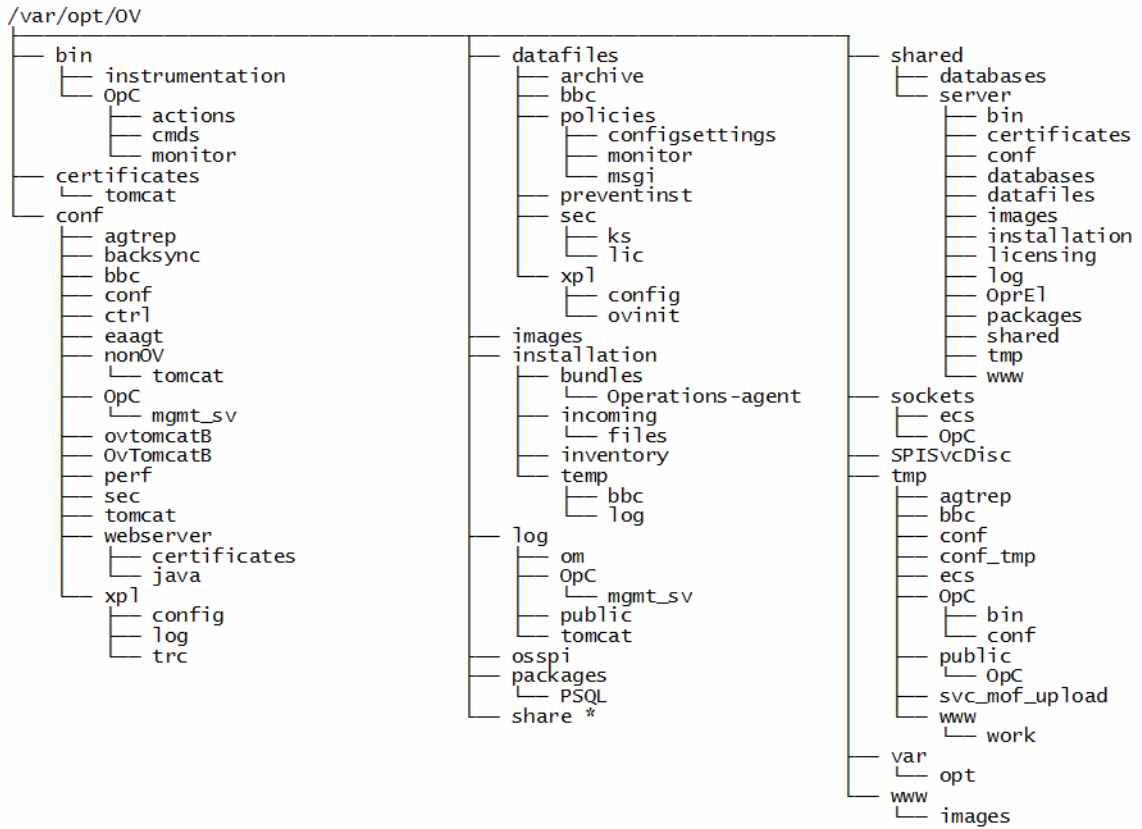
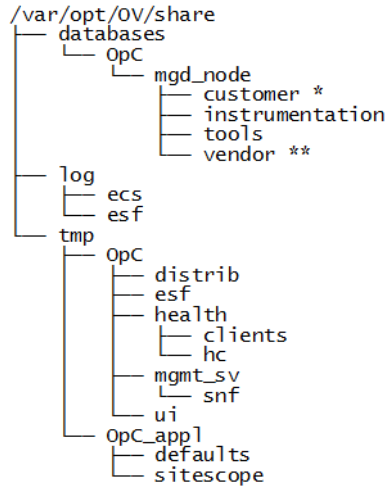


Figure 5-2 File Tree on the Management Server (/var/opt/OV Branch)

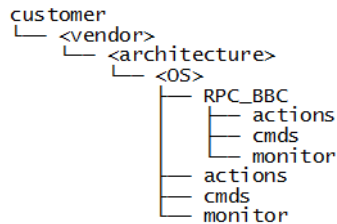


* For the directory subtree of the /var/opt/OV/share directory, see Figure 5-3 on page 182.

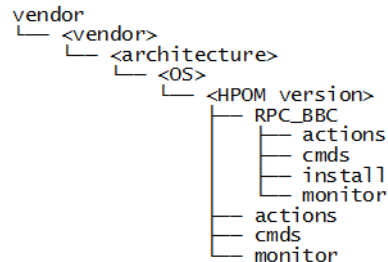
Figure 5-3 File Tree on the Management Server (/var/opt/OV/share Branch)



* Includes a series of customer-specific directory subtrees with the following structure:



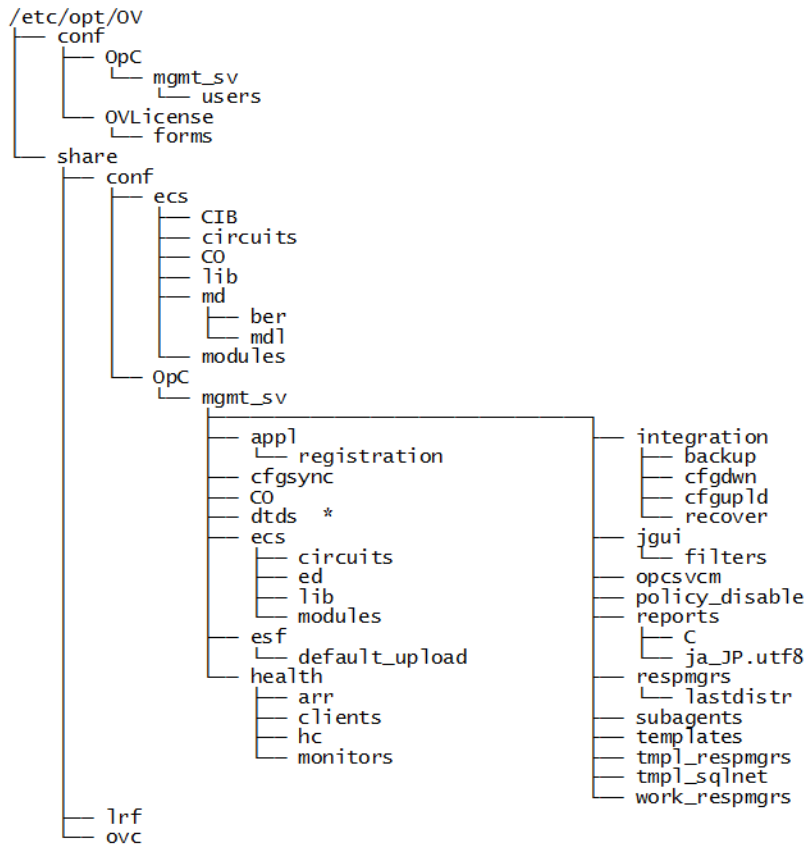
** Includes a series of vendor-specific directory subtrees with the following structure:



<HPOM version> is the version of HPOM that supports a particular agent platform. HPOM can manage several different HPOM versions for each agent platform.

The customer subtree is similar to the vendor subtree, without the HPOM version. You can integrate your additional scripts, including individual scripts and binaries in the monitor, cmds, and actions subdirectories. These files are automatically distributed to the managed node by HPOM.

Figure 5-4 File Tree on the Management Server (/etc/opt/OV Branch)



System Resources Adapted by HPOM

HPOM makes changes in the following system resource files:

- ❑ `/etc/passwd`
Contains the entry for the default HPOM operator.
- ❑ `/etc/group`
Contains the entry for the default HPOM operator.
- ❑ `/etc/services`
Adds the `ito-e-gui` service for the Java GUI.
- ❑ `/etc/xinetd.d/ito-e-gui`
Starts the `/opt/OV/bin/OpC/opcuiwww` process when requested.

6 Software Administration on the Management Server

In This Chapter

This chapter describes how to do the following:

- ❑ Deinstall HPOM from the management server.
- ❑ Deinstall the Java GUI.
- ❑ Reinstall HPOM on the management server.

Deinstalling HPOM

To deinstall HPOM, follow these steps:

1. Log on to the management server as the `root` user.
2. Stop all managed node services by running the following command:

```
/opt/OV/bin/OpC/opcragt -stop -all
```

3. *Optional:* Deinstall the HPOM software from all managed nodes, excluding the management server, by running the `inst.sh` script:

```
/opt/OV/bin/OpC/agtinstall/inst.sh -r
```

4. Check if any Java GUIs are connected to the management server by running the following command:

```
/opt/OV/contrib/OpC/listguis
```

If there are Java GUIs connected to the management server, stop them by selecting **File->Exit**. Alternatively, you can stop the Java GUIs by using the `kill` command.

IMPORTANT

Before removing server packages, remove all server patches and applications that have a dependency on server packages. Otherwise, the removal of the HP Operations management server might fail.

5. Start the HPOM deinstallation by running the `ovoremove` script:

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

NOTE

For the information about the additional steps that you might need to perform, see the latest edition of the *HPOM Software Release Notes*.

The `ovoremove` script checks the current directory and if there are any opened Java GUIs.

The following text is displayed:

```
Welcome to the HP Operations Manager for UNIX removal
```

Press **ENTER** to verify that you want the removal procedure to start.

NOTE

The whole removal procedure is written in the following log files that you can view at any time during the removal procedure:

- /var/opt/OV/log/OpC/mgmt_sv/installation.log
- /var/opt/OV/log/OpC/mgmt_sv/installation.log.error
- /var/opt/OV/log/OpC/mgmt_sv/installation.log.verbose

The `ovoremove` script detects if the management server runs as a HARG and removes the Administration UI. It also detects which server add-on packages are installed, and then it asks you if you want to continue with the removal of server add-ons.

6. Press **ENTER** to accept `y` as the default answer.

The `ovoremove` script continues with the following:

- Server add-on packages removal
- Event Storm Filter component removal
- Health Check component removal
- Web server configuration removal
- Java GUI configuration removal
- Deintegration from the start-stop sequence
- Database removal
- Other server configuration removal

IMPORTANT

If the `opc_op` user and the `opcgrp` group are still present on the system after the HPOM deinstallation, you can remove them manually.

7. Press **ENTER** to continue.

The `ovoremove` script detects the installed software and informs you about the packages and components that will be removed:

- ECS Composer packages
- Localization packages
- Server packages
- Core components

8. Press **ENTER** to continue with the software removal.

After the software removal is done, the `ovoremove` script asks you if you want to continue with the local agent removal.

9. Press **ENTER** to accept `y` as the default answer and remove the local agent.

When the local agent is removed, the HPOM deinstallation procedure is finished.

NOTE

Do not remove the `/opt/OV`, `/etc/opt/OV`, and `/var/opt/OV` directories unless all HP products are removed.

If the `/var/opt/midas` directory (containing the configuration file created when the Administration UI is installed) is still present on the system after the HPOM deinstallation, it is recommended to remove it by running the following command:

```
rm -r /var/opt/midas
```

To deinstall the database, see the documentation supplied by the database vendor.

Deinstalling the Java GUI

If you no longer need the Java GUI, you can easily deinstall it.

Deinstalling the Java GUI from a Windows Client

To deinstall the Java GUI from a Windows client, follow these steps:

1. Close all running GUIs on the client.
2. Select **Start->Control Panel->Programs and Features**.
The Programs and Features window opens.
3. In the Programs and Features window, select **HP Operations Manager Java Console**, and then click **Uninstall**.

Deinstalling the Java GUI from a Linux Client

To deinstall the Java GUI from a Linux client, follow these steps:

1. Close all running GUIs.
2. Deinstall the Java GUI by using the `rpm` utility. To do so, type the following:

```
/bin/rpm -e HPOvOUWwwGui
```

Make sure that you also remove the language-specific (or locale-specific) package:

- *English*
`/bin/rpm -e HPOvOUWwwEng`
- *Spanish*
`/bin/rpm -e HPOvOUWwwSpa`
- *Japanese*
`/bin/rpm -e HPOvOUWwwJpn`
- *Korean*
`/bin/rpm -e HPOvOUWwwKor`

- *Simplified Chinese*

```
/bin/rpm -e HPOvOUWwwSch
```

Deinstalling the Java GUI from Other UNIX-based Systems

To deinstall the Java GUI from other UNIX-based systems, follow these steps:

1. Close all running GUIs on the client.
2. Remove the `/opt/OV/www/htdocs/ito_op/` directory and its contents.

Reinstalling HPOM

To reinstall HPOM, follow these steps:

1. Make a copy of old management server certificates by running the following command:

```
/opt/OV/bin/OpC/opcsvcertbackup -backup \  
-passwd <passwd> -file <old_certs>
```

In this instance, *<passwd>* is the user password and *<old_certs>* is the file with the old management server certificates.

If you omit the *-file* option, a *.tar* archive file is created at the following default location:

```
/tmp/opcsvcertbackup.<date_time>.tar
```

2. Make a copy of the old management server *OvCoreId* by running the following command:

```
/opt/OV/bin/ovcoreid -ovrg server > /tmp/mgmtsv_coreid
```

NOTE

Make sure that the old management server *OvCoreId* and certificates are reused after the HP Operations management server installation. If they are not reused, managed nodes cannot communicate with the management server.

3. Download the configuration data by following these steps:

- a. Create an empty download specification file:

```
mkdir /tmp/cfgdwn  
echo "*" ;" > /tmp/cfgdwn/download.dsf
```

- b. Download the configuration:

```
/opt/OV/bin/OpC/opccfgdwn /tmp/cfgdwn/download.dsf \  
/tmp/cfgdwn
```


4. *Optional*: Download all messages by following these steps:
 - a. Perform a history download:

```
/opt/OV/bin/OpC/opchistdwn -older 0s -file \  
/tmp/history
```
 - b. Acknowledge all active messages:

```
/opt/OV/bin/OpC/opcack -u <user_for_all_msg_grps> \  
-a -f
```
 - c. Perform a second history download:

```
/opt/OV/bin/OpC/opchistdwn -older 0s -file /tmp/active
```
5. Deinstall the current HPOM software by using the `ovoremove` script:

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

NOTE

After you run the `ovoremove` script, make sure that you check the latest edition of the *HPOM Software Release Notes* for the information about the additional steps that you might need to perform.

6. Install HPOM as described in “Installing and Configuring the HPOM Software on the Management Server System” on page 62.
7. Update the `OvCoreId` and certificates on the new management server by following these steps:
 - a. Stop all HPOM processes:

```
/opt/OV/bin/ovc -kill
```
 - b. Install the certificate backup from the old HP Operations management server:

```
/opt/OV/bin/OpC/opcsvcertbackup -restore \  
-passwd <passwd> -file <old_certs> -force
```

In this instance, `<passwd>` is the user password and `<old_certs>` is the file with the old management server certificates.

IMPORTANT

Do not forget to use the `-force` option when installing the certificate backup from the old HP Operations management server.

- c. Update the local agent `OvCoreId` in the database:

```
/opt/OV/bin/OpC/utils/opcnode -chg_id \  
node_name=<local_agent_hostname> \  
id=`cat /tmp/mgmtsv_coreid`
```

To verify that the `OvCoreId` was correctly updated in the database, run the following command:

```
/opt/OV/bin/OpC/utils/opcnode -list_id \  
node_list=<local_agent_hostname>
```

8. Upload the configuration data by running the following command:

```
/opt/OV/bin/OpC/opccfgupld -replace /tmp/cfgdwn
```

9. *Only if you downloaded all the messages:* Upload the messages by following these steps:

- a. Upload the active messages from your download:

```
/opt/OV/bin/OpC/opchistupl /tmp/active
```

- b. Unacknowledge the active messages in the history message browser and disown them in the message browser by using the Java GUI.

For detailed information, see the *HPOM Java GUI Operator's Guide*.

- c. Upload the history messages:

```
/opt/OV/bin/OpC/opchistupl /tmp/history
```

10. Restart the HPOM processes:

```
/opt/OV/bin/ovc -start
```

11. Check agent connectivity by running the following command:

```
/opt/OV/bin/OpC/opcragt <remote_agent_hostname>
```

Reinitializing the HPOM Database and Configuration

If required, you can reinitialize the HPOM database and configuration on the management server after reinstalling HPOM.

To reinitialize the HPOM database and configuration, follow these steps:

1. If required, deinstall HPOM from all managed nodes as described in the *HPOM Administrator's Reference*.

CAUTION

After you reinitialize the HPOM database, all the node configuration is lost. You must reconfigure the nodes.

2. *Only if you use the Oracle database with HPOM:* As the `root` user, export the Oracle variables as follows:

```
export ORACLE_HOME=/opt/oracle/product/<version>
export ORACLE_BASE=/opt/oracle
```

3. *Only if HPOM was deinstalled:* Reinstall HPOM as described in “Reinstalling HPOM” on page 192.

4. Stop HP Operations management server and agent processes by running the following commands:

```
/opt/OV/bin/OpC/opcsv -stop
/opt/OV/bin/ovc -stop AGENT
```

5. Clean the database, including the configuration for operators and nodes, as well as all active and history messages. To do so, run the following commands:

```
su - root
/opt/OV/bin/OpC/opcdbinit -c [-v]
exit
```

The `opcdbinit` command uses the following modes:

- | | |
|----|--|
| -c | <i>Clean mode.</i> Cleans up tables and loads the default configuration. |
| -v | <i>Verbose mode.</i> Used to show the detailed processing progress. |

Reinstalling HPOM

6. Restart the HP Operations management server and agent processes by running the following commands:

```
/opt/OV/bin/OpC/opcsv -start
```

```
/opt/OV/bin/ovc -start AGENT
```

7 Migrating HPOM from One System to Another

In This Chapter

This chapter describes the migration process from one system to another (for example, the migration from HPOM on HP-UX on HP Integrity to HPOM on Red Hat Enterprise Linux).

Before starting with the migration, consider the following terms used in this chapter:

Old server The source management server from which you migrate HPOM.

New server The target management server on which you migrate HPOM.

Verifying Installation Requirements for the Management Server

Make sure that the new server meets at least the minimum system requirements as described in Chapter 1, “Installation Requirements for the Management Server.”

As a general rule, you must perform migrations in the following order:

1. Hardware
2. Operating system (including operating system patches)
3. Database
4. HPOM software

HPOM places no restrictions on the number of managed nodes with the 60-day Instant-On license. Make sure that you acquire the correct license for your requirements before the Instant-On license expires.

If you have a product installed that is integrated with the old server (for example, HP Performance Manager), make sure this product is compatible with a newer version of HPOM before starting the HPOM migration process. For information about how to perform the HPOM migration in this situation, see the documentation of the integrated product.

Migration Scenarios

When migrating from one system to another, you can choose one of the following scenarios:

- ❑ Migration to a System with a Different IP Address and Hostname
- ❑ Upgrade of the Systems in a MoM Setup by Reusing the IP Addresses and Hostnames

NOTE

Unlike the upgrade procedure described in Chapter 8, “Upgrading HPOM to Version 9.20,” these scenarios require almost no operational downtime.

Migration to a System with a Different IP Address and Hostname

If the hostname and the IP address of the new server are different from those of the old server, it is recommended that you configure the new server as a backup server. The basics of this scenario are as follows:

- ❑ New hardware with a new IP address and a new hostname is used for the new server.
- ❑ Depending on the setup, you can switch to the stand-alone server setup after the migration process is finished and shut down the old server.
- ❑ If the old server is to be switched off after the migration, you can request a new server permanent license in exchange for the old license (contact the HP Password Delivery Center). In the meantime, you can work on the new server with the 60-day Instant-On license.
- ❑ After setting up the new server, you can also upgrade the old server to HPOM 9.20 (for example, if a hardware cluster will be reused).
- ❑ Migration can be performed almost without operational downtime.
- ❑ Messages can be synchronized in both directions, from the old server to the new server and vice versa, whereas the configuration data exchange is only possible from the old server to the new server.
- ❑ All managed nodes must be updated with the root certificate of the new server.
- ❑ Can also be used for hardware upgrades of the same HPOM version.

To migrate to the system with the different IP address and hostname, complete these tasks:

- ❑ Task 1: “Downloading the Old Server Configuration” on page 202
- ❑ Task 2: “Setting Up a New Server” on page 203
- ❑ Task 3: “Uploading the Saved HPOM Configuration” on page 204
- ❑ Task 4: “Establishing a Trust Relationship Between the Two Management Servers” on page 206
- ❑ Task 5: “Setting Up Message Forwarding Between the Management Servers” on page 210

NOTE

For detailed information about setting up a backup server, see the *HPOM Concepts Guide*.

Downloading the Old Server Configuration

NOTE

In case the migration is performed from HPOM 8.xx to HPOM 9.xx, templates are converted to policies. The conversion takes place automatically during the template upload. The version of all newly created policies is set to 1.0, and the version of all HPOM 9.xx delivered default policies is 9.0.

For detailed information about the HPOM policies, see the *HPOM Administrator's Reference* and the *HPOM Concepts Guide*. For more information about the conversion of templates to policies, see “Converting Templates to Policies” on page HIDDEN.

To download the old server configuration, follow these steps:

1. Include service data into the download by running the following command:

```
/opt/OV/bin/ovconfchg -ovrg server -ns opc -set \  
OPC_OPCCFGDWN_ALL_INCLUDE_SELDIST_SERVICES TRUE
```

2. Create a download specification file for all configuration data:

```
echo "*" ;" > /tmp/download.dsf
```

3. Download the configuration:

```
/opt/OV/bin/OpC/opccfgdwn -force -backup \  
/tmp/download.dsf /tmp/cfgdwn
```

4. If you want to migrate your server configuration settings, store the output of `ovconfget -ovrg server` into a file, and then transfer it to the new server.

The process of downloading the old server configuration may be repeated several times during the migration. This is because the configuration changes (for example, adding new managed nodes) take place in the old production server environment, and must, therefore, be synchronized to the new server occasionally.

NOTE

The audit records cannot be migrated from HPOM 8.xx to HPOM 9.xx. Download the audit data before migrating HPOM if you want to keep a copy of all audit entries. Enter the following command:

```
/opt/OV/bin/OpC/opcauddwn -older 0s -file /tmp/audit
```

For detailed information about the message transfer from the old server to the new server, see “Setting Up Message Forwarding Between the Management Servers” on page 210.

Setting Up a New Server

NOTE

The pure installation of the new server can be done independently of any activities in the old production server environment.

To set up a new server, follow these steps:

1. Install the HP Operations management server as described in Chapter 2, “Installing and Configuring HPOM on the Management Server.”

IMPORTANT

Make sure your system meets hardware and software requirements for the HPOM software installation. For information about the installation requirements, see Chapter 1, “Installation Requirements for the Management Server.”

2. Install an Oracle database or a PostgreSQL database on the new server.

For details, see “Installing an Oracle Database” on page 46 or “Installing a PostgreSQL Database” on page 58.

3. After the new server and the database are installed, add the new server (the backup server) as a managed node to your old server. To do this, on the old server, run the following command:

```
/opt/OV/bin/OpC/Utils/opcnode -add_node \  
node_name=<new_server> group_name=<nodegrp_name> \  
net_type=<network_type> mach_type=<machine_type> \  
id=<new_server_OvCoreId>
```

NOTE

You can verify that the OvCoreId was correctly updated in the database of the old server by running the following command:

```
/opt/OV/bin/OpC/Utils/opcnode -list_id \  
node_list=<new_server_hostname>
```

For more information, see the *opcnode (1M)* manual page.

Uploading the Saved HPOM Configuration

To upload the previously saved configuration with `opccfgupld` on the new server, follow these steps:

1. Transfer the saved configuration files to the new server.
2. Stop the HP Operations management server processes:

```
/opt/OV/bin/ovc -stop SERVER
```

IMPORTANT

In a cluster environment, first disable the HA resource group monitoring by running the following command:

```
/opt/OV/lbin/ovharg -monitor ov-server disable
```

You must also make sure that the upload is performed on the active cluster node.

3. If you stored the output of `ovconfget -ovrg server` into a file and transferred it to the new server, follow these steps:

- a. Edit the file by running the following command:

```
/opt/OV/bin/ovconfchg -ovrg server -edit
```

- b. In the editor, merge the configuration.

Make sure that you add only the variables that you modified, and not all internal HPOM variables. Failing to do so may cause problems with the HP Operations management server installation.

To determine which variables were modified, run the following command on the old server:

```
/opt/OV/bin/ovconfchg -ovrg server -edit
```

Then compare this output with the output from the new server.

4. Upload the configuration on the new server by running the following command:

```
/opt/OV/bin/OpC/opccfgupld -replace -subentity \  
-configured <download_directory>
```

For example:

```
/opt/OV/bin/OpC/opccfgupld -replace -subentity \  
-configured /tmp/cfgdwn
```

5. Verify that the old server node is configured on the new server by running the following command:

```
/opt/OV/bin/OpC/Utils/opcnode -list_nodes
```

If the old server is not listed, run the following command:

```
/opt/OV/bin/OpC/Utils/opcnode -add_node \  
node_name=<old_server> group_name=<nodegrp_name> \  
net_type=<network_type> mach_type=<machine_type> \  
id=<old_server_OvCoreId>
```

To get the OvCoreId, run the following command on the old server:

```
/opt/OV/bin/OpC/Utils/opcnode -list_id \  
node_list=<old_server_hostname>
```

6. If the old server is running in an HA cluster and the new server is a stand-alone server, run the following command on the new server:

```
/opt/OV/bin/OpC/Utils/opcnode -list_virtual \  
node_name=<new_server>
```

If a line similar to `cluster_package=ov-server` appears, run the following commands:

```
/opt/OV/bin/OpC/Utils/opcnode \  
-set_physical node name=<new_server>  
  
/opt/OV/bin/OpC/Utils/opcnode -list_virtual
```

An output similar to the following one should appear:

```
node '<new_server>' is not a virtual one
```

7. Start the HP Operations management server processes:

```
/opt/OV/bin/ovc -start SERVER
```

In a cluster environment: Enable the HA resource group monitoring by using the following command:

```
/opt/OV/lbin/ovharg -monitor ov-server enable
```

Establishing a Trust Relationship Between the Two Management Servers

To establish a trust relationship between the old server and the new server, follow these steps:

1. *If the old server has a Certification Authority (default):* Share the server certificates by exporting the local CA trusted certificates:

```
/opt/OV/bin/ovcert -exporttrusted -file \  
/tmp/<hostname>.cert -ovrg server
```

For detailed information, see the *HPOM Administrator's Reference*.

2. Copy the certificate file to the new server, and then follow these steps:
 - a. Import the certificates from the old server to the new server by running the following command on the new server:

```
/opt/OV/bin/ovcert -importtrusted -file \  
/tmp/<hostname>.cert -ovrg server
```

NOTE

To view the current certificates before importing the certificates from the old server to the new server, run the following command on the new server:

```
/opt/OV/bin/ovcert -list
```

- b. On the new server, propagate the trusted certificates of the old server to the local agent by running the following command:

```
/opt/OV/bin/ovcert -updatetrusted
```

To check whether an additional CA trusted certificate is installed, list the installed certificates by running the following command:

```
/opt/OV/bin/ovcert -list
```

3. Import the CA trusted certificate of the new server to the old server. To do so, follow these steps:

- a. On the new server, run the following command:

```
/opt/OV/bin/ovcert -exporttrusted -file \  
/tmp/<hostname>.cert -ovrg server
```

- b. Copy the file to the old server, and then import the certificates there:

```
/opt/OV/bin/ovcert -importtrusted -file \  
/tmp/<hostname>.cert -ovrg server
```

NOTE

Because the file contains all trusted certificates from the old server, you will receive a warning that the certificate is already installed.

- c. On the old server, propagate the new server's trusted certificates to the local agent by running the following command:

```
/opt/OV/bin/ovcert -updatetrusted
```

To check whether the additional CA trusted certificate is installed, list the installed certificates by using the following command:

```
/opt/OV/bin/ovcert -list
```

4. Configure the flexible management policy on the old server:

- *If you have the MoM setup:* Add the new server to the `/etc/opt/OV/share/conf/OpC/mgmt_sv/respmgrs/allnodes` file, and then verify the syntax:

```
/opt/OV/bin/OpC/opcmomchk allnodes
```

- *If you do not have the MoM setup:* The system contains several example files that are located in the following directory:

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

Create a copy of the backup server example policy, and then modify it to reflect your own configuration. To confirm that the file syntax is configured correctly in the new policy file, run the following command:

```
/opt/OV/bin/OpC/opcmomchk <policy_filename>
```

Name the file `allnodes` and copy it to the following directory:

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

5. Deploy the flexible management policy to all nodes. On the old server, run the following command:

```
/opt/OV/bin/OpC/opcragt -distrib -policies -all
```

Make sure that you update the trusted certificates on the remote agents. In the Java GUI, mark all the managed nodes, and then start the Update Trusts application in the Certificate Tools application group.

6. On the new server, check if the agents can be contacted:

```
/opt/OV/bin/OpC/opcragt -status -all
```

Run the command on the old server as well, and then compare its output with the output of the new server.

NOTE

On the old server, you can use multiple threads for the `opcragt` command by running the following command:

```
/opt/OV/bin/ovconfchg -ovrg server -ns opc -set \  
OPCRAGT_USE_THREADS TRUE
```

On the new server, `opcragt` is multi-threaded by default.

NOTE

The agents that could not be contacted are listed in the following file:

```
/var/opt/OV/share/tmp/OpC/mgmt_sv/opcragt-status-failed
```

7. Copy the `allnodes` file from the old server to the new server. The file location is the following:

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

8. *Ignore this step at this point.*

You can perform this step later if you plan to shut down the old server when the new server is up and running, and the old server is still referenced in the settings.

Change the following configuration variables on all affected agents:

```
sec.core.auth:MANAGER  
sec.core.auth:MANAGER_ID  
sec.cm.client:CERTIFICATE_SERVER
```

On either of the servers, run the following commands:

```
/opt/OV/bin/OpC/opcragt -set_config_var \  
sec.cm.client:CERTIFICATE_SERVER= \  
<new_server_hostname> <node_list>
```

```
/opt/OV/bin/OpC/opcragt -set_config_var \  
sec.core.auth:MANAGER= \  
<new_server_hostname> <node_list>
```

```
/opt/OV/bin/OpC/opcragt -set_config_var \  
sec.core.auth:MANAGER_ID= \  
<new_server_core_id> <node_list>
```

In these instances, `<node_list>` is usually `-all`.

9. *Ignore this step at this point.*

In a server pooling environment, perform this step when the new server is up and running.

To configure all managed nodes to use the new server as the primary manager, run the following command on the new server:

```
/opt/OV/bin/OpC/opcragt -primmgr -all
```

10. *Optional:* You can upgrade the managed nodes to the latest version at any time later on. For more information, see “Upgrading the HP Operations Agent Software” on page 239.

Setting Up Message Forwarding Between the Management Servers

When the new server is completely functioning, the messages must be synchronized. It is recommended to have a shadow period during which the new server acts as a backup server for the old server. The shadow period can last only several hours, but it can also take days or weeks, depending on the company requirements.

NOTE

Only new incoming messages are synchronized by using message forwarding. All the messages that had arrived before the shadow period began must be handled on the old server.

To set up message forwarding between the servers, follow these steps:

1. Prepare the following configuration file on the old server:

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

- *If you have the MoM with message forwarding setup:* Add the new server to the existing `msgforw` file, and then verify the syntax by running the following command:

```
/opt/OV/bin/OpC/opcmomchk
```

- *If you do not have the MoM with message forwarding setup:* The system contains an example file that is located in the following directory:

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

Create a copy of the `msgforw` example policy and modify it to reflect your own configuration. The following is an excerpt for a two server setup:

```
...
MSGTARGETRULE
DESCRIPTION "forward all messages"
MSGTARGETRULECONDS
MSGTARGETMANAGERS
MSGTARGETMANAGER
    TIMETEMPLATE "$OPC_ALWAYS"
    OPCMGR IP 0.0.0.0 "<new_server_hostname>"
MSGCONTROLLINGMGR
MSGTARGETMANAGER
    TIMETEMPLATE "$OPC_ALWAYS"
    OPCMGR IP 0.0.0.0 "<old_server_hostname>"
MSGCONTROLLINGMGR
...
```

IMPORTANT

Both servers must be mentioned in the message target rule and the `MSGCONTROLLINGMGR` keyword must be used.

For detailed information, see the *opcmom(4)* manual page.

To confirm that the file syntax is configured correctly in the new policy file, run the following command:

```
/opt/OV/bin/OpC/opcmomchk <policy_filename>
```

Name the file `msgforw`, and copy it to the following directory:

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

2. Make sure that message forwarding is enabled on the old server.
3. Check message forwarding as follows:
 - a. Create several messages, and then check if they arrive in the GUI connected to the new server.

- b. Acknowledge the message on the new server, and then check if it is synchronized to the old server.
4. Set up message forwarding on the new server when the agents send the messages directly to the new server. To do so, reuse the `msgforw` file from the old server:
 - a. Copy the `msgforw` file from the old server to the new server, and then put it into the following directory:

```
/etc/opt/OV/share/conf/OpC/mgmt_sv/respmgrs
```
 - b. On the new server, run the following command:

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

After the shadow period is over, follow these steps:

1. Make sure that the operators start using the new server.

For detailed information, see the *HPOM Administrator's Reference*.
2. *Optional:* Download and upload the history messages from the old server to the new server as follows:
 - a. On the old server, run the following command:

```
/opt/OV/bin/OpC/opchistdown -until \  
<start_of_shadow_period> -file /tmp/history
```

In this instance, `<start_of_shadow_period>` is a timestamp in the mm/dd/yy format.
 - b. Copy the file to the new server, and then run the following command:

```
/opt/OV/bin/OpC/opchistupl /tmp/history
```

Upgrade of the Systems in a MoM Setup by Reusing the IP Addresses and Hostnames

This scenario uses the concept of the MoM backup server. Therefore, this scenario can only be applied in the MoM setups. While upgrading to the new server, one server is put into the maintenance mode and the other server completely takes over. The basics of this scenario are the following:

- ❑ Server IP addresses, hostnames, and certificates are reused.
- ❑ It is not important if a new hardware is introduced or the existing hardware is reused—IP addresses and hostnames are taken over.
- ❑ Existing permanent license of the old server that is upgraded to HPOM 9.20 can be reused. However, if this is not possible, request a new server's permanent license in exchange for the old license. For details, contact the HP Password Delivery Center.
- ❑ Upgrade process can be performed almost without operational downtime.
- ❑ Messages can be synchronized in both directions, from the old server to the new server, and vice versa, whereas the configuration data exchange is possible only from the old server to the new server.
- ❑ Agents do not have to be updated because the server's certificates, the private keys, and the `OvCoreId` are reused.
- ❑ Can also be used for the hardware upgrades of the same HPOM version.

NOTE

Because this scenario basically represents a subcase of the upgrade procedure described in Chapter 8, "Upgrading HPOM to Version 9.20," only the specifics of the MoM upgrade are described in this section.

Upgrading Systems in a MoM Setup by Reusing IP Addresses and Hostnames

To upgrade the systems in the MoM setup by reusing the IP addresses and the hostnames, assume you have server A and server B, and all agents currently report to server A. Then assume that server A shall be upgraded. Continue as follows:

1. *Ignore this step in a server pooling environment:* Switch all agents to report to server B. On server B, run the following command:

```
/opt/OV/bin/OpC/opcragt -primmgr -all
```

2. Make sure that message forwarding between server A and server B is switched to HTTPS communication.

If required, perform the following steps on both servers:

- a. Enable HTTPS-based message forwarding by running the following command:

```
/opt/OV/bin/ovconfchg -ovrg server -ns opc -set \  
OPC_HTTPS_MSG_FORWARD TRUE
```

- b. Restart processes on both servers:

```
/opt/OV/bin/ovc -stop  
/opt/OV/bin/ovc -start
```

- c. Verify that HTTPS-based message forwarding works correctly by sending several test messages and acknowledging them. In addition, check that message synchronization works correctly.

3. Stop server A.

From the moment you stop server A, server B starts buffering all messages and message operations. Run the following command:

```
/opt/OV/bin/ovc -stop
```

NOTE

During the upcoming upgrade installation of server A, it can happen that server B sends buffered messages as soon as server A is up.

Upgrade of the Systems in a MoM Setup by Reusing the IP Addresses and Hostnames

4. If server A is to be replaced by a new hardware, back up its certificates and the OvCoreId:

```
/opt/OV/bin/OpC/opcsvcertbackup -backup \  
-passwd <password> -file <my_cert_backup>
```

In this instance, <my_cert_backup> is the file where you backed up the certificates.

5. To upgrade the management server, see Chapter 8, “Upgrading HPOM to Version 9.20.”

6. *Ignore this step if the old hardware of server A was reused:* If server A was replaced by a new hardware, the initial installation generated a new OvCoreId and new certificates. Server B cannot forward messages to server A at this point. Therefore, you must reinstall the saved OvCoreId and certificates. Run the following commands:

```
/opt/OV/bin/ovc -kill  
  
/opt/OV/bin/OpC/opcsvcertbackup -restore \  
-passwd <password> -file <my_cert_backup> -force
```

In this instance, <password> is the same password as you used for backing up the certificates and the OvCoreId of server A in step 4 and <my_cert_backup> is the file where you backed up the certificates.

It may happen that in the meantime certain configuration changes are done on server B.

7. Make sure that you synchronize the servers:
 - a. On server B, run the following commands:

```
echo "*" ;" >/tmp/all.dsf  
mkdir /tmp/all  
  
/opt/OV/bin/OpC/opccfgdwn -backup /tmp/all.dsf \  
/tmp/all
```

- b. On server A, run the following command:

```
/opt/OV/bin/OpC/opccfgupld -replace -subentity \  
<data_from_B>
```

In this instance, <data_from_B> is the data downloaded from server B.

8. Start server processes on server A by running the following command:

```
/opt/OV/bin/ovc -start
```

NOTE

At this point, server B can forward all messages and message operations that were buffered.

9. *Ignore this step in a server pooling environment:*

Optional: Switch the agents back to server A. On server A, run the following command:

```
/opt/OV/bin/OpC/opcragt -primmgr -all
```

8 **Upgrading HPOM to Version 9.20**

In This Chapter

This chapter describes how to upgrade from HPOM 9.1x to HPOM 9.20 on the same system.

NOTE

You can either upgrade the software on the same system, as described in the following sections, or migrate your data to a new HPOM 9.20 installation on a different system. For detailed information about migrating HPOM, see Chapter 7, “Migrating HPOM from One System to Another.”

In this chapter, you can also find information about the following topics:

- ❑ “Upgrading an HPOM Database” on page 226
- ❑ “Upgrading the Java GUI” on page 238
- ❑ “Upgrading the HP Operations Agent Software” on page 239
- ❑ “Upgrading HPOM in a Cluster Environment” on page 240
- ❑ “Migrating Licenses to HPOM 9.20” on page 241

IMPORTANT

The HP Operations agent software is no longer shipped together with HPOM. To obtain the supported agent version, request the agent media 11.1x from HP.

Upgrading from HPOM 9.1x to HPOM 9.20

To upgrade HPOM from version 9.1x to version 9.20, complete these tasks:

- ❑ Task 1: “Verifying Installation Requirements for the Management Server” on page 219
- ❑ Task 2: “Upgrading HPOM from Version 9.1x to Version 9.20” on page 220

IMPORTANT

The Administration UI is upgraded during the HPOM upgrade procedure only if your system has direct Internet access.

If your system does not have direct Internet access, you must use the `OMUADMINUI_9.20.190_UPGRADE.zip` file available for download at ftp://ovweb.external.hp.com/pub/cpe/ito/AdminUI_upgrade/ and follow the instructions in the `README.txt` file.

Verifying Installation Requirements for the Management Server

When verifying installation requirements for the management server, do the following:

- ❑ Make sure that the new management server meets at least the minimum system requirements as described in Chapter 1, “Installation Requirements for the Management Server.”
- ❑ Make sure that HPOM 9.1x is installed and configured on the system on which the upgrade is performed.
- ❑ If the upgrade is performed in a cluster environment, make sure that HPOM 9.1x is installed and configured in the cluster environment.

Upgrading HPOM from Version 9.1x to Version 9.20

To upgrade HPOM from version 9.1x to version 9.20, follow these steps:

1. Back up server certificates and the OvCoreId by running the following command:

```
/opt/OV/bin/OpC/opcsvcertbackup -backup
```

2. Start the HPOM upgrade procedure:

- If you upgrade HPOM from a DVD-ROM, type the following:

```
<mount_point>/ovupgrade
```

In this instance, *<mount_point>* is the location where the HPOM installation DVD is mounted.

- If you upgrade HPOM using DVD content, type the following:

```
<master_directory>/HPOMDVD/ovupgrade
```

For example, if you created the */tmp* directory as the master directory, you can start *ovupgrade* by typing the following:

```
/tmp/HPOMDVD/ovupgrade
```

The following text appears:

```
Welcome to the HP Operations Manager for UNIX upgrade
```

3. Press **ENTER** to verify that you want the upgrade procedure to start.

The *ovupgrade* script continues with detecting special environments and creating a file permission snapshot.

IMPORTANT

In a cluster environment: You must first perform the upgrade procedure on the active cluster node, and then on all passive cluster nodes. During the upgrade procedure on the passive cluster nodes, make sure not to perform a server switchover.

You are prompted to enter the HPOM software package repository location where all server packages are located.

4. Press **ENTER** to accept the default repository location, or enter the desired location, and then press **ENTER**.

You are prompted to enter the HP Operations agent software location.

5. After you enter the HP Operations agent software location, press **ENTER**.

You are prompted to enter the HPOM Administration UI software location.

6. After you enter the HPOM Administration UI software location, press **ENTER**.

The `ovoupgrade` script checks which patches are installed and removes them. After deleting the patches, it checks and installs the server setup package that contains the server installation infrastructure.

7. Press **ENTER** to continue with detecting installed software.

The `ovoupgrade` script informs you about the software that will be removed.

8. Press **ENTER** to continue with the software removal.

The `ovoupgrade` script continues with installing the local agent. After the process of installing the local agent returns the `OK` value, it checks core component packages, server packages, localization packages, and ECS Composer packages.

9. Press **ENTER** to continue with installing the packages.

After all the packages are installed, you can manually install available management server patches.

10. Press **ENTER** to continue.

The `ovoupgrade` script performs the integration into the start/stop sequence and installs agent deployment packages.

11. If you want to enable the Event Storm Filter component, press **ENTER**. Otherwise, press `n` followed by **ENTER**.

For detailed information about the Event Storm Filter component, see the *HPOM Administrator's Reference*.

12. If you want to enable the Health Check component, press **ENTER**. Otherwise, press `n` followed by **ENTER**.

For detailed information about the Health Check component, see the *HPOM Administrator's Reference*.

13. Press **ENTER** to confirm that you want to install the server add-on packages.

After the server add-on packages are installed, the `ovoupgrade` script asks you if you want to migrate your database from Oracle to PostgreSQL.

14. Press **ENTER** to accept the default value `n` and not to migrate from the Oracle database to the PostgreSQL database, or press `y` followed by **ENTER** and start the migration from the Oracle database to the PostgreSQL database.

Migrating from Oracle to PostgreSQL

If you decided to migrate your Oracle database to PostgreSQL, follow these steps:

- a. Answer the questions listed in Table 8-1 by either accepting the default value and pressing **ENTER**, or typing the desired value followed by **ENTER**.

Table 8-1

Oracle to PostgreSQL-related Migration Questions

| Question | Description and/or Default Value |
|--|---|
| Do you wish HPOM to manage the PSQL cluster (<code>n</code> for independent / remote scenarios)? | Depending on whether you want to have a managed database (HPOM manages a local database that will be created from the beginning or was created by using the <code>psqlcluster</code> tool) or an independent database (HPOM connects to an independent local or remote database, but does not manage it), choose <code>y</code> or <code>n</code> . |
| Clear and re-initialize the tables if they already exist? | <code>y</code> |
| PSQL cluster directory | The main directory where the PostgreSQL cluster is stored. |
| PSQL binary directory | The directory where the PostgreSQL binaries are stored. Keep in mind that the location of this directory varies depending on the distribution or the version. |

Table 8-1 Oracle to PostgreSQL-related Migration Questions (Continued)

| Question | Description and/or Default Value |
|---|---|
| PSQL library directory | The directory where the PostgreSQL client libraries are stored. Keep in mind that the location of this directory varies depending on the distribution or the version. |
| PSQL data directory | The directory where the data tablespaces are stored. This directory must be empty or non-existing. If you do not provide an answer to this question, <cluster_dir>/HPOM is used. |
| PSQL index directory | The directory where the index tablespaces are stored. This directory must be empty or non-existing. If you do not provide an answer to this question, <cluster_dir>/HPOM is used. |
| Do you wish to start the PSQL cluster automatically at boot time? | Press y if you want the database cluster to be started automatically each time the system is started. Otherwise, you must start the database cluster manually before you can start HPOM. |
| Hostname | The system on which the database cluster or server is installed. |
| Port | The port on which the database cluster or server listens. It is usually set to 5432 or 5444. |
| Database name | The name of the HPOM database. The default is <code>openview</code> . |
| OS DBA user | The operating system user that controls database processes and has access to all PostgreSQL binaries and HPOM database directories. This user is usually set to <code>postgres</code> . |
| DB DBA user | The name of the administrator user inside the database cluster or server, which is usually set to <code>postgres</code> . |

Table 8-1 Oracle to PostgreSQL-related Migration Questions (Continued)

| Question | Description and/or Default Value |
|------------------------------|---|
| DB DBA user password | The password of the administrator user inside the database cluster or server, which is usually set to postgres. |
| Database opc_op password | The password for the opc_op database user. The default is opc_op. |
| Database opc_report password | The password for the opc_report database user. The default is opc_report. |

After you answer all the questions, the `ovoupgrade` script checks the database configuration data and the summary of all provided answers appears.

- b. Check the summary data, and then press **ENTER** to perform the database configuration.
- c. Press **ENTER** to continue. The `ovoupgrade` script continues as follows:
 - Stops the Oracle database.
 - Uploads the configuration, history messages, and active messages to the PostgreSQL database.

At this point, the Administration UI is either installed (if you do not have it installed it yet) or upgraded (if it is already installed). In the first case, you must answer the Administration UI-related questions described in Table 2-2 on page 72.

15. If you want to switch HPOM to non-root operation¹, press **y** followed by **ENTER**. Otherwise, accept the default value **n** by pressing **ENTER**.

For detailed information about non-root operation, see the *HPOM Concepts Guide*.

Before the `ovoupgrade` script completes the upgrade procedure, it informs you about the commands that you must run if you want to revert file permission changes made during the upgrade. An output similar to the following one appears:

1. Non-root operation is not supported on RHEL 5.x.

You can revert file permission changes made during the upgrade by running the following commands:

```
/opt/OV/bin/OpC/install/ovoconfigure -revertPermissions  
/opt/OV/bin/OpC/install/file_permissions.09.10.240.conf
```

IMPORTANT

If you decided to switch HPOM to non-root operation, make sure not to revert file permission changes.

Upgrading an HPOM Database

Table 8-2 shows which database versions are supported with HPOM 9.20.

Table 8-2 Supported Database Versions

| Oracle Database Versions | PostgreSQL Database Versions |
|--|---|
| <ul style="list-style-type: none">• 11gR1 (11.1.0.7)• 11gR2 (11.2.0.1–11.2.0.4) | <ul style="list-style-type: none">• 9.1• 9.2• 9.3 |

For detailed information about installing an Oracle database or a PostgreSQL database, see “Installing an Oracle Database” on page 46 or “Installing a PostgreSQL Database” on page 58.

Upgrading an Oracle Database

Starting with Oracle 11.2, Oracle distributes patch sets as full installations. Although it is possible to install the update on top of the previous Oracle version and then migrate the data by using the Oracle tools, this is not recommended. Instead, use the “out-of-place upgrade” method where you install the new version in a new, separate ORACLE_HOME directory, and then migrate the data from the old installation to the new installation.

To upgrade an Oracle database (for example, version 11.1 to version 11.2) by using the “out-of-place upgrade” method, follow these steps:

1. Download all configuration data by performing the following steps:

a. Create an empty download specification file:

```
mkdir /tmp/cfgdwn  
echo "*" ;" > /tmp/cfgdwn/download.dsf
```

b. Download the configuration:

```
/opt/OV/bin/OpC/opccfgdwn /tmp/cfgdwn/download.dsf \  
/tmp/cfgdwn
```

2. *Optional*: Download all messages by following these steps:
 - a. Perform a history download:

```
/opt/OV/bin/OpC/opchistdwn -older 0s -file \  
/tmp/history
```
 - b. Acknowledge all active messages:

```
/opt/OV/bin/OpC/opcack -u <user_for_all_msg_grps> \  
-a -f
```
 - c. Perform a second history download:

```
/opt/OV/bin/OpC/opchistdwn -older 0s -file /tmp/active
```
3. Stop HP Operations management server processes by running the following command:

```
/opt/OV/bin/ovc -kill
```
4. Depending on whether you have a local database or a remote/independent database, choose one of the following procedures to stop the Oracle database:
 - *Local database*

```
/sbin/init.d/ovoracle stop
```
 - *Remote/independent database*
 - a. Switch to the oracle user:

```
su - oracle
```
 - b. Set the `ORACLE_HOME` environment variable so that it points to the location where the old Oracle database is installed:

```
export \  
ORACLE_HOME=/opt/oracle/product/<old_version>
```
 - c. Set the `ORACLE_SID` environment variable. For example:

```
export ORACLE_SID=openview
```
 - d. Run the SQL*Plus tool:

```
ORACLE_HOME/bin/sqlplus /nolog
```
 - e. Stop the Oracle database by running the following commands:

```
connect / as sysdba
```

```
shutdown
```

```
exit
```

- f. Switch back to the root user:

```
exit
```

5. *Recommended:* Back up the old Oracle home directories, data directories, and configuration files.

6. Remove the old Oracle database instance by running the following command:

```
/opt/OV/bin/OpC/opcdbsetup -d
```

7. Remove the old Oracle installation. For detailed information, see the Oracle documentation.

NOTE

Depending on the HPOM environment, removing the old Oracle installation may include removing the Oracle server as well as the client and instant client products.

8. Install the new Oracle database version as described in “Installing an Oracle Database” on page 46.

When installing the new Oracle database version, keep in mind the following:

- Because there might be a difference in required operating system versions, patches, and kernel parameters for different Oracle versions, make sure that your system meets the requirements stated in the Oracle documentation.
- The `.profile` file for the Oracle user or other configuration files (for example, `/etc/oratab`, listener configuration files, and so on) may contain one or more of the following Oracle configuration variables: `ORACLE_HOME`, `ORACLE_SID`, and `ORACLE_BASE`. If this is the case, it is important to update them to the new values before proceeding with the upgrade.

9. Run the Oracle database setup tool (that is, `opcdbsetup`) and make sure to use the appropriate values for the new database version.

NOTE

The links from the HPOM library directory to the Oracle client libraries (that is, `libclntsh.so` and `libnnz11.so`) are updated and point to the new location. If this is not the case, you can recreate them either manually or by running the `/opt/OV/bin/OpC/opcdblink oracle` command.

10. Make sure that the new Oracle database is up and running. Depending on whether you have a local database or a remote/independent database, choose one of the following procedures to restart the Oracle database:

- *Local database*

```
/sbin/init.d/ovoracle start
```

- *Remote / independent database*

- a. Switch to the `oracle` user:

```
su - oracle
```

- b. Set the `ORACLE_HOME` environment variable so that it points to the location where the new Oracle database is installed:

```
export \  
ORACLE_HOME=/opt/oracle/product/<new_version>
```

- c. Set the `ORACLE_SID` environment variable. For example:

```
export ORACLE_SID=openview
```

- d. Run the SQL*Plus tool:

```
ORACLE_HOME/bin/sqlplus /nolog
```

- e. Start the Oracle database by running the following commands:

```
connect / as sysdba
```

```
startup
```

```
exit
```

- f. Switch back to the `root` user:

```
exit
```

11. Upload the configuration data by running the following command:

```
/opt/OV/bin/OpC/opccfgupld -replace /tmp/cfgdwn
```
12. If you downloaded all the messages, upload them by following these steps:
 - a. Upload the active messages from your download:

```
/opt/OV/bin/OpC/opchistupl /tmp/active
```
 - b. Unacknowledge the active messages in the history message browser and disown them in the message browser by using the Java GUI.

For detailed information, see the *HPOM Java GUI Operator's Guide*.
 - c. Upload the history messages:

```
/opt/OV/bin/OpC/opchistupl /tmp/history
```
13. Restart HP Operations management server processes by running the following command:

```
/opt/OV/bin/ovc -start
```

Upgrading a PostgreSQL Database

The methods for upgrading a PostgreSQL database differ depending on the PostgreSQL database version to which you want to upgrade. The PostgreSQL database version is represented either by the first two digits of a version number—the major PostgreSQL database version (for example, 9.1)—or the first three digits of a version number—the minor PostgreSQL database version (for example, 9.1.1).

Because minor PostgreSQL database versions are always compatible with earlier and later minor PostgreSQL database versions of the same major PostgreSQL database version, the upgrade procedure is simple and consists of replacing the executables while the management server is down and restarting the management server. In this case, the data directory remains unchanged. For details, see “Upgrading a Minor PostgreSQL Database Version” on page 231.

When upgrading the major PostgreSQL database version, the contents of the data directory changes, which makes this method more complicated than the method for upgrading the minor PostgreSQL database version. For details, see “Upgrading a Major PostgreSQL Database Version” on page 233.

NOTE

Because there might be a difference in required operating system versions, patches, and kernel parameters for different PostgreSQL versions, make sure that your system meets the requirements stated in the PostgreSQL documentation before you start the upgrade procedure. It is also recommended that you back up your system before upgrading the PostgreSQL database.

Upgrading a Minor PostgreSQL Database Version

To upgrade a minor PostgreSQL database version (for example, version 9.1.1 to version 9.1.5), follow these steps:

1. Stop HP Operations management server processes by running the following command:

```
/opt/OV/bin/ovc -kill
```

2. Depending on whether you have a managed database or a remote/manual database, choose one of the following two commands to stop the PostgreSQL database:

- *For a managed database:*

```
/etc/init.d/ovopsql stop current
```

- *For a remote / manual database:*

```
su - <OS_DBA_user>  
<PostgreSQL_binary_directory>/pg_ctl \  
-D <PostgreSQL_cluster_directory> stop
```

3. Install new PostgreSQL server binaries.

For details, see “Installing PostgreSQL Server Binaries” on page 59.

NOTE

The new PostgreSQL server binaries may be installed at the same location as the old ones. If you have another PostgreSQL database cluster running on the old PostgreSQL server binaries, it is highly recommended that you temporarily stop them during the installation of the new PostgreSQL server binaries.

4. *If required:* Edit the binary or library paths in the following files:

```
/etc/opt/OV/share/conf/ovdbconf
```

```
<PostgreSQL_cluster_directory>/hpom.conf
```

5. Recreate the required links to the PostgreSQL database client libraries and binaries by running the following command:

```
/opt/OV/bin/OpC/opcdblink psql
```

NOTE

Make sure that `/opt/OV/lib64/PSQL` points to the correct location (that is, to the PostgreSQL library directory). If not, recreate the link manually.

6. Depending on whether you have a managed database or a remote/manual database, choose one of the following two commands to restart the PostgreSQL database:

- *For a managed database:*

```
/etc/init.d/ovopsql start current
```

- *For a remote/manual database:*

```
su - <OS_DBA_user>
```

```
<PostgreSQL_binary_directory>/pg_ctl \
```

```
-D <PostgreSQL_cluster_directory> start -l logfile
```

7. Restart HP Operations management server processes by running the following command:

```
/opt/OV/bin/OpC/opcsv -start
```


Upgrading a Major PostgreSQL Database Version

To upgrade a major PostgreSQL database version (for example, version 9.1 to version 9.2), follow these steps:

1. Download all configuration data by following these steps:
 - a. Create an empty download specification file:

```
mkdir /tmp/cfgdwn  
echo "*" ;" > /tmp/cfgdwn/download.dsf
```
 - b. Download the configuration:

```
/opt/OV/bin/OpC/opccfgdwn /tmp/cfgdwn/download.dsf \  
/tmp/cfgdwn
```
2. *Optional:* Download all messages by following these steps:
 - a. Perform a history download:

```
/opt/OV/bin/OpC/opchistdwn -older 0s -file \  
/tmp/history
```
 - b. Acknowledge all active messages:

```
/opt/OV/bin/OpC/opcack -u <user_for_all_msg_grps> \  
-a -f
```
 - c. Perform a second history download:

```
/opt/OV/bin/OpC/opchistdwn -older 0s -file /tmp/active
```
3. Stop HP Operations management server processes by running the following command:

```
/opt/OV/bin/ovc -kill
```
4. Depending on whether you have a managed database or a remote/manual database, choose one of the following two commands to stop the PostgreSQL database:
 - *For a managed database:*

```
/etc/init.d/ovopsql stop current
```
 - *For a remote/manual database:*

```
su - <OS_DBA_user>
```

```
<PostgreSQL_binary_directory>/pg_ctl \  
-D <PostgreSQL_cluster_directory> stop
```

5. Install new PostgreSQL server binaries.

For details, see “Installing PostgreSQL Server Binaries” on page 59.

6. Create and configure a PostgreSQL database cluster as described in “Creating and Configuring a PostgreSQL Database Cluster” on page 146.

NOTE

The PostgreSQL database cluster must be created with the new PostgreSQL server binaries (that is, the ones you installed in step 5).

7. *Recommended:* Back up old PostgreSQL database cluster directory and configuration files.

8. Remove the old PostgreSQL database cluster installation by choosing one of the following two methods:

- *Automatically:*

As the root user, run the following command:

```
/opt/OV/bin/OpC/psqlsetup remove
```

- *Manually:*

As the root user, follow these steps:

a. Delete the old PostgreSQL database cluster directory:

```
rm -rf <old_cluster_directory>
```

b. Delete the HPOM database configuration file:

```
rm -f /etc/opt/OV/share/conf/ovdbconf
```

c. If the PostgreSQL database cluster is set to autostart, edit the `/etc/ovopsql` configuration file, and then delete the old PostgreSQL database cluster directory within the configuration file.

9. Make sure that the new PostgreSQL database cluster is up and running. Depending on whether you have a managed database or a remote/manual database, choose one of the following two commands to restart the PostgreSQL database:
 - *For a managed database:*

```
/etc/init.d/ovopsql start current
```
 - *For a remote / manual database:*

```
su - <OS_DBA_user>  
  
<PostgreSQL_binary_directory>/pg_ctl \  
-D <PostgreSQL_cluster_directory> start -l logfile
```
10. Run the PostgreSQL database setup tool (that is, `psqlsetup`) according to the new installation and configuration.
11. Upload the configuration data by running the following command:

```
/opt/OV/bin/OpC/opccfgupld -replace /tmp/cfgdwn
```
12. If you downloaded all the messages, upload them by following these steps:
 - a. Upload the active messages from your download:

```
/opt/OV/bin/OpC/opchistupl /tmp/active
```
 - b. Unacknowledge the active messages in the history message browser and disown them in the message browser by using the Java GUI.

For detailed information, see the *HPOM Java GUI Operator's Guide*.
 - c. Upload the history messages:

```
/opt/OV/bin/OpC/opchistupl /tmp/history
```
13. Restart HP Operations management server processes by running the following command:

```
/opt/OV/bin/ovc -start
```

Preparing the Administration UI to Use the New HPOM Database

To prepare the Administration UI to use the new HPOM database, follow these steps:

1. Stop and clean the Administration UI by running the following commands:

```
/opt/OV/OMU/adminUI/adminui stop
```

```
/opt/OV/OMU/adminUI/adminui clean
```

2. *Oracle only*: Update the ORACLE_HOME variable in the midas_env.sh file.
3. Update the following configuration files with the appropriate JDBC connection string:

```
/opt/OV/OMU/adminUI/conf/ovoinstall.properties
```

```
/opt/OV/OMU/adminUI/conf/ovoconfig.properties
```

```
/opt/OV/OMU/adminUI/conf/opccfg.properties
```

```
/opt/OV/OMU/adminUI/conf/ovoappl.properties
```

Each of these configuration files contains a JDBC connection string that looks as follows:

- *Oracle*:

```
ovodb.url=jdbc:oracle:thin:@<SERVER>:<PORT>:<SID>
```

The connection string should be in one line, without line feeds and without blanks inside it.

NOTE

To obtain the correct Oracle JDBC connection string, check the \$ORACLE_HOME/network/admin/tnsnames.ora file.

- *PostgreSQL*:

```
ovodb.url=jdbc:Postgresql://<PostgreSQL_host>:<port>/<DB_name>
```

For example:

```
ovodb.url=jdbc:Postgresql://avocado.hp.com:5433/openview
```

4. Start the Administration UI by running the following command:

```
/opt/OV/OMU/adminUI/adminui start
```

Upgrading the Java GUI

To upgrade the Java GUI, follow these steps:

1. Deinstall any previous version of the Java GUI from the client system.

For detailed information about deinstalling the Java GUI, see “Deinstalling the Java GUI” on page 190.

2. Install the new version of the Java GUI on the client system.

For details, see Chapter 3, “Installing the Java GUI.”

Upgrading the HP Operations Agent Software

To upgrade the HP Operations agent software to a newer version, run the `inst.sh` script:

```
/opt/OV/bin/OpC/agtinstall/inst.sh
```

For detailed information about how to upgrade the HP Operations agent software automatically by using the installation script, see the *HPOM Administrator's Reference* and the *inst.sh(1M)* manual page.

Upgrading HPOM in a Cluster Environment

To upgrade the HP Operations management server running in a cluster environment to version 9.20, you must first perform the upgrade procedure on the active cluster node, and then on all passive cluster nodes.

When upgrading HPOM from version 9.1x to version 9.20, follow the procedure described in “Upgrading from HPOM 9.1x to HPOM 9.20” on page 219.

Migrating Licenses to HPOM 9.20

When migrating from an existing HPOM system to another or upgrading an existing HPOM system, it is possible to move license passwords from an HPOM 9.1x system to an HPOM 9.20 system. All HPOM 9.1x license passwords are compatible with HPOM 9.20.

HPOM 9.20 license passwords are exchangeable between the HP-UX on HP Integrity, Sun Solaris, and Linux operating systems.

Prerequisite for License Migration

The IP address on the source and target systems must be the same. If this is not the case, the license passwords do not work on the target system and must be moved through the HP Password Delivery Center.

NOTE

It is possible to install license passwords from systems with a different IP address. However, this does not mean that they are valid on the target system. Validity is checked during runtime and license passwords without matching IP addresses are ignored.

Migrating Licenses

To migrate license passwords from an HPOM 9.1x source system to an HPOM 9.20 target system, follow these steps:

1. Copy the license passwords from the source system to a safe place on the target system.

The license passwords are located in the following file:

```
/var/opt/OV/shared/server/OprEl/AutoPass/LicFile.txt
```

For example, to copy the file, run the following command:

```
scp \  
/var/opt/OV/shared/server/OprEl/AutoPass/LicFile.txt \  
<target_sys>:<directory>/HPOM9-LicFile-Backup.txt
```

2. On the target system, install the license passwords selectively by using the GUI (recommended) or nonselectively by using the `ovolicense` tool.

IMPORTANT

Make sure that you never copy the license passwords directly into the AutoPass license password file or overwrite the AutoPass license password file with another license password file, as this could result in license locks.

Installing the License Passwords Selectively by Using the AutoPass GUI

- a. On the HPOM 9.20 target system, run the following command to open the AutoPass GUI:

```
ovolicense -gui -a HPOM
```
- b. In the GUI, select **Install License Key**, and then **Install/Restore License Key from file**.
- c. Click **Browse** to select the license file copied from the source system.
- d. Click **View file contents**.
- e. Select your license passwords from the list, and then click **Install**.

Installing the License Passwords Nonselectively by Using the `ovolicense` Tool

On the HPOM 9.20 target system, call the `ovolicense` tool to import the license passwords from the backup file.

For example:

```
ovolicense -i -a HPOM -f \  
<directory>/HPOM9-LicFile-Backup.txt
```

This imports all passwords from the specified files.

9 **Installing HPOM in an HP ServiceGuard Environment**

In This Chapter

This chapter describes the following:

- ❑ Installation and configuration of the HP Operations management server in an HP ServiceGuard environment
- ❑ Deinstallation of the HP Operations management server from cluster nodes

NOTE

For information on how to upgrade HPOM from version 9.1x to version 9.20 in a cluster environment, see “Upgrading HPOM in a Cluster Environment” on page 240.

For detailed information about the administration of the HP Operations management server in a cluster environment, see the *HPOM Administrator’s Reference*.

Before proceeding with the installation and configuration of the HP Operations management server in an HP ServiceGuard cluster environment, consider the following HP ServiceGuard cluster terms used in this chapter:

HA Resource Group

Application running in a cluster environment. A high-availability (HA) resource group can simultaneously be a cluster object that represents an application in a cluster. HA resource group is equivalent to a package in the HP ServiceGuard environment.

Volume Group One or more disk drives that are configured to form a single large storage area.

Logical Volume An arbitrary-size space in a volume group that can be used as a separate file system or as a device swap space.

Configuration Scenarios

When installing the HP Operations management server and the Oracle Database server in a cluster environment, you can choose one of the following configuration scenarios:

❑ **Basic management server configuration**

This is the simplest cluster configuration. You can use all backup and maintenance commands without restrictions.

The HP Operations management server and the Oracle Database server are part of the same HA resource group.

❑ **Decoupled management server configuration**

With this setup, you can use both physical nodes with the HPOM HA resource group running on one node and the Oracle Database server resource group on the other node. The HP Operations management server and the Oracle Database server are configured as separate HA resource groups by the HP Operations management server installation scripts. This configuration scenario is also known as 3Tier HP Operations management server configuration in a cluster environment.

The backup scripts are adapted to work even if the HPOM and Oracle HA resource groups are running on different nodes. But to restore a backup, the HPOM and Oracle HA resource groups must run on the same node.

❑ **Independent database server configuration**

Following this scenario, you can use a remote database. The remote database should also run on a cluster. Otherwise the high availability of the HPOM setup is compromised. You may find this scenario useful if you already have a central database server cluster that you also want to use for the HPOM database. With this scenario, on the other hand, you cannot use the HPOM backup scripts.

Configuration Scenarios

In exceptional cases, the Oracle Database server can be configured as an independent database server:

Install the Oracle client software on the cluster nodes that are hosting the HP Operations management server. You can install the independent database as a stand-alone server or as an HA resource group on an independent cluster.

Installation Requirements

To run HPOM in an HP ServiceGuard environment, you must meet the following requirements:

- ❑ RHEL versions 6.x.

For the most up-to-date list of supported RHEL versions, see the support matrix at the following location:

<http://support.openview.hp.com/selfsolve/document/KM323488>

- ❑ HP ServiceGuard version 11.20
- ❑ Make sure to use LVM as the logical volume manager.

IMPORTANT

Make sure that the HP Operations agent version is 11.04.016 or higher.

For additional requirements about installing HPOM, see Chapter 1, “Installation Requirements for the Management Server.”

Installation Requirements for an Oracle Database

The Oracle Database (the database binaries) should preferably be installed on a local disk.

In exceptional cases, you can decide to install the Oracle Database server binaries on a shared disk. For the preparation of such an environment, you will need to perform the additional configuration steps that are marked as optional in the configuration procedures.

For more information on installing the Oracle Database server binaries, see “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 261.

Installing and Configuring the HP Operations Management Server on Cluster Nodes

NOTE

You must complete the following tasks first on the first cluster node, and then on each additional cluster node.

To install and configure the HP Operations management server in a cluster environment, complete these tasks:

- ❑ Task 1: “Before You Install the HP Operations Management Server on the First Cluster Node” on page 249
- ❑ Task 2: “Before You Install the HP Operations Management Server on Additional Cluster Nodes” on page 259
- ❑ Task 3: “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 261
- ❑ Task 4: “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 269

IMPORTANT

You cannot install HPOM simultaneously on all cluster nodes. When the installation process is completed on one cluster node, begin the installation on the next node, until HPOM is installed on all the nodes in a cluster environment.

Preparation Steps

Before you start installing and configuring the HP Operations management server on a cluster node, complete these tasks:

- ❑ Task 1: “Before You Install the HP Operations Management Server on the First Cluster Node” on page 249
- ❑ Task 2: “Before You Install the HP Operations Management Server on Additional Cluster Nodes” on page 259

Before You Install the HP Operations Management Server on the First Cluster Node

Before you install the HP Operations management server on the first cluster node, you must perform appropriate preparation procedures depending on the cluster environment you want to configure. Choose one of the following HP Operations management server scenarios:

- ❑ **Basic environment**

Using this scenario, Oracle and HP Operations server are configured as part of a single HA resource group.

See “Preparation Steps for the First Cluster Node in a Basic Environment” on page 250.

- ❑ **Decoupled environment**

Using this scenario, Oracle and HP Operations server are separated, Oracle is configured as a separate HA resource group. In this case there are two independent resource groups, one for Oracle and one for the HP Operations management server.

See “Preparation Steps for the First Cluster Node in a Decoupled Environment” on page 253.

- ❑ **Independent database server**

Using this scenario, the Oracle Database is configured on a node that is not part of the cluster, or on a cluster node independently of the HP Operations management server installation.

See “Preparation Steps for the First Cluster Node in a Cluster Environment Using an Independent Database Server” on page 257.

Preparation Steps for the First Cluster Node in a Basic Environment

Before you install the HP Operations management server in a cluster environment, follow these steps:

1. Define the following:
 - a. Define the `ov_vg` volume group consisting of at least one shared disk for the HA resource group.

IMPORTANT

When defining the volume group or any of the volumes within the volume group, you can specify an optional name.

Make sure you do not use the MINUS SIGN (-) sign in the volume group and the logical volume names.

- b. Define the following volumes within the `ov_vg` volume group:

- `ov_volume_etc`
- `ov_volume_var`
- `ov_volume_lcore`
- `ov_volume_ora_data`
- `ov_volume_ora_index*`
- `ov_volume_ora_core**`

* If the Oracle Database index directory is different from the Oracle data directory.

** If you choose to install Oracle Database server binaries on a shared disk.

2. Make sure that file systems for the following are available:

- `/etc/opt/OV/share`
- `/var/opt/OV/share`
- `/var/opt/OV/shared/server`
- HP Operations management server database
- HP Operations management server database index files*

- ❑ Oracle Database server binaries**

* If the Oracle Database index directory is different from the Oracle data directory.

** If you choose to install the Oracle Database server binaries on a shared disk.

IMPORTANT

When choosing a file system type of shared file systems, keep in mind that GFS and GFS2 are not supported with HPOM.

3. Prepare mount points for the shared file systems:

- ❑ /etc/opt/OV/share
- ❑ /var/opt/OV/share
- ❑ /var/opt/OV/shared/server
- ❑ Mount point for the HP Operations management server database.

You may select an alternative mount point. The default is the following:

```
/u01/oradata/<ORACLE_SID>
```

In this instance, <ORACLE_SID> is the value of the ORACLE_SID variable used for the configuration of the HP Operations management server database. It is usually set to openview.

- ❑ Mount point for the Oracle Database index directory if the Oracle Database index directory is different from the Oracle data directory.
- ❑ Mount point for the Oracle Database server binaries if they will be installed on a shared disk. The mount point is equal to the value of the ORACLE_BASE variable.

Table 9-1

Disk Space Required for Shared File Systems

| Shared File System | Recommended |
|--------------------|---------------------|
| /etc/opt/OV/share | 2 GB |
| /var/opt/OV/share | 2.5 GB ^a |

Table 9-1 Disk Space Required for Shared File Systems (Continued)

| Shared File System | Recommended |
|---|---------------------|
| /var/opt/OV/shared/server | 2.5 GB |
| /u01/oradata/openview | 2 GB ^b |
| Oracle Database index directory (<i>optional</i>) | 100 MB ^b |
| Oracle Database server binaries (<i>optional</i>) | 10 GB |

- a. Further disk space will be required when SPIs are installed.
- b. For small- to medium-sized installations. Larger installations and high numbers of messages will result in greater space requirements.

4. Start the `ov_vg` volume group by typing the following:

```
/sbin/vgchange -a y ov_vg
```

5. Mount the shared file systems on the prepared mount points as follows:

- a. `/bin/mount [-t <FSType>] \
/dev/ov_vg/ov_volume_var /var/opt/OV/share`
- b. `/bin/mount [-t <FSType>] \
/dev/ov_vg/ov_volume_etc /etc/opt/OV/share`
- c. `/bin/mount [-t <FSType>] \
/dev/ov_vg/ov_volume_lcore \
/var/opt/OV/shared/server`
- d. `/bin/mount [-t <FSType>] \
/dev/ov_vg/ov_volume_ora_data \
/<oracle_database_mount_point>`

In this instance, `<oracle_database_mount_point>` is the mount point you chose for the HP Operations management server database.

e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/bin/mount [-t <FSType>] \  
/dev/ov_vg/ov_volume_ora_index \  
/<oracle_database_index_mount_point>
```

In this instance, `<oracle_database_index_mount_point>` is the mount point for the Oracle Database index directory.

- f. *Optional:* If you choose to install Oracle Database server binaries on a shared disk:

```
/bin/mount [-t <FSType>] \  
/dev/ov_vg/ov_volume_ora_core \  
/<oracle_binaries_mount_point>
```

In this instance, `<oracle_binaries_mount_point>` is the mount point you chose for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

6. Start the Virtual Network IP by using the `cmmodnet` command:

```
/usr/sbin/cmmodnet -a -i <IP> <subnet>
```

In this instance, `<IP>` is the IP address of the virtual host that you previously selected and `<subnet>` is the subnet address of the virtual host you previously selected.

After completing the preparation steps, continue with installing the Oracle Database server. See “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 261.

Preparation Steps for the First Cluster Node in a Decoupled Environment

Before you install the HP Operations management server in a cluster environment, follow these steps:

1. Define the following:
 - a. Define the `ov_vg` volume group consisting of at least one shared disk for the HA resource group.
 - b. Define the following volumes within the `ov_vg` volume group:
 - `ov_volume_etc`
 - `ov_volume_var`
 - `ov_volume_lcore`
 - c. Define the `ovoracle_vg` volume group consisting of at least one shared disk for the HA resource group.

Preparation Steps

d. Define the following volumes within the `ovoracle_vg` volume group:

- `ov_volume_ora_data`
- `ov_volume_ora_index*`
- `ov_volume_ora_core**`

* If the Oracle Database index directory is different from the Oracle data directory.

** If you choose to install the Oracle Database server binaries on a shared disk.

IMPORTANT

When defining the volume group or any of the volumes within the volume group, you can specify an optional name.

Make sure you do not use the MINUS SIGN (-) sign in the volume group and the logical volume names.

2. Make sure that file systems for the following are available:

- `/etc/opt/OV/share`
- `/var/opt/OV/share`
- `/var/opt/OV/shared/server`
- HP Operations management server database
- HP Operations management server database index files*
- Oracle Database server binaries**

* If the Oracle Database index directory is different from the Oracle data directory.

** If you choose to install the Oracle Database server binaries on a shared disk (equal to the value of the `ORACLE_BASE` variable).

IMPORTANT

When choosing a file system type of shared file systems, keep in mind that GFS and GFS2 are not supported with HPOM.

3. Prepare mount points for the shared file systems:

- /etc/opt/OV/share
- /var/opt/OV/share
- /var/opt/OV/shared/server
- Mount point for the HP Operations management server database.

You may select an alternative mount point. The default is:

/u01/oradata/<ORACLE_SID>

In this instance, <ORACLE_SID> is the value of the ORACLE_SID variable used for the configuration of the HP Operations management server database. It is usually set to openview.

- Mount point for the Oracle Database index directory if the Oracle Database index directory is different from the Oracle data directory.
- Mount point for the Oracle Database server binaries if you choose to install the Oracle Database server binaries on a shared disk (equal to the value of the ORACLE_BASE variable).

Table 9-2

Disk Space Required for Shared File Systems

| Shared File System | Recommended |
|---|---------------------|
| /etc/opt/OV/share | 2 GB |
| /var/opt/OV/share | 2.5 GB ^a |
| /var/opt/OV/shared/server | 2.5 GB |
| /u01/oradata/openview | 2 GB ^b |
| Oracle Database index directory (<i>optional</i>) | 100 MB ^b |
| Oracle Database server binaries (<i>optional</i>) | 10 GB |

a. Further disk space will be required when SPIs are installed.

b. For small- to medium-sized installations. Larger installations and high numbers of messages will result in greater space requirements.

Preparation Steps

4. Start the `ov_vg` and `ovoracle_vg` volume groups by typing the following:

```
/sbin/vgchange -a y ov_vg
```

```
/sbin/vgchange -a y ovoracle_vg
```

5. Mount the shared file systems on the prepared mount points as follows:

a. `/bin/mount [-t <FSType>] \
/dev/ov_vg/ov_volume_var /var/opt/OV/share`

b. `/bin/mount [-t <FSType>] \
/dev/ov_vg/ov_volume_etc /etc/opt/OV/share`

c. `/bin/mount [-t <FSType>] \
/dev/ov_vg/ov_volume_lcore \
/var/opt/OV/shared/server`

d. `/bin/mount [-t <FSType>] \
/dev/ovoracle_vg/ov_volume_ora_data \
/<oracle_database_mount_point>`

In this instance, `<oracle_database_mount_point>` is the mount point you chose for the HP Operations management server database and `<FSType>` is a file system type of shared file systems.

- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/bin/mount [-t <FSType>] \  
/dev/ovoracle_vg/ov_volume_ora_index \  
/<oracle_database_index_mount_point>
```

In this instance, `<oracle_database_index_mount_point>` is the mount point for the HP Operations management server database index files.

- f. *Optional:* If you choose to install Oracle Database server binaries on a shared disk:

```
/bin/mount [-t <FSType>] \  
/dev/ovoracle_vg/ov_volume_ora_core \  
/<oracle_binaries_mount_point>
```


In this instance, *<oracle_binaries_mount_point>* is the mount point you chose for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

6. Activate the HP Operations server Virtual Network IP by using the `cmmodnet` command:

```
/usr/sbin/cmmodnet -a -i <IP> <subnet>
```

In this instance, *<IP>* is the IP address of the virtual host that you previously selected and *<subnet>* is the subnet address of the virtual host you previously selected.

7. Activate the Oracle Virtual Network IP by using the `cmmodnet` command:

```
/usr/sbin/cmmodnet -a -i <IP> <subnet>
```

In this instance, *<IP>* is the IP address of the virtual host that you previously selected and *<subnet>* is the subnet address of the virtual host you previously selected.

After completing the preparation steps, continue with installing the Oracle Database server. See “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 261.

Preparation Steps for the First Cluster Node in a Cluster Environment Using an Independent Database Server

Before you install the HP Operations management server in a cluster environment, follow these steps:

1. Define the following:
 - a. Define the `ov_vg` volume group consisting of at least one shared disk for the HA resource group.

IMPORTANT

When defining the volume group or any of the volumes within the volume group, you can specify an optional name.

Make sure you do not use the MINUS SIGN (-) sign in the volume group and the logical volume names.

Preparation Steps

b. Define the following three volumes within the `ov_vg` volume group:

- `ov_volume_etc`
- `ov_volume_var`
- `ov_volume_lcore`

2. Make sure that file systems for the following are available:

- `/etc/opt/OV/share`
- `/var/opt/OV/share`
- `/var/opt/OV/shared/server`

IMPORTANT

When choosing a file system type of shared file systems, keep in mind that GFS and GFS2 are not supported with HPOM.

3. Prepare mount points for the shared file systems:

- `/etc/opt/OV/share`
- `/var/opt/OV/share`
- `/var/opt/OV/shared/server`

Table 9-3

Disk Space Required for Shared File Systems

| Shared File System | Recommended |
|--|---------------------|
| <code>/etc/opt/OV/share</code> | 2 GB |
| <code>/var/opt/OV/share</code> | 2.5 GB ^a |
| <code>/var/opt/OV/shared/server</code> | 2.5 GB |

a. Further disk space will be required when SPIs are installed.

4. Start the `ov_vg` volume group by typing the following:

```
/sbin/vgchange -a y ov_vg
```

5. Mount the shared file systems on the prepared mount points as follows:

- a. `/bin/mount [-t <FSType>] \
/dev/ov_vg/ov_volume_var /var/opt/OV/share`
- b. `/bin/mount [-t <FSType>] \
/dev/ov_vg/ov_volume_etc /etc/opt/OV/share`
- c. `/bin/mount [-t <FSType>] \
/dev/ov_vg/ov_volume_lcore \
/var/opt/OV/shared/server`

6. Start the Virtual Network IP by using the `cmmodnet` command:

```
/usr/sbin/cmmodnet -a -i <IP> <subnet>
```

In this instance, `<IP>` is the IP address of the virtual host that you previously selected and `<subnet>` is the subnet address of the virtual host you previously selected.

Before You Install the HP Operations Management Server on Additional Cluster Nodes

Before you install the HP Operations management server on additional cluster nodes, you must perform appropriate preparation procedures. The preparation steps are identical for all HP Operations management server installation scenarios.

Preparation Steps for Additional Cluster Nodes

The following preconditions must be met before installing the HP Operations management server on an additional cluster node:

- ❑ The HP Operations management server must already be installed and running on one of the cluster nodes. This allows you to add a local node to the HP Operations management server configuration and install and start the HP Operations agent software on the local node.
- ❑ On the node where HPOM is running, enable the remote-shell connection for user `root` to the node where you plan to install the HP Operations management server software. You can do this by putting the following line into `/.rhosts`:

```
<node> root
```

Preparation Steps

You can check if the remote shell is enabled by using the following command:

```
rsh <active_node> -l root -n ls
```

A list of files on the `root` directory from the node where the HP Operations management server is running should be displayed.

In more secure environments, it is possible to set up a secure shell (SSH) connection between the node where you plan to install an HP Operations server and the node where the HP Operations server is running.

For the HP Operations server installation, you must enable passwordless SSH access for user `root` between these two nodes. `ssh` and `scp` are the two commands that are used during the installation. Both commands must be accessible from the main path.

You can check if the secure remote shell is enabled by using the following command:

```
ssh <active_node> -l root -n ls
```

The type of connection will be automatically detected. A secure connection has a higher priority if both types of connection are enabled.

- ❑ Shared file systems must *not* be mounted on this cluster node. They are already mounted on the cluster node where the HP Operations management server is running.
- ❑ Virtual IP must *not* be activated on this node because it is already used on the node where the HP Operations management server is running.

Installing the Oracle Database Server for HPOM in a Cluster Environment

The Oracle Database server binaries must be installed on a local disk to enable the high availability of the Oracle Database server and consequently of the HP Operations management server. If the Oracle Database server binaries become corrupt, it is very important that the Oracle Database server can be switched to another cluster node with intact Oracle Database server binaries.

In exceptional cases, you may want to install the Oracle Database server binaries on a shared disk. This way only one set of Oracle Database server binaries is installed but there is a greater risk of losing Oracle availability. If you choose the decoupled scenario for installing HPOM, a separate Oracle client installation is also needed.

Table 9-4 Configuration Scenarios Based on the File System Location

| | | Oracle Database server location | | |
|--------------------------------|-------------|--|---|---|
| | | Local File System | Shared File System (Exceptional) | Remote File System |
| Configuration scenarios | Basic | See “Oracle Database Server on a Local Disk”: “Basic HP Operations management server installation” on page 263. | See “Oracle Database Server on a Shared Disk (Exceptional)”: “Basic HP Operations management server installation” on page 264. | |
| | Decoupled | See “Oracle Database Server on a Local Disk”: “Decoupled HP Operations management server database installation” on page 263. | See “Oracle Database Server on a Shared Disk (Exceptional)”: “Decoupled HP Operations management server database installation” on page 265. | |
| | Independent | See “Oracle Database Server on a Local Disk”: “Independent database server installation” on page 263. | | See “Oracle Database Server on a Remote File System”: “Independent database server installation” on page 267. |

Oracle Database Server on a Local Disk

❑ Basic HP Operations management server installation

Install the Oracle Database software as described in “Installing an Oracle Database” on page 46.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 269.

❑ Decoupled HP Operations management server database installation

Install the Oracle Database software as described in “Installing an Oracle Database” on page 46.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 269.

❑ Independent database server installation

- *First cluster node*

Install the Oracle Database software as described in “Installing an Oracle Database” on page 46.

- *Additional cluster node*

Install the Oracle Net Services and Oracle client software on the local disk, all other Oracle configuration steps will be performed by the HP Operations server installation script.

NOTE

After the Oracle server installation, make sure to create a script or a binary named as follows:

```
/opt/OV/bin/OpC/Utils/ha/ha_check_oracle
```

The exit code of this script or binary must be 0 if the Oracle Database server runs, or other than 0 if it does not run. This script or binary, with which the HP Operations management server checks the status of the Oracle Database, must be present on all HP Operations management server cluster nodes.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 269.

IMPORTANT

When the following questions appear during the independent database server configuration, make sure that you answer as follows:

- Separate Oracle from Server?
Press **y**.
 - Configure Server and Oracle DB running as separate HA resource groups?
Press **n**.
 - Set up the database manually (local/remote)?
Press **y**.
 - Is the manually configured database already set up?
Press **n**.
-

Oracle Database Server on a Shared Disk (Exceptional)

The installation script automatically detects if Oracle Database server binaries are located on a shared disk, or if the `ORACLE_BASE` directory is a mount point for an external file system containing the Oracle Database server binaries (the file system must always be mounted on the `ORACLE_BASE` mount point).

The installation procedures for Oracle depend on the type of the HP Operations server installation:

❑ Basic HP Operations management server installation

Install the Oracle Database software as described in “Installing an Oracle Database” on page 46.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 269.

❑ **Decoupled HP Operations management server database installation**

When Oracle is separated from the HP Operations server, and Oracle Database server binaries are installed on a shared disk, install the Oracle client software on the local disk, so that the HP Operations server can connect to the Oracle Database server through the Oracle client. You *must* install the Oracle client software on a location other than `ORACLE_BASE`. The path to the Oracle client must be the same on all HP Operations management server cluster nodes.

- *First cluster node*

Install the Oracle client software on the local disk and then the Oracle server software on a shared disk as described in “Installing an Oracle Database” on page 46.

When installing and configuring the HP Operations server, the `ORACLE_BASE` and `ORACLE_HOME` variables must be set to the Oracle Database server location.

NOTE

Do not use the Instant Client, but the full Oracle Client (the Runtime installation type).

After installing the HP Operations management server, follow these steps:

1. Copy the following configuration files from the Oracle Database server location on the shared disk (`<Oracle_server_home>/network/admin/`) to the Oracle client location on the local disk (`<Oracle_client_home>/network/admin/`):

- `listener.ora`
- `sqlnet.ora`
- `tnsnames.ora`
- `tnsnv.ora`

2. To contain the location of the Oracle client software, modify the `ORACLE_HOME` variable in the following location:

`/etc/opt/OV/share/conf/ovdbconf`

3. Stop the HP Operations management server as an HA resource group by using the following command:

```
/opt/OV/bin/ovharg_config ov-server -stop \  
<local_hostname>
```

4. Add the following lines to the `/etc/sysconfig/ovoracle` file:

```
ORACLE_HOME=<Oracle_Server_Home>  
ORACLE_SID=<ORACLE_SID>  
export ORACLE_HOME ORACLE_SID
```

The `/etc/sysconfig/ovoracle` file is used as a configuration file by the `/etc/init.d/ovoracle` script, which is used by the Oracle HARG to start the Oracle Database.

NOTE

Make sure that you use the latest version of the `/etc/init.d/ovoracle` script. Copy the file from `newconfig` by running the following command:

```
cp /opt/OV/newconfig/OpC/etc/init.d/ovoracle \  
/etc/init.d/ovoracle
```

5. Remove the existing links in `/opt/OV/lib64` to the libraries located in the Oracle Database server directory, and replace them with links to Oracle client libraries:

```
— ln -sf <ORACLE_HOME>/lib/libclntsh.so \  
/opt/OV/lib64/libclntsh.so  
— ln -sf <ORACLE_HOME>/lib/libclntsh.so \  
/opt/OV/lib64/libclntsh.so.11.1  
— ln -sf <ORACLE_HOME>/lib/libnnz11.so \  
/opt/OV/lib64/libnnz11.so
```

6. Start the HP Operations management server as an HA resource group by using the following command:

```
/opt/OV/bin/ovharg_config ov-server -start \  
<local_hostname>
```

The HP Operations management server will now connect to the Oracle Database server through the Oracle client.

- *Additional cluster node*

Install the Oracle client software on a local disk, all other Oracle configuration steps will be performed by the HP Operations management server installation script.

NOTE

When installing and configuring the HP Operations server, the ORACLE_HOME variable must be set to the Oracle client location.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 269.

Oracle Database Server on a Remote File System

- ❑ Independent database server installation

If the Oracle Database server will be running on a remote system that is not part of the local node:

- *First cluster node*

Configure the Oracle Database as described in “Setting Up HPOM with a Remote/Manual Oracle Database” on page 130.

- *Additional cluster node*

Install the Oracle Net Services and Oracle client software on the local disk, all other Oracle configuration steps will be performed by the HP Operations server installation script.

NOTE

After the Oracle server installation, make sure to create a script or a binary named as follows:

```
/opt/OV/bin/OpC/utlils/ha/ha_check_oracle
```

The exit code of this script or binary must be 0 if the Oracle Database server runs, or other than 0 if it does not run. This script or binary, with which the HP Operations management server checks the status of the Oracle Database, must be present on all HP Operations management server cluster nodes.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 269.

IMPORTANT

When the following questions appear during the independent database server configuration, make sure that you answer as follows:

- Separate Oracle from Server?
Press **y**.
 - Configure Server and Oracle DB running as separate HA resource groups?
Press **n**.
 - Set up the database manually (local/remote)?
Press **y**.
 - Is the manually configured database already set up?
Press **n**.
-

Installing and Configuring the HP Operations Management Server on Cluster Nodes

When installing HPOM in a cluster environment, you must provide responses to some questions and specify some values differently than in the stand-alone HPOM installation. These cluster-specific questions differ depending on whether you are installing and configuring the HP Operations management server on the first cluster node or on an additional cluster node.

IMPORTANT

Make sure that cluster node names are the same as hostnames. Otherwise, the configuration fails.

Installing and Configuring the HP Operations Management Server on the First Cluster Node

To install and configure the HP Operations management server on the first cluster node, follow these steps:

1. After the `ovoconfigure` script detects a special environment, provide answers to the following cluster-specific questions:

| Question | Instruction |
|--|--|
| Run HPOM Server as an HA resource group | Press y followed by ENTER .
The script checks the remote shell connection and the secure remote shell connection. |
| Would you prefer to use REMSH even though SSH is enabled | Press ENTER to accept the default answer (that is, n). |

| Question | Instruction |
|-----------------------------|--|
| HA Resource Group name | <p>Press ENTER to accept the default answer (that is, <code>ov-server</code>), or specify an alternative name for the HA resource group, and then press ENTER.</p> <p>HA resource groups are created during the installation of HPOM. The <code>ovinstall</code> script builds the package or the service control file, and the configuration file automatically. Do not create these files manually and do not use your own configuration files. If you already did it, remove them before starting the installation of HPOM.</p> <p>IMPORTANT: The entered HA resource group name may not be one of the already existing names.</p> |
| Server virtual hostname | <p>Enter the short name of the virtual host (for example, <code>virtip1</code>).</p> |
| Separate Oracle from Server | <p>To separate Oracle from the HP Operations management server, press y. The following question is displayed:</p> <p>Configure Server and Oracle DB running as separate HA resource groups?</p> <p><i>If you want to configure Oracle as a separate HA resource group:</i> Press ENTER to accept the default answer. You are prompted to enter the Oracle HA resource group name (for example, <code>ov-oracle</code>) and the Oracle virtual hostname (for example, <code>virtip2</code>).</p> <p>IMPORTANT: The entered HA resource group name may not be one of the already existing names.</p> <p><i>If you do not want to configure Oracle as a separate HA resource group:</i> Press n followed by ENTER and continue with the HP Operations management server installation where Oracle is an independent database server.</p> |

| Question | Instruction |
|------------------------|--|
| Oracle Base | Choose the Oracle database base directory (the default is /opt/oracle). |
| Oracle Data Directory | Choose the directory where HP Operations server database files are stored. |
| Oracle Index Directory | Choose the directory where HP Operations server database index files are stored (by default, it is the same as the Oracle data directory). |

The ovoconfigure script continues with checking shared file systems.

2. If you want to add a new shared file system, follow these steps:

a. Press **y** followed by **ENTER**.

You are prompted to enter the shared file system mount point.

b. Type the desired shared file system mount point, and then press **ENTER**.

Otherwise, accept the default value **n** by pressing **ENTER**.

The ovoconfigure script continues with checking virtual hosts.

3. If you want to add a new virtual host, follow these steps:

a. Press **y** followed by **ENTER**.

You are prompted to add the virtual hostname.

b. Type the desired virtual hostname (for example, virtip3), and then press **ENTER**.

Otherwise, accept the default value **n** by pressing **ENTER**.

The summary of all shared file systems and virtual hosts is displayed, after which the ovoconfigure script asks you if you want to continue.

4. Press **ENTER**.

An output similar to the following one should appear:

```
Cluster preconfiguration . . . . . OK
```

5. Press **ENTER** to continue with the database configuration and the server initialization.

Make sure to answer all the questions related to the database configuration and the server initialization.

6. Press **ENTER** to continue with the cluster configuration.

An output similar to the following one should appear:

```
Cluster configuration on FIRST cluster node
-----
OVHARG configuration . . . . . OK
Configure Server cluster configuration . . . . . OK
Server cluster postconfiguration . . . . . OK
Server HARG creation . . . . . OK
Cluster successfully configured
```

7. Press **ENTER** to continue.

The server final configuration starts. It consists of the following:

- Management server policy group assignment
- Subagents configuration
- Java GUI configuration
- Web server configuration
- Certificates backup

8. Press **ENTER** to start the HP Operations management server as an HA resource group.

At this point, agent deployment packages are installed, the local agent is configured, and the configuration is distributed to the local agent.

NOTE

To limit the server communication to the virtual IP only, run the following command:

```
/opt/OV/bin/ovconfchg -ovrg server -ns bbc.http -set \
CLIENT_BIND_ADDR <virtual_IP_of_HPOM_cluster>
```


Installing and Configuring the HP Operations Management Server on an Additional Cluster Node

To install and configure the HP Operations management server on an additional cluster node, follow these steps:

1. After the `ovoconfigure` script detects a special environment, you are asked if you want to run the HP Operations management server as an HA resource group.

Press **y** followed by **ENTER**.

The script checks the remote shell connection and the secure remote shell connection, and then the following question appears:

Would you prefer to use REMSH even though SSH is enabled?

2. Press **ENTER** to accept the default answer (that is, **n**).

You are prompted to enter the HA resource group name.

3. Press **ENTER** to accept the default answer (that is, `ov-server`), or specify an alternative name for the HA resource group, and then press **ENTER**.

IMPORTANT

The entered HA resource group must be configured and running on the first cluster node.

An output similar to the following one should appear:

```
Cluster preconfiguration . . . . . OK
```

4. Press **ENTER** to continue with the server initialization.

During the server initialization, `ovoconfigure` performs the integration into the start-stop sequence.

5. Press **ENTER** to continue with the cluster configuration.

An output similar to the following one should appear:

```
Cluster configuration on ADDITIONAL cluster node
-----
OVHARG configuration . . . . . OK
Configure Server cluster configuration . . . . . OK
```

Installing and Configuring the HP Operations Management Server on Cluster Nodes

```
Configure Oracle cluster configuration . . . . . OK  
Server cluster postconfiguration . . . . . OK  
Adding local node to Server HARG . . . . . OK
```

Cluster successfully configured

6. Press **ENTER** to continue with the server final configuration that consists of the following:

- Management server policy group assignment
- Java GUI configuration
- Web server configuration
- Agent deployment packages installation
- Local agent configuration
- Distributing configuration to the local agent

Log Files

For details about the cluster-specific installation, check the following log files:

- ❑ `/var/opt/OV/log/OpC/mgmt_sv/installation.log.verbose`

Contains information about the success and eventual problems during the installation.

- ❑ `/var/opt/OV/hacluster/ov-server/trace.log1`,
`/var/opt/OV/hacluster/ov-server/error.log`, and
`/var/log/messages`

Contain information about managing the HA resource group.

NOTE

The HARG `trace.log` file size is limited. When the maximum file size is reached, `trace.log` is moved into `trace.log.old` and the new information is written into a new `trace.log` file.

The maximum size of the `trace.log` file can be changed by editing the `/var/opt/OV/hacluster/<HARG name>/settings` file, and adding the following line:

```
TRACING_FILE_MAX_SIZE=<maximum_size_in_kBytes>
```

For example:

```
TRACING_FILE_MAX_SIZE=7000
```

-
1. Only if previously enabled by entering the following:
`/opt/OV/sbin/ovharg -tracing ov-server enable`
The `trace.log` file is automatically updated with the information about starting the HA resource group during the installation on the first cluster node.

Deinstalling the HPOM Software from Cluster Nodes

The HPOM software can be deinstalled in one of two ways:

❑ From all cluster nodes

When deinstalling the HP Operations management server from a cluster environment, you must perform the deinstallation procedure in the following sequence:

1. Deinstall the HP Operations management server from the **passive cluster nodes**. These are the systems that are installed and configured to run the HP Operations management server, but are currently *not* running.

For details on how to deinstall the HP Operations server from the passive cluster nodes, see “Deinstalling HPOM from Passive Cluster Nodes” on page 277.

2. When the HP Operations management server software is deinstalled from all passive nodes, deinstall the software from the **active cluster node**. This is the system on which the HP Operations management server is currently up and running as an HA resource group.

For details on how to deinstall the HP Operations management server from the active cluster node, see “Deinstalling HPOM from the Active Cluster Node” on page 277.

❑ From selected cluster nodes

After you deinstall the HP Operations management server software from a cluster node, this node will no longer be able to run the HP Operations management server. The cluster environment running the HP Operations server will be reduced by one node.

To deinstall HP Operations management server software from a cluster node, this node must be in the passive state. For details on how to deinstall HP Operations management server software from passive cluster nodes, see “Deinstalling HPOM from Passive Cluster Nodes” on page 277.

Deinstalling HPOM from Passive Cluster Nodes

Before the HP Operations management server software is deinstalled from a passive cluster node, the following requirements must be met:

1. The HP Operations server HA resource group `ov-server` may not be active on this node.
2. Virtual host must *not* be active.
3. Shared file systems must *not* be mounted.

After ensuring that all these requirements are met, deinstall the HP Operations management server as described in Chapter 6, “Software Administration on the Management Server.”

Deinstalling HPOM from the Active Cluster Node

When the HP Operations management server is deinstalled from all the passive cluster nodes, you can start the deinstallation process from the node on which the HP Operations management server is running.

Deinstall the HP Operations management server software from this node as described in Chapter 6, “Software Administration on the Management Server,” on page 185.

Stopping the HP Operations Management Server in a Cluster Environment for Maintenance

Sometimes, you need to stop the HP Operations management server to install a patch, perform an upgrade, conduct maintenance, and so on.

To stop the HP Operations management server, follow these steps:

1. Disable the HA resource group monitoring by using the command:

```
/opt/OV/sbin/ovharg -monitor ov-server disable
```

2. Stop the HP Operations management server.

The HP Operations management server must *not* be stopped by using the cluster-related commands. Only the HPOM commands such as `ovc` and `opcsv` may be used.

CAUTION

Before you run the `opcsv -stop`, `ovc -stop`, or `ovc -kill` command, you must disable the HA resource group monitoring. Failing to do so results in a failover.

3. Perform the intended action (the patch installation, an upgrade, the maintenance, and so on).

4. Start the HP Operations management server.

The HP Operations management server must *not* be started by using the cluster-related commands. Only the HPOM commands such as `ovc` and `opcsv` may be used.

5. Enable the HA resource group monitoring by using the command:

```
/opt/OV/sbin/ovharg -monitor ov-server enable
```

NOTE

Before enabling the HA resource group monitoring, make sure that the HP Operations management server is running.

10

Installing HPOM in a Red Hat Cluster Suite Environment

In This Chapter

This chapter describes the following:

- ❑ Installation and configuration of the HP Operations management server in a Red Hat Cluster Suite environment
- ❑ Deinstallation of the HP Operations management server from cluster nodes

NOTE

For information on how to upgrade HPOM from version 9.1x to version 9.20 in a cluster environment, see “Upgrading HPOM in a Cluster Environment” on page 240.

For detailed information about the administration of the HP Operations management server in a cluster environment, see the *HPOM Administrator’s Reference*.

Before proceeding with the installation and configuration of the HP Operations management server in a Red Hat Cluster Suite environment, consider the following Red Hat Cluster Suite terms used in this chapter:

HA Resource Group

Application running in a cluster environment. A high-availability (HA) resource group can simultaneously be a cluster object that represents an application in a cluster. HA resource group is equivalent to a service in the Red Hat Cluster Suite environment.

Volume Group One or more disk drives that are configured to form a single large storage area.

Logical Volume An arbitrary-size space in a volume group that can be used as a separate file system or as a device swap space.

Configuration Scenarios

When installing the HP Operations management server and the Oracle Database server in a cluster environment, you can choose one of the following configuration scenarios:

❑ **Basic management server configuration**

This is the simplest cluster configuration. You can use all backup and maintenance commands without restrictions.

The HP Operations management server and the Oracle Database server are part of the same HA resource group.

❑ **Decoupled management server configuration**

With this setup, you can use both physical nodes with the HPOM HA resource group running on one node and the Oracle Database server resource group on the other node. The HP Operations management server and the Oracle Database server are configured as separate HA resource groups by the HP Operations management server installation scripts. This configuration scenario is also known as 3Tier HP Operations management server configuration in a cluster environment.

The backup scripts are adapted to work even if the HPOM and Oracle HA resource groups are running on different nodes. But to restore a backup, the HPOM and Oracle HA resource groups must run on the same node.

❑ **Independent database server configuration**

Following this scenario, you can use a remote database. The remote database should also run on a cluster. Otherwise the high availability of the HPOM setup is compromised. You may find this scenario useful if you already have a central database server cluster that you also want to use for the HPOM database. With this scenario, on the other hand, you cannot use the HPOM backup scripts.

Configuration Scenarios

In exceptional cases, the Oracle Database server can be configured as an independent database server:

Install the Oracle client software on the cluster nodes that are hosting the HP Operations management server. You can install the independent database as a stand-alone server or as an HA resource group on an independent cluster.

Installation Requirements

To run HPOM in a Red Hat Cluster Suite environment, you must meet the following requirements:

- ❑ RHEL 5.x or 6.x

For the most up-to-date list of supported RHEL versions, see the support matrix at the following location:

<http://support.openview.hp.com/selfsolve/document/KM323488>

- ❑ Red Hat Cluster Suite
- ❑ Make sure to use LVM as the logical volume manager.

For additional requirements about installing HPOM, see Chapter 1, “Installation Requirements for the Management Server.”

Installation Requirements for an Oracle Database

The Oracle Database (the database binaries) should preferably be installed on a local disk.

In exceptional cases, you can decide to install the Oracle Database server binaries on a shared disk. For the preparation of such an environment, you will need to perform the additional configuration steps that are marked as optional in the configuration procedures.

For more information on installing the Oracle Database server binaries, see “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 298.

Installing and Configuring the HP Operations Management Server on Cluster Nodes

NOTE

You must complete the following tasks first on the first cluster node, and then on each additional cluster node.

To install and configure the HP Operations management server in a cluster environment, complete these tasks:

- ❑ Task 1: “Before You Install the HP Operations Management Server on the First Cluster Node” on page 285
- ❑ Task 2: “Before You Install the HP Operations Management Server on Additional Cluster Nodes” on page 295
- ❑ Task 3: “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 298
- ❑ Task 4: “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 306

IMPORTANT

You cannot install HPOM simultaneously on all cluster nodes. When the installation process is completed on one cluster node, begin the installation on the next node, until HPOM is installed on all the nodes in a cluster environment.

Preparation Steps

Before you start installing and configuring the HP Operations management server on a cluster node, complete these tasks:

- ❑ Task 1: “Before You Install the HP Operations Management Server on the First Cluster Node” on page 285
- ❑ Task 2: “Before You Install the HP Operations Management Server on Additional Cluster Nodes” on page 295

Before You Install the HP Operations Management Server on the First Cluster Node

Before you install the HP Operations management server on the first cluster node, you must perform appropriate preparation procedures depending on the cluster environment you want to configure. Choose one of the following HP Operations management server scenarios:

- ❑ **Basic environment**

Using this scenario, Oracle and HP Operations server are configured as part of a single HA resource group.

See “Preparation Steps for the First Cluster Node in a Basic Environment” on page 286.

- ❑ **Decoupled environment**

Using this scenario, Oracle and HP Operations server are separated, Oracle is configured as a separate HA resource group. In this case there are two independent resource groups, one for Oracle and one for the HP Operations management server.

See “Preparation Steps for the First Cluster Node in a Decoupled Environment” on page 289.

- ❑ **Independent database server**

Using this scenario, the Oracle Database is configured on a node that is not part of the cluster, or on a cluster node independently of the HP Operations management server installation.

See “Preparation Steps for the First Cluster Node in a Cluster Environment Using an Independent Database Server” on page 293.

Preparation Steps for the First Cluster Node in a Basic Environment

Before you install the HP Operations management server in a cluster environment, follow these steps:

1. Define the following:
 - a. Define the `ov-vg` volume group consisting of at least one shared disk for the HA resource group.
 - b. Define the following volumes within the `ov-vg` volume group:
 - `ov-volume-etc`
 - `ov-volume-var`
 - `ov-volume-lcore`
 - `ov-volume-ora-data`
 - `ov-volume-ora-index*`
 - `ov-volume-ora-core**`

* If the Oracle Database index directory is different from the Oracle data directory.

** If you choose to install Oracle Database server binaries on a shared disk.

NOTE

When defining the volume group or any of the volumes within the volume group, you can specify an optional name.

2. Make sure that file systems for the following are available:
 - `/etc/opt/OV/share`
 - `/var/opt/OV/share`
 - `/var/opt/OV/shared/server`
 - HP Operations management server database
 - HP Operations management server database index files*
 - Oracle Database server binaries**

* If the Oracle Database index directory is different from the Oracle data directory.

** If you choose to install the Oracle Database server binaries on a shared disk.

IMPORTANT

When choosing a file system type of shared file systems, keep in mind that GFS and GFS2 are not supported with HPOM.

3. Prepare mount points for the shared file systems:

- /etc/opt/OV/share
- /var/opt/OV/share
- /var/opt/OV/shared/server
- Mount point for the HP Operations management server database.

You may select an alternative mount point. The default is the following:

```
/u01/oradata/<ORACLE_SID>
```

In this instance, <ORACLE_SID> is the value of the ORACLE_SID variable used for the configuration of the HP Operations management server database. It is usually set to openview.

- Mount point for the Oracle Database index directory if the Oracle Database index directory is different from the Oracle data directory.
- Mount point for the Oracle Database server binaries if they will be installed on a shared disk. The mount point is equal to the value of the ORACLE_BASE variable.

Table 10-1

Disk Space Required for Shared File Systems

| Shared File System | Recommended |
|---------------------------|---------------------|
| /etc/opt/OV/share | 2 GB |
| /var/opt/OV/share | 2.5 GB ^a |
| /var/opt/OV/shared/server | 2.5 GB |

Table 10-1 Disk Space Required for Shared File Systems (Continued)

| Shared File System | Recommended |
|---|---------------------|
| /u01/oradata/openview | 2 GB ^b |
| Oracle Database index directory (<i>optional</i>) | 100 MB ^b |
| Oracle Database server binaries (<i>optional</i>) | 10 GB |

- a. Further disk space will be required when SPIs are installed.
- b. For small- to medium-sized installations. Larger installations and high numbers of messages will result in greater space requirements.

4. Start the `ov-vg` volume group by typing the following:

- For RHEL 5.x:
`/usr/sbin/vgchange -a y ov-vg`
- For RHEL 6.x:
`/sbin/vgchange -a y ov-vg`

5. Mount the shared file systems on the prepared mount points as follows:

- a. `/bin/mount [-t <FSType>] /dev/ov-vg/ov-volume-var \ /var/opt/OV/share`
- b. `/bin/mount [-t <FSType>] /dev/ov-vg/ov-volume-etc \ /etc/opt/OV/share`
- c. `/bin/mount [-t <FSType>] /dev/ov-vg/ov-volume-lcore \ /var/opt/OV/shared/server`
- d. `/bin/mount [-t <FSType>] \ /dev/ov-vg/ov-volume-ora-data \ /<oracle_database_mount_point>`

In this instance, `<oracle_database_mount_point>` is the mount point you chose for the HP Operations management server database.

- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/usr/sbin/mount -F <FSType>/bin/mount [-t <FSType>] \  
/dev/ov-vg/ov-volume-ora-index \  
/<oracle_database_index_mount_point>
```

In this instance, *<oracle_database_index_mount_point>* is the mount point for the Oracle Database index directory.

- f. *Optional:* If you choose to install Oracle Database server binaries on a shared disk:

```
/usr/sbin/mount -F <FSType>/bin/mount [-t <FSType>] \  
/dev/ov-vg/ov-volume-ora-core \  
/<oracle_binaries_mount_point>
```

In this instance, *<oracle_binaries_mount_point>* is the mount point you chose for the Oracle Database server binaries installation (equal to the value of the ORACLE_BASE variable).

6. Start the Virtual Network IP by using the `ip` command:

```
ip addr add <IP/subnet> dev <iface>
```

In this instance, *<IP>* is the IP address of the virtual host that you previously selected, *<subnet>* is the subnet address of the virtual host you previously selected, and *<iface>* is the interface that hosts the new IP address.

After completing the preparation steps, continue with installing the Oracle Database server. See “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 298.

Preparation Steps for the First Cluster Node in a Decoupled Environment

Before you install the HP Operations management server in a cluster environment, follow these steps:

1. Define the following:
 - a. Define the `ov-vg` volume group consisting of at least one shared disk for the HA resource group.
 - b. Define the following volumes within the `ov-vg` volume group:
 - `ov-volume-etc`

Preparation Steps

- `ov-volume-var`
- `ov-volume-lcore`
- c. Define the `ovoracle-vg` volume group consisting of at least one shared disk for the HA resource group.
- d. Define the following volumes within the `ovoracle-vg` volume group:
 - `ov-volume-ora-data`
 - `ov-volume-ora-index*`
 - `ov-volume-ora-core**`

* If the Oracle Database index directory is different from the Oracle data directory.

** If you choose to install the Oracle Database server binaries on a shared disk.

NOTE

When defining the volume group or any of the volumes within the volume group, you can specify an optional name.

2. Make sure that file systems for the following are available:

- `/etc/opt/OV/share`
- `/var/opt/OV/share`
- `/var/opt/OV/shared/server`
- HP Operations management server database
- HP Operations management server database index files*
- Oracle Database server binaries**

* If the Oracle Database index directory is different from the Oracle data directory.

** If you choose to install the Oracle Database server binaries on a shared disk (equal to the value of the `ORACLE_BASE` variable).

IMPORTANT

When choosing a file system type of shared file systems, keep in mind that GFS and GFS2 are not supported with HPOM.

3. Prepare mount points for the shared file systems:

- /etc/opt/OV/share
- /var/opt/OV/share
- /var/opt/OV/shared/server
- Mount point for the HP Operations management server database.

You may select an alternative mount point. The default is:

```
/u01/oradata/<ORACLE_SID>
```

In this instance, <ORACLE_SID> is the value of the ORACLE_SID variable used for the configuration of the HP Operations management server database. It is usually set to openview.

- Mount point for the Oracle Database index directory if the Oracle Database index directory is different from the Oracle data directory.
- Mount point for the Oracle Database server binaries if you choose to install the Oracle Database server binaries on a shared disk (equal to the value of the ORACLE_BASE variable).

Table 10-2

Disk Space Required for Shared File Systems

| Shared File System | Recommended |
|---|---------------------|
| /etc/opt/OV/share | 2 GB |
| /var/opt/OV/share | 2.5 GB ^a |
| /var/opt/OV/shared/server | 2.5 GB |
| /u01/oradata/openview | 2 GB ^b |
| Oracle Database index directory (<i>optional</i>) | 100 MB ^b |
| Oracle Database server binaries (<i>optional</i>) | 10 GB |

Preparation Steps

- a. Further disk space will be required when SPIs are installed.
 - b. For small- to medium-sized installations. Larger installations and high numbers of messages will result in greater space requirements.
4. Start the `ov-vg` and `ovoracle-vg` volume groups by typing the following:

- *For RHEL 5.x:*

```
/usr/sbin/vgchange -a y ov-vg
```

```
/usr/sbin/vgchange -a y ovoracle-vg
```

- *For RHEL 6.x:*

```
/sbin/vgchange -a y ov-vg
```

```
/sbin/vgchange -a y ovoracle-vg
```

5. Mount the shared file systems on the prepared mount points as follows:

- a. `/bin/mount [-t <FSType>] \
/dev/ov-vg/ov-volume-var /var/opt/OV/share`

- b. `/bin/mount [-t <FSType>] \
/dev/ov-vg/ov-volume-etc /etc/opt/OV/share`

- c. `/bin/mount [-t <FSType>] \
/dev/ov-vg/ov-volume-lcore \
/var/opt/OV/shared/server`

- d. `/bin/mount [-t <FSType>] \
/dev/ovoracle-vg/ov-volume-ora-data \
/<oracle_database_mount_point>`

In this instance, `<oracle_database_mount_point>` is the mount point you chose for the HP Operations management server database and `<FSType>` is a file system type of shared file systems.

- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/bin/mount [-t <FSType>] \  
/dev/ovoracle-vg/ov-volume-ora-index \  
/<oracle_database_index_mount_point>
```

In this instance, `<oracle_database_index_mount_point>` is the mount point for the HP Operations management server database index files.

- f. *Optional:* If you choose to install Oracle Database server binaries on a shared disk:

```
/bin/mount [-t <FSType>] \  
/dev/ovoracle-vg/ov-volume-ora-core \  
/<oracle_binaries_mount_point>
```

In this instance, `<oracle_binaries_mount_point>` is the mount point you chose for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

6. Activate the HP Operations server Virtual Network IP by using the `ip` command:

```
ip addr add <IP/subnet> dev <iface>
```

In this instance, `<IP>` is the IP address of the virtual host that you previously selected, `<subnet>` is the subnet address of the virtual host you previously selected, and `<iface>` is the interface that hosts the new IP address.

7. Activate the Oracle Virtual Network IP by using the `ip` command:

```
ip addr add <IP/subnet> dev <iface>
```

In this instance, `<IP>` is the IP address of the virtual host that you previously selected, `<subnet>` is the subnet address of the virtual host you previously selected, and `<iface>` is the interface that hosts the new IP address.

After completing the preparation steps, continue with installing the Oracle Database server. See “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 298.

Preparation Steps for the First Cluster Node in a Cluster Environment Using an Independent Database Server

Before you install the HP Operations management server in a cluster environment, follow these steps:

1. Define the following:
 - a. Define the `ov-vg` volume group consisting of at least one shared disk for the HA resource group.

Preparation Steps

- b. Define the following three volumes within the `ov-vg` volume group:
 - `ov-volume-etc`
 - `ov-volume-var`
 - `ov-volume-lcore`

NOTE

When defining the volume group or any of the volumes within the volume group, you can specify an optional name.

- 2. Make sure that file systems for the following are available:
 - `/etc/opt/OV/share`
 - `/var/opt/OV/share`
 - `/var/opt/OV/shared/server`

IMPORTANT

When choosing a file system type of shared file systems, keep in mind that GFS and GFS2 are not supported with HPOM.

- 3. Prepare mount points for the shared file systems:
 - `/etc/opt/OV/share`
 - `/var/opt/OV/share`
 - `/var/opt/OV/shared/server`

Table 10-3 Disk Space Required for Shared File Systems

| Shared File System | Recommended |
|--|---------------------|
| <code>/etc/opt/OV/share</code> | 2 GB |
| <code>/var/opt/OV/share</code> | 2.5 GB ^a |
| <code>/var/opt/OV/shared/server</code> | 2.5 GB |

a. Further disk space will be required when SPIs are installed.

4. Start the `ov-vg` volume group by typing the following:
 - For RHEL 5.x:

```
/usr/sbin/vgchange -a y ov-vg
```
 - For RHEL 6.x:

```
/sbin/vgchange -a y ov-vg
```
5. Mount the shared file systems on the prepared mount points as follows:
 - a.

```
/bin/mount [-t <FSType>] \  
/dev/ov-vg/ov-volume-var /var/opt/OV/share
```
 - b.

```
/bin/mount [-t <FSType>] \  
/dev/ov-vg/ov-volume-etc /etc/opt/OV/share
```
 - c.

```
/bin/mount [-t <FSType>] \  
/dev/ov-vg/ov-volume-lcore \  
/var/opt/OV/shared/server
```
6. Start the Virtual Network IP by using the `ip` command:

```
ip addr add <IP/subnet> dev <iface>
```

In this instance, `<IP>` is the IP address of the virtual host that you previously selected, `<subnet>` is the subnet address of the virtual host you previously selected, and `<iface>` is the interface that hosts the new IP address.

Before You Install the HP Operations Management Server on Additional Cluster Nodes

Before you install the HP Operations management server on additional cluster nodes, you must perform appropriate preparation procedures. The preparation steps are identical for all HP Operations management server installation scenarios.

Preparation Steps for Additional Cluster Nodes

The following preconditions must be met before installing the HP Operations management server on an additional cluster node:

- ❑ The HP Operations management server must already be installed and running on one of the cluster nodes. This allows you to add a local node to the HP Operations management server configuration and install and start the HP Operations agent software on the local node.
- ❑ On the node where HPOM is running, enable the remote-shell connection for user `root` to the node where you plan to install the HP Operations management server software. You can do this by putting the following line into `/.rhosts`:

```
<node> root
```

You can check if the remote shell is enabled by using the following command:

```
rsh <active_node> -l root -n ls
```

A list of files on the `root` directory from the node where the HP Operations management server is running should be displayed.

In more secure environments, it is possible to set up a secure shell (SSH) connection between the node where you plan to install an HP Operations server and the node where the HP Operations server is running.

For the HP Operations server installation, you must enable passwordless SSH access for user `root` between these two nodes. `ssh` and `scp` are the two commands that are used during the installation. Both commands must be accessible from the main path.

You can check if the secure remote shell is enabled by using the following command:

```
ssh <active_node> -l root -n ls
```

The type of connection will be automatically detected. A secure connection has a higher priority if both types of connection are enabled.

- ❑ Shared file systems must *not* be mounted on this cluster node. They are already mounted on the cluster node where the HP Operations management server is running.

- ❑ Virtual IP must *not* be activated on this node because it is already used on the node where the HP Operations management server is running.

Installing the Oracle Database Server for HPOM in a Cluster Environment

The Oracle Database server binaries must be installed on a local disk to enable the high availability of the Oracle Database server and consequently of the HP Operations management server. If the Oracle Database server binaries become corrupt, it is very important that the Oracle Database server can be switched to another cluster node with intact Oracle Database server binaries.

In exceptional cases, you may want to install the Oracle Database server binaries on a shared disk. This way only one set of Oracle Database server binaries is installed but there is a greater risk of losing Oracle availability. If you choose the decoupled scenario for installing HPOM, a separate Oracle client installation is also needed.

Table 10-4 Configuration Scenarios Based on the File System Location

| | | Oracle Database server location | | |
|--------------------------------|-------------|--|---|---|
| | | Local File System | Shared File System (Exceptional) | Remote File System |
| Configuration scenarios | Basic | See “Oracle Database Server on a Local Disk”: “Basic HP Operations management server installation” on page 300. | See “Oracle Database Server on a Shared Disk (Exceptional)”: “Basic HP Operations management server installation” on page 301. | |
| | Decoupled | See “Oracle Database Server on a Local Disk”: “Decoupled HP Operations management server database installation” on page 300. | See “Oracle Database Server on a Shared Disk (Exceptional)”: “Decoupled HP Operations management server database installation” on page 302. | |
| | Independent | See “Oracle Database Server on a Local Disk”: “Independent database server installation” on page 300. | | See “Oracle Database Server on a Remote File System”: “Independent database server installation” on page 304. |

Oracle Database Server on a Local Disk

❑ Basic HP Operations management server installation

Install the Oracle Database software as described in “Installing an Oracle Database” on page 46.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 306.

❑ Decoupled HP Operations management server database installation

Install the Oracle Database software as described in “Installing an Oracle Database” on page 46.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 306.

❑ Independent database server installation

- *First cluster node*

Install the Oracle Database software as described in “Installing an Oracle Database” on page 46.

- *Additional cluster node*

Install the Oracle Net Services and Oracle client software on the local disk, all other Oracle configuration steps will be performed by the HP Operations server installation script.

NOTE

After the Oracle server installation, make sure to create a script or a binary named as follows:

```
/opt/OV/bin/OpC/Utils/ha/ha_check_oracle
```

The exit code of this script or binary must be 0 if the Oracle Database server runs, or other than 0 if it does not run. This script or binary, with which the HP Operations management server checks the status of the Oracle Database, must be present on all HP Operations management server cluster nodes.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 306.

IMPORTANT

When the following questions appear during the independent database server configuration, make sure that you answer as follows:

- Separate Oracle from Server?
Press **y**.
 - Configure Server and Oracle DB running as separate HA resource groups?
Press **n**.
 - Set up the database manually (local/remote)?
Press **y**.
 - Is the manually configured database already set up?
Press **n**.
-

Oracle Database Server on a Shared Disk (Exceptional)

The installation script automatically detects if Oracle Database server binaries are located on a shared disk, or if the `ORACLE_BASE` directory is a mount point for an external file system containing the Oracle Database server binaries (the file system must always be mounted on the `ORACLE_BASE` mount point).

The installation procedures for Oracle depend on the type of the HP Operations server installation:

❑ Basic HP Operations management server installation

Install the Oracle Database software as described in “Installing an Oracle Database” on page 46.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 306.

❑ **Decoupled HP Operations management server database installation**

When Oracle is separated from the HP Operations server, and Oracle Database server binaries are installed on a shared disk, install the Oracle client software on the local disk, so that the HP Operations server can connect to the Oracle Database server through the Oracle client. You *must* install the Oracle client software on a location other than `ORACLE_BASE`. The path to the Oracle client must be the same on all HP Operations management server cluster nodes.

• *First cluster node*

Install the Oracle client software on the local disk and then the Oracle server software on a shared disk as described in “Installing an Oracle Database” on page 46.

When installing and configuring the HP Operations server, the `ORACLE_BASE` and `ORACLE_HOME` variables must be set to the Oracle Database server location.

NOTE

Do not use the Instant Client, but the full Oracle Client (the Runtime installation type).

After installing the HP Operations management server, follow these steps:

1. Copy the following configuration files from the Oracle Database server location on the shared disk (`<Oracle_server_home>/network/admin/`) to the Oracle client location on the local disk (`<Oracle_client_home>/network/admin/`):
 - `listener.ora`
 - `sqlnet.ora`
 - `tnsnames.ora`
 - `tnsnv.ora`
2. To contain the location of the Oracle client software, modify the `ORACLE_HOME` variable in the following location:
`/etc/opt/OV/share/conf/ovdbconf`

3. Stop the HP Operations management server as an HA resource group by using the following command:

```
/opt/OV/bin/ovharg_config ov-server -stop \  
<local_hostname>
```

4. Add the following lines to the `/etc/sysconfig/ovoracle` file:

```
ORACLE_HOME=<Oracle_Server_Home>  
ORACLE_SID=<ORACLE_SID>  
export ORACLE_HOME ORACLE_SID
```

The `/etc/sysconfig/ovoracle` file is used as a configuration file by the `/etc/init.d/ovoracle` script, which is used by the Oracle HARG to start the Oracle Database.

NOTE

Make sure that you use the latest version of the `/etc/init.d/ovoracle` script. Copy the file from `newconfig` by running the following command:

```
cp /opt/OV/newconfig/OpC/etc/init.d/ovoracle \  
/etc/init.d/ovoracle
```

5. Remove the existing links in `/opt/OV/lib64` to the libraries located in the Oracle Database server directory, and replace them with links to Oracle client libraries:

```
— ln -sf <ORACLE_HOME>/lib/libclntsh.so \  
/opt/OV/lib64/libclntsh.so  
— ln -sf <ORACLE_HOME>/lib/libclntsh.so \  
/opt/OV/lib64/libclntsh.so.11.1  
— ln -sf <ORACLE_HOME>/lib/libnnz11.so \  
/opt/OV/lib64/libnnz11.so
```

6. Start the HP Operations management server as an HA resource group by using the following command:

```
/opt/OV/bin/ovharg_config ov-server -start \  
<local_hostname>
```

The HP Operations management server will now connect to the Oracle Database server through the Oracle client.

- *Additional cluster node*

Install the Oracle client software on a local disk, all other Oracle configuration steps will be performed by the HP Operations management server installation script.

NOTE

When installing and configuring the HP Operations server, the ORACLE_HOME variable must be set to the Oracle client location.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 306.

Oracle Database Server on a Remote File System

- ❑ Independent database server installation

If the Oracle Database server will be running on a remote system that is not part of the local node:

- *First cluster node*

Configure the Oracle Database as described in “Setting Up HPOM with a Remote/Manual Oracle Database” on page 130.

- *Additional cluster node*

Install the Oracle Net Services and Oracle client software on the local disk, all other Oracle configuration steps will be performed by the HP Operations server installation script.

NOTE

After the Oracle server installation, make sure to create a script or a binary named as follows:

```
/opt/OV/bin/OpC/utlils/ha/ha_check_oracle
```

The exit code of this script or binary must be 0 if the Oracle Database server runs, or other than 0 if it does not run. This script or binary, with which the HP Operations management server checks the status of the Oracle Database, must be present on all HP Operations management server cluster nodes.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 306.

IMPORTANT

When the following questions appear during the independent database server configuration, make sure that you answer as follows:

- Separate Oracle from Server?
Press **y**.
 - Configure Server and Oracle DB running as separate HA resource groups?
Press **n**.
 - Set up the database manually (local/remote)?
Press **y**.
 - Is the manually configured database already set up?
Press **n**.
-

Installing and Configuring the HP Operations Management Server on Cluster Nodes

When installing HPOM in a cluster environment, you must provide responses to some questions and specify some values differently than in the stand-alone HPOM installation. These cluster-specific questions differ depending on whether you are installing and configuring the HP Operations management server on the first cluster node or on an additional cluster node.

IMPORTANT

Make sure that cluster node names are the same as hostnames. Otherwise, the configuration fails.

Installing and Configuring the HP Operations Management Server on the First Cluster Node

To install and configure the HP Operations management server on the first cluster node, follow these steps:

1. After the `ovoconfigure` script detects a special environment, provide answers to the following cluster-specific questions:

| Question | Instruction |
|--|--|
| Run HPOM Server as an HA resource group | Press y followed by ENTER .
The script checks the remote shell connection and the secure remote shell connection. |
| Would you prefer to use REMSH even though SSH is enabled | Press ENTER to accept the default answer (that is, n). |

| Question | Instruction |
|-----------------------------|--|
| HA Resource Group name | <p>Press ENTER to accept the default answer (that is, <code>ov-server</code>), or specify an alternative name for the HA resource group, and then press ENTER.</p> <p>HA resource groups are created during the installation of HPOM. The <code>ovinstall</code> script builds the package or the service control file, and the configuration file automatically. Do not create these files manually and do not use your own configuration files. If you already did it, remove them before starting the installation of HPOM.</p> <p>IMPORTANT: The entered HA resource group name may not be one of the already existing names.</p> |
| Server virtual hostname | <p>Enter the short name of the virtual host (for example, <code>virtip1</code>).</p> |
| Separate Oracle from Server | <p>To separate Oracle from the HP Operations management server, press y. The following question is displayed:</p> <p>Configure Server and Oracle DB running as separate HA resource groups?</p> <p><i>If you want to configure Oracle as a separate HA resource group:</i> Press ENTER to accept the default answer. You are prompted to enter the Oracle HA resource group name (for example, <code>ov-oracle</code>) and the Oracle virtual hostname (for example, <code>virtip2</code>).</p> <p>IMPORTANT: The entered HA resource group name may not be one of the already existing names.</p> <p><i>If you do not want to configure Oracle as a separate HA resource group:</i> Press n followed by ENTER and continue with the HP Operations management server installation where Oracle is an independent database server.</p> |

| Question | Instruction |
|------------------------|--|
| Oracle Base | Choose the Oracle database base directory (the default is /opt/oracle). |
| Oracle Data Directory | Choose the directory where HP Operations server database files are stored. |
| Oracle Index Directory | Choose the directory where HP Operations server database index files are stored (by default, it is the same as the Oracle data directory). |

The ovoconfigure script continues with checking shared file systems.

2. If you want to add a new shared file system, follow these steps:

a. Press **y** followed by **ENTER**.

You are prompted to enter the shared file system mount point.

b. Type the desired shared file system mount point, and then press **ENTER**.

Otherwise, accept the default value **n** by pressing **ENTER**.

The ovoconfigure script continues with checking virtual hosts.

3. If you want to add a new virtual host, follow these steps:

a. Press **y** followed by **ENTER**.

You are prompted to add the virtual hostname.

b. Type the desired virtual hostname (for example, virtip3), and then press **ENTER**.

Otherwise, accept the default value **n** by pressing **ENTER**.

The summary of all shared file systems and virtual hosts is displayed, after which the ovoconfigure script asks you if you want to continue.

4. Press **ENTER**.

An output similar to the following one should appear:

```
Cluster preconfiguration . . . . . OK
```

5. Press **ENTER** to continue with the database configuration and the server initialization.

Make sure to answer all the questions related to the database configuration and the server initialization.

6. Press **ENTER** to continue with the cluster configuration.

An output similar to the following one should appear:

```
Cluster configuration on FIRST cluster node
-----
OVHARG configuration . . . . . OK
Configure Server cluster configuration . . . . . OK
Server cluster postconfiguration . . . . . OK
Server HARG creation . . . . . OK
Cluster successfully configured
```

7. Press **ENTER** to continue.

The server final configuration starts. It consists of the following:

- Management server policy group assignment
- Subagents configuration
- Java GUI configuration
- Web server configuration
- Certificates backup

8. Press **ENTER** to start the HP Operations management server as an HA resource group.

At this point, agent deployment packages are installed, the local agent is configured, and the configuration is distributed to the local agent.

NOTE

To limit the server communication to the virtual IP only, run the following command:

```
/opt/OV/bin/ovconfchg -ovrg server -ns bbc.http -set \
CLIENT_BIND_ADDR <virtual_IP_of_HPOM_cluster>
```

Installing and Configuring the HP Operations Management Server on an Additional Cluster Node

To install and configure the HP Operations management server on an additional cluster node, follow these steps:

1. After the `ovoconfigure` script detects a special environment, you are asked if you want to run the HP Operations management server as an HA resource group.

Press **y** followed by **ENTER**.

The script checks the remote shell connection and the secure remote shell connection, and then the following question appears:

Would you prefer to use REMSH even though SSH is enabled?

2. Press **ENTER** to accept the default answer (that is, **n**).

You are prompted to enter the HA resource group name.

3. Press **ENTER** to accept the default answer (that is, `ov-server`), or specify an alternative name for the HA resource group, and then press **ENTER**.

IMPORTANT

The entered HA resource group must be configured and running on the first cluster node.

An output similar to the following one should appear:

```
Cluster preconfiguration . . . . . OK
```

4. Press **ENTER** to continue with the server initialization.

During the server initialization, `ovoconfigure` performs the integration into the start-stop sequence.

5. Press **ENTER** to continue with the cluster configuration.

An output similar to the following one should appear:

```
Cluster configuration on ADDITIONAL cluster node
-----
OVHARG configuration . . . . . OK
Configure Server cluster configuration . . . . . OK
```

Installing and Configuring the HP Operations Management Server on Cluster Nodes

```
Configure Oracle cluster configuration . . . . . OK  
Server cluster postconfiguration . . . . . OK  
Adding local node to Server HARG . . . . . OK
```

Cluster successfully configured

6. Press **ENTER** to continue with the server final configuration that consists of the following:

- Management server policy group assignment
- Java GUI configuration
- Web server configuration
- Agent deployment packages installation
- Local agent configuration
- Distributing configuration to the local agent

Log Files

For details about the cluster-specific installation, check the following log files:

- ❑ `/var/opt/OV/log/OpC/mgmt_sv/installation.log.verbose`

Contains information about the success and eventual problems during the installation.

- ❑ `/var/opt/OV/hacluster/ov-server/trace.log1`,
`/var/opt/OV/hacluster/ov-server/error.log`, and
`/var/log/messages`

Contain information about managing the HA resource group.

NOTE

The HARG `trace.log` file size is limited. When the maximum file size is reached, `trace.log` is moved into `trace.log.old` and the new information is written into a new `trace.log` file.

The maximum size of the `trace.log` file can be changed by editing the `/var/opt/OV/hacluster/<HARG name>/settings` file, and adding the following line:

```
TRACING_FILE_MAX_SIZE=<maximum_size_in_kBytes>
```

For example:

```
TRACING_FILE_MAX_SIZE=7000
```

-
1. Only if previously enabled by entering the following:
`/opt/OV/sbin/ovharg -tracing ov-server enable`
The `trace.log` file is automatically updated with the information about starting the HA resource group during the installation on the first cluster node.

Deinstalling the HPOM Software from Cluster Nodes

The HPOM software can be deinstalled in one of two ways:

❑ From all cluster nodes

When deinstalling the HP Operations management server from a cluster environment, you must perform the deinstallation procedure in the following sequence:

1. Deinstall the HP Operations management server from the **passive cluster nodes**. These are the systems that are installed and configured to run the HP Operations management server, but are currently *not* running.

For details on how to deinstall the HP Operations server from the passive cluster nodes, see “Deinstalling HPOM from Passive Cluster Nodes” on page 314.

2. When the HP Operations management server software is deinstalled from all passive nodes, deinstall the software from the **active cluster node**. This is the system on which the HP Operations management server is currently up and running as an HA resource group.

For details on how to deinstall the HP Operations management server from the active cluster node, see “Deinstalling HPOM from the Active Cluster Node” on page 314.

❑ From selected cluster nodes

After you deinstall the HP Operations management server software from a cluster node, this node will no longer be able to run the HP Operations management server. The cluster environment running the HP Operations server will be reduced by one node.

To deinstall HP Operations management server software from a cluster node, this node must be in the passive state. For details on how to deinstall HP Operations management server software from passive cluster nodes, see “Deinstalling HPOM from Passive Cluster Nodes” on page 314.

Deinstalling HPOM from Passive Cluster Nodes

Before the HP Operations management server software is deinstalled from a passive cluster node, the following requirements must be met:

1. The HP Operations server HA resource group `ov-server` may not be active on this node.
2. Virtual host must *not* be active.
3. Shared file systems must *not* be mounted.

After ensuring that all these requirements are met, deinstall the HP Operations management server as described in Chapter 6, “Software Administration on the Management Server.”

Deinstalling HPOM from the Active Cluster Node

When the HP Operations management server is deinstalled from all the passive cluster nodes, you can start the deinstallation process from the node on which the HP Operations management server is running.

Deinstall the HP Operations management server software from this node as described in Chapter 6, “Software Administration on the Management Server,” on page 185.

Stopping the HP Operations Management Server in a Cluster Environment for Maintenance

Sometimes, you need to stop the HP Operations management server to install a patch, perform an upgrade, conduct maintenance, and so on.

To stop the HP Operations management server, follow these steps:

1. Disable the HA resource group monitoring by using the command:

```
/opt/OV/sbin/ovharg -monitor ov-server disable
```

2. Stop the HP Operations management server.

The HP Operations management server must *not* be stopped by using the cluster-related commands. Only the HPOM commands such as `ovc` and `opcsv` may be used.

CAUTION

Before you run the `opcsv -stop`, `ovc -stop`, or `ovc -kill` command, you must disable the HA resource group monitoring. Failing to do so results in a failover.

3. Perform the intended action (the patch installation, an upgrade, the maintenance, and so on).

4. Start the HP Operations management server.

The HP Operations management server must *not* be started by using the cluster-related commands. Only the HPOM commands such as `ovc` and `opcsv` may be used.

5. Enable the HA resource group monitoring by using the command:

```
/opt/OV/sbin/ovharg -monitor ov-server enable
```

NOTE

Before enabling the HA resource group monitoring, make sure that the HP Operations management server is running.

Installing HPOM in a Red Hat Cluster Suite Environment

Stopping the HP Operations Management Server in a Cluster Environment for Maintenance

11 **Installing HPOM in a Veritas Cluster Environment**

In This Chapter

This chapter describes the following:

- ❑ Installation and configuration of the HP Operations management server in a Veritas cluster environment
- ❑ Deinstallation of the HP Operations management server from cluster nodes

NOTE

For information on how to upgrade HPOM from version 9.1x to version 9.20 in a cluster environment, see “Upgrading HPOM in a Cluster Environment” on page 240.

For detailed information about the administration of the HP Operations management server in a cluster environment, see the *HPOM Administrator’s Reference*.

Before proceeding with the installation and configuration of the HP Operations management server in a Veritas cluster environment, consider the following Veritas cluster term used in this chapter:

HA Resource Group

Application running in a cluster environment. A high-availability (HA) resource group can simultaneously be a cluster object that represents an application in a cluster.

Configuration Scenarios

When installing the HP Operations management server and the Oracle Database server in a cluster environment, you can choose one of the following configuration scenarios:

❑ **Basic management server configuration**

This is the simplest cluster configuration. You can use all backup and maintenance commands without restrictions.

The HP Operations management server and the Oracle Database server are part of the same HA resource group.

❑ **Decoupled management server configuration**

With this setup, you can use both physical nodes with the HPOM HA resource group running on one node and the Oracle Database server resource group on the other node. The HP Operations management server and the Oracle Database server are configured as separate HA resource groups by the HP Operations management server installation scripts. This configuration scenario is also known as 3Tier HP Operations management server configuration in a cluster environment.

The backup scripts are adapted to work even if the HPOM and Oracle HA resource groups are running on different nodes. But to restore a backup, the HPOM and Oracle HA resource groups must run on the same node.

❑ **Independent database server configuration**

Following this scenario, you can use a remote database. The remote database should also run on a cluster. Otherwise the high availability of the HPOM setup is compromised. You may find this scenario useful if you already have a central database server cluster that you also want to use for the HPOM database. With this scenario, on the other hand, you cannot use the HPOM backup scripts.

In exceptional cases, the Oracle Database server can be configured as an independent database server:

Install the Oracle client software on the cluster nodes that are hosting the HP Operations management server. You can install the independent database as a stand-alone server or as an HA resource group on an independent cluster.

Installation Requirements

To run HPOM in a Veritas cluster environment, you must meet the following requirements:

- ❑ RHEL 5.x or 6.x

For the most up-to-date list of supported RHEL versions, see the support matrix at the following location:

<http://support.openview.hp.com/selfsolve/document/KM323488>

- ❑ Veritas Cluster Server 5.1
- ❑ Make sure to use Veritas Volume Manager as the logical volume manager.

For additional requirements about installing HPOM, see Chapter 1, “Installation Requirements for the Management Server.”

Installation Requirements for an Oracle Database

The Oracle Database (the database binaries) should preferably be installed on a local disk.

In exceptional cases, you can decide to install the Oracle Database server binaries on a shared disk. For the preparation of such an environment, you will need to perform the additional configuration steps that are marked as optional in the configuration procedures.

For more information on installing the Oracle Database server binaries, see “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 336.

Installing and Configuring the HP Operations Management Server on Cluster Nodes

NOTE

You must complete the following tasks first on the first cluster node, and then on each additional cluster node.

To install and configure the HP Operations management server in a cluster environment, complete these tasks:

- ❑ Task 1: “Before You Install the HP Operations Management Server on the First Cluster Node” on page 323
- ❑ Task 2: “Before You Install the HP Operations Management Server on Additional Cluster Nodes” on page 334
- ❑ Task 3: “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 336
- ❑ Task 4: “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 344

IMPORTANT

You cannot install HPOM simultaneously on all cluster nodes. When the installation process is completed on one cluster node, begin the installation on the next node, until HPOM is installed on all the nodes in a cluster environment.

Preparation Steps

Before you start installing and configuring the HP Operations management server on a cluster node, complete these tasks:

- ❑ Task 1: “Before You Install the HP Operations Management Server on the First Cluster Node” on page 323
- ❑ Task 2: “Before You Install the HP Operations Management Server on Additional Cluster Nodes” on page 334

Before You Install the HP Operations Management Server on the First Cluster Node

Before you install the HP Operations management server on the first cluster node, you must perform appropriate preparation procedures depending on the cluster environment you want to configure. Choose one of the following HP Operations management server scenarios:

- ❑ **Basic environment**

Using this scenario, Oracle and HP Operations server are configured as part of a single HA resource group.

See “Preparation Steps for the First Cluster Node in a Basic Environment” on page 324.

- ❑ **Decoupled environment**

Using this scenario, Oracle and HP Operations server are separated, Oracle is configured as a separate HA resource group. In this case there are two independent resource groups, one for Oracle and one for the HP Operations management server.

See “Preparation Steps for the First Cluster Node in a Decoupled Environment” on page 328.

- ❑ **Independent database server**

Using this scenario, the Oracle Database is configured on a node that is not part of the cluster, or on a cluster node independently of the HP Operations management server installation.

See “Preparation Steps for the First Cluster Node in a Cluster Environment Using an Independent Database Server” on page 332.

Preparation Steps for the First Cluster Node in a Basic Environment

Before you install the HP Operations management server in a cluster environment, follow these steps:

1. Define the following:
 - a. Define the `ov-dg` disk device group consisting of at least one shared disk for the HA resource group.
 - b. Define the following volumes within the `ov-dg` disk device group:
 - `ov-volume-etc`
 - `ov-volume-var`
 - `ov-volume-lcore`
 - `ov-volume-ora-data`
 - `ov-volume-ora-index*`
 - `ov-volume-ora-core**`

* If the Oracle Database index directory is different from the Oracle data directory.

** If you choose to install Oracle Database server binaries on a shared disk

NOTE

When defining the disk device group or any of the volumes within the disk device group, you can specify an optional name.

2. Make sure that file systems for the following are available:
 - `/etc/opt/OV/share`
 - `/var/opt/OV/share`
 - `/var/opt/OV/shared/server`
 - HP Operations management server database
 - HP Operations management server database index files*
 - Oracle Database server binaries**

* If the Oracle Database index directory is different from the Oracle data directory.

** If you choose to install the Oracle Database server binaries on a shared disk.

3. Prepare mount points for the shared file systems:

- /etc/opt/OV/share
- /var/opt/OV/share
- /var/opt/OV/shared/server
- Mount point for the HP Operations management server database.

You may select an alternative mount point. The default is the following:

```
/u01/oradata/<ORACLE_SID>
```

In this instance, <ORACLE_SID> is the value of the ORACLE_SID variable used for the configuration of the HP Operations management server database. It is usually set to openview.

- Mount point for the Oracle Database index directory if the Oracle Database index directory is different from the Oracle data directory.
- Mount point for the Oracle Database server binaries if they will be installed on a shared disk. The mount point is equal to the value of the ORACLE_BASE variable.

Table 11-1 Disk Space Required for Shared File Systems

| Shared File System | Recommended |
|---|---------------------|
| /etc/opt/OV/share | 2 GB |
| /var/opt/OV/share | 2.5 GB ^a |
| /var/opt/OV/shared/server | 2.5 GB |
| /u01/oradata/openview | 2 GB ^b |
| Oracle Database index directory (<i>optional</i>) | 100 MB ^b |
| Oracle Database server binaries (<i>optional</i>) | 10 GB |

Preparation Steps

- a. Further disk space will be required when SPIs are installed.
- b. For small- to medium-sized installations. Larger installations and high numbers of messages will result in greater space requirements.

4. Import the `ov-dg` disk device group on the current node by entering the following command:

```
/usr/sbin/vxdg import ov-dg
```

5. Start the volumes by entering the following command:

```
/usr/sbin/vxvol -g ov-dg startall
```

6. Check whether all the volumes of the `ov-dg` disk device group are started by running the following command:

```
/usr/sbin/vxinfo -g ov-dg
```

If the volumes are started, an output similar to the following appears:

```
ov-volume-var Started
ov-volume-etc Started
ov-volume-lcore Started
ov-volume-ora-data Started
ov-volume-ora-index Started*
ov-volume-ora-core Started**
```

* If the Oracle Database index directory is different from the Oracle data directory.

** If the Oracle Database server binaries will be installed on a shared disk.

7. Mount the shared file systems on the prepared mount points as follows:

- a. `/bin/mount [-t <FSType>] \
/dev/vx/dsk/ov-dg/ov-volume-etc /etc/opt/OV/share`
- b. `/bin/mount [-t <FSType>] \
/dev/vx/dsk/ov-dg/ov-volume-var /var/opt/OV/share`

- c.

```
/bin/mount [-t <FSType>] \  
/dev/vx/dsk/ov-dg/ov-volume-1core \  
/var/opt/OV/shared/server
```
- d.

```
/bin/mount [-t <FSType>] \  
/dev/vx/dsk/ov-dg/ov-volume-ora-data \  
/<oracle_database_mount_point>
```

In this instance, *<oracle_database_mount_point>* is the mount point you chose for the HP Operations management server database and *<FSType>* is a file system type of shared file systems.

- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/bin/mount [-t <FSType>] \  
/dev/vx/dsk/ov-dg/ov-volume-ora-index \  
/<oracle_database_index_mount_point>
```

In this instance, *<oracle_database_index_mount_point>* is the mount point for the Oracle Database index directory.

- f. *Optional:* If you choose to install Oracle Database server binaries on a shared disk:

```
/bin/mount [-t <FSType>] \  
/dev/vx/dsk/ov-dg/ov-volume-ora-core \  
/<oracle_binaries_mount_point>
```

In this instance, *<oracle_binaries_mount_point>* is the mount point you chose for the Oracle Database server binaries installation (equal to the value of the ORACLE_BASE variable).

- 8. Start the Virtual Network IP by using the `ip` command:

```
ip addr add <IP/subnet> dev <iface>
```

In this instance, *<IP>* is the IP address of the virtual host that you previously selected, *<subnet>* is the subnet address of the virtual host you previously selected, and *<iface>* is the interface that hosts the new IP address.

After completing the preparation steps, continue with installing the Oracle Database server. See “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 336.

Preparation Steps for the First Cluster Node in a Decoupled Environment

Before you install the HP Operations management server in a cluster environment, follow these steps:

1. Define the following:
 - a. Define the `ov-dg` disk device group consisting of at least one shared disk for the HA resource group.
 - b. Define the following volumes within the `ov-dg` disk device group:
 - `ov-volume-etc`
 - `ov-volume-var`
 - `ov-volume-lcore`
 - c. Define the `ovoracle-dg` disk device group consisting of at least one shared disk for the HA resource group.
 - d. Define the following volumes within the `ovoracle-dg` disk device group:
 - `ov-volume-ora-data`
 - `ov-volume-ora-index*`
 - `ov-volume-ora-core**`

* If the Oracle Database index directory is different from the Oracle data directory.

** If you choose to install the Oracle Database server binaries on a shared disk.

NOTE

When defining the disk device group or any of the volumes within the disk device group, you can specify an optional name.

2. Make sure that file systems for the following are available:
 - `/etc/opt/OV/share`
 - `/var/opt/OV/share`
 - `/var/opt/OV/shared/server`

- ❑ HP Operations management server database
- ❑ HP Operations management server database index files*
- ❑ Oracle Database server binaries**

* If the Oracle Database index directory is different from the Oracle data directory.

** If you choose to install the Oracle Database server binaries on a shared disk (equal to the value of the ORACLE_BASE variable).

3. Prepare mount points for the shared file systems:

- ❑ /etc/opt/OV/share
- ❑ /var/opt/OV/share
- ❑ /var/opt/OV/shared/server
- ❑ Mount point for the HP Operations management server database.

You may select an alternative mount point. The default is the following:

/u01/oradata/<ORACLE_SID>

In this instance, <ORACLE_SID> is the value of the ORACLE_SID variable used for the configuration of the HP Operations management server database. It is usually set to openview.

- ❑ Mount point for the Oracle Database index directory if the Oracle Database index directory is different from the Oracle data directory.
- ❑ Mount point for the Oracle Database server binaries if you choose to install the Oracle Database server binaries on a shared disk (equal to the value of the ORACLE_BASE variable).

Table 11-2 Disk Space Required for Shared File Systems

| Shared File System | Recommended |
|---------------------------|---------------------|
| /etc/opt/OV/share | 2 GB |
| /var/opt/OV/share | 2.5 GB ^a |
| /var/opt/OV/shared/server | 2.5 GB |

Table 11-2 Disk Space Required for Shared File Systems (Continued)

| Shared File System | Recommended |
|---|---------------------|
| /u01/oradata/openview | 2 GB ^b |
| Oracle Database index directory (<i>optional</i>) | 100 MB ^b |
| Oracle Database server binaries (<i>optional</i>) | 10 GB |

- a. Further disk space will be required when SPIs are installed.
- b. For small- to medium-sized installations. Larger installations and high numbers of messages will result in greater space requirements.

4. Import the `ov-dg` and `ovoracle-dg` disk device groups on the current node by entering the following commands:

```
/usr/sbin/vxdg import ov-dg
/usr/sbin/vxdg import overacle-dg
```

5. Start the volumes by entering the following commands:

```
/usr/sbin/vxvol -g ov-dg startall
/usr/sbin/vxvol -g overacle-dg startall
```

6. Check the following:

- a. Check whether all the volumes of the `ov-dg` disk device group are started by running the following command:

```
/usr/sbin/vxinfo -g ov-dg
```

If the volumes are started, an output similar to the following appears:

```
ov-volume-var Started
ov-volume-etc Started
ov-volume-lcore Started
```

- b. Check whether all the volumes of the `ovoracle-dg` disk device group are started by running the following command:

```
/usr/sbin/vxinfo -g overacle-dg
```

If the volumes are started, an output similar to the following appears:

```
ov-volume-ora-data Started
ov-volume-ora-index Started*
ov-volume-ora-core Started**
```

* If the Oracle Database index directory is different from the Oracle data directory.

** If the Oracle Database server binaries will be installed on a shared disk.

7. Mount the shared file systems on the prepared mount points as follows:

- a. `/bin/mount [-t <FSType>] \
/dev/vx/dsk/ov-dg/ov-volume-etc /etc/opt/OV/share`
- b. `/bin/mount [-t <FSType>] \
/dev/vx/dsk/ov-dg/ov-volume-var /var/opt/OV/share`
- c. `/bin/mount [-t <FSType>] \
/dev/vx/dsk/ov-dg/ov-volume-lcore \
/var/opt/OV/shared/server`
- d. `/bin/mount [-t <FSType>] \
/dev/vx/dsk/ovoracle-dg/ov-volume-ora-data \
/<oracle_database_mount_point>`

In this instance, `<oracle_database_mount_point>` is the mount point you chose for the HP Operations management server database.

- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/bin/mount [-t <FSType>] \  
/dev/vx/dsk/ovoracle-dg/ov-volume-ora-index \  
/<oracle_database_index_mount_point>
```

In this instance, `<oracle_database_index_mount_point>` is the mount point for the HP Operations management server database index files.

Preparation Steps

- f. *Optional:* If you choose to install Oracle Database server binaries on a shared disk:

```
/bin/mount [-t <FSType>] \  
/dev/vx/dsk/ovoracle-dg/ov-volume-ora-core \  
/<oracle_binaries_mount_point>
```

In this instance, *<oracle_binaries_mount_point>* is the mount point you chose for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

8. Start the Virtual Network IP by using the `ip` command:

```
ip addr add <IP/subnet> dev <iface>
```

In this instance, *<IP>* is the IP address of the virtual host that you previously selected, *<subnet>* is the subnet address of the virtual host you previously selected, and *<iface>* is the interface that hosts the new IP address.

After completing the preparation steps, continue with installing the Oracle Database server. See “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 336.

Preparation Steps for the First Cluster Node in a Cluster Environment Using an Independent Database Server

Before you install the HP Operations management server in a cluster environment, follow these steps:

1. Define the following:
 - a. Define the `ov-dg` disk device group consisting of at least one shared disk for the HA resource group.
 - b. Define the following volumes within the `ov-dg` disk device group:
 - `ov-volume-etc`
 - `ov-volume-var`
 - `ov-volume-lcore`

NOTE

When defining the disk device group or any of the volumes within the disk device group, you can specify an optional name.

2. Make sure that file systems for the following are available:

- /etc/opt/OV/share
- /var/opt/OV/share
- /var/opt/OV/shared/server

3. Prepare mount points for the shared file systems:

- /etc/opt/OV/share
- /var/opt/OV/share
- /var/opt/OV/shared/server

Table 11-3

Disk Space Required for Shared File Systems

| Shared File System | Recommended |
|---------------------------|---------------------|
| /etc/opt/OV/share | 2 GB |
| /var/opt/OV/share | 2.5 GB ^a |
| /var/opt/OV/shared/server | 2.5 GB |

a. Further disk space will be required when SPIs are installed.

4. Import the `ov-dg` disk device group on the current node by entering the following command:

```
/usr/sbin/vxdg import ov-dg
```

5. Start the volumes by entering the following command:

```
/usr/sbin/vxvol -g ov-dg startall
```

6. Check whether all the volumes of the `ov-dg` disk device group are started by running the following command:

```
/usr/sbin/vxinfo -g ov-dg
```

If the volumes are started, an output similar to the following appears:

```
ov-volume-var Started
ov-volume-etc Started
ov-volume-lcore Started
```

Preparation Steps

7. Mount the shared file systems on the prepared mount points as follows:

- a. `/bin/mount [-t <FSType>] \
/dev/vx/dsk/ov-dg/ov-volume-etc /etc/opt/OV/share`
- b. `/bin/mount [-t <FSType>] \
/dev/vx/dsk/ov-dg/ov-volume-var /var/opt/OV/share`
- c. `/bin/mount [-t <FSType>] \
/dev/vx/dsk/ov-dg/ov-volume-lcore \
/var/opt/OV/shared/server`

8. Start the Virtual Network IP by using the `ip` command:

```
ip addr add <IP/subnet> dev <iface>
```

In this instance, `<IP>` is the IP address of the virtual host that you previously selected, `<subnet>` is the subnet address of the virtual host you previously selected, and `<iface>` is the interface that hosts the new IP address.

Before You Install the HP Operations Management Server on Additional Cluster Nodes

Before you install the HP Operations management server on additional cluster nodes, you must perform appropriate preparation procedures. The preparation steps are identical for all HP Operations management server installation scenarios.

Preparation Steps for Additional Cluster Nodes

The following preconditions must be met before installing the HP Operations management server on an additional cluster node:

- ❑ The HP Operations management server must already be installed and running on one of the cluster nodes. This allows you to add a local node to the HP Operations management server configuration and install and start the HP Operations agent software on the local node.

- ❑ On the node where HPOM is running, enable the remote-shell connection for user `root` to the node where you plan to install the HP Operations management server software. You can do this by putting the following line into `/.rhosts`:

```
<node> root
```

You can check if the remote shell is enabled by using the following command:

```
remsh <active_node> -l root -n ls
```

A list of files on the `root` directory from the node where the HP Operations management server is running should be displayed.

In more secure environments, it is possible to set up a secure shell (SSH) connection between the node where you plan to install an HP Operations server and the node where the HP Operations server is running.

For the HP Operations server installation, you must enable passwordless SSH access for user `root` between these two nodes. `ssh` and `scp` are the two commands that are used during the installation. Both commands must be accessible from the main path.

You can check if the secure remote shell is enabled by using the following command:

```
ssh <active_node> -l root -n ls
```

The type of connection is automatically detected. A secure connection has a higher priority if both types of connection are enabled.

- ❑ Shared file systems must *not* be mounted on this cluster node. They are already mounted on the cluster node where the HP Operations management server is running.
- ❑ The virtual IP must *not* be activated on this node because it is already used on the node where the HP Operations management server is running.

Installing the Oracle Database Server for HPOM in a Cluster Environment

The Oracle Database server binaries must be installed on a local disk to enable the high availability of the Oracle Database server and consequently of the HP Operations management server. If the Oracle Database server binaries become corrupt, it is very important that the Oracle Database server can be switched to another cluster node with intact Oracle Database server binaries.

In exceptional cases, you may want to install the Oracle Database server binaries on a shared disk. This way only one set of Oracle Database server binaries is installed but there is a greater risk of losing Oracle availability. If you choose the decoupled scenario for installing HPOM, a separate Oracle client installation is also needed.

Table 11-4 Configuration Scenarios Based on the File System Location

| | | Oracle Database server location | | |
|--------------------------------|-------------|--|---|---|
| | | Local File System | Shared File System (Exceptional) | Remote File System |
| Configuration scenarios | Basic | See “Oracle Database Server on a Local Disk”: “Basic HP Operations management server installation” on page 338. | See “Oracle Database Server on a Shared Disk (Exceptional)”: “Basic HP Operations management server installation” on page 339. | |
| | Decoupled | See “Oracle Database Server on a Local Disk”: “Decoupled HP Operations management server database installation” on page 338. | See “Oracle Database Server on a Shared Disk (Exceptional)”: “Decoupled HP Operations management server database installation” on page 340. | |
| | Independent | See “Oracle Database Server on a Local Disk”: “Independent database server installation” on page 338. | | See “Oracle Database Server on a Remote File System”: “Independent database server installation” on page 342. |

Oracle Database Server on a Local Disk

❑ Basic HP Operations management server installation

Install the Oracle Database software as described in “Installing an Oracle Database” on page 46.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 344.

❑ Decoupled HP Operations management server database installation

Install the Oracle Database software as described in “Installing an Oracle Database” on page 46.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 344.

❑ Independent database server installation

- *First cluster node*

Install the Oracle Database software as described in “Installing an Oracle Database” on page 46.

- *Additional cluster node*

Install the Oracle Net Services and Oracle client software on the local disk, all other Oracle configuration steps will be performed by the HP Operations server installation script.

NOTE

After the Oracle server installation, make sure to create a script or a binary named as follows:

```
/opt/OV/bin/OpC/Utils/ha/ha_check_oracle
```

The exit code of this script or binary must be 0 if the Oracle Database server runs, or other than 0 if it does not run. This script or binary, with which the HP Operations management server checks the status of the Oracle Database, must be present on all HP Operations management server cluster nodes.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 344.

IMPORTANT

When the following questions appear during the independent database server configuration, make sure that you answer as follows:

- Separate Oracle from Server?
Press **y**.
 - Configure Server and Oracle DB running as separate HA resource groups?
Press **n**.
 - Set up the database manually (local/remote)?
Press **y**.
 - Is the manually configured database already set up?
Press **n**.
-

Oracle Database Server on a Shared Disk (Exceptional)

The installation script automatically detects if Oracle Database server binaries are located on a shared disk, or if the `ORACLE_BASE` directory is a mount point for an external file system containing the Oracle Database server binaries (the file system must always be mounted on the `ORACLE_BASE` mount point).

The installation procedures for Oracle depend on the type of the HP Operations server installation:

❑ Basic HP Operations management server installation

Install the Oracle Database software as described in “Installing an Oracle Database” on page 46.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 344.

❑ **Decoupled HP Operations management server database installation**

When Oracle is separated from the HP Operations server, and Oracle Database server binaries are installed on a shared disk, install the Oracle client software on the local disk, so that the HP Operations server can connect to the Oracle Database server through the Oracle client. You *must* install the Oracle client software on a location other than `ORACLE_BASE`. The path to the Oracle client must be the same on all HP Operations management server cluster nodes.

• *First cluster node*

Install the Oracle client software on the local disk and then the Oracle server software on a shared disk as described in “Installing an Oracle Database” on page 46.

When installing and configuring the HP Operations server, the `ORACLE_BASE` and `ORACLE_HOME` variables must be set to the Oracle Database server location.

NOTE

Do not use the Instant Client, but the full Oracle Client (the Runtime installation type).

After installing the HP Operations management server, follow these steps:

1. Copy the following configuration files from the Oracle Database server location on the shared disk (`<Oracle_server_home>/network/admin/`) to the Oracle client location on the local disk (`<Oracle_client_home>/network/admin/`):

- `listener.ora`
- `sqlnet.ora`
- `tnsnames.ora`
- `tnsnv.ora`

2. To contain the location of the Oracle client software, modify the `ORACLE_HOME` variable in the following location:

`/etc/opt/OV/share/conf/ovdbconf`

3. Stop the HP Operations management server as an HA resource group by using the following command:

```
/opt/OV/bin/ovharg_config ov-server -stop \  
<local_hostname>
```

4. Add the following lines to the /etc/sysconfig/ovoracle file:

```
ORACLE_HOME=<Oracle_Server_Home>  
ORACLE_SID=<ORACLE_SID>  
export ORACLE_HOME ORACLE_SID
```

The /etc/sysconfig/ovoracle file is used as a configuration file by the /etc/init.d/ovoracle script, which is used by the Oracle HARG to start the Oracle Database.

NOTE

Make sure that you use the latest version of the /etc/init.d/ovoracle script. Copy the file from newconfig by running the following command:

```
cp /opt/OV/newconfig/OpC/etc/init.d/ovoracle \  
/etc/init.d/ovoracle
```

5. Remove the existing links in /opt/OV/lib64 to the libraries located in the Oracle Database server directory, and replace them with links to Oracle client libraries:

```
— ln -sf <ORACLE_HOME>/lib/libclntsh.so \  
/opt/OV/lib64/libclntsh.so  
— ln -sf <ORACLE_HOME>/lib/libclntsh.so \  
/opt/OV/lib64/libclntsh.so.11.1  
— ln -sf <ORACLE_HOME>/lib/libnnz11.so \  
/opt/OV/lib64/libnnz11.so
```

6. Start the HP Operations management server as an HA resource group by using the following command:

```
/opt/OV/bin/ovharg_config ov-server -start \  
<local_hostname>
```

The HP Operations management server will now connect to the Oracle Database server through the Oracle client.

- *Additional cluster node*

Install the Oracle client software on a local disk, all other Oracle configuration steps will be performed by the HP Operations management server installation script.

NOTE

When installing and configuring the HP Operations server, the ORACLE_HOME variable must be set to the Oracle client location.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 344.

Oracle Database Server on a Remote File System

- ❑ Independent database server installation

If the Oracle Database server will be running on a remote system that is not part of the local node:

- *First cluster node*

Configure the Oracle Database as described in “Setting Up HPOM with a Remote/Manual Oracle Database” on page 130.

- *Additional cluster node*

Install the Oracle Net Services and Oracle client software on the local disk, all other Oracle configuration steps will be performed by the HP Operations server installation script.

NOTE

After the Oracle server installation, make sure to create a script or a binary named as follows:

```
/opt/OV/bin/OpC/utlils/ha/ha_check_oracle
```

The exit code of this script or binary must be 0 if the Oracle Database server runs, or other than 0 if it does not run. This script or binary, with which the HP Operations management server checks the status of the Oracle Database, must be present on all HP Operations management server cluster nodes.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 344.

IMPORTANT

When the following questions appear during the independent database server configuration, make sure that you answer as follows:

- Separate Oracle from Server?
Press **y**.
 - Configure Server and Oracle DB running as separate HA resource groups?
Press **n**.
 - Set up the database manually (local/remote)?
Press **y**.
 - Is the manually configured database already set up?
Press **n**.
-

Installing and Configuring the HP Operations Management Server on Cluster Nodes

When installing HPOM in a cluster environment, you must provide responses to some questions and specify some values differently than in the stand-alone HPOM installation. These cluster-specific questions differ depending on whether you are installing and configuring the HP Operations management server on the first cluster node or on an additional cluster node.

IMPORTANT

Make sure that cluster node names are the same as hostnames. Otherwise, the configuration fails.

Installing and Configuring the HP Operations Management Server on the First Cluster Node

To install and configure the HP Operations management server on the first cluster node, follow these steps:

1. After the ovoconfigure script detects a special environment, provide answers to the following cluster-specific questions:

| Question | Instruction |
|--|--|
| Run HPOM Server as an HA resource group | Press y followed by ENTER .
The script checks the remote shell connection and the secure remote shell connection. |
| Would you prefer to use REMSH even though SSH is enabled | Press ENTER to accept the default answer (that is, n). |

| Question | Instruction |
|-----------------------------|--|
| HA Resource Group name | <p>Press ENTER to accept the default answer (that is, <code>ov-server</code>), or specify an alternative name for the HA resource group, and then press ENTER.</p> <p>HA resource groups are created during the installation of HPOM. The <code>ovinstall</code> script builds the package or the service control file, and the configuration file automatically. Do not create these files manually and do not use your own configuration files. If you already did it, remove them before starting the installation of HPOM.</p> <p>IMPORTANT: The entered HA resource group name may not be one of the already existing names.</p> |
| Server virtual hostname | <p>Enter the short name of the virtual host (for example, <code>virtip1</code>).</p> |
| Separate Oracle from Server | <p>To separate Oracle from the HP Operations management server, press y. The following question is displayed:</p> <p>Configure Server and Oracle DB running as separate HA resource groups?</p> <p><i>If you want to configure Oracle as a separate HA resource group:</i> Press ENTER to accept the default answer. You are prompted to enter the Oracle HA resource group name (for example, <code>ov-oracle</code>) and the Oracle virtual hostname (for example, <code>virtip2</code>).</p> <p>IMPORTANT: The entered HA resource group name may not be one of the already existing names.</p> <p><i>If you do not want to configure Oracle as a separate HA resource group:</i> Press n followed by ENTER and continue with the HP Operations management server installation where Oracle is an independent database server.</p> |

| Question | Instruction |
|-----------------------------|--|
| HA Resource Group name | <p>Press ENTER to accept the default answer (that is, <code>ov-server</code>), or specify an alternative name for the HA resource group, and then press ENTER.</p> <p>HA resource groups are created during the installation of HPOM. The <code>ovinstall</code> script builds the package or the service control file, and the configuration file automatically. Do not create these files manually and do not use your own configuration files. If you already did it, remove them before starting the installation of HPOM.</p> <p>IMPORTANT: The entered HA resource group name may not be one of the already existing names.</p> |
| Server virtual hostname | <p>Enter the short name of the virtual host (for example, <code>virtip1</code>).</p> |
| Separate Oracle from Server | <p>To separate Oracle from the HP Operations management server, press y. The following question is displayed:</p> <p>Configure Server and Oracle DB running as separate HA resource groups?</p> <p><i>If you want to configure Oracle as a separate HA resource group:</i> Press ENTER to accept the default answer. You are prompted to enter the Oracle HA resource group name (for example, <code>ov-oracle</code>) and the Oracle virtual hostname (for example, <code>virtip2</code>).</p> <p>IMPORTANT: The entered HA resource group name may not be one of the already existing names.</p> <p><i>If you do not want to configure Oracle as a separate HA resource group:</i> Press n followed by ENTER and continue with the HP Operations management server installation where Oracle is an independent database server.</p> |

| Question | Instruction |
|------------------------|--|
| Oracle Base | Choose the Oracle database base directory (the default is /opt/oracle). |
| Oracle Data Directory | Choose the directory where HP Operations server database files are stored. |
| Oracle Index Directory | Choose the directory where HP Operations server database index files are stored (by default, it is the same as the Oracle data directory). |

The ovoconfigure script continues with checking shared file systems.

2. If you want to add a new shared file system, follow these steps:

a. Press **y** followed by **ENTER**.

You are prompted to enter the shared file system mount point.

b. Type the desired shared file system mount point, and then press **ENTER**.

Otherwise, accept the default value **n** by pressing **ENTER**.

The ovoconfigure script continues with checking virtual hosts.

3. If you want to add a new virtual host, follow these steps:

a. Press **y** followed by **ENTER**.

You are prompted to add the virtual hostname.

b. Type the desired virtual hostname (for example, virtip3), and then press **ENTER**.

Otherwise, accept the default value **n** by pressing **ENTER**.

The summary of all shared file systems and virtual hosts is displayed, after which the ovoconfigure script asks you if you want to continue.

4. Press **ENTER**.

An output similar to the following one should appear:

```
Cluster preconfiguration . . . . . OK
```

5. Press **ENTER** to continue with the database configuration and the server initialization.

Make sure to answer all the questions related to the database configuration and the server initialization.

6. Press **ENTER** to continue with the cluster configuration.

An output similar to the following one should appear:

```
Cluster configuration on FIRST cluster node
-----
OVHARG configuration . . . . . OK
Configure Server cluster configuration . . . . . OK
Server cluster postconfiguration . . . . . OK
Server HARG creation . . . . . OK
Cluster successfully configured
```

7. Press **ENTER** to continue.

The server final configuration starts. It consists of the following:

- Management server policy group assignment
- Subagents configuration
- Java GUI configuration
- Web server configuration
- Certificates backup

8. Press **ENTER** to start the HP Operations management server as an HA resource group.

At this point, agent deployment packages are installed, the local agent is configured, and the configuration is distributed to the local agent.

NOTE

To limit the server communication to the virtual IP only, run the following command:

```
/opt/OV/bin/ovconfchg -ovrg server -ns bbc.http -set \  
CLIENT_BIND_ADDR <virtual_IP_of_HPOM_cluster>
```

Installing and Configuring the HP Operations Management Server on an Additional Cluster Node

To install and configure the HP Operations management server on an additional cluster node, follow these steps:

1. After the `ovoconfigure` script detects a special environment, you are asked if you want to run the HP Operations management server as an HA resource group.

Press **y** followed by **ENTER**.

The script checks the remote shell connection and the secure remote shell connection, and then the following question appears:

Would you prefer to use REMSH even though SSH is enabled?

2. Press **ENTER** to accept the default answer (that is, **n**).

You are prompted to enter the HA resource group name.

3. Press **ENTER** to accept the default answer (that is, `ov-server`), or specify an alternative name for the HA resource group, and then press **ENTER**.

IMPORTANT

The entered HA resource group must be configured and running on the first cluster node.

An output similar to the following one should appear:

```
Cluster preconfiguration . . . . . OK
```

4. Press **ENTER** to continue with the server initialization.

During the server initialization, `ovoconfigure` performs the integration into the start-stop sequence.

5. Press **ENTER** to continue with the cluster configuration.

An output similar to the following one should appear:

```
Cluster configuration on ADDITIONAL cluster node
-----
OVHARG configuration . . . . . OK
Configure Server cluster configuration . . . . . OK
```

Installing and Configuring the HP Operations Management Server on Cluster Nodes

```
Configure Oracle cluster configuration . . . . . OK  
Server cluster postconfiguration . . . . . OK  
Adding local node to Server HARG . . . . . OK
```

Cluster successfully configured

6. Press **ENTER** to continue with the server final configuration that consists of the following:

- Management server policy group assignment
- Java GUI configuration
- Web server configuration
- Agent deployment packages installation
- Local agent configuration
- Distributing configuration to the local agent

Log Files

For details about the cluster-specific installation, check the following log files:

- ❑ `/var/opt/OV/log/OpC/mgmt_sv/installation.log.verbose`

Contains information about the success and eventual problems during the installation.

- ❑ `/var/opt/OV/hacluster/ov-server/trace.log1`,
`/var/opt/OV/hacluster/ov-server/error.log`, and
`/var/VRTSvcs/log/engine_A.log`

Contain information about managing the HA resource group.

NOTE

The HARG `trace.log` file size is limited. When the maximum file size is reached, `trace.log` is moved into `trace.log.old` and the new information is written into a new `trace.log` file.

The maximum size of the `trace.log` file can be changed by editing the `/var/opt/OV/hacluster/<HARG name>/settings` file, and adding the following line:

```
TRACING_FILE_MAX_SIZE=<maximum_size_in_kBytes>
```

For example:

```
TRACING_FILE_MAX_SIZE=7000
```

-
1. Only if previously enabled by entering the following:
`/opt/OV/sbin/ovharg -tracing ov-server enable`
The `trace.log` file is automatically updated with the information about starting the HA resource group during the installation on the first cluster node.

Deinstalling the HPOM Software from Cluster Nodes

The HPOM software can be deinstalled in one of two ways:

❑ From all cluster nodes

When deinstalling the HP Operations management server from a cluster environment, you must perform the deinstallation procedure in the following sequence:

1. Deinstall the HP Operations management server from the **passive cluster nodes**. These are the systems that are installed and configured to run the HP Operations management server, but are currently *not* running.

For details on how to deinstall the HP Operations server from the passive cluster nodes, see “Deinstalling HPOM from Passive Cluster Nodes” on page 353.

2. When the HP Operations management server software is deinstalled from all passive nodes, deinstall the software from the **active cluster node**. This is the system on which the HP Operations management server is currently up and running as an HA resource group.

For details on how to deinstall the HP Operations management server from the active cluster node, see “Deinstalling HPOM from the Active Cluster Node” on page 353.

❑ From selected cluster nodes

After you deinstall the HP Operations management server software from a cluster node, this node will no longer be able to run the HP Operations management server. The cluster environment running the HP Operations server will be reduced by one node.

To deinstall HP Operations management server software from a cluster node, this node must be in the passive state. For details on how to deinstall HP Operations management server software from passive cluster nodes, see “Deinstalling HPOM from Passive Cluster Nodes” on page 353.

Deinstalling HPOM from Passive Cluster Nodes

Before the HP Operations management server software is deinstalled from a passive cluster node, the following requirements must be met:

1. The HP Operations server HA resource group `ov-server` may not be active on this node.
2. Virtual host must *not* be active.
3. Shared file systems must *not* be mounted.

After ensuring that all these requirements are met, deinstall the HP Operations management server as described in Chapter 6, “Software Administration on the Management Server.”

Deinstalling HPOM from the Active Cluster Node

When the HP Operations management server is deinstalled from all the passive cluster nodes, you can start the deinstallation process from the node on which the HP Operations management server is running.

Deinstall the HP Operations management server software from this node as described in Chapter 6, “Software Administration on the Management Server.”

Stopping the HP Operations Management Server in a Cluster Environment for Maintenance

Sometimes, you need to stop the HP Operations management server to install a patch, perform an upgrade, conduct maintenance, and so on.

To stop the HP Operations management server, follow these steps:

1. Disable the HA resource group monitoring using the command:

```
/opt/OV/lbin/ovharg -monitor ov-server disable
```

2. Stop the HP Operations management server.

The HP Operations management server must *not* be stopped by using the cluster-related commands. Only the HPOM commands such as `ovc` and `opcsv` may be used.

CAUTION

Before you run the `opcsv -stop`, `ovc -stop`, or `ovc -kill` command, you must disable the HA resource group monitoring. Failing to do so results in a failover.

3. Perform the intended action (the patch installation, an upgrade, the maintenance, and so on).

4. Start the HP Operations management server.

The HP Operations management server must *not* be started by using the cluster-related commands. Only the HPOM commands such as `ovc` and `opcsv` may be used.

5. Enable the HA resource group monitoring using the command:

```
/opt/OV/lbin/ovharg -monitor ov-server enable
```

NOTE

Before enabling the HA resource group monitoring, make sure that the HP Operations management server is running.
