

HP Operations Manager

Installation Guide

Software Version: 9.10

for Sun Solaris



Manufacturing Part Number: None

March 2011

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1. Installation Requirements for the Management Server	
In This Chapter	26
Choosing the Correct Installation and Upgrade Path	27
Verifying the Installation Requirements	30
Hardware Requirements	31
Software Requirements	37
Supported Agent Platforms	43
2. Installing and Configuring HPOM on the Management Server	
In This Chapter	46
Before You Install and Configure HPOM	47
Configuring Input/Output for Multiple Language Support	48
Installing and Configuring HPOM	50
Installing and Verifying an Oracle Database	51
Required Oracle Products.	51
Using an Existing Oracle Database.	52
Before You Install an Oracle Database	53
Installing an Oracle Database	57
Installing and Configuring the HPOM Software on the Management Server System	66
Usage of the ovoidinstall and ovoconfigure Scripts	67
Running ovoidinstall	69
Installing and Configuring the HPOM Software on the Management Server	72
Viewing the Installation Log Files.	81
Starting HPOM and Verifying the Installation	82
After You Install HPOM	85
Reconfiguring the HPOM Software.	86
3. Installing the Java Operator GUI	
In This Chapter	90
Supported Platforms	91
Supported Languages	92
Installation Requirements.	94
Hardware Requirements	94
Software Requirements	95
Supported Web Browsers	96

Installing the HPOM Java Operator GUI	97
Installation Requirements	97
Installing HPOM Java GUI Through HTTP	98
Installing HPOM Java GUI Through FTP	99
Installing HPOM Java GUI on Sun Solaris Systems Other than HP Operations Management Servers	101
Installing Service Navigator	103
Determining the size of max_thread_proc.	103
Service Navigator Product Bundles.	104
Starting the HPOM Java GUI.	105
ito_op Startup Script	105
Starting the Java GUI on a PC	106
Starting the Java GUI on a UNIX-based System	106
Starting the Java GUI from a Web Browser	107
Starting the Online Documentation	108
Connecting Through a Firewall	109
Configuring the HTTP Server	110
Configuring a Netscape Server	111
Configuring a W3C Jigsaw Server	112

4. Service Management and Manual Database Configuration

In This Chapter	114
Starting and Stopping HPOM.	115
Starting and Stopping an Oracle Database Automatically	116
Starting and Stopping an Oracle Database Manually.	117
Starting an Oracle Database Manually.	117
Stopping an Oracle Database Manually	118
Native Language Support in an Oracle Database	119
Environment Variables in an Oracle Database	120
Alternative Database Locations	121
Setting Up HPOM with a Remote/Manual Oracle Database	122
Requirements	122
Limitations During the HPOM Runtime.	124
Creating and Configuring the HPOM Database.	124
Installing and Configuring HPOM with a Remote/Manual Oracle Database.	137
Setting Up HPOM in an Oracle Real Application Clusters (RAC) Environment. ...	139

Requirements	139
Limitations During the HPOM Runtime.	140
Installing Oracle RAC	141
Creating and Configuring the HPOM Database.	141
Installing and Configuring HPOM in an RAC Environment.	160
5. Directory Structure on the Management Server	
In This Chapter	164
HPOM File Tree on the Management Server.	165
System Resources Adapted by HPOM.	171
6. Software Administration on the Management Server	
In This Chapter	174
Deinstalling the Entire HPOM Installation.	175
Deinstalling the HPOM Java GUI	178
Deinstalling the Java GUI from a PC Client	178
Deinstalling the Java GUI from a Solaris Client	179
Deinstalling the Java GUI from Other UNIX-based Systems	179
Deinstalling Service Navigator	180
Deinstalling the Service Navigator GUI Client	180
Deinstalling Service Navigator from an HPOM Management Server.	181
Reinstalling the HPOM Software	182
Reinitializing the HPOM Database and Configuration	186
7. Configuration Migration	
In This Chapter	190
Introduction of the UTF-8 Character Set.	191
Conversion of Templates to Policies	193
Use of Policy Groups Instead of Template Groups	196
HPOM 8.xx Instrumentation on the HPOM 9.xx Management Server	199
HPOM 8.xx SPIs on the HPOM 9.xx Management Server	201
Decoupling of the HPOM 9.xx Management Server from NNM.	202
Removal of DCE Support.	203
Introduction of a New Paradigm for a Node Identification	204
Obsolescence of the Motif GUI	205

Behavior of Other HPOM 8.xx Configuration Object Types	206
--	-----

8. Migrating HPOM

In This Chapter	208
Verifying the Installation Requirements for the Management Server	209
Installing the Oracle Database	210
Migration Scenarios	211
Migration to a System with a Different IP Address and a Hostname	212
Downloading the Old Server Configuration	214
Setting Up a New Server	216
Uploading the Saved HPOM Configuration	218
Establishing a Trust Relationship Between the Two Management Servers	221
Setting Up Message Forwarding Between the Management Servers	225
Upgrade of the Systems in a MoM Setup by Reusing the IP Addresses and Hostnames	228

9. Upgrading HPOM to Version 9.10

In This Chapter	234
Upgrading from HPOM 8.xx to HPOM 9.10	235
Verifying the Installation Requirements for the Management Server	236
Backing Up the Current HPOM 8.xx Installation	237
Downloading the Current HPOM 8.xx Configuration	239
Installing the New Oracle Version	243
Upgrading the Old Version of HPOM	244
Uploading the Saved HPOM Configuration	248
Upgrading from HPOM 9.0x to HPOM 9.10	251
Verifying the Installation Requirements for the Management Server	251
Upgrading the Old Version of HPOM	251
Upgrading the HPOM Java Operator UI	254
Upgrading Service Navigator	255
Upgrading Managed Nodes	257
License Migration to HPOM 9.10	258
Prerequisite for License Migration	258
License Migration	258
Cluster Environment	261

10. Installing HPOM in a Sun Cluster Environment

In This Chapter	264
Configuration Scenarios	265
Installation Requirements.....	268
Installation Requirements for an Oracle Database	268
Creating a Network Interface Group	269
Installing and Configuring the HP Operations Management Server on Cluster Nodes.....	270
Preparation Steps	272
Before You Install the HP Operations Management Server on the First Cluster Node	273
Before You Install the HP Operations Management Server on Additional Cluster Nodes	299
Installing the Oracle Database Server for HPOM in a Cluster Environment.....	306
Oracle Database Server on a Local Disk.....	308
Oracle Database Server on a Shared Disk (Exceptional).....	309
Oracle Database Server on a Remote File System	312
Installing and Configuring the HP Operations Management Server on Cluster Nodes.....	313
Installing and Configuring the HP Operations Management Server on the First Cluster Node	314
Installing and Configuring the HP Operations Management Server on the Additional Cluster Node	319
Log Files	321
Deinstalling the HPOM Software from Cluster Nodes	322
Deinstalling HPOM from Passive Cluster Nodes	323
Deinstalling HPOM from the Active Cluster Node.....	323
Stopping the HP Operations Management Server in a Cluster Environment for Maintenance	324
Upgrading HPOM from Version 8.xx to Version 9.10 in a Cluster Environment. . .	325
Upgrading the HP Operations Management Server on the Active Cluster Node	326
Upgrading the HP Operations Management Server on the Passive Cluster Node	328

11. Installing HPOM in a VERITAS Cluster Environment

In This Chapter	330
Configuration Scenarios	331
Installation Requirements.....	334
Installation Requirements for an Oracle Database	334
Installing and Configuring the HP Operations Management Server on Cluster Nodes.....	335
Preparation Steps	337
Before You Install the HP Operations Management Server on the First Cluster Node	338
Before You Install the HP Operations Management Server on Additional Cluster Nodes	359
Installing the Oracle Database Server for HPOM in a Cluster Environment.....	361
Oracle Database Server on a Local Disk.....	363
Oracle Database Server on a Shared Disk (Exceptional).....	364
Oracle Database Server on a Remote File System	367
Installing and Configuring the HP Operations Management Server on Cluster Nodes.....	368
Installing and Configuring the HP Operations Management Server on the First Cluster Node	369
Installing and Configuring the HP Operations Management Server on the Additional Cluster Node	374
Log Files	376
Deinstalling the HPOM Software from Cluster Nodes	377
Deinstalling HPOM from Passive Cluster Nodes	378
Deinstalling HPOM from the Active Cluster Node.....	378
Stopping the HP Operations Management Server in a Cluster Environment for Maintenance	379
Upgrading HPOM from Version 8.xx to Version 9.10 in a Cluster Environment....	380
Upgrading the HP Operations Management Server on the Active Cluster Node	381
Upgrading the HP Operations Management Server on the Passive Cluster Node	383

Printing History

The printing date and part number of the manual indicate the edition of the manual. The printing date will change when a new edition is printed. Minor changes may be made before a reprint without changing the printing date. The part number of the manual will change when extensive changes are made.

Manual updates may be issued between editions to correct errors or to document product changes. To ensure that you receive the latest edition of the manual, you should subscribe to the product-support service. See your HP sales representative for details.

First Edition:	HPOM 9.10	June 2010
Second Edition:	HPOM 9.10	September 2010
Third Edition:	HPOM 9.10	February 2011

Conventions

The following typographical conventions are used in this manual:

Table 1 **Typographical Conventions**

Font	Meaning	Example
<i>Italic</i>	Book titles and manual page names	For more information, see the <i>HPOM Administrator's Reference</i> and the <i>opc(1m)</i> manual page.
	Emphasis	You <i>must</i> follow these steps.
	Variable that you must supply when entering a command (in angle brackets)	At the prompt, enter rlogin <i><username></i> .
	Parameters to a function	The <i>oper_name</i> parameter returns an integer response.
Computer	Text and other items on the computer screen	The following system message displays: Are you sure you want to remove current group?
	Command names	Use the <code>grep</code> command ...
	Function names	Use the <code>opc_connect()</code> function to connect...
	File and directory names	Edit the <code>itooopc</code> file... <code>/opt/OV/bin/OpC/</code>
	Process names	Check to see if <code>opcmona</code> is running.
Computer Bold	Text that you enter	At the prompt, enter ls -l .

Table 1 **Typographical Conventions (Continued)**

Font	Meaning	Example
Keycap	Keyboard keys	Press Return .
	Menu name followed by a colon (:) means that you select the menu, and then the item. When the item is followed by an arrow (->), a cascading menu follows.	From the menu bar, select Actions: Filtering -> All Active Messages .
	Buttons in the user interface	Click OK .

Documentation Map

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

Electronic Versions of the Manuals

All the HPOM manuals are available as Adobe Portable Document Format (PDF) files in the documentation directory on the HPOM product DVD.

Alternatively, you can download all the HPOM product manuals from the following website, which requires login credentials:

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

Watch this website regularly for the latest edition of the *HPOM Software Release Notes*, which is updated every two to three months with the latest news (for example, additionally supported operating system versions, the latest patches and so on).

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

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

<management_server>

Fully qualified hostname of the HPOM management server

<lang>

System language set on the management server, for example, C for the English environment

You can also find a selection of product manuals in the following locations on the HP Operations management server file system after software installation is complete:

- **HP Operations Manager:**

`/opt/OV/www/htdocs/ito_doc/<lang>/manuals`

- **HPOM Administration UI**

`/opt/OV/OMU/adminUI/jre/db/docs/pdf/`

- **Hotfix Deployment Tool**

`/opt/OV/contrib/OpC/Hotfix_deployment_tool/`

- **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 Java GUI Online Information is found in the following location on the HP Operations management server file system after software installation is complete:

`/opt/OV/www/htdocs/ito_op/help/<lang>/ovo/html/`

HPOM Manuals

This section provides an overview of the most important manuals provided with HPOM on UNIX and HPOM on Linux. For information about additional documentation, see “Electronic Versions of the Manuals” on page 15. Table 2 on page 17 lists the manuals, indicates who the target audience is, and briefly describes the manuals scope and contents.

Table 2 **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
<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 the managed nodes and helps with HPOM administration and troubleshooting. Also, provides information for those who are responsible for installing, configuring, maintaining, and troubleshooting the HP Operations <i>Service Navigator</i> . This manual also contains a high-level overview of the concepts behind service management.
<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.

Table 2 **HPOM Manuals (Continued)**

Manual Title	Audience	Description
<i>HPOM Java GUI Operator's Guide</i>	Administrators Operators	Provides you with a detailed description of the HPOM Java-based operator GUI and the 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 Software Release Notes</i>	Administrators	Lists new features and helps you with the following tasks: <ul style="list-style-type: none">• Compare features of the current software with features of previous versions.• Determine system and software compatibility.• Solve known problems.
<i>HPOM Firewall Concepts and Configuration Guide</i>	Administrators	Describes the HPOM firewall concepts and provides instructions for configuring the secure environment.
<i>HPOM Web Services Integration Guide</i>	Administrators	Describes the HPOM Web-Services integration.
<i>HPOM Server Configuration Variables</i>	Administrators	List and explains the variables that are available to configure the HPOM management server.

HPOM Online Information

The following information is available online, that is, on the HPOM management server after installation and initial configuration is complete.

Table 3 **HPOM Online Information**

Online Information	Description
HPOM Java GUI Online Information	HTML-based help system for the HPOM Java-based operator 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.
HPOM manual pages	<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, enter one of the following addresses (URLs) in your web browser:</p> <ul style="list-style-type: none">• Standard Connection: http://<HPOM_management_server>:8081/ITO_MAN• Secure Connection: https://<HPOM_management_server>:8444/ITO_MAN <p>In these URLs, <HPOM_management_server> is the fully qualified hostname of your HPOM management server. Note that the manual pages for the HPOM agents are installed on each managed node.</p>

HPOM Administration UI Documentation

The following information is available online, that is: on the HPOM management server after installation and initial configuration is complete.

Table 4 **HPOM Administration UI Documentation**

Online Information	Description
HPOM Administration UI Online Help	<p>The online help for the HPOM administrator GUI provides context-sensitive information about individual pages, menus, and options displayed in the administrator's graphical user interface. Menus and menu options differ according to the data context in which you are working. Start the HPOM administrator's user interface by entering the following URL in a supported Web browser:</p> <ul style="list-style-type: none">• Standard Connection: http://<HPOM_management_server>:9662• Secure Connection: https://<HPOM_management_server>:9663
<i>HPOM Administration UI Installation Guide</i>	This document provides information about the installation, basic configuration and troubleshooting of Administration UI.
<i>HPOM Administration UI Administration and Configuration Guide</i>	This document provides information about the architecture, configuration, maintenance and troubleshooting of Administration UI.
<i>HPOM Administration UI User Guide</i>	This document provides instructions on usage of the Administration UI software.
<i>HPOM Administration UI Performance and Scalability Guide</i>	This document provides information and recommendations about designing and configuring the environment to run Administration UI.
<i>HPOM Administration UI Release Notes</i>	This document lists new features of the Administration UI, provides installation hints and information on the product known problems and workarounds.

HPOM Online Help

This preface describes online documentation for the HP Operations Manager (HPOM) administrator and the HPOM operator Java graphical user interface (Java GUI).

Online Help for the HPOM Administrator GUI

The online help for the HPOM administrator GUI provides context-sensitive 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. The OMU Administration UI online-help provides information about the following data contexts:

❑ **HPOM for UNIX:**

Describes the user interface displayed when you are working in the *HP Operations Manager for UNIX* data context. In the HPOM for UNIX data context, you manage all HPOM for UNIX-related objects, for example: nodes, policies, categories, applications, users, message groups, and so on.

❑ **Server:**

Describes the user interface displayed when you are working in the *server* data context. In the data server context, you can add new jobs, manage tasks, and browse details of log files on the local or currently selected server.

❑ **Admin:**

Describes the user interface displayed when you are working in the Administration (Admin) data context. In the *Admin* data context, you configure and manage the administrator users who log in to the HPOM Admin UI, the servers that you manage with the HPOM Admin UI, and the licenses that HPOM Admin UI requires to function.

Accessing the Admin GUI Online Help

To access online help for the HPOM Administrator's GUI (Admin UI), perform the following steps:

1. Start the HPOM administrator's user interface by entering the following URL in a supported Web browser:
 - Standard Connection:
http://localhost:9662
 - Secure Connection:
https://localhost:9663
2. Log in to the HPOM administrator UI. The default user name and password are as follows:

User name	opc_adm
Password	OpC_adm
3. In the Web browser that opens, click the Help icon in the title bar.
4. Select the link that corresponds to the technical area you need help for, for example: HPOM for UNIX, Server, or Admin.
5. To display context-sensitive help for the current page displayed in the HPOM Admin UI, click the Help icon in the top right of the page.

Online Help for the Java GUI and Service Navigator

The online help for the Java GUI includes information about the HP Service Navigator (Service Navigator) and helps operators to become familiar with and use the HPOM product.

The online help for the HPOM Java GUI includes the following information:

- ❑ **Tasks:**
Step-by-step instructions to help you complete important procedures.
- ❑ **Concepts:**
Introduction to the key concepts and features underlying the product features and functionality.
- ❑ **Troubleshooting:**
Tips, tricks, and solutions to common problems you might encounter while using the product.

□ **Index:**

List of topics in alphabetical order to help you find the information you need, quickly and easily.

Accessing the Java GUI Online Help

To access online help for the Java GUI, perform the following steps:

1. Configure HPOM to use your preferred browser.
2. Start the Java GUI and, in the Java GUI menu bar, select **Help: Contents**
3. In the Web browser that opens, choose the topic you want to read about.

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.

Choosing the Correct Installation and Upgrade Path

Before you start to install HPOM, you need to choose an installation path that best suits your requirements. For example, you *must* decide whether you are installing a new version of HPOM or performing an upgrade from a previous version of HPOM. For a description of the standard HPOM installation and upgrade tasks, see Table 1-1.

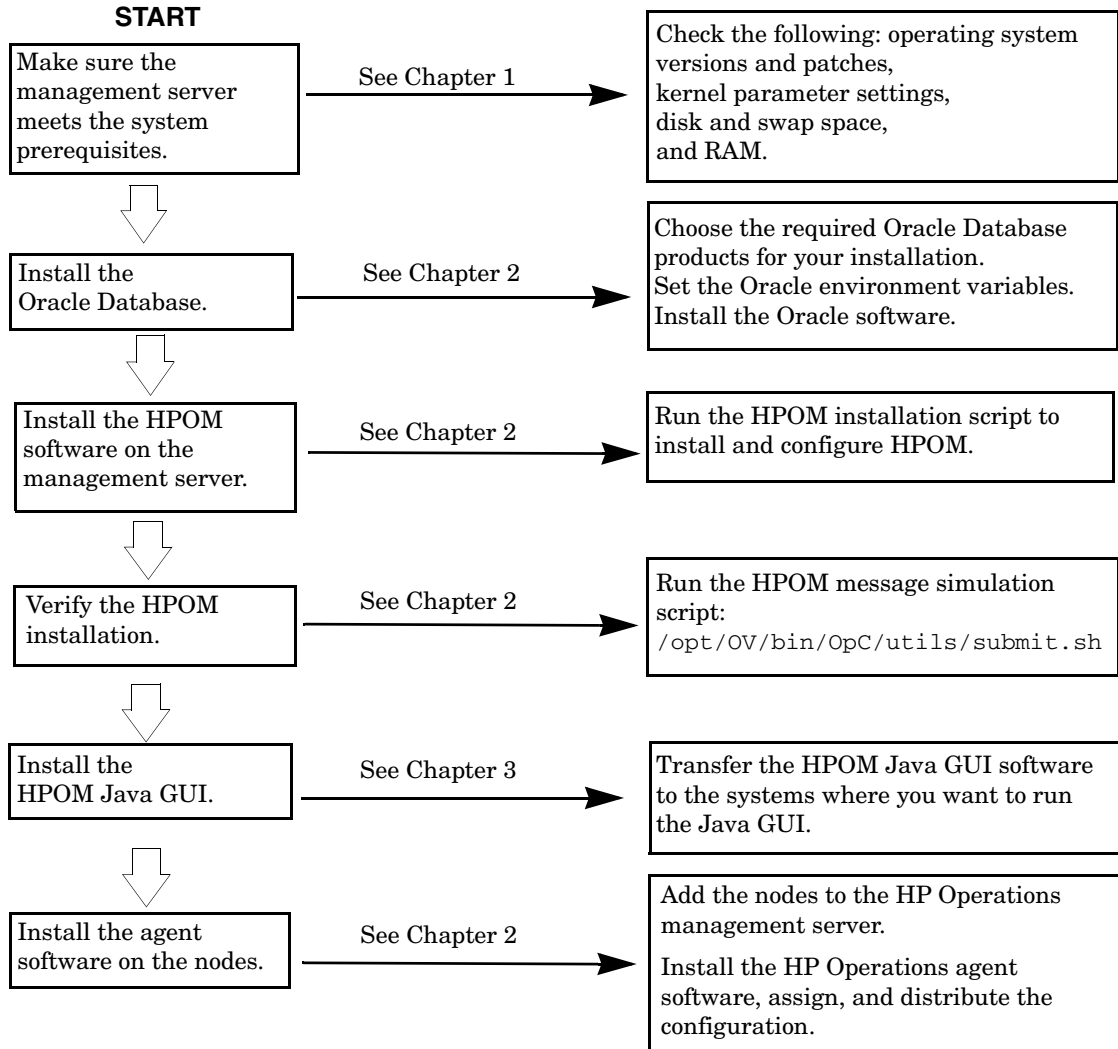
Table 1-1 **Choosing the Correct Installation and Upgrade Path**

Task	Requirement	Reference
1. Install HPOM 9.xx for UNIX on the management server.	1. Have management server hardware that conforms to <i>at least</i> the minimum system requirements for the HP Operations management server.	This Chapter. Chapter 2, “Installing and Configuring HPOM on the Management Server,” on page 45
2. Install the HPOM Java GUI.	1. Have HPOM 9.xx installed on the management server. 2. Install the HPOM Java GUI software on the systems where the HPOM Java GUI will be running.	Chapter 3, “Installing the Java Operator GUI,” on page 89
3. Install HPOM in a Sun Cluster Environment	1. Install the HPOM filesets on the first Sun Cluster node. 2. Install HPOM on additional Sun Cluster nodes.	Chapter 10, “Installing HPOM in a Sun Cluster Environment,” on page 263
4. Install HPOM in a VERITAS Cluster Environment	1. Install the HPOM filesets on the first VERITAS Cluster Server node. 2. Install HPOM on additional VERITAS Cluster Server nodes.	Chapter 11, “Installing HPOM in a VERITAS Cluster Environment,” on page 329

Table 1-1 **Choosing the Correct Installation and Upgrade Path (Continued)**

Task	Requirement	Reference
5. Upgrade HPOM to version 9.xx.	<ol style="list-style-type: none"> 1. Have management server hardware and software that conforms to <i>at least</i> the minimum system requirements for the HPOM 9.xx management server. 2. Upgrade to HPOM 9.xx. 	<p>This Chapter.</p> <p>Chapter 9, “Upgrading HPOM to Version 9.10,” on page 233</p>
6. Install or update HP Operations agent software on the managed nodes.	<ol style="list-style-type: none"> 1. Have HPOM installed on the management server. 2. Add the nodes to the HP Operations management server. 3. Install the HP Operations agent software, assign and distribute the configuration. 	<p><i>HPOM Administrator’s Reference</i></p> <p><i>HPOM HTTPS Agent Concepts and Configuration Guide</i></p>

Figure 1-1 Summary of Standard HPOM Installation Tasks



Verifying the 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 a 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 31
- ❑ “Software Requirements” on page 37

After completing the prerequisites, continue with “Resolving Hostnames” on page 39, then adapt your system resources if they are below the required minimum. The kernel parameter values are managed by Resource Control. For details, see “Kernel Parameters for the Management Server” on page 40.

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.

For more information about the HPOM installation script, see Chapter 2, “Installing and Configuring HPOM on the Management Server.”

Hardware Requirements

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

- ❑ Sun SPARC
- ❑ Additional disk space
- ❑ Additional RAM
- ❑ Swap space (see Table 1-2 on page 34)
- ❑ 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 the Oracle Database on a dedicated system. For further information, see “Setting Up HPOM with a Remote/Manual Oracle Database” on page 122.

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 required disk space for the HP Operations management server is approximately 20 GB.

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 Oracle Database.

NOTE

An automatic file system layout with small physical disks is *not* suitable for HPOM.

If you have a Solaris system with small physical disks and you have chosen the “Automatic File System Layout” option during the installation of the Solaris operating system, then the resulting file system layout will *not* meet HPOM disk space requirements.

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. For more information, see the *Performance Guide*.

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 1-2 on page 34.

Table 1-2 Minimum Swap Space Required for HPOM Installation on the Management Server

Product	Required Swap Space (MB)
Sun Solaris 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.
- 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 in blocks, run the command:

```
/usr/sbin/swap -l
```

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.

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.

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 1-3 shows on which operating system version the HP Operations management server is supported.

CAUTION

When installing Sun Solaris, choose the Developer System Support option (DSS) for Software Group.

Table 1-3

Supported Operating System Version for the Management Server

Operating System	Platform	Supported Operating System Version
Solaris (minimum DSS installation)	Sun SPARC	10

NOTE

HPOM 9.xx on Sun Solaris 10 is a 32-bit application. HPOM runs on the 64-bit Sun Solaris 10 operating system, but it *does not* support integrations with 64-bit applications on the API level. Oracle 11g is a 64-bit application and therefore *must* be installed on a system running a 64-bit Sun Solaris 10 operating system. HPOM connects to the Oracle Database through the 32-bit SQL interface.

Operating System and Environment Patches

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

NOTE

In addition to the operating system patches required for the management server, it is necessary to install the agent patches required for the Sun Solaris managed nodes. For more details, see the *HPOM HTTPS Agent Concepts and Configuration Guide*.

You can obtain the latest versions of Sun Solaris operating system patches, including download and installation instructions, from the Sun website at the following location:

<http://www.sunsolve.sun.com>

IMPORTANT

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

Check the latest edition of the HPOM Software Release Notes for last-minute documentation about the required patches.

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> website. Patches with higher revisions should also be suitable, but they were not tested.

Verifying Requirements Manually

You can check the prerequisites manually, before starting the HPOM installation script.

- ❑ To check the available disk space, run the command:
`/usr/sbin/df -k`
- ❑ To check the available swap space in blocks, run the command:
`/usr/sbin/swap -l`
- ❑ To check the available RAM, run the command:
`/usr/sbin/prtconf | more`
- ❑ To check the hostnames, see “Resolving Hostnames” on page 39.
- ❑ To check the kernel parameters’ values, see “Kernel Parameters for the Management Server” on page 40.

Resolving Hostnames

The name service *must* be configured in such a way that hostnames are resolved as fully qualified hostnames.

You can resolve hostnames in one of four ways:

- ❑ DNS (recommended)
- ❑ NIS
- ❑ NIS+
- ❑ files

<IP address> <fully qualified hostname> <short hostname>

When using `files`, verify that the following set of items is present for all the hosts contained in the `/etc/hosts` file:

A short hostname may *not* be longer than 8 characters. Whenever a host is added to `/etc/hosts`, make sure that its name is fully qualified.

For example, for the `hpmgr` host in the `bbn.hp.com` domain, the following line *must* be entered in the `/etc/hosts` file:

193.197.95.42 hpmgr.bbn.hp.com hpmgr

Verifying the Installation Requirements

When using other hostname resolution methods, such as DNS or NIS+, make sure the entry for the local node in `/etc/hosts` contains the fully qualified hostname. The fully qualified hostname *must* be listed before the short hostname.

Kernel Parameters for the Management Server

Before adapting the kernel parameters to their recommended values, load the semaphores and shared memory modules as described in “Loading the Semaphores and Shared Memory Modules” on page 40.

Loading the Semaphores and Shared Memory Modules

For the HPOM installation script to run successfully, the semaphores and shared memory need to be enabled.

Use the `modinfo(1M)` command to check whether the required modules are loaded:

```
/usr/sbin/modinfo | grep shmsys
```

```
/usr/sbin/modinfo | grep semsys
```

If the modules are *not* loaded on your system (in which case `sysdef` lists each related kernel parameter value as zero), you must load the modules manually by using the `modload(1M)` command:

```
/usr/sbin/modload /kernel/sys/semsys /kernel/sys/shmsys
```

In addition, you must force-load the semaphore and shared memory modules at boot time to ensure that the kernel parameters are set correctly.

To force the semaphores and shared memory modules to be loaded automatically, enter the following lines at the beginning of your `/etc/system` file:

```
forceload: sys/shmsys
```

```
forceload: sys/semsys
```


Checking the Kernel Parameter Values

Make sure you load the `semsys` as well as `shmsys` modules before checking the current values of the kernel parameters. Otherwise, you may inadvertently lower the current `semsys` and `shmsys` values. For more information about loading these modules, see “Loading the Semaphores and Shared Memory Modules” on page 40.

To check the kernel parameter values, run the following commands:

- ❑ For the `project.*` parameters:

```
prctl -P -t privileged -n <parameter_name> -i \  
project user.root
```

- ❑ For the `process.*` parameters:

```
prctl -P -t privileged -n <parameter_name> -i process $$
```

The HPOM installation utility `ovoinstall` also checks your current settings.

Table 1-4 shows the minimum kernel settings, which are required when installing HPOM on the management server.

Table 1-4 Minimum Kernel Settings Required for HPOM Installation on the Management Server

<code>project.max-sem-ids</code>	100
<code>project.max-shm-memory</code>	4294967296 (4 GB)
<code>project.max-shm-ids</code>	100
<code>process.max-sem-nsems</code>	256

Oracle Database

HPOM 9.xx is certified to work with one of the following:

- ❑ Oracle Database 11g Release 1 Enterprise or Standard Edition with 11.1.0.7 Patch Set for the Oracle Database Server for Sun Solaris 10
- ❑ Oracle Database 11g Release 2 Enterprise or Standard Edition for the Oracle Database Server for Sun Solaris 10

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

If you have an 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.

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.

Installation Requirements for the Management Server
Verifying the Installation Requirements

In This Chapter

This chapter explains how to do the following:

- ❑ Install and configure HP Operations Manager (HPOM) for the first time on the management server.
- ❑ Set up the Oracle Database for use with HPOM.
- ❑ Reconfigure the HPOM software.

NOTE

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

Before You Install and Configure HPOM

Before installing and configuring HPOM, make sure that your system meets the following prerequisites:

- ❑ Sun Solaris operating system (minimum Developer System Support) *must* be installed.
- ❑ Kernel parameters on the management server *must* be adapted. See “Verifying the Installation Requirements” on page 30.
- ❑ Sun Solaris 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 32.
- ❑ 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” on page 48.

When the prerequisites are met, you can start with the HPOM installation and configuration.

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.

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 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
```

NOTE

The LANG variable will determine the language of HPOM messages, templates, and uploaded configuration.

If some of the contents are not available for the chosen locale, HPOM will default to the English contents instead.

2. Set locales on the client system:

- ❑ Windows XP:

Select **Control Panel: Date, Time, Language, and Regional Options: Regional and Language Options**. The Regional and Language Options window appears.

Click the **Advanced** tab, and 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 and Verifying an Oracle Database” on page 51
- ❑ Task 2: “Installing and Configuring the HPOM Software on the Management Server System” on page 66
- ❑ Task 3: “Starting HPOM and Verifying the Installation” on page 82

Installing and Verifying an Oracle Database

For operation with HPOM, install and set up one of the following:

- ❑ Oracle Database 11g Release 1 Enterprise or Standard Edition with 11.1.0.7 Patch Set for the Oracle Database server for Sun Solaris on SPARC
- ❑ Oracle Database 11g Release 2 Enterprise or Standard Edition for the Oracle Database Server for Sun Solaris on SPARC

For more detailed instructions than those provided in this section, or for non-standard installations, see the documentation supplied with the Oracle Database product.

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 the management server processes, including the 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 122. These products enable remote access to the Oracle Database.

Using an Existing Oracle Database

IMPORTANT

HPOM can be installed and configured using the existing database, but it requires its own database instance. Although it is possible to configure HPOM with an existing instance, this is *not* supported.

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

1. See the Oracle product documentation to make sure that the database is compatible with Oracle version 11g (11.1 or 11.2).
2. Make sure the Oracle environment variables are set as described in “Before You Install an Oracle Database” on page 53.
3. Continue with “Installing and Configuring the HPOM Software on the Management Server System” on page 66.

Before You Install an Oracle Database

Before installing 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

The dynamically linked Oracle environments are *not* supported.

2. Run `smc` as the `root` user, and create the `oracle` user with the following attributes:

- a. Create a UNIX group named `dba`.

The group ID should be greater than 100.

- b. Create a UNIX group named `oinstall`.

The group ID should be greater than 100.

- c. Create a UNIX user named `oracle`.

The user ID should be greater than 100.

NOTE

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.

- d. Make the `oracle` user a member of the `oinstall` group as the primary group and `dba` as the secondary group.

- e. As the home directory of the `oracle` user, use:

`/export/home/oracle`

NOTE

On Sun Solaris systems, the directory on which you can create user home directories is `/export/home/`. The `/home/` directory is a mount point for remote user home directories.

- f. The required shell for the oracle user is Korn shell (ksh).

Add the following line to the `/export/home/oracle/.profile` file:

```
SHELL=/bin/ksh
```

3. Set `umask` to allow users to access the Oracle binaries:

```
umask 022
```

4. Create the directories required by the Oracle installation:

- a. Create the Oracle home directory `ORACLE_HOME`:

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

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

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

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

- b. Create a base directory for the Oracle installation files:

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

You can also choose a different directory. If you do so, use the new directory consistently in all subsequent steps.

Change the ownership and set correct permissions by entering 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 entering:

```
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 `/export/home/oracle/.profile` of the oracle user:

❑ **export ORACLE_BASE=/opt/oracle**

This variable determines the location and the version of the Oracle installation. The /opt subdirectory prefix is the recommended default. You can use other prefixes, if needed.

❑ **export ORACLE_HOME=\$ORACLE_BASE/product/<version>**

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. You can choose a different setting, if needed.

NOTE

The `export ORACLE_BASE=/opt/oracle` and `export ORACLE_HOME=$ORACLE_BASE/product/<version>` Oracle environment variables are no longer mandatory for the operation with HPOM.

❑ **export ORACLE_SID=openview**

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

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

If you use a short filename file system on the management server, `ORACLE_SID` may not be longer than four characters.

❑ **export ORACLE_TERM=hp**

This variable specifies the terminal definition resource file for an `xterm` terminal setting to be used with the Oracle installer and other Oracle tools.

If you normally use `dtterm`, change the setting to `ORACLE_TERM=ansi`.

Installing and Verifying an Oracle Database

❑ **export PATH=\$PATH:\$ORACLE_HOME/bin**

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

7. Install the Oracle Database as described in “Installing an Oracle Database” on page 57.

Installing an Oracle Database

This section describes how to install one of the following:

- ❑ Oracle Database 11g Release 1 with 11.1.0.7 Patch Set for the Oracle Database Server for Sun Solaris on SPARC
- ❑ Oracle Database 11g Release 2 for the Oracle Database Server for Sun Solaris on SPARC

The procedure described in “Installing and Verifying an Oracle Database Version 11g” on page 58 installs Oracle without creating the `openview` database. After installing the HPOM software, `ovoconfigure` creates the `openview` database and configures the HPOM software as described in “Installing and Configuring the HPOM Software on the Management Server System” on page 66.

NOTE

Browse through this section before starting the installation. The order of the system prompts can slightly differ from the procedure described in “Installing and Verifying an Oracle Database Version 11g” on page 58. These slight variations do not indicate any problems with the installation.

Installing and Verifying an Oracle Database Version 11g

NOTE

The Oracle 11g Database Release 1 Enterprise Edition (64-bit) or the Oracle 11g Database Release 2 Enterprise Edition (64-bit) for Sun Solaris on SPARC is available on a DVD-ROM. This product, as well as all required Patch Sets, can be downloaded from the Oracle web site.

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

1. During the Oracle installation, you will need to perform some steps as user `root` and some as user `oracle`. Open two terminal windows:

- a. Log on as the `root` user in the first terminal window, and as the `oracle` user in the second.
- b. Make sure that the `ORACLE_TERM` environment variable is set correctly. To check the setting, enter:

```
echo $ORACLE_TERM
```

If `ORACLE_TERM` is not set, enter the following:

```
export ORACLE_TERM=xterm
```

- c. Verify, and if necessary, set the `ORACLE_HOME` and `ORACLE_SID` variables.

For example:

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

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

```
export ORACLE_HOME
```

```
export ORACLE_SID=openview
```

- d. Set the `DISPLAY` environment variable:

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

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

NOTE

On most Solaris systems, the disk is mounted automatically when you insert it into the disk drive. If the disk is not mounted automatically, follow step 2 to mount it.

2. Perform the following as the `root` user:

- a. Insert the appropriate disk into the disk drive. To verify whether the disk is mounted automatically, enter the following command:

```
ls /dvd/dvd0
```

- b. If the previous command fails to display the contents of the disk, enter the following command to mount the disk:

```
/usr/sbin/mount -r -F hsfs \  
</dev/dsk/cxydzs2> </dvd>
```

In this instance, `</dvd>` is the disk mount point directory, and `</dev/dsk/cxydzs2>` is the device name for the disk device, for example, `/dev/dsk/c0t2d0s2`.

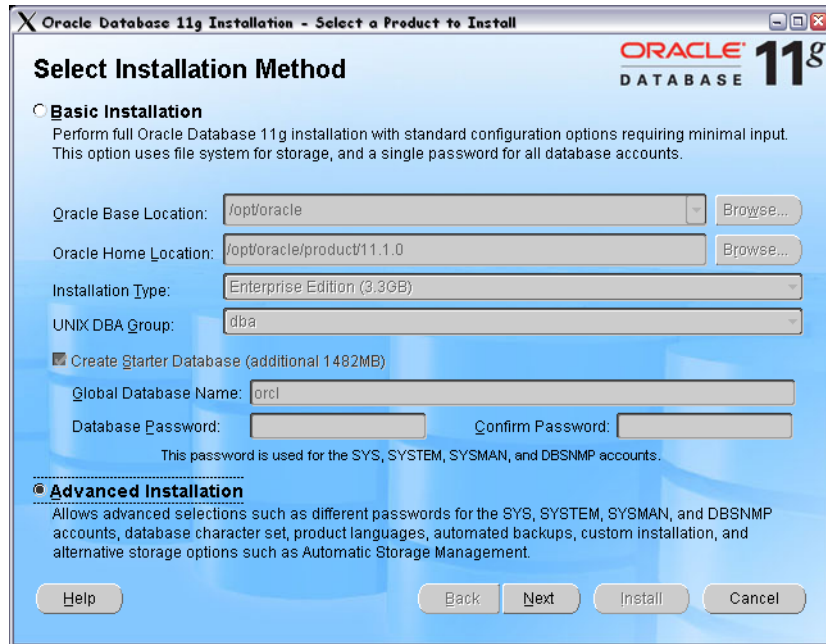
NOTE

It is recommended that you copy the contents of installation media to a hard disk.

3. As the `oracle` user, start the Oracle Universal Installer by entering the full path of the database directory on the installation media, which must be followed by the command:

```
./runInstaller
```

When the Oracle Universal Installer is started, the Select Installation Method window opens.



Select the **Advanced Installation** check box, and then click **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.

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

The Select Installation Type window appears.

5. In the Select Installation Type window, select **Enterprise Edition** or **Standard Edition** check box according to your needs or your Oracle licence agreement, and click **Next**.

The Install Location window opens.

NOTE

If you will be running a non-English HP Operations management server, you can add languages by clicking the **Product Languages...** button, and selecting languages from the list. The default language is English.

6. If you set all Oracle variables properly, click **Next** in the Install Location window.

The Product-Specific Prerequisite Checks window appears.

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

NOTE

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

The Select Configuration Option window opens.

8. In the Select Configuration Option window, select the **Install Software Only** check box, and then click **Next**.

The Privileged Operating System Groups window appears.

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

The Summary window opens.

10. In the Summary window, click **Install** to start the installation.

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

- a. Open a terminal window.
- b. Log on as the `root` user.
- c. Run the following two scripts:

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

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

The following should be displayed for `${ORACLE_HOME}/root.sh`:

```
The following environment variables are set as:  
ORACLE_OWNER=oracle  
ORACLE_HOME=/opt/oracle/product/<version>
```

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

Use the default values.

The following should be displayed for

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

```
Changing permissions of /opt/oracle/oraInventory to 770.  
Changing groupname of /opt/oracle/oraInventory to  
oinstall.
```

```
The execution of the script is complete.
```

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

The End of Installation window opens.

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

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

13. If you use the Oracle Database Release 1, install 11.1.0.7 Patch Set or later for the Oracle Database Server for Sun SPARC Solaris. For detailed information about installing the Patch Set for the Oracle Database Server, see the Oracle product documentation.
14. If you use the Oracle Database Release 2, consider that starting with relational database management system (RDBMS) 11g R2, Oracle no longer provides the `libclntsh.so` and `libnnz11.so` 32-bit client libraries together with the 64-bit versions of their database server or the client. HPOM 9.xx on HP-UX 11i v3 and HPOM 9.xx on Sun Solaris 10 are built as 32-bit applications, so these libraries are needed for the proper operation.

To obtain the `libclntsh.so` and `libnnz11.so` libraries, follow these steps:

- a. Download the Oracle 11g R2 32-bit database client from the Oracle download page, and then uncompress it.
- b. Set `umask` to allow users to access the Oracle binaries:

```
umask 022
```

- c. Create the `lib32` subdirectory in the `ORACLE_HOME` directory by running the following command:

```
mkdir -p /opt/oracle/product/11.2.0/lib32
```

- d. Assign permissions to the `lib32/` subdirectory by running the following commands:

```
chown oracle:oinstall \  
/opt/oracle/product/11.2.0/lib32  
chmod 755 /opt/oracle/product/11.2.0/lib32
```

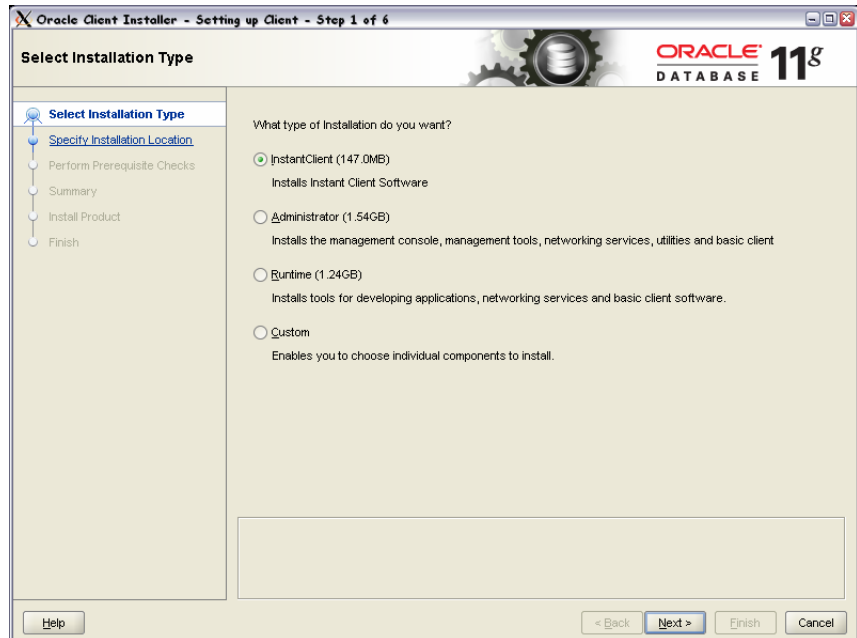
- e. Create a new Oracle home directory, for example:

```
mkdir -p /opt/oracle/product/11.2.0-32
```

- f. Assign permissions to the new Oracle home directory by running the following commands:

```
chown oracle:oinstall /opt/oracle/product/11.2.0-32  
chmod 755 /opt/oracle/product/11.2.0-32
```

- g. As the oracle user, export `ORACLE_HOME=<new_oracle_home>`, and then run the Oracle Universal Installer. During the Oracle client installation, in the Select Installation Type window, select **Instant Client**.



- h. When the installation is finished, copy the `libclntsh.so.11.1` and `libnnz11.so` from the newly created `ORACLE_HOME` directory to the `lib32` subdirectory in the old `ORACLE_HOME` directory.

Run the following commands:

```
cp /opt/oracle/product/11.2.0-32/libclntsh.so.11.1 \
/opt/oracle/product/11.2.0/lib32/
```

```
cp /opt/oracle/product/11.2.0-32/libnnz11.so \
/opt/oracle/product/11.2.0/lib32/
```

- i. Navigate to the `lib32` subdirectory of the old `ORACLE_HOME` directory by running the following command:

```
cd /opt/oracle/product/11.2.0/lib32/
```

- j. In the `lib32` subdirectory of the old `ORACLE_HOME` directory, create the following links:


```
ln -s libclntsh.so.11.1 libclntsh.so
```

```
ln -s libclntsh.so.11.1 libclntsh.so.10.1
```

The new file structure of the old ORACLE_HOME\lib32 directory must be the following:

```
lrwxr-xr-x libclntsh.so -> libclntsh.so.11.1
```

```
lrwxr-xr-x libclntsh.so.10.1 -> libclntsh.so.11.1
```

```
-rwxr-xr-x libclntsh.so.11.1
```

```
-rwxr-xr-x libnnz11.so
```

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`.

NOTE

Sun Solaris 10 are supported with HPOM 9.xx.

For recent updates, see the support matrix at the following location:

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

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.”

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

Notice that the `ovoconfigure` script prompts you for the following pieces of information:

- ORACLE_BASE value
- ORACLE_HOME value
- Destination for Oracle data files and index files
- Database language
- Passwords for the `opc_op` and `opc_report` database users
- Password for the existing database user `system`
- Oracle DBA user
- ORACLE_SID value
- Oracle Listener Name
- Oracle Listener Port
- Oracle Net Service Name

Usage of the `ovoinstall` and `ovoconfigure` Scripts

This section contains the description of the `ovoinstall` and `ovoconfigure` scripts as well as the options that can be used with these scripts. For detailed information about the installation and configuration steps, see “Installing and Configuring the HPOM Software on the Management Server” on page 72.

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

The `ovoinstall` script does the following:

- ❑ Collects all information required for the installation and the configuration of the HPOM software.
- ❑ Checks for installed operating system patches and lists patches that must be installed.
- ❑ Checks kernel parameters and disk space requirements.
- ❑ Installs the HPOM software on your management server system.

The syntax of the `ovoinstall` script is the following:

```
ovoinstall [-pkgdir <package dir>] [-defaults <defaults file>]
           [-no_clear_display] [-u|-unattended] [-check]
```

The `ovoconfigure` script does the following:

- ❑ Creates the `openview` database and configures the HPOM software.
- ❑ Installs the local agent (if enabled) and deploys the agent configuration to the local agent.
- ❑ Starts the HPOM processes.

The syntax of the `ovoconfigure` script is the following:

```
ovoconfigure [-pkgdir <package dir>] [-defaults <defaults file>]
             [-no_clear_display] [-u|-unattended]
             [-check [kernel|ram|swap|free_space|patches|
                    software|process|files ]]
```

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

<code>-pkgdir <package dir></code>	Enables you to specify an alternative location for HPOM packages.
--	---

<code>-defaults <defaults file></code>	Enables you to specify an alternative file that contains 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.

Running ovoidinstall

Before running `ovoidinstall`, verify whether you are using Network Information Services (NIS or 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 are using NIS or NIS+, keep the following in mind before running the `ovoidinstall` installation script:

- ❑ Make sure that, if the `opc_op` user already exists in the NIS or NIS+ environment, it belongs to the `opcgrp` group. If it does not exist, the `opc_op` user will be created by the `ovoidinstall` script during the HPOM installation.
- ❑ Make sure that the home directories of the `opc_op` and `oracle` users are accessible on the HP Operations management server, and that they are the same as on the NIS or NIS+ server.

If you are not using NIS or NIS+ for user or group management, `ovoidinstall` automatically sets up both groups and users.

You can install the HPOM software on the management server in one of the following ways:

- ❑ **From a DVD-ROM**

See “Preparing for the HPOM Software Installation and Configuration from a DVD-ROM” on page 70.

- ❑ **Using DVD Content**

See “Preparing for the HPOM Software Installation and Configuration Using DVD Content” on page 70.

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, follow these steps:

1. Insert the HPOM server installation DVD into the DVD-ROM drive.

NOTE

On most Solaris systems, the disk is mounted automatically when you insert it into the disk drive. If the disk is not mounted automatically, follow step 2 to mount it.

2. Create a directory to mount the DVD-ROM:

```
mkdir /<mount_point>
```

Example:

```
mkdir /dvdrom
```

3. Mount the DVD-ROM:

```
mount -r -F cdfs /dev/<dvdrom_drive_name> /<mount_point>
```

For example, for a local DVD-ROM, you can enter:

```
mount -r -F cdfs /dev/dsk/c0t2d0 /dvdrom
```

NOTE

To install the HPOM software in a non-global zone, you must add read-only access to DVD media in the non-global zone.

You can find step-by-step instructions on how to add access to DVD media in a non-global zone at the following location:

<http://docs.sun.com/app/docs/doc/817-1592/gauck?a=view>

Preparing for the HPOM Software Installation and Configuration Using DVD Content

To prepare for the HPOM software installation and configuration using DVD content, follow these steps:

1. Create a master directory to serve as a holder for the disk subdirectory. It can be, for example, the `/tmp` directory.
2. Create the `HPOMDVD` directory as a subdirectory of the master directory.
3. Store the content of the HPOM installation DVD in this directory.

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 each configuration step (see Table 2-1).

Table 2-1 Installation Procedure Options

Options	Description
back	Enables you to return to the previous step.
exit	Enables you to stop the procedure.
y n ^a	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. This option is not available with all procedure steps.

To install and configure the HPOM software on the management server, complete the following 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 48.

To check the setting, enter:

```
echo $LANG
```


3. Start the HPOM installation:

- If you are installing HPOM from a DVD-ROM, enter the following:

```
/<mount_point>/ovoinstall
```

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

- If you are installing HPOM using DVD content, enter the following:

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

For example, if you created the */tmp* directory as a master directory, you can start *ovoinstall* by entering the following:

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

The following text appears:

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

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.

4. Do one of the following:

- Press **Enter** to accept the default repository location.
- Enter the desired location.

The *ovoinstall* script checks and installs the server setup package, which contains the server installation infrastructure.

Press **Enter** to continue with checking the system.

5. *ovoinstall* checks the following during the system check:

- 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, you can enter **back** and repeat the whole process of checking the system, **exit** to cancel the installation, or **?** to gain more information.

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

After the system check returns all `OK` values, press **Enter** to continue.

`ovoinstall` then checks the core component packages, server packages, and agent packages before starting the package installation.

6. After all packages are checked, press **Enter** to continue with the package installation.

NOTE

If any of the required packages fails to be installed, enter **back** and reinstall it.

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

The `ovoinstall` script then asks you whether you want to continue with the server software configuration.

NOTE

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

7. If you decide to continue with the server software configuration, press **Enter**. The `ovoconfigure` script is started automatically and the following text appears:

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

Press **Enter** to continue with checking the system. For system check details, see step 5.

NOTE

If a specific system check is skipped, it means that it is already checked and is OK.

The `ovoconfigure` script continues with detecting special environments.

8. When the detection procedure finishes, you must either accept the default settings or customize the following parameters:

- Certificate backup password

Determine the password used for certificate backup as well as for certificate restore.

- Configure HP Performance Manager

Accept or decline whether the HP Performance Manager is to be configured during the server configuration. The default is `no`.

If you answer **yes**, the following appears:

```
HP Performance Manager node (<nodename>:<port>)
[exit,back,?, ""] ?
```

Specify the network node and the port of the HP Performance Manager.

If you choose not to configure the HP Performance Manager during the HP Operations server configuration, press **Enter** to continue.

NOTE

The HP Performance Manager can also be configured after the server configuration.

The summary of all provided answers appears. To correct any value, type **back**, and set the value to match the required value. After you check the data, press **Enter** to continue.

The ovoconfigure script continues as follows:

- Adds the `opc_op` user.
- Creates the Instant-On license.
- Sets the embedded licensing configuration.

9. If adding the `opc_op` user, creating the Instant-On license, or setting the embedded licensing configuration fails to be executed, you can enter **back** and execute it once again, or **exit** to cancel the configuration.

Press **Enter** to continue.

10. Continue by answering the following questions related to the database configuration:

- Configure the database?

The default value is yes.

- Enable automatic database startup?

The default value is yes.

- Clear and re-initialize the tables if already exist?

The default value is yes.

- Set up the database manually (local/remote)?

The default value is no.

This question allows you to choose how to create the database, locally or remotely.

If your answer is **yes**, the ovoconfigure script pauses instead of creating the database, allowing you to manually create the database and configure it by entering **opcdbsetup -p** in another window.

If your answer is **no**, the following question appears:

Configure the database automatically for remote login?

The default answer to this question is yes. If you choose the default answer, the database installation program creates an Oracle password file and gives proper rights to the `SYSTEM`

database user so that the Oracle Remote Manager (RMAN) can access the database during the execution of backup or restore scripts.

If you answer **no** to this question, you can grant these permissions manually later on.

For detailed information about backing up data on the management server, see the *HPOM Administrator's Reference*.

After you answer all the questions related to the database configuration, `ovoconfigure` continues with the Oracle Database-related prompts that are the following:

Oracle Base

The Oracle Database base directory, which is usually the same as the `ORACLE_BASE` variable. The default is `/opt/oracle`.

Oracle Home

The Oracle Database home directory, which is usually the same as the `ORACLE_HOME` variable. The default is `/opt/oracle/product/11.1.0`.

Oracle User

The Oracle user for the HP Operations server database. The default is `oracle`.

Oracle SID

The Oracle SID of the HP Operations server database. The default is `openview`.

NOTE

The `ovoinstall` script will use this value also as the database name if it was 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 server database files are stored (for example, `/opt/oracle/oradata`).

Oracle Index Directory

The directory where the HP Operations server database index files are stored. By default, it is the same as the Oracle data directory.

- Oracle User `opc_op` Password
- Oracle User `opc_report` Password
- Oracle User `system` Password
- Database Character Set (NLS_LANG)

Enter the desired NLS_LANG value in the `<lang>_<region>.AL32UTF8` form. The default value is `american_america.AL32UTF8`.

- Oracle Listener Name

The default is `LISTENER`.

- Oracle Listener Port

The default is `1521`.

- Oracle Net Service Name

The default is `ov_net`.

NOTE

The default value, which is one of the possible options, is displayed after each individual prompt. For more information about installation procedure options, see Table 2-1 on page 72.

When the settings are specified, `ovoconfigure` checks the database configuration data, and the summary of all provided answers appears. To correct any value, enter `back`, and set the value to match the required value.

Check the data, and press **Enter** to continue. The following output should be displayed:

```
Database configuration . . . . .
```

The result of the database configuration, which appears after some time, should be `OK`. If the database configuration fails, enter **back**, and repeat the procedure.

NOTE

The whole 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.

After the database configuration is successfully finished, the server initialization starts.

IMPORTANT

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

- | | |
|---------------|--|
| back | If you enter <code>back</code> , you are asked all the questions related to the database configuration once again. |
| repeat | If you enter <code>repeat</code> , the answers you provided for the database configuration are reused. |

When you enter `back` or `repeat`, you *may be* asked the following two questions:

- Do you want to clear DB tables?

Answer `y` if you want to clear all the tables, but not to drop the whole database, before repeating the database configuration.

- Do you want to completely drop the DB?

Answer `y` if you want to completely drop the database and reconfigure it again.

If you answer `n` to both the above questions, the database is unaffected, and the manual repair is needed.

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

During the server initialization, `ovoconfigure` performs the integration into the start-stop sequence and checks the required disk space.

11. Press **Enter** to continue.

The `ovoconfigure` script starts the server final configuration, which consists of the following steps:

- Management server policy group assignment
- Configuring subagents
- Java GUI configuration
- Web server configuration
- Backup certificates
- Starting server
- Installing local agent
- Distributing configuration to the local agent
- Installing server add-ons

12. Press **Enter** to install the server add-on packages.

13. After installing the HPOM software on the management server, you can check whether the installation was successful. For more information, see “Starting HPOM and Verifying the Installation” on page 82.

14. When the installation and configuration are completed, unmount the DVD-ROM drive by entering:

```
umount /<mount_point>
```

15. Make the HPOM manual pages available for users.

Add the `opt/OV/man` directory to the `MANPATH` environment variable by entering:

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

```
export MANPATH
```

NOTE

The `MANPATH` environment variable *must* be set either for the current user by the user in `.profile`, or for all users by the system administrator in `/etc/profile`.

Viewing the Installation Log Files

When `ovoinstall` finishes installing the HPOM software, verify that 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 enter:

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

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

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 should be displayed:

```
OM Control Management Server status:
```

```
-----
```

```
OMU Action Manager opcactm (13577) is running
OMU BBC Config Adapter opcbbcdist (13960) is running
OMU Cert. Server Adapter opccsad (13944) is running
OMU Display Manager opcdispn (13523) is running
OMU TT & Notify Manager opcttnsm (13908) is running
OMU Forward Manager opcforwm (13926) is running
OMU Message Manager opcmmsgm (13886) is running
OMU Message Receiver (HTTPS) opcmsgrb (13557) is running
OMU Service Engine opcsvcm (13995) is running
OMU Request Sender ovoareqsdr (13541) is running
OMU Service Discovery Server opcsvcdisc (14047) is running
OMU HTTPS Communication Proxy opcuihttps (14063) is running
```

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

```
-----
```

```
OV Control ovcd (13504) is running
OV Communication Broker ovbbccb (13505) is running
OV Certificate Server ovcs (13506) is running
```

If the HP Operations 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 entering the following command:

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

An output similar to the following should be displayed:

OVO Managed Node status:

opcmsga	OVO Message Agent	AGENT, EA	(18525)	Running
opcacta	OVO Action Agent	AGENT, EA	(18526)	Running
opcmsgi	OVO Message Interceptor	AGENT, EA	(18527)	Running
opcple	OVO Logfile Encapsulator	AGENT, EA	(18528)	Running
opcmona	OVO Monitor Agent	AGENT, EA	(18529)	Running
opctrapi	OVO SNMP Trap Interceptor	AGENT, EA	(18530)	Running

NOTE

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 as user `root` by entering:

```
/opt/OV/bin/OpC/utlils/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. To be able to test and use an application configured as Window (Input/Output) from the HPOM User's Assigned Applications window, you will probably have to complete one of the following tasks:

- ❑ As the `root` user, set the UNIX password for the default operator `opc_op` for each managed node where you want to use Input/Output applications.

To do this, enter:

```
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 the executing user `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, as 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, as it can represent a security risk.

After You Install HPOM

After you complete the installation of HPOM, decide whether you need to create additional Oracle Database users.

During the initial configuration setup, Oracle creates the default users `sys`, `system`, `outln`, and `dbstmp`, 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 password of these Oracle users with the Oracle tool, SQL*Plus.

Example:

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

Reconfiguring the HPOM Software

If you want to reconfigure the HPOM software, you *must* 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 122.

To reconfigure the HPOM software, follow these steps:

1. Make sure that the NLS language variable (`NLS_LANG`) is set correctly by entering:

```
export NLS_LANG=american_america.AL32UTF8
```

2. 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 48.

To check the setting, enter:

```
echo $LANG
```

3. Export all Oracle environment variables.

For instructions, see “Before You Install an Oracle Database” on page 53.

NOTE

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

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

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

Respond to the questions as they are displayed.

The configuration utility asks whether you want to configure your database automatically:

- ❑ Type **y** (yes) to configure your database automatically. This is the recommended method. You are prompted to enter the Oracle system user password.
- ❑ Type **n** (no) if you configured your database on an independent database server.

NOTE

If you want to use an independent 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 122.

If you choose **y**, the configuration continues with the following prompts:

- a. Enter the password of the Oracle Database user `system`.

Do one of the following:

- If you do not have a configured database, press **Enter** for HPOM to create the database and the user `system`.
 - If you want HPOM to use an existing database, enter the password of the Oracle Database user `system`.
- b. You are asked to enter the password for the Oracle Database user `opc_op`.

NOTE

The `opc_op` database user is independent of the operating system user `opc_op`, and the HPOM user `opc_op`.

Enter a password of your choice.

If you need to change this password at a later date, use the `opcdbpwd` command.

CAUTION

Do not change the password in the database directly. HPOM stores the password in an encrypted file. If the password in the database is different from the password in the encrypted file, HPOM *cannot* connect to the database.

- c. You are asked to enter the password for the Oracle Database user `opc_report`.

NOTE

The database user `opc_report` is required for read-only access to the database for report-writing tools.

Enter a password of your choice. This password is not used by HPOM itself. You can change it directly in Oracle at a later time. When changing this password, you also need to change the password in your reporting solution.

- d. You are asked whether you require the automatic startup of the database at the system boot time.

Accept the default: **Yes**

- e. You are asked to choose a data directory for the system table space, the control files, the redo log files, and the HPOM data table spaces.
- f. You are asked to choose an index directory for the HPOM index table spaces.
- g. The database setup utility uses the answers you give to create and configure the database, which can take some time.

The utility performs the following configuration steps:

- Creates and configures the Oracle Database.
- Creates HPOM table spaces and users.
- Creates HPOM tables.
- Loads the initial HPOM configuration into the database.
- Configures Net and starts the Net listener.

The utility then does the following:

- Configures the agent on the management server.
- Configures the web server.
- Verifies the installed HP Operations platform by starting the HP Operations server processes.

3 **Installing the Java Operator GUI**

In This Chapter

This chapter describes how to do the following:

- ❑ Install the HP Operations Manager (HPOM) Java operator graphical user interface (GUI).
- ❑ Configure a web server to use customized icons and background graphics.
- ❑ Access the online documentation.

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

Supported Platforms

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

NOTE

On all operating system platforms not listed in the following table, you run the HPOM Java GUI at your own risk.

Table 3-1

Supported Platforms of the HPOM Java GUI Client

Supported Platforms	Java Application	Java Applet ^a
HP-UX 11i v3 on HP Integrity	yes	yes
Mac OS 10.4 R6 or higher	yes	yes
Red Hat Linux 9.0	yes	yes
Solaris 10 for Sun SPARC Station	yes	yes
Windows 2000 Windows XP Windows 2003 Windows Vista Windows 7	yes	yes

a. For a list of supported web browsers, see “Supported Web Browsers” on page 96.

CAUTION

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

Supported Languages

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

Table 3-2 Supported Languages of the HPOM Java GUI Client

Supported Platforms	Language
HP-UX 11i v3 on HP Integrity	English Spanish Japanese Korean Simplified Chinese
Mac OS 10.4 R6 or higher	English Spanish Japanese Korean Simplified Chinese
Red Hat Linux 9.0	English Spanish Japanese Korean Simplified Chinese
Solaris 10 for Sun SPARC Station	English Spanish Japanese Korean Simplified Chinese

Table 3-2 Supported Languages of the HPOM Java GUI Client (Continued)

Supported Platforms	Language
Windows 2000	English
Windows XP	Spanish
Windows 2003	Japanese
Windows Vista	Korean
Windows 7	Simplified Chinese

NOTE

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

For example, to start a Spanish Java GUI, select **Spain (Spanish)** in the logon window.

Installation Requirements

This section describes the hardware and software requirements for installing the HPOM Java Operator GUI. It also describes the recommended patches and 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 a Pentium-based personal computer (PC) with at least 500 Mhz, a minimum of 256 MB RAM, and additional 30MB RAM per GUI session.

Software Requirements

In general, Java Runtime Environment (JRE), version 1.6.0.12 or higher *must* be installed on the system where the HPOM Java GUI will be installed and running.

For the platforms listed in Table 3-3, the required versions of JRE are included in the HPOM Java GUI installation directory on the management server:

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

Table 3-3 Bundled JRE Versions

Platform	JRE Version	File name
Windows 2000/XP/2003/Vista/7	1.6.0.12	ITO_JAVA.exe

NOTE

HPOM delivers JRE 1.6.0.12 only for Windows as a part of the install shield package.

If you want to use the Java GUI on any other operating system, including the HP Operations management server, you must download JRE 1.6.0.12 by yourself. You must also set the `JAVA_DIR` environment variable before using the following script to start the Java GUI:

```
/opt/OV/bin/OpC/ito_op
```

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 Java SE Runtime Environment 6 (JRE 1.6.0 or higher)

Supported Web Browsers

If you want to run the HPOM 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 Windows:
 - Microsoft Internet Explorer 5.5, 6, 7, or 8
 - Mozilla 1.7
- ❑ HP-UX 11i, Sun Solaris, Red Hat Enterprise Linux, and Mac OS:
 - Mozilla 1.7

NOTE

The external browser is the default browser on UNIX, while the default browser on Windows is ActiveX.

Installing the HPOM Java Operator GUI

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

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

Installation Requirements

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

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

Note that the `maxfiles` kernel parameter needs to be adjusted to ensure good performance.

- ❑ HPOM software for the management server is installed.
- ❑ JRE 1.6.0.12 *must* be installed on the system where the HPOM Java GUI will be installed and running. See also Table 3-3 on page 95.

The HPOM installation automatically installs and configures a Tomcat Web server on the management server.

Installing HPOM Java GUI Through HTTP

To install HPOM through HyperText Transfer Protocol (HTTP), follow these steps:

1. Make sure that all the prerequisites are met as described in “Installation Requirements” on page 94.
2. Make sure that an HTTP server is installed and running.

If you are using the HPOM Tomcat server, make sure the `ovtomcatB` process is running. To check whether the `ovtomcatB` process is running, enter the following:

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

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

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

3. 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.

4. Follow the instructions given on the web page:
 - If you are running the Java GUI on a PC running Microsoft Windows, download and execute the `ITO_JAVA.exe` file.
 - If you are running the Java GUI on a UNIX-based system, download and untar the `ito_op_install.tar` file. Make sure that you have JRE for your platform installed. The recommended version of JRE is 1.6.0.12 or higher.

Installing HPOM Java GUI Through FTP

To install HPOM through File Transfer Protocol (FTP), follow these steps:

1. Make sure that all the prerequisites are met as described in “Installation Requirements” on page 94.

The HP Operations management server installation automatically installs the GUI client binaries in the following directory on the management server:

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

2. Transferring the files through FTP:
 - a. Start the MS-DOS command prompt or a terminal window on the system where the GUI will be installed.
 - b. Open an FTP connection to the HP Operations management server by entering:

```
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 entering:
bin
- d. Change to the directory where the GUI software is located by entering:

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

Retrieve the Java GUI executable.

- For a PC-based system, enter:
get ITO_JAVA.exe
- For a UNIX-based system, enter:

```
get ito_op_install.tar
```

For UNIX-based systems, you *must* download platform-specific JREs from their websites. The recommended version of JRE is 1.6.0.12 or higher.

Close the FTP connection when the files are transferred successfully.

3. Extract the software from the files, enter:

- PC-based system:

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

This starts the installation wizard that guides you through the installation.

- UNIX-based system:

```
tar xvf ito_op_install.tar
```

Installing HPOM Java GUI on Sun Solaris Systems Other than HP Operations Management Servers

On Sun Solaris systems other than HP Operations management servers, use the `pkgadd` utility to install the Java GUI client.

To install HPOM Java GUI on Sun Solaris systems with `pkgadd`, follow these steps:

1. Ensure that all the prerequisites are met as described in “Installation Requirements” on page 94.
2. Enter the commands as stated below:
 - a. For all languages, first enter the following command:

```
pkgadd -d \  
/<mount_point>/packages/HPOvOUWwwGui.sparc \  
HPOvOUWwwGui
```

- b. For each language respectively, enter the following command:

- *English*

```
pkgadd -d \  
/<mount_point>/packages/HPOvOUWwwEng.sparc \  
HPOvOUWwwEng
```

- *Spanish*

```
pkgadd -d \  
/<mount_point>/packages/HPOvOUWwwSpa.sparc \  
HPOvOUWwwSpa
```

- *Japanese*

```
pkgadd -d \  
/<mount_point>/packages/HPOvOUWwwJpn.sparc \  
HPOvOUWwwJpn
```

- *Korean*

```
pkgadd -d \  
/<mount_point>/packages/HPOvOUWwwKor.sparc \  
HPOvOUWwwKor
```

- *Simplified Chinese*

```
pkgadd -d \  
/<mount_point>/packages/HPOvOUWwwSch.sparc \  
HPOvOUWwwSch
```

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

Installing Service Navigator

To ensure that the Service Navigator is properly installed on your management server system, perform the following:

❑ **Adapt kernel parameters**

The `max_thread_proc` kernel parameter must be set appropriately. See “Determining the size of `max_thread_proc`” on page 103.

❑ **Install HPOM**

For detailed information about installing HPOM, see Chapter 2, “Installing and Configuring HPOM on the Management Server.”

IMPORTANT

Service Navigator is installed automatically during the installation of HPOM 9.xx management server.

❑ **Install the Java-based Operator GUI**

For detailed information about installing the Java operator GUI, see “Installing the Java Operator GUI” on page 89.

NOTE

For more information about upgrading to the current version of Service Navigator, see “Upgrading Service Navigator” on page 255.

Determining the size of `max_thread_proc`

The `max_thread_proc` kernel parameter determines the maximum number of threads allowed in each process. By default, HPOM and Service Navigator require this parameter to be set to 1024. This value is a result of the following formula and is sufficient for standard HPOM and Service Navigator environments. For larger environments, use the following formula as a guideline for increasing this value.

$$\text{threads} = \quad [NumberOfGUIs * 2] + \\ \quad \quad \quad [NumberOfAPIClients] +$$

$$[\text{Numberofopcservice}] + x + 9$$

x = 1 (if service logging is enabled)

x = 0 (if service logging is disabled)

where:

NumberOfGUIs =

Number of running Service Navigator GUIs.

NumberofAPIClients =

If using the APIs of the Developer's Toolkit:
 Number of API clients.

Numberofopcservice =

Number of concurrent opcservice commands.
 opcservice uses internally the APIs of the Developer's Toolkit. Therefore, the number of concurrent opcservice commands that may run at any time must be added to calculate the value for max_thread_proc.

Service Navigator Product Bundles

The Service Navigator principle bundle is a hierarchical structure made up of associated bundles, products, and filesets.

Table 3-4 Service Navigator Software Bundles

Product	Fileset	Product
HPOvOUser	HPOVOUSVCENG	Service Navigator Localized Files - English
	HPOVOUSVCJPNa	Service Navigator Localized Files - Japanese
	HPOVOUSVCKOR	Service Navigator Localized Files - Korean
	HPOVOUSVCMGR	Service Navigator Manager
	HPOVOUSVCSCH	Service Navigator Localized Files - Simplified Chinese
	HPOVOUSVCSPA	Service Navigator Localized Files - Spanish

Starting the HPOM Java GUI

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

NOTE

To log on to the HPOM GUI for the first time, use default users and passwords. The default logon passwords are the following:

- ❑ 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 at a later time, but you will not be allowed to set the password back to the default.

If you want to access web pages that start Java 2 applets in a workspace, the Java GUI itself *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 107.

Make sure you use the proper `LANG` variable when starting the HPOM 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 PC

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

To start the HPOM Java operator GUI on a PC, 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 HPOM Java GUI starts and displays a logon screen.

2. Enter the HPOM username and password.

NOTE

Username can contain also Unicode characters.

3. Enter the management server hostname.

Starting the Java GUI on a UNIX-based System

To start the HPOM Java operator GUI on a UNIX 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 HPOM Java GUI is now started and displays a logon screen.

3. Enter the HPOM username and password.

NOTE

Username can contain also 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 HPOM Java GUI from a web browser. Simply download the Java applet provided with the GUI client software.

To start the HPOM 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 94.
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.

Starting the Online Documentation

The HTML-based online documentation supplied with the Java GUI is automatically installed on the HP Operations management server. However, before you can access the online help from within HPOM, you *must* configure the HPOM Java GUI to open a web browser at the corresponding URL of the management server.

NOTE

It is recommended that you view the online documentation with Microsoft Internet Explorer (Windows) or Mozilla (UNIX).

You can change your web browser preferences by selecting **Edit->Preferences...** from the menu bar, then clicking the **Web Browser** tab in the Preferences dialog box. For details, see the *HPOM Java GUI Operator's Guide*.

To start the HPOM online documentation, in the HPOM Java GUI, select **Help->Contents** from the menu bar.

The URLs for the online documentation are the following:

```
http://<management_server>:8081/ITO_OP/help/\  
<lang>/ovo/html/index.htm
```

```
https://<management_server>:8444/ITO_OP/help/\  
<lang>/ovo/html/index.htm
```

For example, in these URLs, *<lang>* is *c* for English and *ja* for Japanese.

The online documentation for the Java GUI is displayed. Use the navigation tree in the left pane to find the topics that interest you, or use the index to search for a specific term.

NOTE

You can change the URL for the online documentation in the Preferences dialog box of the HPOM Java GUI. Select **Preferences** from the Edit menu to open this dialog box.

Connecting Through a Firewall

If you want to access the HP Operations management server with the HPOM 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 HPOM Java GUI, you need to 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
- ❑ W3C Jigsaw

This section describes how to configure these web servers for use with the HPOM Java GUI.

Configuring a Netscape Server

To configure Netscape for installing and accessing the HPOM Java GUI, complete the following steps:

1. Select the Netscape 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 Server

To configure a W3C Jigsaw web server for installing and accessing the HPOM Java GUI, complete the following 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 Manual 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 an Oracle Database automatically.
- ❑ Start and stop an Oracle Database manually.
- ❑ Set up HPOM with a remote/manual Oracle 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. Subagent communication processes are handled 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 an Oracle Database Automatically

You can use the HPOM shell script `/etc/init.d/ovoracle` to ensure a clean, automatic startup and shutdown of the Oracle Database whenever you start or shut down the HP Operations management server. If you choose to start the HP Operations management server processes automatically at the system startup, the Oracle Database *must* be running before HPOM.

The following are linked to the `ovoracle` script:

❑ Startup

`/etc/rc3.d/S83ovoracle`

❑ Shutdown

`/etc/rc0.d/K11ovoracle`
`/etc/rc1.d/K11ovoracle`

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

`/etc/rc.config.d/ovoracle`

Change both the `OVORACLE` and `OVORALISTENER` variable 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 an Oracle Database Manually

If you choose not to incorporate the Oracle `startup` and `shutdown` commands in the system boot sequence, you must start and stop the database manually as described in “Starting an Oracle Database Manually” and “Stopping an Oracle Database Manually”. Make sure to start the database before starting HPOM and stop the database after stopping HPOM.

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 shut down 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
```

Native Language Support in an Oracle Database

This section summarizes the Native Language Support (NLS) rules followed by an installed Oracle Database.

NOTE

The same character set *must* be used for both the Oracle Database and the environment of the HPOM user interface and server processes. This helps to avoid unnecessary conversions taking place in the Oracle Database. After you install an Oracle Database, you can no longer change the 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>
```

HPOM uses the following `NLS_LANG` setting:

English language: `american_america.AL32UTF8`

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 a dynamic database table `v$nls_parameters` that contains the settings for the language and character set parameters.

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 an Oracle Database Automatically” on page 116.

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

Alternative Database Locations

The following table shows several alternative database installations, describes the location of associated processes, and lists the entries used in the foundation config component (FCC).

Table 4-1 Alternative Database Locations

Database Scenario	Entries used in the FCC	Location of Processes
Local Database	DATABASE ov_net	All database processes, HP Operations management server processes, and GUI processes run on the management server. They connect to the database server.
Remote/Manual Oracle Database (See “Setting Up HPOM with a Remote/Manual Oracle Database” on page 122.)	DATABASE ov_net	On the database server: <ul style="list-style-type: none"> • Oracle processes On the HP Operations management server: <ul style="list-style-type: none"> • HP Operations server processes • GUI processes

Setting Up HPOM with a Remote/Manual Oracle Database

This section describes how to set up HPOM with a remote/manual Oracle Database. It contains the following information:

- ❑ System requirements for Oracle and HPOM
See “Requirements” on page 122.
- ❑ HPOM system limitations
See “Limitations During the HPOM Runtime” on page 124.
- ❑ Instructions for creating and configuring the database for HPOM
See “Creating and Configuring the HPOM Database” on page 124.
- ❑ Instructions for installing and configuring HPOM with a remote/manual Oracle Database
See “Installing and Configuring HPOM with a Remote/Manual Oracle Database” on page 137.

Requirements

The system requirements are the following:

- ❑ **Oracle Requirements**
Only Oracle 11g is supported at this time. The Oracle Database server and the Oracle Database client (on the HP Operations management server) must be of the same version.

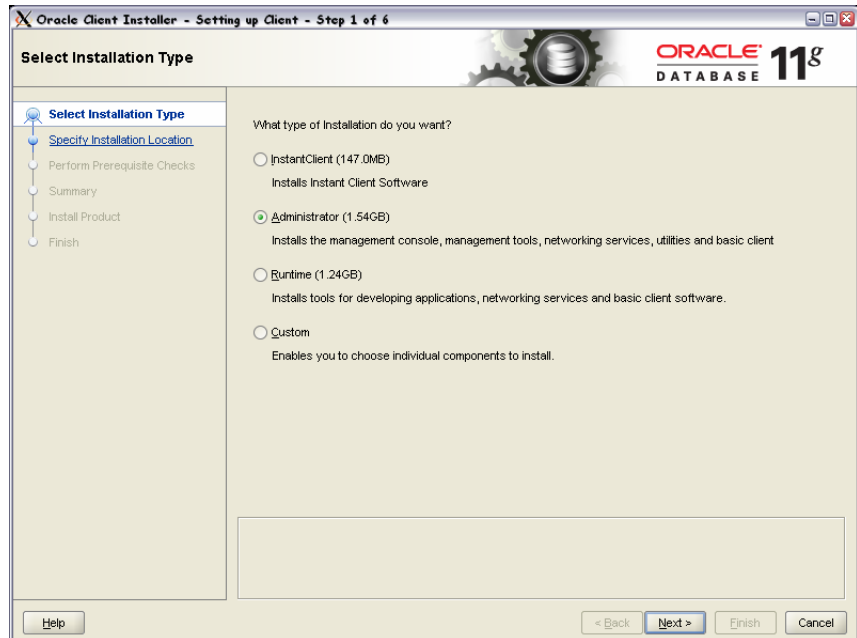
IMPORTANT

If you are using the Oracle Database 11g Release 2, you must install the 32-bit version of the client. The 64-bit version is not supported at the moment.

Some versions of the client may include the 32-bit `libclntsh.so` and `libnnz11.so` libraries inside the `lib/` directory instead of the `lib32/` directory. In this case, create symlink named `lib32` that points to the `lib/` directory.

During the Oracle client installation, select the **Administrator** installation type as shown in Figure 4-1.

Figure 4-1 Select Installation Type Window



The Oracle Database server can be installed on any platform supported by Oracle.

❑ **HPOM Requirements**

HPOM requirements are the following:

- Uses a previously created Oracle Database for HPOM.
- Access to the HPOM database should be configured (Oracle Net Services).

Limitations During the HPOM Runtime

During the HPOM runtime, the following limitations apply:

- ❑ For a previously created Oracle Database setup, the same limitations apply as for a remote/manual Oracle Database setup.
- ❑ Removing the database or dropping the tablespaces by using `opcdbsetup` is not supported. You can remove the database or drop tablespaces manually.

When removing the database manually, remove also the following files from the HP Operations management server when the database is removed:

- `/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 can only run 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 supported.

Creating and Configuring the HPOM Database

Before approaching the HPOM software installation, you must complete the following pre-installation tasks to be able to use a manual/remote Oracle Database:

- ❑ Task 1: “Creating the HPOM Database” on page 124
- ❑ Task 2: “Configuring Access to the HPOM Database” on page 134

Creating the HPOM Database

Creating the HPOM database on the remote database server involves the processes of installing the Oracle Database on the database server as well as the processes of creating and configuring the HPOM database.

NOTE

Before proceeding, verify that your system meets the following Oracle 11g requirements:

- Oracle 11gR1 (with Patch Set 11.1.0.7.0 or higher) or 11gR2
 - Oracle Net Services 11.1.0.7.0 or 11.2.0.1.0
 - SQL * Plus 11.1.0.7.0 or 11.2.0.1.0
-

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`.

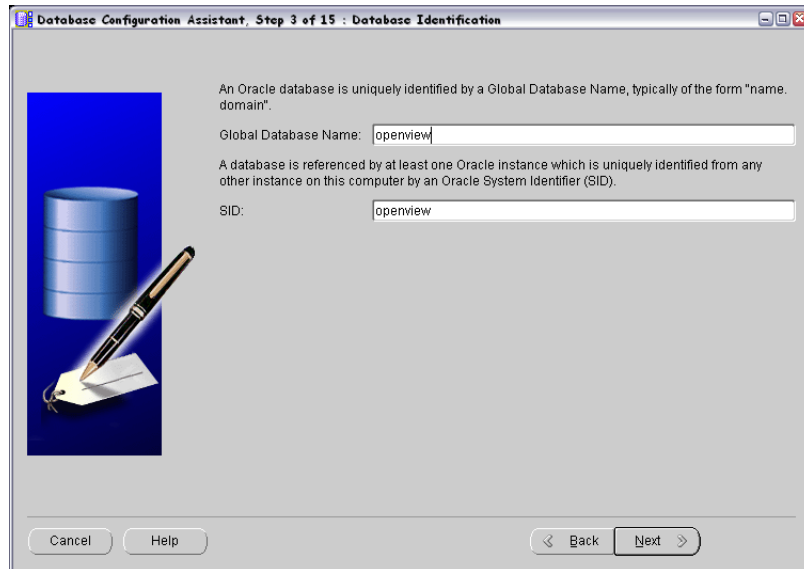
The Welcome window opens.

NOTE

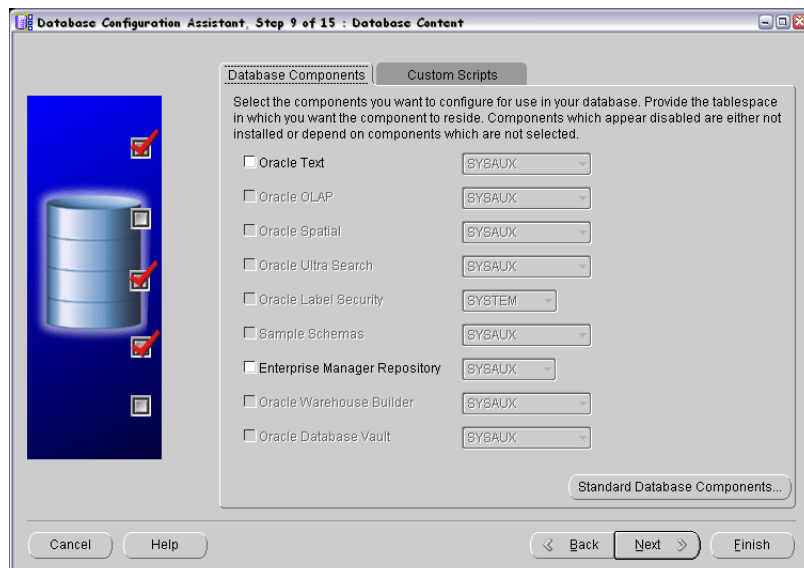
In the process of creating the database by using the Oracle Database Creation Assistant, follow the wizard. Not all steps in the wizard are described in this procedure. In all steps, not described below, leave default values or make custom selections that suit your needs.

2. In the Database Templates window, select the **Custom Database** template in the list, and click **Next**.

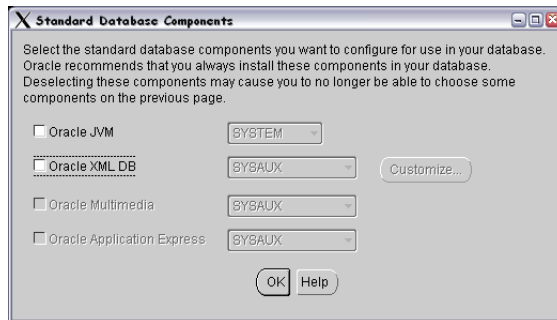
3. In the Database Identification window, enter the global database name and the Oracle System Identifier (for example, enter `openview` for the global database name). Click **Next**.



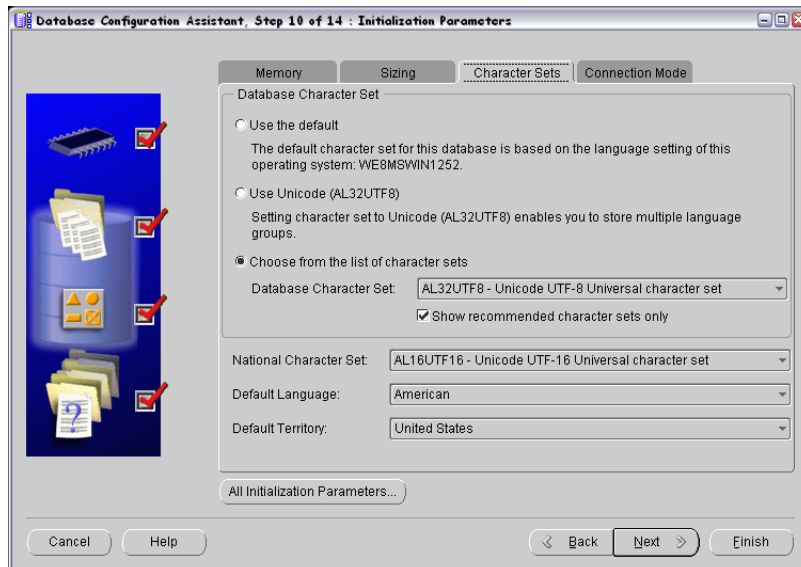
4. In the Database Components tab of the Database Content window, clear all the components.



5. Click **Standard Database Components** in the Database Components window, and then clear all the features. Click **OK**.



6. In the Connection Mode tab of the Initialization Parameters window, select **Dedicated Server Mode**.
7. 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*.

8. Click **All Initialization Parameters**, and then set initialization parameters according to your needs.

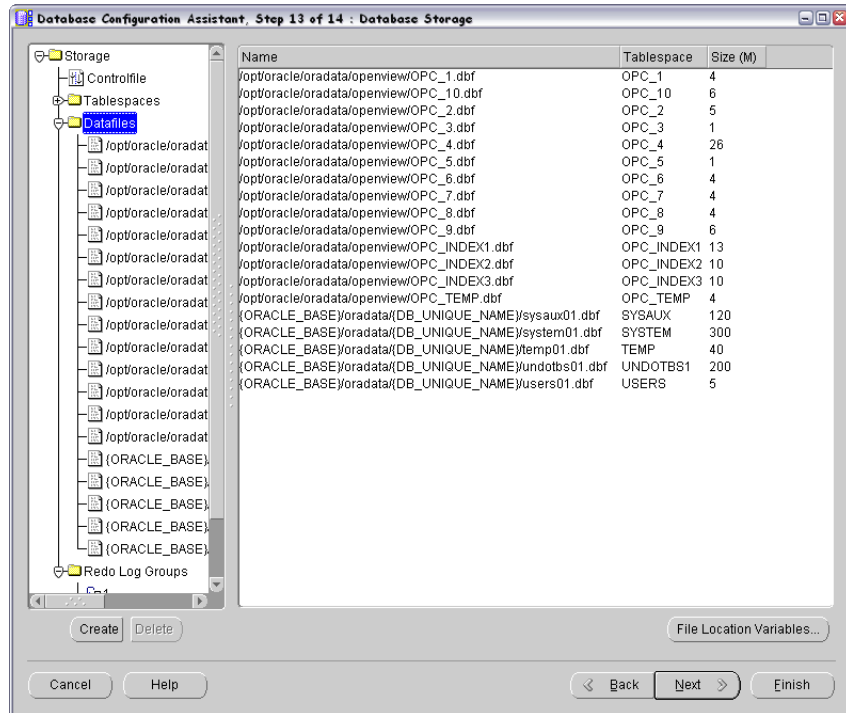
Parameter	Value
db_block_size	16384
diagnostic_dest	<ORACLE_BASE>
db_files	80
db_file_multiblock_read_count	16
memory_target ^a	500M
log_checkpoint_interval	99999
processes	200
dml_locks	100
log_buffer	1572864
max_dump_file_size	10240
open_cursors	1024
sort_area_size	262144
compatible	11.1.0.0.0

- 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`.

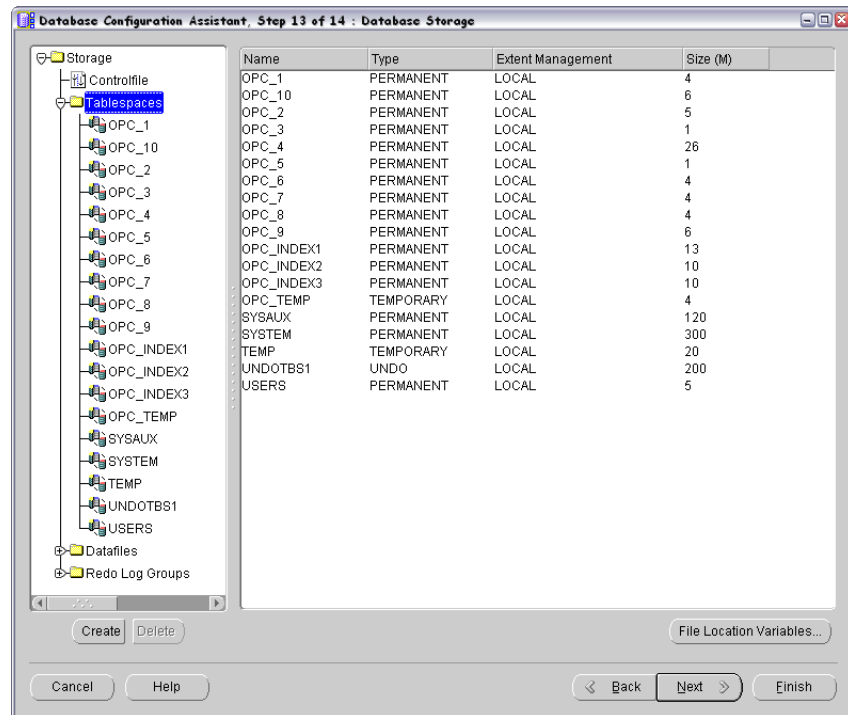
9. Create tablespaces and their datafiles by using the recommended initial sizes. Create the datafiles as autoextend files, so that the datafiles can grow as needed.

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

Autoextend can be enabled in the Datafiles list under the Storage tab.



Set OPC_TEMP as a default temporary tablespace.



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*.

10. Click **Next** to create the database. Select the **Create Database** option, and then click **Finish**.
11. When the database is created, define the passwords for the `system` and `sys` users.

IMPORTANT

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

Configuring Users, Passwords, and Rights Manually

After you successfully create the HPOM database by using the Database Creation Assistant, manually configure users, passwords, and user rights on the database server. 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 (template), 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 only run on the database server. If the HP Operations agent is running on the database server, you can assign the `mondbfile` policy there.

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 the access to the HPOM database, you must set up Net Services on the database server. You can either use Oracle tools to configure the Net Services, or create the Net Services manually. You can choose an Oracle Net alias (HPOM default is `ov_net`). You can specify the used Net Services alias when configuring the HP Operations management server.

Creating Net Services Manually

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 `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 135.

NOTE

The example files described in “Syntax Examples for the .ora Files” on page 135 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 tnsnav.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 72 with regard to the following steps:

1. When the `ovoinstall` script asks you whether you want to continue with the server configuration, leave the `ovoinstall` window open, and in another window, as the `root` user, install the latest HP Operations management server patch.
2. In this same window, type `y`, and then press **Enter** to continue with the server configuration.

When the `ovoconfigure` script asks you whether you want to set up the database manually, leave the `ovoconfigure` window open.

3. In another window, 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. In this same window, 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 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)
```

-
4. 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
```

5. Return to the `ovoconfigure` window. Type **y**, and then press **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`).

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.

This section contains the following information:

- ❑ System requirements for Oracle and HPOM
See "Requirements" on page 139.
- ❑ HPOM system limitations
See "Limitations During the HPOM Runtime" on page 140.
- ❑ Instructions for creating and configuring the database for HPOM
See "Creating and Configuring the HPOM Database" on page 141.
- ❑ Instructions for enabling database access on the HP Operations management server
See "Installing and Configuring HPOM in an RAC Environment" on page 160.

Requirements

The system requirements are the following:

- ❑ **Oracle RAC Requirements**

The Oracle RAC server requirements are described in the Oracle RAC documentation at the following URL:

<http://www.oracle.com/technology/documentation/database.html>

The Oracle Database server and the Oracle Database client (on the HP Operations management server) must be of the same version.

The Oracle Database server can be installed and used with HPOM on any platform supported by the HP Operations management server.

❑ **HPOM Requirements**

HPOM requirements are the following:

- Supported with the HPOM 9.00 management server or later.
- Uses a previously created Oracle Database for HPOM.
- Used in HPOM *only* as an independent database server.
- Access to the HPOM database should be configured (Oracle Net Services).

IMPORTANT

HPOM supports Oracle 11g Release 1 RAC (patch level 11.1.0.7 or later) or Oracle 11g Release 2 RAC (patch level 11.2.0.1).

Limitations During the HPOM Runtime

During the HPOM runtime, the following limitations apply:

- ❑ For a previously created Oracle Database setup, the same limitations apply as for a remote/manual Oracle Database setup.
- ❑ Removing the database or dropping the tablespaces by using `opcdbsetup` is not supported. You can remove the database or drop tablespaces manually.

When removing the database manually, remove also the following files from the HP Operations management server when the database is removed:

- `/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 `opcadddbf` tool is not supported.

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>

Creating and Configuring the HPOM Database

Before approaching the HPOM software installation, you must complete the following pre-installation tasks to be able to use a remote/manual Oracle Database:

- ❑ Task 1: “Creating the HPOM Database” on page 141
- ❑ Task 2: “Configuring Access to the HPOM Database” on page 154

Creating the HPOM Database

Creating the HPOM database on the RAC cluster nodes involves the processes of creating and configuring the HPOM database.

NOTE

Before proceeding, verify that your system meets the following Oracle 11g requirements:

- ❑ Oracle 11g R1 (with Patch Set 11.1.0.7.0 or higher) or Oracle 11g R2
- ❑ Oracle Net Services 11.1.0.7.0 or Oracle Net Services 11.2.0.1.0
- ❑ SQL * Plus 11.1.0.7.0 or SQL * Plus 11.2.0.1.0

Creating and Configuring the HPOM Database on Cluster Nodes

To create and configure the HPOM database on all cluster nodes¹, follow these steps:

1. Database instances can be created automatically or manually on all cluster nodes.

Service Management and Manual Database Configuration
Setting Up HPOM in an Oracle Real Application Clusters (RAC) Environment

1. Log on to the database server as the `oracle` user, and start the Database Configuration Assistant. Run the following command:

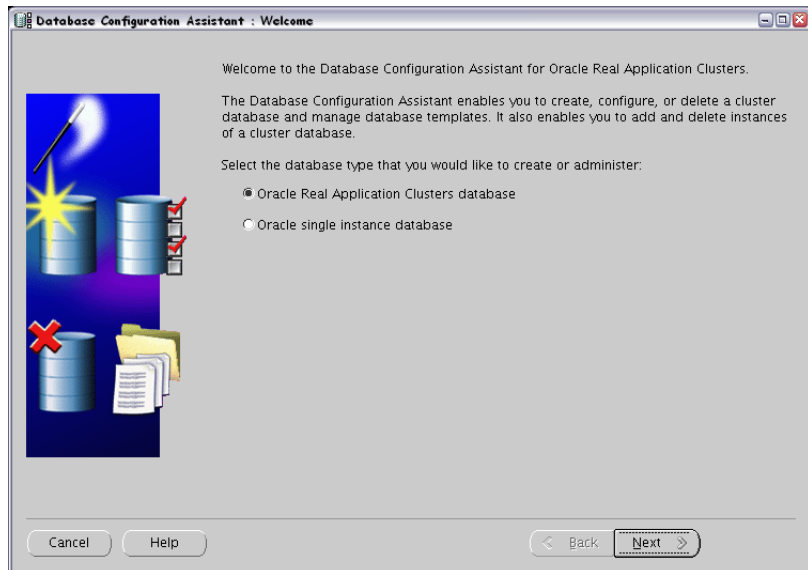
```
$ORACLE_HOME/bin/dbca &
```

The Welcome window opens.

NOTE

In the process of creating the database by using the Oracle Database Creation Assistant, follow the wizard steps. 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 meet your needs (for example, for storage options).

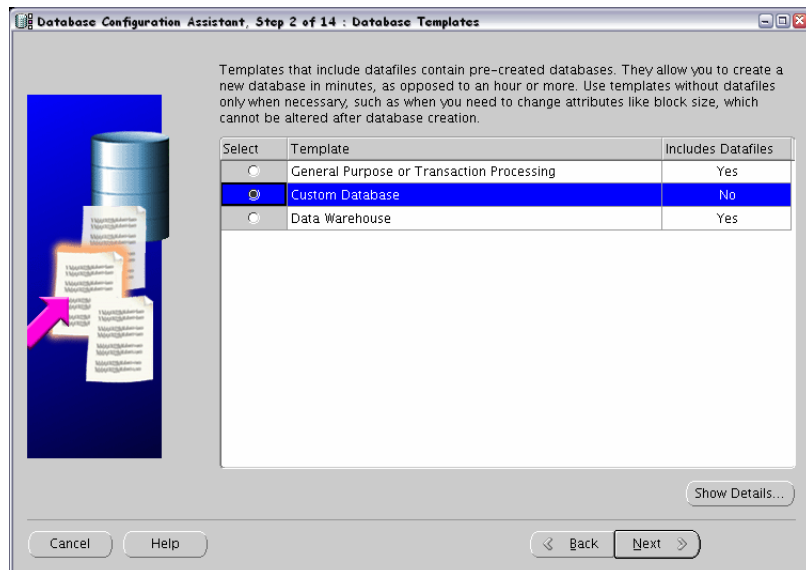
2. In the Welcome window, select **Oracle Real Application Clusters database**, and click **Next**.



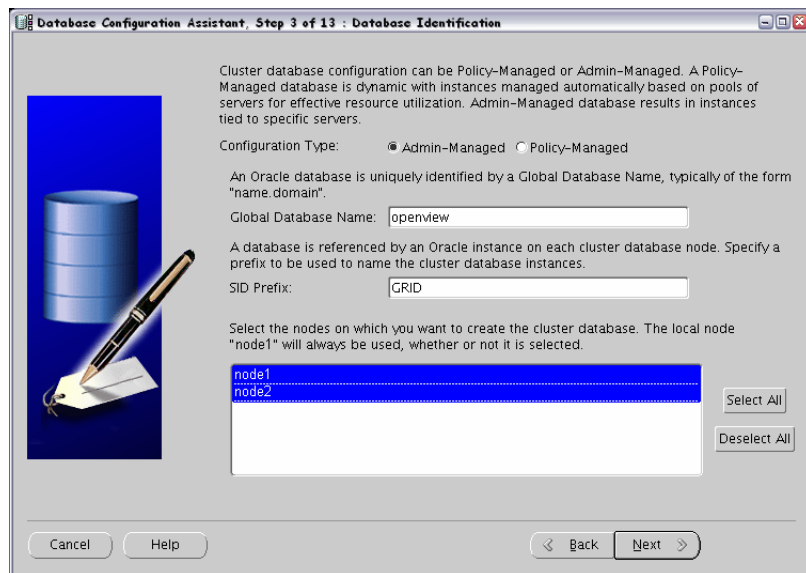
NOTE

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 click **Next**.
5. In the Database Templates window, select the **Custom Database** template, 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, set the password, and click **Next**.

IMPORTANT

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

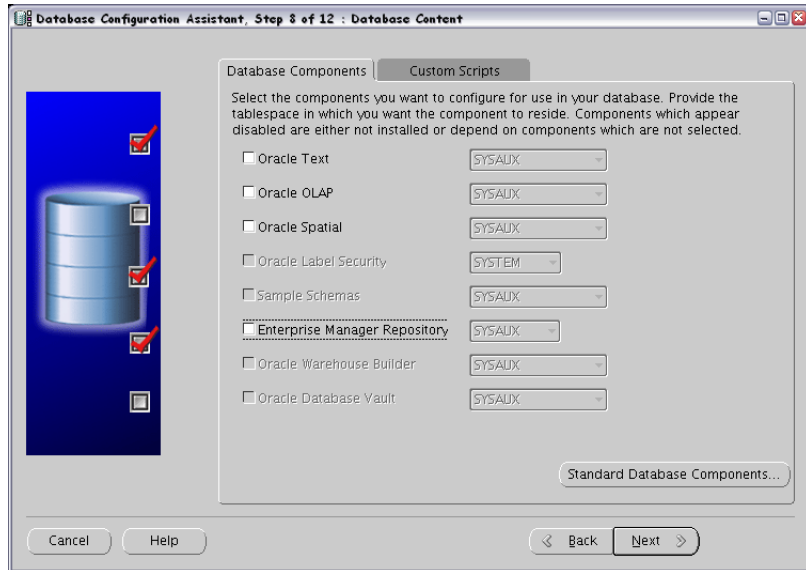
If specifying an incorrect password or changing the ASMSNMP password does not solve the issue, check it with your database administrator or see the Oracle product documentation.

-
- 10. *If you are using Oracle Database 11g Release 2, skip this step:* Set the SYS password, and click **OK**.

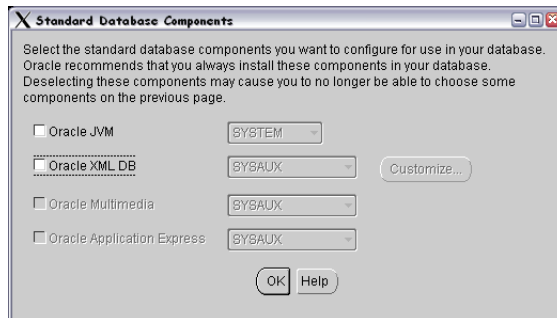
IMPORTANT

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

11. In the Database Components tab of the Database Content window, first clear all the components.



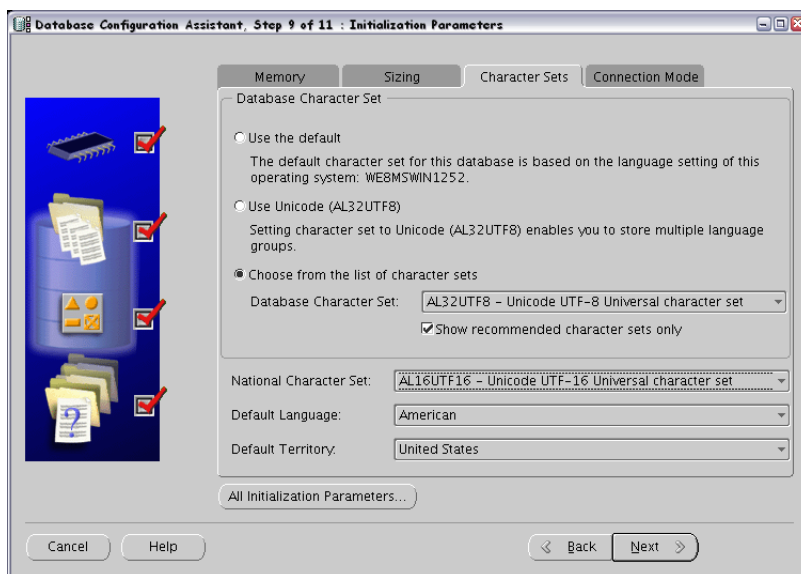
After you cleared all the components, click **Standard Database Components....** The Standard Database Components window opens.



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. Click **All Initialization Parameters**, and then set initialization parameters according to your needs.

Parameter	Value
db_block_size	16384
diagnostic_dest	/opt/oracle

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

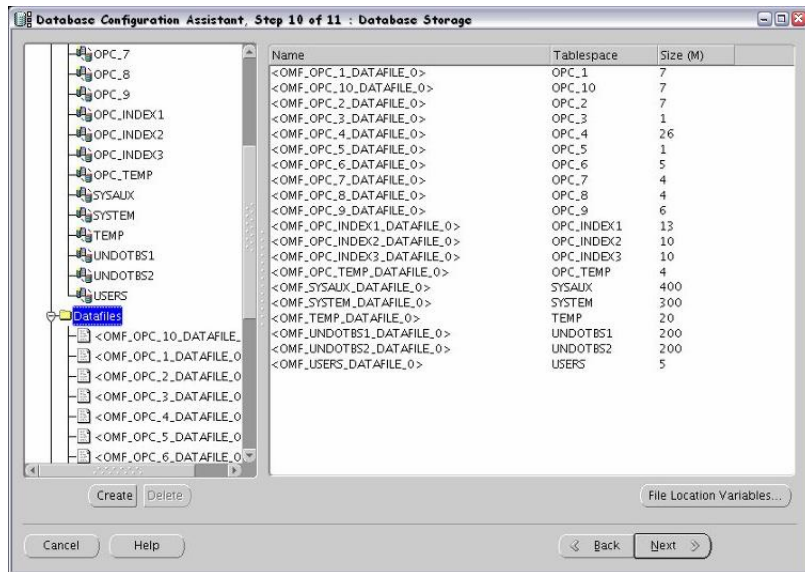
a. The variable that controls the global memory usage of the HPOM instance. The other variable, `memory_max_target`, allows you to dynamically increase the value of `memory_target`. By default, the `memory_max_target` parameter takes the same value as `memory_target`. If you want to adjust the `memory_target`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

16. Create tablespaces and their datafiles by using the recommended initial sizes. Create the datafiles as autoextend files, so that the datafiles can grow as needed.

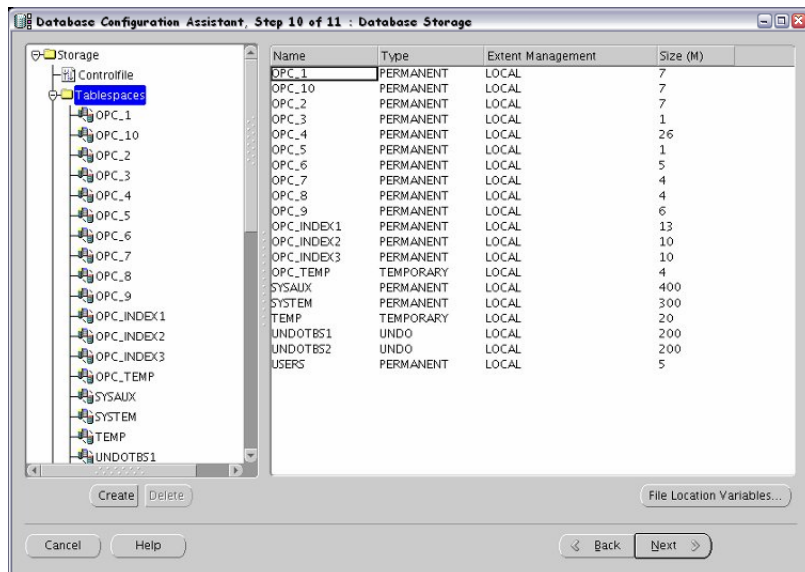
Tablespace Name	Tablespace Type	Datafile	
		Size	Next
SYSTEM	Locally managed/permanent	300M	1M
SYSAUX	Locally managed/permanent	400M	1M
TEMP	Locally managed/temporary	20M	5M

Tablespace Name	Tablespace Type	Datafile	
		Size	Next
OPC_1	Locally managed/permanent	7M	6M
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

Autoextend can be enabled in the Datafiles list under the Storage tab.



Set OPC_TEMP as a default temporary tablespace.



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*.

NOTE

Additional tablespaces are required depending on whether you plan to use Undo Tablespace Management or Rollback Segments.

17. Click **Next** to create the database. Select the **Create Database** option, and then click **Finish**.

Configuring Users, Passwords, and User Rights Manually

After you successfully create the HPOM database by using the Database Creation Assistant, manually configure users, passwords, and user rights on the database server. 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 set up Net Services on all cluster nodes of the database server. You can either use Oracle tools to configure the Net Services, or create the Net Services manually. You can choose an Oracle Net alias (HPOM default is `ov_net`). You can 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 4-2 Example of RAC Configuration

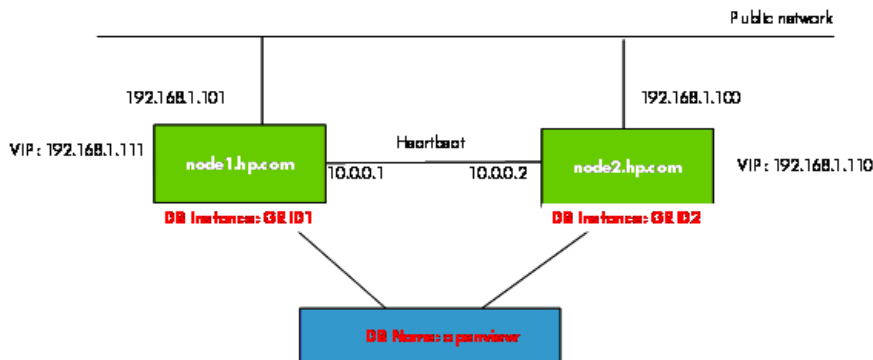


Figure 4-2 shows the example of the Oracle RAC configuration for the following managed nodes:

- ❑ `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 4-2). 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 157.

NOTE

The example files described in “Syntax Examples for the `.ora` Files” on page 157 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)
        (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)
        )
      )
    )
  )
```

Service Management and Manual Database Configuration

Setting Up HPOM in an Oracle Real Application Clusters (RAC) Environment

```
(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 `tnsnv.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 RAC Environment

Before you begin the HPOM installation, verify that your HP Operations management server system or both HPOM cluster server nodes meet the following requirements:

- ❑ Oracle 11g R1 (with Patch Set 11.1.0.7.0 or higher) or Oracle 11g R2 (with Patch Set 11.2.0.1.0)
- ❑ Oracle Net Services 11.1.0.7.0 or Oracle Net Services 11.2.0.1.0
- ❑ SQL * Plus 11.1.0.7.0 or SQL * Plus 11.2.0.1.0

Installing and Configuring HPOM in an 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 72 or in Chapter 10, Installing HPOM in a Sun Cluster Environment, or Chapter 11, Installing HPOM in a VERITAS Cluster Environment, with regard to the following steps:

1. When the `ovoinstall` script asks you whether you want to continue with the server configuration, leave the `ovoinstall` window open.
2. In another window, as the `root` user, install the latest HP Operations management server patch.

IMPORTANT

If you are installing HPOM in a cluster environment, install the latest HP Operations management server patch for all cluster nodes.

3. In this same window, type `y`, and then press **Enter** to continue with the server configuration.

When the `ovoconfigure` script asks you whether you want to set 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. In another window, 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/tnsnav.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 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`, and then press **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`).

5 Directory Structure on the Management Server

In This Chapter

This chapter provides file trees showing the hierarchy of the HP Operations Manager (HPOM) directories on the management server.

HPOM File Tree on the Management Server

The layout of the 11.x file system conforms to the standard structure of 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. For more information on agent file trees, see the *HPOM HTTPS Agent Concepts and Configuration Guide*.

Figure 5-1 File Tree on the Management Server (/opt/OV Branch)

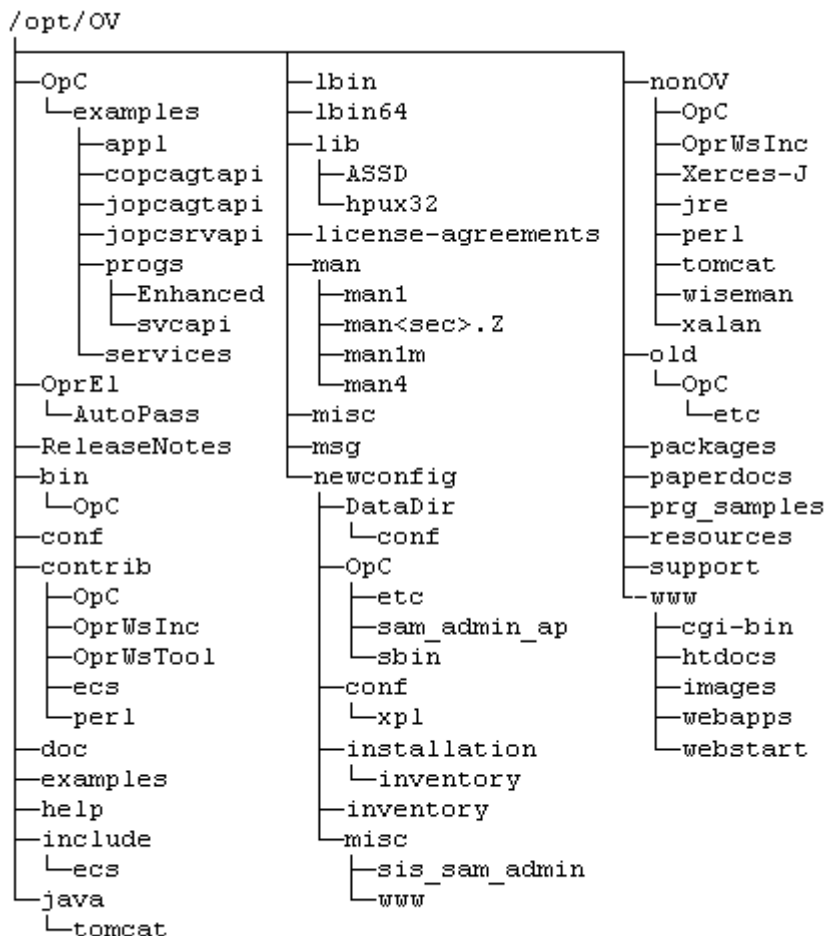
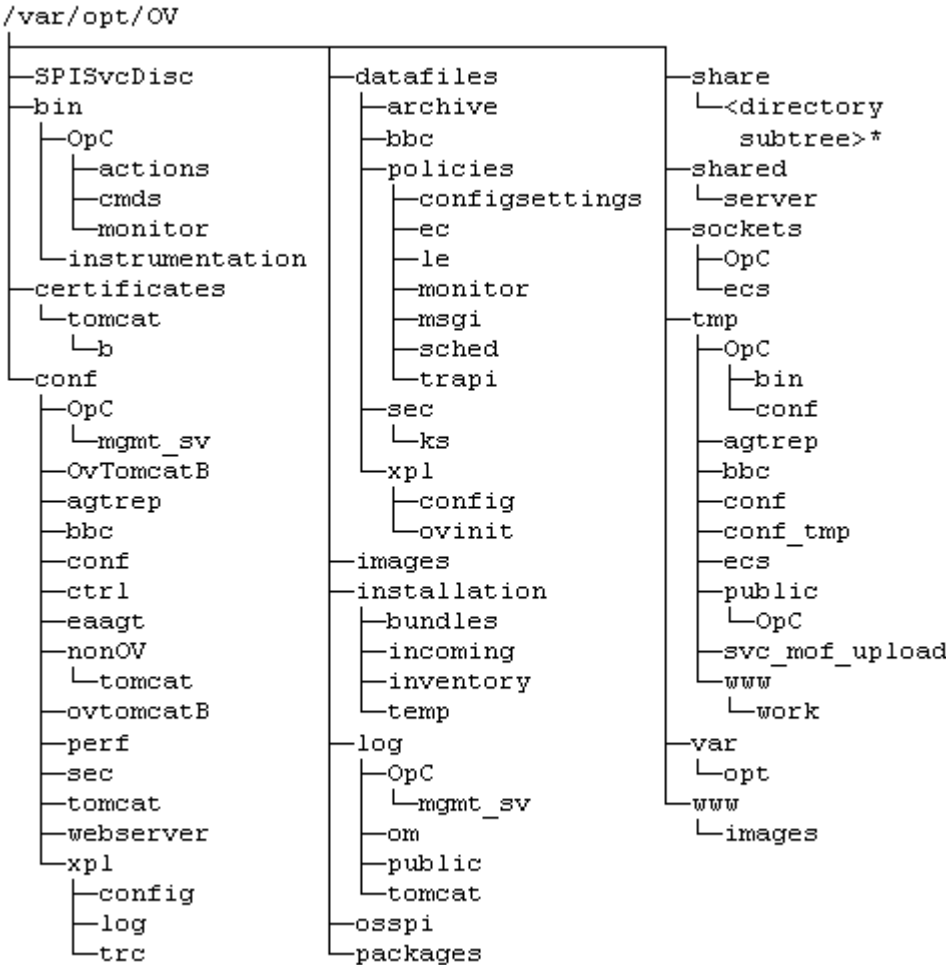
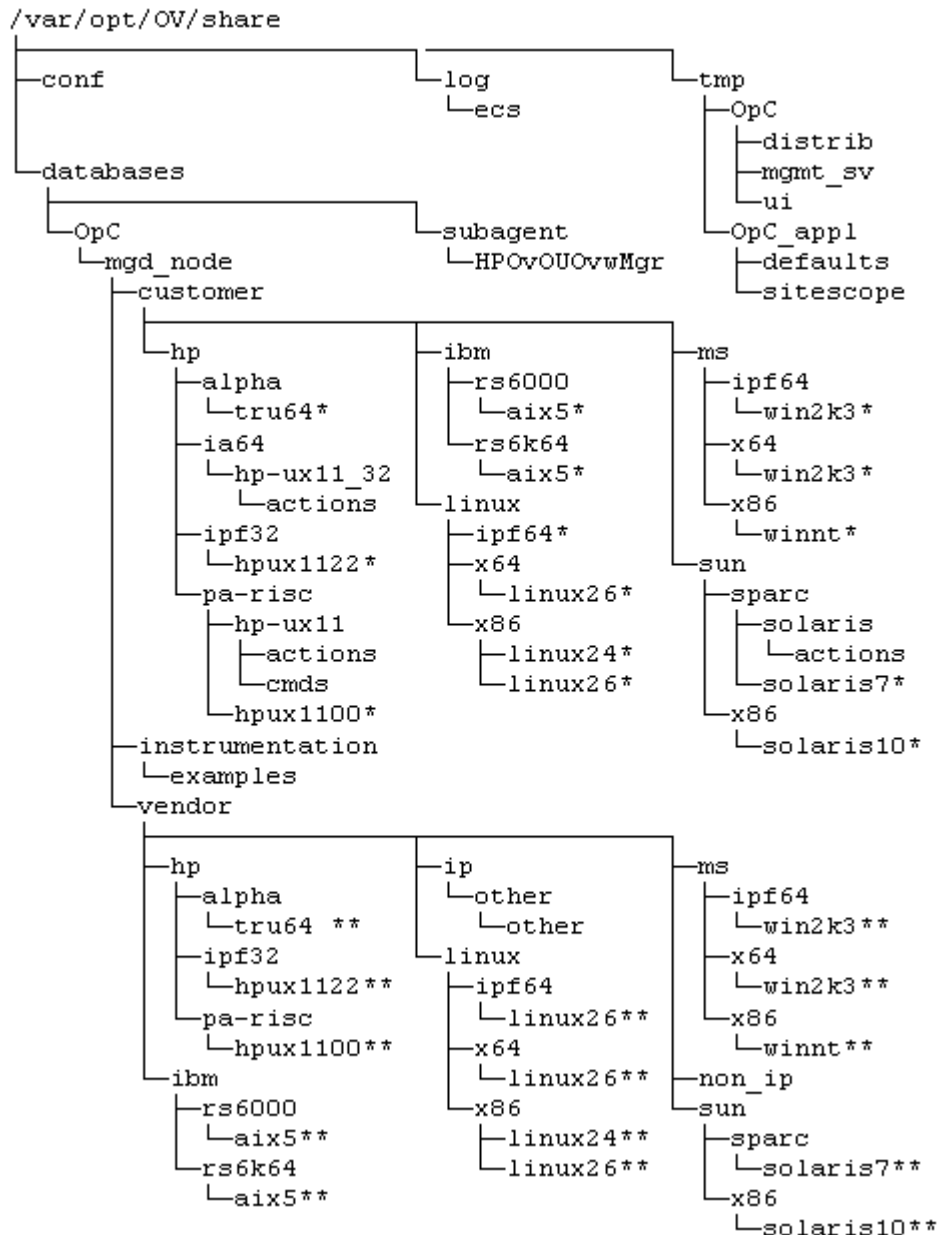


Figure 5-2 File Tree on the Management Server (/var/opt/OV Branch)



* For the directory subtree of the /var/opt/OV/share directory, see Figure 5-3 on page 168.

Figure 5-3 File Tree on the Management Server (/var/opt/OV/share Branch)



* Includes the following customer specific operating system directory subtree:

```
├── RPC_BBC
│   ├── actions
│   ├── cmds
│   └── monitor
├── actions
├── cmds
└── monitor
```

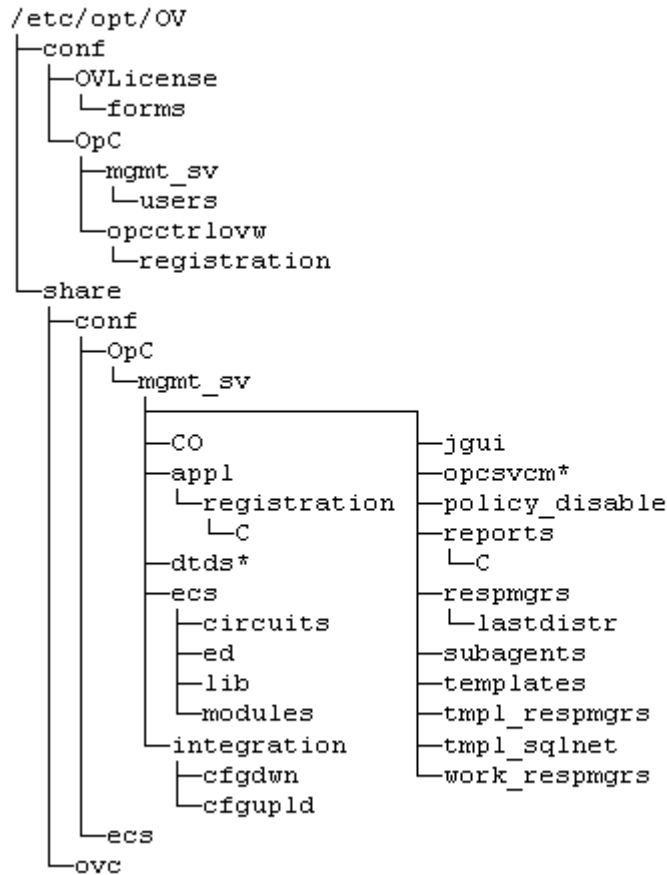
** Includes the following vendor specific operating system directory subtree:

```
└─<hpom_version>
  ├── RPC_BBC
  │   ├── actions
  │   ├── cmds
  │   ├── install
  │   └── monitor
  ├── actions
  ├── cmds
  └── monitor
```

In this instance, *<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 sub-tree 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)



* Only if Service Navigator is installed.

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/inetd.conf`
Starts the `/opt/OV/bin/OpC/opcuiwww` process when requested.

Directory Structure on the Management Server
HPOM File Tree on the Management Server

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 HPOM Java GUI.
- ❑ Deinstall the HPOM Service Navigator.
- ❑ Reinstall HPOM on the management server.

Deinstalling the Entire HPOM Installation

To deinstall the entire HPOM installation, follow these steps:

1. Log on to the management server as the `root` user.
2. Stop all managed node services by entering the following command:

```
/opt/OV/bin/OpC/opcragt -stop -all
```

3. Deinstall the HPOM software from all the managed nodes, excluding the management server, by using the `inst.sh` script.

Enter the following:

```
/opt/OV/bin/OpC/agtinstall/inst.sh -r
```

4. Check whether any HPOM GUIs are connected to the management server by entering the following command:

```
/opt/OV/contrib/OpC/listguis
```

If there are HPOM GUIs connected to the management server, stop them by selecting **File->Exit**. Alternatively, you can use the `kill(1)` 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 can fail.

5. To start the HPOM deinstallation, start the `ovoremove` script by entering:

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

NOTE

After you run the `ovoremove` script, make sure that you see the latest edition of the *HPOM Software Release Notes* for the information about the additional steps that you might need to perform.

The following text appears:

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 log files, which you can view at any time during the removal procedure.

Check the following log files for problems you may encounter during the deinstallation:

- /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 first detects whether the management server is running as HARG, removes the local agent, stops the management server, and then detects which server add-on packages are installed.

After `ovoremove` detects which server add-on packages are installed, it asks you whether you want to continue with the removal of server add-on packages.

6. Press **Enter** to accept the default answer (for example, "y"), or choose one of the answers, which are displayed after each individual removal procedure step.

The `ovoremove` script continues with the removal of the following:

- Server add-on packages
- Web server configuration
- Java GUI configuration
- Deintegration from the start-stop sequence
- Database
- Other server configuration
- `opc_op` user

7. Press **Enter** to continue.

After the `ovoremove` script detects the installed software (that is, the HP Operations management server), it informs you about the packages and components that will be removed. These are the following:

- ECS composer packages
- Agent packages

- ❑ Localization packages
- ❑ Server packages
- ❑ Core components

The `ovoremove` script then asks you whether you want to continue with the software removal, during which the HP Operations management server is removed.

8. Press **y** to finish the HPOM deinstallation procedure.

NOTE

Do not remove `/opt/OV`, `/etc/opt/OV`, and `/var/opt/OV` unless all HP products are removed.

To deinstall the Oracle Database, see the documentation supplied by the database vendor.

Deinstalling the HPOM Java GUI

If you no longer need the HPOM Java GUI, you can easily deinstall it.

Deinstalling the Java GUI from a PC Client

To deinstall the HPOM Java GUI from a PC client, follow these steps:

1. Close all running GUIs on the client.
2. Select **Start->Settings->Control Panel**. The Windows Control Panel opens.
3. In the Windows Control Panel, double-click the Add/Remove Programs icon.

The Add/Remove Programs Properties dialog box opens.

4. In the Add/Remove Programs Properties dialog box, select **HP Operations for UNIX Java Console**, and then click **Add/Remove....**

Deinstalling the Java GUI from a Solaris Client

To deinstall the HPOM Java GUI from a Solaris client, follow these steps:

1. Close all running GUIs.
2. Deinstall the HPOM Java GUI interactively by using the `pkgrm` utility. Enter the following:

```
/usr/sbin/pkgrm HPOvOUWwwGui
```

Make sure that you also remove the language-specific (or locale-specific) package:

- *English*

```
/usr/sbin/pkgrm HPOvOUWwwEng
```
- *Spanish*

```
/usr/sbin/pkgrm HPOvOUWwwSpa
```
- *Japanese*

```
/usr/sbin/pkgrm HPOvOUWwwJpn
```
- *Korean*

```
/usr/sbin/pkgrm HPOvOUWwwKor
```
- *Simplified Chinese*

```
/usr/sbin/pkgrm HPOvOUWwwSch
```

Deinstalling the Java GUI from Other UNIX-based Systems

To deinstall the HPOM 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.

Deinstalling Service Navigator

If you no longer need Service Navigator, you can easily deinstall it from the GUI client or from the management server.

Deinstalling the Service Navigator GUI Client

NOTE

This procedure deinstalls the entire HPOM Java GUI. If you want to remove *only* services, deassign them from the operator. Alternatively, you can use `opcservice -remove <service_name>` to remove only one service including subservices, or `opcservice -remove` to remove all services.

❑ PC client

1. Close all running GUIs on the client.
2. Select **Start: Settings -> Control Panel**. The Windows Control Panel opens.
3. In the Windows Control Panel, double-click the **Add/Remove Programs** icon. The Add/Remove Programs Properties dialog box opens.
4. In the Add/Remove Programs Properties dialog box, select **HP Operations for UNIX Java Console** and click **Add/Remove ...**

❑ **HP-UX client**

1. Close all running HPOM GUIs on the client.
2. Deinstall Service Navigator interactively, using the `swremove` command. Enter the following:

```
/usr/sbin/swremove OVOPC-SVC
```

3. Check the following logfiles for problems that are occurring during the deinstallation:

- `/var/adm/sw/swagent.log`
- `/var/adm/sw/swremove.log`

❑ **Other UNIX-based systems (for example, AIX systems)**

1. Close all running HPOM GUIs on the client.
2. Remove the directory `ito_op/` and its contents.

Deinstalling Service Navigator from an HPOM Management Server

To deinstall Service Navigator product from the HPOM management server, perform the following:

1. Ensure that all client GUIs that are accessing Service Navigator are closed.
2. Deinstall Service Navigator interactively, using the `swremove` command. Enter the following:

```
/usr/sbin/swremove OVOPC-SVC
```

3. Check the following logfiles for problems that are occurring during the deinstallation:

- `/var/adm/sw/swagent.log`
- `/var/adm/sw/swremove.log`

Reinstalling the HPOM Software

To reinstall the HPOM software, follow these steps:

1. Make a copy of old management server certificates.

Run the following command:

```
/opt/OV/bin/OpC/opcsvcertbackup -backup \  
-passwd <passwd> -file <old_certs>
```

In this instance, *<passwd>* is the user's 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`.

Run 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 the old management server certificates and the `OvCoreId` are not reused, the managed nodes cannot communicate with the management server.

3. Download all configuration data:

- 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:* To download all messages, follow these steps:
 - a. Perform a history download by entering:

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

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

```
/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 see the latest edition of the *HPOM Software Release Notes* for the information about the additional steps that you might need to perform.

6. Install the HPOM software as described in “Installing and Configuring the HPOM Software on the Management Server System” on page 66.
7. Update the `OvCoreId` and certificates on the new management server:
 - a. Stop all the processes:

```
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’s 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>
```

In this instance, `<local_agent_hostname>` is the hostname of the local agent.

8. Upload configuration data:

```
opccfgupld -replace /tmp/cfgdwn
```

9. If you downloaded all messages, upload them now:

- 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:

```
ovc -start
```

11. Check the agent connectivity by entering the following command:

```
opcragt <remote_agent>
```


In this instance, *<remote_agent>* is the hostname of the remote agent.

Reinitializing the HPOM Database and Configuration

If required, you can reinitialize the HPOM database and configuration on the management server after reinstalling the HPOM software.

To reinitialize the database and configuration, follow these steps:

1. If required, deinstall the HPOM software from all the 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. As user `root`, export the Oracle variables as follows:

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

3. If the software was deinstalled, reinstall it as described in “Reinstalling the HPOM Software” on page 182.

4. Stop the HP Operations server and agent processes:

```
/opt/OV/bin/OpC/opcsv -stop
/opt/OV/bin/ovc -stop AGENT
```

5. Clean the database, including the configuration for operators and nodes, and all active and history messages.

Enter:

```
su - root
/opt/OV/bin/OpC/opcdbinit -c [-v]
exit
```

The `opcdbinit` command uses the following modes:

- | | |
|----|---|
| -c | Clean mode. Cleans up tables and loads the default configuration. |
| -v | Verbose mode. Used to show the detailed processing progress. |

- Restart all the HP Operations management server and agent processes by entering:

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

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

7 Configuration Migration

In This Chapter

This chapter describes new concepts and alterations that are introduced with HPOM 9.xx and the resulting configuration changes that have an impact on the migration.

These configuration changes are related to the following new concepts and alterations coming with HPOM 9.xx:

- ❑ Introduction of the UTF-8 Character Set
- ❑ Conversion of Templates to Policies
- ❑ Use of Policy Groups Instead of Template Groups
- ❑ HPOM 8.xx Instrumentation on the HPOM 9.xx Management Server
- ❑ HPOM 8.xx SPIs on the HPOM 9.xx Management Server
- ❑ Decoupling of the HPOM 9.xx Management Server from NNM
- ❑ Removal of DCE Support
- ❑ Introduction of a New Paradigm for a Node Identification
- ❑ Obsolescence of the Motif GUI

In this chapter you can also find a list of all HPOM 8.xx configuration object types on which the migration has no impact. For details, see “Behavior of Other HPOM 8.xx Configuration Object Types” on page 206.

Introduction of the UTF-8 Character Set

The HPOM 9.xx database uses the UTF-8 character set. This has the following impact on the migration:

- ❑ All the data that is downloaded from the HPOM 8.xx database and uploaded to the HPOM 9.xx database is converted to UTF-8.

For example, assume that the HPOM 8.xx download data is placed in the `<download_dir>/C` directory (the character set being ISO88591). At the HPOM 9.xx data upload, the data is automatically converted from ISO88591 to UTF-8.

- ❑ The HPOM 9.xx download produces UTF-8 output data.

If you managed HPOM 8.xx download data in the file system and want to continue with that approach on the HPOM 9.xx management server, make sure that you use UTF-8 capable tools or editors.

NOTE

If the data is in the ASCII character set, no change is required because ASCII is a subset of both UTF-8 and ISO88591, as well as some other character sets.

English environments are usually not concerned because pure ASCII is used there.

-
- ❑ Because the HPOM 9.xx database uses the UTF-8 character set, the output data from HPOM command line utilities and APIs is in the UTF-8 character set as well. No conversion to other character sets is done. Similarly, all input data for command line utilities and APIs should be in UTF-8 and no conversion takes place. For example, a new description text of a policy group contains non-ASCII characters and you change it by using a command.

Therefore, to work with HPOM commands or HPOM API-based programs, it is necessary to run these in a UTF-8 environment.

Example: You had `LANG=C` so far.

To work with HPOM 9.xx, you must set the `LANG` environment variable to an appropriate UTF-8 locale, such as `en_US.UTF-8`.

If only ASCII characters will be used, you can continue using the C locale, but even in this case the UTF-8 locale is recommended.

Example: You had `LANG=es_ES.iso885915@euro` so far.

To work with HPOM 9.xx, you must set the `LANG` environment variable to an appropriate UTF-8 locale, such as `es_ES.UTF-8`.

Example: You had `ja_JP.sjis` so far.

To work with HPOM 9.xx, you must set the `LANG` environment variable to an appropriate UTF-8 locale, such as `ja_JP.UTF-8`.

Conversion of Templates to Policies

With HPOM 9.xx, templates are automatically converted to policies 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. Conversion of templates to policies has the following impact on the migration:

- ❑ An HPOM 8.xx template with a policy header is provided at the HPOM 9.xx upload. The policy header contains a world wide unique ID for the policy version and a container ID that is shared by all policies of the same name and the same type. HPOM 8.xx templates contained an ID that was used only within a single database, whereas the HPOM 9.xx policy IDs are kept during the upload to a different server.

A policy can be modified in the same way as a template (that is, by using the Administrator's GUI or an editor after downloading it to the file system).

- ❑ Each HPOM 8.xx template receives version number 1.0 when being uploaded to the HPOM 9.xx management server. Each subsequent upload of HPOM 8.xx configuration data to the HPOM 9.xx management server overwrites previously uploaded 1.0 versions.

NOTE

Policy modification usually leads to a new policy version. However, there is an important exception—the configuration upload by using `opccfgupld`. In this case, if an existing policy version is being uploaded, an overwrite is always performed.

It is recommended to continue with the template development for production purposes on the HPOM 8.xx management server until the HPOM 9.xx management server is completely functional. The configuration download on the HPOM 8.xx management server and the configuration upload on the HPOM 9.xx management server can be performed multiple times during the migration process. It is important that the same set of templates or policies is developed and maintained on just one management server, either the HPOM 8.xx management server or the HPOM 9.xx management server, and not on both in parallel.

- ❑ HPOM 8.xx template assignments to nodes, node groups, and template groups point to 1.0 policy versions after the migration from HPOM 8.xx to HPOM 9.xx.

All HPOM 8.xx template assignments are converted into fix version policy assignments. During the migration from HPOM 8.xx to HPOM 9.xx, the `LATEST` and `MINOR_TO_LATEST` assignments are not created.
- ❑ When template conditions are migrated to policies, they are no longer stored in their own database tables. Instead, the whole policy body (the former template) is stored in one piece in the database. Consider that the policy body is still checked for syntactical correctness when uploading a policy of one of the default policy types.

Managed nodes that are mentioned in policies are no longer resolved to node objects in the HPOM 9.xx database. For example, assume that you specified an action node with an IP address in the template, and now the IP address was changed in the database. The HPOM 9.xx policy points to the old IP address, whereas the HPOM 8.xx template was automatically updated. For that reason, it is recommended to use node names in policies. If the IP address is used, make sure that you edit all the policies referencing that IP address if the IP address was changed.
- ❑ All HPOM 8.xx monitor templates are converted to advanced monitoring threshold policies during the upload to HPOM 9.xx.

NOTE

Although the syntax of the policy data seems to be completely different from the syntax of the monitor template, the policy is in fact semantically identical to the template.

-
- ❑ Responsible manager configuration (the `allnodes` file) is not converted to a policy format on the HPOM 9.xx management server. The same mechanism is used as for HPOM 8.xx.
 - ❑ Policies on managed nodes are not affected by the conversion of templates to policies that occurs on the management server. This is because managed nodes already use the policy format that is introduced with HPOM 9.xx on the management server.

Because of that, you can deploy policies from the HPOM 9.xx management server to, for example, 8.17 HTTPS agents.

For detailed information about 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 192.

Use of Policy Groups Instead of Template Groups

Because HPOM 9.xx uses policy groups instead of template groups, the impact on the migration is as follows:

- ❑ Template groups were structured as directed acyclic graphs (DAG), whereas policy groups are structured as trees.

During the migration process, the template group structure is converted to the tree structure, which could lead to data duplication (see Example 7-1).

Example 7-1 Duplicated Template Group after the Migration

Assume that you have GA, GB, and GC HPOM 8.xx template groups. Now assume that the GC template group is a group with some basic templates that are used in both the GA context and the GB context. Therefore, GC is assigned to both GA and GB. After the migration from HPOM 8.xx to HPOM 9.xx, you get the /GA/GC and /GB/GC trees. This means that the GC template group was duplicated and that any modification on GC must be performed at two places, at /GA/GC and /GB/GC.

With HPOM 8.xx, you had to perform modification only once, at GC.

- ❑ A policy group must now be identified by its path, and no longer only by its name, which was the case with HPOM 8.xx.

If just the name of a policy group is specified, it is assumed that it is a top-level policy group. Therefore it could be necessary to update certain commands.

For example, taking into account Example 7-1, the following command does not work anymore because GC is not a top-level group:

```
opcnode -assign_tmpl node_name=my_node \  
net_type=NETWORK_IP templ_name=GC \  
templ_type=TEMPLATE_GROUP
```

On the contrary, the following command still works:

```
opcnode -assign_tmpl node_name=my_node \  
net_type=NETWORK_IP templ_name=GA \  
templ_type=TEMPLATE_GROUP
```

NOTE

It is recommended to update all commands to use complete policy group paths and to avoid command options that have `templ` in their names. For example:

```
opcnode -assign_pol_group node_name=my_node \  
net_type=NETWORK_IP pol_group=/GA
```

-
- ❑ Because of the change from DAG format to tree format, the slash (/) and the backslash (\) characters have a special meaning as path delimiters.

During the migration from HPOM 8.xx to HPOM 9.xx, the template group names that contain the slash or the backslash character are converted to use the underscore (_) character instead. For example, the `SPI for SAP R/3` template group is renamed to `SPI for SAP R_3`.

A list of renamed template groups is printed by `opccfgup1d`. See also `/var/opt/OV/log/OpC/mgmt_sv/opccfgup1d.log`.

- ❑ All assignments to template groups are migrated as described in the following example:

Example 7-2 Migration of All Assignments to Template Groups

Assume that the `G/C` HPOM 8.xx template group is assigned to the `G/A` and `G/B` groups. Now also assume that the `NG` node group has `G/C` assigned and that the `T` template is assigned to `G/C`.

The following actions take place during the migration:

- `G/A` is renamed to `G_A`, `G/B` to `G_B`, and `G/C` to `G_C`.
- The `/G_A`, `/G_A/G_C`, `/G_B`, and `/G_B/G_C` policy groups are created.
- The `T` policy (version 1.0) is assigned to the `/G_A/G_C` and `/G_B/G_C` policy groups.
- The `NG` node group has an assignment to the `/G_A/G_C` and `/G_B/G_C` policy groups.

NOTE

It is recommended to continue with the template group-related actions for the production environment on the HPOM 8.xx management server until the HPOM 9.xx management server is completely functional.

You can download the configuration on the HPOM 8.xx management server and upload it on the HPOM 9.xx management server multiple times during the migration process.

A partial download of templates and template groups as well as a selective download of single templates or template groups is supported and can be uploaded on the HPOM 9.xx management server.

HPOM 8.xx Instrumentation on the HPOM 9.xx Management Server

HPOM 8.xx instrumentation (actions, commands, and monitors) is adopted by the HPOM 9.xx management server and is stored in the same directory as on the HPOM 8.xx management server.

The new category-based instrumentation concept works in parallel and it has a higher priority in case of naming conflicts (see Example 7-3). For details about the category-based instrumentation, see the *HPOM Administrator's Reference*.

Example 7-3 Priority in Case of Naming Conflicts

Assume that the `my_monitor.sh` file is stored on the HPOM 8.xx management server at the following location:

```
/var/opt/OV/share/databases/OpC/mgd_node/customer/linux/ \
x86/linux26/monitor/my_monitor.sh
```

The `my_monitor.sh` file can be found at the same location on the HPOM 9.xx management server.

Now assume that there is another file with the same name at, for example, the following location:

```
/var/opt/OV/share/databases/OpC/mgd_node/instrumentation/ \
my_category/Unix/Linux/my_monitor.sh
```

In this case, the second file has a higher priority than the first one. A prerequisite is that the data from `my_category` is deployed—either because an appropriate policy has it assigned or because the `/my_category/` category is directly assigned to the concerned node.

NOTE

It is recommended to migrate from the old schema (that is, actions/commands/monitors) to the category-based schema in parts. For example, move all instrumentation belonging to a certain application from the old schema to the new one at once.

The `seldist` mechanism is still available on the HPOM 9.xx management server, but it is only applied on the `actions/commands/monitor` area, and not on the category-based instrumentation.

HPOM 8.xx SPIs on the HPOM 9.xx Management Server

You cannot install an HPOM 8.xx SPI on the HPOM 9.xx management server. However, you can download the configuration on the HPOM 8.xx management server and upload it on the HPOM 9.xx management server.

SPI policies and instrumentation can be used as with the previous version.

Decoupling of the HPOM 9.xx Management Server from NNM

Because the HPOM 9.xx management server is decoupled from NNM, the NNM-related application types are not migrated. The application entries are ignored by `opccfgupld`. During the upgrade procedure, you receive the warnings for OV Applications and OV Services that are not loaded to the database. A message is printed (see `/var/opt/OV/log/OpC/mgmt_sv/opccfgupld.log`).

An example of a message:

```
"0: WRN: Mon Apr 6 13:00:54 2009: opccfgupld (9849/1):  
[appl_lset.scp:2501]: Application "OV Node View" of type  
OV_PLATFORM obsoleted. (OpC50-255)"
```

NOTE

The application setup between HPOM 8.xx and HPOM 9.xx is not changed.

To find NNM-related applications, `grep OV_PLATFORM` in the HPOM 8.xx configuration download tree. As an example, see the `/var/opt/OV/share/tmp/OpC_appl/defaults/C/APPLICATIONS` directory on the HPOM 8.xx management server.

The applications that call NNM tools on the local HP Operations management server cannot be ported to the HPOM 9.xx management server. Other applications can be adapted manually. However, no automatic migration is possible.

NOTE

With HPOM 9.xx, the terms “application” and “application group” are changed to “tool” and “tool group”. This name change, however, does not affect technical details or concepts.

Removal of DCE Support

With HPOM 9.xx, DCE is not supported anymore and this fact has the following impact on the migration:

- ❑ When upgrading from HPOM 8.xx to HPOM 9.xx, all HPOM 8.xx nodes with obsolete or unknown node platforms (for example, DCE nodes) are by default converted to IP/Other/Other nodes. This means that the nodes that were not migrated to HTTPS nodes are not skipped during the upload of the data from the HPOM 8.xx management server, but uploaded as IP/Other/Other nodes. The IP/Other/Other nodes enable you to receive messages regarding them from the HPOM 8.xx management server. However, it is not possible to start actions on the HPOM 9.xx management server or to deploy the configuration from the HPOM 9.xx management server to the IP/Other/Other nodes.

With the `OPC_CFGUPLD_UNKNOWN_PLAT_UPLD` variable set to `FALSE` (the default value is `TRUE`), the nodes with obsolete or unknown platforms are not uploaded to the database and a record is written to the `opccfgupld` log file for each skipped node (`/var/opt/OV/log/OpC/mgmt_sv/opccfgupld.log`).

- ❑ Integration compiled on the HPOM 8.xx management server can run on the HPOM 9.xx management server without the need to recompile or relink. A relink is necessary when you explicitly require the DCE library because your application directly or indirectly calls DCE functions and you did not link the DCE library. HPOM libraries no longer provide the DCE library link.
- ❑ The default policies that are installed with the management server are removed from the DCE agent specifics. For example, the templates and the template groups that belong to the MPE/iX platform are removed. However, they still exist on the HPOM 8.xx management server, so they are restored during the migration from HPOM 8.xx to HPOM 9.xx.

NOTE

You can safely ignore any `opccfgupld` output regarding MPE, SGI, SCO, Novell Netware, Dynix, or SNI.

Introduction of a New Paradigm for a Node Identification

HPOM 9.xx uses a new paradigm for identifying a node—the case insensitive node name must be unique in the database. As a side effect, external node patterns for IP names and non-IP names are mapped together. The `OPC_NODE_PATTERN_IP_NAME` (254) and `OPC_NODE_PATTERN_OTHER` (255) values are automatically mapped during the upload, and the former one is kept. The same conversion takes place when calling the `opcnode_*` APIs.

NOTE

The fact that external node patterns for hostnames are treated as case insensitive with HPOM 9.xx should have no impact on the migration.

Obsolescence of the Motif GUI

Motif GUI functionality is no longer supported with HPOM 9.xx. Because HPOM 9.xx no longer uses the Motif GUI operator and the administrator's GUI, the impact on the migration is as follows:

- ❑ Configuration related to Motif GUI operators is removed during the upload on the HPOM 9.xx management server.
- ❑ The HPOM 8.xx administrator `opc_adm` is kept during the upload on the HPOM 9.xx management server. The `opc_adm` administrator acts as the default administrator on the HPOM 9.xx management server.

NOTE

With HPOM 9.xx, multiple administrators are supported.

- ❑ HPOM 8.xx template administrators can be manually added as HPOM 9.xx administrators who have read or write permissions on policies and policy groups.

Behavior of Other HPOM 8.xx Configuration Object Types

HPOM 8.xx configuration object types listed in this section need no special consideration regarding the migration from HPOM 8.xx to HPOM 9.xx because the data is simply downloaded on the HPOM 8.xx management server and uploaded on the HPOM 9.xx management server. These configuration object types are the following:

- Managed nodes
- Node groups
- Node hierarchies
- Layout groups
- Message groups
- Responsibility matrix
- Operators
- Services
- Filter definitions and other configuration for the Java GUI
- Application groups
- Trouble ticket and notification service definitions
- Regroup conditions
- Management server configuration
- Outage definitions
- Responsible manager configuration
- Message forwarding configuration

NOTE

Downloading data on the HPOM 9.xx management server and uploading data on the HPOM 8.xx management server are not supported.

8 Migrating HPOM

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 9000 to HPOM on Sun Solaris.

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 the Installation Requirements for the Management Server

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.”

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. Ensure 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 HP Operations management 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.

Installing the Oracle Database

To install the Oracle Database on the new management server, follow these steps:

1. Prepare the system for the Oracle Database installation.

For detailed prerequisites and installation steps for the Oracle Database, see “Installing and Verifying an Oracle Database” on page 51.

2. Install and set up the Oracle Database for Sun Solaris.

For instructions, see the documentation supplied with the Oracle 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 a Hostname
- ❑ Upgrade of the Systems in a MoM Setup by Reusing the IP Addresses and Hostnames

NOTE

You can migrate to a system with the different IP address and the hostname. Alternately, you can upgrade the systems in the MoM setup by reusing the IP addresses and hostnames. Unlike the simple upgrade procedure described in Chapter 9, “Upgrading HPOM to Version 9.10,” these scenarios require almost no operational downtime.

Migration to a System with a Different IP Address and a Hostname

If the hostname and 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. If you do so, you can migrate to the new server by using the MoM setup. The basics of this scenario are the following:

- ❑ New hardware with a new IP address and a hostname is used for the new server.
- ❑ Can be applied on all HPOM 8.xx setups: the stand-alone server setup, the MoM setup, and the hardware cluster setup.
- ❑ 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 process, you can request a new server's 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.xx (for example, if a hardware cluster shall be reused).
- ❑ Migration process can almost be performed without operational downtime.
- ❑ Messages can be synchronized in both directions, from the old server to the new server, and vice versa, while the configuration data exchange is only possible from the old server to the new server.
- ❑ Because HPOM 9.xx no longer supports DCE communication, message forwarding between the HPOM 8.xx management server and the HPOM 9.xx management server must be switched to HTTPS.
- ❑ All managed nodes must be updated with the root certificate of the new server.
- ❑ Can also be used for the 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 214
- ❑ Task 2: “Setting Up a New Server” on page 216
- ❑ Task 3: “Uploading the Saved HPOM Configuration” on page 218
- ❑ Task 4: “Establishing a Trust Relationship Between the Two Management Servers” on page 221
- ❑ Task 5: “Setting Up Message Forwarding Between the Management Servers” on page 225

NOTE

For detailed information about setting up a backup server, see the *HPOM Concepts Guide*.

Downloading the Old Server Configuration

NOTE

With 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*. See also "Converting Templates to Policies" on page 239 for more information about the conversion of templates to policies.

To download the old server configuration, follow these steps:

1. Include the service data into the download by entering 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 the new managed nodes) take place in the productive old server environment, and therefore must 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
```

NOTE

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 225.

Setting Up a New Server

NOTE

The pure installation of the new server can be done independently of any activities in the productive old server environment.

To set up the new server, follow these steps:

1. Install the HP Operations management server software as described in Chapter 2, “Installing and Configuring HPOM on the Management Server.”

IMPORTANT

Make sure your system meets the hardware and software requirements for the HPOM 9.xx software installation. For information about the installation requirements, see Chapter 1, “Installation Requirements for the Management Server.”

2. After the new server is installed, perform the following steps on the old server:
 - a. Add the new server (the backup server) as a managed node on your old server, for example, by using the `opcnode` command line utility:

```
/opt/OV/bin/OpC/Utils/opcnode -add_node \  
node_name=<new_server> group_name=<nodegrp_name> \  
net_type=<network_type> mach_type=<machine_type>
```

For example:

```
opcnode -add_node \  
node_name=omu9server net_type=NETWORK_IP \  
group_name=hp_ux mach_type=MACH_BBC_HPUX_IPF32 \  
node_label=omu9server
```

For more information, see the *opcnode (1M)* manual page.

- b. The new server must be added to the node bank of the old server including its `OvCoreID`.

On the new server, enter the following command:


```
/opt/OV/bin/OpC/utils/opcnode -list_id \  
node_list=<new_server_hostname>
```

On the old server, enter the following command:

```
/opt/OV/bin/OpC/utils/opcnode -chg_id \  
node_name=<new_server_hostname> \  
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>
```

Uploading the Saved HPOM Configuration

To upload the previously saved configuration with `opccfgupld` on the new server, perform as follows:

1. Transfer the saved configuration files to the new server.
2. Stop the HP Operations management server processes:

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

In a cluster environment: First disable the HA resource group monitoring by using the following command:

```
/opt/OV/lbin/ovharg -monitor ov-server disable
```

NOTE

Make sure that in the cluster environment the upload is performed on the active node.

3. If you stored the output of `ovconfget -ovrg server` into a file and transferred it to the new server, perform the following:

- a. Run 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, enter 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:

```
/opt/OV/bin/OpC/opccfgupld -replace -subentity \  
-configured <download_directory>
```

For example:

```
opt/OV/bin/OpC/opccfgupld -replace -subentity \  
-configured /tmp/cfgdwn
```

NOTE

With 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.

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, enter the following:

```
/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, enter 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 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/sbin/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, perform as follows:

1. If the old server has a Certification Authority, which is the 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 about establishing a shared CA in the MoM environments, see the *HPOM HTTPS Agent Concepts and Configuration Guide*.

2. Copy the file to the new server, and then import certificates:
 - a. Copy the certificate file to the new server.
 - b. Import the certificates from the old server to the new server by entering the following command on the new server:

```
/opt/OV/bin/ovcert -importtrusted -file \  
/tmp/<hostname>.cert -ovrg server
```

NOTE

You can view the current certificates before importing the certificates from the old server to the new server. Enter the following command on the new server:

```
/opt/OV/bin/ovcert -list
```

- c. On the new server, propagate the old server's trusted certificates to the local agent. Enter the following command on the new server:

```
/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
```

3. Repeat steps 1 and 2 to import the new server's CA trusted certificate to the old server. Perform as follows:

a. On the new server, enter the following:

```
/opt/OV/bin/ovcert -exporttrusted -file \  
/tmp/<hostname>.cert -ovrg server
```

b. Copy the file to the old server, and import the certificates there:

```
/opt/OV/bin/ovcert -importtrusted -file \  
/tmp/<hostname>.cert -ovrg server
```

NOTE

Because the file contains all the 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. On the old server, enter the following:

```
/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 already 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 yet:* The system contains several example files, which 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 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, enter 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 whether 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 switch on multiple threading for the `opcragt` command by entering:

```
/opt/OV/bin/ovconfchg -ovrg server -ns opc -set \  
OPCRAGT_USE_THREADS TRUE
```

On the new server, `opcragt` is multiple-threaded by default.

NOTE

The agents, which could not be contacted, are also 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.*

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, enter the following:

```
/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 this instance, *<node_list>* is usually *-all*.

9. *Ignore this step at this point.*

In the server pooling environments, 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, enter 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 Managed Nodes” on page 257.

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 the new incoming messages are synchronized by using message forwarding. All the messages, which had arrived before the shadow period began, must be handled on the old server.

To set up message forwarding between the servers, perform as follows:

1. Make sure that you prepare the following configuration file on the old server:

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

- ❑ *If you already have the MoM with message forwarding setup:* Add the new server to the existing `msgforw` file, and then verify the syntax by entering the following command:

```
/opt/OV/bin/OpC/opcmomchk
```

- ❑ *If you do not have the MoM with message forwarding setup yet:* The system contains an example file, which 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 the 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. Enable message forwarding on the old server.

Because the new server can only be contacted by using HTTPS communication, enter the following command:

```
/opt/OV/bin/ovconfchg -ovrg server -ns opc -set \
OPC_HTTPS_MSG_FORWARD TRUE
```

For detailed information, see the *HPOM HTTPS Agent Concepts and Configuration Guide*.

3. Activate message forwarding on the old server by restarting the server processes:

```
/opt/OV/bin/ovstop ovoacomm
```

```
/opt/OV/bin/ovstart opc
```

4. Check message forwarding:

- a. Create several messages, and check whether they arrive in the GUI connected to the new server.
 - b. Acknowledge the message on the new server, and check whether it is synchronized to the old server.
5. When the agents send the messages directly to the new server, set up message forwarding on the new server as well.

You can do this by reusing 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, enter the following command:

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

After the shadow period is over, perform as follows:

1. Make sure that the operators start using the new server. For detailed information, see the *HPOM Administrator's Reference*.
2. *Optional:* To download and upload the history messages from the old server to the new server, do the following:
 - a. On the old server, enter 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 enter 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 whether a new hardware is introduced, or the existing hardware is reused - the IP addresses and the hostnames are taken over.
- ❑ Existing permanent license of the old server, which is upgraded to HPOM 9.xx, can be reused.
- ❑ Upgrade process can almost be performed without operational downtime.
- ❑ Messages can be synchronized in both directions, from the old server to the new server, and vice versa, while the configuration data exchange is only possible from the old server to the new server.
- ❑ Because HPOM 9.xx does no longer support DCE communication, message forwarding between the HPOM 8.xx management server and the HPOM 9.xx management server must be switched to HTTPS.
- ❑ 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 9, Upgrading HPOM to Version 9.10, only the specifics of the MoM upgrade are described below.

Upgrading the Systems in the MoM Setup by Reusing the IP Addresses and Hostnames

To upgrade the systems in the MoM setup by reusing the IP addresses and 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 with completing the following steps:

1. *Ignore this step in the server pooling environments:*

Switch all agents to report to server B. On server B, enter 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. Because the new server can only be contacted by using HTTPS communication, enter the following command:

```
/opt/OV/bin/ovconfchg -ovrg server -ns opc -set \  
OPC_HTTPS_MSG_FORWARD TRUE
```

- b. Restart the processes on both servers:

```
/opt/OV/bin/ovstop ovoacomm
```

```
/opt/OV/bin/ovstart opc
```

- c. Verify that HTTPS-based message forwarding works correctly: send several test messages, and then acknowledge them. Check that the message synchronization works correctly.

3. Stop server A.

From the moment you stop server A, server B starts buffering all messages and message operations. Enter the following command:

```
/opt/OV/bin/ovstop ovoacomm
```

NOTE

During the upcoming upgrade installation of server A, it can happen that server B sends the buffered messages as soon as server A is up.

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, complete these tasks:

- Task 1: “Downloading the Current HPOM 8.xx Configuration” on page 239
- Task 2: “Upgrading the Old Version of HPOM” on page 244
- Task 3: “Installing and Configuring the HPOM Software on the Management Server” on page 72
- Task 4: “Uploading the Saved HPOM Configuration” on page 248

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. Enter 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
```

Upgrade of the Systems in a MoM Setup by Reusing the IP Addresses and Hostnames

```
/opt/OV/bin/OpC/opccfgdwn -backup /tmp/all.dsf \  
/tmp/all
```

- b. On server A, enter 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 the server processes on server A:

```
/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 the server pooling environments:*

Optional: Switch the agents back to server A. On server A, run the following command:

```
/opt/OV/bin/OpC/opcragt -primmgr -all
```

Migrating HPOM

Upgrade of the Systems in a MoM Setup by Reusing the IP Addresses and Hostnames

9 **Upgrading HPOM to Version 9.10**

In This Chapter

This chapter describes the following:

- ❑ Upgrade procedure from HPOM 8.xx to HPOM 9.10 on the same system
- ❑ Upgrade procedure from HPOM 9.0x to HPOM 9.10 on the same system

NOTE

You can either upgrade the software on the same system, as described in the following sections, or migrate your HPOM 8.xx data to a new HPOM 9.10 installation on a different system. For detailed information about migrating HPOM, see Chapter 8, “Migrating HPOM.”

Upgrading from HPOM 8.xx to HPOM 9.10

To upgrade from HPOM 8.xx to HPOM 9.10 with database customizations, complete these tasks:

- ❑ Task 1: “Verifying the Installation Requirements for the Management Server” on page 236
- ❑ Task 2: “Backing Up the Current HPOM 8.xx Installation” on page 237
- ❑ Task 3: “Downloading the Current HPOM 8.xx Configuration” on page 239
- ❑ Task 4: “Installing the New Oracle Version” on page 243
- ❑ Task 5: “Upgrading the Old Version of HPOM” on page 244
- ❑ Task 6: “Installing and Configuring the HPOM Software on the Management Server” on page 72
- ❑ Task 7: “Uploading the Saved HPOM Configuration” on page 248
- ❑ Task 8: “Upgrading the HPOM Java Operator UI” on page 254
- ❑ Task 9: “Upgrading Managed Nodes” on page 257

NOTE

Before starting the upgrade procedure, read Chapter 7, “Configuration Migration.”

Verifying the Installation Requirements for the Management Server

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.”

Note which versions of the operating system and the Oracle Database are required to upgrade the HPOM software. As a general rule, you *must* perform upgrades 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. Ensure that you acquire the correct license for your requirements before the Instant-On licence expires.

If you have a product installed that is integrated into or certified with HPOM 8.xx (for example, HP Performance Manager), make sure this product is compatible with HPOM 9.10 before starting the HPOM upgrade process.

For information about how to perform the HPOM upgrade in this situation, see the documentation of the integrated product.

Backing Up the Current HPOM 8.xx Installation

To back up the current HPOM installation, follow these steps:

1. Exit all GUIs.
2. Stop all other applications on the system.
3. Make a full backup of the current installation:

- a. Enter the following:

```
/opt/OV/bin/OpC/opc_backup
```

The system prompts you with the following:

```
Do you want to use the full or configuration backup?  
(f|c) ==>
```

- b. Enter **f** for a *full* backup, which includes the HPOM binaries and the configuration data.

The system prompts you with the following:

```
Do you want to back up another directory, too?  
(y|n) ==>
```

- c. Enter **y** (yes) or **n** (no) as required.

The system prompts you with the following:

```
Please enter the backup destination:
```

- d. Enter a filename for the backup data, for example, `/tmp/opc_backup_full_hpom`, or enter a tape device.
- e. Store the backup data on backup media or a separate system. For more information, see the *opc_backup(1M)* manual page.

NOTE

It is strongly recommended that you save the management server certificates and the `OvCoreId` of the HPOM 8.xx management server.

Backing Up Management Server Certificates

To make a copy of the old management server certificates, run the following command:

```
/opt/OV/bin/OpC/opcsvcertbackup -backup \  
-passwd <passwd> -file <old_certs>
```

In this instance, *<passwd>* is the user's 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
```

NOTE

Make sure that the old management server `OvCoreId` and certificates are reused after the HP Operations management server installation. If the old management server certificates and the `OvCoreId` are not reused, the managed nodes cannot communicate with the management server.

Downloading the Current HPOM 8.xx Configuration

This section describes the procedure for downloading the current HPOM 8.xx configuration. With HPOM 9.xx, a new concept of policy management is introduced, therefore it is very important that you get acquainted with the basics described in “Converting Templates to Policies” on page 239 before continuing with the procedure for downloading the current HPOM 8.xx configuration.

Converting Templates to Policies

Consider the following basics before you download the current HPOM 8.xx configuration:

- ❑ With 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.
- ❑ All HPOM 8.xx template assignments to nodes, node groups, and template groups will point to 1.0 policy versions after the migration to HPOM 9.xx.

All HPOM 8.xx template assignments are converted into fix version policy assignments. During the migration from HPOM 8.xx to HPOM 9.xx, the LATEST and MINOR_TO_LATEST assignments are not created.
- ❑ Managed nodes that are mentioned in policies are no longer resolved to node objects in the HPOM 9.xx database. For example, assume that you specified an action node with the IP address in the template, and now the IP address was changed in the database. The HPOM 9.xx policy points to the old IP address, while the HPOM 8.xx template was updated automatically. For that reason, it is recommended to use node names in policies. If the IP address is used, make sure that you edit all the policies referencing that IP address if the IP address was changed.
- ❑ All HPOM 8.xx monitor templates are converted into monitor threshold policies during the migration. Although the policies seem to be different in terms of the syntax, they are in fact semantically identical to the templates.
- ❑ During the migration, the template group names containing a slash character (/) or a backslash character (\) are converted to use an underscore character (_) instead. For example, the SPI for SAP R/3 template group name is renamed to SPI for SAP R_3.

- ❑ All assignments of template groups are migrated as described in the following example:

Example 9-1 Migration of All Assignments of Template Groups

Assume that the G/C HPOM 8.xx template group is assigned to the G/A and G/B groups. Now also assume that the NG node group has G/C assigned, and that the T template is assigned to G/C.

The following take place during the migration:

- G/A is renamed to G_A, G/B to G_B, and G/C to G_C.
- The /G_A, /G_A/G_C, /G_B, and /G_B/G_C policy groups are created.
- The T policy (version 1.0) will be assigned to the /G_A/G_C and /G_B/G_C policy groups.
- The NG node group has an assignment to the /G_A/G_C and /G_B/G_C policy groups.

NOTE

For detailed information about the HPOM policies, see the *HPOM Administrator's Reference* and the *HPOM Concepts Guide*.

Procedure for Downloading the Current HPOM 8.xx Configuration

To download the current HPOM 8.xx configuration, follow these steps:

1. Create a new user or modify an existing user in the User Bank.

This user *must* have full responsibility for *all* message groups and node groups. You will need this user later on to acknowledge all active messages. You can use `opc_adm` for this purpose.

2. Verify that all running Java-based GUIs are stopped.

Enter the following command:

```
ps -eaf | grep opcu
```

3. Stop the HP Operations server processes by entering the following command:

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

4. Stop the local agent on the management server by entering the following command:

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

5. *Optional:* To download the service data, enter the following command:

```
ovconfchg -ovrg server -ns opc -set \  
OPC_OPCCFGDWN_ALL_INCLUDE_SELDIST_SERVICES TRUE
```

6. Download all the configuration data:

- a. Create an empty download specification file:

```
echo "*" ;" > /tmp/download.dsf
```

- b. Download the configuration:

```
/opt/OV/bin/OpC/opccfgdwn /tmp/download.dsf \  
/tmp/cfgdwn
```

NOTE

If you want to migrate also the service status logs, download them as described in “Upgrading Service Navigator” on page 255.

7. *Optional:* To migrate your active messages, do as follows:

- a. Perform a history download by entering the following command:
`/opt/OV/bin/OpC/opchistdown -older 0s -file /tmp/history`
 - b. Acknowledge all active messages by running `opcack` for the user you previously set up:
`/opt/OV/bin/OpC/opcack -u <user_for_all_msg_grps> -a -f`
 - c. Perform a second history download by entering the following command:
`/opt/OV/bin/OpC/opchistdown -older 0s -file /tmp/active`
8. *Optional:* To migrate your server configuration settings, store the output of `ovconfget -ovrg server` into a file.

Installing the New Oracle Version

The following table contains the operating system and the Oracle Database version supported by HPOM 9.10.

Table 9-1 Supported Oracle Version

HPOM Version	Solaris Version	Oracle Version
9.10	Solaris 10	11.1.0.7 or 11.2.0.1

If you do not use Oracle 11g with HPOM 8.31 or higher, make sure that both versions of the Oracle Database server (Oracle 9i or Oracle 10g for HPOM 8.xx and Oracle 11g for HPOM 9.10) are installed on the management server before upgrading to HPOM 9.10. During the upgrade, the old database is dropped and the new database for HPOM 9.10 is configured.

If you used the Oracle Database version 11.1.0.6 with HPOM 8.xx, make sure that you update it to 11.1.0.7 or 11.2.0.1 before starting the HPOM 9.10 software installation described in step 9 of the “Upgrading the Old Version of HPOM” section.

NOTE

You can remove the old Oracle version from the system after the upgrade if you do not need it.

Detailed information about installing the Oracle Database version is available in the “Installing and Verifying an Oracle Database” section and Oracle product documentation.

NOTE

The `.profile` file for the Oracle user may contain the `ORACLE_HOME`, the `ORACLE_SID`, or the `ORACLE_BASE` variable. If this is true, it is important to set them up correctly during the different phases of the upgrade:

- ❑ When Oracle 11.1.0.7 or 11.2.0.1 server is going to be installed, variables must point to the new (used with HPOM 9.10) Oracle Database server.
- ❑ During the first steps of the upgrade, variables must be set up according to the old (used with HPOM 8.xx) Oracle Database server.

- ❑ After the old database is dropped, variables must be set up again to the new server before continuing with the HPOM 9.10 installation. For detailed information, see “Upgrading the Old Version of HPOM” on page 244.

Upgrading the Old Version of HPOM

The standard upgrade procedure can be executed with the `ovoupgrade` script that is provided with HPOM 9.10 and is located on the HPOM 9.10 installation DVD (HPOMDVD).

NOTE

Before starting the upgrade procedure, you must remove server add-on packages¹, which will not be removed by the server remove script.

To upgrade the old version of the HP Operations management server software, follow these steps:

1. Back up server certificates and the `OvCoreId`.

Enter the following command:

```
/opt/OV/bin/OpC/opcsvcertbackup -backup
```

2. Start the HPOM upgrade procedure:

- If you are upgrading HPOM from a DVD-ROM, enter the following:

```
/<mount_point>/ovoupgrade
```

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

- If you are upgrading HPOM using DVD content, enter the following:

```
/<master_directory>/HPOMDVD/ovoupgrade
```

For example, if you create the `/tmp` directory as a master directory, you can start `ovoupgrade` by entering the following:

-
1. The server add-on packages are different products (for example, SPIs) that were installed additionally, that is, outside the HPOM 8.xx server installation.

`/tmp/HPOMDVD/ovoupgrade`

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

3. Press **Enter** if you want to accept the default repository location, or enter the desired location.

The `ovoupgrade` script checks and installs the server setup package.

4. Press **Enter** to continue.

The following text appears:

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

5. Press **Enter** to continue.

The `ovoupgrade` script continues with the old server removal during which the local agent, SPIs, the database, the documentation, the agent software, the server software, and Core components are removed.

An output similar to the following is displayed:

```
Removing old Server
Removing local Agent . . . . . OK
Removing SPIs . . . . . OK
Stopping Server . . . . . OK
Removing database . . . . . OK
Removing documentation . . . . . OK
Removing Agent software . . . . . OK
Removing Server software . . . . . OK
Removing Core components . . . . . OK
```

NOTE

If the old server removal step returns a `FAILED` value, enter `repeat` to repeat the step.

If the old server removal step returns a `FAILED` value because of the package dependencies check, you can safely skip this step. Otherwise, fix the problem and repeat the step.

6. The `ovoupgrade` script continues with removing NNM.

You can choose among the following options:

- Remove NNM Software only.
- Remove NNM Data and Software.
- Help - reprint the option descriptions.

Choose the Remove NNM Data and Software option, which removes Network Node Manager log files, configuration files, and the database from your system.

The `ovoupgrade` script then asks you whether you want to continue with removing NNM data and software.

7. To continue, enter **y**.

IMPORTANT

Make sure that you do not use the `kill` command or Control-C to stop the removal process because it could result in a system corruption.

After you get the notification of the successful removal of NNM, the following output should be displayed as well:

```
Old Server removal successfully finished
```

When the following two questions appear, keep the defaults:

- Do you want to keep HPLwdce on the system?
- Do you want to keep Software Distributor on the system?

After that the following question is displayed:

```
Do you want to automatically continue with the installation?
```

IMPORTANT

Before installing the HPOM software on the management server, make sure that your system meets the hardware and software requirements for the HPOM 9.10 software installation. For information about the installation requirements, see Chapter 1, “Installation Requirements for the Management Server.”

If you used the Oracle Database version 11.1.0.6 with HPOM 8.xx, make sure that you update it to 11.1.0.7 or 11.2.0.1 at this point.

8. You can now automatically continue with the server installation and configuration. For detailed information, see “Installing and Configuring the HPOM Software on the Management Server” on page 72.

NOTE

After installing the HPOM software on the management server, make sure that the management server certificates and the `OvCoreId` are identical before and after the installation. If they are not identical, or if they even do not exist, you can reinstall them by entering the following command:

```
/opt/OV/bin/OpC/opcsvcertbackup -restore \  
-passwd <passwd> -file <old_certs> -force
```

In this instance, `<passwd>` is the user’s password and `<old_certs>` is the file with the old management server certificates.

When the management server installation is finished, the HPOM 8.xx configuration can be uploaded to HPOM 9.10. For detailed information about uploading the saved configuration, see “Uploading the Saved HPOM Configuration” on page 248.

Uploading the Saved HPOM Configuration

To upload the previously saved configuration with `opccfgupld`, follow these steps:

1. *In a cluster environment only:* Disable the HA resource group monitoring by using the command:

```
/opt/OV/lbin/ovharg -monitor ov-server disable
```

2. If you stored the output of `ovconfget -ovrg server` into a file, perform the following:

- a. Run the command:

```
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 server installation.

To determine which configuration settings were modified, first call `ovconfget -ovrg server` on the HPOM 9.10 installation, and then compare this output with the `ovconfget -ovrg server` output stored from the HPOM 8.xx installation.

3. Stop the HP Operations server processes by entering:

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

4. Upload the configuration data:

```
opccfgupld -add -subentity -configured \  
-upgrade <language_subfolder> <download_directory>
```

For example:

```
opccfgupld -add -subentity -configured \  
-upgrade ja_JP.SJIS /tmp/cfgdwn
```

5. After uploading data with `-add -subentity`, you can upload the data with `-replace -subentity` if you exclude the managed nodes:

- a. Copy the index file of the download:

```
download_directory /$LANG/*.idx
```

Example:


```
cp /tmp/cfgdwn/C/cfgdwn.idx /tmp/cfgdwn/C/nonodes.idx
```

- b. Modify the copied index file.

Remove the node bank section from the index file. This is everything from the line:

```
ENTITY NODE_BANK
```

To the semi colon (';') before the node defaults:

```
;
```

```
ENTITY NODE_DEFAULTS *
```

Remove the following line if it exists:

```
CONTENTS *;
```

- c. Upload your configuration data by using the command:

```
opccfgupld -replace -subentity -configured \  
-upgrade <old_locale> -index \  
<index_file> <upload_directory>
```

In this instance, *<index_file>* is the copied index file of the download.

For example:

```
opccfgupld -replace -subentity -configured \  
-upgrade ja_JP.SJIS -index \  
/tmp/cfgdwn/C/nonodes.idx /tmp/cfgdwn
```

HPOM 9.xx requires a UTF-8 locale to be used. Because the downloaded data is stored according to the old HPOM locale, the `opccfgupld` command might not find the data if you do not include the `-upgrade <old_locale>` option.

NOTE

With 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.

6. Start the HP Operations server processes by entering:

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

7. Upload your active messages.

If you downloaded your active messages, upload them now:

- 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
```

8. *In a cluster environment only:* Enable the HA resource group monitoring by running 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.

After the upgrade, specific customized configuration files can be restored from the backup, if needed.

Upgrading from HPOM 9.0x to HPOM 9.10

To upgrade HPOM from version 9.0x to version 9.10, complete these tasks:

- ❑ Task 1: “Verifying the Installation Requirements for the Management Server” on page 251
- ❑ Task 2: “Upgrading the Old Version of HPOM” on page 251

Verifying the Installation Requirements for the Management Server

When verifying the 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 9.0x 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 9.0x is installed and configured in the cluster environment.

Upgrading the Old Version of HPOM

The standard upgrade procedure can be executed with the `ovoupgrade_9.0x` script that is available for download from the following location:

ftp://ovweb.external.hp.com/pub/cpe/ito/latest_ovoinstall

To upgrade the old version of the HP Operations management server software, follow these steps:

1. Download the `ovoupgrade_9.0x` script.
2. Start the HPOM upgrade procedure:
 - If you are upgrading HPOM from a DVD-ROM, copy the `ovoupgrade_9.0x` script to `/tmp`, and then type the following:

```
/tmp/ovoupgrade_9.0x
```

- If you are upgrading HPOM using DVD content, copy the `ovoupgrade_9.0x` script to `<master_directory>/HPOMDVD/`.

For example, if you create the `/tmp` directory as a master directory, copy the `ovoupgrade_9.0x` script to `/tmp/HPOMDVD/`, and then start the `ovoupgrade_9.0x` script by typing the following:

```
/tmp/HPOMDVD/ovoupgrade_9.0x
```

IMPORTANT

In a cluster environment, the `ovoupgrade_9.0x` script must be run on all cluster nodes.

Make sure that you first perform the upgrade procedure on the active cluster node, and then on all passive cluster nodes. During the upgrade procedure on all passive cluster nodes, you may not perform a server switchover.

The following text appears:

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

```
Press Enter to verify that you want the upgrade procedure to start.
```

```
The ovoupgrade_9.0x script checks the HP Operations management server version. If the version is correct, you are prompted to enter the HPOM software package repository location where all server packages are located.
```

3. Press **Enter** to accept the default repository location, or enter the desired location.

```
The ovoupgrade_9.0x script checks the server setup package, detects the cluster environment, stops the HP Operations management server, and deinstalls any installed HPOM 9.0x patches.
```

```
The ovoupgrade_9.0x script then continues with installing the server setup package, which contains the server installation infrastructure.
```

4. Press **Enter** to continue.

The `ovouppgrade_9.0x` script checks core component packages, server packages, and agent packages, and then starts the package upgrade.

After all packages are upgraded, the `ovouppgrade_9.0x` script pauses so that you can manually install HPOM patches.

5. Press **Enter** to continue.

The `ovouppgrade_9.0x` script continues as follows:

- Creates the Instant-On license.
- Sets the embedded licensing configuration.
- Upgrades server add-ons.
- Starts the HP Operations management server.
- Upgrades the local agent.
- Performs a fix based on QCCR1A109471 (reuploads default server policies).
- Performs a fix based on QCCR1A90549 (recreates the table platforms).

6. After upgrading the HPOM software on the management server, you can check whether the upgrade was successful by reviewing the installation log files. For more information, see “Viewing the Installation Log Files” on page 81.

Upgrading the HPOM Java Operator UI

To upgrade the HPOM Java GUI, follow these steps:

1. Deinstall any previous version of the HPOM Java GUI from the client system.

For detailed information about deinstalling the Java GUI, see “Deinstalling the HPOM Java GUI” on page 178.

2. Install the new version of the HPOM Java GUI on the client system.

For details, see Chapter 3, “Installing the Java Operator GUI.”

Upgrading Service Navigator

To upgrade Service Navigator from version 8.xx to 9.10, follow these steps:

1. If service status logging is enabled and you want to migrate service status logs, perform the following:

- a. Download all service status logs by entering:

```
/opt/OV/bin/OpC/opcsvcdwn -file /tmp/svclogs
```

- b. Store the download data on a tape or a separate system.

2. Store the service and service logs repository files on a tape or a separate system:

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

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

3. Upgrade the HP Operations management server as described in “Upgrading HPOM to Version 9.10” on page 233.

NOTE

Service Navigator is installed automatically during the installation of the HPOM 9.10 management server.

4. If you downloaded service status logs, upload them now by entering:

```
/opt/OV/bin/OpC/opcsvcupl /tmp/svclogs
```

5. Stop the HP Operations management server by running the following command:

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

6. Restore the service and service logs repository files to their original location on the management server:

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

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

7. Start the HP Operations management server by running the following command:

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

8. Check the configuration and service assignments by entering the following:

```
/opt/OV/bin/OpC/opcservice -list
```

```
/opt/OV/bin/OpC/opcservice -operators
```

9. Upgrade the HPOM Java operator GUI if it is not already upgraded.

Upgrading Managed Nodes

IMPORTANT

The major version of your HP Operations agent software may not be higher than the version of your HP Operations management server software.

To upgrade the managed nodes to a newer version, run the `inst.sh` script by entering the following:

```
/opt/OV/bin/OpC/agtinstall/inst.sh
```

At the beginning, you must enter one or more systems for which software maintenance should be done and the managed node platform.

For detailed information, see the *inst.sh(IM)* manual page.

License Migration to HPOM 9.10

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 8.xx system to an HPOM 9.10 system or from an HPOM 9.0x system to an HPOM 9.10 system. HPOM 8.xx agent license passwords and HPOM 8.xx Target Connector license passwords are compatible with HPOM 9.10 and can be reused, while all HPOM 9.0x license passwords are compatible with HPOM 9.10.

License passwords for the Desktop Agent, Tier 0 Agent to Tier 4 Agent, and the Target Connector can be reused when migrating from an HPOM 8.xx system to HPOM 9.10. Other license passwords are either unavailable for HPOM 9.10 or must be moved through the HP Password Delivery Center.

HPOM 9.10 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 will 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 will be checked during runtime and license passwords without matching IP addresses will be ignored.

License Migration

To migrate license passwords from an HPOM 8.xx system to an HPOM 9.10 system or from an HPOM 9.0x system to an HPOM 9.10 system, follow these steps:

1. On the source system, copy the license passwords from the HPOM 8.xx source system to a safe place on the target system.

On the HPOM 8.xx system, the license passwords are located in the following file:

```
/var/opt/OV/HPOvLIC/LicFile.txt
```

On the HPOM 9.0x 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/HPOvLIC/LicFile.txt \  
<target_sys>:<directory>/HPOM8-LicFile-Backup.txt
```

2. On the HPOM 9.10 target system, install the license passwords selectively by using the GUI (recommended) or non-selectively 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.

Selectively by Using the AutoPass GUI

- a. On the HPOM 9.10 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 click **Install**.

Non-Selectively by Using the `ovolicense` Tool

On the HPOM 9.10 target system, call the `ovolicense` tool to import the license passwords from the backup file.

Example:

Upgrading HPOM to Version 9.10
License Migration to HPOM 9.10

```
ovolicense -i -a HPOM -f \  
<directory>/HPOM8-LicFile-Backup.txt
```

This imports all passwords from the specified files.

Cluster Environment

Since the uploaded configuration does not overwrite the current management server configuration, the part of server configuration for cluster environment will be preserved. No additional server configuration is required.

In This Chapter

This chapter describes the following:

- ❑ Installation and configuration of the HP Operations management server in a Sun cluster environment
- ❑ Deinstallation of the HP Operations management server from cluster nodes
- ❑ Upgrade of the HP Operations management server in a Sun cluster environment

NOTE

See the *HPOM Administrator's Reference* for detailed information about the administration of the HP Operations management server in a cluster environment.

Before proceeding with the installation and configuration of the HP Operations management server in a Sun cluster environment, consider the following Sun 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.

Network Interface

Group

A group of network interfaces.

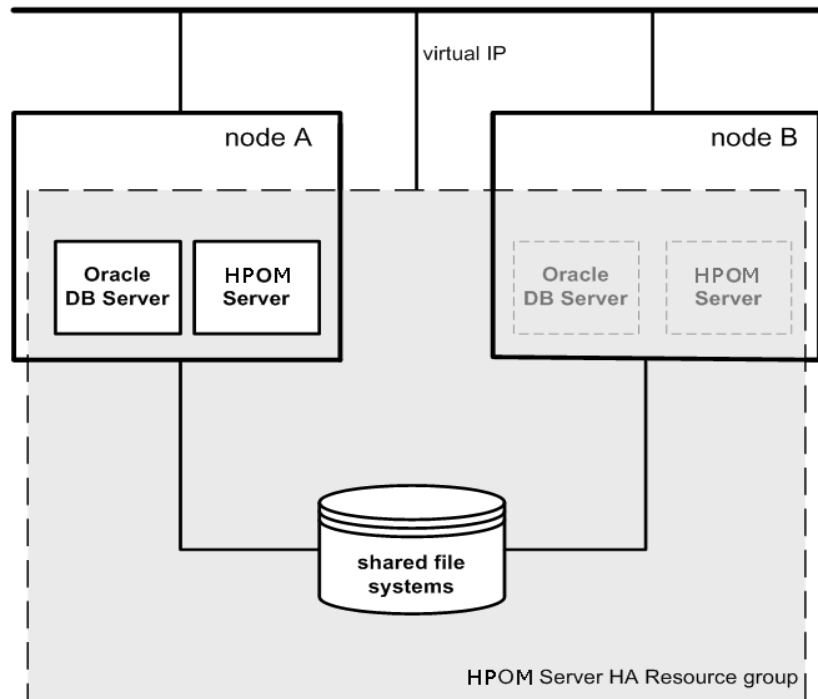
Configuration Scenarios

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.

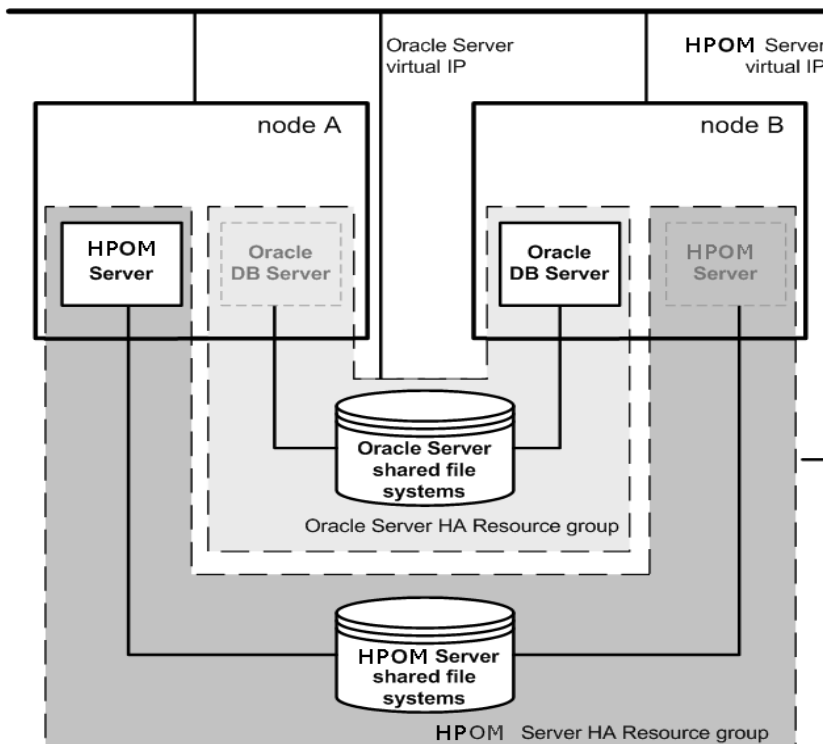
The HP Operations management server and the Oracle Database server are part of the same HA resource group.



❑ **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 have been 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.

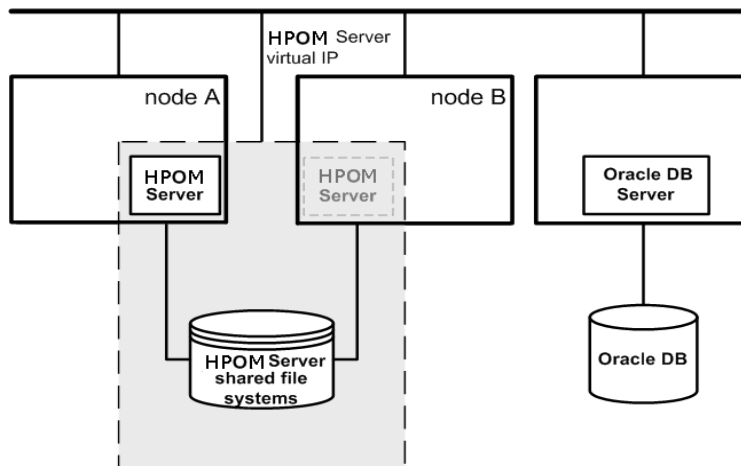


❑ **Independent database server configuration**

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 Sun Cluster environment, you *must* meet the following requirements:

- ❑ Solaris 10
- ❑ Sun Cluster 3.2

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 306.

Creating a Network Interface Group

Before you start with the installation of the HP Operations management server in a Sun Cluster environment, you need to create a Network Interface Group on all the cluster nodes.

IP Network Multipathing is used for the HA networking. For this reason, you must put a specific network interface into the IPMP group.

Assign the network interface to a specific IPMP group.

For example:

```
ifconfig hme0 group ipmp
```

NOTE

You must perform the same IPMP-related configuration steps on all the cluster nodes before installing the HP Operations management server.

To check if the interface is properly assigned, use the `ifconfig -a` command.

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.

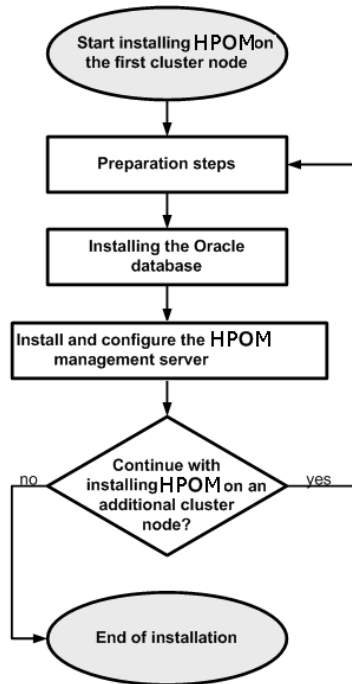
To install and configure the HP Operations management server in a cluster environment, complete these tasks:

- ❑ Task 1: “Before You Install the HP Operations Management Server on the First Cluster Node” on page 273
- ❑ Task 2: “Before You Install the HP Operations Management Server on Additional Cluster Nodes” on page 299
- ❑ Task 3: “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 306
- ❑ Task 4: “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 313

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.

Figure 10-1 **Flow of the HP Operations Management Server Installation and Configuration**



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 273
- ❑ Task 2: “Before You Install the HP Operations Management Server on Additional Cluster Nodes” on page 299

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 274.

❑ **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 283.

❑ **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 294.

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:

- ❑ If you are using VERITAS Volume Manager:
 - 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 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.

- ❑ If you are using Solaris Volume Manager:
 - a. Define the `ov-dg` disk device group consisting of at least one shared disk for the HA resource group. The disk device group is represented as a disk set in this case.
 - b. Define the following metadevices or volumes within the `ov-dg` disk device group:
 - `d0`

- d1
- d2
- d3
- d4*
- d5**

* 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.

- If you are using Solaris ZFS:
 - a. Define the `ov-pool` ZFS storage pool consisting of at least one shared disk for HA resource group.
 - b. Define the following ZFS datasets within the `ov-pool` ZFS storage pool with the `mountpoint` property listed in Table 10-1:

Table 10-1 ZFS Datasets and the mountpoint Property

ZFS Dataset	mountpoint Property
<code>ov-etc</code>	<code>/etc/opt/OV/share</code>
<code>ov-var</code>	<code>/var/opt/OV/share</code>
<code>ov-lcore</code>	<code>/var/opt/OV/shared/server</code>
<code>ov-ora-data</code>	<code>/opt/oradata/openview</code>
<code>ov-ora-index^a</code>	Oracle Database index directory (<i>optional</i>)
<code>ov-ora-core^b</code>	Oracle Database server binaries (<i>optional</i>)

- a. If the Oracle Database index directory is different from the Oracle data directory.
- b. If you choose to install Oracle Database server binaries on a shared disk.

IMPORTANT

All file systems in the `ov-pool` ZFS storage pool must have the `canmount` property set to `yes`.

NOTE

When defining the ZFS storage pool or any of the ZFS datasets within the storage pool, 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 server database
- HP Operations 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 can select an alternative mount point. The default is the following:

```
/opt/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 10-2 Disk Space Required for Shared File Systems

Shared File System	Recommended	Initial
<code>/etc/opt/OV/share</code>	100 MB	2 MB
<code>/var/opt/OV/share</code>	1 GB ^a	600 MB
<code>/var/opt/OV/shared/server</code>	100 MB	1 MB
<code>/opt/oradata/openview</code>	2 GB ^b	900 MB
Oracle Database index directory (<i>optional</i>)	100 MB ^b	50 MB
Oracle Database server binaries (<i>optional</i>)	10 GB	8 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.

NOTE

If you are using the ZFS file system, you can ignore the recommendations listed in Table 10-2. The disk space is assigned to the shared file system automatically.

The size of the `ov-pool` ZFS storage pool must be greater than the sum of the used shared file systems.

4. Import the following:

- ❑ If you are using VERITAS Volume Manager or Solaris Volume Manager, import the `ov-dg` disk device group on the current node by entering the following command:

```
/usr/cluster/bin/cldg online -n <hostname> ov-dg
```

- ❑ If you are using Solaris ZFS, import the `ov-pool` ZFS storage pool on the current node by entering the following command:

```
/usr/sbin/zpool import ov-pool
```

5. Mount the shared file systems on the prepared mount points:

- ❑ If you are using VERITAS Volume Manager, mount the shared file systems on the prepared mount points as follows:

```
a. /usr/sbin/mount -F <FSType> \  
/dev/vx/dsk/ov-dg/ov-volume-etc /etc/opt/OV/share
```

```
b. /usr/sbin/mount -F <FSType> \  
/dev/vx/dsk/ov-dg/ov-volume-var /var/opt/OV/share
```

```
c. /usr/sbin/mount -F <FSType> \  
/dev/vx/dsk/ov-dg/ov-volume-lcore \  
/var/opt/OV/shared/server
```

```
d. /usr/sbin/mount -F <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 have chosen for the HP Operations 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:

```
/usr/sbin/mount -F <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:

```
/usr/sbin/mount -F <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 have chosen for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

- ❑ If you are using Solaris Volume Manager, mount the shared file systems on the prepared mount points as follows:

- a. `/usr/sbin/mount -F ufs /dev/md/ov-dg/dsk/d0 \
/etc/opt/OV/share`
- b. `/usr/sbin/mount -F ufs /dev/md/ov-dg/dsk/d1 \
/var/opt/OV/share`
- c. `/usr/sbin/mount -F ufs /dev/md/ov-dg/dsk/d2 \
/var/opt/OV/shared/server`
- d. `/usr/sbin/mount -F ufs /dev/md/ov-dg/dsk/d3 \
/<oracle_database_mount_point>`

In this instance, `<oracle_database_mount_point>` is the mount point you have chosen for the HP Operations server database.

- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/usr/sbin/mount -F ufs /dev/md/ov-dg/dsk/d4 \  
/<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 ufs /dev/md/ov-dg/dsk/d5 \  
/<oracle_binaries_mount_point>
```

In this instance, `<oracle_binaries_mount_point>` is the mount point you have chosen for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

- ❑ If you are using Solaris ZFS, check whether the ZFS datasets are imported and the shared file systems are mounted by running the following command:

```
/usr/sbin/zfs list -o name,mounted,mountpoint \
| grep 'ov-pool/'
```

If the ZFS datasets are imported and the shared file systems are mounted, an output similar to the following appears:

```
ov-pool/ov-etc          yes    /etc/opt/OV/share
ov-pool/ov-lcore       yes    /var/opt/OV/share
ov-pool/ov-var         yes    /var/opt/OV/shared/server
ov-pool/ov-ora-data    yes    /opt/oradata/openview
ov-pool/ov-ora-index   yes    /opt/oradata/index*
ov-pool/ov-ora-core    yes    /opt/oracle**
```

* 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.

6. If you are using VERITAS Volume Manager or Solaris Volume Manager, edit the `/etc/vfstab` file.

If you are using Solaris ZFS, ignore this step.

- If you are using VERITAS Volume Manager, edit the `/etc/vfstab` file, and add the following lines:

- a. `/dev/vx/dsk/ov-dg/ov-volume-etc \`
`/dev/vx/rdisk/ov-dg/ov-volume-etc \`
`/etc/opt/OV/share <FSType> 1 no -`
- b. `/dev/vx/dsk/ov-dg/ov-volume-var \`
`/dev/vx/rdisk/ov-dg/ov-volume-var \`
`/var/opt/OV/share <FSType> 1 no -`
- c. `/dev/vx/dsk/ov-dg/ov-volume-lcore \`
`/dev/vx/rdisk/ov-dg/ov-volume-lcore \`
`/var/opt/OV/shared/server <FSType> 1 no -`
- d. `/dev/vx/dsk/ov-dg/ov-volume-ora-data \`
`/dev/vx/rdisk/ov-dg/ov-volume-ora-data \`
`/<oracle_database_mount_point> <FSType> 1 no -`

In this instance, `<oracle_database_mount_point>` is the mount point you have chosen for the HP Operations 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:

```
/dev/vx/dsk/ov-dg/ov-volume-ora-index \
/dev/vx/rdsk/ov-dg/ov-volume-ora-index \
/<oracle_database_index_mount_point> \
<FSType> 1 no -
```

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:

```
/dev/vx/dsk/ov-dg/ov-volume-ora-core \
/dev/vx/rdsk/ov-dg/ov-volume-ora-core \
/<oracle_binaries_mount_point> <FSType> 1 no -
```

In this instance, `<oracle_binaries_mount_point>` is the mount point you have chosen for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

- If you are using Solaris Volume Manager, edit the `/etc/vfstab` file, and add the following lines:

- a. `/dev/md/ov-dg/dsk/d0 \`
`/dev/md/ov-dg/rdsk/d0 \`
`/etc/opt/OV/share ufs 1 no -`
- b. `/dev/md/ov-dg/dsk/d1 \`
`/dev/md/ov-dg/rdsk/d1 \`
`/var/opt/OV/share ufs 1 no -`
- c. `/dev/md/ov-dg/dsk/d2 \`
`/dev/md/ov-dg/rdsk/d2 \`
`/var/opt/OV/shared/server ufs 1 no -`
- d. `/dev/md/ov-dg/dsk/d3 \`
`/dev/md/ov-dg/rdsk/d3 \`
`/<oracle_database_mount_point> ufs 1 no -`

Preparation Steps

In this instance, `<oracle_database_mount_point>` is the mount point you have chosen for the HP Operations server database.

- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/dev/md/ov-dg/dsk/d4 \
/dev/md/ov-dg/rdsk/d4 \
/<oracle_database_index_mount_point> ufs 1 no -
```

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:

```
/dev/md/ov-dg/dsk/d5 \
/dev/md/ov-dg/rdsk/d5 \
/<oracle_binaries_mount_point> ufs 1 no -
```

In this instance, `<oracle_binaries_mount_point>` is the mount point you have chosen for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

7. Start the Virtual Network IP by using the `ifconfig` command:

```
ifconfig <network_interface>:1
```

For example, you can configure the IP address as follows:

- a. `ifconfig <network_interface>:1 plumb`
 b. `ifconfig <network_interface>:1 inet \`
`<IP> netmask 255.255.0.0 up`

In these instances, `<network_interface>` is the physical network interface used for the virtual IP (`hme0` is used as the network interface on Solaris) and `<IP>` is the IP address of the virtual host that you have 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 306.

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:
 - If you are using VERITAS Volume Manager:
 - 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-var`
 - `ov-volume-etc`
 - `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.

Preparation Steps

- ❑ If you are using Solaris Volume Manager:
 - a. Define the `ov-dg` disk device group consisting of at least one shared disk for the HA resource group. The disk device group is represented as a disk set in this case.
 - b. Define the following metadevices or volumes within the `ov-dg` disk device group:
 - `d0`
 - `d1`
 - `d2`
 - c. Define the `ovoracle-dg` disk device group consisting of at least one shared disk for the HA resource group. The disk device group is represented as a disk set in this case.
 - d. Define the following volumes within the `ovoracle-dg` disk device group:
 - `d0`
 - `d1*`
 - `d2**`

* 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.
- ❑ If you are using Solaris ZFS:
 - a. Define the `ov-pool` ZFS storage pool consisting of at least one shared disk for HA resource group.
 - b. Define the following ZFS datasets within the `ov-pool` ZFS storage pool with the `mountpoint` property listed in Table 10-3:

Table 10-3 ZFS Datasets and the mountpoint Property

ZFS Dataset	mountpoint Property
<code>ov-etc</code>	<code>/etc/opt/OV/share</code>
<code>ov-var</code>	<code>/var/opt/OV/share</code>

Table 10-3 ZFS Datasets and the mountpoint Property

ZFS Dataset	mountpoint Property
ov-lcore	/var/opt/OV/shared/server

- c. Define the `ovoracle-pool` ZFS storage pool consisting of at least one shared disk for the HA resource group.
- d. Define the following ZFS datasets within the `ovoracle-pool` ZFS storage pool with the mountpoint property listed in Table 10-4:

Table 10-4 ZFS Datasets and the mountpoint Property

ZFS Dataset	mountpoint Property
ov-ora-data	/opt/oradata/openview
ov-ora-index ^a	Oracle Database index directory (<i>optional</i>)
ov-ora-core ^b	Oracle Database server binaries (<i>optional</i>)

- a. If the Oracle Database index directory is different from the Oracle data directory.
- b. If you choose to install Oracle Database server binaries on a shared disk.

IMPORTANT

All file systems in the `ov-pool` and `ovoracle-pool` ZFS storage pools must have the `canmount` property set to `yes`.

NOTE

When defining the ZFS storage pool or any of the ZFS datasets within the storage pool, 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 server database
- HP Operations 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 can select an alternative mount point. The default is the following:

```
/opt/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 10-5 Disk Space Required for Shared File Systems

Shared File System	Recommended	Initial
<code>/etc/opt/OV/share</code>	100 MB	2 MB
<code>/var/opt/OV/share</code>	1 GB ^a	600 MB
<code>/var/opt/OV/shared/server</code>	100 MB	1 MB
<code>/opt/oradata/openview</code>	2 GB ^b	900 MB
Oracle Database index directory (<i>optional</i>)	100 MB ^b	50 MB
Oracle Database server binaries (<i>optional</i>)	10 GB	8 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.

NOTE

If you are using the ZFS file system, you can ignore the recommendations listed in Table 10-5.

The size of the `ov-pool` ZFS storage pool as well as the size of the `ovoracle-pool` ZFS storage pool must be greater than the sum of the used shared file systems.

4. Import the following:

- ❑ If you are using VERITAS Volume Manager or Solaris Volume Manager, import the `ov-dg` and `ovoracle-dg` disk device groups on the current node by entering the following:

```
/usr/cluster/bin/cldg online -n <hostname> ov-dg
```

```
/usr/cluster/bin/cldg online -n <hostname> ovoracle-dg
```

- ❑ If you are using Solaris ZFS, import the `ov-pool` and `ovoracle-pool` ZFS storage pools on the current node by entering the following commands:

```
/usr/sbin/zpool import ov-pool
```

```
/usr/sbin/zpool import ovracle-pool
```

5. Mount the shared file systems on the prepared mount points:

- ❑ If you are using VERITAS Volume Manager, mount the shared file systems on the prepared mount points as follows:

a. `/usr/sbin/mount -F <FSType> \
/dev/vx/dsk/ov-dg/ov-volume-etc /etc/opt/OV/share`

b. `/usr/sbin/mount -F <FSType> \
/dev/vx/dsk/ov-dg/ov-volume-var /var/opt/OV/share`

c. `/usr/sbin/mount -F <FSType> \
/dev/vx/dsk/ov-dg/ov-volume-lcore \
/var/opt/OV/shared/server`

d. `/usr/sbin/mount -F <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 have chosen for the HP Operations 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:

```
/usr/sbin/mount -F <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 Oracle Database index directory.

- f. *Optional:* If you choose to install Oracle Database server binaries on a shared disk:

```
/usr/sbin/mount -F <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 have chosen for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

- If you are using Solaris Volume Manager, mount the shared file systems on the prepared mount points as follows:

- a. `/usr/sbin/mount -F ufs /dev/md/ov-dg/dsk/d0 \
/etc/opt/OV/share`
- b. `/usr/sbin/mount -F ufs /dev/md/ov-dg/dsk/d1 \
/var/opt/OV/share`
- c. `/usr/sbin/mount -F ufs /dev/md/ov-dg/dsk/d2 \
/var/opt/OV/shared/server`
- d. `/usr/sbin/mount -F ufs \
/dev/md/ovoracle-dg/dsk/d0 \
/<oracle_database_mount_point>`

In this instance, `<oracle_database_mount_point>` is the mount point you have chosen for the HP Operations server database.

- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/usr/sbin/mount -F ufs \  
/dev/md/ovoracle-dg/dsk/d1 \  
/<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 ufs \  
/dev/md/ovoracle-dg/dsk/d2 \  
/<oracle_binaries_mount_point>
```

In this instance, `<oracle_binaries_mount_point>` is the mount point you have chosen for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

- ❑ If you are using Solaris ZFS:
 - a. Check whether the ZFS datasets of the `ov-pool` are imported and the shared file systems are mounted by running the following command:

```
/usr/sbin/zfs list -o name,mounted,mountpoint \  
| grep 'ov-pool/'
```

If the ZFS datasets are imported and the shared file systems are mounted, an output similar to the following appears:

```
ov-pool/ov-etc      yes      /etc/opt/OV/share  
ov-pool/ov-lcore   yes      /var/opt/OV/share  
ov-pool/ov-var     yes      /var/opt/OV/shared/server
```

- b. Check whether the ZFS datasets of the `ovoracle-pool` are imported and the shared file systems are mounted by running the following command:

```
/usr/sbin/zfs list -o name,mounted,mountpoint \  
| grep 'ovoracle-pool/'
```

If the ZFS datasets are imported and the shared file systems are mounted, an output similar to the following appears:

```
ovoracle-pool/ov-ora-data  yes  /opt/oradata/openview  
ovoracle-pool/ov-ora-index yes  /opt/oradata/index*  
ovoracle-pool/ov-ora-core yes  /opt/oracle**
```

* 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.

6. If you are using VERITAS Volume Manager or Solaris Volume Manager, edit the `/etc/vfstab` file.

If you are using Solaris ZFS, ignore this step.

- ❑ If you are using VERITAS Volume Manager, edit the `/etc/vfstab` file, and add the following lines:

- a. `/dev/vx/dsk/ov-dg/ov-volume-etc \
/dev/vx/rdsk/ov-dg/ov-volume-etc \
/etc/opt/OV/share <FSType> 1 no -`

- b. `/dev/vx/dsk/ov-dg/ov-volume-var \`
`/dev/vx/rdisk/ov-dg/ov-volume-var \`
`/var/opt/OV/share <FSType> 1 no -`
- c. `/dev/vx/dsk/ov-dg/ov-volume-lcore \`
`/dev/vx/rdisk/ov-dg/ov-volume-lcore \`
`/var/opt/OV/shared/server <FSType> 1 no -`
- d. `/dev/vx/dsk/ovoracle-dg/ov-volume-ora-data \`
`/dev/vx/rdisk/ovoracle-dg/ov-volume-ora-data \`
`/<oracle_database_mount_point> <FSType> 1 no -`

In this instance, *<oracle_database_mount_point>* is the mount point you have chosen for the HP Operations 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:

```
/dev/vx/dsk/ovoracle-dg/ov-volume-ora-index\  
/dev/vx/rdisk/ovoracle-dg/ov-volume-ora-index \  
/<oracle_database_index_mount_point> \  
<FSType> 1 no -
```

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:

```
/dev/vx/dsk/ovoracle-dg/ov-volume-ora-core \  
/dev/vx/rdisk/ovoracle-dg/ov-volume-ora-core \  
/<oracle_binaries_mount_point> <FSType> 1 no -
```

In this instance, *<oracle_binaries_mount_point>* is the mount point you have chosen for the Oracle Database server binaries installation (equal to the value of the ORACLE_BASE variable).

- If you are using Solaris Volume Manager, edit the `/etc/vfstab` file, and add the following lines:

- a. `/dev/md/ov-dg/dsk/d0 \
/dev/md/ov-dg/rdsk/d0 \
/etc/opt/OV/share ufs 1 no -`

Preparation Steps

- b. `/dev/md/ov-dg/dsk/d1 \`
`/dev/md/ov-dg/rdsk/d1\`
`/var/opt/OV/share ufs 1 no -`
- c. `/dev/md/ov-dg/dsk/d2 \`
`/dev/md/ov-dg/rdsk/d2 \`
`/var/opt/OV/shared/server ufs 1 no -`
- d. `/dev/md/dsk/ovoracle-dg/dsk/d0 \`
`/dev/md/rdsk/ovoracle-dg/dsk/d0 \`
`/<oracle_database_mount_point> ufs 1 no -`

In this instance, *<oracle_database_mount_point>* is the mount point you have chosen for the HP Operations server database.

- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/dev/md/dsk/ovoracle-dg/dsk/d1 \
/dev/md/rdsk/ovoracle-dg/dsk/d1 \
/<oracle_database_index_mount_point> ufs 1 no -
```

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:

```
/dev/md/dsk/ovoracle-dg/dsk/d2 \
/dev/md/rdsk/ovoracle-dg/dsk/d2 \
/<oracle_binaries_mount_point> ufs 1 no -
```

In this instance, *<oracle_binaries_mount_point>* is the mount point you have chosen for the Oracle Database server binaries installation (equal to the value of the ORACLE_BASE variable).

7. Start the HP Operations server Virtual Network IP by using the `ifconfig` command:

```
ifconfig <network_interface>:1
```

For example, you can configure the IP address as follows:

- a. `ifconfig <network_interface>:1 plumb`
- b. `ifconfig <network_interface>:1 inet \`
`<IP> netmask 255.255.0.0 up`

In these instances, `<network_interface>` is the physical network interface used for the virtual IP (hme0 is used as the network interface on Solaris) and `<IP>` is the IP address of the virtual host that you have previously selected.

8. Start the Oracle Virtual Network IP by using the `ifconfig` command:

```
ifconfig <network_interface>:2
```

For example, you can configure the IP address as follows:

- a. **ifconfig <network_interface>:2 plumb**
- b. **ifconfig <network_interface>:2 inet \
<IP> netmask 255.255.0.0 up**

In these instances, `<network_interface>` is the physical network interface used for the virtual IP (hme0 is used as the network interface on Solaris) and `<IP>` is the IP address of the Oracle virtual host that 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 306.

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:

- ❑ If you are using VERITAS Volume Manager:
 - 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-var`
 - `ov-volume-etc`
 - `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.

- ❑ If you are using Solaris Volume Manager:
 - a. Define the `ov-dg` disk device group consisting of at least one shared disk for the HA resource group. The disk device group is represented as a disk set in this case.
 - b. Define the following metadevices or volumes within the `ov-dg` disk device group:
 - `d0`
 - `d1`
 - `d2`
- ❑ If you are using Solaris ZFS:
 - a. Define the `ov-pool` ZFS storage pool consisting of at least one shared disk for HA resource group.

- b. Define the following ZFS datasets within the `ov-pool` ZFS storage pool with the `mountpoint` property listed in Table 10-6:

Table 10-6 ZFS Datasets and the `mountpoint` Property

ZFS Dataset	mountpoint Property
<code>ov-etc</code>	<code>/etc/opt/OV/share</code>
<code>ov-var</code>	<code>/var/opt/OV/share</code>
<code>ov-lcore</code>	<code>/var/opt/OV/shared/server</code>

IMPORTANT

All file systems in the `ov-pool` ZFS storage pool must have the `canmount` property set to `yes`.

NOTE

When defining the ZFS storage pool or any of the ZFS datasets within the storage pool, 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 10-7 **Disk Space Required for Shared File Systems**

Shared File System	Recommended	Initial
/etc/opt/OV/share	100 MB	2 MB
/var/opt/OV/share	1 GB ^a	600 MB
/var/opt/OV/shared/server	100 MB	1 MB

a. Further disk space will be required when SPIs are installed.

NOTE

If you are using the ZFS file system, you can ignore the recommendations listed in Table 10-7. The disk space is assigned to the shared file system automatically.

The size of the `ov-pool` ZFS storage pool must be greater than the sum of the used shared file systems.

4. Import the following:

- ❑ If you are using VERITAS Volume Manager or Solaris Volume Manager, import the `ov-dg` disk device group on the current node by entering the following command:

```
/usr/cluster/bin/cldg online -n <hostname> ov-dg
```

- ❑ If you are using Solaris ZFS, import the `ov-pool` ZFS storage pool on the current node by entering the following command:

```
/usr/sbin/zpool import ov-pool
```

5. Mount the shared file systems on the prepared mount points:

- ❑ If you are using VERITAS Volume Manager, mount the shared file systems on the prepared mount points as follows:

a. **/usr/sbin/mount -F <FSType> \
/dev/vx/dsk/ov-dg/ov-volume-etc /etc/opt/OV/share**

b. **/usr/sbin/mount -F <FSType> \
/dev/vx/dsk/ov-dg/ov-volume-var /var/opt/OV/share**


```
c. /usr/sbin/mount -F <FSType> \  
   /dev/vx/dsk/ov-dg/ov-volume-lcore \  
   /var/opt/OV/shared/server
```

- If you are using Solaris Volume Manager, mount the shared file systems on the prepared mount points as follows:

```
a. /usr/sbin/mount -F ufs \  
   /dev/md/ov-dg/dsk/d0 /etc/opt/OV/share
```

```
b. /usr/sbin/mount -F ufs \  
   /dev/md/ov-dg/dsk/d1 /var/opt/OV/share
```

```
c. /usr/sbin/mount -F ufs \  
   /dev/md/ov-dg/dsk/d2 /var/opt/OV/shared/server
```

- If you are using Solaris ZFS, check whether the ZFS datasets are imported and the shared file systems are mounted by running the following command:

```
/usr/sbin/zfs list -o name,mounted,mountpoint \  
| grep 'ov-pool/'
```

If the ZFS datasets are imported and the shared file systems are mounted, an output similar to the following appears:

```
ov-pool/ov-etc          yes      /etc/opt/OV/share  
ov-pool/ov-lcore       yes      /var/opt/OV/share  
ov-pool/ov-var         yes      /var/opt/OV/shared/server
```

6. If you are using VERITAS Volume Manager or Solaris Volume Manager, edit the `/etc/vfstab` file.

If you are using Solaris ZFS, ignore this step.

- If you are using VERITAS Volume Manager, edit the `/etc/vfstab` file, and add the following lines:

```
a. /dev/vx/dsk/ov-dg/ov-volume-etc \  
   /dev/vx/rdisk/ov-dg/ov-volume-etc \  
   /etc/opt/OV/share <FSType> 1 no -
```

```
b. /dev/vx/dsk/ov-dg/ov-volume-var \  
   /dev/vx/rdisk/ov-dg/ov-volume-var \  
   /var/opt/OV/share <FSType> 1 no -
```

Preparation Steps

```
c. /dev/vx/dsk/ov-dg/ov-volume-lcore \
   /dev/vx/rdsk/ov-dg/ov-volume-lcore \
   /var/opt/OV/shared/server <FSType> 1 no -
```

- If you are using Solaris Volume Manager, edit the `/etc/vfstab` file, and add the following lines:

```
a. /dev/md/ov-dg/dsk/d0 \
   /dev/md/ov-dg/rdsk/d0 \
   /etc/opt/OV/share ufs 1 no -
```

```
b. /dev/md/ov-dg/dsk/d1 \
   /dev/md/ov-dg/rdsk/d1 \
   /var/opt/OV/share ufs 1 no -
```

```
c. /dev/md/ov-dg/dsk/d2 \
   /dev/md/ov-dg/rdsk/d2 \
   /var/opt/OV/shared/server ufs 1 no -
```

7. Start the Virtual Network IP by using the `ifconfig` command:

```
ifconfig <network_interface>:1
```

For example, you can configure the IP address as follows:

```
a. ifconfig <network_interface>:1 plumb
b. ifconfig <network_interface>:1 inet \
   <IP> netmask 255.255.0.0 up
```

In these instances, `<network_interface>` is the physical network interface used for the virtual IP (`hme0` is used as the network interface on Solaris) and `<IP>` is the IP address of the virtual host that 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 except one step where you edit the `/etc/vfstab` file. For details, see “Editing the `/etc/vfstab` File” on page 300.

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 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.
- ❑ 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.

Editing the `/etc/vfstab` File

If you are using VERITAS Volume Manager or Solaris Volume Manager, you need to edit the `/etc/vfstab` file. When you edit the `/etc/vfstab` file, it is important that you choose the appropriate preparation procedure depending on the cluster environment you want to configure. If you are using ZFS file systems, you do not need to perform this procedure. Choose one of the following:

- ❑ *Cluster nodes are in a basic environment:*

When cluster nodes are in the basic environment, edit the `/etc/vfstab` file as follows:

- If you are using VERITAS Volume Manager, add the following lines:
 - a. `/dev/vx/dsk/ov-dg/ov-volume-etc \`
`/dev/vx/rdsk/ov-dg/ov-volume-etc \`
`/etc/opt/OV/share vxfs 1 no -`
 - b. `/dev/vx/dsk/ov-dg/ov-volume-var \`
`/dev/vx/rdsk/ov-dg/ov-volume-var \`
`/var/opt/OV/share vxfs 1 no -`
 - c. `/dev/vx/dsk/ov-dg/ov-volume-lcore \`
`/dev/vx/rdsk/ov-dg/ov-volume-lcore \`
`/var/opt/OV/shared/server vxfs 1 no -`

- d. `/dev/vx/dsk/ov-dg/ov-volume-ora-data \`
`/dev/vx/rdsk/ov-dg/ov-volume-ora-data \`
`/opt/oradata vxfs 1 no -`
- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/dev/vx/dsk/ov-dg/ov-volume-ora-index \  
/dev/vx/rdsk/ov-dg/ov-volume-ora-index \  
<oracle_database_index_mount_point> vxfs 1 no -
```

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:

```
/dev/vx/dsk/ov-dg/ov-volume-ora-core \  
/dev/vx/rdsk/ov-dg/ov-volume-ora-core \  
<oracle_binaries_mount_point> vxfs 1 no -
```

In this instance, `<oracle_binaries_mount_point>` is the mount point you have chosen for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

NOTE

If you are using file systems of a type other than VxFS, replace `vxfs` with the file system type name.

- If you are using Solaris Volume Manager, add the following lines:
 - a. `/dev/md/dsk/ov-dg/dsk/d0 \
/dev/md/rdsk/ov-dg/rdsk/d0 \
/etc/opt/OV/share ufs 1 no -`
 - b. `/dev/md/dsk/ov-dg/dsk/d1 \
/dev/vx/rdsk/ov-dg/rdsk/d1 \
/var/opt/OV/share ufs 1 no -`
 - c. `/dev/md/dsk/ov-dg/dsk/d2 \
/dev/vx/rdsk/ov-dg/rdsk/d2 \
/var/opt/OV/shared/server ufs 1 no -`

Preparation Steps

- d. `/dev/md/dsk/ov-dg/dsk/d3 \`
`/dev/md/rdisk/ov-dg/rdsk/d3 \`
`/opt/oradata ufs 1 no -`
- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/dev/md/dsk/ov-dg/dsk/d4 \
/dev/vx/rdsk/ov-dg/rdsk/d4 \
/<oracle_database_index_mount_point> ufs 1 no -
```

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:

```
/dev/md/dsk/ov-dg/dsk/d5 \
/dev/vx/rdsk/ov-dg/rdsk/d5 \
/<oracle_binaries_mount_point> ufs 1 no -
```

In this instance, `<oracle_binaries_mount_point>` is the mount point you have chosen for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

- ❑ *Cluster nodes are in a decoupled environment:*

When cluster nodes are in the decoupled environment, edit the `/etc/vfstab` file as follows:

- If you are using VERITAS Volume Manager, add the following lines:

- a. `/dev/vx/dsk/ov-dg/ov-volume-etc \`
`/dev/vx/rdsk/ov-dg/ov-volume-etc \`
`/etc/opt/OV/share vxfs 1 no -`
- b. `/dev/vx/dsk/ov-dg/ov-volume-var \`
`/dev/vx/rdsk/ov-dg/ov-volume-var \`
`/var/opt/OV/share vxfs 1 no -`
- c. `/dev/vx/dsk/ov-dg/ov-volume-lcore \`
`/dev/vx/rdsk/ov-dg/ov-volume-lcore \`
`/var/opt/OV/shared/server vxfs 1 no -`

d. `/dev/vx/dsk/ovoracle-dg/ov-volume-ora-data \`
`/dev/vx/rdisk/ovoracle-dg/ov-volume-ora-data \`
`/opt/oradata vxfs 1 no -`

e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/dev/vx/dsk/ovoracle-dg/ov-volume-ora-index \  
/dev/vx/rdisk/ovoracle-dg/ov-volume-ora-index \  
/<oracle_database_index_mount_point> vxfs 1 no -
```

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:

```
/dev/vx/dsk/ovoracle-dg/ov-volume-ora-core \  
/dev/vx/rdisk/ovoracle-dg/ov-volume-ora-core \  
/<oracle_binaries_mount_point> vxfs 1 no -
```

In this instance, `<oracle_binaries_mount_point>` is the mount point you have chosen for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

NOTE

If you are using file systems of a type other than VxFS, replace `vxfs` with the file system type name.

• If you are using Solaris Volume Manager, add the following lines:

a. `/dev/md/dsk/ov-dg/dsk/d0 \
/dev/md/rdisk/ov-dg/rdisk/d0 \
/etc/opt/OV/share ufs 1 no -`

b. `/dev/md/dsk/ov-dg/dsk/d1 \
/dev/vx/rdisk/ov-dg/rdisk/d1 \
/var/opt/OV/share ufs 1 no -`

c. `/dev/md/dsk/ov-dg/dsk/d2 \
/dev/vx/rdisk/ov-dg/rdisk/d2 \
/var/opt/OV/shared/server ufs 1 no -`

Preparation Steps

- d. `/dev/md/dsk/ovoracle-dg/dsk/d0 \`
`/dev/md/rdisk/ovoracle-dg/rdisk/d0 \`
`/opt/oradata ufs 1 no -`
- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/dev/md/dsk/ovoracle-dg/dsk/d1 \
/dev/vx/rdisk/ovoracle-dg/rdisk/d1 \
/<oracle_database_index_mount_point> ufs 1 no -
```

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:

```
/dev/md/dsk/ovoracle-dg/dsk/d2 \
/dev/vx/rdisk/ovoracle-dg/rdisk/d2 \
/<oracle_binaries_mount_point> ufs 1 no -
```

In this instance, `<oracle_binaries_mount_point>` is the mount point you have chosen for the Oracle Database server binaries installation (equal to the value of the `ORACLE_BASE` variable).

- *Cluster environment uses an independent database server:*

When the cluster environment uses the independent database server, edit the `/etc/vfstab` file as follows:

- If you are using VERITAS Volume Manager, add the following lines:

- a. `/dev/vx/dsk/ov-dg/ov-volume-etc \`
`/dev/vx/rdisk/ov-dg/ov-volume-etc \`
`/etc/opt/OV/share vxfs 1 no -`
- b. `/dev/vx/dsk/ov-dg/ov-volume-var \`
`/dev/vx/rdisk/ov-dg/ov-volume-var \`
`/var/opt/OV/share vxfs 1 no -`
- c. `/dev/vx/dsk/ov-dg/ov-volume-lcore \`
`/dev/vx/rdisk/ov-dg/ov-volume-lcore \`
`/var/opt/OV/shared/server vxfs 1 no -`

NOTE

If you are using file systems of a type other than VxFS, replace `vxf`s with the file system type name.

- If you are using Solaris Volume Manager, add the following lines:
 - a.

```
/dev/md/dsk/ov-dg/dsk/d0 \  
/dev/md/rdisk/ov-dg/rdisk/d0 \  
/etc/opt/OV/share ufs 1 no -
```
 - b.

```
/dev/md/dsk/ov-dg/dsk/d1 \  
/dev/vx/rdisk/ov-dg/rdisk/d1 \  
/var/opt/OV/share ufs 1 no -
```
 - c.

```
/dev/md/dsk/ov-dg/dsk/d2 \  
/dev/vx/rdisk/ov-dg/rdisk/d2 \  
/var/opt/OV/shared/server ufs 1 no -
```

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 have chosen the decoupled scenario for installing HPOM, a separate Oracle client installation will be needed also.

Table 10-8 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 308.	See “Oracle Database Server on a Shared Disk (Exceptional)”: “Basic HP Operations management server installation” on page 309.	
	Decoupled	See “Oracle Database Server on a Local Disk”: “Decoupled HP Operations management server database installation” on page 308.	See “Oracle Database Server on a Shared Disk (Exceptional)”: “Decoupled HP Operations management server database installation” on page 309.	
	Independent	See “Oracle Database Server on a Local Disk”: “Independent database server installation” on page 308.		See “Oracle Database Server on a Remote File System”: “Independent database server installation” on page 312.

Oracle Database Server on a Local Disk

❑ **Basic HP Operations management server installation**

Install the Oracle Database software as described in “Installing and Verifying an Oracle Database” on page 51.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 313.

❑ **Decoupled HP Operations management server database installation**

Install the Oracle Database software as described in “Installing and Verifying an Oracle Database” on page 51.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 313.

❑ **Independent database server installation**

- *First cluster node*

Install the Oracle Database software as described in “Installing and Verifying an Oracle Database” on page 51.

- *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.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 313.

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 and Verifying an Oracle Database” on page 51.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 313.

❑ 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 and Verifying an Oracle Database” on page 51.

NOTE

When installing and configuring the HP Operations server, the `ORACLE_BASE` and `ORACLE_HOME` variables must be set to the Oracle Database server location.

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 using the following command:

```
/opt/OV/bin/ovharg_config ov-server -stop \  
<local_hostname>
```

4. Add the following lines to the `/etc/rc.config.d/ovoracle` file:

```
ORACLE_HOME=<Oracle_Server_Home>  
ORACLE_SID=<ORACLE_SID>  
export ORACLE_HOME ORACLE_SID
```

The `/etc/rc.config.d/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
```

Installing the Oracle Database Server for HPOM in a Cluster Environment

5. Remove the existing links in `/opt/OV/lib` to the libraries located in the Oracle Database server directory, and replace them with links to Oracle client libraries:

```
— ln -sf <ORACLE_HOME>/lib32/libclntsh.so \
  /opt/OV/lib/libclntsh.so
— ln -sf <ORACLE_HOME>/lib32/libclntsh.so \
  /opt/OV/lib/libclntsh.so.1.0
— ln -sf <ORACLE_HOME>/lib32/libclntsh.so \
  /opt/OV/lib/libclntsh.so.10.1
— ln -sf <ORACLE_HOME>/lib32/libclntsh.so \
  /opt/OV/lib/libclntsh.so.11.1
— ln -sf <ORACLE_HOME>/lib32/libclntsh.so \
  /opt/OV/lib/libopcora.so
— ln -sf <ORACLE_HOME>/lib32/libnnz11.so \
  /opt/OV/lib/libnnz11.so
```

6. Start the HP Operations management server as an HA resource group 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 313.

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 122.

- *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.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 313.

Installing and Configuring the HP Operations Management Server on Cluster Nodes

Install the HP Operations management server as described in Chapter 2, “Installing and Configuring HPOM on the Management Server,” on page 45.

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 whether you are installing and configuring the HP Operations management server on the first cluster node or on the additional cluster node:

- ❑ “Installing and Configuring the HP Operations Management Server on the First Cluster Node” on page 314
- ❑ “Installing and Configuring the HP Operations Management Server on the Additional Cluster Node” on page 319

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 has detected a special environment, provide answers to the following cluster-specific questions:

- Run HPOM Server as an HA resource group
[exit, back, ?, y|n, "n"]?

Press **y**.

- HA Resource Group name?
[ov-server]

HA resource groups (packages) are created during the installation of HPOM. `ovoinstall` will build the package control file and the configuration file automatically. Do not create packages manually and do not use your own configuration files. If you have already created the cluster packages manually, remove them before starting the installation of HPOM.

IMPORTANT

The entered HA resource group name may not be one of the already existing names.

Press **Enter** to accept the default answer, or specify an alternative name for the HA resource group.

- Server virtual hostname?

Enter the short name of the virtual host (for example, `virtip1`).

- Separate Oracle from Server?

If you would like to separate Oracle from the HP Operations server, choose **y** and answer the following questions. Otherwise press **Enter** to continue with the basic HP Operations management server installation.

Installing and Configuring the HP Operations Management Server on Cluster Nodes

- Configure Server and Oracle DB running as separate HA resource groups?

If you choose to configure Oracle as a separate HA resource group, press **Enter** and answer the following questions, otherwise select **n** and continue with the HP Operations management server installation where Oracle is an independent database server.

- Oracle HA resource group name?
[ov-oracle]

Press **Enter** to accept the default answer, or specify an alternative name for the Oracle HA resource group.

IMPORTANT

The entered HA resource group name may not be one of the already existing names.

- Oracle virtual hostname?

Enter the short name of the virtual host (for example, virtip2).

- Oracle Base?

The Oracle Database base directory. The default is `/opt/oracle`.

- Oracle Data Directory?

The directory where HP Operations server database files are stored. The default is `/opt/oradata/openview`.

- Oracle Index Directory?

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.

An output similar to the following appears:

Mount point	Volume group	Volume	FS type

<code>/var/opt/OV/share</code>	<code>ov-pool</code>	<code>ov-var</code>	<code>zfs</code>
<code>/var/opt/OV/shared/server</code>	<code>ov-pool</code>	<code>ov-lcore</code>	<code>zfs</code>

```
/etc/opt/OV/share          ov-pool          ov-etc           zfs
/opt/oradata/openview     ov-pool          ov-ora-data     zfs
```

You can add a new shared file system at this point.

2. *Optional:* To add a new shared file system, follow these steps:

a. Press **y** when the following question appears:

```
Add a new shared file system [exit,back,?,y|n,"n"] ?
```

You are prompted to enter the shared file system mount point:

```
Shared file system mount point [exit,back,?, "" ] ?
```

b. Type the desired shared file system mount point (for example, /opt/OV/OMU/adminUI).

c. Press **Enter** to finish adding the new shared file system.

The ovoconfigure script continues with checking virtual hosts.

The following output appears:

```
Hostname IP Address  Netmask    Interface
-----
virtip   10.17.1.120 255.255.0.0 hme0
```

You can add a new virtual host at this point.

3. *Optional:* To add a new virtual host, follow these steps:

a. Press **y** when the following question appears:

```
Add a new virtual host [exit,back,?,y|n,"n"] ?
```

You are prompted to add the virtual hostname:

```
Virtual hostname [exit,back,?, "" ] ?
```

b. Type the desired virtual hostname (for example, virtip3).

c. Press **Enter** to finish adding the virtual host.

The summary of all shared file systems and virtual hosts appears, after which the ovoconfigure script asks you whether you want to continue.

4. Press **Enter**. The following output should appear:

```
Cluster preconfiguration . . . . . OK
```

Installing and Configuring the HP Operations Management Server on Cluster Nodes

The ovoconfigure script continues with the database configuration and the server initialization. During the server initialization, ovoconfigure performs the integration into the start-stop sequence, installs the add-on packages, and finishes the cluster configuration. An output similar to the following 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
```

5. Press `Enter` to continue.

The server final configuration starts and it consists of the following steps:

- Management server policy group assignment
- Subagents configuration
- Java GUI configuration
- Web server configuration
- Certificates backup

After the server final configuration returns all OK values, the following information appears:

```
Server will be started as HARG
If needed, review HARG configuration before starting
```

6. Press `Enter` to continue with the following:

- Starting the server as an HA resource group
- Installing the local agent
- Distributing configuration to the local agent
- Installing server add-ons

The agent installation and the policy distribution are performed automatically.

NOTE

To limit the server communication to only the virtual IP, run the following command:

```
ovconfchg -ovrg server -ns bbc.http -set CLIENT_BIND_ADDR \  
<virtual_IP_of_HPOM_cluster>
```

Installing and Configuring the HP Operations Management Server on the Additional Cluster Node

To install and configure the HP Operations management server on the additional cluster node, follow these steps:

1. After the `ovoconfigure` script has detected a special environment, provide answers to the following cluster-specific questions:

Run HPOM Server as an HA resource group
[exit, back, ?, y|n, "n"]?

Press **y**.

HA resource group name?
[ov-server]

Press **Enter** to continue, or specify an alternative name for the HA resource group.

IMPORTANT

The entered HA resource group must be configured and running on the first cluster node.

`ovoconfigure` checks the remote shell (`remsh`) connection and the secure remote shell (`ssh`) connection. An output similar to the following should appear:

```
Checking remote shell (remsh) connection . . . . OK
Checking secure remote shell (ssh) connection . OK
```

The following question appears:

```
Would you prefer to use REMSH even though SSH is enabled
[exit, back, ?, y|n, "n"]?
```

2. Press **Enter** to continue. The following output should appear:

```
Cluster preconfiguration . . . . . OK
```

`ovoconfigure` continues with the server initialization. During the server initialization, `ovoconfigure` performs the integration into the start-stop sequence, installs the add-on packages, and finishes the cluster configuration.

An output similar to the following should appear:

```
Cluster configuration on ADDITIONAL cluster node
-----
OVHARG configuration . . . . . OK
Configure Server cluster configuration . . . . . OK
Configure Oracle cluster configuration . . . . . OK
Server cluster postconfiguration . . . . . OK
Adding local node to Server HARG . . . . . OK
Cluster successfully configured
```

3. Press **Enter** to continue.

The server final configuration starts and it consists of the following steps:

- Management server policy group assignment
- Java GUI configuration
- Web server configuration
- Installing the local agent
- Distributing configuration to the local agent
- Installing server add-ons

The agent installation and the policy distribution are performed automatically.

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/adm/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/lbin/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 323.

2. When the HP Operations management server software has been 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 323.

❑ 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 323.

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 173.

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.

Upgrading HPOM from Version 8.xx to Version 9.10 in a Cluster Environment

To upgrade the HP Operations management server running in a cluster environment to version 9.10, you must first perform the upgrade procedure on the active node, and then on all passive nodes.

Before upgrading the HP Operations management server running in a cluster environment, make sure that you have read the following sections:

- ❑ “Upgrading from HPOM 8.xx to HPOM 9.10” on page 235
- ❑ Chapter 7, “Configuration Migration,” on page 189

IMPORTANT

When upgrading HPOM from version 9.0x to version 9.10, follow the procedure described in “Upgrading from HPOM 9.0x to HPOM 9.10” on page 251.

Upgrading the HP Operations Management Server on the Active Cluster Node

To upgrade the HP Operations management server to version 9.10 on the node where the HP Operations management server is currently running, follow these steps:

1. Put the HP Operations management server represented as an HA resource group in the maintenance mode to disable possible failovers when the HP Operations management server is stopped.

Disable the HA resource group monitoring by using the following command:

```
/opt/OV/sbin/ovharg -monitor ov-server disable
```

2. Back up the current installation.

See “Backing Up the Current HPOM 8.xx Installation” on page 237.

3. Download the current HPOM 8.xx configuration.

See “Downloading the Current HPOM 8.xx Configuration” on page 239.

4. Install the new Oracle Database version.

See “Installing and Verifying an Oracle Database” on page 51.

5. Upgrade the old version of HPOM.

See “Upgrading the Old Version of HPOM” on page 244.

During the upgrade procedure, you must also provide an answer to the following question:

```
Do you want to reuse existing HA Resource Group configuration?
```

NOTE

If you answer that you want to reuse the existing HA resource group configuration, the new HA resource group configuration features cannot be used.

6. Upload the saved HPOM configuration.

See “Uploading the Saved HPOM Configuration” on page 248.

7. Upgrade the Java GUI.

See “Upgrading the HPOM Java Operator UI” on page 254.

Upgrading the HP Operations Management Server on the Passive Cluster Node

To upgrade the HP Operations management server to version 9.10 on the remaining cluster nodes on which the HP Operations management server is not currently running, follow these steps:

1. Install the new Oracle Database version.

See “Installing and Verifying an Oracle Database” on page 51.

2. Upgrade the old version of HPOM.

See “Upgrading the Old Version of HPOM” on page 244.

During the upgrade, you must also provide answers to the following two questions:

- Is HPOM running as an HA Resource Group?

If the management server has been configured as an HA resource group, answer *y*.

- HA Resource Group name?
[ov-server]

Press **Enter** to continue, or specify an alternative name for the HA resource group.

The entered HA resource group must be configured and running on the first cluster node.

3. Upgrade the Java GUI.

See “Upgrading the HPOM Java Operator UI” on page 254.

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
- ❑ Upgrade of the HP Operations management server in a VERITAS cluster environment

NOTE

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.

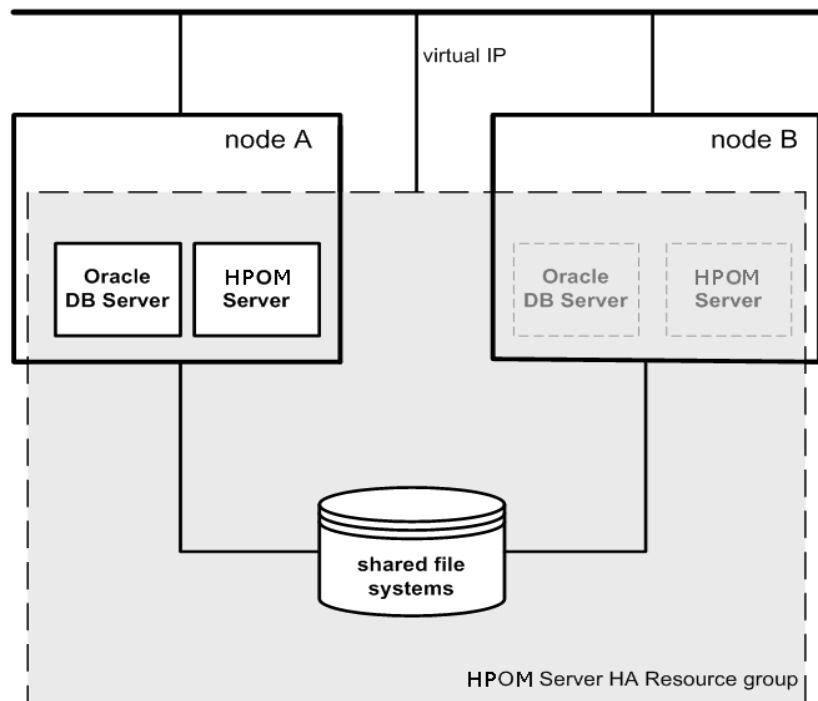
Configuration Scenarios

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.

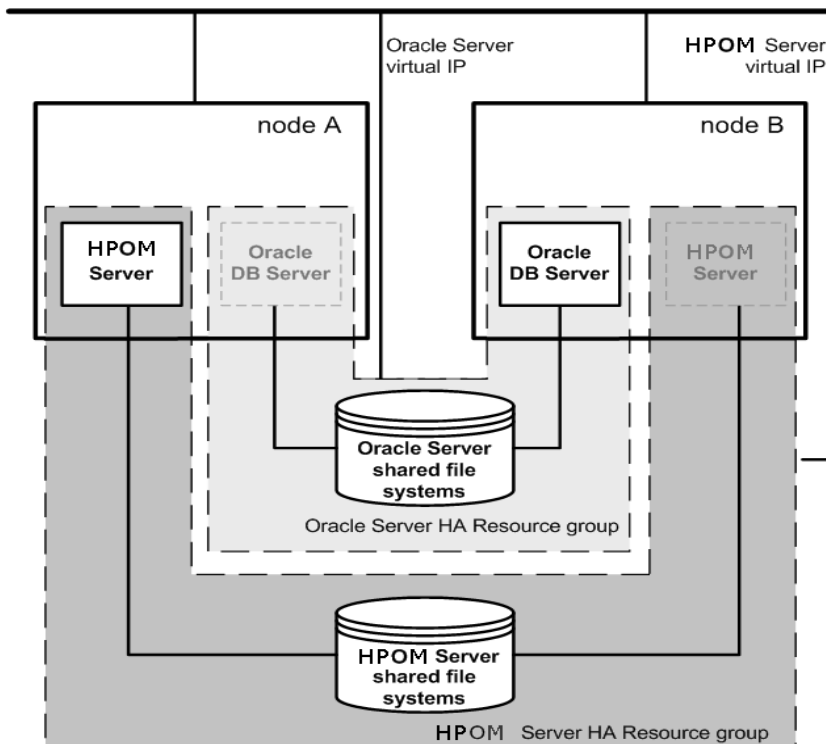
The HP Operations management server and the Oracle Database server are part of the same HA resource group.



❑ **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.

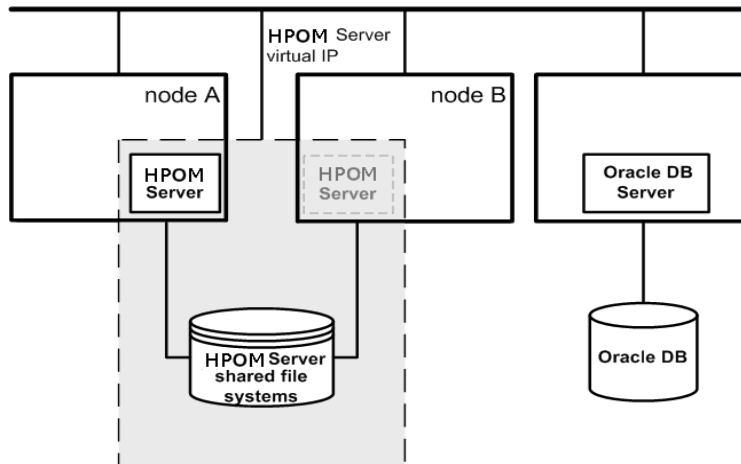


❑ **Independent database server configuration**

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 VERITAS cluster environment, you *must* meet the following requirements:

- ❑ Solaris 10
- ❑ Veritas Cluster Server 5.0 Maintenance Pack 3

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 361.

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.

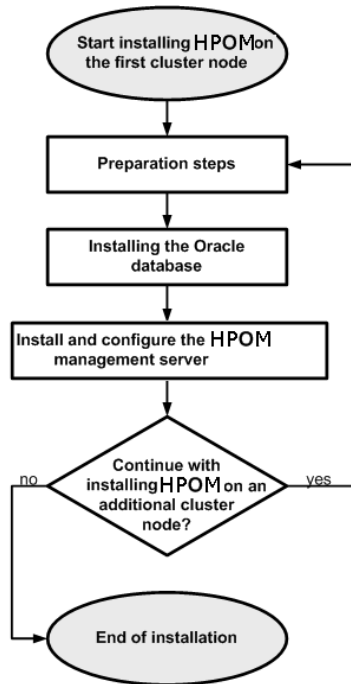
To install and configure the HP Operations management server in a cluster environment, complete these tasks:

- ❑ Task 1: “Before You Install the HP Operations Management Server on the First Cluster Node” on page 338
- ❑ Task 2: “Before You Install the HP Operations Management Server on Additional Cluster Nodes” on page 359
- ❑ Task 3: “Installing the Oracle Database Server for HPOM in a Cluster Environment” on page 361
- ❑ Task 4: “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 368

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.

Figure 11-1 **Flow of the HP Operations Management Server Installation and Configuration**



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 338
- ❑ Task 2: “Before You Install the HP Operations Management Server on Additional Cluster Nodes” on page 359

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 339.

❑ **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 346.

❑ **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 355.

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:
 - ❑ If you are using VERITAS Volume Manager:
 - 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.

- ❑ If you are using Solaris ZFS:
 - a. Define the `ov-pool` ZFS storage pool consisting of at least one shared disk for HA resource group.
 - b. Define the following ZFS datasets within the `ov-pool` ZFS storage pool with the `mountpoint` property set to `legacy`:
 - `ov-etc`
 - `ov-var`

Preparation Steps

- ov-lcore
- ov-ora-data
- ov-ora-index*
- ov-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

IMPORTANT

All ZFS datasets must have the mountpoint property set to legacy.

NOTE

When defining the ZFS storage pool or any of the ZFS datasets within the storage pool, 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 server database
- HP Operations 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:

```
/opt/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	Initial
/etc/opt/OV/share	100 MB	2 MB
/var/opt/OV/share	1 GB ^a	600 MB
/var/opt/OV/shared/server	100 MB	1 MB
/opt/oradata/openview	2 GB ^b	900 MB
Oracle Database index directory (<i>optional</i>)	100 MB ^b	50 MB
Oracle Database server binaries (<i>optional</i>)	10 GB	8 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.

NOTE

If you are using the ZFS file system, you can ignore the recommendations listed in Table 11-1.

The size of the `ov-pool` ZFS storage pool must be greater than the sum of the used shared file systems.

4. Import the following:

- ❑ If you are using VERITAS Volume Manager, import the `ov-dg` disk device group on the current node by entering the following command:

```
/usr/sbin/vxdg import ov-dg
```

- ❑ If you are using Solaris ZFS, import the `ov-pool` ZFS storage pool on the current node by entering the following command:

```
/usr/sbin/zpool import ov-pool
```

5. If you are using VERITAS Volume Manager, start the volumes by entering the following command:

```
/usr/sbin/vxvol -g ov-dg startall
```

6. Check the following:

- ❑ If you are using VERITAS Volume Manager, 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.

- ❑ If you are using Solaris ZFS, check whether the ZFS datasets are imported by running the following command:

```
/usr/sbin/zfs list -o name,mountpoint \  
| grep 'ov-pool/'
```

If the ZFS datasets are imported, an output similar to the following appears:

```
ov-pool/ov-etc          legacy  
ov-pool/ov-lcore       legacy  
ov-pool/ov-var         legacy  
ov-pool/ov-ora-data    legacy  
ov-pool/ov-ora-index   legacy*  
ov-pool/ov-ora-core    legacy**
```

* 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:

- ❑ If you are using VERITAS Volume Manager, mount the shared file systems on the prepared mount points as follows:

- a. **/usr/sbin/mount -F <FSType> \
/dev/vx/dsk/ov-dg/ov-volume-etc /etc/opt/OV/share**
- b. **/usr/sbin/mount -F <FSType> \
/dev/vx/dsk/ov-dg/ov-volume-var /var/opt/OV/share**
- c. **/usr/sbin/mount -F <FSType> \
/dev/vx/dsk/ov-dg/ov-volume-lcore \
/var/opt/OV/shared/server**
- d. **/usr/sbin/mount -F <FSType> \
/dev/vx/dsk/ov-dg/ov-volume-ora-data \
/<oracle_database_mount_point>**

Preparation Steps

In this instance, `<oracle_database_mount_point>` is the mount point you chose for the HP Operations 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:

```
/usr/sbin/mount -F <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:

```
/usr/sbin/mount -F <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).

- If you are using Solaris ZFS, mount the shared file systems on the prepared mount points as follows:

- a. **`/usr/sbin/mount -F zfs \
ov-pool/ov-etc /etc/opt/OV/share`**
- b. **`/usr/sbin/mount -F zfs \
ov-pool/ov-var /var/opt/OV/share`**
- c. **`/usr/sbin/mount -F zfs \
ov-pool/ov-lcore /var/opt/OV/shared/server`**
- d. **`/usr/sbin/mount -F zfs ov-pool/ov-ora-data \
/<oracle_database_mount_point>`**

In this instance, `<oracle_database_mount_point>` is the mount point you chose for the HP Operations server database.

- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:


```
/usr/sbin/mount -F zfs ov-pool/ov-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 zfs ov-pool/ov-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 `ifconfig` command:

```
ifconfig <network_interface>:1
```

For example, you can configure the IP address as follows:

- a. **ifconfig <network_interface>:1 plumb**
- b. **ifconfig <network_interface>:1 inet \
<IP> netmask 255.255.0.0 up**

In these instances, *<network_interface>* is the physical network interface used for the virtual IP (`hme0` is used as the network interface on Solaris) and *<IP>* is the IP address of the virtual host that 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 361.

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:

- ❑ If you are using VERITAS Volume Manager:
 - 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.

- ❑ If you are using Solaris ZFS:
 - a. Define the `ov-pool` ZFS storage pool consisting of at least one shared disk for HA resource group.

- b. Define the following ZFS datasets within the `ov-pool` ZFS storage pool with the `mountpoint` property set to `legacy`:
 - `ov-etc`
 - `ov-var`
 - `ov-lcore`
- c. Define the `ovoracle-pool` ZFS storage pool consisting of at least one shared disk for the HA resource group.
- d. Define the following ZFS datasets within the `ovoracle-pool` ZFS storage pool with the `mountpoint` property set to `legacy`:
 - `ov-ora-data`
 - `ov-ora-index*`
 - `ov-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

All ZFS datasets must have the `mountpoint` property set to `legacy`.

NOTE

When defining the ZFS storage pool or any of the ZFS datasets within the storage pool, 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 server database
 - HP Operations server database index files*

Preparation Steps

- ❑ 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:

`/opt/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	Initial
/etc/opt/OV/share	100 MB	2 MB
/var/opt/OV/share	1 GB ^a	600 MB
/var/opt/OV/shared/server	100 MB	1 MB
/opt/oradata/openview	2 GB ^b	900 MB
Oracle Database index directory (<i>optional</i>)	100 MB ^b	50 MB
Oracle Database server binaries (<i>optional</i>)	10 GB	8 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.

NOTE

If you are using the ZFS file system, you can ignore the recommendations listed in Table 11-2.

The size of the `ov-pool` ZFS storage pool as well as the size of the `ovoracle-pool` ZFS storage pool must be greater than the sum of the used shared file systems.

4. Import the following:

- ❑ If you are using VERITAS Volume Manager, 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 ovoracle-dg
```

- ❑ If you are using Solaris ZFS, import the `ov-pool` and `ovoracle-pool` ZFS storage pools on the current node by entering the following commands:

```
/usr/sbin/zpool import ov-pool
```

```
/usr/sbin/zpool import ovracle-pool
```

5. If you are using VERITAS Volume Manager, start the volumes by entering the following commands:

```
/usr/sbin/vxvol -g ov-dg startall
```

```
/usr/sbin/vxvol -g ovracle-dg startall
```

6. Check the following:

- ❑ If you are using VERITAS Volume Manager:

- 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 `ovracle-dg` disk device group are started by running the following command:

```
/usr/sbin/vxinfo -g ovracle-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.

- ❑ If you are using Solaris ZFS:

- a. Check whether the ZFS datasets of the `ov-pool` are imported by running the following command:

```
/usr/sbin/zfs list -o name,mountpoint \  
| grep 'ov-pool/'
```

If the ZFS datasets are imported, an output similar to the following appears:

```
ov-pool/ov-etc      legacy  
ov-pool/ov-lcore   legacy  
ov-pool/ov-var     legacy
```

- b. Check whether the ZFS datasets of the `ovoracle-pool` are imported by running the following command:

```
/usr/sbin/zfs list -o name,mountpoint \  
| grep 'ovoracle-pool/'
```

If the ZFS datasets are imported, an output similar to the following appears:

```
ovoracle-pool/ov-ora-data    legacy  
ovoracle-pool/ov-ora-index  legacy*  
ovoracle-pool/ov-ora-core   legacy**
```

* 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:

- If you are using VERITAS Volume Manager, mount the shared file systems on the prepared mount points as follows:
 - a.

```
/usr/sbin/mount -F <FSType> \  
/dev/vx/dsk/ov-dg/ov-volume-etc /etc/opt/OV/share
```
 - b.

```
/usr/sbin/mount -F <FSType> \  
/dev/vx/dsk/ov-dg/ov-volume-var /var/opt/OV/share
```
 - c.

```
/usr/sbin/mount -F <FSType> \  
/dev/vx/dsk/ov-dg/ov-volume-lcore \  
/var/opt/OV/shared/server
```
 - d.

```
/usr/sbin/mount -F <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 server database.

- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:

```
/usr/sbin/mount -F <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 server database index files.

- f. *Optional:* If you choose to install Oracle Database server binaries on a shared disk:

```
/usr/sbin/mount -F <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).

- If you are using Solaris ZFS, mount the shared file systems on the prepared mount points as follows:

a. **`/usr/sbin/mount -F zfs \
ov-pool/ov-etc /etc/opt/OV/share`**

b. **`/usr/sbin/mount -F zfs \
ov-pool/ov-var /var/opt/OV/share`**

c. **`/usr/sbin/mount -F zfs \
ov-pool/ov-lcore /var/opt/OV/shared/server`**

d. **`/usr/sbin/mount -F zfs ovoracle-pool/ov-ora-data \
/<oracle_database_mount_point>`**

In this instance, `<oracle_database_mount_point>` is the mount point you chose for the HP Operations server database.

- e. *Optional:* If the Oracle Database index directory is different from the Oracle data directory:


```
/usr/sbin/mount -F zfs \  
ovoracle-pool/ov-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 zfs ovroracle-pool/ov-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 `ifconfig` command:

```
ifconfig <network_interface>:1
```

For example, you can configure the IP address as follows:

- a. `ifconfig <network_interface>:1 plumb`
- b. `ifconfig <network_interface>:1 inet \
<IP> netmask 255.255.0.0 up`

In these instances, *<network_interface>* is the physical network interface used for the virtual IP (`hme0` is used as the network interface on Solaris) and *<IP>* is the IP address of the virtual host that you previously selected.

9. Start the Oracle Network IP by using the `ifconfig` command:

```
ifconfig <network_interface>:2
```

For example, you can configure the IP address as follows:

- a. `ifconfig <network_interface>:2 plumb`
- b. `ifconfig <network_interface>:2 inet \
<IP> netmask 255.255.0.0 up`

In these instances, *<network_interface>* is the physical network interface used for the virtual IP (`hme0` is used as the network interface on Solaris) and *<IP>* is the IP address of the virtual host that you previously selected.

Preparation Steps

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 361.

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:
 - ❑ If you are using VERITAS Volume Manager:
 - 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.

- ❑ If you are using Solaris ZFS:
 - a. Define the `ov-pool` ZFS storage pool consisting of at least one shared disk for HA resource group.
 - b. Define the following ZFS datasets within the `ov-pool` ZFS storage pool with the `mountpoint` property set to `legacy`:
 - `ov-etc`
 - `ov-var`
 - `ov-lcore`

IMPORTANT

All ZFS datasets must have the `mountpoint` property set to `legacy`.

NOTE

When defining the ZFS storage pool or any of the ZFS datasets within the storage pool, 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	Initial
/etc/opt/OV/share	100 MB	2 MB
/var/opt/OV/share	1 GB ^a	600 MB
/var/opt/OV/shared/server	100 MB	1 MB

a. Further disk space will be required when SPIs are installed.

NOTE

If you are using the ZFS file system, you can ignore the recommendations listed in Table 11-3.

The size of the `ov-pool` ZFS storage pool must be greater than the sum of the used shared file systems.

4. Import the following:

- If you are using VERITAS Volume Manager, import the `ov-dg` disk device group on the current node by entering the following command:

```
/usr/sbin/vxdg import ov-dg
```

- ❑ If you are using Solaris ZFS, import the `ov-pool` ZFS storage pool on the current node by entering the following command:

```
/usr/sbin/zpool import ov-pool
```

5. If you are using VERITAS Volume Manager, start the volumes by entering the following command:

```
/usr/sbin/vxvol -g ov-dg startall
```

6. Check the following:

- ❑ If you are using VERITAS Volume Manager, 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
```

- ❑ If you are using Solaris ZFS, check whether the ZFS datasets are imported by running the following command:

```
/usr/sbin/zfs list -o name,mountpoint \  
| grep 'ov-pool/'
```

If the ZFS datasets are imported, an output similar to the following appears:

```
ov-pool/ov-etc    legacy
ov-pool/ov-lcore legacy
ov-pool/ov-var    legacy
```

7. Mount the shared file systems on the prepared mount points:

- ❑ If you are using VERITAS Volume Manager, mount the shared file systems on the prepared mount points as follows:

```
a. /usr/sbin/mount -F <FSType> \  
/dev/vx/dsk/ov-dg/ov-volume-etc /etc/opt/OV/share
```

Preparation Steps

- b. `/usr/sbin/mount -F <FSType> \
/dev/vx/dsk/ov-dg/ov-volume-var /var/opt/OV/share`
 - c. `/usr/sbin/mount -F <FSType> \
/dev/vx/dsk/ov-dg/ov-volume-lcore \
/var/opt/OV/shared/server`
- If you are using Solaris ZFS, mount the shared file systems on the prepared mount points as follows:
- a. `/usr/sbin/mount -F zfs \
ov-pool/ov-etc /etc/opt/OV/share`
 - b. `/usr/sbin/mount -F zfs \
ov-pool/ov-var /var/opt/OV/share`
 - c. `/usr/sbin/mount -F zfs \
ov-pool/ov-lcore /var/opt/OV/shared/server`
8. Start the Virtual Network IP by using the `ifconfig` command:

```
ifconfig <network_interface>:1
```

For example, you can configure the IP address as follows:

- a. `ifconfig <network_interface>:1 plumb`
- b. `ifconfig <network_interface>:1 inet \
<IP> netmask 255.255.0.0 up`

In these instances, `<network_interface>` is the physical network interface used for the virtual IP (`hme0` is used as the network interface on Solaris) and `<IP>` is the IP address of the virtual host that 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
```

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.

Preparation Steps

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 363.	See “Oracle Database Server on a Shared Disk (Exceptional)” : “Basic HP Operations management server installation” on page 364.	
	Decoupled	See “Oracle Database Server on a Local Disk” : “Decoupled HP Operations management server database installation” on page 363.	See “Oracle Database Server on a Shared Disk (Exceptional)” : “Decoupled HP Operations management server database installation” on page 364.	
	Independent	See “Oracle Database Server on a Local Disk” : “Independent database server installation” on page 363.		See “Oracle Database Server on a Remote File System” : “Independent database server installation” on page 367.

Oracle Database Server on a Local Disk

❑ **Basic HP Operations management server installation**

Install the Oracle Database software as described in “Installing and Verifying an Oracle Database” on page 51.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 368.

❑ **Decoupled HP Operations management server database installation**

Install the Oracle Database software as described in “Installing and Verifying an Oracle Database” on page 51.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 368.

❑ **Independent database server installation**

- *First cluster node*

Install the Oracle Database software as described in “Installing and Verifying an Oracle Database” on page 51.

- *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.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 368.

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 and Verifying an Oracle Database” on page 51.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 368.

❑ 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 and Verifying an Oracle Database” on page 51.

NOTE

When installing and configuring the HP Operations server, the `ORACLE_BASE` and `ORACLE_HOME` variables must be set to the Oracle Database server location.

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
- tnsnav.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/rc.config.d/ovoracle` file:

```
ORACLE_HOME=<Oracle_Server_Home>  
ORACLE_SID=<ORACLE_SID>  
export ORACLE_HOME ORACLE_SID
```

The `/etc/rc.config.d/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/lib` to the libraries located in the Oracle Database server directory, and replace them with links to Oracle client libraries:

```
— ln -sf <ORACLE_HOME>/lib32/libclntsh.so \  
  /opt/OV/lib/libclntsh.so  
— ln -sf <ORACLE_HOME>/lib32/libclntsh.so \  
  /opt/OV/lib/libclntsh.so.1.0  
— ln -sf <ORACLE_HOME>/lib32/libclntsh.so \  
  /opt/OV/lib/libclntsh.so.10.1  
— ln -sf <ORACLE_HOME>/lib32/libclntsh.so \  
  /opt/OV/lib/libclntsh.so.11.1  
— ln -sf <ORACLE_HOME>/lib32/libclntsh.so \  
  /opt/OV/lib/libopcora.so  
— ln -sf <ORACLE_HOME>/lib32/libnnz11.so \  
  /opt/OV/lib/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 368.

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 122.

- *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.

After installing the Oracle Database server, continue with “Installing and Configuring the HP Operations Management Server on Cluster Nodes” on page 368.

Installing and Configuring the HP Operations Management Server on Cluster Nodes

Install the HP Operations management server as described in Chapter 2, “Installing and Configuring HPOM on the Management Server.”

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 whether you are installing and configuring the HP Operations management server on the first cluster node or on the additional cluster node:

- ❑ “Installing and Configuring the HP Operations Management Server on the First Cluster Node” on page 369
- ❑ “Installing and Configuring the HP Operations Management Server on the Additional Cluster Node” on page 374

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:

- Run HPOM Server as an HA resource group
[exit, back, ?, y|n, "n"]?

Press **y**.

- HA Resource Group name?
[ov-server]

HA resource groups (packages) are created during the installation of HPOM. `ovinstall` will build the package control file and the configuration file automatically. Do not create packages manually and do not use your own configuration files. If you already created the cluster packages manually, remove them before starting the installation of HPOM.

IMPORTANT

The entered HA resource group name may not be one of the already existing names.

Press **Enter** to accept the default answer, or specify an alternative name for the HA resource group.

- Server virtual hostname?

Enter the short name of the virtual host (for example, `virtip1`).

- Separate Oracle from Server?

If you would like to separate Oracle from the HP Operations server, choose **y** and answer the following questions. Otherwise press **Enter** to continue with the basic HP Operations management server installation.

- Configure Server and Oracle DB running as separate HA resource groups?

If you choose to configure Oracle as a separate HA resource group, press **Enter** and answer the following questions, otherwise select **n** and continue with the HP Operations management server installation where Oracle is an independent database server.

- Oracle HA resource group name?
[ov-oracle]

Press **Enter** to accept the default answer, or specify an alternative name for the Oracle HA resource group.

IMPORTANT

The entered HA resource group name may not be one of the already existing names.

- Oracle virtual hostname?

Enter the short name of the virtual host (for example, virtip2).

- Oracle Base?

The Oracle Database base directory. The default is /opt/oracle.

- Oracle Data Directory?

The directory where HP Operations server database files are stored. The default is /opt/oradata/openview.

- Oracle Index Directory?

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.

An output similar to the following appears:

Mount point	Volume group	Volume	FS type
-----	-----	-----	-----
/var/opt/OV/share	ov-dg	ov-volume-var	ufs
/var/opt/OV/shared/server	ov-dg	ov-volume-lcore	ufs

```
/etc/opt/OV/share          ov-dg          ov-volume-etc          ufs
/opt/oradata/openview     ov-dg          ov-volume-ora-data    ufs
```

You can add a new shared file system at this point.

2. *Optional:* To add a new shared file system, follow these steps:

a. Press **y** when the following question appears:

```
Add a new shared file system [exit,back,?,y|n,"n"] ?
```

You are prompted to enter the shared file system mount point:

```
Shared file system mount point [exit,back,?, "" ] ?
```

b. Type the desired shared file system mount point (for example, /opt/OV/OMU/adminUI).

c. Press **Enter** to finish adding the new shared file system.

The ovoconfigure script continues with checking virtual hosts.

The following output appears:

```
Hostname IP Address  Netmask    Interface
-----
virtip   10.17.1.120  255.255.0.0 eth0
```

You can add a new virtual host at this point.

3. *Optional:* To add a new virtual host, follow these steps:

a. Press **y** when the following question appears:

```
Add a new virtual host [exit,back,?,y|n,"n"] ?
```

You are prompted to add the virtual hostname:

```
Virtual hostname [exit,back,?, "" ] ?
```

b. Type the desired virtual hostname (for example, virtip3).

c. Press **Enter** to finish adding the virtual host.

The summary of all shared file systems and virtual hosts appears, after which the ovoconfigure script asks you whether you want to continue.

4. Press **Enter**. The following output should appear:

```
Cluster preconfiguration . . . . . OK
```

The ovoconfigure script continues with the database configuration and the server initialization. During the server initialization, ovoconfigure performs the integration into the start-stop sequence, installs the add-on packages, and finishes the cluster configuration. An output similar to the following 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
```

5. Press **Enter** to continue.

The server final configuration starts and it consists of the following steps:

- Management server policy group assignment
- Subagents configuration
- Java GUI configuration
- Web server configuration
- Certificates backup

After the server final configuration returns all OK values, the following information appears:

```
Server will be started as HARG
If needed, review HARG configuration before starting
```

6. Press **Enter** to continue with the following:

- Starting the server as an HA resource group
- Installing the local agent
- Distributing configuration to the local agent
- Installing server add-ons

The agent installation and the policy distribution are performed automatically.

NOTE

To limit the server communication to only the virtual IP, run the following command:

```
ovconfchg -ovrg server -ns bbc.http -set CLIENT_BIND_ADDR \  
<virtual_IP_of_HPOM_cluster>
```

Installing and Configuring the HP Operations Management Server on the Additional Cluster Node

To install and configure the HP Operations management server on the additional cluster node, follow these steps:

1. After the `ovoconfigure` script detects a special environment, provide answers to the following cluster-specific questions:

Run HPOM Server as an HA resource group
[exit, back, ?, y|n, "n"]?

Press **y**.

HA resource group name?
[ov-server]

Press **Enter** to continue, or specify an alternative name for the HA resource group.

IMPORTANT

The entered HA resource group must be configured and running on the first cluster node.

`ovoconfigure` checks the remote shell (`remsh`) connection and the secure remote shell (`ssh`) connection. An output similar to the following should appear:

```
Checking remote shell (remsh) connection . . . . OK
Checking secure remote shell (ssh) connection . OK
```

The following question appears:

```
Would you prefer to use REMSH even though SSH is enabled
[exit, back, ?, y|n, "n"]?
```

2. Press **Enter** to continue. The following output should appear:

```
Cluster preconfiguration . . . . . OK
```

`ovoconfigure` continues with the server initialization. During the server initialization, `ovoconfigure` performs the integration into the start-stop sequence, installs the add-on packages, and finishes the cluster configuration.

Installing and Configuring the HP Operations Management Server on Cluster Nodes

An output similar to the following should appear:

```
Cluster configuration on ADDITIONAL cluster node
-----
OVHARG configuration . . . . . OK
Configure Server cluster configuration . . . . . OK
Configure Oracle cluster configuration . . . . . OK
Server cluster postconfiguration . . . . . OK
Adding local node to Server HARG . . . . . OK
Cluster successfully configured
```

3. Press **Enter** to continue.

The server final configuration starts and it consists of the following steps:

- Management server policy group assignment
- Java GUI configuration
- Web server configuration
- Installing the local agent
- Distributing configuration to the local agent
- Installing server add-ons

The agent installation and the policy distribution are performed automatically.

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/lbin/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 378.

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 378.

❑ 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 378.

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/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 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.

Upgrading HPOM from Version 8.xx to Version 9.10 in a Cluster Environment

To upgrade the HP Operations management server running in a cluster environment to version 9.10, you must first perform the upgrade procedure on the active node, and then on all passive nodes.

Before upgrading the HP Operations management server running in a cluster environment, make sure that you read the following:

- ❑ “Upgrading from HPOM 8.xx to HPOM 9.10” on page 235
- ❑ Chapter 7, “Configuration Migration,” on page 189

IMPORTANT

When upgrading HPOM from version 9.0x to version 9.10, follow the procedure described in “Upgrading from HPOM 9.0x to HPOM 9.10” on page 251.

Upgrading the HP Operations Management Server on the Active Cluster Node

To upgrade the HP Operations management server to version 9.10 on the node where the HP Operations management server is currently running, follow these steps:

1. Put the HP Operations management server represented as an HA resource group in the maintenance mode to disable possible failovers when the HP Operations management server is stopped.

Disable the HA resource group monitoring by running the following command:

```
/opt/ov/sbin/ovharg -monitor ov-server disable
```

2. Back up the current installation.

See “Backing Up the Current HPOM 8.xx Installation” on page 237.

3. Download the current HPOM 8.xx configuration.

See “Downloading the Current HPOM 8.xx Configuration” on page 239.

4. Install the new Oracle Database version.

See “Installing and Verifying an Oracle Database” on page 51.

5. Upgrade the old version of HPOM.

See “Upgrading the Old Version of HPOM” on page 244.

During the upgrade procedure, you must also provide an answer to the following question:

```
Do you want to reuse existing HA Resource Group configuration?
```

NOTE

If you answer that you want to reuse the existing HA resource group configuration, the new HA resource group configuration features cannot be used.

6. Upload the saved HPOM configuration.

See “Uploading the Saved HPOM Configuration” on page 248.

7. Upgrade the Java GUI.

See “Upgrading the HPOM Java Operator UI” on page 254.

Upgrading the HP Operations Management Server on the Passive Cluster Node

To upgrade the HP Operations management server to version 9.10 on the remaining cluster nodes on which the HP Operations management server is not currently running, follow these steps:

1. Install the new Oracle Database version.

See “Installing and Verifying an Oracle Database” on page 51.

2. Upgrade the old version of HPOM.

See “Upgrading the Old Version of HPOM” on page 244.

During the upgrade, you must also provide answers to the following two questions:

- Is HPOM running as an HA Resource Group?

If the management server is configured as an HA resource group, answer *y*.

- HA Resource Group name?
[ov-server]

Press **Enter** to continue, or specify an alternative name for the HA resource group.

The entered HA resource group must be configured and running on the first cluster node.

3. Upgrade the Java GUI.

See “Upgrading the HPOM Java Operator UI” on page 254.

Installing HPOM in a VERITAS Cluster Environment

Upgrading HPOM from Version 8.xx to Version 9.10 in a Cluster Environment