HP OpenView VantagePoint Operations for UNIX Installation Guide

Management Server on Sun Solaris English Version

HP OpenView VantagePoint Operations for Sun Solaris

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Printing History

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

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First Edition: August 1998

Second Edition: April 1999

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Conventions

The following typographical conventions are used in this manual.

Table 1 Typographical Conventions

Font Type	What the Font Type Represents	Example
Italic	Book or manual titles, and man page names	Refer to the *HP OpenView VantagePoint Operations Administrator's Reference Volume I* and the *opc(1M)* manpage for more information.
	Provides emphasis	You *must* follow these steps.
	Specifies a variable that you must supply when entering a command	At the prompt type: `rlogin` *your_name* where you supply your login name.
	Parameters to a function	The *oper_name* parameter returns an integer response.
Bold	New terms	The **monitor agent** observes...
`Computer`	Text and items on the computer screen	The system replies: `Press Enter`
	Command names	Use the `grep` command ...
	Function names	Use the `opc_connect()` function to connect...
	File and directory names	`/opt/OV/bin/OpC/`
	Process names	Check to see if `opcmona` is running.
	Window/dialog box names	In the `Add Logfile` window...
`Computer Bold`	Text that you must enter	At the prompt, type: **`ls -l`**
Keycap	Keyboard keys	Press **Return**.

Table 1 Typographical Conventions

Font Type	What the Font Type Represents	Example
[Button]	Buttons on the user interface.	Click [Operator]. Click on the [Apply] button.
Menu Items	A menu name followed by a colon (:) means that you select the menu, then the item. When the item is followed by an arrow (->), a cascading menu follows.	Select Actions:Utilities-> Reports...

The IT/Operations Documentation Map

ITO provides a set of manuals and online help which aim to assist you in using ITO and improve your understanding of the underlying concepts. This section illustrates what information is available and where you can find it.

HP OpenView IT/Operations Printed Manuals

This section provides an overview of the printed manuals and their contents.

The *HP OpenView VantagePoint Operations Concepts Guide*

provides you with an understanding of ITO on two levels. As an operator, you can learn about ITO's basic structure; as an administrator, you can use this book to gain an insight into the setup and configuration of ITO in your own environment.

The *HP OpenView VantagePoint Operations Installation Guide for the Management Server*

is for administrators who install ITO software on the management server and perform initial configuration. It includes:

- verification of software and hardware requirements
- software installation and de-installation instructions
- configuration instructions using defaults

The *HP OpenView VantagePoint Operations Administrator's Reference Volume I*

is for people who install ITO on the managed nodes and are responsible for the administration and troubleshooting of ITO in general. Volume I contains conceptual and general information about the ITO managed nodes.

The *HP OpenView VantagePoint Operations Administrator's Reference Volume II*

contains platform-specific information about each managed node platform.

The *HP OpenView VantagePoint Operations Error Message Reference*

is for administrators involved in ITO problem solving. It provides a copy of all ITO error messages that have additional instructional text available. This book contains no information that is not also available from the user interface.

Managing Your Network with HP OpenView Network Node Manager

is for administrators and operators. It describes the basic functionality of HP OpenView Network Node Manager which is an embedded part of ITO.

The *HP OpenView VantagePoint Navigator Concepts and Configuration Guide*

provides information for administrators who are responsible for installing, configuring, maintaining, and troubleshooting the HP OpenView ServiceNavigator. It also contains a high-level overview of the concepts behind service management.

The *HP OpenView VantagePoint Operations Reporting and Database Schema*

contains a detailed description of the ITO database tables and provides examples for generating reports from the ITO database.

The *HP OpenView VantagePoint Operations Software Release Notes*

give a description of new features. In addition, they provide information to help you:

- compare the current software's features with those available in previous versions of the software
- determine system and software compatibility
- solve known problems

ITO Online Information

The following information is available online:

The HP OpenView VantagePoint Operations Administrator's Guide to Online Information

is a context-sensitive help system and contains detailed help for each window of the ITO administrator GUI as well as step-by-step instructions for performing administrative tasks.

The HP OpenView VantagePoint Operations Operator's Guide to Online Information

is a context-sensitive help system and contains detailed help for each window of the ITO operator Motif GUI as well as step-by-step instructions for operator tasks.

The HP OpenView VantagePoint Operations Java GUI Online Information

is available in HTML-format for the ITO Java-based operator GUI and the ServiceNavigator, and contains detailed information about general ITO and ServiceNavigator concepts and tasks for the ITO operator, as well as reference and troubleshooting information.

The HP OpenView VantagePoint Operations Man Pages

are available online for ITO. They are also available in HTML format; open your Internet browser at the following URL:

`http://<management_server>:8880/ITO_MAN`

where <*management_server*> is the fully qualified hostname of your management server.

HP OpenView IT/Operations Developer's Toolkit

If you purchase the HP OpenView IT/Operations Developer's Toolkit, you receive the full ITO documentation set, as well as the following manuals:

The *HP OpenView VantagePoint Operations Application Integration Guide*

suggests several ways in which external applications can be integrated into ITO.

The *HP OpenView VantagePoint Operations Developer's Reference*

provides an overview of all available application programming interfaces (APIs).

Advanced Network Security for HP OpenView IT/Operations

If you purchase the Advanced Network Security (ANS) extension for HP OpenView IT/Operations, you receive the following additional documentation:

HP OpenView VantagePoint Advanced Security User's Guide

provides information for administrators who are responsible for installing, configuring, maintaining, and troubleshooting ANS.

NOTE The Advanced Network Security extension is available only for ITO management server on HP-UX.

Electronic Version of the Manuals

All manuals except the VP Operations Software Release Notes are also included as Adobe Portable Document Format (PDF) files in the appropriate documentation software bundle. See the *VP Operations Installation Guide for the Management Server* for general installation instructions. The manuals are installed into the following directory on the management server:

/opt/OV/doc/<LANG>/OpC/

Alternatively, you can download the manuals from the following web site:

http://ovweb.external.hp.com/lpe/doc_serv

Or, view them in HTML format at:

http://www.docs.hp.com

ITO DynaText Library

The ITO DynaText Library is a collection of ITO manuals in online format based on DynaText. DynaText is an application for viewing, searching, printing, and annotating your online library. The browser and the manuals are available in the appropriate ITO documentation software bundle. See the *VP Operations Installation Guide for the Management Server* for general installation instructions. Once the bundle is installed, you can open the library by selecting `Online Manuals` from the `Help` menu of any primary ITO window.

Using the Online Help System

The ITO Motif GUI Online Help System

ITO's Motif GUI online information consists of two separate volumes, one for operators and one for administrators. In the operator's volume, you will find the HP OpenView IT/Operations Quick Start describing the main operator windows. Both volumes include:

- ❏ information you need to perform tasks, whether you are an operator or an administrator
- ❏ popup menus, reference information about ITO icons, accessible with just a point and click on the right mouse button
- ❏ information about errors displayed in the ITO-Error Information window. You can get help either when the error occurs or by using the message number provided to perform a keyword search within the help system
- ❏ an index search utility that leads you directly to the desired topic
- ❏ a glossary of terms that are important to users of ITO
- ❏ help on help for users just getting started with online information systems
- ❏ a printing facility, which allows you to print any or all topics in the help system (a HP LaserJet printer is required to print graphics)

You can access the help system in any of the following ways:

- ❏ in any active text field or on any active button, press the **F1** key,
- ❏ click the `Help` button in the bottom of any window
- ❏ open the drop-down `Help` menu from the menu bar
- ❏ click a symbol and use the right-hand mouse button to access the `Help` menu

You can then select task lists which are arranged by activity, or window and field lists. You can access any topic in the help volume from every help screen. Hyperlinks provide related information on other help topics.

You can also get context sensitive help in the `Message Browser` and

`Message Source Templates` window. After selecting `Help: On Context` from the menu, the cursor changes into a question mark which you can then position over the area on which you want help. When you click the mouse button, the required help page is displayed in its help window.

The ITO Java-based GUI and OV ServiceNavigator Online Documentation

The ITO Java-based GUI online documentation helps operators to become familiar with and use the ITO product. The following information is included:

- Tasks—Step-by-step instructions for using ITO and the OV ServiceNavigator
- Concepts—An introduction to the key concepts and features of ITO and the OV ServiceNavigator.
- References—Detailed information to help operators maximize their use of ITO and the OV ServiceNavigator.
- Troubleshooting—Solutions to common problems you may encounter while using ITO or the OV ServiceNavigator.
- Index—An index to help operators quickly find the information they need.

To view any topic, open the appropriate folders in the frame on the left and click on the topic title. Hyperlinks provide related information on other help topics.

Access the help system by selecting `Help: Contents` from the main menu of the Java GUI. A web browser opens and displays the help contents. Note that you must first configure ITO to use your preferred browser, see the *VP Operations Installation Guide for the Management Server* for more information.

1 Prerequisites for Installation of the Management Server on Sun Solaris

In This Chapter

This chapter describes how to select the correct system to use as an HP OpenView IT/Operations (ITO) management server running on a Sun Solaris platform.

It is recommended that you check your system parameters manually before running the pre-installation checks of the analysis phase described in Chapter 2, “Installing ITO for Sun Solaris on the Management Server,” on page 47. This chapter lists the minimum recommended hardware and software prerequisites for the management server.

Summary of Installation Tasks

Before you start to install ITO, you need to choose an installation process that suits your requirements. First, you must decide whether you are installing ITO for the first time or whether you are upgrading to ITO from either a previous version of ITO, or from HP OpenView Network Node Manager (NNM). See Table 1-1 on page 23 for a description of the recommended installation/upgrade paths.

Table 1-1 Choosing the Installation Process

To Do This Process...	You Need	Refer To
1. Install ITO A.06.00 for Sun Solaris on the management server.	1. Have management server hardware that conforms to at least the minimum system requirements for the ITO management server. 2. Install the appropriate `Min` or `Full` ITO fileset listed in Table 2-1 on page 69. 3. Use the `opcconfig` script to configure ITO.	Chapter 1, "Prerequisites for Installation of the Management Server on Sun Solaris," on page 21 and "Installing ITO for Sun Solaris on the Management Server" on page 47.
2. Install additional ITO Agent software.	1. Have at least a minimal (`Min`) installation of ITO version A.06.00 on the management server. 2. Install the required agent software.	Chapter 6, "Administration of the Software on the Management Server," on page 119.

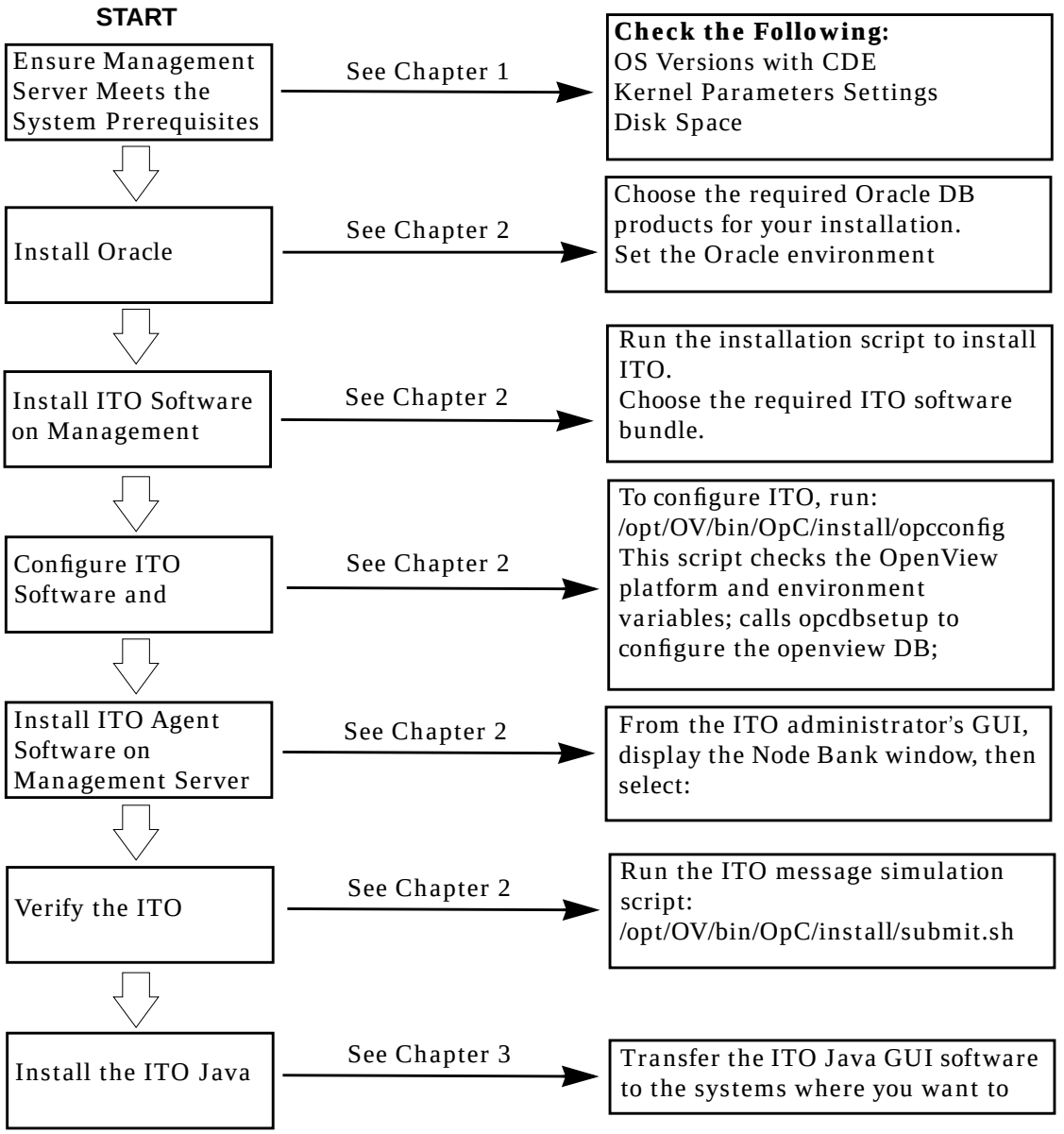
Table 1-1 Choosing the Installation Process

To Do This Process...	You Need	Refer To
3. Install the ITO Java GUI.	1. Have at least a minimum (`Min`) installation of ITO version A.06.00 on the management server. 2. Install the ITO Java GUI software on the systems where the ITO Java GUI will be running.	Chapter 3, "Installing the Java-based Operator GUI," on page 81.
4. Install ITO in a Sun Cluster Environment	1. Install the appropriate ITO `Min` or `Full` fileset on the first Sun Cluster node. 2. Install ITO on any additional Sun Cluster nodes.	Appendix A, "Installing ITO in a Sun Cluster Environment," on page 167.
5. Upgrade an installation of NNM 6.1 to full ITO functionality.	1. Have NNM version 6.1 installed on the management server. 2. Install the appropriate ITO `Up` fileset listed in Table 2-1 on page 69 in the same way as described for the ITO installation.	Chapter 1, "Prerequisites for Installation of the Management Server on Sun Solaris," on page 21 and "Installing ITO for Sun Solaris on the Management Server" on page 47.
6. Upgrade an installation of ITO version A.05.xx on Solaris 7 to A.06.00 on Solaris 7.	1. Have ITO version A.05.xx installed on the management server. Download the configuration data. 2. Install the correct version of the database. 3. Install the correct ITO fileset. 4. Use the `opccfgupld` script to upload *saved* configuration data to the new database.	Chapter 1, "Prerequisites for Installation of the Management Server on Sun Solaris," on page 21 and Chapter 7, "Upgrading to ITO version A.06.00," on page 133.

Table 1-1 Choosing the Installation Process

To Do This Process...	You Need	Refer To
7. Upgrade an installation of ITO version A.05.xx on Solaris 2.6 to A.06.00 on Solaris 7or 8, A.05.xx on Solaris 7 to A.06.00 on Solaris 8.	1. Have ITO version A.05.xx or A.06.00 installed on the Solaris 2.6 or 7 management server. Download the configuration data. 2. Upgrade the version of the operating system on the ITO management server system to Solaris 7 or 8. 3. Install the correct version of the database. 4. Install the correct ITO fileset. 5. Use the `opccfgupld` script to upload *saved* configuration data to the new database.	Chapter 1, "Prerequisites for Installation of the Management Server on Sun Solaris," on page 21 and Chapter 7, "Upgrading to ITO version A.06.00," on page 133.
8. Upgrade an installation of ITO version A.04.xx to ITO A.06.00.	1. Upgrade to ITO version A.05.xx on the management server first. 2. See Solution 6.	Chapter 1, "Prerequisites for Installation of the Management Server on Sun Solaris," on page 21 and Chapter 7, "Upgrading to ITO version A.06.00," on page 133.
9. Install/update ITO agent software on the managed nodes.	1. Have ITO installed on the management server. 2. Add the nodes to the `ITO Node Bank`. 3. Install the ITO agent software and distribute the configuration.	*VP Operations Administrator's Reference Volume I*.

Figure 1-1 Summary of Standard ITO Installation Tasks



Management Server Requirements

The ITO management server for Solaris is the controlling element of the entire ITO system so you should carefully select the right system as the management server. Before selecting a system to use as the management server, decide how many managed nodes are to be monitored, and approximately how many messages will be processed in the final ITO environment. Migrating the management server to a larger system at a later date requires considerable effort, particularly if your configuration is large and includes hundreds of managed nodes.

To help you to check whether your system is suitable for use as an ITO management server, use the analysis phase of the ITO installation script. After completing the pre-installation checks, adapt your system resources if they are below the required minimum, as reported in the analysis logfile. When your system conforms to the ITO prerequisites, continue to install the ITO software as described in Chapter 2, “Installing ITO for Sun Solaris on the Management Server,” on page 47.

The minimum hardware and software requirements are discussed in this chapter. It is recommended that you review them carefully before starting the ITO installation script. You can check all critical parameters to ensure that your system meets the minimum requirements, as it is described in “Checking Prerequisites of the Management Server” on page 27.

The following sections in this chapter list all system requirements in detail. You may find it useful to review them before running the analysis phase.

Checking Prerequisites of the Management Server

Check the prerequisites on the management server, either:

- by running the analysis part of the ITO installation script, or
- manually, before running the ITO installation script.

Checking Prerequisites with the Installation Script

Run the analysis part of the ITO installation script to check your system prerequisites automatically. The analysis phase checks the following:

- ❏ Operating system version
- ❏ Available disk space
- ❏ RAM and swap space
- ❏ Kernel parameters

The results of the analysis phase are written to the logfile `/var/adm/sw/swagent.log`. It is recommended that you remove this file occasionally to prevent it from becoming too large.

After completing the prerequisites, check first the hostnames, see “Resolving of Hostnames” on page 29, then adapt your system resources if they are below the required minimum. The kernel parameter value can be adapted in the file: `/etc/system`. For details how to do it, see “Kernel Parameters for the Management Server” on page 29.

When your system conforms with the prerequisites and after adaptation if required, continue with the ITO installation as described in Chapter 2, “Installing ITO for Sun Solaris on the Management Server,” on page 47.

Checking Prerequisites Manually

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

- ❏ To check the operating system version, run the command:

  `uname -sr`

  For example:

  - for Sun Solaris 7 the output is: `SunOS 5.7`
  - for Sun Solaris 8 the output is: `SunOS 5.8`

- ❏ To check the available disk space, run the command:

  `df -k`

- ❏ To check 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 of Hostnames” on page 29.
- ❏ To check the kernel parameters value, see “Kernel Parameters for the

Management Server" on page 29.

Resolving of Hostnames

The name service must be configured in such a way that hostnames are resolved as fully qualified hostnames. Resolving of hostnames can be performed either by using:

- DNS (recommended), or
- NIS+, or
- files.

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

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

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

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

  193.197.95.42 hpmgr.bbn.hp.com hpmgr

Even when using other hostname resolution methods (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

For the ITO installation script to run successfully, 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 on your system the modules are not loaded (in that case sysdef will list each related kernel parameter value as zero), you will have to load them manually with the modload(1M) command:

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

NOTE

Make sure to load the `semsys` as well as `shmsys` parameters before checking the current values of the kernel parameters, otherwise you may lower the `semsys` and `shmsys` current values without even knowing it. Make sure also to check the current kernel parameters values before adjusting them. Do never *LOWER* current values of kernel parameter. For the minimal kernel parameters values needed by ITO refer to Table 1-2 on page 31

To check the kernel parameters value, run the command:

```
/usr/sbin/sysdef | more
```

Furthermore, you will have to force-load the two modules at boot time to ensure that the kernel parameters are set correctly.

Following is a procedure for forcing the semaphores and shared memory modules to be loaded automatically.

Enter the following lines at the end of your `/etc/system` file:

```
forceload: sys/shmsys
forceload: sys/semsys
```

For a description of kernel parameters, see Table 1-2 on page 31.

WARNING **The values of some kernel parameters on your system may already be higher than the one shown in Table 1-2; if so, do not decrease them in the `/etc/system` file. Values in Table 1-2 are minimal values that are needed for a successful installation and operation of ITO. Any additional software installed on the management server may require increasing some of the values.**

Table 1-2 Important Configurable Kernel Parameters for the Management Server

Parameter	Description	Minimum Value
shminfo_shmmax	Maximum shared memory segment size in bytes.	0x40000000 (1 GB or greater)
shminfo_shmseg	Maximum number of shared memory segments per process.	20 or greater
shminfo_shmmni	Number of shared memory identifiers to pre-allocate.	100 or greater
seminfo_semmni	Number of semaphore identifiers.	100 or greater
seminfo_semaem	Adjust on exit maximum value.	16384
seminfo_semmap	Number of entries in semaphore map.	66
seminfo_semmns	Number of semaphores in system.	200 or greater
seminfo_semmnu	Number of undo structures in system.	30
seminfo_semume	Maximum number of undo entries per process.	10
seminfo_semvmx	Semaphore maximum value.	32767
seminfo_semmsl	Maximum number of semaphores per ID.	30
rlim_fd_cur	Maximum number of file descriptors per process (sysdef will display the parameter as Process Resource Limit Tunables (file descriptors)).	120[a]

a. If your installation includes more than 35 nodes that use DCE/TCP communication, increase the setting of `rlim_fd_cur` by: 3*Number_of_DCE/TCP_nodes +15. If your installation includes more than 6 users accessing the Java-based UI at the same time, increase the setting of `rlim_fd_cur` by: 14*Number_of_Users +28. If both of the above cases apply, use the higher of the two values.

After modifying the kernel parameters you will have to reboot your system in order to make the new values active.

Following is a an example of kernel parameters in the `/etc/system` file:

```
forceload: sys/shmsys
forceload: sys/semsys
set shmsys:shminfo_shmmax=1073741824
set shmsys:shminfo_shmseg=20
set shmsys:shminfo_shmmni=100
set semsys:seminfo_semmni=100
set semsys:seminfo_semaem=16384
set semsys:seminfo_semmap=66
set semsys:seminfo_semmns=200
set semsys:seminfo_semmnu=30
set semsys:seminfo_semume=10
set semsys:seminfo_semvmx=32767
set semsys:seminfo_semmsl=30
set rlim_fd_cur=120
```

Hardware Requirements

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

- Sun Ultra System Workstation or Enterprise Server, with at least one X terminal or workstation.

  For information about display redirection to a Windows NT system, see “Required Configuration for Display Redirection to Windows” on page 38.

- A color, bit-mapped monitor with a resolution of 1280 x 1024. The monitor need not be physically connected to the management server if you use the X-redirection mechanism.
- A graphic board supporting at least 8 color planes.
- A mouse.

- ❏ Additional disk space, see Table 1-3 on page 33.
- ❏ Additional RAM, see Table 1-4 on page 35.
- ❏ Swap space, see Table 1-5 on page 36.
- ❏ CD-ROM drive - optional.

Disk Space

Review the following questions before selecting a system to be the management server.

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

Table 1-3 Disk Space Requirements with an Oracle Database

Product	Disk Space Required
RDBMS Binaries	215 MB (Oracle 8.0.6)[a] 475 MB (Oracle 8.1.6)
ITO Binaries (ITOEngOraMin) In Directory • `/opt/OV` • `/etc/opt/OV` • `/var/opt/OV`	418 MB (Total)[b] Requires: • 250 MB • 16 MB • 152 MB
Files saved by NNM and SNMP agent patch in directory `/system`	100 MB
ITO Data in Database	270 MB [c]
Software Distributor • `/usr`	20 MB
Total Disk Space Required:	1023 MB (Oracle 8.0.6) 1283 MB (Oracle 8.1.6)

a. This value includes only those Oracle products that are required by ITO.

b. This value does not include space required for the tape image(s) of each type of platform installed on the management server. For each platform tape image that you install, allow approximately 10 MB of additional disk space. For the local agent only, allow 28 MB; all agents, allow about 60 MB.
c. Capacity for the initial size of the database: Oracle's auto-extend feature automatically increases the disk space according to the additional configuration and message requirements.

NOTE Automatic file system layout is not suitable for ITO, at least for systems with 4GB disks.

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

For structural details of the ITO directories, see Chapter 5, "Directory Structure on the Management Server," on page 111.

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

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

NOTE 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 OS, then the resulting file system layout will not meet ITO's disk space requirements listed in Table 1-3 on page 33.

2. How many types of agent platform are to be managed by ITO?

   This affects the number of tape images installed on the management server. For each tape image you need about 10 MB additional disk space. To install all agents, allow approximately 60 MB.

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

   The disk I/O time affects the application startup time and swapping activities. It is therefore recommended to distribute the database, and ITO binaries over several disks. To maintain optimum performance, do not locate swap space on these disks.

RAM and Swap Space

The amount of available RAM and swap space determines whether applications can run, and also how fast they run. The more RAM you make available, the better the application performance you can achieve. This is because the system's swapping and paging activities are reduced.

Review the following questions before selecting a system to serve as a management server:

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

   In addition to the values given in Table 1-4 on page 35 you will require an extra 25 MB of RAM per ITO operator session.

Table 1-4 Minimum RAM Required for ITO Installation on the Management Server

Product	Additional RAM
RDBMS database	32 MB [a]
HP OpenView IT/Operations	96 MB [b, c]
Minimum total	128 MB

a. A higher value than proposed by the database documentation is required because ITO does some tuning for performance improvements.
b. Assumes up to 500 nodes and includes RAM for CDE. The larger your IP network the more memory you will need.

c. This value depends upon the number of GUIs running in parallel and the number of active and acknowledged messages.

2. Does the system provide enough swap space?

   In most cases, you need a total of 300 MB of swap space on the management server.

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

Individual requirements are listed in Table 1-5 on page 36.

Table 1-5 Minimum Required Swap Space for Installation on the Management Server

Product	Required Swap Space (MB)
Sun Solaris Operating System	100
Oracle database	30
HP OpenView IT/Operations	170 [a]
Minimum Total	300

a. This value depends upon the number of GUIs running in parallel and the number of active and acknowledged messages.

To check your currently available swap space in blocks (1 block contains 512 bytes), run:

```
/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 ITO 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 Motif GUI, about 35 MB of RAM/swap is required; for each additional operating Java-based GUI, about 20 MB of RAM/swap is required. This value is sufficient for a browser containing approximately 3000 messages.

4. How many background graphics are integrated into the HP OpenView platform?

   Note that background graphics can also slow down the system by using excessive RAM.

It is recommended to reserve enough physical memory to accommodate all the virtual memory needs of ITO. This will prevent the need for process swapping, and will result in the best possible performance. The performance of ITO may decrease if swapping becomes necessary.

Performance

Your performance considerations will ensure effective ITO operation. For example, the number of processed ITO messages and the GUI performance depends on the available CPU time and overall CPU power. Always consider the demands of other installed applications on CPU time, disk access, and RAM/swap usage.

As the throughput of LAN packets is a limiting factor to a management server's performance it is recommended that you don't use the management server system as a server for other purposes (NFS, NIS (YP), DNS, and so on). However, configuring the management server system as a secondary Domain Name Server, can increase the speed of name look-ups.

Connectivity

The connectivity between managed nodes and the management server affects the time ITO needs to install ITO software and configuration on managed nodes, as well as the time needed to respond to problems. The connectivity between the display stations and the management server affects the performance of your ITO GUI operations if X redirection is required.

Review the following questions:

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

   The management server should at least be accessible while managed

nodes are operating; if not, the following inconveniences might 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 comes up again, the managed nodes forward all locally buffered ITO messages to the management server. This might reduce the performance if hundreds of messages have to be processed.

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

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

3. Are the display stations of the ITO operators and the management server connected via fast lines?

   Having slow lines between the management server and your display stations lowers ITO GUI performance because of the required X-redirection.

Required Configuration for Display Redirection to Windows

ITO supports WRQ Reflection X for Windows which enables you to redirect an ITO display to a Windows system.

Table 1-6 Required Display Redirection Configuration

	Configuration
Hardware requirements on Windows PC	Minimum 80486 / 100 MHz or Pentium with at least 32 MB main memory and at least 25 MB free disk space for a full Reflection X installation
Software requirements on Windows PC	Windows NT Version 4.0 Reflection X Version 6.0 for Windows NT
Screen resolution	1280 x 1024
Max. number of colors	256

Table 1-6 Required Display Redirection Configuration

	Configuration
Min. network bandwidth	128 kBps (256 kBps are recommended)

Table 1-7 Required Reflection X Settings

	Settings
Window	`X Terminal` Desktop option
XDMP	`Direct` option Enter the system name you want to connect to.
Font	75 dpi must be listed first in the fonts path.
Mouse	Middle mouse button: emulation enabled

Software Requirements

The following software must be correctly installed on the management server before you install ITO:

- ❏ Sun Solaris 7 or 8 with CDE and minimum Developer System Support (DSS) installation running on Sun Ultra Workstation/Server.

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

Table 1-8 Operating System Versions on the Management Server Supported by ITO

Operating System	Platform	Supported OS Versions
Solaris (minimum DSS installation option)	Sun Ultra Workstation	7 and 8
Solaris (minimum DSS installation option)	Sun Ultra Enterprise Server	7 and 8

ITO requires network communication services, X Window System, and Common Desktop Environment (CDE) online help packages to be installed. These packages are part of CDE which is installed on the management server with the Solaris operating system.

If you have an existing Solaris operating system, check what software packages are already installed on the workstation chosen as the management server. Use admintool(1M) or enter the following command:

```
pkginfo | more
```

Use the software view of admintool to check which installation option was used when the OS was initially installed.

Table 1-9 Required CDE Packages

Packages	Description
SUNWdtbas SUNWdtcor SUNWdtdmn SUNWdtdst SUNWmfrun SUNWdticn SUNWdtwm SUNWdtdst SUNWdtezt SUNWdthe SUNWdthev SUNWdthez SUNWbtool SUNWsprot	SUNWdtbas - CDE base SUNWdtcor - CORE (CDE) SUNWdtdmn - CDE daemons SUNWdtdst- CDE DESKTOP APPS SUNWmfrun - Motif RunTime Kit SUNWdticn- CDE icons SUNWdtwm- CDE DESKTOP WINDOW MANAGER SUNWdtdst- CDE Desktop Applications SUNWdtezt- Solaris Desktop Extensions Applications SUNWdthe- CDE HELP RUNTIME SUNWdthev- CDE HELP VOLUMES SUNWdthez- Desktop Power Pack Help Volumes SUNWbtool- CCS tools bundled with SunOS SUNWsprot- Solaris Bundled Tools

For the ITO installation to run successfully on some Solaris operating systems patches are required. For a full list of patches, see Table 1-10 on page 41.

To check which patches are already installed on the workstation chosen as the management server, enter the following command:

```
showrev -p | more
```

Table 1-10 Required Solaris OS Patches

Solaris Version	Patch No	Description
Solaris 7	Year 2000 Compliance Patches	Solaris Year 2000 Compliance patches. Although not all listed patches are required for ITO it is recommended to install all of them in order to make your system fully Year 2000 compliant.

Table 1-10 Required Solaris OS Patches

Solaris Version	Patch No	Description
Solaris 8	108949-02 or later	CDE 1.4: libDtHelp/libDtSvc patch.

You can obtain the latest versions of Solaris OS patches from the Sun web site at `http://www.sun.com/`, including downloading and installation instructions.

- With ITO for Sun Solaris systems, both NCS and DCE communication protocols are supported. For DCE based operations, to provide DCE server functionality in the environments where the commercial DCE software is not available, a lightweight DCE client is included with ITO. The supplied dced daemon is capable of emulating the NCS local location broker.

  In order to integrate with the environments that already provide commercial DCE software, ITO is compatible with the following products:

  — IBM DCE 3.1 for Sun Solaris 7 and 8

  — DASCOM DCE 1.1.4.3 for Sun Solaris 7 and 8

NOTE The embedded lightweight DCE client provides a minimal DCE functionality required by ITO. It does not support advanced DCE functionality such as Cell Directory Services or Security Services.

- Oracle8 Database 8.0.6 or 8.1.6 for Sun SPARC Solaris and the additional products shown in Table 1-11 on page 43.

  If you have an existing Oracle8 database and want to check which Oracle products are installed, check the file:

  For Oracle 8.0.6:

  `/<ORACLE_HOME>/orainst/unix.rgs`

  For Oracle 8.1.6:

  `/<ORACLE_HOME>/install/unix.rgs`

The Table 1-11 lists the Oracle products requirements:

Table 1-11 Required Oracle Products for HP OpenView IT/Operations

Oracle Version	Oracle Products
Oracle 8.0.6.0.0	• Oracle8 Server (RDBMS) 8.0.6 • PL/SQL 8.0.6.0.0 • SQL*Plus 8.0.6.0.0 • NET8 8.0.6.0.0 • TCP/IP Protocol Adapter 8.0.6.0.0[a]
Oracle 8.1.6.0.0	• Oracle8i Server 8.1.6.0.0[b] • Net8 Products 8.1.6.0.0[c] • Oracle Utilities 8.1.6.0.0[c] • Oracle Installation Products 8.1.6.0.0[c]

a. Contained in the Oracle product Net8 Protocol Adapters 8.0.6.0.0. ITO requires only the TCP/IP protocol adapter.
b. The `Optional` components are not required.
c. All subproducts are required.

Agent Platforms Supported by ITO

Table 1-12 Agent Platforms Supported by ITO

Operating System	Platform	Supported OS Versions	Supported Communication Type [a]
Solaris	Sun SPARCstation	2.5.1, 2.6, 7 and 8	DCE /NCS
Windows NT[b]	Intel 486 or higher	4.0 (NT server and workstation)	DCE[c]
Windows 2000[b]	Intel Pentium	5.0 (Professional and Server Family)	DCE[c]

Table 1-12 Agent Platforms Supported by ITO

Operating System	Platform	Supported OS Versions	Supported Communication Type [a]
HP-UX	HP 9000 Technical Workstations and HP 9000 Enterprise Servers[d]	10.20, 11.0	DCE
AIX	IBM RS/6000 BULL DPX/20	4.2, 4.3.1, 4.3.2 and 4.3.3	NCS/DCE
RedHat LINUX	Intel 486 or higher[e]	5.1, 5.2, 6.0 and 6.1	DCE
Novell NetWare	Intel 486 or higher	4.1, 4.11, 4.11 SFT III, 5.0 and 5.1	EZRPC[f]
IRIX	Silicon Graphics	6.2, 6.4, 6.5	NCS
Digital UNIX Tru64 UNIX	DEC Alpha	4.0D 4.0E, 4.0F, 5.0A	DCE

a. DCE is not included with the operating system for the following agent platforms:
Linux (to be downloaded from a Linux web site)
Solaris (supplied with the ITO agent software)
Novell NetWare (EZ-RPC supplied with the ITO agent software)
DCE is included with the operating system for all other platforms that support DCE (but may have to be installed separately as an optional product).

b. ITO does not support advanced features or additional software products of the Microsoft Windows NT/2000 operating system; for example Microsoft Cluster Server.

c. ITO supports the Remote Procedure Calls (RPCs), but not the security features.

d. ITO uses the same binaries as for HP 9000 Technical Workstations.

e. See `http://www.redhat.com/support/hardware` for a list of platforms that are compatible with Linux RedHat.

f. Transport Independent Remote Procedure Call.

NOTE

When DCE managed nodes communicate with the management server over a fast network (LAN), choose DCE RPC (UDP) in preference to DCE RPC (TCP) as the communication protocol for the best performance.

You can select the communication type in the `Node Advanced Options` and `Node Advanced Options` window.

Only use DCE RPC (TCP) when the managed nodes are connected by way of a slow or busy network (for example, WAN or X25), or if a large volume of data is being transmitted. Under these conditions, DCE RPC (TCP) is the more reliable communication protocol.

Table 1-13 Operating System versions on Managed Nodes Supported by VantagePoint Performance

Operating System	Platform	Supported OS Versions	Supported Communication Type[a]
AIX[b]	RS6000	4.1, 4.2, 4.3.2	NCS
Digital UNIX[b] Tru64 UNIX[b]	DEC AlphaServers Digital DEC 3000	4.0D, 4.0E, 4.0F	DCE
HP -UX[c]	HP 9000 Technical Workstations	10.20, 11.0	DCE
HP-UX[c]	HP 9000 Enterprise Servers	10.20, 11.0	DCE
NCR UNIX[b]	34xx, 4xxx, 51xx	03.02	NCS
SINIX Reliant[b]	SNI RM200, RM300, RM400, RM600	5.43, 5.44, 5.45	NCS/DCE

Table 1-13 Operating System versions on Managed Nodes Supported by VantagePoint Performance

Operating System	Platform	Supported OS Versions	Supported Communication Type[a]
Sun Solaris[c]	Sun SPARCstations, SPARCservers, SPARCclassics	2.5.1, 2.6, 7	NCS/DCE

a. For communication between VantagePoint Reporter and VantagePoint Performance Manager and the VantagePoint Performance Agent.
b. Software is provided on separate CDs.
c. Software is bundled with the ITO management server software.

2 Installing ITO for Sun Solaris on the Management Server

In This Chapter

This chapter describes how to install ITO for Sun Solaris for the first time on the management server using HP OpenView Software Distributor supplied with the ITO installation script.

NOTE

It is not possible to run both, the Japanese and English versions of ITO on the same management server because different database character sets must be used that are incompatible with each other.

You will also find a description of how to configure and set up the Oracle database for use with ITO in this chapter.

If HP OpenView Network Node Manager is already installed on your system, you can upgrade to full ITO functionality by choosing one of the upgrade software bundles listed in. To upgrade from NNM to ITO, start at the section “Installing the ITO Software on the Management Server” on page 61.

Installation Summary

Before installing ITO make sure that your system confirms with the prerequisites:

- ❏ Sun Solaris operating system (min. Developer System Support) with CDE must be installed.
- ❏ Kernel parameters on the management server must be adapted. See “Checking Prerequisites of the Management Server” on page 27.
- ❏ Sun Solaris patches must be installed. See Table 1-10 on page 41.
- ❏ Enough disk space must be available in the right partitions of the file system.

When your system conforms with the prerequisites you can start with the ITO installation. To install ITO successfully, perform the following tasks:

1. Install and check your chosen database.
2. Install the ITO software on the management server.
3. Configure the ITO software on the management server.
4. Distribute the ITO agent software to the local “managed node” on the management server.
5. Verify the ITO installation.

This chapter describes all installation tasks for ITO, and additionally the requirements for an Oracle RDBMS installation and for the creation and configuration of an Oracle RDBMS for use with ITO. For additional information about installing this product, see the vendor’s manuals supplied with the products.

Installing and Checking an Oracle Database

NOTE

Oracle8™ is a product of the Oracle Corporation and cannot be purchased directly from Hewlett-Packard.

Oracle for OpenView is available from Hewlett-Packard and provides a “license-to-use” for the Oracle products listed in Table 1-11 on page 42.

It is the customer’s responsibility to install and set up the Oracle database for operation with ITO. This section describes the installation of an Oracle database for use with ITO. For more detailed instructions, or for non-standard installations, see the vendor’s manuals supplied with the product.

Required Oracle Products

See Table 1-11 on page 43 for a complete list of required Oracle products.

A standalone ITO system has the database and all management server processes, including user-interface processes, running on the same system. However, if the database is installed on a different server than the ITO management server, you must also install the additional Oracle products as described in the section “Using a Separate Database Server System” on page 106.

Preparing for an Oracle Database Installation

If you want to use an existing Oracle database, ignore this section and continue with “Installing the ITO Software on the Management Server” on page 61.

Before installing an Oracle database on the management server, do the following:

1. Make sure that your system conforms to the hardware and software requirements listed in Chapter 1, “Prerequisites for Installation of the Management Server on Sun Solaris,” on page 21.

   In particular, make sure that kernel parameters match those in Table 1-2 on page 31.

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

   a. Create a UNIX group named **dba**.

      The group ID should be greater than 100.

   b. Create a UNIX user named **oracle**.

      The user ID should be greater than 100.

   c. Make the user **oracle** a member of the group **dba**.

   d. 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 directory `/home/` is a mount point for remote user home directories.

   e. Recommended shell for the oracle user is **Korn shell (ksh)**.

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

   umask 022

4. Create the Optimal Flexible Architecture (OFA) directory structure:

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

   Where <*version*> is one of the supported version of the Oracle database: 8.0.6 or 8.1.6

5. Change the ownership of the directories to `oracle:dba`, enter:

   chown -R oracle:dba /opt/oracle

6. Change the permissions of the directories, enter:

   chmod -R 755 /opt/oracle

7. Set the following Oracle environment variables in the `/export/home/oracle/.profile` of user oracle:

   - **export ORACLE_BASE=/opt/oracle**

     This variable determines the location of the Oracle installation.

The subdirectory prefix /opt is the recommended default; you can use other appropriate prefixes if required.

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

  Where <*version*> is one of the supported version of the Oracle database: 8.0.6 or 8.1.6.

  This variable determines the location and the version of the Oracle installation. This is the recommended setting; you can choose a different setting if required.

- **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 the setting of *ORACLE_SID*. When configuring the database, the script opcconfig(1M) detects that a database of this name exists and asks whether you also want to use it for the ITO database objects. If you choose this approach, the ITO 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* must be no longer than four characters long.

- **export ORACLE_TERM=xterm**

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

  If you normally use a dtterm, use ORACLE_TERM=dtterm instead.

- **export NLS_LANG=american_america.WE8ISO8859P1**

  This variable determines the character set to be used for the database.

8. Set the *PATH* variable in the .profile of user oracle:

   export PATH=$PATH:$ORACLE_HOME/bin

9. Install the Oracle database as described below.

Installing an Oracle Database

This section describes how to install an Oracle database for use with ITO. For more detailed information, or for non-standard installations, see the vendor's documentation supplied with the Oracle database.

The following procedures install the Oracle image without creating the `openview` database. After installing the database and ITO software, you will create the `openview` database when you run `opcconfig(1M)`, as described in "Configuring the ITO Software" on page 71.

NOTE It is recommended that you first browse through this section before starting the installation, as the order of the questions can vary. This is a standard behavior and is not a sign of a failed installation.

Install Oracle as follows:

1. Log in as user root.
2. Make sure that the `/opt/bin` directory exists; if it is not there, create it.
3. Insert the Oracle CD-ROM into the drive. The CD-ROM is automatically mounted on Sun Solaris System.
4. Install the Oracle database:
   - If you are installing Oracle 8.0.6, continue with "To Install Oracle 8.0.6" on page 53.
   - If you are installing Oracle 8.1.6, continue with "To Install Oracle 8.1.6" on page 58.

To Install Oracle 8.0.6

Install Oracle 8.0.6 as follows:

1. As user root create the `/var/opt/oracle/oratab` file (as follows). Make sure to set the *ORACLE_OWNER* variable:
   a. **`export ORACLE_OWNER=oracle`**
   b. **`/cdrom/cdrom0/orainst/oratab.sh`**

2. Switch to user oracle:

   su - oracle

3. Change to the orainst directory on the CD-ROM:

   cd /cdrom/cdrom0/orainst

4. Make sure that the Oracle environment variable ORACLE_TERM is set to **xterm**. To check the setting, enter:

   echo $ORACLE_TERM

5. Verify, and if necessary set the following Oracle environment variables. See "Preparing for an Oracle Database Installation" on page 48, for the recommended values.

   echo $ORACLE_SID

   echo $ORACLE_HOME

6. Start either the MOTIF or the character-mode version of the Oracle installer. The character-mode version is recommended for Oracle 8.0.6.

   - To start the MOTIF version of the Oracle installer:

     a. Set your DISPLAY environment variable to <nodename>:0.0

     b. Enter:

        ./orainst /m

     c. If part of the text displayed in the Oracle Installer is truncated, temporarily change the default font size to 11.5 point or less, then restart the Motif installer.

   - To run the Oracle installer in character mode, enter:

     ./orainst /c

   The Oracle installer requires that you answer certain questions about the Oracle installation.

   a. Select the installation method.

      Select: **Default Install**

NOTE If using any language other than English, use the `Custom Install` option. You will be asked to specify the language of your choice at a later stage.

If you use the `Custom Install` option with Oracle 8.0.6, use the character-mode installer, and when prompted, enter the language of your choice (rather than **`All Languages`**).

b. Select the Installer activity.

Select: **`Install, Upgrade, or De-install Software`**

c. Select the Installer option.

Select: **`Install New Product - Do Not Create DB Objects`**

d. Verify the settings of the Oracle variables displayed in the `Environment Variables` window.

e. If asked to choose to relink Oracle product executable.

Select: **`N`**

f. The installer displays the values you have selected. Confirm, or go back as required.

g. In the `Software Asset Manager` window, choose the required Oracle products from the list of available products on the CD-ROM. When the list is complete, click [`Install`].
See Table 1-11 on page 43 for a list of required Oracle products.

The following message is displayed:

`Analyzing Dependencies...`

h. If asked, enter the UNIX group name for the DBA group.

Enter: **`dba`**

i. If asked, select the OSOPER group.

Select: **`dba`**

The Oracle installation now proceeds.

j. If asked `“Would you like to regenerate shared version of the Oracle library for Pro*C, OCI and XA clients?”`.

Enter: **`No`**

k. If asked "Do you want to install the Legato Storage Manager (LSM) media management product for Recovery Manager tape backup and restore?"

Enter: **No**

l. When the Installer has finished, the following message is displayed:

```
Installer Actions Completed
```

m. After a successful installation, the Oracle installer returns to the Software Asset Manager window. To exit the Oracle installer, select:

Exit

7. Run the root.sh script as follows:

a. Log in as user root.

b. Set the variables *ORACLE_HOME* and *ORACLE_SID*.

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

export ORACLE_SID=openview
```

c. Change to the Oracle installer directory:

```
cd $ORACLE_HOME/orainst
```

d. Run the root.sh script:

```
sh root.sh
```

8. The following information is displayed:

```
The following environment variables are set as follows:

ORACLE_OWNER=oracle
ORACLE_HOME=/opt/oracle/product/<version>
ORACLE_SID=openview

Are these settings correct (Y/N)? [Y]:
```

Enter **Y** to accept these settings.

9. The root.sh script displays the following prompt:

```
Enter the full pathname of the local bin directory
[/opt/bin]:
```

Accept the default setting.

10. If the following prompt is displayed:

    ```
    ORACLE_HOME does not match the home directory for oracle.
    Okay to continue? [N]:
    ```

    Enter: **Y**

    The file `/var/opt/oracle/oratab` is created and updated.

11. Unmount the CD-ROM drive:

    ```
    cd /; eject
    ```

12. Oracle library includes some unresolved symbols. Solve this problem in the following way:

    a. Edit `$ORACLE_HOME/bin/genclntsh`, and add a comment (#) to the following line (normally line 145):

    ```
    # ar d $LIBCOMMON soropt.o
    ```

    b. Run:

    ```
    $ORACLE_HOME/bin/genclntsh
    ```

CAUTION

If you are running the Oracle Web Server on the default port 8888 it is recommended that you either:

- Reconfigure the Oracle Web Server to use a different port

  or

- Remove the Oracle Web Server from the system. For more information or for non-standard installations, see the vendor's documentation supplied with the Oracle database.

To Install Oracle 8.1.6

Install Oracle 8.1.6 as follows:

1. Switch to user oracle:

   su - oracle

2. Change to the directory on the CD-ROM:

   cd /cdrom/cdrom0

3. Make sure that the Oracle environment variable ORACLE_TERM is set to **xterm**. To check the setting, enter:

   echo $ORACLE_TERM

4. Verify, and if necessary set the following Oracle environment variables. See "Preparing for an Oracle Database Installation" on page 48, for the recommended values.

   echo $ORACLE_SID

   echo $ORACLE_HOME

5. Set your DISPLAY environment variable.

   DISPLAY=<nodename>:0.0

6. Start the Oracle installer.

   ./runInstaller

   Once the Oracle Installer is started, the Welcome window appears.

7. Click [Next].

   The File Locations window appears. Do not change the text in the Source field. This is the location of the installation files.

   The Destination field displays the value of the ORACLE_HOME variable.

8. In the File Locations window, click [Next].

   The UNIX Group Name window appears.

9. In the UNIX Group Name window select [Next].

10. If requested run the orainstRoot.sh script. Open a new terminal window:

    a. Log in as user root.

b. Set the variables *ORACLE_HOME* and *ORACLE_SID*.

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

c. Change to the Oracle installer directory:

```
cd /tmp/OraInstall
```

d. Run the `orainstRoot.sh` script.

```
./orainstRoot.sh
```

Close the terminal window and go back to installer window then select `[Retry]`.

11. In the `Available Product` window, select the `Oracle8 Enterprise Edition 8.1.6.0.0` category.

    The `Installation Types` window appears.

12. In the `Installation Types` window, select the `Custom` installation type.

    The `Available Product Components` window appears.

13. In the `Available Product Components` window choose the required Oracle products from the list of available products on the CD-ROM. See Table 1-11 on page 43 for a list of required Oracle products.

    When the list is complete, click `[Next]`. Provide appropriate responses to any windows that appear. If asked whether to create a database, enter **`No.`**

14. In the `Summary` window, review the information to ensure that you have enough disk space. You cannot make any product or space allocation changes once the installation begins.

15. In the `Summary` window click `[Install]` and wait until the selected products are installed. When prompted run the `root.sh` script as described in the next step.

16. To run the `root.sh` script open a new terminal window:

    a. Log in as user root.

    b. Set the variables *ORACLE_HOME* and *ORACLE_SID*.

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

c. Change to the Oracle installer directory:

```
cd $ORACLE_HOME
```

d. Run the `root.sh` script

```
sh ./root.sh
```

17. The following information is displayed:

```
The following environment variables are set as follows:

ORACLE_OWNER=oracle
ORACLE_HOME=/opt/oracle/product/<version>
ORACLE_SID=openview
```

18. The `root.sh` script displays the following prompt:

```
Enter the full pathname of the local bin directory
[/usr/local/bin]:
```

Accept the default settings.

19. If the following prompt is displayed:

```
ORACLE_HOME does not match the home directory for oracle.
Okay to continue? [N]:
```

Enter: **Y**

The file `/var/opt/oracle/oratab` is updated.

20. The `Configuration Tools` window appears at the end of the installation and starts the following assistants:

CAUTION Cancel these assistants with **Ctrl C** as soon as they are started. You can ignore any resulting error messages.

- Net8 Configuration Assistant
- Oracle Database Configuration Assistant

21. The `End of Installation` window appears. Click `[Exit]` to exit the Oracle `Installer`.

22. Unmount the CD-ROM drive:

```
cd /; eject
```

Installing the ITO Software on the Management Server

Overview

To install the ITO software on an Sun Solaris management server, run the ITO installation script.

TIP

Although ITO is installed with HP OpenView Software Distributor (SD), you can also detect the installed ITO bundles by using the Sun Solaris native tools for package management `pkginfo(1)`.

The ITO installation script uses the `swinstall` utility of HP OpenView Software Distributor, supplied with ITO installation script, for installing ITO.

The ITO installation script does the following:

- ❏ analyzes the suitability of your system for installing ITO,
- ❏ installs HP OV Software Distributor A.02.10.

  If you already have HP OV Software Distributor A.02.10 installed on your system, the ITO installation script will not install it.
- ❏ installs the HP Dascom Lightweight DCE package (HPlwdce),
- ❏ installs the ITO software on your management server,
- ❏ installs the most recent SNMP Agent and NNM patches,

Before running the ITO installation script, refer to “Installation Summary” on page 49 for:

- ❏ a list of kernel parameters that must be configured on your management server and

- ❏ a list of software products that must be installed on the management server

before ITO installation can begin.

The time required to install the entire ITO software depends on your management server hardware.

Analyzing the Suitability of Your System for an ITO Installation

The analysis phase of the installation, started by `swinstall` utility of HP OV Software Distributor, checks the versions of installed software, all relevant system parameters including available disk space, RAM and swap space, and the kernel parameters.

For details of the installation analysis phase view the logfile `/var/adm/sw/swagent.log`. After completing the installation analysis, adapt your system resources if they are below the required minimum, as suggested. When your system conforms to the ITO requirements (after adaptation if required) continue with the installation of ITO.

For details of the system requirements, see Chapter 1, “Prerequisites for Installation of the Management Server on Sun Solaris,” on page 21. You may find it useful to review this chapter before starting the installation.

Installing the ITO Software Using the ITO Installation Script

If the management server passes all checks in the analysis phase, after confirming that you want to continue with the installation, the ITO installation script installs the selected ITO software bundle.

When the ITO installation script has completely installed the ITO software, verify that the installation has been successful by checking the end of the `/var/adm/sw/swagent.log` logfile. Either open the logfile using your text editor, or enter:

```
more /var/adm/sw/swagent.log
```

NOTE It is recommended that you delete this logfile occasionally to prevent it from becoming too large. If you have never deleted this logfile, and have perhaps installed ITO several times, make sure that you review the latest installation log at the end of the file.

Running the ITO Installation Script

Before running the ITO installation script check whether you are using Network Information Services (NIS+) for user or group management. You can retrieve that information by checking the `/etc/nsswitch.conf` file (entries for passwd and group). If so, you must set up the groups `opcgrp` and `dba` and then users `opc_op` (belonging to group `opcgrp`) and `oracle` (belonging to group `dba`) before running the install script from the CD-ROM. If you are not using NIS+ for user or group management, the ITO installation script will automatically set up both, groups and users.

NOTE Before starting the ITO software installation stop all, if any, NCS based applications running on your system.

Install the ITO software on the Sun Solaris management server as follows:

1. Log in as user root.
2. Set the user root's umask.

   `umask 022`

3. Make sure that the Oracle environment variable is set. To check the setting, enter:

   `echo $ORACLE_HOME`

   Also make sure that the Oracle shared library `libclntsh.so.1.0` (for Oracle 8.0.6) or `libclntsh.so.8.0` (for Oracle 8.1.6), and symbolic link `libclntsh.so` are located in the following directory `$ORACLE_HOME/lib`, if not, create it by running:

   `$ORACLE_HOME/bin/genclntsh`

4. Make sure that the environment variable `LANG` is set to `C`. To check the setting, enter:

   `echo $LANG`

5. Insert the ITO installation CD-ROM into the drive. The CD-ROM is automatically mounted on Sun Solaris Systems.
6. Change to the directory on the CD-ROM.

```
cd /cdrom/cdrom0/
```

7. Start the ITO installation script.

   ```
   ./install
   ```

8. The ITO installation script checks which SD version is currently installed on your system. If no, or older version of SD is detected, the ITO install script installs the required SD.

9. The ITO installation script checks which DCE packages are currently installed on your system and installs the lightweight DCE client package. If no DCE package was detected the lightweight DCE is configured and the `dced` daemon is started.

NOTE If some DCE is already installed on your system, make sure that the dced daemon is started at the system boot time.

10. From the terminal window, as shown in Figure 2-1 on page 65 select the ITO software bundle you want to install on your system. For a list of software bundles refer to Table 2-1 on page 69.

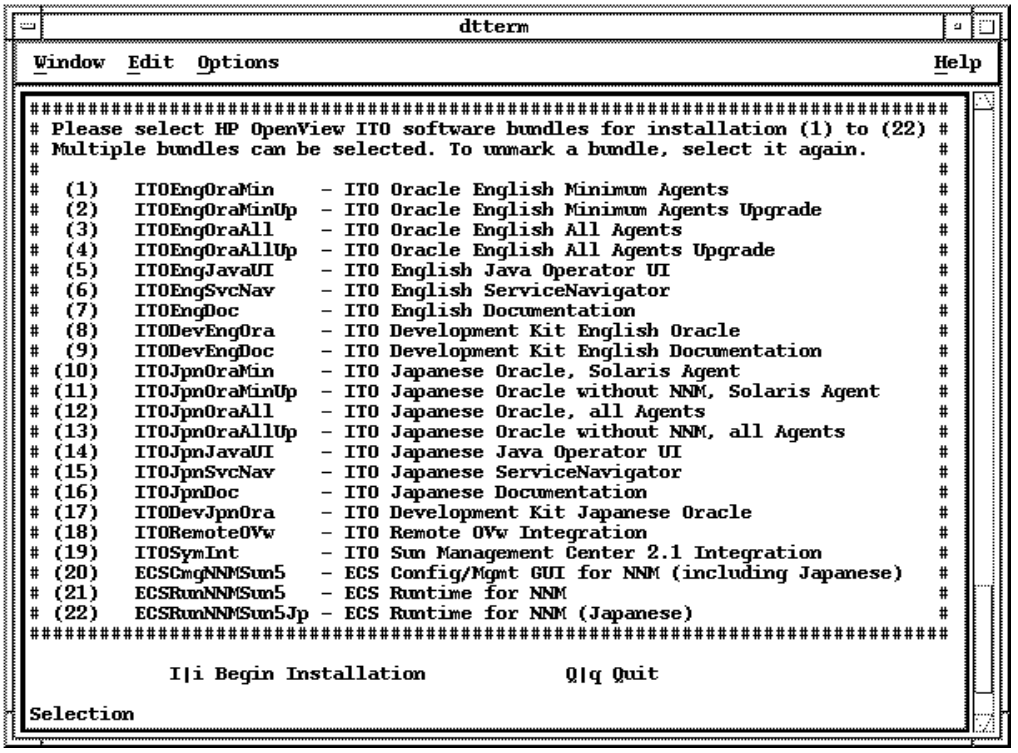
TIP To get a readable list of ITO software bundles you will have to resize your terminal window.

NOTE Do not select a bundle that installs an ITO integration. ITO integrations, such as ITO Sun Management Center 2.1 Integration, must be installed after the ITO installation has completed.

- In the `Selection` field, enter the number listed next to the software bundle name. For example, if you want to install `ITOEngOraMin` you will have to enter **`1`**. To unmark a previously selected bundle enter again the same number (for example 1). After having selected all software bundles that you wish to install, enter **`I/i`** to proceed with the installation or **`Q/q`** to quit the installation.

NOTE Make sure you do not install on the same system English and Japanese bundles and do not install the Development Tool Kit bundle with full product bundles.

Figure 2-1 ITO Software Installation Bundles



NOTE For details about ITO software bundles see, Table 2-1 on page 69.

NOTE

If you install the **Minimal** ITO bundle (`ITOEngOraMin` or `ITOEngOraMinUp`), you may need to load the software for specific ITO agents at a later time. See"Installing Agent Software on the Management Server" on page 121.

11. Select whether you want to start the analysis part of the installation. The following message is displayed:

```
You can now start the analysis phase to check that the
system is suitable for installing the selected bundle.
This is not mandatory but recommended.
```

NOTE

You can follow the progress of your installation by viewing the analysis and installation logfiles. This enables you to detect any warnings or errors at an early stage. In a different terminal window, enter:

```
tail -f /var/adm/sw/swagent.log
```

12. Select whether you want to start the ITO installation. If you selected `ITOEngOraAll` software bundle, the following information is displayed:

```
This installation will put the following software on your
system:
ITO English Management Server for Sun Solaris - All Agents

Do you want to begin the installation? (y|n):
```

Enter **Y** to start the installation of the ITO software.

WARNING

Do not abort the installation with Ctrl-C or kill, as this might corrupt your system.

13. Unmount the CD-ROM drive:

```
cd /; eject
```

14. Make the ITO man pages available for users; add the `/opt/OV/man`

directory to the MANPATH environment variable as following:

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

The MANPATH environment variable must be set either:

- for the current user; by the user in his/her .profile or
- for all users; by the system administrator in the /etc/profile

15. When you have successfully installed the ITO software, continue with “Configuring the ITO Software” on page 71.

After installing and configuring the ITO software, you may install the ITO Sun Management Center 2.1 integration.

1. Start the ITO installation script.

   `./install`

2. From the terminal window select the bundle `ITOSymInt`.

   To the selection field enter the number listed next to the software bundle name.

3. After having selected the software bundle, enter `i or I` to proceed with the installation.

4. Select whether you want to start the analysis part of the installation. The following message is displayed:

   ```
   You can now start the analysis phase to check that the
   system is suitable for installing the selected bundle.
   This is not mandatory but recommended.
   ```

NOTE

You can follow the progress of your installation by viewing the analysis and installation logfiles. This enables you to detect any warnings or errors at an early stage. In a different terminal window, enter:

`tail -f /var/adm/sw/swagent.log`

5. Select whether you want to start the installation of the ITO Sun Management Center 2.1 Integration. The following information is displayed:

   ```
   This installation will put the following software on your
   system:

   ITOSymInt - ITO Sun Management Center 2.1 Integration

   Do you want to begin the installation (Y/N)? [Y]
   ```

   Enter **Y** to start the installation.

For more information, refer to the *HP OpenView IT/Operations Integration for Sun Management Center 2.1 User's Guide.*

Below is a list of ITO Software bundles along with their description.

Table 2-1 ITO Software Bundles (English)

ITO Bundle	Description
ITOEngOraMin	HP OpenView ITO Oracle English Minimum Agents.
ITOEngOraMinUp	HP OpenView Oracle English Minimum Agents Upgrade (upgrades an NNM 6.1 Installation to full ITO functionality).
ITOEngOraAll	HP OpenView ITO Oracle English All Agents
ITOEngOraAllUp	HP OpenView ITO Oracle English All Agents Upgrade (upgrades an NNM 6.1 Installation to full ITO functionality)
ITOEngJavaUI	HP OpenView ITO Java-based GUI
ITOEngSvcNav	HP OpenView ServiceNavigator English
ITOEngDoc	HP OpenView ITO Documentation (English)
ITODevEngOra	HP OpenView ITO Developer's Kit (English)
ITODevEngDoc	HP OpenView ITO Developer's Kit Documentation (English)
ITORemoteOVw	HP OpenView ITO Remote OVw Integration
ITOSymInt	HP OpenView ITO Integration for Sun Management Center 2.1
ECSmgNNMSun5	ECS Config/Mgmt GUI for NNM
ECSRunNNMSun5	ECS Runtime for NNM (English)

The names of the ITO bundles help you to choose the required language, database, and agents for installation. The different labels used in the ITO bundle names are as follows:

Bundle Label	
All	Contains the agent software for all managed node platform architectures.
Eng	English language version of ITO.
Dev	Developer's Toolkit for ITO.
Min	Contains only the agent software for the architecture of the management server.
Ora	ITO for the Oracle database.
Up	Required when Network Node Manager (NNM) version 6.1 is already installed on the management server, and you are upgrading it to ITO.
SvcNav	ServiceNavigator for ITO.
JavaUI	ITO Java Operator UI.
Doc	ITO Documentation.

Configuring the ITO Software

After successfully installing the ITO software, as user `root` run the ITO configuration script `opcconfig` on the management server as described below. Before running `opcconfig`, check the following important details:

NOTE

If you want to use a separate system as the database server, first configure the database server system as described in "Using a Separate Database Server System" on page 106.

1. Before starting to configure ITO, make sure that the NLS language variable (`NLS_LANG`) is set correctly.

   `export NLS_LANG=american_america.WE8ISO8859P1`

2. Make sure that the environment variable `LANG` is set to `C`. To check the setting, enter:

   `echo $LANG`

3. Verify that the variables *`ORACLE_BASE`*, *`ORACLE_HOME`*, and *`ORACLE_SID`* are set correctly. See "Installing and Checking an Oracle Database" on page 50.

To start the `opcconfig` script, enter:

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

Respond to the questions as they are displayed. The configuration script does the following:

1. Asks whether you want to configure your chosen database automatically, using the installation script.

   - Enter **`y`** (yes) to configure your chosen database automatically; this is the recommended method. You are prompted to enter the Oracle system user password.
   - Choose **`n`** (no) if you have already configured your database on a separate database server.

NOTE SQL*Net is required for every installation of the ITO A.06.00 management server.

If you choose the answer **yes**, the installation continues with the following prompts:

a. Asks you to enter the password of the Oracle database user: `system`.

   If you do not have a configured database, press **Enter** for ITO to create the database and the user; `system`. If you want ITO to use an existing database, enter the password of the Oracle database user: `system`.

b. Asks you to enter the password for the Oracle Database user `opc_op`.

NOTE The database user `opc_op` is independent of the OS user `opc_op`, and the ITO user `opc_op`.

Enter a password of your choice.

If you need to change this password at a later date, use the command `opcdbpwd`. Do not change the password in the database directly; ITO stores the password in an encrypted file and if the password in the database is different form the password in the encrypted file, ITO cannot connect to the database.

c. Asks you 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 ITO itself. You can change it directly in Oracle.

d. Asks whether you require automatic startup of the database at system boot time.

   Accept Default: **Yes**

e. Allows you to choose a data directory for the system table space, the control files, the redo log files, and the ITO data table spaces.

f. Allows you to choose an index directory for the ITO index table spaces.

g. Prompts you to supply the Oracle environment variables. Only the default responses are shown:

   ORACLE_SID = **openview**
   ORACLE_BASE = **/opt/oracle**
   ORACLE_HOME = **<ORACLE_BASE>/product/<*version*>**
   ORACLE DBA User = **oracle**

   Where <*version*> is one of the supported versions of the Oracle database: 8.0.6 or 8.1.6

h. The database setup script uses the answers you give to create and configure the database, which can take some time. The following configuration steps are performed:

   - create and configure the Oracle database
   - create the ITO table spaces and users
   - create the ITO tables
   - load the initial ITO configuration into the database
   - configure SQL*Net and start the SQL*NET listener

2. Verifies the installed HP OpenView platform by starting the OpenView server processes.

3. Checks and verifies the OVW fields for ITO.

4. Displays the login screen for the ITO GUI so that you can log in as the ITO administrator. Enter the default login and password as follows:

   user: **opc_adm**

   password: **OpC_adm**

   Note that the startup of the ITO GUI can take several minutes but is complete when the Node Bank window opens.

   To start ITO manually, enter **opc** at the command line.

Installing ITO Agent Software on the Management Server

During the installation, the default agent configuration templates are assigned to the management server. The management server is often referred to as the **local managed node**.

Install the ITO agent software on the management server and start the ITO agent services using the administrator's GUI as follows:

1. Open the `Node Bank` window if it isn't open already.

   To open this window, select `Window: Node Bank` from any submap menu. Click the icon representing the management server system.

2. Select `Actions: Agents->Install/Update SW & Config...` from the menu to open the `Install/Update Software and Configuration` window.

   When the window opens, do the following:

   a. Click the following check boxes to select the components you want to install:

      - `Agent Software`
      - `Templates`
      - `Actions`
      - `Monitors`
      - `Commands`

   b. Click the option button `Nodes in list requiring update`, then click the [`Get Map Selections`] button to list the target node. You will see that the management server is displayed in the list box.

   c. Click [`OK`].

      A terminal window opens and displays the progress of the software installation. When the installation finishes, check that no error messages are displayed and close the terminal window by pressing **Return**.

3. Change the default administrator password **opc_adm**.

   Select `Actions: Utilities->Change Password...` from the menu. Enter your old and new passwords in the appropriate fields, as

requested.

4. Select `Map: Exit` from the menu of the `Node Bank` to quit the ITO GUI.
5. You can check the progress of the agent software installation by viewing the following logfiles:

   `/var/opt/OV/log/OpC/mgmt_sv/inst_sum.log`

   `/var/opt/OV/log/OpC/mgmt_sv/install.log`

Verifying the ITO Installation

1. Check that all ITO agent services are operating on the management server, enter:

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

   Alternatively, in the ITO administrator's GUI you can double-click the ITO Status symbol in the Application Bank. Output similar to the following should be displayed:

```
ITO Managed Node status :
-------------------------
Control Agent     /opt/OV/bin/OpC/opcctla(1227) is running
Message Agent     /opt/OV/bin/OpC/opcmsga(1228) is running
Subagent 1:
Action Agent      /opt/OV/bin/OpC/opcacta(1229) is running
Logfile
Encapsulator      /opt/OV/bin/OpC/opcle(1241)   is running
Monitor Agent     /opt/OV/bin/OpC/opcmona(1243) is running
Message
Interceptor       /opt/OV/bin/OpC/opcmsgi(1248) is running
Trap Interceptor /opt/OV/bin/OpC/opctrapi(1253)is running
Event Correlation
Agent             /opt/OV/bin/OpC/opceca(1260) is running
```

2. Start the ITO GUI as one of the default users, for example, opc_op, and verify that it works correctly:

   Enter: **opc**

   User login: **opc_op**

   Password: **OpC_op**

   Note that the ITO GUI can take several minutes to start up. The startup is complete when the following windows open:

   - Root
   - Managed Nodes [opc_op]
   - Application Desktop [opc_op]
   - Message Groups [opc_op]
   - Message Browser [opc_op]

3. Submit test messages as user root, enter:

   /opt/OV/bin/OpC/utils/submit.sh

   This script sends simulated messages to the Message Browser. The number of messages received depends on the configuration of your system; you will usually receive five or six.

4. To be able to test and use an application configured as Window (Input/Output) from the ITO User's Assigned Applications window, you will probably have to perform one of the following processes:

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

   passwd opc_op

   Note that by default, the user opc_op is not allowed to login to the system (* entry in /etc/passwd).

   In addition, working as opc_adm in the ITO administrator's GUI, set the password for an Input/Output application, for example the Virtual Terminal application for the operator opc_op:

   a. Select Window: Application Bank from the menu in any submap to open the Application Bank.

   b. Move the mouse pointer so that it is over the symbol Virtual Terminal.

   c. Click and hold down the right mouse button.

      This displays a popup menu for the object.

   d. Choose Modify... from the popup menu to open the Modify Internal Application: Virtual Terminal window.

   e. In the Platform Family / User Name listbox of the Modify Internal Application: Virtual Terminal window, double-click the entry for UNIX/opc_op. This opens the Change User window.

   f. In the Password field of the Change User window, enter the password for operator opc_op.

   -Or-

   ❑ Make sure the file *$HOME*/.rhosts 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.

Now make an entry in .rhosts for the user opc_op on the managed node. For example:

<management_server>.HPMGR.BBN.COM opc_op

-Or-

❑ Make sure the file /etc/hosts.equiv exists on the managed node. If it doesn't, create it.

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

<management_server>.HPMGR.BBN.COM

Post-installation Notes

After you have completed the installation and configuration of ITO, you should consider the following issues and decide whether they need addressing in your environment:

- During the initial configuration setup, Oracle creates the default users; `sys`, `system`, and `dbsnmp` and gives them default passwords. You can change the password of an Oracle user the Oracle tool, `svrmgrl`, as the following example illustrates:

  ```
  su - oracle
  svrmgrl
  SVRMGR> connect internal
  SVRMGR> alter user system identified by new_password
  SVRMGR> exit
  exit
  ```

- The backup option you choose determines what (if any) further configuration might be necessary. You can choose between the off-line backup (`opcbackup`) or the automatic backup (`ovbackup.ovpl`). For more information, see the respective man pages, *opc_backup(1M)* and *ovbackup.ovpl(1M)* or the section on system maintenance in the *VP Operations Administrator's Reference Volume I*.

- Customize the Oracle database if, for example, you wish to take advantage of Oracle features that enable you to use additional disks. For more information, see the section on database maintenance in the *VP Operations Administrator's Reference Volume I*.

3 Installing the Java-based Operator GUI

In This Chapter

This chapter describes how to install the ITO Java-based operator GUI and how to configure a web server so that you can use your own customized icons and background graphics as well as access the online documentation. This section assumes that you have already installed the ITO software as described in Chapter 2, “Installing ITO for Sun Solaris on the Management Server,” on page 47, and a supported web server as described by the vendor of the server.

Supported Platforms

The ITO Java-based GUI should, in theory, run on all platforms that meet the requirements listed in "Installation Requirements" on page 84. However, the software was tested only on the OS platforms listed in Table 3-1 on page 83, and is therefore supported only on these OS platforms.

On all OS platforms not listed in Table 3-1 on page 83, customers run the ITO Java-based GUI at their own risk.

Table 3-1 Supported Platforms of the ITO Java-based GUI Client

Supported Platforms	Java Application	Java Applet[a]
HP-UX 10.20 and 11.0	yes	no
Windows 95 and 98	yes	yes
Windows NT 4.0 Windows 2000	yes	yes
Solaris 7 and 8 for Sun SPARC Station	yes	no

a. See "Supported Web Browsers" on page 86 for a list of supported web browsers.

NOTE Running the ITO Java-based GUI on a UNIX platform can lead to performance problems and is not recommended.

NOTE It is strongly recommended to run the ITO Java-based GUI as a Java application and *not* as a Java applet because of stability problems caused by the Java Runtime Environment (JRE) on MS Windows.

Installation Requirements

Hardware Requirements

Best performance is achieved with a Pentium-based PC with at least 150Mhz, a minimum of 96 MB RAM, and an additional 30MB RAM per GUI session.

Software Requirements

In general, Java Runtime Environment version 1.1.8 or later and Java Foundation Class (JFC) 1.1.1 or later must be installed on the system where the ITO Java-based GUI will be installed and running.

TIP If you install JRE version 1.2 (Java 2 Runtime Environment), messages, message details, and application output can be printed from the ITO Java-based GUI.

For the platforms listed in Table 3-2 on page 84, the required versions of JRE (and JFC) are included in the ITO Java-based GUI installation directory on the management server:

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

Table 3-2 Bundled JRE Versions

Supported Platforms	JRE Bundled	Filenames
HP-UX 10.20	JRE 1.1.8 JFC 1.1.1	`jre_HP-UX10.tar` `swingall.jar`
HP-UX 11.0	JRE 1.2.2	`jre_HP-UX11.tar`
Solaris 7 and 8 for Sun SPARCstation	JRE 1.2.2	`jre_SunOS5.tar`
Windows 95 and 98[a]	JRE 1.2.2	`ITO_JAVA.exe`

Table 3-2 Bundled JRE Versions

Supported Platforms	JRE Bundled	Filenames
Windows NT 4.0 Windows 2000	JRE 1.2.2	ITO_JAVA.exe

a. Winsock 2.0 for Windows 95 required.

Recommended Patches

TIP HP recommends that you also install the latest HP-UX patches for JRE to take advantage of the latest JRE performance improvements. They can be downloaded for free from the following web site:

`http://www.unixsolutions.hp.com/products/java/index.html`

Then click on `Download free Java software for HP-UX`.

Supported Web Browsers

If you want to run the ITO Java-based GUI as an applet by way of a web-based browser, or if you want to use the online documentation supplied with the Java-based GUI, you must have one of the following web browsers installed:

- ❏ on MS Windows:
  - MS Internet Explorer version 4.01 or higher
  - Netscape Navigator version 4.07 or higher
- ❏ on HP-UX and Sun Solaris (online documentation only because running the ITO Java-based GUI as an applet is not supported on these platforms):
  - Netscape Navigator version 4.07 or higher

Installing the ITO Java-based GUI

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

The ITO management server installation automatically installs the ITO Java-based GUI binaries into the `/opt/OV/www/htdocs/ito_op/` directory on the management server. See Table 3-3 on page 87 for a description of the contents of this directory.

Table 3-3 Contents of ito_op Directory on the Management Server

Files	Description
`ITO_JAVA.exe`	Install shield package for installation on a PC; it includes: • `jre1.2\` (Java 2 for MS Windows 95 and 98, NT 4.0 and Windows 2000) • `itooprc` (resource file) • `ito_op.bat` (ITO Java GUI start script) • `ito_op.jar` (ITO Java GUI classes) • `ov2.ico` (OpenView icon)
`JFC_LICENSE.txt`	JFC license text.
`VPO.cer`	ITO certificate for running the GUI as applet.
`contents.htm`	HTML page for downloading the GUI client from the management server.
`help/`	Online documentation files (HTML-based).
`identitydb.obj`	Security signature file.
`index.htm`	HTML page for downloading the GUI client from the management server.
`ito_for_activator.html`	HTML page for running the GUI in a web-based browser.

Table 3-3 Contents of ito_op Directory on the Management Server

Files	Description
`ito_op.jar`	ITO Java GUI classes
`ito_op_install.tar`	Tar achive for installation on a UNIX-based system; it includes: • `ito_op` (shell script to start the GUI) • `ito_op.jar` (ITO Java GUI classes) • `swingall.jar` (JDK 1.1.1)
`jre_HP-UX10.tar`	JRE 1.1.8 for HP-UX 10.20.
`jre_HP-UX11.tar`	JRE 1.2.2 for HP-UX 11.0.
`jre_SunOS5.tar`	JRE 1.2.2 for Sun Solaris (SPARC).
`swingall.jar`	JDK 1.1.1.
`topics.htm`	HTML page for downloading the GUI client from the management server.

Installation Prerequisites

Before installing the ITO Java-based operator GUI make sure that the following prerequisites are met:

- ❏ The management server system meets all hardware and software requirements as described in Chapter 1, “Prerequisites for Installation of the Management Server on Sun Solaris,” on page 21. Note that the kernel parameter maxfiles may need to be adjusted to ensure good performance.
- ❏ The ITO version A.06.00 software for the management server must be installed. See Chapter 2, Installing ITO for Sun Solaris on the Management Server,.

  Note that you *cannot* run earlier versions of the Java-based GUI with an ITO version A.06.00 management server, or vice versa. If you want to use the ITO version A.06.00 Java-based GUI, you must first upgrade your management server to this version of ITO, and then re-install the GUI client.

- ❑ JRE 1.1.8 or later and Java Foundation Class (JFC) 1.1.1 or later must be installed on the system where the ITO Java-based GUI will be installed and running. See also Table 3-2 on page 84.

The ITO installation automatically installs and configures an Apache Web server on the management server. See "Configuring the HTTP Server" on page 94 for configuration instructions for other web servers.

Installation Via the HTTP Server

1. Ensure that all prerequisites are met as described in "Installation Requirements" on page 84, and that an HTTP server is installed and running. See "Configuring the HTTP Server" on page 94 for information about configuring a web server other than the Apache Web server.
2. On the system where the Java-based GUI will be running, open the following URL in a web browser:

   `http://<management_server>:8880/ITO_OP`

   where <*management_server*> is the fully qualified hostname of your management server.
3. Follow the instructions given on this web page.

   - If you are running the Java-based GUI on a PC running MS Windows, download and execute the file `ITO_JAVA.exe`.
   - If you are running the Java-based GUI on a HP-UX system, download and untar the following files:
     - HP-UX 10.20: `jre_HP-UX10.tar` and `ito_op_install.tar`
     - HP-UX 11.0: `jre_HP-UX11.tar`

     See also "Installation on HP-UX with swinstall" on page 91.
   - If you are running the Java-based GUI on a Solaris system, download and untar the files `jre_SunOS5.tar`.
   - If you are running the Java-based GUI on a UNIX-based system, download and untar the file `ito_op_install.tar`; make sure that you have JRE for your platform installed.

Installation Via FTP

1. Ensure that all prerequisites are met as described in “Installation Requirements” on page 84.

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

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

2. To transfer the files via ftp:

   a. Start the MS-DOS command prompt or a terminal window on the system where the GUI will be installed.

   b. To open an ftp connection to the ITO management server, enter:

      `ftp <management_server>`

      where <*management_server*> is the hostname of your management server.

   c. Make sure that binary mode is used, enter:

      `bin`

   d. Change to the directory where the GUI software is located, enter:

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

   e. Retrieve the Java GUI executable.

      For a PC-based system:

      `get ITO_JAVA.exe`

      For a UNIX-based system:

      `get ito_op_install.tar`

      For a HP-UX 10.20 system, also retrieve `jre_HP-UX10.tar`, or `jre_HP-UX11.tar` for a HP-UX 11.0 system; for a Solaris system, retrieve `jre_SunOS5.tar`. All other UNIX-based systems must download JRE for their platform from the appropriate web sites.

      Close the ftp connection when the files were transferred successfully.

3. Extract JRE, enter:

   for HP-UX 10.x: **`tar xvf jre_HP-UX10.tar`**

for HP-UX 11.x: **`tar xvf jre_HP-UX11.tar`**

for Sun Solaris: **`tar xvf jre_SunOS5.tar`**

4. Extract the software from the files, enter:

   - For a PC-based system:

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

     This starts an install shied that will guide you through the installation.

   - For a UNIX-based system:

     `tar xvf ito_op_install.tar`

     This creates the directory `/opt/OV/www/htdocs/ito_op/`.

Installation on HP-UX with swinstall

On a HP-UX system, you can also use the HP SD-UX utility swinstall to install the GUI client from CD-ROM.

1. Ensure that all prerequisites are met as described in “Installation Requirements” on page 84.
2. Follow the instructions for using the swinstall GUI given in Chapter 2, Installing ITO for Sun Solaris on the Management Server,.

   Select the appropriate software bundle and proceed with the installation:

   - `ITOEngJavaUI` (for English installations)
   - `ITOSpaJavaUI` (for Spanish installations, not available with ITO for Sun Solaris)

Starting the ITO Java-based GUI

Starting the GUI on a PC

The install shield of the ITO Java-based GUI client software installs a desktop shortcut for the GUI. To start the ITO Java-based GUI, either use the installed desktop shortcut, or enter:

<drive_letter>:**<installation_directory>\ito_op.bat**

The ITO Java-based GUI is now started and displays a login screen. Enter the ITO user name and password.

Starting the GUI on a UNIX-based System

To start the ITO Java-based GUI on a UNIX system, enter:

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

The ITO Java-based GUI is now started and displays a login screen. Enter the ITO user name and password.

For more information about `ito_op`, see the man page *ito_op(1M)*.

Starting the GUI via a Web-based Browser

You do not need to install the GUI if you want to start the ITO Java-based GUI by way of a web-based browser. Simply download the Java applet provided with the GUI client software. Note, however, that this may cause performance problems and is not recommended.

1. Ensure that all prerequisites are met as described in “Installation Requirements” on page 84.
2. On the system where the Java-based GUI will be running, open the following URL in a web browser:

   http://<management_server>:8880/ITO_OP

   where <*management_server*> is the fully qualified hostname of your management server.
3. Follow the instructions given on this web page for downloading the Java applet.

Starting the Online Documentation

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

1. In the ITO Java-based GUI, select `Help: Contents` from the menu bar.

   A window opens that lets you select a web browser to be used for running web-based applications.

2. Select the web browser you want to use and click on `[OK]`.

   The web browser opens at the following URL:

   `http://<management_server>:8880/ITO_OP/help/\`
   `<lang>/index.htm`

   where <*lang*> is `en` for English .

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

Note that you can change the URL for the online documentation in the `Preferences` property sheet of the ITO Java-based GUI. Select `Preferences` from the `Edit` menu to open this property sheet.

Connecting Through a Firewall

If you want to access the ITO management server with the ITO Java-based GUI from outside a firewall, you need to open port 2531. Port 2531 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 ITO Java-based GUI, you need to configure your HTTP server to do so. The configuration varies depending on the type of HTTP server you have. The following Web servers are supported:

- ❏ NCSA/Apache (automatically installed and configured with the ITO installation)
- ❏ Netscape
- ❏ CERN/W3C

This section describes how to configure these Web servers for use with the ITO Java-based GUI.

Netscape Server Configuration

To configure Netscape to install and access the ITO Java-based GUI, select the Netscape server that you want to configure and perform the following steps.

From the `Netscape Enterprise Configuration` window:

1. Click the [`Content mgmt`] button at the top of the window.
2. Select `Additional Document Directories` in the left side of the window.
3. For `URL prefix`, enter:

   `ITO_OP/`

4. For `Map To Directory`, enter:

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

5. Click [`OK`].
6. Click [`Save and Apply`].

Restart your Web server and open the following URL:

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

Where <*server_hostname*> is the hostname of your Web server, including the domain.

Ensure that the `.exe` extension is defined in the following file:

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

Add the following line to the file:

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

CERN/W3C Server Configuration

To configure a CERN/W3C Web server to install and access the ITO Java-based GUI, add the following line to the file `httpd.conf`:

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

Restart your Web server and open the following URL:

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

Where <*server_hostname*> is the hostname of your Web server, including the domain.

4 Startup/Shutdown Services and Manual Database Configuration

In This Chapter

This chapter describes how to set up automatic startup and shutdown operations for the ITO management-server services. It describes both automatic and manual startup and shutdown methods for your installed database.

ITO Startup and Shutdown Operations

When you configure ITO, the startup of ITO processes (ovstart/ovstop) is automatically integrated into the system boot sequence.

The ITO management server services are started automatically by the ovstart command. This service is integrated so that it is executed during the system boot phase. Similarly, ITO management server services are automatically shut down by the command ovstop. The ovstart and ovstop scripts are located in:

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

The script opcsv is also available to start and stop ITO services by calling ovstart/ovstop. The opcsv script is located in the following directory:

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

opcsv -start First calls **ovstop opc**, then **ovstart opc** and **ovstart ovoacomm**.

opcsv -stop Calls **ovstop opc**.

opcsv -status Displays more detailed ITO status information than **ovstatus opc**.

NOTE

The command **opcsv -stop** does not stop all messages from subagent processes such as HP OpenView IT/Administration. Subagent communication processes depend on the ITO OpenAgent (ovoacomm), which is not stopped by the opcsv command. If you want to stop both the OpenAgent and ITO server processes, use: **ovstop opc ovoacomm**. Conversely, if you want to start both the OpenAgent and ITO processes, use: **ovstart opc ovoacomm**

For more information, see the man page *opcsv(1M)* and *ovstart(1M)*.

The ITO installation process automatically configures the DCE RPC daemon so that it is started in the system boot phase.

Automatic Startup and Shutdown of an Oracle Database

You can use the ITO shell script `/sbin/init.d/ovoracle` to ensure a clean, automatic startup and shutdown of an Oracle database whenever you start and shutdown the ITO management server. If you choose to start the ITO management server processes automatically at system startup, the Oracle database must be running before ITO.

`ovoracle` is linked to `/etc/rc3.d/S83ovoracle` (for the start) and `/etc/rc0.d/K11ovoracle` , `/etc/rc1.d/K11ovoracle` (for the shutdown). The option for the automatic startup and shutdown of the database is set in the file:

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

Use `opcconfig` to configure the database for ITO: you are asked whether you want to enable database startup and shutdown in the system boot phase. If you answer **yes**, ITO automatically enables the startup.

You can enable automatic startup and shutdown of the database by editing the `/etc/rc.config.d/ovoracle` file.
Set the ORACLE_HOME and NLS_LANG variables.
Change both the OVORACLE and OVORALISTENER variable to 1 as shown in the following extract from the file:
`/etc/rc.config.d/ovoracle`

```
# 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
```

Manual Startup and Shutdown of an Oracle Database

If you choose not to incorporate the Oracle `startup/shutdown` commands in the system boot sequence, you will need to start and stop the database manually as described below. You must start the database before starting ITO and stop the database after stopping ITO.

Manual Startup of an Oracle Database

To start an Oracle database manually:

1. Switch to user oracle:

   `su - oracle`

2. Set the *`ORACLE_HOME`* environment variable. The default is as follows:

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

   Where <*`version`*> is one of the supported versions of the Oracle database.

3. Set the *`ORACLE_SID`* environment variable. Default is as follows:

   `export ORACLE_SID=openview`

4. Run the server manager tool `svrmgrl` to administrate the database:

   `<ORACLE_HOME>/bin/svrmgrl`

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

   ```
   connect internal
   startup
   exit
   ```

6. Switch back to user root:

   `exit`

Manual Shutdown of an Oracle Database

To shut down an Oracle database manually:

1. Switch to user oracle:

   su - oracle

2. Set the *ORACLE_HOME* environment variable. Default is as follows:

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

   Where <*version*> is one of the supported versions of the database.

3. Set the *ORACLE_SID* environment variable. Default is as follows:

   export ORACLE_SID=openview

4. Run the server manager tool `svrmgrl`:

   <ORACLE_HOME>/bin/svrmgrl

5. Enter the following to stop the Oracle database:

   ```
   connect internal
   shutdown
   exit
   ```

6. Switch back to user root:

   exit

Native Language Support (NLS) by an Oracle Database

NOTE

The same character set must be used for both the Oracle database and the environment of the ITO user-interface and server processes. This helps to avoid unnecessary conversions taking place in the Oracle database. Once you have installed an Oracle database, you can no longer change the character set.

An installed Oracle database obeys the following rules for NLS:

Use the `CHARACTER SET` option of the `CREATE DATABASE` command to define the database language. When the `opcdbsetup` script creates the database, it uses the following character set for English language installations:

```
CHARACTER SET = "american_america.WE8ISO8859P1"
```

These NLS parameters are controlled by the Oracle environment *NLS_LANG* which has the format:

<language>_<territory>.<character_set>

ITO uses the following setting of *NLS_LANG*:

English language: `american_america.WE8ISO8859P1`

By default, ITO uses the value of *NLS_LANG* set in the Oracle environment. If *NLS_LANG* is not set in the Oracle environment, ITO uses the value specified in the file:

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

ITO 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.

Resolving the Oracle Environment Variables

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

1. Determine the *ORACLE_HOME* variable.

   If *ORACLE_HOME* is set in the environment, this value is used. If not, ITO uses the value from the configuration file `/etc/opt/OV/share/conf/ovdbconf`

2. Determine the *ORACLE_SID* variable.

   If *ORACLE_SID* is set in the environment, this value is used. If not, ITO uses the value from the configuration file `/etc/opt/OV/share/conf/ovdbconf`

3. Determine the *NLS_LANG* variable.

   If *NLS_LANG* is set in the environment, this value is used. If not, ITO uses the value from the configuration file `/etc/opt/OV/share/conf/ovdbconf`

4. Determine the *ORA_NLS* variable.

   This variable is needed for a Japanese language installation of Oracle. If *ORA_NLS* is not set in the environment, ITO selects the appropriate setting.

5. Determine whether the parameter `DATABASE <database>` is set in the file `/opt/OV/bin/OpC/install/opcsvinfo`.

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

   For example, if the following line is entered in the file `opcsvinfo`:

   ```
   DATABASE ov_net
   ```

   The string `opc_op/<password>@ov_net` is used to connect to the SQL*Net V2 identifier `ov_net`.

6. Connect to the database as described in the section “Installing and Checking an Oracle Database” on page 50. If `DATABASE` is not used, use the connect string `opc_op/<passwd>`

Alternative Database Locations

The following table shows several alternative database installations, describes the location of associated processes, and lists the entries required in the file: `/opt/OV/bin/OpC/install/opcsvinfo`

Table 4-1 Alternative Database Locations

Database Scenario	Entries in opcsvinfo	Location of Processes
Independent Database Server (See "Using a Separate Database Server System" on page 106.)	`DATABASE ov_remote`	On the database server: • Oracle processes On the ITO management server: • ITO server processes • UI Processes
Local Database using SQL*NET (default)	`DATABASE ov_net`	All processes (database, ITO management server, and the GUI) run on the management server. They connect to the database server using SQL*NET.

Using a Separate Database Server System

It is recommended to set up the Oracle database and the ITO management server on the *same* system. This reduces the complexity of your computing environment and allows you to use all ITO administration tools. However, if the system resources on the ITO management server system are not sufficient, you may set up a separate database server system. You can use Oracle SQL*Net or Net8 as the network link between the ITO system and the database server system.

NOTE The ITO backup and recover programs only function when the database is on the local management server. For a consistent backup, the data files and the data in the database must be synchronized.

1. Install the following products on the *database server*. For more information on the required product versions, see Table 1-11 on page 43:

   - ❏ Oracle8 Enterprise version 8.0.6 or 8.1.6.
   - ❏ SQL*Net or Net8 to match the Oracle Server.
   - ❏ TCP/IP Protocol Adapter (V2) to match the SQL*Net version.
   - ❏ PL/SQL to match the Oracle server.
   - ❏ SQL*Plus.

   In addition, you must install the following products on the ITO *management server*:

   - ❏ SQL*Net V2 or Net8 to match the Oracle Server.
   - ❏ TCP/IP Protocol Adapter (V2) or Net8 protocol adapters to match the SQL*Net version.
   - ❏ SQL*Plus.

2. Make sure that you stop all ITO processes on the management server.
3. Install ITO on the ITO management-server system following the installation procedure described in “Installing the ITO Software on the Management Server” on page 61.

4. Export the /opt/OV, /etc/opt/OV, and /var/opt/OV directories on the ITO management server and assign write access, and access for user root using admintool.
5. Login as root on the database server (the system on which you wish to run the database).
6. On the database server system, create the group opcgrp and the user opc_op with the same ID as on the ITO management server. You may use admintool, the Sun Solaris system-administration tool
7. Mount the /opt/OV, /etc/opt/OV, and /var/opt/OV directories from the management server with NFS to the database server. Make sure that the directory is exported on the management server with write access and access for root.

   umask 022

   mkdir /opt/OV /etc/opt/OV /var/opt/OV

   mount <mgmt_server>:/opt/OV /opt/OV

   mount <mgmt_server>:/etc/opt/OV /etc/opt/OV

   mount <mgmt_server>:/var/opt/OV /var/opt/OV

8. Copy the following scripts that control automatic database startup from the ITO management server to the database server:

   - /etc/rc.config.d/ovoracle
   - /sbin/init.d/ovoracle

   On the database server, link the files:

   - **ln -s /sbin/init.d/ovoracle /etc/rc0.d/K11ovoracle**
   - **ln -s /sbin/init.d/ovoracle /etc/rc1.d/K11ovoracle**
   - **ln -s /sbin/init.d/ovoracle /etc/rc3.d/S83ovoracle**

   Add the values for *ORACLE_HOME*, *ORACLE_SID*, and *NLS_LANG* to /etc/rc.config.d/ovoracle:

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

   where <*version*> is the version of the Oracle database you have installed; for example, 8.0.6 or 8.1.6.

   export ORACLE_SID=openview

   export NLS_LANG=american_america.WE8ISO8859P1

9. Make sure that the user opc_op exists on the database server. If it does not exist, use admintool (1M) to create the user with the same user ID as used on the management server.
10. Call `opcdbsetup` on the database server to create and configure the database:

    `/opt/OV/bin/OpC/opcdbsetup`

    See the man page *opcdbsetup(1M)* for more details.
11. `opcdbsetup` automatically configures SQL*NET and starts the SQL*NET listener. Copy the following SQL*NET files from the database server to the ITO management server – these files are required on both systems:

    - `$ORACLE_HOME/network/admin/sqlnet.ora`
    - `$ORACLE_HOME/network/admin/tnsnames.ora`
    - `$ORACLE_HOME/network/admin/tnsnav.ora`

NOTE If you use a different value for *ORACLE_HOME* on the ITO management server, you will have to adapt these files on the management server because several log and trace files reference *ORACLE_HOME*.

12. Unmount the `/opt/OV`, `/etc/opt/OV`, and `/var/opt/OV` directories.
13. Exit the database server.
14. Log in as user root on the management server.
15. `opcdbsetup` creates symbolic links from the Oracle shared library to ITO libraries. If you use a different *ORACLE_HOME* on the ITO management server and on the database server, you will need to change the links on the ITO management server:

    `ln -sf <ORACLE_HOME>/lib/libclntsh.so\`
    `/opt/OV/lib/libclntsh.so`

    `ln -sf <ORACLE_HOME>/lib/libclntsh.so\`
    `/opt/OV/lib/libclntsh.so.1.0`

    Make sure the Oracle shared library has the required execute permissions:

    `chmod +x <ORACLE_HOME>/lib/libclntsh.so`
16. Reset the name of the ITO management server in the database by

changing the IP address using the opcchgaddr command, enter:

```
/opt/OV/contrib/OpC/opcchgaddr -label mgmt_sv IP\
<DB_server_IP_addr> <DB_server_name>\
IP <ITO_mgmt_server_IP_addr> <ITO_mgmt_server_name>
```

Since opcdbsetup was run on the database server system, the entry in the database for the ITO management server uses the hostname and IP address of the database server system. This is incorrect: the entry needs to be changed to reflect the hostname and IP address of the ITO management server itself.

17. Use the ITO administrator GUI *after* running opcconfig to:

    - ❑ Change the machine type of the ITO management server, if the machine type of the database server and the ITO management server are different.
    - ❑ De-assign the mondbfile template from the ITO-managment server template group and, if an ITO agent is running on the database-server system, assign the mondbfile template there.

18. You have now finished setting up the separate database system and can continue with the configuration of the ITO software which is described in “Configuring the ITO Software” on page 71. When you are running opcconfig, remember to answer, **No** to the question:

    ```
    Do you want to configure the database automatically (y/n)
    [y] n
    ```

5 Directory Structure on the Management Server

In This Chapter

This chapter provides file trees showing the hierarchy of ITO directories on the management server.

ITO File Tree on the Management Server

The major ITO directories on Sun Solaris systems are as follows:

`/opt/OV` Contains all the ITO binaries.

`/etc/opt/OV` Contains configuration data.

`/var/opt/OV` Contains run-time data.

NOTE The file tree may include additional subdirectories if ITO agent software or other HP OpenView software is installed. For more information on agent file trees, see the *VP Operations Administrator's Reference Volume II*.

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

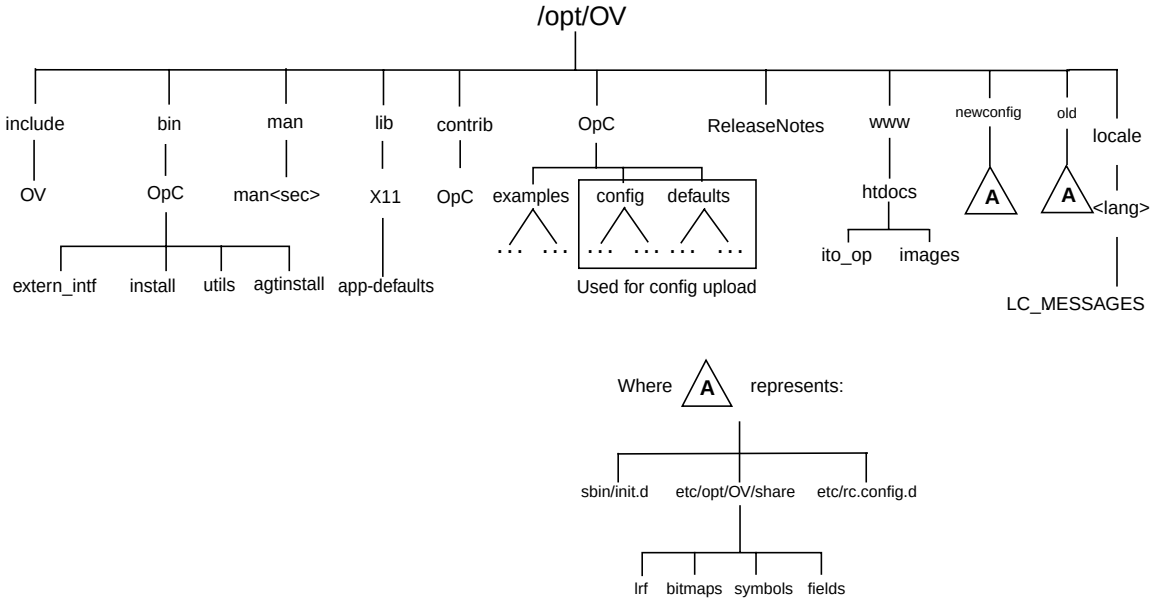


Figure 5-2 File Tree on the Management Server (/var/opt/OV Branch)

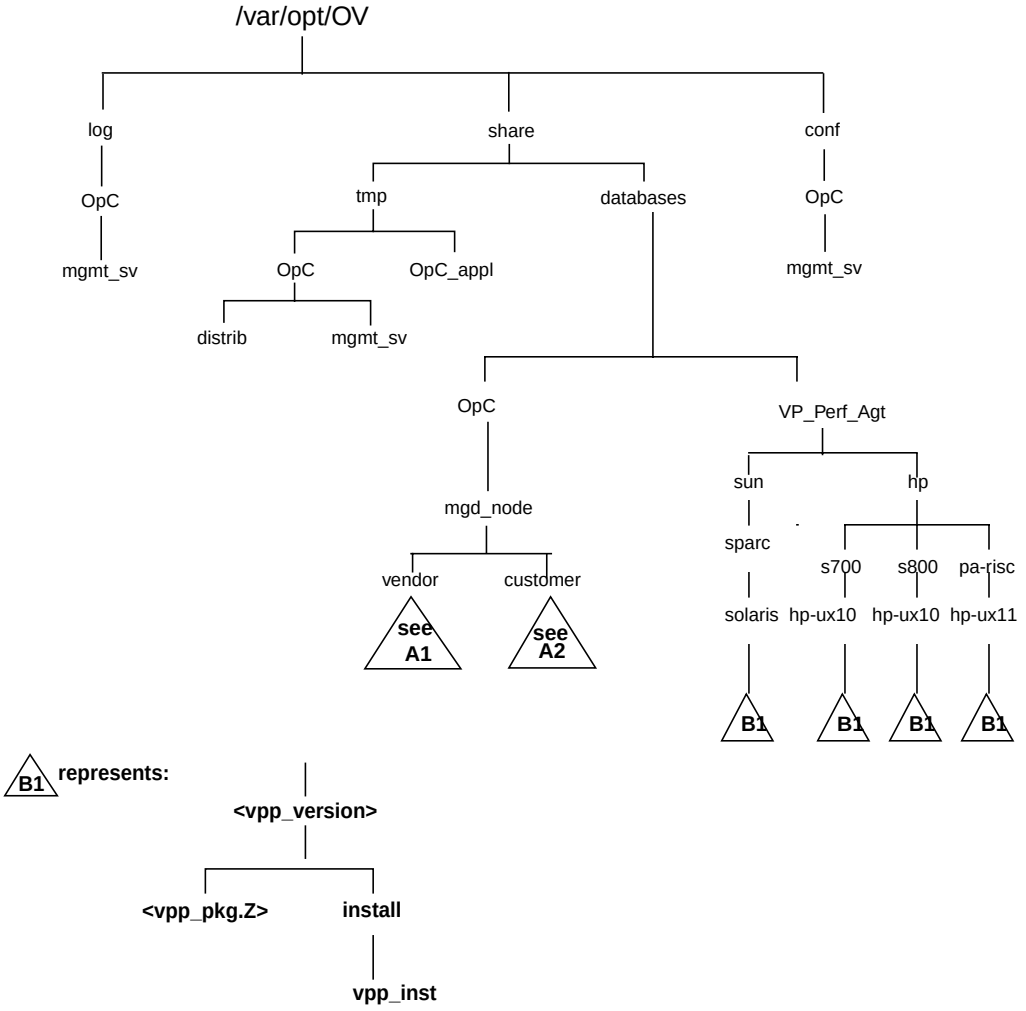
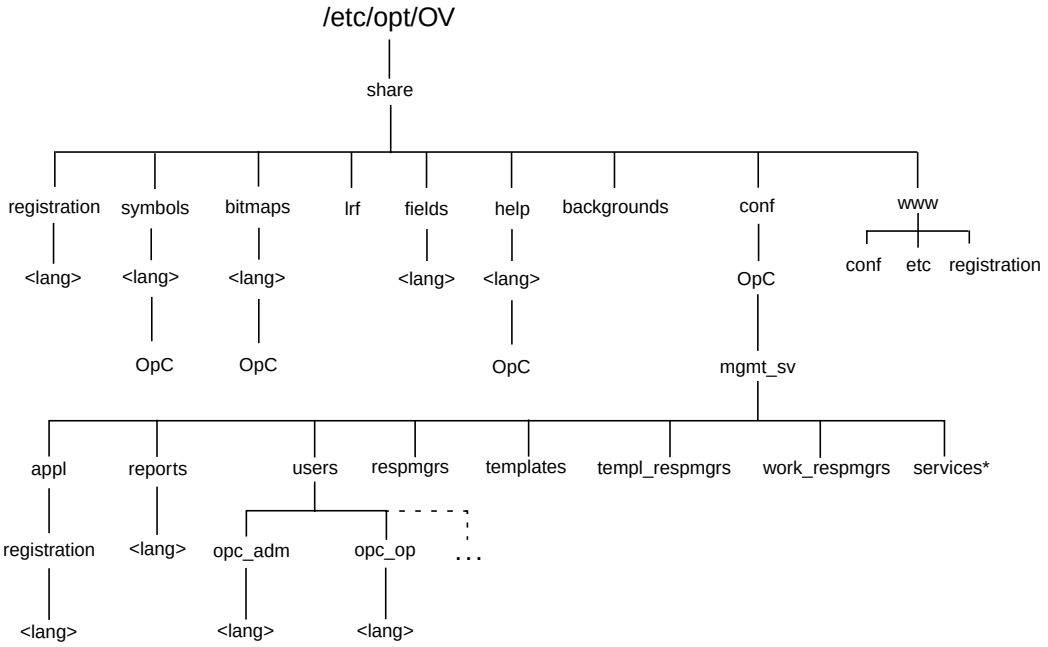
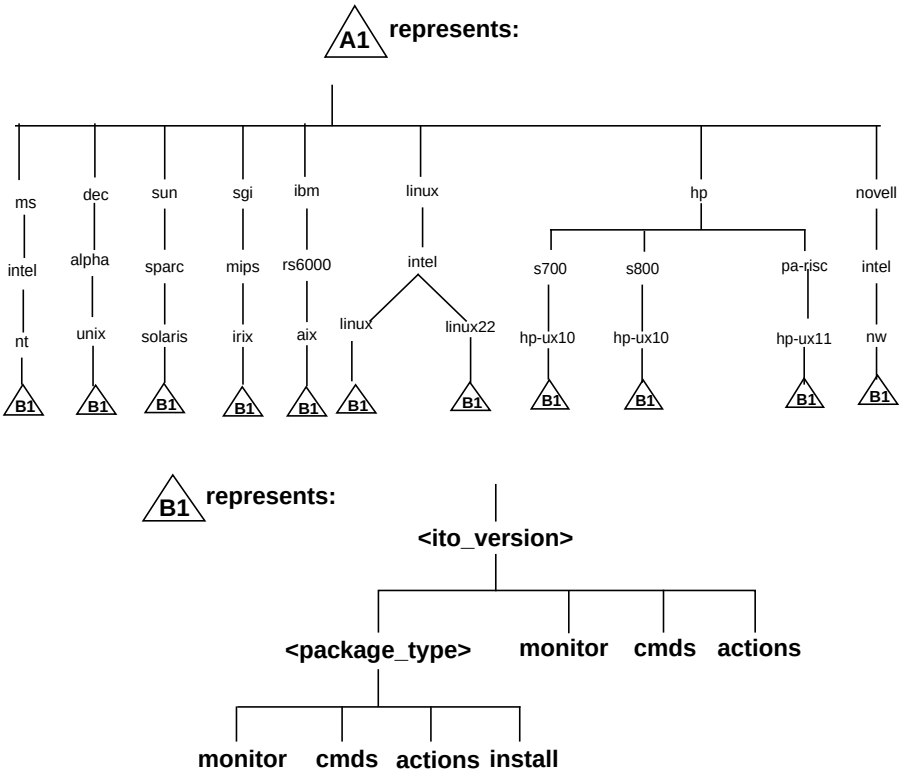


Figure 5-3 File Tree on the Management Server (/etc/opt/OV Branch)



* only if the HP OpenView VantagePoint Navigator is installed

Figure 5-4 Vendor-specific ITO Software Sub-tree on Management Server



Where:

<ito_version> Is the version of ITO that supports a particular agent platform, for example A.06.00.

ITO can manage several different ITO versions for each agent platform. For more information about ITO version management, see the *VP Operations Administrator's Reference Volume II*.

<package_type> Is the communication type used by the remote procedure calls (RPC) of a particular agent platform, for example:

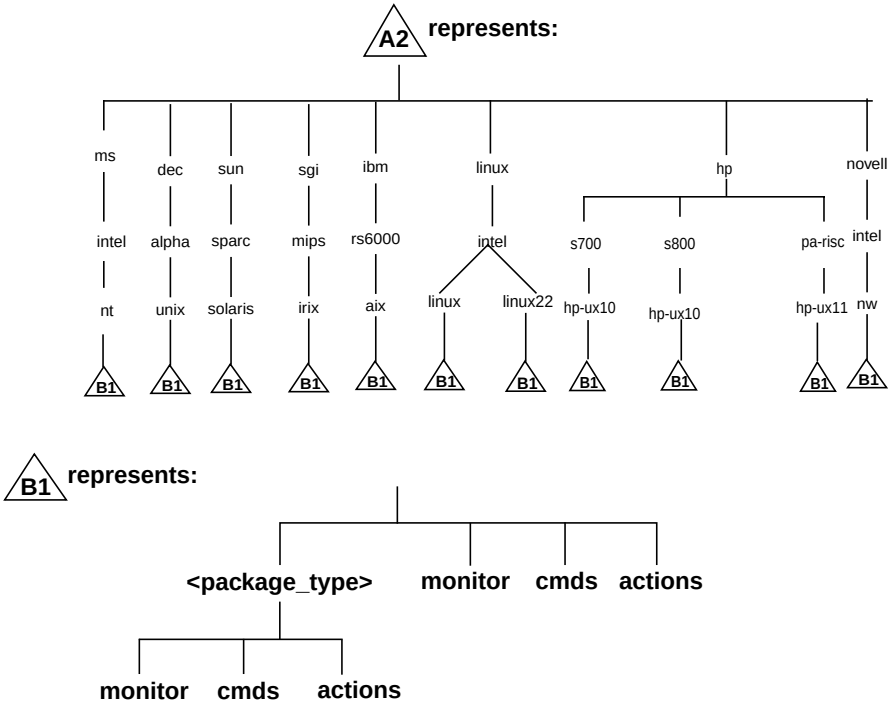
- RPC_NCS
- RPC_DCE_TCP
- RPC_DCE_UDP

NOTE

When DCE managed nodes communicate with the management server over a fast network (LAN), choose DCE RPC (UDP) in preference to DCE RPC (TCP) as the communication protocol for the best performance.

The customer sub-tree is similar to the vendor sub-tree, without the ITO version and package-type branches. 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 ITO.

Figure 5-5 Customer-specific ITO Software Sub-tree on Management Server



6 Administration of the Software on the Management Server

In This Chapter

This chapter describes:

- How to install the agent software on the management server.
- How to de-install ITO software from the management server.
- How to re-install the ITO software on the management server.

To install ITO agent software on the managed nodes, see the *VP Operations Administrator's Reference Volume I* .

Installing Agent Software on the Management Server

If you did not install all agent software packages during the initial installation of the ITO management server, for example if you installed the **Minimal** ITO bundle, you may need to load the software for specific ITO agents at a later date. To install the agent software on the managed nodes, see the first few chapters of the *VP Operations Administrator's Reference Volume I* .

NOTE

This section assumes that you have completed the installation of ITO on the management server. Only use this method if you have not already installed all software for the ITO agents.

Agent software installation is enabled through `agtswinstall` utility, which is provided on the distribution media.

To check which ITO agent packages are already installed, do:

- ❏ change to the directory on the CD-ROM, enter:

  `cd /cdrom/cdrom0/`

- ❏ run:

  `./agtswinstall -l`

To check whether a single fileset is installed, run:

`./agtswinstall -l -c <ITO_agent_fileset>`

Where <*`ITO_agent_fileset`*> is the name of the ITO agent fileset.

To install ITO agent software on the management server:

1. Set the umask of user root, enter:

   `umask 022`

2. Check that all ITO GUI processes are terminated:

   `ps -eaf | grep opcui`

This must not report any active ITO GUI processes.

NOTE `opcuiwww` process is not an ITO GUI process, it is an ITO management server process. It does not have to be stopped.

3. Make sure that the database is running; if not, start it now.
4. Install the client fileset on the management server using `agtswinstall` from the command line. Enter either:

   for interactive mode:

   `./agtswinstall`

   - or -

   `./agtswinstall -c <ITO_agent_fileset>`

   For example, to install the MS Windows NT agent package on the management server, you would enter:

   `./agtswinstall -c OVOPC-NT-CLT`

All default templates are integrated when you first install and integrate the database.

NOTE Agent configuration data is automatically stored into database.

Table 6-1 ITO Generic Agent Filesets in OVOPC-CLT

<platform_selector>	Fileset	Description
sun/sparc/solaris	OVOPC-SOL-CLT	Managed node functions for Sun SPARC systems running Solaris[a].
ms/intel/nt	OVOPC-NT-CLT	Managed node functions for Intel-based PCs running MS Windows NT and Windows 2000.

Table 6-1 ITO Generic Agent Filesets in OVOPC-CLT

<platform_selector>	Fileset	Description
hp/s700/hp-ux10 hp/s800/hp-ux10	OVOPC-UX10-CLT	Managed node functions for HP 9000 Technical Workstation or Enterprise Server systems running HP-UX 10.20
hp/pa-risc/hp-ux11	OVOPC-UX11-CLT	Managed node functions for HP 9000 Technical Workstation or Enterprise Server systems running HP-UX 11.0
ibm/rs6000/aix	OVOPC-AIX-CLT	Managed node functions for IBM RS/6000 systems running AIX.
linux/intel/linux linux/intel/linux22	OVOPC-LIN-CLT	Managed node functions for Intel-based PC's running RedHat Linux 5.x or 6.x.
novell/intel/nw	OVOPC-NW-CLT	Managed node functions for Intel-based systems running Novell NetWare
sgi/mips/irix	OVOPC-SGI-CLT	Managed-node functions for Silicon Graphics running IRIX.
dec/alpha/unix	OVOPC-OSF-CLT	Managed node functions for DEC Alpha systems running Digital UNIX.

a. Never delete this agent platform.

For more information about the contents of these filesets, see the tables in Appendix B, “Bundling of ITO for Sun Solaris Software,” on page 191.

De-installing the Entire ITO Installation

Perform the following tasks as user root on the management server:

1. Stop all managed node services using the appropriate GUI windows, or enter:

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

2. De-install the ITO software from all managed nodes, including the management server using the `De-install ITO Software and Configuration` window in the administrator's GUI.

   Select `Actions: Agents->Deinstall...`

NOTE De-install all ITO agents belonging to the management server environment before you de-install the ITO management server. If you don't, the removal process will fail.

   If the management server is in turn managed by another management server according to the flexible manager functionality, you must also de-install the software from this managed node. After completely de-installing the entire ITO installation, you can re-install the managed node software from the server using the `Force Update` option.

3. Check that all ITO GUI processes are terminated:

   ps -eaf | grep opcui

NOTE `opcuiwww` process is not an ITO GUI process, it is an ITO management server process. It will be stopped in step 4.

   Otherwise, terminate them by selecting `Map: Exit`, or by pressing **Ctrl** + **E** in any HP OpenView submap. Alternatively, use the `kill(1)` command.

4. Stop all ITO management services:

   /opt/OV/bin/ovstop opc ovoacomm

5. Verify that all ITO services have been stopped:

   ps -eaf | grep opc

   This should not report any ITO process.

6. Remove the ITO tablespaces from the Oracle database, enter either:

   /opt/OV/bin/OpC/opcdbsetup -r [-v]

NOTE Run `opcdbsetup` with `-r option`, if you want to remove the ITO tables and tablespaces from the Oracle database.

- or -

/opt/OV/bin/OpC/opcdbsetup -d [-v]

NOTE If you run any other OpenView product on your system, do not run `opcdbsetup` with option `-d`. It removes not only the ITO tables and tablespaces from the Oracle database, but the entire openview database.

Where:

`-r`	Removal mode. Drops all ITO tables, including ITO tablespaces from the openview database.
`-d`	Destroy mode. Removes the entire openview database, including non-ITO tables and tablespaces.
`-v`	Verbose mode; shows processing steps.

A list of ITO tables is provided in the *VP Operations Reporting and Database Schema*.

7. De-install ITO by using the `remove` script provided on the distribution media. To start ITO de-installation; as user root:

   - change to the directory on the CD-ROM, enter:

     cd /cdrom/cdrom0/

   - start the de-installation script, enter:

     ./remove

8. Check the following logfiles for problems occurring during de-installation:
   - `/var/adm/sw/swagent.log`
   - `/var/adm/sw/swremove.log`
9. For every installed NNM and SNMP Agent patch remove the following directories:

   `/system/<patch_ID>`
10. If no other installed product is using HPlwdce, you can de-install it. Enter the following command:

    `pkgrm HPlwdce`

To de-install the Oracle database, see the appropriate manual supplied by the database vendor.

De-installing the ITO Java-based GUI

If you no longer require the ITO Java-based operator GUI, you can easily de-install it using the following instructions:

- PC client:
  1. Close all running GUIs on the client.
  2. Select `Add/Remove Programs` from the Windows `Control Panel`
  3. Select `HP VantagePoint for UNIX Java Console` and click on `[Add/Remove-]`
- Solaris client:
  1. Close all running GUIs on the client.
  2. De-install the ITO Java-based GUI interactively, using the remove script provided on the distribution media. Start remove and select `ITOEngJavaUI`.
  3. Check the following logfiles for problems occurring during the de-installation:
     - `/var/adm/sw/swagent.log`
     - `/var/adm/sw/swremove.log`
- Other UNIX-based systems:
  1. Close all running GUIs on the client.
  2. Remove the directory `/opt/OV/www/htdocs/ito_op/` and its contents.

De-installing Agent Software from the Management Server

If you no longer use a particular ITO managed platform, you may want to de-install a managed node package from the management server.

NOTE Only de-install an ITO agent software package from the ITO management server when you are sure that you will never use that type of agent.

If you have managed nodes configured for an agent platform do not de-install the agent package as this can result in the loss of configuration for the managed nodes.

To de-install managed node software from the management server:

1. Make sure that the database is running. If not, start it now.
2. Check that all ITO GUI process are terminated:

   ```
   ps -eaf | grep opcui
   ```

NOTE `opcuiwww` process is not an ITO GUI process, it is an ITO management server process. It does not have to be stopped.

   This must not report any active ITO GUI processes.

3. Remove the agent software package for the managed node from the management server using the `agtswinstall` which is provided on the distribution media. Do following:

   - change to the directory on the CD-ROM, enter:

     ```
     cd /cdrom/cdrom0/
     ```

- run either:

  for interactive mode: **`./agtswinstall -r`**

  or: **`./agtswinstall -r -c <fileset>`**

For example, to remove the MS Windows NT agent package from the management server, you would enter:

```
./agtswinstall -r -c OVOPC-NT-CLT
```

Re-installing ITO on the Management Server

Re-installation of ITO should be done with care. You may need to re-install the ITO software, for example, if files are accidentally deleted. If you also need to re-initialize your ITO database and configuration, see “Re-installing ITO on the Management Server” on page 130.

Re-installing ITO Software

1. De-install ITO as described in “De-installing the Entire ITO Installation” on page 124.
2. Install ITO as described in Chapter 2, “Installing ITO for Sun Solaris on the Management Server,” on page 47.

Re-initializing the Database and Configuration

If required, you can re-initialize the ITO database and configuration on the management server after re-installing the ITO software as follows:

1. If required, de-install ITO software from all managed nodes, as described in the *VP Operations Administrator's Reference Volume I* . Note that after you have re-initialized the ITO database, all node configuration will be lost. You must then reconfigure the nodes.
2. Remove all HP OpenView maps of all ITO users. To do this:
   a. Start an HP OpenView Windows session:

      /opt/OV/bin/ovw

   b. Select `Map: Open...` from the menu. Click on the administrator's and operators' entries and delete them.
3. Clean up the `/etc/opt/OV/share/conf/OpC/mgmt_sv/users` directory. Delete all subdirectories except `itop`, `opc_op`, `opc_adm`, and `netop`.
4. If the software has been de-installed, re-install it as described above.
5. Stop all ITO management services:

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

6. Cleanup the database, including the configuration for operators and nodes, and all active and history messages:

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

   Where:

`-c`	clean tables and load default configuration
`-v`	verbose mode; used to show processing progress

7. Restart all ITO management services:

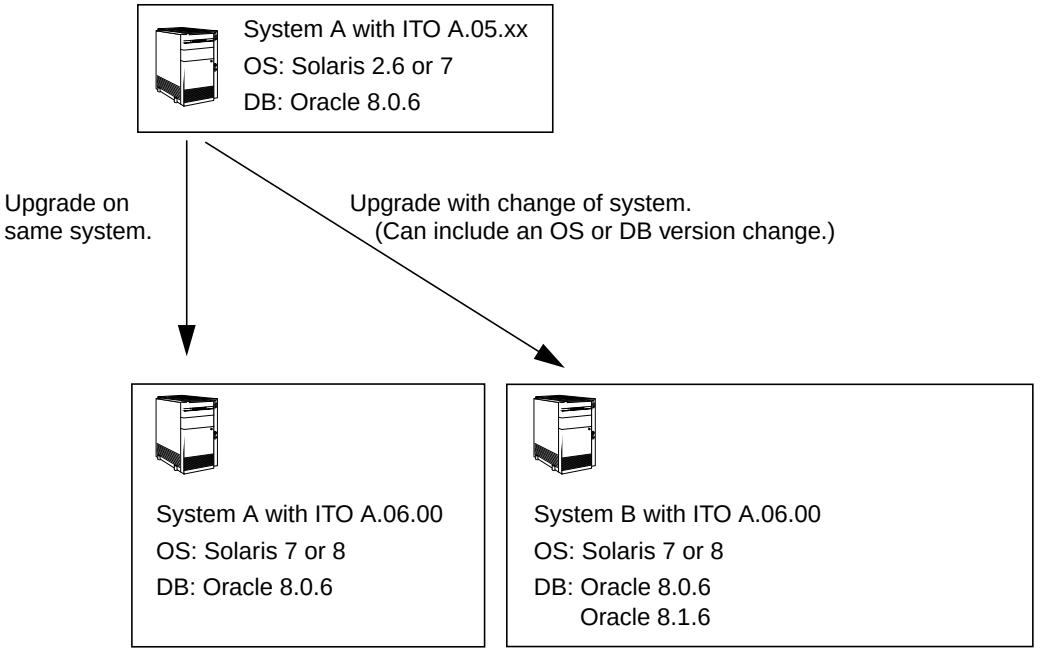
   ```
   /opt/OV/bin/ovstart opc
   ```

7 Upgrading to ITO version A.06.00

In This Chapter

This section describes how to upgrade an installed ITO version A.05.xx to ITO version A.06.00. In general, you can upgrade ITO on the same system or you can select a new system for the ITO management server. You should choose the latter upgrade path, if you also want to upgrade the operating system and/or the database version. Figure 7-1 on page 134 shows the supported upgrade paths.

Figure 7-1 Supported Upgrade Paths



Customers using a version of ITO prior to ITO A.05.xx must first upgrade to ITO A.05.xx before they can upgrade to ITO A.06.00. In addition, you will need to ensure that the correct operating system and the correct version of the database are installed *before* starting the ITO software upgrade process. For more information, see “Checking Prerequisites of the Management Server” on page 27.

NOTE

If you have a product installed that is integrating or is certified with ITO A.05.xx, for example HP OpenView IT/Administration or a SMART Plug-In, you must ensure that this product is also compatible with ITO version A.06.00 before starting the ITO upgrade process. See the documentation of the integrating product for information about how to perform the ITO upgrade in this situation.

If your database server and ITO management server reside on separate systems, see “Upgrading ITO Software in an Environment with a Separate Database Server” on page 156.

Upgrading from ITO A.05.xx to ITO A.06.00

This section describes the procedure for upgrading ITO software from version A.05.xx to version A.06.00 on systems running Solaris 7 or 8. You will need to carry out the high-level steps provided in the order described:

1. Download the configuration on the ITO management server.
2. Back up the current ITO installation.
3. Check the prerequisites of the management server, paying special attention to the operating system and database versions required for the new software. Any operating-system and database upgrade must be done *before* the ITO software upgrade.
4. If you are upgrading on the same system, remove the tables from the ITO database.
5. Install and configure the ITO software.
6. Upload the previously saved configuration.
7. Upgrade managed nodes.
8. Upgrade the Java-based operator GUI.

More information on each step may be found in the corresponding sections that follow.

NOTE

Note that you must ensure that the correct version of the Solaris operating system and Oracle database is installed on the system on which you want to install (upgrade to) the ITO A.06.00 software *before* you install the new ITO software.

Earlier versions of the ITO Java-based GUI,(versions below A.06.00) are also *not* compatible with ITO version A.06.00, and must be upgraded as well. See “Upgrading the ITO Java-based Operator GUI” on page 157 for more information.

ITO Upgrade Restrictions

The following NNM data is *not* migrated by ITO, if you are changing your management server system during the upgrade; see the NNM B.06.10 *Migration Guide* (HP Part Number J1240-90029) for more information about migrating NNM data:

- ovw maps including customizations to ovw maps for ITO, for example background graphics, are *not* migrated. The maps necessary for ITO are created when the GUI is started.
- Topology data is *not* migrated but can be recreated by discovering the network again.
- Event data.
- Data in the NNM data warehouse.

If you upgrade ITO on the same management server system, all NNM data is migrated except of data in the NNM data warehouse.

Download the Current ITO Configuration

1. Some default templates and applications have changed with ITO A.06.00. If you have modified these templates or applications, rename them before downloading the data. This ensures that the old, default configuration does not overwrite the new, modified configuration.
2. If you want to migrate your active messages, perform the following steps:
   a. Perform a history download:

      ```
      /opt/OV/bin/OpC/opchistdwn -older 0s -file \
      /tmp/history
      ```

   b. Acknowledge all active messages.
   c. Perform a second history download:

      ```
      /opt/OV/bin/OpC/opchistdwn -older 0s -file \
      /tmp/active
      ```

   d. Store the two downloads on a tape or a separate system.
3. If you want to migrate audit data, perform the following steps:
   a. Download all audit data:

      ```
      /opt/OV/bin/OpC/opcauddwn -older 0s -file /tmp/audit
      ```

   b. Store the download data on a tape or a separate system.
4. Download all data.
   a. In the ITO administrator GUI, select `Actions->Server->Download Configuration`.
   b. Select the `All Configuration Data` option.
   c. Choose a directory for the download, for example `/tmp/upgrade`.
5. Continue with “Back Up the Current ITO Installation” on page 139.

Back Up the Current ITO Installation

1. Exit all ITO GUIs.
2. Stop all OpenView daemons:

   /opt/OV/bin/ovstop
3. Stop other applications on the system as required.
4. Make a full backup of the current installation:

   a. Enter:

      /opt/OV/bin/OpC/opc_backup

   b. When prompted:

      ```
      Do you want to use the full or configuration backup?
      (f|c) ==>
      ```

      Enter: **f** for a *full* backup that includes the ITO binaries and the configuration data.
5. Continue with “Check the Prerequisites of the Management Server” on page 140.

Check the Prerequisites of the Management Server

Make sure that the management server meets at least the minimum system requirements as described in Chapter 1, “Prerequisites for Installation of the Management Server on Sun Solaris,” on page 21. Pay particular attention to which versions of the operating system and Oracle database are required for the current *and* upgrade ITO software. As a general rule, any upgrade must be approached in the following order:

1. operating system
2. database
3. ITO software

NNM allows a maximum of 250 nodes to be managed with an Instant-On license. If your environment includes more than 250 nodes, make sure that you have *all* the necessary licenses available *before* you start the software-upgrade process. For more information, see “Installing and Verifying Product Licenses” on page 165.

Upgrade the Oracle Database Version

Table 7-1 shows the operating system and Oracle database versions supported with ITO A.05.xx and A.06.00.

Table 7-1 Supported Oracle Versions

ITO Version	Solaris Version	Oracle Version
A.05.xx	Solaris 2.6	7.3.4 8.0.5 8.0.6
A.05.xx	Solaris 7	7.3.4 8.0.5 8.0.6
A.06.00	Solaris 7	8.0.6 8.1.6

Table 7-1 Supported Oracle Versions

ITO Version	Solaris Version	Oracle Version
A.06.00	Solaris 8	8.0.6 8.1.6

If you are currently running ITO A.05.xx with an Oracle version lower than 8.0.6, you must upgrade to Oracle 8.0.6 first. 8.0.6 is the Oracle version that should be used when upgrading to A.06.00 as described in this chapter.

Since Oracle 8.0.6 is supported by both ITO A.05.xx and ITO A.06.00, you can verify that the database upgrade worked using the current ITO installation. This makes the subsequent ITO upgrade easier. Once you have successfully upgraded to ITO A.06.00, you can decide whether to stay with Oracle 8.0.6 or upgrade to 8.1.6.

Upgrade the Oracle database as described in the documentation supplied with the database. If you changed the setting of the *ORACLE_HOME* variable when upgrading the database, you will have to manually change the setting of *ORACLE_HOME* in the following files, which are created, modified, or used by ITO:

- `/etc/oratab`
- `/etc/profile`
- `/etc/.login`
- `/etc/rc.config.d/ovoracle`
- `/etc/opt/OV/share/conf/ovdbconf`

  You will also need to change the entry for the database release.

- `$ORACLE_HOME/network/admin/tnsnames.ora`
- `$ORACLE_HOME/network/admin/listener.ora`
- `$ORACLE_HOME/network/admin/sqlnet.ora`

Check also the `.profile` and `.cshrc/.kshrc` files of the users that require access to the database; for example, oracle, root, and opc_op.

For more detailed information on maintaining the ITO database, see the section on database maintenance in the *VP Operations Administrator's Reference Volume I*.

If you are upgrading on the same system, continue with “Remove the Tables from the Database” on page 143; if you are upgrading ITO on a new system, continue with “Install and Configure the ITO Software” on page 144.

Remove the Tables from the Database

You only need to remove the ITO A.05.xx tables from the database if you are upgrading ITO on the same system. Note that this will retain any customizations, for example, using different disks for the database.

1. Stop the ITO agents:

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

2. Check that all running Java-based GUIs are terminated:

   ```
   ps -eaf | grep opcui
   ```

3. Stop the HP OpenView platform processes:

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

4. Remove the tables from the database:

   ```
   /opt/OV/bin/OpC/opcdbinst -r
   ```

   See also the man page *opcdbinst(1M)* for more information.

5. Continue with “Install and Configure the ITO Software” on page 144.

Install and Configure the ITO Software

NOTE

ITO bundles with the suffix […]Up, for example ITOEngOraAllUp are intended *only* for customers wishing to upgrade to ITO from an installed version of NNM 6.1. For more information about bundle names, see Table 2-1 on page 69.

To install the ITO management server software:

1. If you have not done already, stop the ITO agents.

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

2. Check that all running Java-based GUIs are terminated:

   ps -eaf | grep opcui

3. Stop the HP OpenView platform processes:

   /opt/OV/bin/ovstop

4. Install and configure the ITO version A.06.00 software as described in the sections "Installing the ITO Software on the Management Server" on page 61 and "Configuring the ITO Software" on page 71.

   - While running opcconfig you may encounter the following warning message. Note that this message can safely be ignored.

     ```
     Checking connection to DB openview...
     Can connect to database openview.
     Creating the ITO tablespaces and users. This may take
     some time ...

     WARNING: Some Oracle errors occured in the script
     crdbopc.sql. Probably these errors occured because of
     second call to opcdbsetup. Please check the spool file
     /opt/oracle//admin/openview/create/crdbopc.lst for
     errors.

     The following errors can be ignored: ORA-01919,
     ORA-00942, ORA-01434, ORA-01543, ORA-01920, ORA-01430 and
     ORA-00955.

     Summary of occured Oracle errors (alphabetic order):
     ORA-00942: table or view does not exist
     ORA-00955: name is already used by an existing object
     ORA-01430: column being added already exists in table
     ```

```
ORA-01434: private synonym to be dropped does not exist
ORA-01543: tablespace 'OPC_1' already exists
ORA-01543: tablespace 'OPC_2' already exists
ORA-01543: tablespace 'OPC_3' already exists
ORA-01543: tablespace 'OPC_4' already exists
ORA-01543: tablespace 'OPC_5' already exists
ORA-01543: tablespace 'OPC_6' already exists
ORA-01543: tablespace 'OPC_7' already exists
ORA-01543: tablespace 'OPC_8' already exists
ORA-01543: tablespace 'OPC_9' already exists
ORA-01543: tablespace 'OPC_INDEX1' already exists
ORA-01543: tablespace 'OPC_INDEX2' already exists
ORA-01543: tablespace 'OPC_TEMP' already exists
ORA-01920: user name 'OPC_OP' conflicts with another user
or role name
ORA-01920: user name 'OPC_REPORT' conflicts with another
user or role name
```

- During the configuration process, `opcdbsetup` may fail with the following error message:

  ```
  Verifying SQL*Net connection...
  Error opc_dflt_lang (3749): Database: ORA-12154
  TNS: could not resolve service name (OpC50-15)
  Could not connect to database ov_net.
  Please look if the database processes are running.
  (OpC50-2)
  WARNING: Could not connect to database using SQL*Net.
  ```

  Most likely Oracle SQL*Net has been configured already. One or more of the following files already reside in `$ORACLE_HOME/network/admin`:

  ```
  sqlnet.ora
  tnsnames.ora
  tnsnav.ora
  listener.ora
  ```

  If you don't require the existing SQL*Net configuration, remove these files from `$ORACLE_HOME/network/admin` and continue with the configuration of ITO.

  If you do require the existing SQL*Net configuration, you will have to manually configure SQL*Net for ITO.

5. After successfully completing the software installation and configuration, return to this page and continue with "Upload the Saved ITO A.05.xx Configuration" on page 146.

Upload the Saved ITO A.05.xx Configuration

Upload the previously saved configuration with `opccfgupld`.

1. Stop the ITO agents:

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

2. Check that all running Java-based GUIs are terminated:

   `ps -eaf | grep opcui`

3. Stop the HP OpenView platform processes:

   `/opt/OV/bin/ovstop`

4. Upload the configuration data:

   `opccfgupld -replace -subentity <download_directory>`

   For example: `opccfgupld -replace -subentity /tmp/upgrade`

5. If you have downloaded your active messages, upload them now.

   a. Upload the “active” messages from your download:

      `/opt/OV/bin/OpC/opchistupl /tmp/active`

   b. Unacknowledge these “active” messages in the `History Message Browser`.

   c. Upload the history messages:

      `/opt/OV/bin/OpC/opchistupl /tmp/history`

6. Continue with “Upload the ITO A.06.00 Delta Configuration” on page 147.

Upload the ITO A.06.00 Delta Configuration

Manually upload the modified ITO A.06.00 default configuration. This step is necessary to restore the ITO A.06.00 default configuration because the modified default configuration that was installed with ITO A.06.00, was partially replaced with your saved configuration in the previous step.

1. If you have customized any of the modified preconfigured elements that are listed in Table 7-2, and Table 7-3 and want to preserve the changes, you need to rename the templates and/or applications using the ITO GUI *before* performing the following step.
2. Upload the ITO A.06.00 delta configuration, enter:

   ```
   opccfgupld -replace -subentity -index upgrade_upd.idx \
   defaults
   ```

   For a list of *new* configuration items, see Table 7-2, “New Preconfigured Elements in ITO A.06.00 (English),” on page 147.

   For a list of *modified* preconfigured elements, see Table 7-3, “Modified Preconfigured Elements in ITO A.06.00 (English),” on page 151.

Table 7-2 New Preconfigured Elements in ITO A.06.00 (English)

Preconfigured Element	New Item(s)	What Has Changed?	New With
Application Groups	MetaFrame Tools	New.	A.06.00
	NT Tools	Contains new applications.	A.06.00
	OV Services	Contains new applications.	A.06.00
	SSP Tools	New.	A.06.00
	UN*X Tools	Contains new applications.	A.06.00
	X-OVw	New.	A.06.00
Applications	hostview	New in SSP Tools.	A.06.00
	EMS Resources	New in UN*X Tools.	A.05.30
	List ITO NT Templates	New in NT Tools.	A.06.00
	List ITO Templates	New in UN*X Tools.	A.06.00

Table 7-2 New Preconfigured Elements in ITO A.06.00 (English)

Preconfigured Element	New Item(s)	What Has Changed?	New With
	ACL Info	New in MetaFrame Tools.	A.06.00
	Auditlog	New in MetaFrame Tools.	A.06.00
	Disconnect	New in MetaFrame Tools.	A.06.00
	Flush	New in MetaFrame Tools.	A.06.00
	License	New in MetaFrame Tools.	A.06.00
	Processes	New in MetaFrame Tools.	A.06.00
	Send Message	New in MetaFrame Tools.	A.06.00
	Servers	New in MetaFrame Tools.	A.06.00
	Sessions	New in MetaFrame Tools.	A.06.00
	Users	New in MetaFrame Tools.	A.06.00
	netcontool	New in SSP Tools.	A.06.00
	Report Configuration	New in OV Services.	A.06.00
	Report Presenter	New in OV Services.	A.06.00
	SSP configuration	New in SSP Tools.	A.06.00
	XOVw-Highlight-Msgnode	New in X-OVw.	A.06.00
	XOVw-Highlight-Selnode	New in X-OVw.	A.06.00
	XOVw-Start	New in X-OVw.	A.06.00
Message Groups	HA	New.	A.06.00
	SSP	New.	A.06.00
Template Groups	AIX	Contains changed templates.	A.05.30

Table 7-2 New Preconfigured Elements in ITO A.06.00 (English)

Preconfigured Element	New Item(s)	What Has Changed?	New With
	AIX with HACMP	Contains changed templates.	A.05.30
	Default	Contains new template groups.	A.05.30
	Linux (RedHat)	New.	A.05.30
	MetaFrame	New in Terminal Server/MetaFrame.	A.06.00
	NetWare	Contains new and renamed templates.	A.06.00
	Solaris	Contains changed templates.	A.05.30
	SSP	New.	A.06.00
	Terminal Server	New in Terminal Server/MetaFrame.	A.06.00
	Terminal Server/MetaFrame	New.	A.06.00
	Windows 2000	New.	A.06.00
Logfile Templates	Abend log	New in NetWare.	A.06.00
	Cron (RedHat Linux)	New in Linux (RedHat).	A.05.30
	dflt_DirectoryEvLog (2000)	New in Windows 2000.	A.06.00
	dflt_DNSEvLog (2000)	New in Windows 2000.	A.06.00
	dflt_FileReplicationEvLog (2000)	New in Windows 2000.	A.06.00
	Logins (Linux)	New in Linux (RedHat).	A.05.30
	Messages (RedHat Linux)	Contains new conditions.	A.06.00
	SSP Logs	New in SSP.	A.06.00
	System Log (MetaFrame)	New in MetaFrame.	A.06.00
	System Log (Terminal Server)	New in Terminal Server.	A.06.00

Table 7-2 New Preconfigured Elements in ITO A.06.00 (English)

Preconfigured Element	New Item(s)	What Has Changed?	New With
	Su (AIX)	Name changed from Su (AIX/Solaris); content changed.	A.05.30
	Su (Solaris)	Name changed from Su (AIX/Solaris); content changed.	A.05.30
Monitor Templates	MF_ICA_Browser	New in MetaFrame.	A.06.00
	MF_Prog_Neighborhood	New in MetaFrame.	A.06.00
	Syslogd	New for most UNIX platforms.	A.06.00
	SSP_cbs	New in SSP.	A.06.00
	TS_Licensing	New in MetaFrame and Terminal Server.	A.06.00
	TS_Service	New in MetaFrame and Terminal Server.	A.06.00
Trap Templates	NetWare NMA 2.1/2.6 Traps	Name changed from NetWare NMA 2.1 Traps; description changed; contains new conditions.	A.06.00
	NetWare NMA 2.6 Threshold Traps	Name changed from NetWare NMA 2.1 Threshold Traps; description changed; contains new conditions.	A.06.00
	SNMP 6.10 Traps	Name changed from SNMP 6.0 Traps; contains new conditions.	A.06.00
	SSP Traps	New in SSP.	A.06.00

Table 7-3 Modified Preconfigured Elements in ITO A.06.00 (English)

Preconfigured Element	Modified Item(s)	What Has Changed?	New With
Logfile Templates	`Cron (Solaris)`	Content changed.	A.05.30
	`dflt_ApplEvLog (NT)`	Description changed.	A.06.00
	`dflt_SecEvLog (NT)`	Description changed.	A.06.00
	`dflt_SysEvLog (NT)`	Description changed.	A.06.00
	`Syslog (Solaris)`	Content changed.	A.05.30
Monitor Templates	`dflt_cpu_util_NT`	Description changed.	A.06.00

3. Clean up any duplicate preconfigured elements.

   After the upgrade, *all* templates (both old and new) appear in their respective upgraded template groups, which if assigned and distributed in their default, post-upgrade state, could lead to unnecessary and duplicated messages. However, you *do* have the opportunity to decide which templates to assign (by modifying the template groups accordingly) before you distribute. This is particularly useful if your old templates have been customized and you wish to keep these customizations in the new, upgraded environment.

4. Remove the obsoleted elements of the default configuration.

   Don't remove obsoleted elements, if you intend to continue managing A.05.xx nodes with a A.06.00 management server.

Table 7-4 Obsolete Preconfigured Elements in ITO A.06.00 (English)

Preconfigured Element	Obsolete Item(s)	Obsolete With
Application Groups	`Performance`	A.06.00
Applications	`Start Glance`	A.06.00
	`Start PerfView`	A.06.00
Template Groups	`PerfView`	A.06.00

Table 7-4 Obsolete Preconfigured Elements in ITO A.06.00 (English)

Preconfigured Element	Obsolete Item(s)	Obsolete With
Logfile Templates	Su (AIX/Solaris)	A.05.30
Monitor Templates	inetd_mon	A.05.30
	inetd_mon_ext	A.05.30
	mib2_mon	A.05.30
	mib2_mon_ext	A.05.30
	snmpd_mon	A.05.30
	snmpd_mon_ext	A.05.30
	swap_util_mwa	A.06.00
opcmsg(1 | 3) Conditions	Generic Performance condition	A.06.00
	MeasureWare action request	A.06.00
	PerfView alarms (REPEAT/END conditions)	A.06.00
	PerfView alarms (START conditions)	A.06.00
	PerfView exception conditions	A.06.00
	Tablesspace Monitor Alert	A.06.00
Schedule Templates	Multiple external monitors	A.05.30

5. Install the product licenses. For more information, see “Installing OVkey Licenses” on page 162.

   This step is only required if you have purchased VantagePoint for UNIX A.05.30 and the installation of the managed node tier Server failed.

6. Restart the OpenView platform including the ITO server processes and integrated products using `ovstart`, enter:

   `ovstart`

7. Upgrade the managed nodes, if required. See “Upgrading Managed

Nodes” on page 154.

8. Upgrade the Java-based operator GUI. See “Upgrading the ITO Java-based Operator GUI” on page 157.

Upgrading Managed Nodes

An ITO version A.06.00 management server can manage A.05.xx and A.06.00 managed nodes. Note, however, that it is strongly recommended to upgrade your managed nodes to ITO version A.06.00 to take advantage of the latest improvements and supported OS versions.

As part of a step-by-step migration you can also temporarily install A.06.00 templates, actions, monitors and commands on an A.05.xx managed node if you do not use any of the new features in the new templates; for example, you could assign and distribute A.06.00 templates to an A.05.xx managed node, if you do not use the Message Key field in the templates. This configuration is only supported as a temporary solution during the ITO migration process.

Note that the version of the ITO agent software *must not be higher* than the version of the ITO management server software. For example, an ITO version A.06.00 DCE agent can *not* communicate with an ITO version A.05.xx management server. If you are operating in a flexible management environment with A.05.xx and A.06.00 management servers, make sure that all ITO DCE agents remain on version A.05.xx until all management servers have been upgraded to ITO version A.06.00.

Upgrade Managed Nodes to A.06.00

Every effort has been made to prevent data loss during the upgrade of the agent software. For most managed-node platforms, the messages queues are converted to the format required by ITO version A.06.00 and then forwarded to the message browser after the upgrade has completed. Events that have not been processed by ITO *before* the upgrade starts will be lost. Message queues on Novell NetWare managed nodes are *not* converted.

1. Stop the ITO agent processes on the managed nodes:

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

2. From the menu bar of the ITO Node Bank, select Actions: Agents -> Install/Update SW & Config.... The Install / Update ITO Software and Configuration window opens:

   a. Check the boxes in the Components section depending on what

parts of the ITO agent you want to upgrade:

- Agent Software: Check this box if you want to upgrade the agent software to version A.06.00.
- Templates: Check this box if you want to install A.06.00 templates on the managed node.

  If you select this option, but did not select the Agent Software box, you must make sure that the templates do not make use of any new features introduced with ITO A.06.00. This is only supported as a temporary solution during the ITO migration process.
- Actions: Check this box if you want to install A.06.00 actions on the managed node.
- Monitors: Check this box if you want to install A.06.00 monitors on the managed node.
- Commands: Check this box if you want to install A.06.00 commands on the managed node.

Select the managed nodes you want to upgrade.

b. Click [OK]. An additional terminal window opens, running the installation script inst.sh(1M). Review the messages carefully as the installation script might require your interaction.

3. After the installation has completed successfully, verify that the ITO agent processes are running. If they are not running, start them manually:

   /opt/OV/bin/OpC/opcragt -status

   /opt/OV/bin/OpC/opcragt -start

Upgrading ITO Software in an Environment with a Separate Database Server

Upgrading the ITO software in an environment where the database-server system is not the same as the ITO management-server system, is identical to the upgrade process described earlier in this chapter. See “Upgrading from ITO A.05.xx to ITO A.06.00” on page 136 for detailed instructions.

Upgrading the ITO Java-based Operator GUI

Note that you can *only* run version A.06.00 of the Java-based GUI with an ITO version A.06.00 management server. Earlier versions of the Java-based GUI are not compatible with a version A.06.00 management server. If you want to use the ITO version A.06.00 Java-based GUI, you must first upgrade your management server to version A.06.00, and then install (or re-install) the GUI client, as appropriate.

1. Locate the resource file `itooprc` in the installation directory of the Java-based GUI and save a copy in another directory.
2. De-install any previous version of the ITO Java-based GUI from the client system, see De-installing the ITO Java -based GUI.
3. If necessary, upgrade the ITO software as described in “Upgrading from ITO A.05.xx to ITO A.06.00” on page 136:
4. Install version A.06.00 of the ITO Java-based GUI on the client system as described in Chapter 3, “Installing the Java-based Operator GUI,” on page 81.

8 Setting Up ITO Licensing

In This Chapter

This chapter describes how to install and configure OVkey licenses for ITO.

About OVkey Licenses

The OVkey license technology is based on node-locked licenses with license passwords in a license file. Each product uses its own license file to handle its own licenses. Customers use the `opclic` command to enter ITO passwords in the following files:

`/etc/opt/OV/share/conf/.itolicense`

`/etc/opt/OV/share/conf/.license`

NOTE Always use the command `opclic`; never edit the files manually.

The file `.itolicense` contains the ITO-specific license information; the file `.license` contains information regarding ITO and any other integrated products that are currently licensed to run; for example, NNM (Network Node Manager) and ECS (Event Correlation Services).

The OVkey licensing technology does not require a license server. This means the product may be used behind firewalls.

You should bear in mind the following points when installing and setting up OVKey licenses in your ITO environment:

- ❏ No license server is required.
- ❏ Licenses are linked to the IP address of the ITO management server and *not* its target ID.
- ❏ Multiple licenses may be linked to one password; for example, ITO managed nodes.
- ❏ One central location for license administration per management server.

Installing OVkey Licenses

This section describes how to set up and activate OVkey licensing for the ITO environment. The configuration of OVkey licenses can be summarized in the following steps. To request and install an ITO product license:

1. Obtain the required information from your host system.
2. Complete the HP OpenView License Request Form by editing the license request-form file and emailing, faxing or mailing the file to HP or visit HP's internet license-request center.
3. Receive license from HP Password Delivery Center.
4. Install and verify the HP OpenView Product License.

These setup steps are described in more detail in the following sections.

Obtaining the Required Information

Obtain the information specified in the following table from the product's licensing papers for your ITO management server, which you should have received when you ordered the product.

Table 8-1 Information Required to Obtain Licenses

Information Required	Where to Find It:
HP Order Number (Permanent passwords only)	The License-to-Use Entitlement Certificate contains the HP Order Number Contact your local system administrator or HP Sales Representative.
IP address of the ITO management server	On the ITO management server, enter: **`/usr/sbin/nslookup <ITO_mgt_server_name>`**
hostname	On the ITO management server, enter: **`hostname`**
Operating System Version	On the ITO management server, enter: **`uname -a`**

Table 8-1 Information Required to Obtain Licenses

Information Required	Where to Find It:
Number of Licenses (Permanent passwords only)	See your HP Purchase Order.

Completing the Product License-Request

You may request a license in either one of two ways:

- ❏ Using HP's internet Password Delivery Service.
- ❏ Completing and submitting a license-request form.

If you have internet access, you can obtain license passwords by visiting the home page of HP's Password Delivery Service at the following address:

`http://www.webware.hp.com/`

You can use this site to:

- ❏ Generate new product passwords, assuming you have already purchased a product and have an HP order number.
- ❏ Move licenses from one machine to another.
- ❏ Migrate licenses from an old version of a product to a new version using a migration password. For more information, see the ITO cover letter, *HP OpenView IT/Operations A.06.00: License Migration*.

If you do *not* have internet access, you can still request a license by carrying out the following steps:

1. Log on to the ITO management server.
2. Make a copy of the appropriate file in the directory `/etc/opt/OV/share/conf/OVLicense/forms/opc/` and edit the copied file:

   `product.VPO_Solaris` for new purchases

   `evaluation.VPO_Solaris` for evaluations

`server_move.VPO_Solaris`	for IP address changes of the server

3. Complete all requested information, save the file in *<file_name>*.
4. Print the form and either mail or fax it to the nearest HP password-delivery center using the information in Table 8-2 on page 164.

Table 8-2 HP Password Delivery Centers

Your Location	Password-Center Location	E-mail Address	Phone/Fax Number	Service Hours (local time)
North/South America	USA	americas_password@cnd.hp.com	+1 (801) 431-1597 +1 (801) 431-3654	08:00-20:00 (EST)[a]
Asia/Pacific	Japan	asia_password@cnd.hp.com	+81 (3) 3227-5264 +81 (3) 3227-5238	09:00-17:00 (JST)[b]
Europe & Africa	Holland	europe_password@cnd.hp.com	+31 (55) 543 4642 +31 (55) 543 4645	08:00-17:00 (CET)[c]

a. Eastern (USA) Standard Time
b. Japanese Standard Time
c. Central European Time

Receiving your License Passwords

You should receive your license password either directly if you use the HP License Delivery center's internet site or within 48 hours from one of the Password Delivery Centers listed in Table 8-2 on page 164, either:

- ❏ by e-mail if you provided an e-mail address on your request form,
- ❏ by fax if you did *not* specify an e-mail address, or
- ❏ by phone if you did *not* specify either fax or e-mail.

Installing and Verifying Product Licenses

To install and verify the ITO A.06.00 product license, use the `opclic` command as follows:

1. Enter the license password in the password file using the following command:

   `/opt/OV/bin/OpC/install/opclic -add [-force] <"license_password"> [<"Annotation">]`

   The license password must be entered on one line and must be enclosed in quotation marks (").

   The `-force` option is only required if a server license password already exists; for example, if an Instant-on license or an evaluation license is installed. For more information, see the man page *opclic(3)*.

NOTE The `opclic` command may not be used to add licenses for the ECS Designer or NNM.

2. The licenses included with the Password Certificate consist of only one line, even though they may appear to wrap to multiple lines. An example of the ITO management-server password string is:

   ```
   # IT/Operations Management Server
   4MSF 97ZW 2SCR KSHT 3DP6 X9BC XF77 TKRV 7XPS U746 EPNB
   4ERP MR9F DH2A EGU7 96Q3 YQ6W LZG9 AZA9 EQ97
   ```

   The first line in the example above is a comment. *Do not include any comment lines in the license file.* The second line (which wraps to two lines) is the password.

3. Make sure that the licenses are correctly added to the license file using the following commands:

   `/opt/OV/bin/OpC/install/opclic -list`

   This command lists all passwords in the license file. This is useful to check which and how many licenses are in the license file. To print a report of the installed licenses, use the following command:

   `/opt/OV/bin/OpC/install/opclic -report`

   This command prints a summary of all installed licenses and checks

if enough licenses are installed to allow ITO to run correctly. If this is not the case, warning messages are displayed.

4. Restart ITO, enter:

   /opt/OV/bin/ovstop

   /opt/OV/bin/ovstart

5. Check that there are no license-related error messages in the ITO error log:

   /var/opt/OV/log/OpC/mgmt_sv/opcerror

A Installing ITO in a Sun Cluster Environment

In This Chapter

This chapter describes how to install and upgrade HP OpenView VantagePoint Operations for Sun Solaris in a Sun Cluster environment.

The following areas are covered in this chapter:

- ❏ Installing and de-installing ITO software in a Sun Cluster environment.
- ❏ Configuring ITO software in a Sun Cluster environment.
- ❏ Installing the ITO Agent in a Sun Cluster environment.

About Sun Cluster

The Sun Cluster system is a software environment that provides high availability (HA) support for Data Services and parallel database access on a cluster of servers (Sun Cluster servers).

Sun Cluster framework software provides hardware and software failure detection, Sun Cluster system administration, system failover and automatic restart of Data Services in the event of failure. The purpose of the Sun Cluster system is to avoid the loss of service by managing failures. This is accomplished by adding hardware redundancy and software monitoring and restart capabilities; these measures reduce single points of failure in the system. A single-point failure is the failure of a hardware or software component that causes the entire system to be inaccessible to client applications.

Glossary of Sun Cluster Terms

Logical host	Logical host in the Sun Cluster environment is a collection of network definitions and disk storage. A logical host, consisting of one or more IP addresses, assigned network adapters and disk storage, is configured as a unit of failover. One or more Data Services are configured to run on a logical host, so that when the logical host moves, the Data Service follows it. The definition of a logical host also includes the list of physical hosts on which it can run.
Failover	Failover is a generic term used when one host assumes responsibility for another host's services.
Takeover	Takeover is an automated failover of a logical host and its Data Services from one Sun Cluster server to another after a failure has been detected. It is an automated process. The failed server is forced to give up control of the logical host.
Switchover	A switchover is a coordinated movement of a logical host from one operational Sun Cluster server to another. It is a manual process that is initiated by an administrator using the *scadmin (1m)* command.

CCD	The Cluster Configuration Database (CCD) is a highly-available, replicated database whose main purpose is to provide a single cluster-wide namespace and configuration repository for the cluster software components for the HA framework.
CCDD	Cluster Configuration Database Daemon (CCDD) performs the initialization, updating, querying and reconfiguration of the Cluster Configuration Database (CCD). The CCDD synchronizes and serializes cluster wide CCD updates and guarantees a consistent view of the replicated copies of the database across all nodes of the cluster.
Data Service	Data Service is a set of modules that acts as an interface between the Sun Cluster High Availability framework and an application. Data Service is in a close relation with a Logical Host - in fact, Data Service runs on a Logical Host (when it is configured with a Logical Host), no matter which physical host's environment is currently being used.

Sun Cluster Installation Requirements

The following Sun Cluster requirements must be met in order to run ITO in a Sun Cluster Environment:

- ❏ Solaris 7 and 8 operating system software on two or more SPARC platforms
- ❏ Sun Cluster 2.2 software
- ❏ VERITAS Volume Manager Storage Administrator 3.0.2
- ❏ Compatible Sun storage

Database Installation Considerations

ITO requires that the entire Oracle database (the database binaries as well as the database itself) is installed on the shared disk and run in the ITO Data Service.

NOTE As the database with the ITO Data Service switches, make sure your installed ITO database is not accessed by applications or products.

Installing the ITO Management Server in a Sun Cluster Environment

Prerequisites and Preparation

Prepare for the installation of ITO in a Sun Cluster environment.

1. Log in as a user root.
2. Define a new disk group consisting of at least two shared disks for ITO Data Service.
3. Define three volumes within this disk group.

NOTE It is recommended to mirror all volumes.

4. Define mount points for these file systems as follows:
   - `/opt/oracle`
   - `/etc/opt/OV/share`
   - `/var/opt/OV/share`

   For required disk space refer to Table A-1.

Table A-1 Disk Space Requirements with an Oracle Database

Product	Disk Space Required
RDBMS Binaries	215 MB (Oracle 8.0.6)[a] 475 MB (Oracle 8.1.6)
ITO Binaries (ITOEngOraMin) In Directory • `/opt/OV` • `/etc/opt/OV` • `/var/opt/OV`	418 MB (Total)[b] Requires: • 250 MB • 16 MB • 152 MB

Table A-1 Disk Space Requirements with an Oracle Database

Product	Disk Space Required
Files saved by NNM and SNMP agent patch in directory `/system`	100 MB
ITO Data in Database	270 MB [c]
Software Distributor • /usr	 20 MB
Total Disk Space Required:	1023 MB (Oracle 8.0.6) 1283 MB (Oracle 8.1.6)

a. This value includes only those Oracle products that are required by ITO.
b. This value does not include space required for the tape image(s) of each type of platform installed on the management server. For each platform tape image that you install, allow approximately 10 MB of additional disk space. For the local agent only, allow 28 MB. For all agents, allow about 60 MB.
c. Capacity for the initial size of the database: Oracle's auto-extend feature increases the disk space automatically according to the additional configuration and message requirements.

5. After all shared directories are successfully created, execute:

```
chmod 777 /etc/opt/OV/share
chmod 777 /var/opt/OV/share
chmod -R 755 /opt/oracle
```

6. Create a logical host with the *scconf (1m)* command. Supply the following parameters:

   - cluster name
   - logical host name
   - cluster node list
   - disk group
   - network interfaces
   - IP addresses

```
/opt/SUNWcluster/bin/scconf <clustername> -L
<logical host> -n <node list> -g <disk-group> -i <network
interface>
```

To check if the logical host is brought up, execute the following command:

```
/opt/SUNWcluster/bin/haget -f master -h <logicalhost>
```

If the logical host is successfully created, the output of this command will list at least one host name.

7. After the logical host has been successfully created, create and configure the logical host's administrative file system, *vfstab (4)*, *dfstab (4)* file and templates for the logical host, by using the following command:

```
/opt/SUNWcluster/bin/scconf <clustername> -F
<logicalhost> [<disk-group>]
```

NOTE Make sure that the /<lhadmfs> directory (the logical host's administrative filesystem directory) exists; if not, create it with the following command:

```
mkdir /<lhadmfs>
```

8. All file systems must be mounted as specified in the /etc/opt/SUNWcluster/conf/hanfs/<logical host>.vfstab file. Make sure the file is identical on all cluster nodes. If the file systems are not mounted, mount them with the following command:

```
/opt/SUNWcluster/bin/scnfs <clustername> mount
<logicalhost>
```

9. Check if all volumes of logical host's disk group are started:

```
/usr/sbin/vxinfo -g <disk-group>
```

The example output is as follows:

```
<disk-group>-stat fsgen Started
ora_vol fsgen Started
etc_vol fsgen Started
var_vol fsgn Started
```

10. If volumes are not started, start them with the following command:

```
/usr/sbin/vxvol -g <disk-group> startall
```

Installing the Database in a Sun Cluster Environment

Install your required RDBMS on the first Sun Cluster node as described in section “Installing and Checking an Oracle Database” on page 50.

Installing ITO on a first Sun Cluster Node

Install ITO on a first Sun Cluster Node as follows:

1. Log in as user root.
2. Set the user root umask:

   umask 022

3. Make sure that the Oracle environment variable is set. To check the setting, enter:

   echo $ORACLE_HOME

   Also make sure that the Oracle shared library `libclntsh.so.1.0` (for Oracle 8.0.6) or `libclntsh.so.8.0` (for Oracle 8.1.6), and symbolic link `libclntsh.so` are located in the following directory `$ORACLE_HOME/lib`. If not, create it by running:

   $ORACLE_HOME/bin/genclntsh

4. Make sure that the environment variable `LANG` is set to `C`. To check the setting, enter:

   echo $LANG

5. Insert the ITO installation CD-ROM into the drive. The CD-ROM is automatically mounted on Sun Solaris systems.
6. Change to the directory on the CD-ROM:

   cd /cdrom/cdrom0/

7. Start the ITO installation script, enter:

   ./install

8. The ITO installation script first checks the system environment. The following message is displayed:

   ```
   Sun Cluster High Availability Environment detected.
   ```

9. Select whether you want to use IT/Operations as a Sun Cluster Highly Available Data Service. The following information is displayed:

   ```
   Do you want to use IT/Operations as a Sun Cluster Highly
   Available Data Service [Y/N] [Y]
   ```

   Enter [**Y**] to start the installation of the ITO software in a Sun Cluster environment.

10. The ITO installation script now checks which version of Sun Cluster Server is currently installed on the system.

11. You are prompted to enter values for the Sun Cluster parameters. The following message is displayed:

```
Please enter values for the following parameters
Cluster Name       <clustername>
Logical Host
Data Service
```

NOTE You do not have to provide any values since the default parameter values, which are saved in the `/etc/opt/SUNWcluster/conf/default_clustername` file are used.

12. The cluster and logical host states are now verified and the following message is displayed:

```
Do you plan to configure IT/Operations on this physical
host [y/n]?
```

Enter [**Y**] if you plan to configure ITO on this physical cluster node. Enter [**N**] if you plan to configure ITO on any other physical cluster nodes.

13. The ITO installation script now does the following:

- It checks which SD package version is currently installed on your system. If no, or older version of SD package is detected, the ITO installation script installs the required package.
- It checks which DCE package is currently installed on your system and installs the lightweight DCE client package. If no DCE package was detected the lightweight DCE is configured and the dced daemon is started.

NOTE If some DCE is already installed on your system, make sure that the dced daemon is started at the system boot time.

14. From the terminal window select the ITO software bundle you want to install on your system. For a list of software bundles refer to Table 2-1 on page 69. Continue as described in section “Running the ITO

Installation Script" on page 63.

15. Select whether you want to start the analysis part of the installation. The following message is displayed:

```
You can now start the analysis phase to check that the
system is suitable for installing the selected bundle.
This is not mandatory but recommended.
```

NOTE

You can follow the progress of your installation by viewing the analysis and installation logfiles. This enables you to detect any possible warnings or errors at an early stage. In a new terminal window, enter:

```
tail -f /var/adm/sw/swagent.log
```

16. Select whether you want to start the ITO installation. If you selected the `ITOEngOraAll`software bundle, the following information is displayed:

```
This installation will put the following software on your
system:
ITO English Management Server for Sun Solaris - All Agents

Do you want to begin the installation? (y|n):
```

Enter [**Y**] to start the installation of the ITO software.

WARNING

Do not abort the installation with Ctrl-C or kill as this might corrupt your system.

17. If you have chosen not to configure ITO on this cluster node (physical host), the ITO install script will remove the shared directories.

18. The ITO installation script updates `opcsvinfo` file as follows:

```
Setting the value of OPC_MGMT_SERVER to <long host name of
the logical host name>.
Setting the value of OPC_SC to TRUE.
```

19. Unmount the CD-ROM drive:

```
cd /; eject
```

20. Make the ITO man pages available for users; add the `/opt/OV/man` directory to the `MANPATH` environment variable as follows:

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

    The `MANPATH` environment variable must be set either:

    - for the current user; by the user in his/her `.profile` or
    - for all users; by the system administrator in the `/etc/profile`

Installing ITO on Additional Sun Cluster Nodes

NOTE Before installing ITO on any other additional Sun Cluster nodes, you must manually switch over a logical host to the node you will install the ITO software to.

1. Log in as a user root.
2. Manually switch over a logical host to the cluster node on which you will install ITO.

   Use the *haswitch (1m)* or the *scadmin (1m)* commands as in the examples below:

   ```
   /opt/SUNWcluster/bin/haswitch <destination host>
   <logical host>
   ```

   or

   ```
   /opt/SUNWcluster/bin/scadmin switch <cluster name>
   <destination host> <logical host>
   ```

3. Install the ITO software on all additional Sun Cluster nodes as described in section “Installing ITO on a first Sun Cluster Node” on page 176.

   Make sure that after you have installed an additional Sun Cluster node, you switch over the logical host to the next cluster node you will install ITO to.

4. When you have successfully installed the ITO software on all cluster nodes, continue with “Configuring ITO in a Sun Cluster Environment” on page 180.

Configuring ITO in a Sun Cluster Environment

After installing ITO on all cluster nodes, you can run the ITO configuration script `opcconfig` on the master cluster node.

1. Before starting to configure ITO make sure that the NLS language variable *NLS_LANG* is set correctly, enter:

   export NLS_LANG=american_america.WE8ISO8859P1

2. Make sure that the environment variable `LANG` is set to `C`. To check the setting, enter:

   echo $LANG

3. Verify that the variables *ORACLE_BASE*, *ORACLE_HOME*, and *ORACLE_SID* are set correctly see “Installing and Checking an Oracle Database” on page 50.

To start the `opcconfig` script, enter:

/opt/OV/bin/OpC/install/opcconfig

Respond to the questions as they are displayed. The configuration script does the following:

1. Select whether you want to use ITO as a Sun Cluster Highly Available Data Service. The following message is displayed:

   ```
   Do you want to use IT/Operations as a Sun Cluster Highly
   Available Data Service [y|n]? [y]
   ```

   Enter [**Y**] to use ITO as a Data Service.

2. The configuration script asks you to enter values for the Sun Cluster parameters. The following message is displayed:

   ```
   Please enter values for the following parameters
   Cluster Name       <clustername>
   Logical Host
   Data Service
   ```

NOTE You do not have to provide any values since the default parameter values, which are saved in the `/etc/opt/SUNWcluster/conf/default_clustername` file are used.

3. The configuration script verifies the cluster and logical host state.
4. The configuration script asks you to enter values for the Data Service attributes. Data Service attributes are set and saved to the following file:

   `/<logical host>/ha/ito/ito_scha.conf`

   The attributes are set as follows:

   ```
   ITO_PMON_TAG ito_pmon
   ITO_PMON_RETRIES 5
   ITO_PMON_TPERIOD -1
   ITO_PMON_SLEEP 60
   ITO_PMON_START 5
   ITO_PMON_EXCLUDE opcsvm
   ITO_START 360
   ITO_START_NET 720
   ITO_STOP 360
   ITO_STOP_NET 720
   ITO_FM_INIT 360
   ITO_FM_START 360
   ITO_FM_STOP 360
   ITO_MAINTENANCE FALSE
   ```

   All attributes can be changed by any user. For a detailed description of Data Service attributes, please refer to “Data Service Attributes” on page 184.
5. The configuration script registers Data Service.
6. You are now asked whether you want to configure your chosen database automatically, using the configuration script.
   - Enter **y** (yes) to configure your chosen database automatically; this is the recommended method.
   - Choose **n** (no) if you have already configured your database on a separate database server.

NOTE SQL*Net is required for every installation of the ITO A.06.00 management server.

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

a. Asks you to enter the password of the Oracle database user `system`.

   If you do not have a configured database, press `Enter` for ITO to create the database and the user `system`. If you want ITO to use an existing database, enter the password of the Oracle database user `system`.

b. Asks you to enter the password for the Oracle Database user `opc_op`.

NOTE The database user `opc_op` is independent of the OS user `opc_op`, and the ITO user `opc_op`.

   Enter a password of your choice.

   If you need to change the password at a later date, use the command `opcdbpwd`. Do not change the password in the database directly; ITO stores the password in an encrypted file and if the password in the database is different form the password in the encrypted file, ITO cannot connect to the database.

c. Asks you 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 ITO itself; you can change it directly in Oracle.

d. Asks whether you require automatic startup of the database at system boot time.

   Accept Default: **Yes**

e. Allows you to choose a data directory for the system table space, the control files, the redo log files, and the ITO data table spaces.

f. Allows you to choose an index directory for the ITO index table spaces.

g. Prompts you to supply the Oracle environment variables: only the default responses are shown:

   ORACLE_SID = **openview**
   ORACLE_BASE = **/opt/oracle**
   ORACLE_HOME = **<ORACLE_BASE>/product/<*version*>**
   ORACLE DBA User = **oracle**

   Where <*version*> is one of the supported versions of the Oracle database: 8.0.6 or 8.1.6

h. The database setup script uses the answers you give to create and configure the database, this may take some time. The following configuration steps are performed:

   - create and configure the Oracle database
   - create the ITO table spaces and users
   - create the ITO tables
   - load the initial ITO configuration into the database
   - configure SQL*Net and start the SQL*NET listener

7. Turns the ITO Data Service on. The Process monitoring starts after the ITO Data Service has been turned on.

8. Checks and verifies the OVW fields for ITO.

9. ITO configuration script displays Data Service, maintenance mode, process monitoring status, ITO Management Server and Open Agent status.

10. Displays the login screen for the ITO GUI so that you can log in as the ITO administrator. Enter the default login and password as follows:

    user: **opc_adm**

    password: **OpC_adm**

    Note that the startup of the ITO GUI can take several minutes but is complete when the `Node Bank` window opens.

To start ITO manually, enter **opc** at the command line.

Data Service Attributes

- `ITO_PMON_TAG`

  Sun Cluster's Process Monitor Facility Administration *pmfadm (1m)* registers the ITO Process Monitor `ito_pmon` under this tag.

- `ITO_PMON_RETRIES`

  Process Monitor Facility Administration *pmfadm (1m)* tries to restart ITO Process Monitor at most `n` times (where n is the number of retries) before logical host giveaway is initiated.

- `ITO_PMON_TPERIOD`

  Time Period in minutes over which Process Monitor Facility Administration *pmfadm (1m)* counts the failures. If this parameter is `s`pecified, process failures that have occurred outside of the specified period are not counted.

- `ITO_PMON_SLEEP`

  Time period in seconds, during which ITO process monitor reads ITO Data Service configuration file to retrieve a new value of `ITO_MAINTENANCE` key. The value of this flag can be modified manually.

- `ITO_PMON_START`

  ITO process monitor tries to restart OpenView Platform at most `n` times (where n is the number of retries) before a logical host giveaway is initiated. The value of this flag can be modified manually.

- `ITO_PMON EXCLUDE`

  A list of all ITO/NNM processes not to be monitored by ITO process monitor. The value of this flag can be modified manually.

- `ITO_START`

  ITO Data Service Start Method Timeout.

- `ITO_START_NET`

  ITO Data Service Start Net Method Timeout.

- `ITO_STOP`

ITO Data Service Stop Method Timeout.

- `ITO_STOP_NET`

  ITO Data Service Stop Net Method Timeout.

- `ITO_FM_INIT`

  ITO Data Service Fault Monitor Init Method Timeout.

- `ITO_FM_START`

  ITO Data Service Fault Monitor Start Method Timeout.

- `ITO_FM_STOP`

  ITO Data Service Fault Monitor Stop Method Timeout.

- `ITO_MAINTENANCE`

  This flag indicates whether ITO is in the maintenance mode or not. The default value is `TRUE`. When this flag is set to `FALSE`, the ITO process monitor will not try to restart the OpenView Platform process.

Installing the ITO Agent and Assigning the Trap Template in a Sun Cluster Environment

The following section describes the ITO agent installation in a Sun Cluster environment.

Install the ITO agent on the physical Sun Cluster nodes as follows:

1. Add all physical cluster nodes that are able to run the logical ITO Data Service to the `ITO Node Bank`.
2. Assign the template group `SC/HA Physical Management Server` to each of these nodes.

NOTE Do not assign the trap template directly to the physical Sun Cluster node.

Proceed with installing the agent software on all physical cluster nodes, following this procedure. For detailed information on how to install the ITO agent software, please refer to *VP Operations Administrator's Reference Volume I*.

3. Install the ITO agent software on all physical cluster nodes.
4. Distribute the template group `SC/HA Physical Management Server` to the physical Sun Cluster nodes.
5. Ensure that the agents are running on the physical Sun Cluster nodes.
6. Distribute the preconfigured trap template to the logical ITO node.

NOTE Running the `opctrapi` event interceptor remotely on an SC cluster node that is *not* the ITO management server is not supported.

Change the agent-registration file on all physical SC cluster nodes:

1. Replace the agent registration file for SC:

   ```
   opcagtreg -add /opt/OV/bin/OpC/install/itoagt_sc.reg
   ```

2. Start the agent:

   ```
   opcagt -start
   ```

Running ITO Agents on Sun Cluster Nodes

In a Sun Cluster environment, the ITO management server is not a dedicated physical system. It should be seen more as a logical node that can be switched from one physical cluster node to another, together with the Highly available ITO Data Service. In addition, each Sun Cluster node also functions as a normal ITO managed node, which has the following implications:

- It is meaningless to install or de-install the ITO agent on the logical ITO management server (the Sun Cluster node on which the ITO Data Service is active). The agent software must instead be installed on all physical Sun Cluster nodes. As soon as the ITO Data Service is switched to any one of the physical Sun Cluster nodes, the ITO agent on that node assumes the role of the ITO-management-server agent and holds this special role for as long as the Highly available ITO Data Service is active on that node.
- The switch-over of the logical ITO management server from one Sun Cluster node to another requires that all templates assigned to the logical ITO management server's agent are also switched at the same time. However, since this template switch is supported by the ITO agent running on the management server, it is possible to assign the trap template directly to the logical ITO management server agent. Rather, all templates except the trap template must be assigned and distributed to all the agents in the Sun Cluster. ITO provides a dedicated template group for this purpose.
- The trap template has to be assigned to the agent on the logical ITO management server, which is the Sun Cluster node on which the ITO Data Service is active. Note that, ITO agent will be restarted during ITO management server switch.
- All other ITO agents behave like normal/current agent.

De-installing ITO Software from Sun Cluster Nodes

To de-install ITO software from Sun Cluster nodes:

1. De-install ITO by using the `remove` script provided on the distribution media. To start ITO de-installation on the logical host master cluster node do the following:
   - Log in as user root.
   - Change to the directory on the CD-ROM:

     `cd /cdrom/cdrom0`
   - Start the de-installation script:

     `./remove`

NOTE ITO `remove` script will not remove the logical host, nor the shared filesystems.

2. On the logical host master cluster node, ITO `remove` script will perform the following actions:
   - turn off ITO Data Service (if it has been turned on)
   - dis-associate ITO Data Service from the logical host (if it has not already been dis-associated)
   - unregister ITO Data Service (if it has been registered)
   - remove ITO Data Service files from the logical host's administrative file system
3. De-install ITO on all the remaining Sun Cluster nodes by using the ITO `remove` script.

NOTE It is not necessary to switch the logical host from one Sun Cluster node to another to de-install ITO from all Sun Cluster nodes.

B Bundling of ITO for Sun Solaris Software

In This Chapter

The tables in this appendix list the contents of the various ITO software bundles.

ITO Product Bundles

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

Table B-1 ITO Bundles English

ITO Bundle	ITO Product	Description
ITODevEngDoc	OVNNMgrDYNATEXT OVNNMgrRtDoc OVOPC-DEVDOC OVOPC-DOC	HP OpenView ITO Developer's Toolkit Documentation.

Table B-1 ITO Bundles English

ITO Bundle	ITO Product	Description
ITODevEngOra	OVCHECK OVNNMgr OVNNMgrMan OVOPC OVOPC-CLT OVOPC-CLT-ENG OVOPC-DEV OVOPC- ORA OVOPC-OVW OVOPC-PA OVOPC-PA-CLT OVOPC-PA-DOC OVOPC-WWW OVPlatform OVPlatformDevKit OVPlatformDevMan OVPlatformMan OVSNMPAgent OVSNMPDevKit OVSNMPDevMan	HP OpenView ITO Developer's Toolkit For Oracle/English, including all agents.
ITOEngDoc	OVNNMgrDYNATEXT OVNNMgrRtDOC OVOPC-DOC	HP OpenView ITO English documentation.
ITOEngJavaUI	OVOPC-WWW	HP OpenView ITO English Java-based GUI client.

Table B-1 ITO Bundles English

ITO Bundle	ITO Product	Description
ITOEngOraAll	OVCHECK OVNNMgr OVNNMgrMan OVOPC OVOPC-CLT OVOPC-CLT-ENG OVOPC-ORA OVOPC-OVW OVOPC-PA OVOPC-PA-CLT OVOPC-PA-DOC OVOPC-SCHA OVOPC-WWW OVPlatform OVPlatformMan OVSNMPAgent	HP OpenView ITO Oracle/English full bundle including all agents.
ITOEngOraAllUp	OVCHECK OVOPC OVOPC-CLT OVOPC-CLT-ENG OVOPC-ORA OVOPC-OVW OVOPC-PA OVOPC-PA-CLT OVOPC-PA-DOC OVOPC-WWW	HP OpenView ITO Oracle/English upgrade from NNM 6.1 to ITO including all agents.

Table B-1 ITO Bundles English

ITO Bundle	ITO Product	Description
ITOEngOraMin	OVCHECK OVNNMgr OVNNMgrMan OVOPC OVOPC-CLT OVOPC-ORA OVOPC-OVW OVOPC-PA OVOPC-PA-CLT OVOPC-PA-DOC OVOPC-SCHA OVOPC-WWW OVPlatform OVPlatformMan OVSNMPAgent	HP OpenView ITO Oracle/English minimal agent bundle.
ITOEngOraMinUp	OVCHECK OVOPC OVOPC-CLT OVOPC-ORA OVOPC-OVW OVOPC-PA OVOPC-PA-CLT OVOPC-PA-DOC OVOPC-SCHA OVOPC-WWW	HP OpenView ITO Oracle/English upgrade from NNM 6.1 to ITO including the minimum agents.

Table B-1 ITO Bundles English

ITO Bundle	ITO Product	Description
ITORemoteOVw	OVOPC-OVW	HP OpenView ITO Integration Package for HP Network Node Manager.
ITOSymInt	SYMINT	HP OpenView IT/Operations Sun Management Center Integration.

Table B-2 ITO Products English

ITO Products	Description
OVCHECK	ITO prerequisites.
OVNNMgr	Network Node Manager specific files.
OVNNMgrMan	Network Node Manager manual pages.
OVOPC	Generic filesets for ITO in an English environment, for example, NLS, manpages, etc. (Database independent.)
OVOPC-CLT	Generic client filesets for platforms that are supported in both English and Japanese ITO environments.
OVOPC-CLT-ENG	Client filesets for platforms that are supported only for an English ITO environment.
OVOPC-DEV	ITO Developer's Toolkit fileset.
OVOPC-DEVDOC	ITO Developer's Toolkit documentation (PDF and DynaText).
OVOPC-DOC	Contains the ITO documentation files (PDF and DynaText).
OVOPC-ORA	Contains all filesets for an Oracle database (English).
OVOPC-OVW	Files for the remote ITO Integration Package for Network Node Manager
OVOPC-PA	VantagePoint Performance Agent Integration
OVOPC-PA-CLT	VantagePoint Performance Agent
OVOPC-PA-DOC	VantagePoint Performance Agent Documentation
OVOPC-SCHA	ITO Sun Cluster High Availability
OVOPC-WWW	Fileset for the ITO Java-based Web GUI.
OVPlatform	OVMIN fileset container.
OVPlatformDevKit	OVPlatform's Developer's Kit.
OVPlatformDevMan	OVPlatform's Developer's Kit manual pages.
OVPlatformMan	Manual pages for OVPlatform.

Table B-2 ITO Products English

ITO Products	Description
OVSNMPAgent	SNMP Agent functionality
OVSNMPDevKit	SNMP Developer's Kit
OVSNMPDevMan	SNMP Developer's Kit Manual Pages
SYMINT	ITO Sun Management Center 2.1 Integration..

Table B-3 ITO English Components in the Subproducts

ITO Product	Fileset(s) in Product)	Description of Fileset
OVCHECK	ITOENGORAALL	ITO prerequisites for selected language product.
OVNNMgr	Runtime	NNM specific functionality.
OVNNMgrMan	RuntimeManPages	NNM runtime manual pages.
OVOPC	OVOPC-GUI	ITO GUI client - common files.
	OVOPC-GUI-ENG	ITO GUI client - English files.
	OVOPC-LIB	ITO common files - librarires
	OVOPC-MAN	ITO manual pages.
	OVOPC-AGT-MAN	ITO Agent Man Pages.
	OVOPC-NLS	Management server online help.
	OVOPC-UX-MGR78	Management server bits.
OVOPC-CLT	OVOPC-AIX-CLT	Agent software for IBM RS/6000 systems running on AIX.
	OVOPC-NT-CLT	Agent software for Intel-based PCs running MS Windows NT.
	OVOPC-OSF-CLT	Agent software for DEC Alpha systems running Digital UNIX.
	OVOPC-SOL-CLT	Agent software for Sun SPARC systems running Solaris
	OVOPC-UX10-CLT	Agent software for HP 9000 Series 700/800 systems running HP-UX 10.x
	OVOPC-UX11-CLT	Agent software for HP 9000 Series 700/800 systems running HP-UX 11.x
OVOPC-CLT- ENG	OVOPC-LIN-CLT	Agent software for Intel-based PCs running Linux.
	OVOPC-NW-CLT	Agent software for Intel-based PCs running Novell Netware.
	OVOPC-SGI-CLT	Agent software for Silicon Graphics systems running IRIX.

Table B-3 ITO English Components in the Subproducts

ITO Product	Fileset(s) in Product)	Description of Fileset
OVOPC-DEV	OPVPC-DEV-MAN	ITO Developer's Toolkit manual pages.
	OVOPC-DEV-MGR	ITO Developer's Toolkit management server.
OVOPC-DEVDOC	OVOPC-DOC-DENG	ITO Developer's Toolkit documentation (PDF and DynaText)..
OVOPC-DOC	OVOPC-DOC-RENG	ITO English documentation (PDF and DynaText files).
OVOPC-ORA	OVOPC-GUI-ORA	ITO Client - Oracle files
	OVOPC-UX-ORAA	Oracle-specific management server bits.
	OVOPC-UX-ORAB	Oracle-specific management server bits.
OVOPC-OVW	OVOPC-OVW-MGR	Files for remote ITO GUI integration with Network Node Manager.
	OVOPC-LIB-UTIL	ITO common Files-XML and utility libraries.
OVOPC-PA	OVOPC-PA-INT	VantagePoint Performance Integration
OVOPC-PA-CLT	OVPPC-PA-HP10	Deployable subagent, VantagePoint Performance Agent for HP-UX 10.20
	OVOPC-PA-HP11	Deployable subagent, VantagePoint Performance Agent for HP-UX 11.x
	OVOPC-PA-SOL	Deployable subagent, VantagePoint Performance Agent for Solaris
OVOPC-PA-DOC	OVOPC-PA-EDOC	VantagePoint Performance Agent Documentation
OVOPC-WWW	OVOPC-WWW-ENG	ITO Java-based web GUI—English online documentation and message catalogues
	OVOPC-WWW-GUI	ITO Java-based web GUI—language-independent files
	OVOPC-WWW-ORA	ITO Java-based web GUI—database files and UI server

Table B-3 ITO English Components in the Subproducts

ITO Product	Fileset(s) in Product)	Description of Fileset
OVPlatform	Event	OpenView common platform event management functionality.
	Minimum	OVPlatform runtime configuration.
	Report	NNM Reporting platform functionality.
	SNMP	OVPlatform SNMP functionality.
	Windows	Windows runtime configuration.
OVPlatformDevKit	Minimum	OpenView common platform developer's kit.
	Windows	Windows Developer's Kit.
OVPlatformDevMan	MinimumManPages	OpenView common platform developer's kit man pages.
	WindowsManPages	Windows Developer's Kit man pages.
OVPlatformMan	EventManPages	OpenView common platform event management manual pages.
	MinimumManPages	OVPlatform Minimum manual pages.
	SNMPManPages	OVPlatform SNMP manual pages.
	WindowsManPages	Windows runtime manual pages.
OVSNMPDevKit	DevKit	SNMP Developer's Kit
OVSNMPDevMan	ManPages	SNMP Developer's Kit manual pages.
SYMINT	SYMINT-CORE	ITO/SunMC Integration Core Component.
	SYMINT-DOC	ITO/SunMC Integration Documentation.
	SYMINT-GUI	ITO/SunMC Integration Desktop Component.

C Installing the Remote NNM Integration Package

In This Chapter

This chapter describes how to install the ITO software package for a remote integration with Network Node Manager (NNM). For a list of system requirements and installation instructions for the NNM software, refer to the documentation supplied with NNM.

Installing the NNM Integration Software

In order to make use of the remote ITO integration with NNM, you must manually install the NNM-specific ITO bundle on the NNM system or systems. Before installation, ensure that:

- ❏ NNM is already installed before the installation of the ITO integration bundle.

  For NNM installation and configuration instructions, consult the relevant NNM documentation.

- ❏ An ITO agent is installed on the NNM system.

  For the ITO agent prerequisites and installation instructions, refer to *VP Operations Administrator's Reference Volume II*.

- ❏ An X-Window system, for example Reflection-X on Windows NT/2000, is installed on the ITO GUI client system.

To install the ITO NNM integration software on the NNM system, run the ITO install script to select the software bundle, analyze the suitability of the system, and install the software. Install the ITO software as described in "Installing the ITO Software on the Management Server" on page 61, then configure the software as described in "Configuring the ITO Software" on page 71.

Choose the following software bundle to install the remote NNM integration package: `ITORemoteOVw`.

NOTE For the local use case of NNM, where NNM is installed on the ITO management server, the relevant integration files are automatically installed with the normal ITO installation package.

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