

Open System Management Framework (OSMF)

for HP-UX

Q3 Agent Option

Administrator's Guide

This manual provides information necessary to install, manage, and maintain the OSMF Q3 Agent software.

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Warning Symbols That May Be Used In This Book



Instruction manual symbol; the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual.



Indicates hazardous voltages.



Indicates earth (ground) terminal.



or



Indicates terminal is connected to chassis when such connection is not apparent.



Indicates Alternating current.



Indicates Direct current.

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1.1 In This Guide

This *55452A OSMF Software Q3 Agent System Administrator's Guide* provides information necessary to install, manage, and maintain the OSMF Q3 Agent software (referred to also as the Agent). It makes the assumption you have HP-UX, HP OpenView, and OSMF software experience.

1.1.1 Topics Included in This Guide

This guide includes the following topics:

- A description of the Agent software.
- Minimum system resources required to run the Agent.
- Responsibilities of the system administrator.
- Basic system administration tasks, such as installing and configuring the Agent.
- Configuring the Agent and upper-layer manager to communicate in a distributed management environment.

1.1.2 Naming Conventions Used in this Guide

This guide uses several names to refer to the same objects. The usage of multiple terms for the same object helps define the relationship between objects in different situations. To establish naming conventions, the objects and their corresponding names are listed in the following table:

Object	Names Used for the Object
55452A open synchronization management framework software	OSMF software for HP-UX, OSMF software, OSMF
HP-UX Workstation	OSMF workstation, OSMF system, host system, element manager
TMN Upper-Layer Network Management System	upper-layer management system, upper-layer network manager, upper-layer manager, network manager
OSMF Q3 Agent	Q3 Agent, Agent

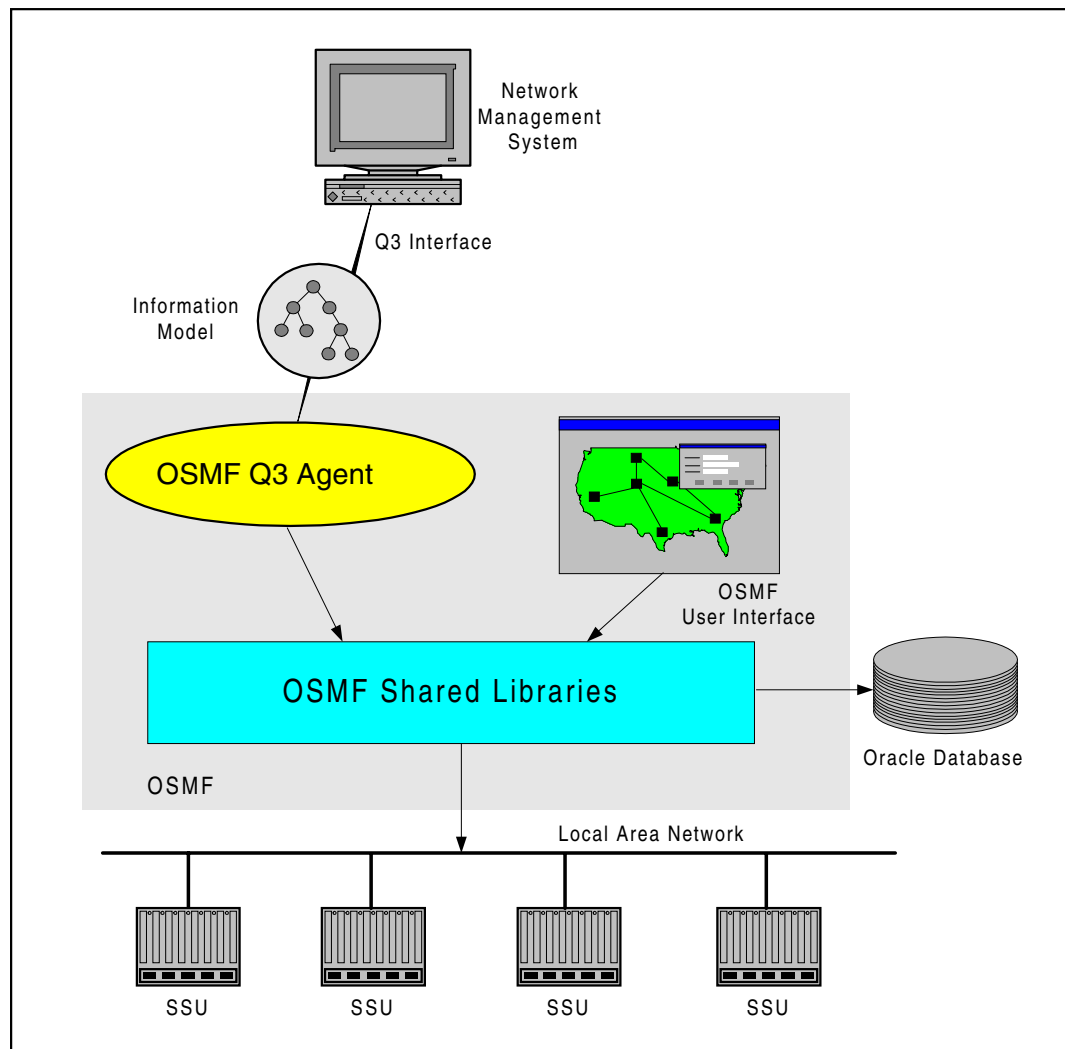
1.2 Description of the Agent

The element management software, the 55452A OSMF software, integrates HP OpenView Windows with an Oracle database and many other modules to facilitate management of SSUs through a user-friendly interface. A higher-layer network management system which might need to communicate with SSUs must do so over a Q3 interface using an Agent running on the OSMF platform. The Agent thus used is the OSMF Q3 Agent.

The OSMF Q3 Agent translates (as required) the information (commands, data, status information, events, etc.) that passes between the OSMF software and an upper-layer network management system. The Agent provides the following functions:

- Allows an upper-layer manager to access up to 1000 network elements (SSUs).
- Enables the upper-layer manager to perform GET and SET operations on certain parameters in the SSUs.
- Enables the upper-layer manager to perform a scoped GET using a filter so it can control the extent and nature of information retrieved from the network element.
- Translates SSU-generated TL/1 events to X.730, X.731, and X.733 events so that the upper-layer manager can process them.

The following figure shows that within the OSMF application, the Agent interacts with other modules by using the OSMF shared libraries.



The Information Model and OSMF

The HP OSI Transport Services product (HP OTS/9000) provides the OSI-compliant communications stack for communications between the Agent and the upper-layer manager. All CMIP requests and responses exchanged between the manager and the Agent are routed through this stack.

In a general sense, the Agent has two main functions, forwarding of events (event forwarding) and transaction handling. Event forwarding involves the processing and forwarding of events from network elements and the system itself to the upper-layer manager. Transaction handling involves the processing of transactions (request-and-response actions) between the upper-layer manager and the system or network elements.

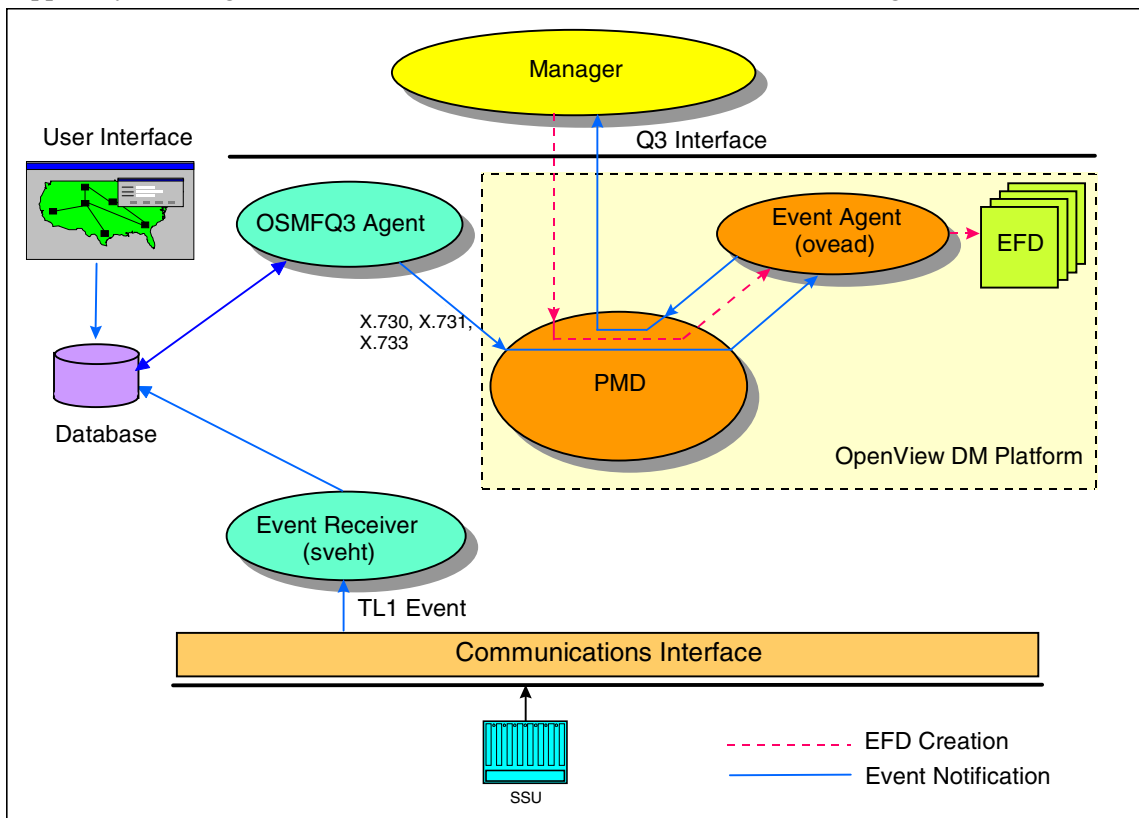
1.2.1 Event Forwarding

In the OSMF event model shown in the following figure, the database does the following in the order shown:

- Receives TL1 events from the Event Receiver (sveht) or the user interface.
- Processes them.
- Notifies the OSMF Q3 Agent of the events via triggers to an Event Dispatcher (not shown).

The Agent then retrieves the events, processes them, and sends acknowledgements back to the database.

There are a variety of events that can be forwarded to the Agent from the database. Events can be SSU generated, OSMF generated, or system related. All these events are converted to X.730, X.731, and X.733 events by an event translator within the Agent and forwarded to HP OpenView's Event Agent (*ovead*) process via the Process Management Daemon (PMD). The *ovead* process checks a list of Event Forwarding Discriminators (EFDs) to determine if the upper-layer manager is interested in the event, and forwards it to the manager.



The *ovead* process is responsible for maintaining the list of EFDs. EFDs are created in the OSMF system by the upper-layer manager in order to selectively control the type of events which must be forwarded to it. The Agent makes no assumptions about the existence or non-existence of EFDs. It is the upper-layer manager's responsibility to create and delete these EFDs.

Events can be classified under the following three categories:

SSU Generated Events. These events are generated asynchronously by the SSU. They include both alarmed and non-alarmed events which originate from the SSU as TL1 messages. It is the responsibility of the Agent to convert these TL1 events to X.730, X.731, and X.733 events based upon the mapping specified in Appendix A, entitled *Fields Supported in Notifications*.

Operator Initiated Events. Whenever an operator uses the Configuration->Modify form to modify an attribute in the SSU, the Agent is notified of this change via an event. These operator initiated events include the following:

- Changes to SSU attributes through any configuration screen.
- Changes to an SSU's operational state (managed, unmanaged).
- Addition of a new SSU.
- Deletion of an SSU.
- Addition of new hardware to an SSU.
- Deletion of hardware from an SSU.

Administrative Events. These events could be either synchronous or asynchronous and are generated as a result of administrative changes within OSMF. The events that are currently supported in this category are as follows:

- Heartbeat failure for an SSU.
- Recovery from a heartbeat failure.
- Alignment failure for an SSU (configuration mismatch).
- Recovery from alignment failure.
- Inventory mismatch.

1.2.2 Transaction Handling

In this sense, the Agent provides translation between the upper-layer manager and the networked SSUs. The upper-layer manager generates and sends GET and SET operations via the Q3 interface to the OSMF platform. These requests are processed and the appropriate TL1 commands are generated and sent by the Agent to appropriate SSUs in the network. Likewise, the Agent processes the TL1 responses to these requests, sending them via the Q3 interface back to the upper-layer manager. The managed objects that make up the Information Model represent the information that is either retrieved from (via a GET operation) or set in the SSUs.

1.3 Materials Provided

The 55452A OSMF Software Q3 Agent Option includes the materials listed in the following table:

Description	Part Number	Qty
Software on DAT tape	55452-13306	1
55452A OSMF Software Q3 Agent System Administrator's Guide (Documentation)	55452-90010	1

1.4 Responsibilities of the System Administrator

The system administrator is responsible for maintenance of the OSMF system and the Agent. This requires the system administrator to understand the workstation hardware and all of the software installed.

The main responsibilities of the system administrator are as follows:

- Installing the Agent software.
- Configuring the Agent (optional).

If the upper-layer manager and Agent will reside on separate machines in a distributed management environment, then the system administrator must also configure the machines to communicate in this environment.

1.5 System Requirements

The hardware and software described in the following sections is required to run the Agent.

1.5.1 Software Requirements

In addition to the software requirements detailed in the section entitled "System Requirements" in the *55452A OSMF Software System Administrator's Guide*, the Agent requires that the OSI Transport Services product, HP OTS/9000, be installed on the workstation running the Agent.

1.5.2 Hardware Requirements

The Agent runs on the same workstation on which the OSMF product runs. Refer to the *55452A OSMF Software System Administrator's Guide* for information on the hardware required to run the OSMF software.

1.5.3 Oracle Database Requirements

Version 1.3 of the Agent is designed to work with release 7.3.3.XX of the Oracle database.

1.6 Prerequisite Knowledge

The procedures in this manual assume that the system administrator has HP-UX, HP OpenView, and OSMF software experience. This knowledge is useful, and in some cases necessary when performing the tasks in this manual.

1.7 Related Documentation

Some procedures in this guide may refer you to procedures or other information that is contained in the *55452A OSMF Software System Administrator's Guide*.

2.1 In this Chapter

The procedures in this chapter explain how to do the following:

- Install the OSMF Software Q3 Agent (referred to as the Agent).
- Start the Agent.
- Stop the Agent.
- Configure the Agent.

The procedures in this chapter assume that the following is true:

- You have at least the minimum standard hardware required for an OSMF system (see the section titled “System Requirements” in the *55452A OSMF Software System Administrator’s Guide*).
- You have HP OpenView DM 4.21, HP OTS/9000, and the Oracle software installed on your workstation.
- You have sufficient knowledge or experience with HP-UX, the OSMF software, and the system hardware to be able to follow these installation instructions.

NOTE

OSMF software, version 3.0 is a prerequisite for version 1.3 of the Agent. Before attempting to install the Agent, ensure that the OSMF software, version 3.0 is installed on the workstation.

2.2 Overview

The installation program, *swinstall*, does the following:

- Copies the Agent’s files to their respective directories.
- Creates a special user account called ‘q3agent.’
- Modifies the database to flag the availability of the Agent option for OSMF.
- Registers the Agent with HP OpenView.

NOTE

Registration is the way the Agent tells HP OpenView that it exists:

- Registration provides information that enables HP OpenView to start or stop the Agent.
- Registration updates the object database with information pertaining to the objects that the Agent will manage. This information is made publicly available to other management stations by the Object Registration Service (ORS) daemon. For more information on object registration please refer to the *HP OpenView TMN Administrator’s Guide*.

The installation process uses the utility *svq3reg.ks* to register the agent. This program uses HP OpenView’s *ovaddobj* command to add the agent’s LRF file (*/etc/opt/OV/share/lrf/hpq3.lrf*) to the ORS database.

2.3 Installing the OSMF Q3 Agent

To install the Agent, use the Software Distributor, as described in the following procedure.

- 1 Log in as **root**, and type the following command to source the OSMF environment (this command must be run from the Korn shell [ksh]):

```
. /opt/smartview/config/env/sv-ux.env
```

- 2 Type the following command to stop HP OpenView:

```
svstop
```

- 3 Insert the OSMF Q3 Agent installation tape into the local system tape drive.

NOTE

You can run “swinstall” directly as an alternative to running it from SAM. If you choose to do this, it is only necessary to perform steps 6 through 11.

- 4 Type the following command to start the System Administration Manager (SAM):

```
/usr/sbin/sam
```

- 5 Double click on **Software Management**.

- 6 Double click on **Install Software to Local Host**.

- 7 Click on **Source Depot Type**, then select **Local Tape**.

- 8 Click on **Source Depot Path**, select the path to the local tape drive, then click **OK**.

Typically, the path to the local tape drive will be /dev/rmt/0m.

- 9 In the Software Selection window, highlight **55452CD**, and click on **Actions>Install (analysis)**.

Install analysis begins automatically, and it normally completes with a status of “Ready.” If a status other than “Ready” is indicated, click the **Logfile...** button in the “Install Analysis” dialog box for information about the problem.

- 10 After install analysis completes, click **OK**, and then click **Yes** in the confirmation window that appears.

After “Yes” is clicked, the execution phase of the install process will start. This phase should complete with no errors.

- 11 When the status shows “Completed” and “Percent Complete=100%,” click **Done**.

- 12 Click **File>Exit** to exit Software Distributor.

- 13 Click **File>Exit SAM** to end the software installation process and exit SAM.

2.4 Configuring the Agent (optional)

The file `/opt/smartview/Q3/config/q3hp.conf` defines two configurable parameters (listed in the following table) which are associated with the Agent. The Agent is shipped with default values for both of these parameters. Agent configuration is thus an optional step, which is required only if either value must be changed. The change is made by editing the file, using any text editor.

Parameter Name and Description	Default Value
Q3_AGENT_NAME Provides a name for the Agent. Assigned to the <i>userLabel</i> attribute of the <i>syncNetworkManager</i> .	Open Synchronization Management Framework 3.0
Q3_CONTEXT_SAVE_INTERVAL Specifies the time interval (in minutes) at which the Agent periodically saves the containment tree in the startup file at <code>/opt/smartview/q3/dat/q3hp.pct</code> . When the Agent starts, it reads the startup file and recreates the containment tree based on the information found in the file.	15

Optionally, you can set these configurable parameters using an Agent configuration utility (`svq3conf.ks`), as in the following procedure:

- 1 Type the following command to go to the directory containing the Agent configuration utility:

```
cd /opt/smartview/Q3/utls
```

- 2 Type the following command to run the Agent configuration utility:

```
./svq3conf.ks -name <agent_name> -interval <save_interval>
```

The message “Configuration file has been changed” is returned when the utility executes successfully.

NOTES

- The Agent configuration utility will not accept spaces in the Agent name. You can use the underscore to denote spaces. If you prefer (or require) spaces in the Agent name, then you must make the change by modifying the `q3hp.conf` file using a text editor.
- You must include both parameters in the command line, even if you wish to only change one of them. You can re-enter the same value for the parameter you do not wish to change.

As an example, to enter the name “OSMF” as the Agent name, and 10 minutes as the save interval, you would enter the following command:

```
svq3conf.ks -name OSMF -interval 10
```


The changes you make using the above command become effective the next time the Agent is started.

2.5 Starting the Agent

After you have installed the Agent software as described in the above procedure, it is automatically started along with other OSMF daemons when the *svstart* command is executed.

When the Agent is started, it determines whether the containment tree must be recreated from the startup file at */opt/smartview/dat/q3hp.pct*.

- **If the Agent finds that the startup file contains valid information**, it reads the file and restores the containment tree exactly as it was before the previous shutdown.
- **If the startup file is empty**, the agent must re-synchronize itself with the OSMF database.

NOTE

“Synchronization” refers to the task of obtaining a list of all the SSUs (managed and unmanaged) from the database and populating the containment tree based on the hardware configuration of each SSU. If the */opt/smartview/dat/q3hp.pct* file is not built or has been deleted, synchronization typically takes about 10 to 20 seconds per SSU. This can result in extremely long Agent startup times if the database contains many SSUs.

In general, you should not delete, modify, or otherwise tamper with the startup file.

After populating the containment tree, the Agent does the following in the order shown:

- Reads all the outstanding events from the database.
- Updates appropriate managed objects in the containment tree.
- Translates these events to X.730, X.731, and X.733 events.
- Forwards them to the upper-layer manager.

Use the following procedure to start the Agent:

- 1 Log in as **root**, and type the following command to source the OSMF environment (this command must be run from the Korn shell [ksh]):

```
. /opt/smartview/config/env/sv-ux.env
```

- 2 Type the following command to start the HP OpenView processes:

```
svstart
```

This command starts all processes, including the Agent. After all processes are spawned, the HP-UX root prompt returns.

NOTE

If the HP OpenView and OSMF processes are already running, the command **ovstart q3hp** can be used to start the Agent independently.

- 3 Type the following command to ensure that the OSMF software-related processes are up:

svstatus

The “svstatus” command outputs a status report to the HP-UX window. The following shows what the report contains if all OSMF software processes are up:

```
OSMF , Release 3.0 (build build_no)

The OSMF environment is set
-----

Openview is up
-----

Status of OSMF daemons ...
-----

Alignment Daemon:           up
HeartBeat Daemon:          up
Event Receiver Daemon:     up
Event Alert Daemon:        up
OVW Communication Daemon:  up
Status Sync Daemon:        up
GPS Agent Daemon:          up

Replication Option is not installed
-----
```

Note that the above report does not indicate the status of the Agent. A separate command is used to view the status of the Agent.

- 4 Type the following command to view the status of the Agent:

```
ovstatus q3hp
```

This command shows the status of the Agent:

- If the Agent is currently running, “RUNNING” will appear in the “State” field of the report.
- If the Agent is currently not running, “NOT_RUNNING” will appear in the “State” field.

2.6 Stopping the Agent

The Agent is automatically stopped along with other OSMF daemons when the *svstop* command is executed. Before the Agent shuts down, it saves the containment tree in the startup file at */opt/smartview/dat/q3hp.pct*.

- 1 Log in as **root**, and type the following command to source the OSMF environment (this command must be run from the Korn shell [ksh]):

```
. /opt/smartview/config/env/sv-ux.env
```

- 2 Type the following command to stop the HP OpenView processes:

```
svstop
```

This command stops all processes, including the Agent. After all processes have terminated, the HP-UX root prompt returns.

NOTE

If the HP OpenView and OSMF processes have already been stopped, the command **ovstop q3hp** can be used to stop the Agent independently.

3.1 In this Chapter

In a typical situation, the upper-layer manager and Agent reside on separate machines, possibly across a distributed network. In these situations, the upper-layer manager must know the following:

- Where the Agent exists
- The managed objects and instances that are under the Agent's control
- How the Agent can be reached.

The HP OpenView Object Registration Service (ORS) can be configured to satisfy the above three requirements. This chapter provides information on configuring HP OpenView platforms at both ends of a distributed network connection so that the upper-layer manager and Agent can communicate.

NOTE

A detailed description of the ORS can be found in the *HP OpenView Telecom DM Administrator's Guide*.

3.2 Overview

Every machine that runs the HP OpenView DM platform has a daemon called the `orsd` daemon. The `orsd` daemon automatically starts whenever the DM platform-related processes start. When many machines participate in a distributed management environment, one of the machines (or, nodes) must be configured as a master ORS node. All other nodes participating in the distributed management environment must be configured as slave ORS nodes. The master ORS node maintains a global repository (database) of all the managed objects that are controlled by each slave node. Thus, when an upper-layer manager wants to manage a specific instance of a managed object, it first queries the master ORS node to determine where the corresponding Agent resides, and then sends a request it.

3.3 Configuring the ORS Nodes

The following procedure configures the upper-layer manager's machine as the master ORS node and the Agent's machine as a slave ORS node.

NOTE

The following procedure must be performed as superuser (root).

- 1 Type the following command on the upper-layer manager's machine to verify that it is configured as a master ORS node:

```
ovorsutil -h
```

By default, when an `orsd` daemon starts up for the first time, it configures the node it is running on as a master ORS node. This should be reflected in the output of the `ovorsutil -h` command, which should appear similar to the following:

ovorsutil: The database contains the following master/slave hierarchy:

```
Master ORS node is: OVDM,ses0,tp0,manager_address
```

```
The following nodes are registered as slave ORS entries:
```

```
The total number of slave entries found is 0.
```

The string `OVDM,ses0,tp0,manager_address` represents the RFC1006 presentation address of the master ORS node. This string must match the presentation address found in file `"/etc/opt/OV/share/conf/local_p_addr"` on the upper-layer manager's machine.

- 2 View the upper-layer manager's `"/etc/opt/OV/share/conf/local_p_addr"` file to verify that the presentation address in it matches the presentation address in the output of the **ovorsutil -h** command.
- 3 If there is a mismatch in the addresses, type the following command on the upper-layer manager's machine:

```
ovorsutil -m OVDM,ses0,tp0,manager_hostname
```

Where `manager_hostname` is the hostname of the upper-layer manager's machine. This command directly sets the upper-layer manager's machine to be the master ORS node. When the command executes successfully, the message "ovorsutil: the change of master node has been requested" will be displayed.

- 4 Type the following command on the Agent's machine to configure it as a slave ORS node:

```
ovorsutil -m master_hostname
```

Where `master_hostname` is the hostname of the master ORS node, which is the upper-layer manager's machine. After this command is executed, the two machines will attempt to synchronize their ORS databases, during which messages that are similar to the following will be displayed:

```
ovorsutil: trying to contact master node OVDM,ses0,tp0,manager_address.
ovorsutil: contact successful, proceeding to request the change.
ovorsutil: the change of master node has been requested.
```

- 5 Type the following command on the upper-layer manager's machine:

```
ovorsutil -h
```

The output of this command should now list the Agent's machine as one of the machines registered as a slave ORS entry.

- 6 Verify that the ORS databases have been synchronized by typing the following command on the upper-layer manager's machine:

```
ovorsutil -d q3hp
```

If the Agent had been installed successfully, the output should show a listing of all the managed objects pertaining to the Q3 Agent, along with the presentation address of the Agent's machine.

NOTE

The Agent can now be accessed from the upper-layer manager that resides on the master ORS node.

A

Fields Supported in Notifications

A.1 Fields Supported in Notifications

X.730, X.731, and X.733 specify the information contained in a notification by defining certain parameters, or fields which constitute the notification. While some of these fields are mandatory, most are optional and implementation specific. The fields in notifications generated by the Agent are listed in the following table:

Parameter	Requirement
Event Type	Mandatory
Probable Cause	Mandatory
Perceived Severity	Mandatory
Additional Text	Optional
Event Time	Passed in CMIS field
Invoke Identifier	Passed in CMIS field
Mode	Passed in CMIS field
Managed Object Class	Passed in CMIS field
Managed Object Instance	Passed in CMIS field

For SSU generated events, the “Event Time” parameter indicates the time when the event actually occurred within the SSU. The “Additional Text” field contains the event description that was present in the original TL1 event.