

Open System Management Framework (OSMF)

for HP-UX

ECS Option

Administrator's Guide

This manual provides the information necessary to install, manage, and maintain the ECS option 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 ECS Option System Administrator's Guide* provides information necessary to install, manage, and maintain the ECS option software. It makes the assumption you have HP-UX and OSMF software experience.

NOTE

System user information regarding the ECS option, such as the viewing of correlated alarms and events, is included in the *55452A OSMF Software User's Guide*.

1.1.1 Topics Included in This Guide

This guide includes the following topics:

- A description of the ECS option software.
- Minimum system resources required to run the ECS option.
- Responsibilities of the system administrator.
- Installation of ECS on the workstation.

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
Event Correlation Services option	ECS option, ECS software, ECS

1.2 Description of the ECS Option

The OSMF software product contains Alarm Viewer and Event History Log screens that allow users to view the alarms and events that are generated by the SSUs in the network. Certain problems which can occur in telecommunications networks, however, can result in hundreds or even thousands of events being generated by SSUs and displayed in these viewers. Determining the underlying cause of these *event storms* can be very difficult.

The Event Correlation Services (ECS) option provides a means of producing a more relevant display of events, thus leading to more efficient troubleshooting of network problems. ECS provides two functions to effect this: *event filtering* and *root-cause analysis*:

Description of the ECS Option

- The ECS *event filtering* function filters out transient events, that is, those events that indicate the occurrence of an event, not an ongoing condition. An example of a transient event is LOGCLRDR, which indicates that the event log has been cleared. Since transient events are typically not pertinent for problem analysis, the ECS filters them.

NOTE

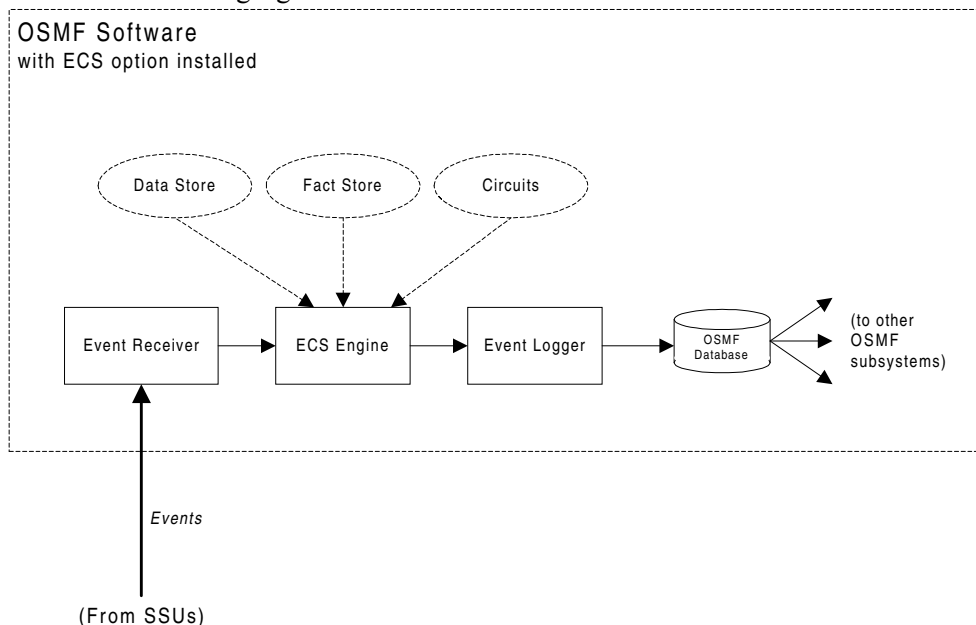
The list of transient events that are filtered is included in Appendix A.

- Certain situations can arise where some problem in the network causes a cascade of related alarms to emanate from the SSUs that are, for example, being fed by an errored signal. This can lead to a burst, or storm, of events. *Root-cause analysis* finds the root cause of such related alarms generated by the SSUs within the synchronization network, and outputs a "root-cause" alarm which identifies the cause of the event storm.

NOTE

Correlation scenarios are included in Appendix B.

When the ECS option is installed, events that are received by the Event Receiver (a part of the standard OSMF software product) are passed to an ECS Engine where the above-mentioned ECS functions are performed. The events that are output by the ECS Engine are passed to the Event Logger, which logs them to the database. The events then become available to the other OSMF subsystems. The following figure illustrates this:

**NOTE**

When the ECS option is *not* installed, the Event Receiver receives, validates, and logs all valid events from managed SSUs directly to the database, where they become available to the other OSMF subsystems.

The ECS Engine uses information in three files (called the *Data Store*, *Fact Store*, and *Circuits*) to perform its functions:

- The *Data Store* file contains information regarding the transient events that the ECS Engine will filter during operation. This file is pre-configured and typically should not be modified.
- The *Fact Store* file contains network topology (specifically, SSU interconnectivity) information. It is updated and reloaded to the ECS Engine whenever a Sync Trail is added to the network map.
- The *Circuits* files contain information that the ECS engine uses to perform root-cause analysis. The Circuits files are pre-configured and should not be user-modified.

1.3 Materials Provided

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

Description	Part Number	Qty
Software on DAT tape	55452-13305	1
<i>55452A OSMF Software ECS Option System Administrator's Guide</i> (Documentation)	55452-90011	1

1.4 Responsibilities of the System Administrator

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

The main responsibility of the system administrator is installing the ECS option software.

1.5 System Requirements

The OSMF ECS option runs on the same workstation on which the OSMF product runs. The hardware requirements for the ECS option are the same as those for the OSMF product. Refer to the *55452A OSMF Software System Administrator's Guide* for information on the hardware requirements for the OSMF product.

In addition to the software requirements detailed in the *55452A OSMF Software System Administrator's Guide*, the ECS option requires that the HP OpenView Event Correlation Services product, version 2.x, be installed on the workstation.

NOTE

The ECS option requires that version 3.0 of the OSMF software be installed on the OSMF workstation.

1.6 Prerequisite Knowledge

The procedures in this manual assume that the system administrator has HP-UX 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*. System user information regarding the ECS option, such as the viewing of correlated alarms and events, is included in the *55452A OSMF Software User's Guide*.

2.1 In this Chapter

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

- Install the OSMF Software ECS Option.
- Start the ECS Option Software.
- Stop the ECS Option Software.

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 the HP OpenView Event Correlation Services product version 2.x 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 OSMF ECS option. Before attempting to install the OSMF ECS option software, ensure that the OSMF software, version 3.0 is installed on the workstation.

2.2 Installing the OSMF ECS Option

To install the OSMF ECS option, 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 ECS option 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 **55452CE**, 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.

2.3 Starting the ECS Option

After the ECS option software is correctly installed, it is automatically started along with other OSMF daemons when the `svstart` command is executed. Use the following procedure to start the ECS Option:

- 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 ECS option processes. After all processes are spawned, the HP-UX root prompt returns.

- 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
Event Logger Daemon:      up

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

If ECS is running, the status of the “Event Logger Daemon” will be up.

2.4 Stopping the ECS Option

ECS is automatically stopped along with other OSMF daemons when the *svstop* command is executed.

- 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 ECS processes. After all processes have terminated, the HP-UX root prompt returns.

A

Transient Events

A.1 Transient Events

The events in the following table are transient events which are filtered by ECS:

Event	Description
INPSSM	Input SSM Changed
ITHCDRM	Other ITH Card Removed
ITHCDIN	Other ITH Card Inserted
CFGRST	Configuration Reset
LOGCLR	EVT Log Cleared
SNSSM	SSM Algorithm Executed
SNOOPER	Sync in normal Operating Mode
SNHAVL	Holdover Available

B

Correlation Scenarios

B.1 Correlation Scenarios

The information below illustrates the four scenarios for correlation. Note that in the ECS option, correlation is restricted to one hierarchical level, such as in the following examples. Also note that an appropriate connection must exist between SSUs as evidenced by the information in the Fact Store in order for events generated by the SSUs to be considered for correlation.

2.1.1 Correlation Scenario 1

In this scenario:

- A situation occurs at SSU-A to cause an “Output Card Not Present” event (OPCDNP) to be generated.
- SSU-B, which receives its input from the above-mentioned output card, disqualifies an input, and produces an “Input Disqualified” event (INDISQ) for the input.



Upon receiving these events, if the ECS Engine determines that the INDISQ event and the OPCDNP event occurred within one minute, and a link exists in the Fact Store between the input that has been disqualified and the output card that is not present, it determines the SSU-A OPCDNP event to be the root-cause event, and the SSU-B INDISQ event to be a related event.

NOTE

SSUs contain certain events that are included for the purpose of providing more information about the reason for the occurrence of a condition. These events have a default severity of NONE, and as such are not reported unless their severity level is changed by the user.

The following two scenarios (correlation scenarios 2 and 3) include one of these events (INPLOS) as an example. The INPLOS (Input Loss of Signal) event provides more insight into the reason for the INDISQ (Input Disqualified) event. The examples assume the INPLOS event has been enabled by the user. Where the INPLOS event is shown in the following two scenarios, any of the descriptor events could be added if enabled.

The events that serve as descriptors to the INDISQ event are the INMEAS, INPLOS, INPOOF, INPULL, and INPAIS events.

2.1.2 Correlation Scenario 2

In this scenario:

- A situation occurs at SSU-A to cause an “Output Card Not Present” event (OPCDNP) to be generated.
- SSU-B, which receives its input from the above-mentioned output card, detects signal loss at an input, disqualifies the input, and produces an “Input Loss of Signal” event (INPLOS) and “Input Disqualified” event (INDISQ) for the input.

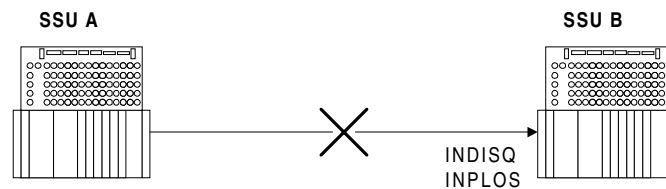


Upon receiving these events, if the ECS Engine determines that the INPLOS, INDISQ, and OPCDNP events occurred within one minute, and a link exists in the Fact Store between the input and the output card that is not present, it determines the SSU-A OPCDNP event to be the root-cause event, and the SSU-B INPLOS event (see above note) and INDISQ event to be related events.

2.1.3 Correlation Scenario 3

In this scenario:

- Some transmission error, such as a severed cable, occurs in a physical path between SSU-A and SSU-B.
- SSU-B detects signal loss at an input, disqualifies the input, and produces an “Input Loss of Signal” event (INPLOS) and “Input Disqualified” event (INDISQ) for the input.



If, within a minute of receiving these events, the ECS Engine does not detect output-related events for the output which feeds the input through a link existing in the Fact Store, it determines the SSU-B INPLOS event (see above note) to be the root-cause event, and the SSU-B INDISQ event to be the related event.

2.1.4 Correlation Scenario 4

In this scenario:

- A situation occurs at SSU-A to cause an “Output Card Not Present” event (OPCDNP) to be generated.
- SSU-B, which receives its input from the above-mentioned output card, disqualifies an input, goes into holdover mode, and produces an “Input Disqualified” event (INDISQ) for the input as well as a “Holdover Mode” event (SNHOLD).



Upon receiving these events, if the ECS Engine determines that the INDISQ, SNHOLD, and OPCDNP events occurred within one minute, and a link exists in the Fact Store between the input that has been disqualified and the output card that is not present, it determines the SSU-A OPCDNP event to be the root-cause event, and the SSU-B INDISQ and SNHOLD events to be related events.

2.2 Special Case Correlation Scenarios

The Alarm Viewer and Event History Log dialog boxes clearly indicate the root-cause/related relationship when the root-cause/related events appear in the same dialog box. In a few special case scenarios, the root-cause and related events get separated (appear in different dialog boxes), and the relationship between them is not as apparent. These scenarios are explained below:

2.2.1 The root-cause event is in the Event History Log, and its related event or events are still active, thereby appearing in the Alarm Viewer:

As an example, consider the situation where an INPDISQ event appears in the Alarm Viewer, and its root-cause event, a non-alarmed INPLOS event, appears in the Event History Log.

In this case, if you double click the root-cause event (INPLOS) in the Event History Log, the “Related Events” dialog box will open, but it will be empty. This is because its related event is not in the same dialog box. Furthermore, after correlation takes place, the INDISQ event will not be shown in the Alarm Viewer unless the “Show Related Alarms” check-box in the Alarm Viewer is chosen because it *is* related, albeit not to an event in the same dialog box.

When the INDISQ event is cleared, it is moved to the Event History Log. Correlation will then again be apparent, as both root-cause and related alarm appear in the same dialog box.

2.2.2 An alarm gets escalated to a higher severity level, then a condition occurs to de-escalate the alarm, and the higher severity level alarm is cleared and sent to the Event History Log:

As an example, consider the situation where a major OPCDNP alarm exists because the active card (card 1) of a protected output card pair is removed. If the second output card (card 2) in the pair is removed, the major OPCDNP alarm is escalated to a critical OPCDNP alarm, a critical OPCDNP alarm is generated by card 2, and an INDISQ alarm is generated by the ITH card in the destination SSU. The critical OPCDNP alarm for card 1 is the root-cause alarm, and the INDISQ alarm is the related alarm. Since these alarms both appear in the Alarm Viewer, their correlation is apparent.

If the second output card is now re-installed, the critical OPCDNP alarm from card 1 is de-escalated to a major OPCDNP alarm, and its critical OPCDNP alarm is cleared and sent to the Event History Log. This critical OPCDNP alarm from card 1 is the root-cause event, and its related event is the INDISQ alarm in the Alarm Viewer. Since they are in different dialog boxes, their correlation is not apparent. After some time, the INDISQ alarm gets cleared, after which its correlation with the OPCDNP event will again become apparent.

In addition, the de-escalated OPCDNP alarm from card 1 is shown as a root-case event as an aid to the user, but does not have any related events, hence, if it is double-clicked, the “Related Events” dialog box will open, but it will be empty.

