HP Domain Enterprise Server Operations Manager Concepts Guide

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Overview of the HP Domain Enterprise Server Operations Manager

HP Domain Enterprise Server Operations Manager (HP DESOP) is a central operations and problem-management product for distributed multi-vendor systems. HP DESOP uses HP OpenView IT/Operations Special Edition (ITO-SE) to provide:

- central message-management for consolidation, simplification and automation of message processing
- central monitoring for proactive problem resolution
- central problem-management for problem notification, resolution and tracking
- central control for efficient management

NOTE The DESOP management server does not support C2 security.

In This Book

This guide provides explanations to help you better understand and use HP Domain Enterprise Server Operations Manager. The guide is organized as follows:

Chapter 1	"Introducing HP Domain Enterprise Server Operations Manager" provides a brief description of HP Domain Enterprise Server Operations Manager's functionality.
Chapter 2	"Understanding DESOP's Structure" describes how DESOP functions, how DESOP is structured and how messages are processed.
Chapter 3	"Performing Daily Tasks" contains descriptions of the environment and problem-solving techniques.

Contents

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1 Introducing HP Domain Enterprise Server Operations Manager (DESOP)

In This Chapter

This chapter introduces DESOP's basic concepts, and includes sections describing:

- central control and management
- managing messages
- managing problems

An Overview of the HP Domain Enterprise Server Operations Manager

HP Domain Enterprise Server Operations Manager (DESOP) is a software application that provides central operations and problem management. HP DESOP uses HP OpenView IT/Operations Special Edition (ITO-SE). The management solution:

- increases the uptime of computing resources
- reduces the amount of problems through preventive actions
- decreases the time needed to resolve problems
- helps to reduce the cost of managing the client-server environment

DESOP is a very flexible solution that can be configured to meet the requirements of any Information Technology (IT) organization and its users.

Central Operations and Problem Management

HP Domain Enterprise Server Operations Manager (DESOP) consists of a central management node which interacts with intelligent software–agents installed on the managed systems (called nodes).

Management status information, messages, and monitoring values are collected from such sources as:

- system or application log files
- SNMP variables

Filters and thresholds are applied, and the information is then converted into a standard format for presentation to the central management node. Although the information is extracted from different sources, DESOP ensures that it is presented in a consistent format. Therefore, regardless of the information's source, operators can respond using consistent and intuitive procedural steps. This results in:

- shorter learning periods for operators
- increased system management efficiency
- reduced need for system application specialists

Once the information is retrieved, DESOP can immediately initiate corrective actions, and provide individual guidance for problem identification and further problem resolution. There are many ways of starting corrective actions in response to these events. For example, Automatic Actions can be started without operator intervention upon receipt of an event. Alternatively, operator-initiated Actions may be predefined and started by the operator in response to a message.

All operator-driven actions, planned daily tasks, and responses to events, are initiated from the central management node, and event-specific Help Text and Instructions lead the operator through the problem resolution process. This makes solution implementation simple and fast. These capabilities result in both improved productivity through management task automation, and reduced errors during problem solving.

Managing Problems

DESOP helps you to solve system- as well as network management-related problems. These problems can occur anywhere within a distributed environment. DESOP notifies operators that a problem has occurred, then provides the resources required to resolve it. The standard elements of problem management are:

- Identification—observing the environment.
- Notification—becoming aware of the problem. DESOP notifies operators of problems by displaying messages and their attributes, including severity, in the “ITO-SE” window.

  Operators see at a glance the severity of the problem and the affected object. They can use the “Message Properties” window to review every detail about the problem and resolve it.
- Analysis—understanding the problem and its cause. In large environments, it is crucial to be able to pinpoint problems quickly.
- Solution—determining how to solve the problem
- Resolution—starting a corrective action to resolve the problem. DESOP provides the following:
  - **Automatic actions**: These do not require operator intervention. These actions implement corrective responses automatically, immediately upon receipt of the message. The operator can quickly determine the status of the action.
  - **Operator-initiated actions**: The operator reviews the message and then starts the corrective action.
  - Specific problem-resolution instructions: These instructions are displayed in the “Instructions” and “Message Properties” windows to assist operators in resolving the problem.
- Tracking—closing the problem.

Daily Operations and Problem Management Procedure

DESOP gathers the elements of daily operations and problem management into this simple procedural flow:

1. Collecting

   Gathering the information for assessing the status of the computing environment.

2. Processing

   Selecting important or critical status information and making it available to the management server.

3. Presenting

   Making the information visible, highlighting problems, and defining problem resolution.

4. Executing

   Performing planned activities and corrective actions, storing information and action logs.

2 Understanding DESOP's Structure

In This Chapter

This chapter describes DESOP's basic elements and capabilities, including:

- understanding events, messages, and actions
- architecture
- message flow
- action flow

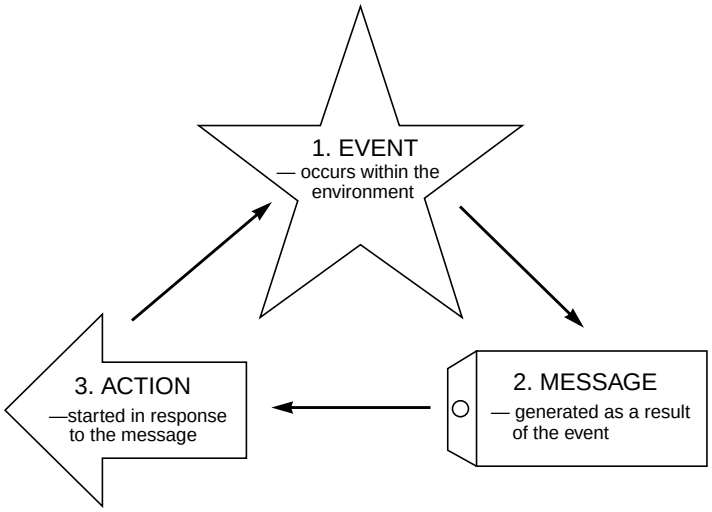
Understanding How DESOP Functions

DESOP's objective is to monitor, control and maintain systems. DESOP performs its tasks by managing:

- events—any occurrence
- messages—reports of events
- actions—responses to messages

The following diagram shows a pictorial representation of this sequence.

Figure 2-1 Events, Messages and Actions



DESOP uses events, messages, and actions to:

- observe and control status
- formulate and provide information
- prohibit or react to and correct problems

Events

An event is a change in status, a particular occurrence, or an incident within the computing environment, that occurs on an object. Typically, an event represents either a change in status, or a threshold violation. For example, the status of a printer changes when the paper tray empties. Or, a threshold is violated when the available disk space falls below a certain level. Each of these occurrences are events, and for each event a message can be created.

Many events represent problems which must be corrected, but not all events are problems. For example, when a user logs on or off a system, the status of the system changes, and an event occurs. However, in general this event requires no action on the part of an operator.

Messages

Messages are structured pieces of information, created by events. DESOP intercepts and collects messages, and thereby is informed of events. Messages can be any length, from a few bits to a complete event description.

DESOP intercepts messages from the following sources:

- Logfiles—DESOP encapsulates logfiles of applications and systems, extracts message information and checks their status.
- Monitored objects—you can set up threshold levels for monitored objects. When measured values of monitored objects exceed configured threshold levels, DESOP will create messages.

After intercepting a message, DESOP can completely restructure it, for example, to present the message to the operator in an understandable format, or to change the severity of the event. For messages which report problems, actions to resolve the problem can be defined.

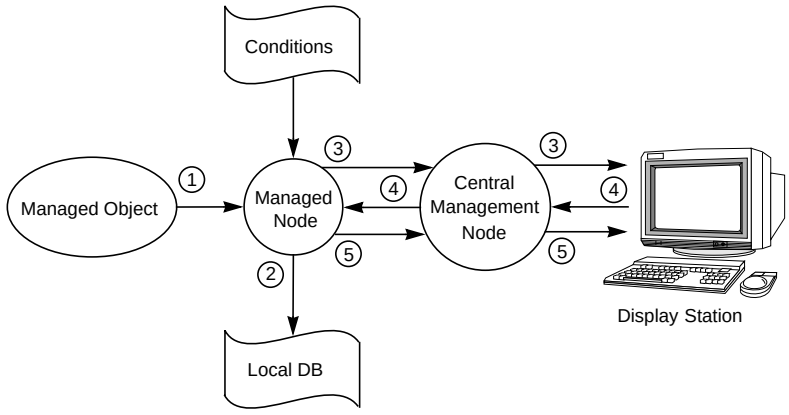
Understanding How Messages are Processed

DESOP uses messages to perform the following tasks:

- communicate information about events
- let the operator detect status changes within the environment
- start corrective actions

DESOP's message handling processing steps are shown in Figure 2-2 and described below.

Figure 2-2 Message Processing Flow



1. The messages are intercepted on the managed node according to the conditions defined.
2. The managed node records the messages in a local database.
3. The managed node tells the central management node the highest severity in its local database. The central management node shows this information to the operator.
4. The operator requests the central management node to show the messages for the managed node.
5. The central management node shows the messages in the managed node's local database.

For more information about how the operator responds to messages, see Chapter 3, "Performing Daily Tasks."

Managing Messages

DESOP's message management features can combine messages into logically related groups. A message group brings together messages from lots of related sources, providing status information about a class of managed objects or services. For example, the message group BACKUP can be used to gather all backup related messages, from sources such as backup applications and tape drives. The message groups are predefined.

Actions

An action is a response to a message. If the event creating the message represents a problem, an action can be started to correct it. An action can be a shell script, program, command, application start, or any other response required.

These actions are preconfigured by the DESOP administrator as responses to specific messages. There are two types of message-bound actions:

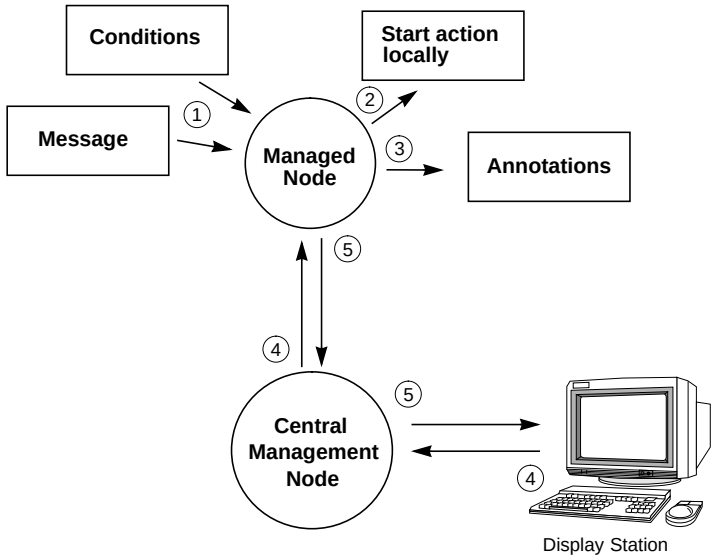
- operator-initiated—the operator reviews the message, then starts the action
- automatic—these actions begin automatically when the message is received

Following are examples which focus on automatic and operator-initiated actions to show what happens to a message when such an action is configured.

Automatic Actions

Automatic actions are message-bound, preconfigured responses to problems. Automatic actions do not require operator interaction, and DESOP starts them as soon as a message is received.

Figure 2-3 Starting an Automatic Action



As shown in Figure 2-3, automatic actions are processed as follows:

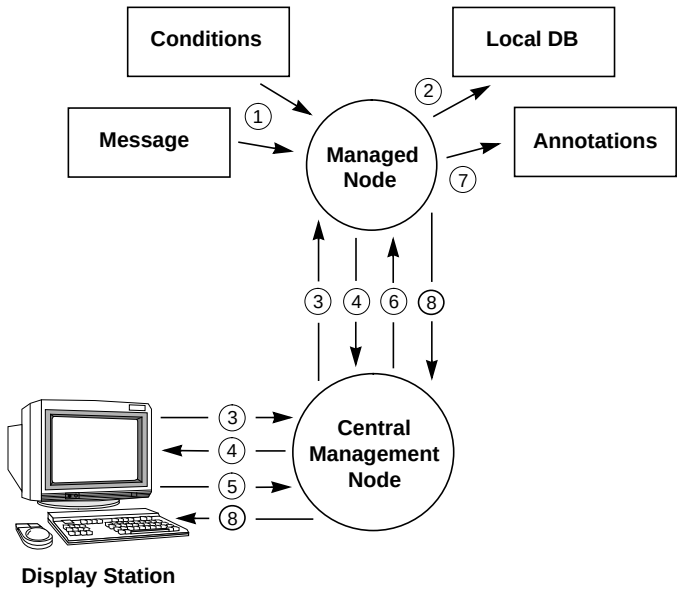
1. The message is intercepted and stored on the managed node according to the conditions defined.
2. The action is started locally. Automatic actions can only execute on the local node.
3. If the message has been so configured, annotations about the execution of the automatic action are stored on the manage node.
4. The operator requests the central management node to show the messages for the managed node.
5. The central management node shows the messages and annotations stored on the manage node.

Operator-Initiated Actions

Operator-initiated actions are also message-bound, preconfigured responses to problems. These actions are started by an operator. Operator-initiated actions are configured for a message instead of an automatic action because of the following:

- The operator might have to perform manual operations in conjunction with the action.
- The starting of the action might be contingent upon conditions within the environment which must first be checked by the operator.

Figure 2-4 Starting an Operator-Initiated Action



As shown in Figure 2-4, an operator-initiated action is processed as follows:

1. The message is intercepted on the managed node according to the conditions defined.
2. The message is stored locally on the managed node.

3. The operator requests the central management node to show the messages for the managed node.
4. The central management node shows the message on the manage node. A message attribute indicates that the message has a preconfigured operator-initiated action.
5. The operator starts the action.
6. The central management node requests the managed node to start the action.
7. If configured, annotations about the execution of the operator-initiated action are stored on the managed node.
8. The central management node shows the annotations.

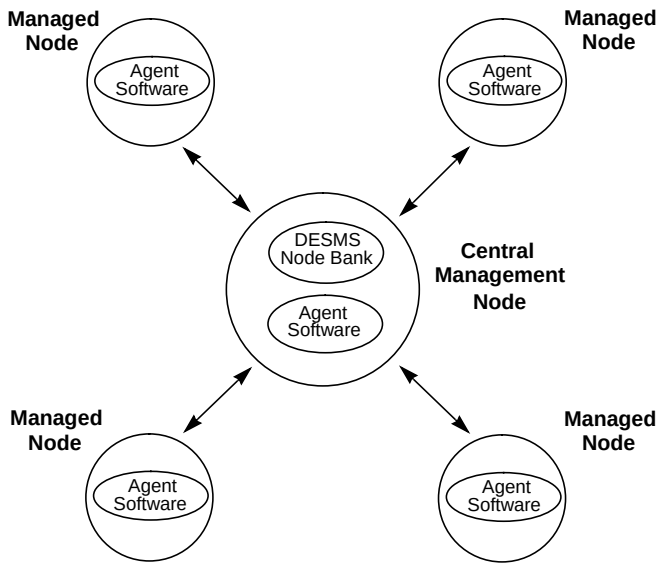
Understanding How DESOP is Structured

Two important elements of DESOP's architecture are:

- the **central management node**, and
- **managed nodes**.

One system is designated as the central management node. By default, the central management node also serves as a managed node. This structure is shown in Figure 2-5.

Figure 2-5 DESOP's Global Architecture



The Central Management Node

The central management node performs the central role of DESOP. It is here that data from the managed nodes is displayed. There is one central management node per DESOP installation, and its basic tasks include:

- displaying data from managed nodes
- storing configuration data about the managed nodes in the node bank

Managed Nodes

The agent software's basic capabilities include:

- Message interception—logfile and DESOP interface messages are intercepted on the managed node.
- Message filtering—messages are compared to conditions and arranged into groups—filters can accept or suppress messages.
- Message storage—messages are retained in a file.
- Action execution—actions are executed locally.
- Threshold monitoring—performance values are monitored in configurable intervals, and messages can be generated when performance varies from limits.

Central Control and Monitoring

Managing status information and resolving problems means that operators must have both control over defined environments, and direct access to systems from a central management station.

Central monitoring of the environment provides real-time and proactive problem solution procedures. DESOP provides a variety of monitoring techniques:

Threshold Monitoring

The DESOP administrator selects critical variables within the environment, and defines acceptable limits called thresholds for each object. These thresholds can be minimum or maximum values.

System-alive Monitoring

DESOP checks that each managed node is operating.

Self Monitoring

DESOP monitors its own operations and verifies that all elements of DESOP are operating correctly.

3 Performing Daily Tasks

In This Chapter

This chapter gives operators an insight into their daily tasks using DESOP, including:

- reviewing their environment
- managing their environment
- examining message attributes
- using the DESMS log file
- using the DESMS trace file
- solving problems and evaluating an action's results
- closing messages

Reviewing Your Environment

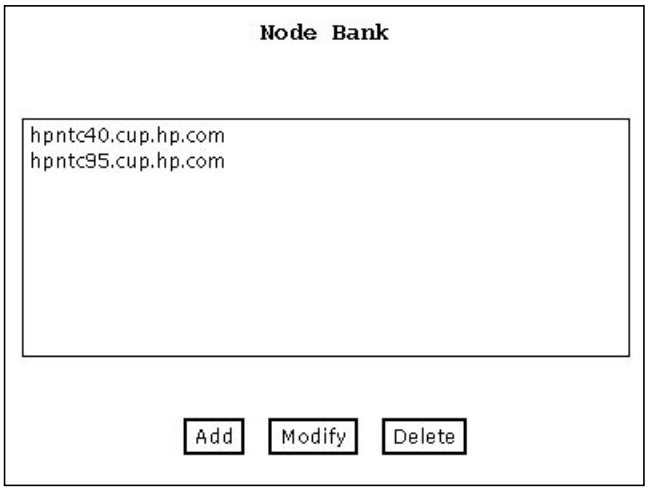
Your working environment comprises the following primary components:

- "Node Bank" window
- "ITO-SE" window

Node Bank

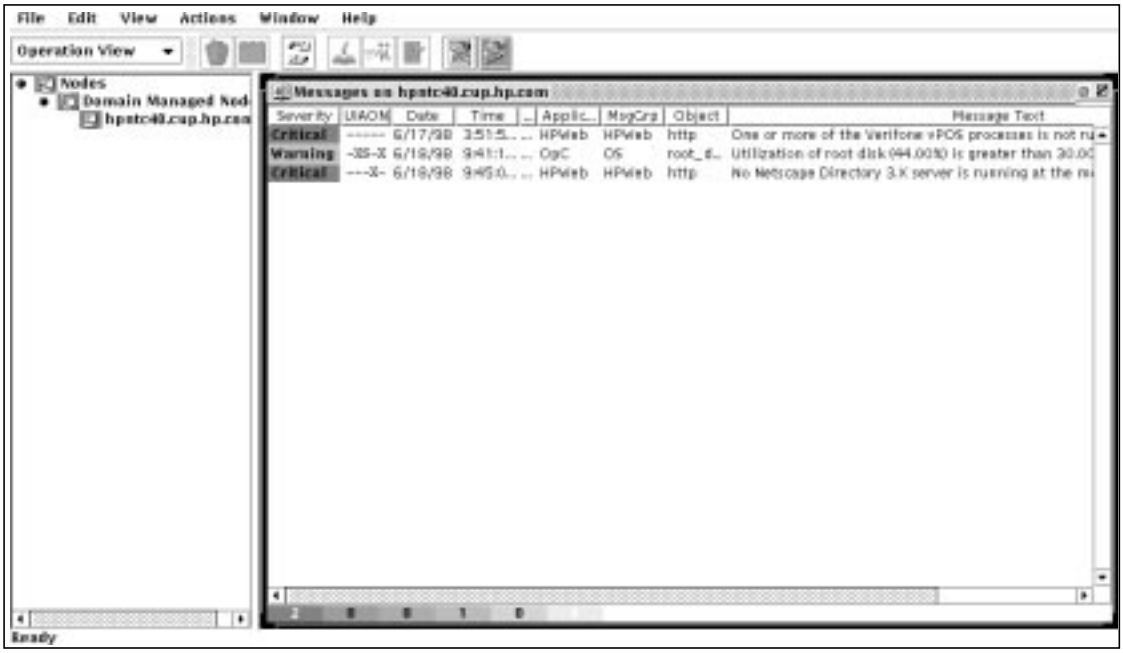
A node icon is a physical representation of a particular operator's managed objects. You can use the window to configure each managed node and the central management node.

Figure 3-1 Managed Nodes Window



ITO-SE

Figure 3-2 ITO-SE Window



You use this window to review the status of managed nodes, manage messages, and guide problem resolution. A managed node hierarchy is displayed with node icons that are colored according to each node's status. Incoming messages are displayed with pre-configured attributes and with status information. You can look at all the details about a single message and initiate an operator-initiated action to resolve the event that triggered a message, or DESOP can perform an automatic action for you. Finally, you can delete messages for which actions have been completed in the "ITO-SE" window.

Managing Your Environment

Your primary daily DESOP tasks are:

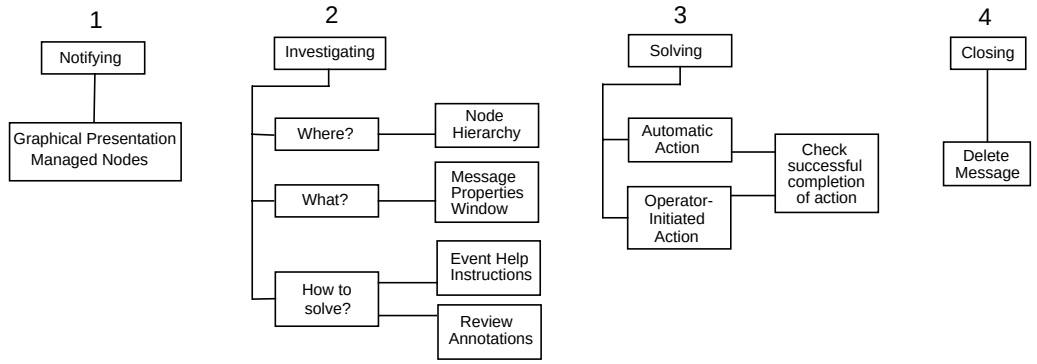
- keeping the environment (systems and applications) operational
- receiving notification about changes in status and about events
- managing messages

With DESOP, you can provide higher service levels and reduce the time you spend doing simple, repetitive tasks. You use messages to observe the activities of your managed nodes. You can detect problems at early stages of development and take corrective actions before problems become critical and impact end users. You select from multiple tools, information sources, and problem-solving techniques to resolve problems. You maintain a complete history database for all problems you have resolved.

Resolving Problems

Problem resolution and message management are closely linked. A message is your key to fully understanding the problem and developing a solution.

Figure 3-3 The Components of Problem Resolution



The major areas of problem resolution are shown in Figure 3-3, and are briefly described here. They are discussed in detail in the following sections of this chapter.

1. **Notifying**: You detect the problem.
2. **Investigating**: You examine the problem, determine where and what has occurred, and develop a plan to solve it. You can take advantage of pre- defined Event help instructions.
3. **Solving**: You correct the problem. Automatic actions don't require your intervention, but you choose when and where to start other actions. After finishing the actions you review the problem—have the actions corrected the problem?
4. **Closing**: You close the problem and delete the message from ITO-SE.

Notifying and Investigating

You use the “ITO-SE” window to review node status and messages, detect problems, and direct problem management activities. This window notifies you about what has happened and where the problems are.

The first source you can use to learn of a problem is the “ITO-SE” window. The window shows you:

- what has happened
- how serious it is

Reviewing Node Status

The “ITO-SE” window displays a hierarchy of managed nodes that shows the status of each managed node. Each node's icon is colored according to the most severe message for the node. Use the node hierarchy to decide if you want to view the messages for a particular node.

Examining Message Attributes

The “ITO-SE” window's key information is contained in the section of the window displaying messages. Each line of the message buffer displays a single message and its attributes. Reading and understanding the attributes is as important as reading the message text. The message attributes tell you about:

- message severity
- message flags
- time created on a managed node
- node name
- application that created the message
- message group
- object

The attributes appear across the Browser Headline. The message displays a value beneath each attribute.

You can select a single message to delete. You can also select a single message to get more detailed information about it (the message number and time received), view any actions configured for the message and the status of the action, and view any message instructions.

You can also delete all of the messages.

Reading the Browser Headline

The following are attributes and descriptions of items that appear in the browser headline:

Browser Headline	**Description**
Messages on *node*	Name of the system on which the message(s) are created.
Severity	The relative importance and status of the message. To comply with telecom standards, DESOP recognizes six severity levels described below:

Severity Level...	**is color coded...**	**and means that...**
Critical	Red	a service-affecting condition has occurred and immediate corrective action is required
Major	Orange	the severity of the problem is relatively high and normal use of the object is likely to be impeded
Minor	Yellow	a problem of relatively low severity has occurred, which should not impede normal use of the object
Warning	Cyan	a potential or impending, service-affecting fault has occurred. Action should be taken to diagnose and correct the problem
Normal	Green	message output is expected: for example, a process is starting or completing, or status information is displayed
Unknown	Blue	the severity level cannot be determined

Message Flags — Indicate the presence of an unmatched message, operator instructions, an automatic action, an operator-initiated action, and annotations.

The following is a description of the flags:

U — Unmatched Message. An unmatched message does not match any of the filters defined for a message source. Filters are sets of conditions which configure DESOP to accept or suppress messages. These messages require your special attention because they can represent problems for which no preconfigured action exists. In general, you should inform the DESOP administrator of unmatched messages so that s/he can improve the corresponding message or suppress conditions.

I — Operator Instructions. Instructions help you resolve the problem. If available, these instructions are displayed in the “Message Properties” and the “Message Instructions” windows.

A — Automatic Action. Indicates that an automatic action has been configured for the message and gives the status of the action. The value of the attribute tells you if the action:

- S was successful
- F has failed
- R is running

O — Operator-Initiated Action. Indicates that an operator-initiated action has been configured for the message and gives the status of the action. You start these actions after reviewing the message. The value of the attribute tells you if an action is:

- X available
- S successful
- F failed
- R running

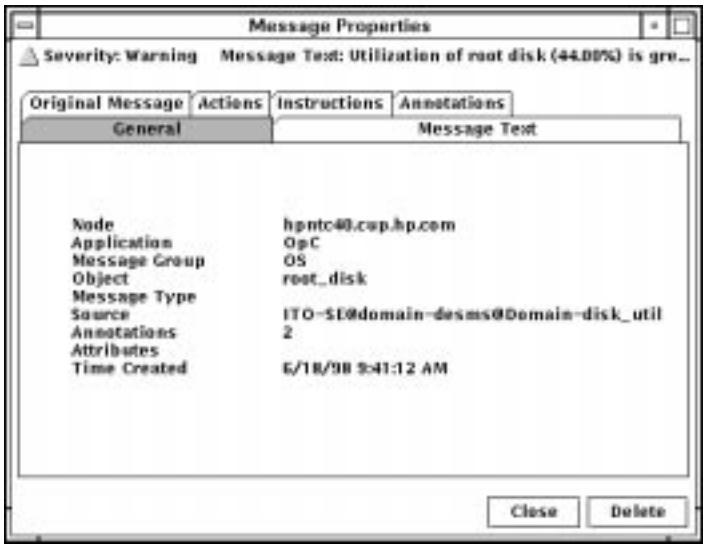
N — Annotations. Indicates if annotations exist for this message.

Date	Date the message was created.
Time	The time of day the message was created.
Application	Name of the application that created the message.
Message Group	Name of the message group to which the message belongs.
Object	Name of the object which was affected by, detected, or caused the problem.
Message Text	The text of the message that was created.

The “Message Properties” window displays one of the following: “General Information,” “Message Text,” “Original Message,” “Actions,” “Instructions,” or “Annotations.” These windows can be reached by selecting a message and using the tool bar, the message pop-up menu, or the Actions Menu.

General Information. This window displays general information about the message such as the name of the system on which the message was created and the name of the application that created the message.

Figure 3-4



Message Text. This window displays an explanation of the message.

Figure 3-5

Original Message. This window displays the actual message.

Figure 3-6

Actions. This window displays the command and status for automatic and operator-initiated actions.

Figure 3-7

`Command` is the command to run.

`Status` is the status of the given command and can be one of five values: started, successful, failed, defined, and none.

Instructions. This window displays any recommended actions to take for the message that was created.

Figure 3-8

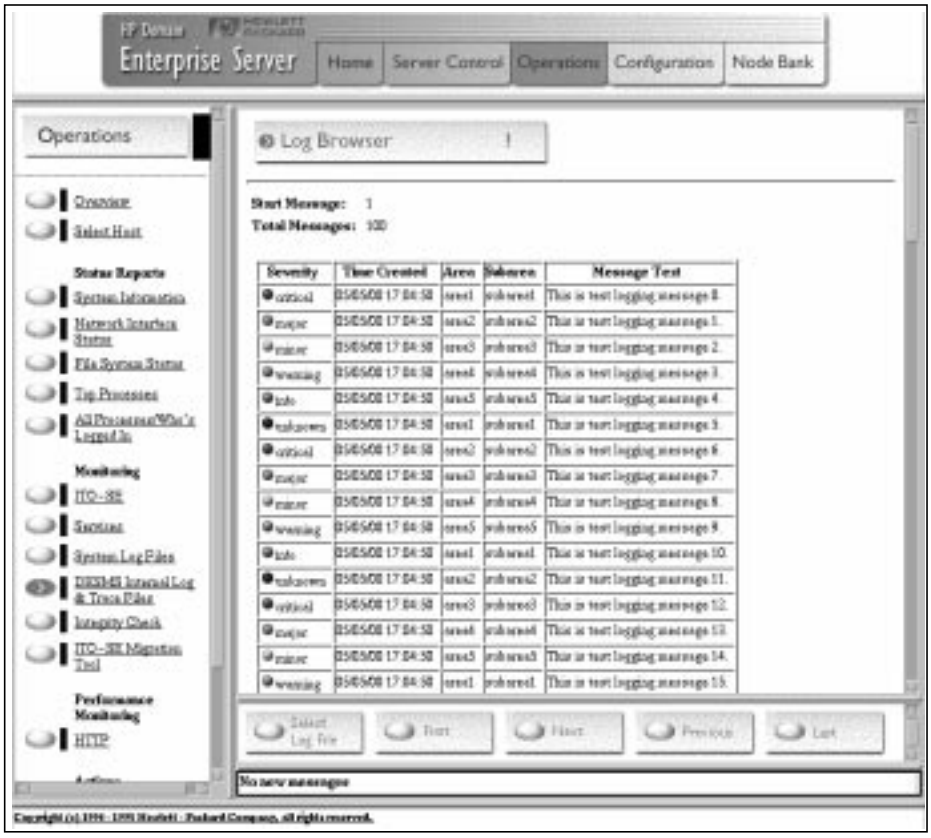
Annotations. This window displays output from automatic or operator-initiated operations.

Figure 3-9

Using the DESMS Log File

Use the DESMS log file to find DESMS internal log messages.

Figure 3-10 DESMS Log File Window



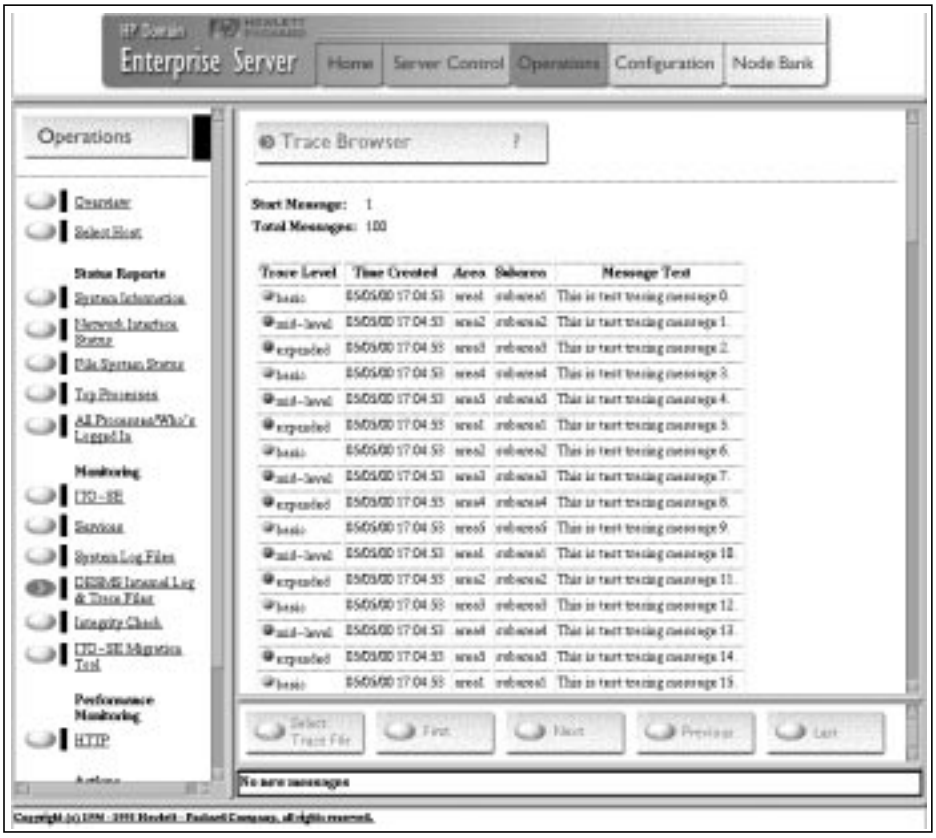
To view another log file, select the “Select Log File” button in the tool bar.

Entries are logged into the `/var/opt/hpwebsuite/hpwebadm/conf/log/desmslog` file by default. You can specify your own log file, but for the file to be viewable by DESMS, it must be in the `/var/opt/hpwebsuite/hpwebadm/conf/log` directory.

Using the DESMS Trace File

Use the DESMS trace file to find DESMS internal trace messages.

Figure 3-11



To view another trace file, select the “Select Trace File” button in the tool bar.

Entries are logged into the `/var/opt/hpwebsuite/hpwebadm/conf/trace/desmstrace` file by default. You can specify your own log file, but for the file to be viewable by DESMS, it must be in the `/var/opt/hpwebsuite/hpwebadm/conf/trace` directory.

Solving Problems

After you have been notified of a problem and have investigated it, the following tools are available to help you solve it:

- automatic actions
- operator-initiated actions
- operator instructions

Evaluating an Action's Results

To maintain a current and accurate overview of the computing environment, you must know the status and results of actions. An action's **status** is the availability and current state of the action, and tells you:

- if an action has been configured for the message
- if the action has been successfully completed

Reviewing action-availability is part of your initial investigation of problems. You review the "Message Properties" window to determine the availability of automatic or operator-initiated actions.

Evaluating action-results is part of solving problems. Actions might not always be successful in resolving a problem. Use the following guidelines to check an action's result:

- Review the message's annotations. If configured to do so, DESOP automatically writes the action's *stdout* and *stderr* as annotations for automatic and operator-initiated actions.

Reviewing Automatic Actions

Automatic actions may be configured for many messages. These actions are then started as soon as the event is detected.

The operator can review a message's automatic action by selecting the "Message Properties" button from the tool bar. See the section "Reading the Browser Headline" on page 38.

After an action has completed, the operator can review the results to assure that the problem has been corrected. If automatic annotations are configured for the message, the operator can review the results of an automatic action by reading the message's annotations. The actions *stdout* and *stderr* are logged as annotations with the message.

Performing Operator-Initiated Actions

Operator-Initiated actions are configured for messages where automatic actions are inappropriate. For example, actions or programs requiring too much CPU should not be started without first evaluating system load factors and requirements. For these types of actions, an operator's intervention and control are necessary.

The operator can review a message's operator-initiated action by selecting the "Message Properties" button from the tool bar. See the section "Reading the Browser Headline" on page 38.

You start the action by clicking on the message and choosing the Perform Actions button. After an action has completed, you review the results to assure that the problem has been corrected. If automatic annotations are configured for the message, you can review the results of an operator-initiated action by reading the message's annotations. The action's *stdout* and *stderr* are logged as annotations with the message.

Performing Operator Instructions

Instructions may be configured for a message, to help you solve a problem. Typically, these might:

- Describe an automatic action. (See the section "Reviewing Automatic Actions" on page 46.)
- Give details of how you should perform an operator-initiated action. (See the section "Performing Operator-Initiated Actions" on page 47.)
- Describe any manual steps required for solving a problem. (For instance, "Start Application X").

You can do this by writing an instruction text to accompany a message.

Closing Messages

After you have completed work on a message, you remove the message from the “ITO-SE” window. To do this, delete the message.

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