HP OpenView Performance Insight

Threshold and Event Generation Module User Guide

Software Version: 5.0

Reporting and Network Solutions 6.0

September 2004

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The support Web site includes:

- Downloadable documentation
- Troubleshooting information
- Patches and updates
- Problem reporting
- Training information
- Support program information

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Overview

The Threshold and Event Generation Module, known commonly as the Thresholds Module, monitors performance data for threshold violations. When the Thresholds Module detects that a threshold has been breached, or that a previous breach has returned to normal, it invokes an action. The default action is to send an SNMP trap.

The Thresholds Module is configurable. You can define threshold policies describing one or more events, and you can enable one or more actions per event. A MIB definition file, included with the Thresholds Module, allows network management systems to interpret the threshold breach and threshold clear traps.

Many of the reporting solutions that install on OVPI include a thresholds sub-package. The thresholds sub-package contains a thresholds policy customized for the solution. If you want to implement thresholding for that particular solution, install the thresholds sub-package and the Thresholds Module. If desired, you may create your own thresholds policy. To do that, use existing files as templates (the Thresholds Module includes template files) or create these files from scratch.

Version History

Version 4.0 of the Thresholds Module was released October 2003 as part of Reporting and Network Solutions (RNS) 4.0. Version 5.0 of the Thresholds Module was released April 2004 as part of RNS 5.0. Version 5.0 includes the following enhancements:

- Supports Oracle as well as Sybase database management software
- Calls a perl script that provides a Java™ interface to the OVPI database

Version 5.0 was released unchanged in August 2004 with RNS 6.0.

Tasks and Traps

The Thresholds Module performs the following tasks:

- Reads policy configuration files
- Creates queries against data in OVPI database tables
- Responds to any exception condition by taking specified actions

- Records the object, the time, and the data values that triggered the exception

Each event is identified by values for Category and Severity. After all threshold exceptions have been identified, the Category and Severity of each exception are used to determine which, if any, of the following actions should occur:

- Send an SNMP trap
- Send SMTP email
- Call a user-defined program

A single event can trigger one or more actions. For example, a single event could trigger a trap, an email, and a program call. The timing of an action depends on the type of action. For example, while traps are sent one at a time, emails are batched together and sent later, after every exception has been processed.

Threshold Examples Package

Installing the optional Threshold Examples package does two things:

- Creates new database tables populated with test data
- Installs configuration files that monitor the new database tables

Since the data in the tables is recycled, the data is always up-to-date. The threshold policies will cause several OVPI threshold SNMP traps to be sent to the local host on a regular basis. This example is intended to illustrate the operation of the Thresholds Module. Installing it is entirely optional.

Sources for Additional Information

For the latest information regarding limitations and known problems affecting the Thresholds Module, see:

Threshold and Event Generation Module 5.0 Release Statement

For information about the threshold sub-package that comes with most report packs, refer to the following user guides:

- *Interface Reporting Report Pack 4.5 User Guide*
- *MPLS VPN Report Pack 3.0 User Guide*
- *Cisco Ping Report Pack 4.0 User Guide*
- *Service Assurance Report Pack 3.0 User Guide*
- *Device Resources Report Pack 3.0 User Guide*
- *System Resources Report Pack 4.0 User Guide*

The following documents may also be of interest to you:

- *Creating and Using Registration Files with HP OpenView NNM*
- *Managing Your Network with HP OpenView Network Node Manager*
- *Performance Insight Administration Guide*

Manuals for OVPI and the reporting solutions that run on OVPI are posted to the following website:

http://www.hp.com/managementsoftware

Select **Technical Support > Product Manuals** to open the Product Manual Search page. Manuals for OVPI are listed under **Performance Insight**. Manuals for report packs, datapipes, and NNM SPIs are listed under **Reporting and Network Solutions**.

The manuals listed under **Reporting and Network Solutions** indicates the month and year of publication. If a user guide is revised and reposted, the date of publication will change even if the software version number does not change. Because updated manuals are posted to this site on a regular basis, you should search this site for updates before using an older PDF that may not be the latest PDF available.

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Package Installation

This chapter covers the following topics:

Upgrading or Removing an Earlier Version

When you insert the RNS CD and select OVPI components for installation, the install script extracts every OVPI package from the CD and copies the results to the Packages directory on your system. When the extraction process finishes, the install script prompts you to launch Performance Insight and start Package Manager.

If you are currently running version 4.0, use the Package Manager to upgrade to version 5.0 by installing the 4.0-to-5.0 upgrade package. If you are currently running any version earlier than 4.0, you cannot upgrade to the latest release. Instead, remove your current version and install version 5.0.

Software Prerequisites

Make sure the following platform software is already installed before installing the Thresholds Module:

- OVPI 5.0
- Any available Service Pack for OVPI 5.0

The Thresholds Module is itself a prerequisite for the various threshold sub-packages that come with most report packs. When you select one of these sub-packages for installation, Package Manager will install the Thresholds Module for you, automatically. However, you also have the option of using the instructions in this chapter to install or upgrade the Thresholds Module *before* you install any threshold sub-package.

Installing Thresholds Module 5.0

Perform the following tasks to install Thresholds Module 5.0:

- Task 1: Stop OVPI Timer and extract OVPI packages from the RNS 6.0 CD
- Task 2: Use Package Manager to install Thresholds Module 5.0
- Task 3: Restart OVPI Timer

Task 1: Extract OVPI packages from the RNS 6.0 CD

1. Log in to the system. On UNIX® systems, log in as root.
2. Stop OVPI Timer and wait for processes to terminate.

   On Windows, do the following:

   a. Select **Control Panel > Administrative Tools > Services**

   b. Select OVPI Timer from the list of services.

   c. From the Action menu, select **Stop**.

   On UNIX, as root, do one of the following:

   — HP-UX: **`sh /sbin/ovpi_timer stop`**

   — Sun: **`sh /etc/init.d/ovpi_timer stop`**
3. Insert the RNS 6.0 CD.

   Windows: The package extraction interface opens automatically.

   UNIX:

   a. Mount the CD (if the CD does not mount automatically).

   b. Navigate to the top level directory on the CD.

   c. Run **`./setup`**
4. Type **1** in the choice field and press **Enter**. The install script displays a percentage complete bar. When the copy is complete, the install script starts Package Manager. The Package Manager Welcome window opens.

Task 2: Install Thresholds Module 5.0

1. Click **Next.** The Package Location window opens.
2. Click **Install**; approve the default installation directory or select a different directory if necessary.
3. Click **Next**. The Report Deployment window opens. Accept the option to Deploy Reports.

   

   The forms that come with the Thresholds Module will not deploy unless you accept the Deploy Reports option.
4. Type your username and password for the OVPI Application Server.
5. Click **Next**. The Package Selection window opens.
6. Click the check boxes next to the following items:

- *Thresholds*
- *ThresholdExample* (optional)
- *ThresholdsRP* (optional)

7 Click **Next**. The Type Discovery window opens; disable the Type Discovery option.

8 Click **Next**. The Selection Summary window opens.

9 Click **Install**. The Installation Progress window opens. When installation is complete, a package installation complete message appears.

10 Click **Done**.

Task 3: Restart OVPI Timer.

On Windows, do the following:

a Select **Control Panel > Administrative Tools > Services**

b Select OVPI Timer from the list of services.

c From the Action menu, select **Start**.

On UNIX, as root, do one of the following:

— HP-UX: **`sh /sbin/ovpi_timer start`**

— Sun: **`sh /etc/init.d/ovpi_timer start`**

Testing the Thresholds Script

To verify that the Thresholds Modules and all the prerequisites have been installed correctly, run one of the following commands.

UNIX:

```
$DPIPE_HOME/bin/perl $DPIPE_HOME/scripts/thresholds.pl -h
```

Windows:

```
%DPIPE_HOME%\bin\perl %DPIPE_HOME%\scripts\thresholds.pl -h
```

The system returns a usage-is statement similar to the following:

```
D:/OVPI/scripts/thresholds.pl -f <rulesfile> [-d]
```

where:

`<rulesfiles>` is an XML threshold rules definition file

`-d` enables the debug mode

The default action file is `{DPIPE_HOME}/lib/threshAct.xml`

If you do not see this statement, see Troubleshooting on page 41.

Uninstalling Thresholds Module 5.0

If you uninstall the Thresholds Module, the threshold sub-packages that depend on the Thresholds Module (for example, MPLS_VPN_Thresholds) will be selected and uninstalled automatically. Follow these steps to remove Thresholds Module 5.0:

1. Log in to the system. On UNIX systems, log in as root.
2. Stop OVPI Timer and wait for processes to terminate.

   On Windows, do the following:

   a. Select **Control Panel > Administrative Tools > Services**
   b. Select OVPI Timer from the list of services.
   c. From the Action menu, select **Stop**.

   On UNIX, as root, do one of the following:

   — HP-UX: **`sh /sbin/ovpi_timer stop`**
   — Sun: **`sh /etc/init.d/ovpi_timer stop`**
3. Start Package Manager. The Package Manager welcome window opens.
4. Click **Next**. The Package Location window opens.
5. Click **Uninstall.**
6. Click **Next**. The Report Undeployment window opens. Keep the defaults.
7. Click **Next**. The Package Selection window opens.
8. Click the check box next to the Thresholds Module.

   Any sub-package that depends on the Thresholds Module (for example, MPLS_VPN_Thresholds) will be selected automatically.
9. Click **Next**. The Selection Summary window opens.
10. Click **Uninstall**. The Progress window opens. When removal is complete, a package removal complete message appears.
11. Click **Done**.
12. Restart OVPI Timer.

    On Windows, do the following:

    a. Select **Control Panel > Administrative Tools > Services**
    b. Select OVPI Timer from the list of services.
    c. From the Action menu, select **Start**.

    On UNIX, as root, do one of the following:

    — HP-UX: **`sh /sbin/ovpi_timer start`**
    — Sun: **`sh /etc/init.d/ovpi_timer start`**

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Defining and Maintaining Actions

This chapter covers the following topics:

Threshold Sub-Packages

Most OVPI report packs are distributed with a thresholds sub-package. The thresholds sub-package contains a customized threshold policy that defines the conditions that cause exceptions to be reported. If you want to modify threshold values, do not modify the thresholds sub-package. Instead, modify threshold values by using the threshold policy that comes with the thresholds sub-package.

If you want to set new threshold limits for some or all of the objects you are monitoring, use one of the forms or the provisioning interface that comes with the report pack. The forms, which are described in this chapter, are easier and faster than the provisioning interface. If you use the provisioning interface, you must export existing property data from OVPI, edit this file by inserting new threshold values, and then re-import the file into OVPI.

Using Forms to Maintain Action Definitions

Action definitions are stored in the OVPI database. You can use OVPI forms to create and maintain action definitions. Access forms from the OVPI Management Console in the Objects section. Forms contain detailed instructions for their use.

All actions have Category and Severity values associated with them. These may be wildcards (*), which match any Category or any Severity. These values are used to associate actions with threshold breaches, which must have a Category and Severity associated with them.

Category Value

The Category value is the name of the event category that will cause this action to occur. To match all categories, use a wildcard by entering an asterisk (*). Category is an arbitrary string value and can be set to any single word value *without* embedded spaces. Using special characters such as punctuation marks, quotes or hash symbols is not recommended since these characters may have special meaning for third party systems.

Severity Value

The Severity value reflects the severity of an event that will cause this action to occur. To match all severities, use a wildcard by entering an asterisk (*). Severity is an arbitrary string value and can be set to any non-null single word value *without* embedded spaces. Using special characters such as punctuation marks, quotes, or hash symbols is not recommended since these characters may have a special meaning for third party systems. Using values that match the severity levels used by other systems is recommended. For example, if you are sending traps to a network management system that assigns traps to severities CRITICAL, HIGH, MEDIUM, and LOW, use these values.

Default Actions

Default actions are those that will occur regardless of the Category or Severity of the threshold breach that has occurred; that is, they will occur for all exceptions. Default actions have wildcards (*) for both the Category and Severity fields.

A default action is inserted into the database during package installation. The default action is to send an SNMP trap to port 162 on the local system using a community string set to “public”. If you want to send traps to a different destination, use a nonstandard SNMP port, or use a different community string, you must edit the SNMP action definitions. Do this by accessing the Update SNMP Trap Action Definition form (see Updating SNMP Trap Actions on page 19) and using it to change the values for server, port, or community.

You may choose to have additional default actions. For example, you can create a user script default action definition by typing the wildcard symbol (*) in the Category and Severity fields on the Create User Script Action Definition form (see Creating User Script Actions on page 25). Then you will have two default actions: an SNMP trap action and user script action.

Creating and Modifying Action Definitions

You can define multiple actions. For example, you may send traps to more than one system, or you may send both email and traps for the same exception. The following are the types of actions you can define:

- SNMP Trap
- SMTP Mail
- User Script

After you create an action definition, you can modify it using the Update SNMP Trap Action Definition form.

Disabling Actions

You can disable actions, but they will remain in the database in case you want to enable them in the future. For instructions, see Disabling an Action on page 29.

Supported Actions

Three actions are supported. Each action requires a set of parameters.

Action 1: SNMP-TRAP

Parameters

- Server
  - The name or address of a server to send traps to. If an address is used it must be resolvable to an IP address.
- Port
  - A numeric port number.
- Community
  - A community string.

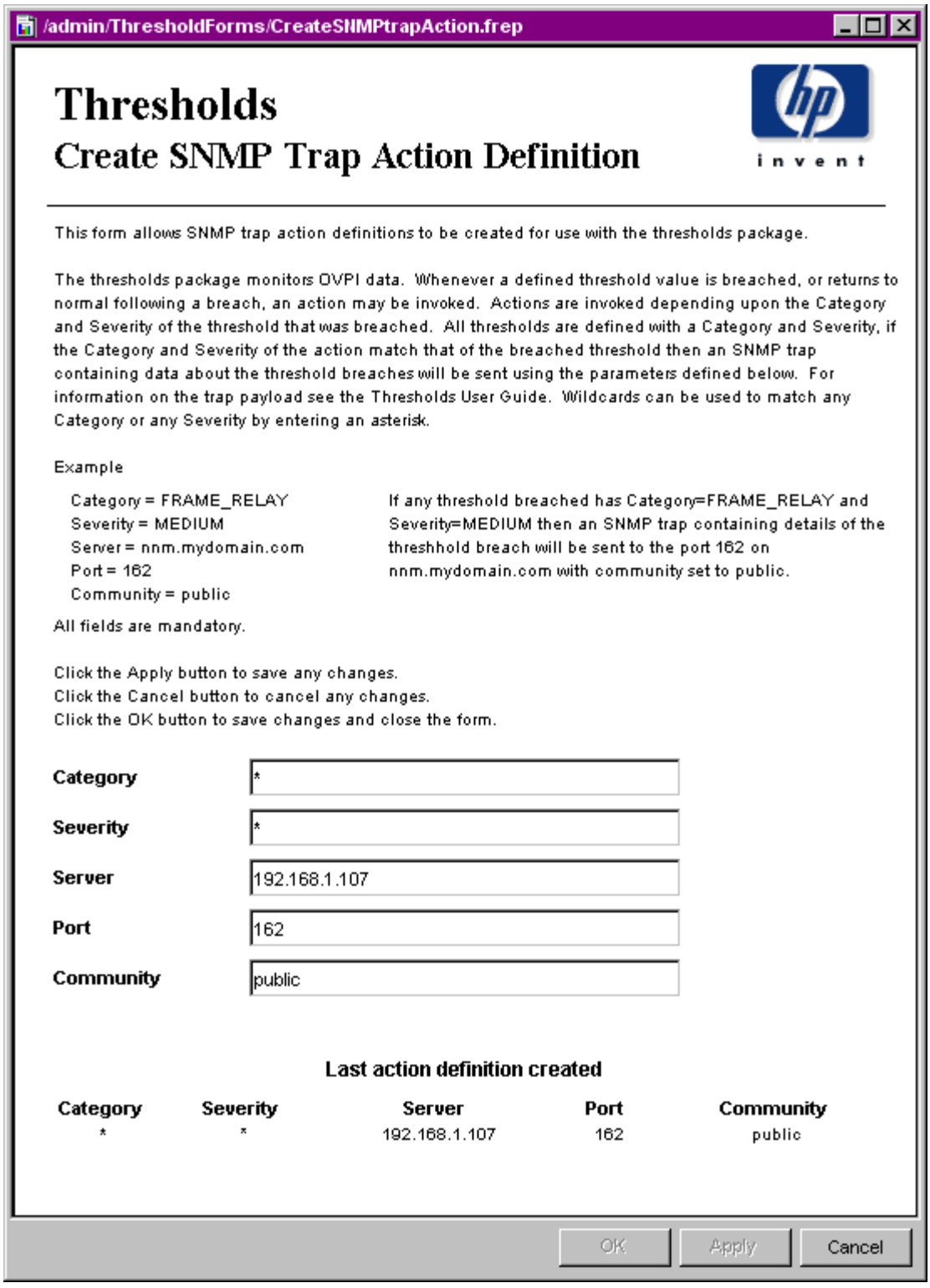
An SNMP trap is sent to the specified server and port using the specified community string.

The ovpiThresholdBreach trap is sent when a threshold condition is initially breached. The ovpiThresholdClear trap is sent when the condition returns to normal. Details about the exception are stored in the trap variables. The package includes a MIB that defines ovpiThresholdBreach and ovpiThresholdClear traps. For details, see OVPI Exception MIB on page 45.

Creating SNMP Trap Actions

To create an SNMP trap action, use the Create SNMP Trap Action Definition form. Follow these steps to launch the form:

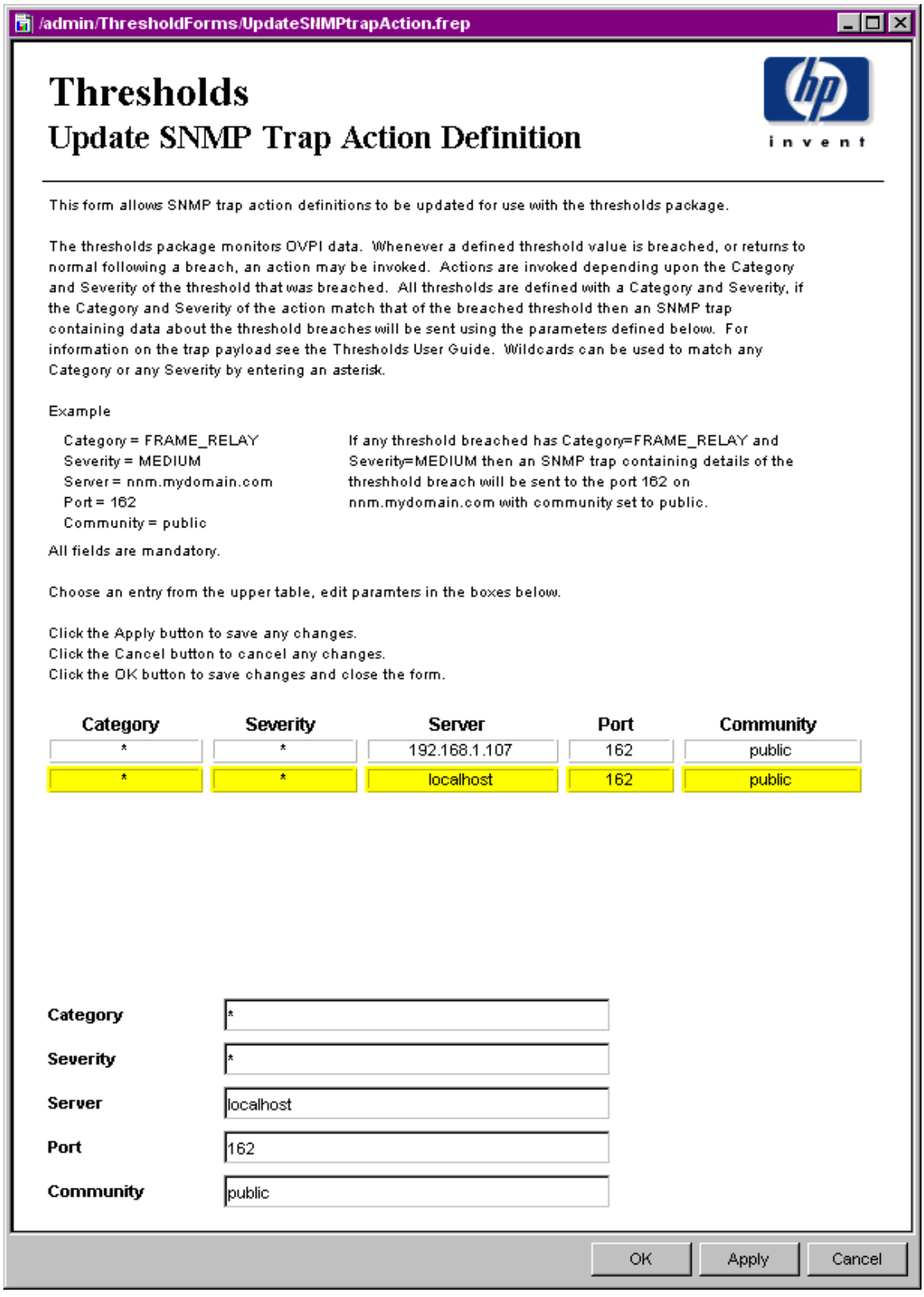
1. In the Management Console, click the **Objects** icon.
2. Select **File > New**.
3. Select **Create SNMP Trap Action** and click **Create**.
4. Follow the instructions on the form.
5. When you finish, click **OK**.


/admin/ThresholdForms/CreateSNMPtrapAction.frep
Thresholds
Create SNMP Trap Action Definition
invent
This form allows SNMP trap action definitions to be created for use with the thresholds package.
The thresholds package monitors OVPI data. Whenever a defined threshold value is breached, or returns to normal following a breach, an action may be invoked. Actions are invoked depending upon the Category and Severity of the threshold that was breached. All thresholds are defined with a Category and Severity, if the Category and Severity of the action match that of the breached threshold then an SNMP trap containing data about the threshold breaches will be sent using the parameters defined below. For information on the trap payload see the Thresholds User Guide. Wildcards can be used to match any Category or any Severity by entering an asterisk.
Example
Category = FRAME_RELAY
Severity = MEDIUM
Server = nnm.mydomain.com
Port = 162
Community = public
If any threshold breached has Category=FRAME_RELAY and Severity=MEDIUM then an SNMP trap containing details of the threshhold breach will be sent to the port 162 on nnm.mydomain.com with community set to public.
All fields are mandatory.
Click the Apply button to save any changes.
Click the Cancel button to cancel any changes.
Click the OK button to save changes and close the form.
Category
*
Severity
*
Server
192.168.1.107
Port
162
Community
public
Last action definition created
Category
Severity
Server
Port
Community
*
*
192.168.1.107
162
public
OK
Apply
Cancel

Updating SNMP Trap Actions

To modify an existing SNMP trap action, use the Update SNMP Trap Action Definition form. Follow these steps to launch the form:

1. In the Management Console, click the **Objects** icon.
2. Select an object so that the General Tasks pane is updated.
3. In the list of forms under General Tasks, double-click **Update SNMP Trap Action**. The form opens.
4. Click the desired action definition from the list of actions near the center of the form. The boxes in the bottom section of the form display the action definition parameters.
5. Modify the desired parameters.
6. When you finish making changes, click **OK**.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The thresholds package monitors OVPI data. Whenever a defined threshold value is breached, or returns to normal following a breach, an action may be invoked. Actions are invoked depending upon the Category and Severity of the threshold that was breached. All thresholds are defined with a Category and Severity, if the Category and Severity of the action match that of the breached threshold then an SNMP trap containing data about the threshold breaches will be sent using the parameters defined below. For information on the trap payload see the Thresholds User Guide. Wildcards can be used to match any Category or any Severity by entering an asterisk.
Example
Category = FRAME_RELAY
Severity = MEDIUM
Server = nnm.mydomain.com
Port = 162
Community = public
If any threshold breached has Category=FRAME_RELAY and Severity=MEDIUM then an SNMP trap containing details of the threshhold breach will be sent to the port 162 on nnm.mydomain.com with community set to public.
All fields are mandatory.
Choose an entry from the upper table, edit paramters in the boxes below.
Click the Apply button to save any changes.
Click the Cancel button to cancel any changes.
Click the OK button to save changes and close the form.
Category
Severity
Server
Port
Community
*
*
192.168.1.107
162
public
*
*
localhost
162
public
Category
*
Severity
*
Server
localhost
Port
162
Community
public
OK
Apply
Cancel

Action 2: SMTP-MAIL

Parameters

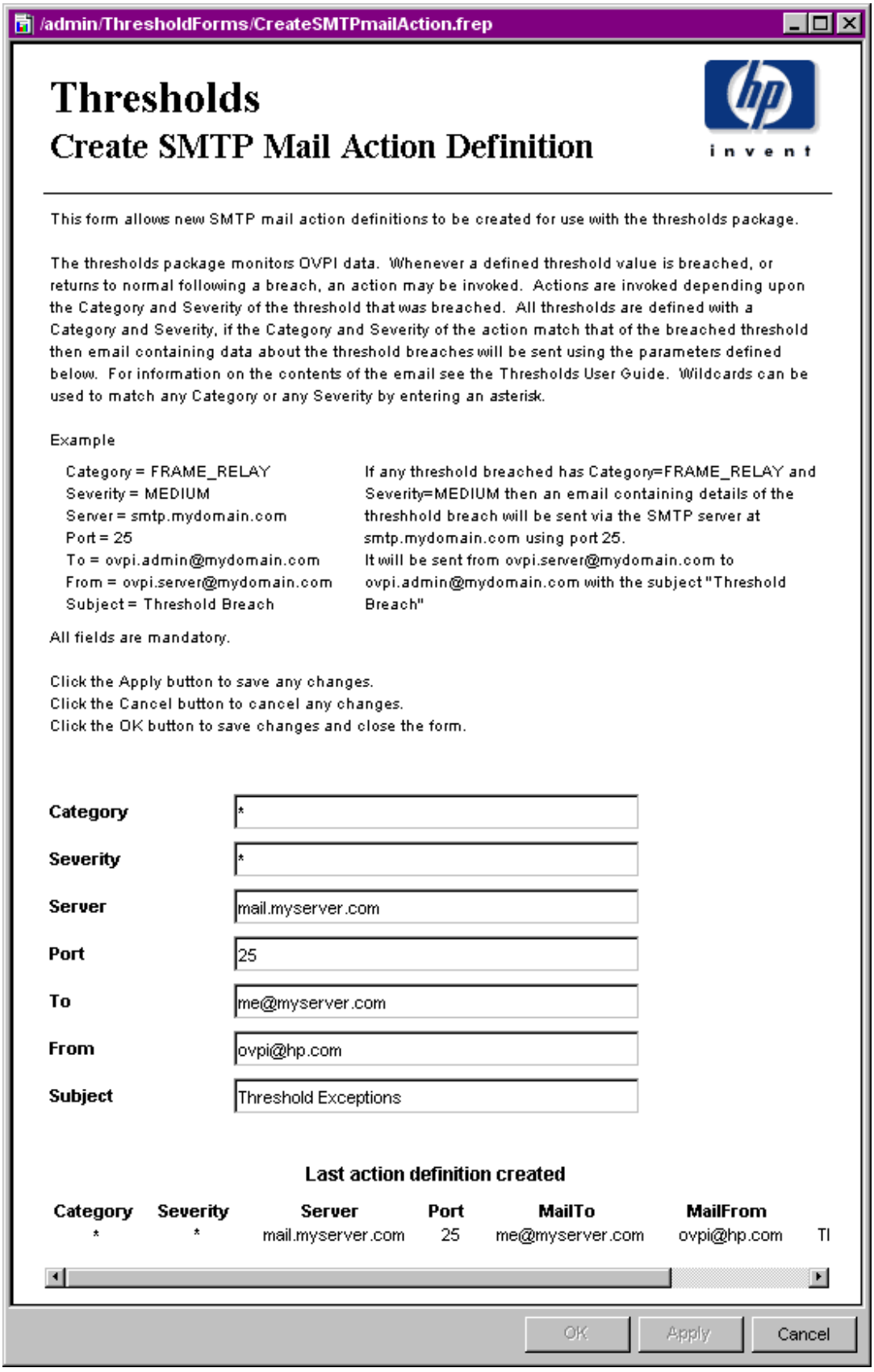
- Server
  - The name or address of an SMTP server which can be used to send email. If an address is used it must be resolvable to an IP address
- Port
  - A numeric port number. The default port for SMTP is 25 but you must check what is used by your server.
- To
  - The address to send email to. This must be a valid email address as defined by your email server, most insist on an internet style *name@domain.com* format.
  - Multiple addresses are not supported, use multiple action definitions to achieve this functionality.
  - Embedded spaces are not permitted in email addresses and may cause messages to fail.
- From
  - The address of the email sender. This must be a valid email address as defined by your email server, most insist on an internet style *name@domain.com* format.
  - Embedded spaces are not permitted in email addresses and may cause messages to fail.
- Subject
  - The subject line for the email which can be include an arbitrary string (including spaces) up to 64 characters long.

An email is sent using the specified SMTP server details. No authentication is used, because the assumption is that the SMTP server will be set up to allow unauthenticated mail from OVPI. The email contains a copy of the exception variables in a CSV-like format. Multiple exceptions will be bundled in a single email for each address.

Creating SMTP Mail Actions

To create an SMTP mail action, use the Create SMTP Mail Action Definition form. Follow these steps to launch the form:

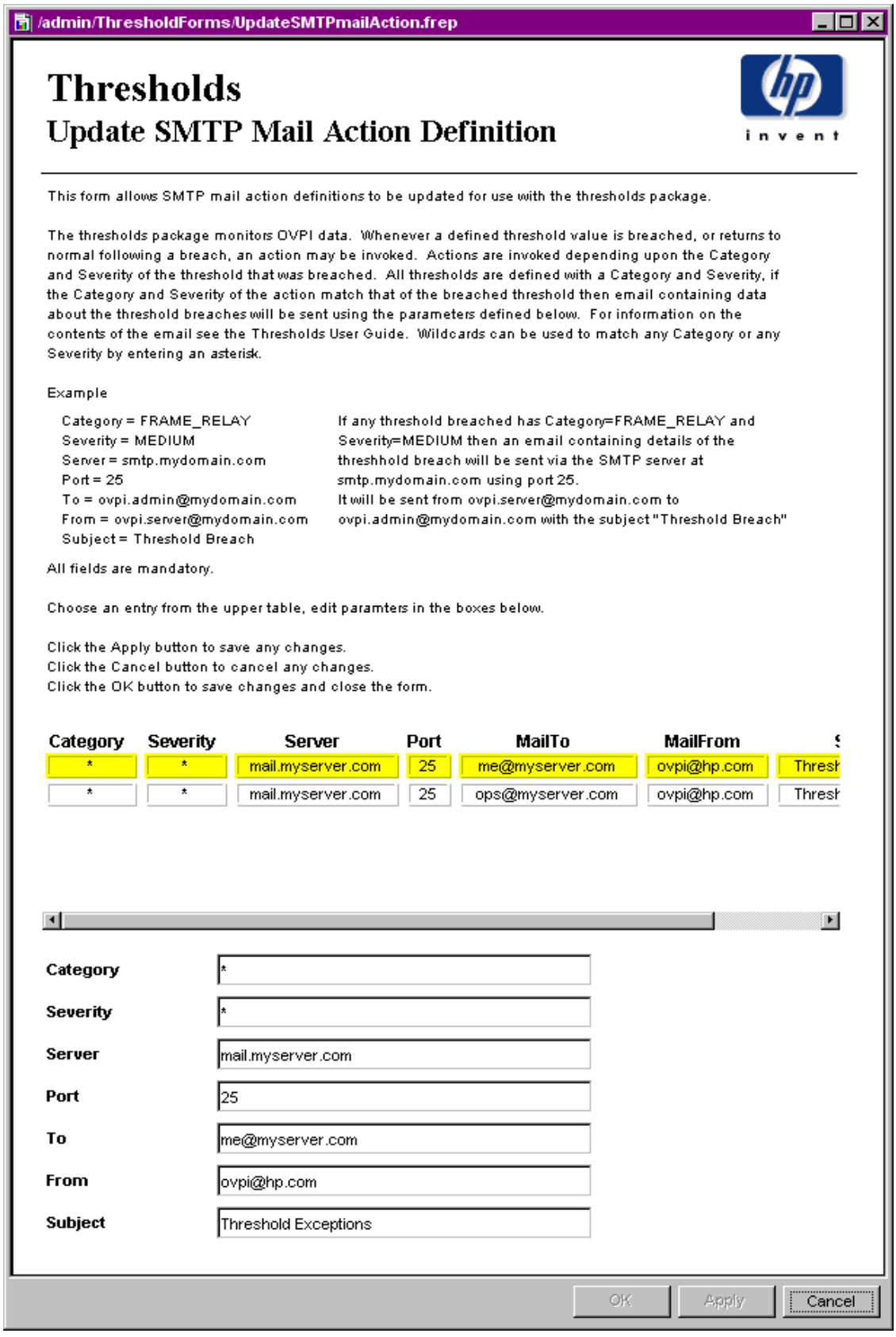
1. In the Management Console, click the **Objects** icon.
2. Select **File > New**.
3. Select **Create SMTP Mail Action** and click **Create**.
4. Follow the instructions on the form.
5. When you finish, click **OK**.


/admin/ThresholdForms/CreateSMTPmailAction.frep
Thresholds
Create SMTP Mail Action Definition
invent
This form allows new SMTP mail action definitions to be created for use with the thresholds package.
The thresholds package monitors OVPI data. Whenever a defined threshold value is breached, or returns to normal following a breach, an action may be invoked. Actions are invoked depending upon the Category and Severity of the threshold that was breached. All thresholds are defined with a Category and Severity, if the Category and Severity of the action match that of the breached threshold then email containing data about the threshold breaches will be sent using the parameters defined below. For information on the contents of the email see the Thresholds User Guide. Wildcards can be used to match any Category or any Severity by entering an asterisk.
Example
Category = FRAME_RELAY
Severity = MEDIUM
Server = smtp.mydomain.com
Port = 25
To = ovpi.admin@mydomain.com
From = ovpi.server@mydomain.com
Subject = Threshold Breach
If any threshold breached has Category=FRAME_RELAY and Severity=MEDIUM then an email containing details of the threshhold breach will be sent via the SMTP server at smtp.mydomain.com using port 25. It will be sent from ovpi.server@mydomain.com to ovpi.admin@mydomain.com with the subject "Threshold Breach"
All fields are mandatory.
Click the Apply button to save any changes.
Click the Cancel button to cancel any changes.
Click the OK button to save changes and close the form.
Category
*
Severity
*
Server
mail.myserver.com
Port
25
To
me@myserver.com
From
ovpi@hp.com
Subject
Threshold Exceptions
Last action definition created
Category
Severity
Server
Port
MailTo
MailFrom
*
*
mail.myserver.com
25
me@myserver.com
ovpi@hp.com
TI
OK
Apply
Cancel

Updating SMTP Mail Actions

To modify an existing SMTP mail action, use the Update SMTP Mail Action Definition form. Follow these steps to launch the form:

1. In the Management Console, click the **Objects** icon.
2. Select an object so that the General Tasks pane is updated.
3. In the list of General Tasks, double-click **Update SMTP Mail Action**. The form opens.
4. Click the desired action definition from the list of actions near the center of the form. The boxes in the bottom section of the form display the action definition parameters.
5. Modify the desired parameters.
6. When you finish making changes, click **OK**.


/admin/ThresholdForms/UpdateSMTPmailAction.frep
Thresholds
Update SMTP Mail Action Definition
invent
This form allows SMTP mail action definitions to be updated for use with the thresholds package.
The thresholds package monitors OVPI data. Whenever a defined threshold value is breached, or returns to normal following a breach, an action may be invoked. Actions are invoked depending upon the Category and Severity of the threshold that was breached. All thresholds are defined with a Category and Severity, if the Category and Severity of the action match that of the breached threshold then email containing data about the threshold breaches will be sent using the parameters defined below. For information on the contents of the email see the Thresholds User Guide. Wildcards can be used to match any Category or any Severity by entering an asterisk.
Example
Category = FRAME_RELAY
Severity = MEDIUM
Server = smtp.mydomain.com
Port = 25
To = ovpi.admin@mydomain.com
From = ovpi.server@mydomain.com
Subject = Threshold Breach
If any threshold breached has Category=FRAME_RELAY and Severity=MEDIUM then an email containing details of the threshhold breach will be sent via the SMTP server at smtp.mydomain.com using port 25. It will be sent from ovpi.server@mydomain.com to ovpi.admin@mydomain.com with the subject "Threshold Breach"
All fields are mandatory.
Choose an entry from the upper table, edit paramters in the boxes below.
Click the Apply button to save any changes.
Click the Cancel button to cancel any changes.
Click the OK button to save changes and close the form.
Category
Severity
Server
Port
MailTo
MailFrom
mail.myserver.com
me@myserver.com
ovpi@hp.com
ops@myserver.com
Category
Severity
Server
Port
To
From
Subject
Threshold Exceptions
OK
Apply
Cancel

Action 3: USER-SCRIPT

Parameters

A CSV file is created for each exception type (combination of Category and Severity). The specified program is then called once for each file created and the filename is passed as a parameter.

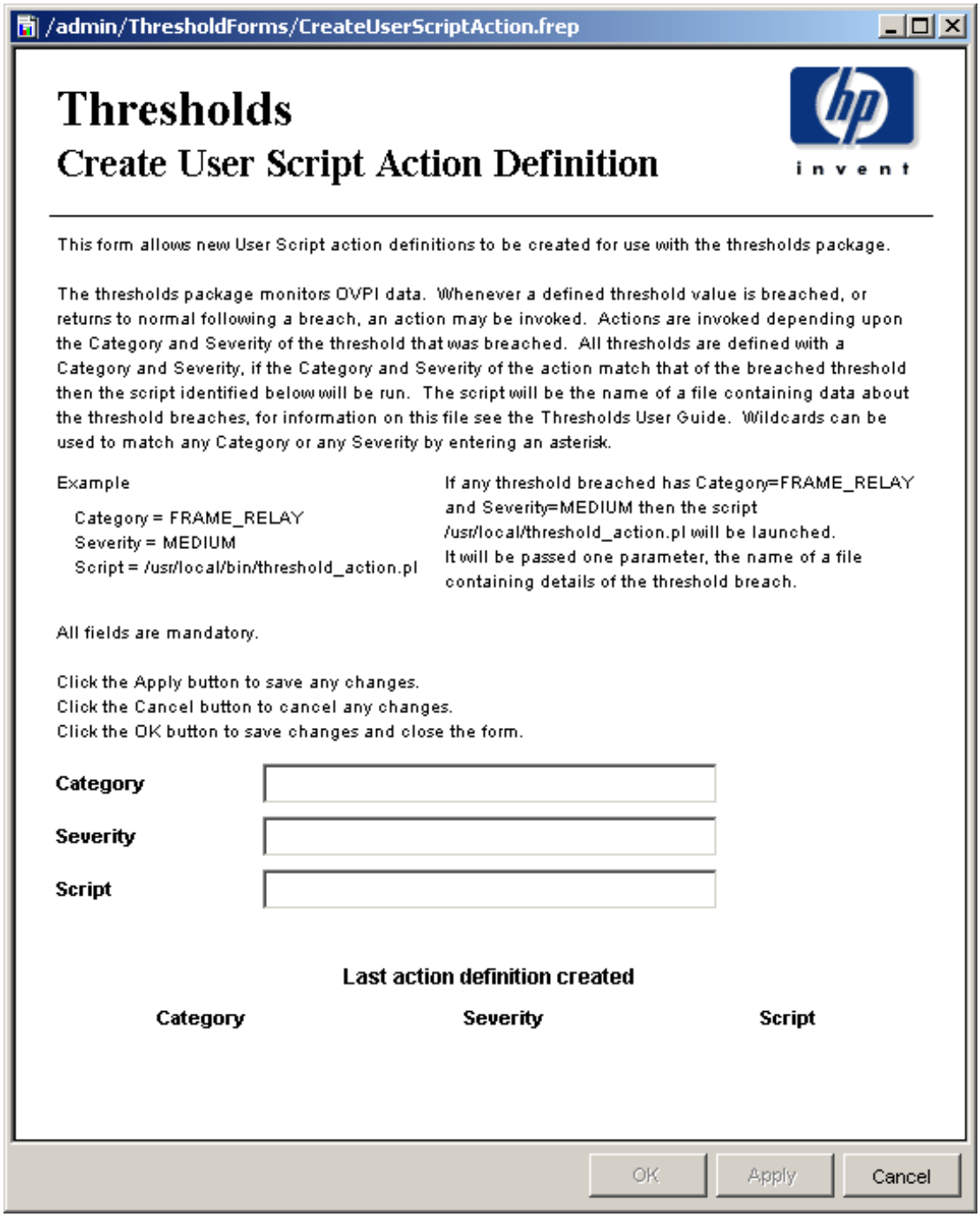
The user script program is called using the command line supplied. If the program is not on the user's path, an appropriate path name should be included. In addition, the user must have suitable permissions to run the program. The program is responsible for managing the files created; the thresholding package does not archive or delete them.

The program is launched independent of the thresholding package and may outlive the instance that invokes it. Be careful when calling processes that require user intervention. If a backlog of processes develops, OVPI may slow down or even crash. For this reason, it is good practice to call processes that run to completion automatically.

Creating User Script Actions

To create a user script action, use the Create User Script Action Definition form. Follow these steps to launch the form:

1. In the Management Console, click the **Objects** icon.
2. Select **File > New**.
3. Select **Create User Script Action Definition** and click **Create**.
4. Follow the instructions on the form.
5. When you finish, click **OK**.



Updating User Script Actions

To modify an existing user script action, use the Update User Script Action Definition form. Follow these steps to launch the form:

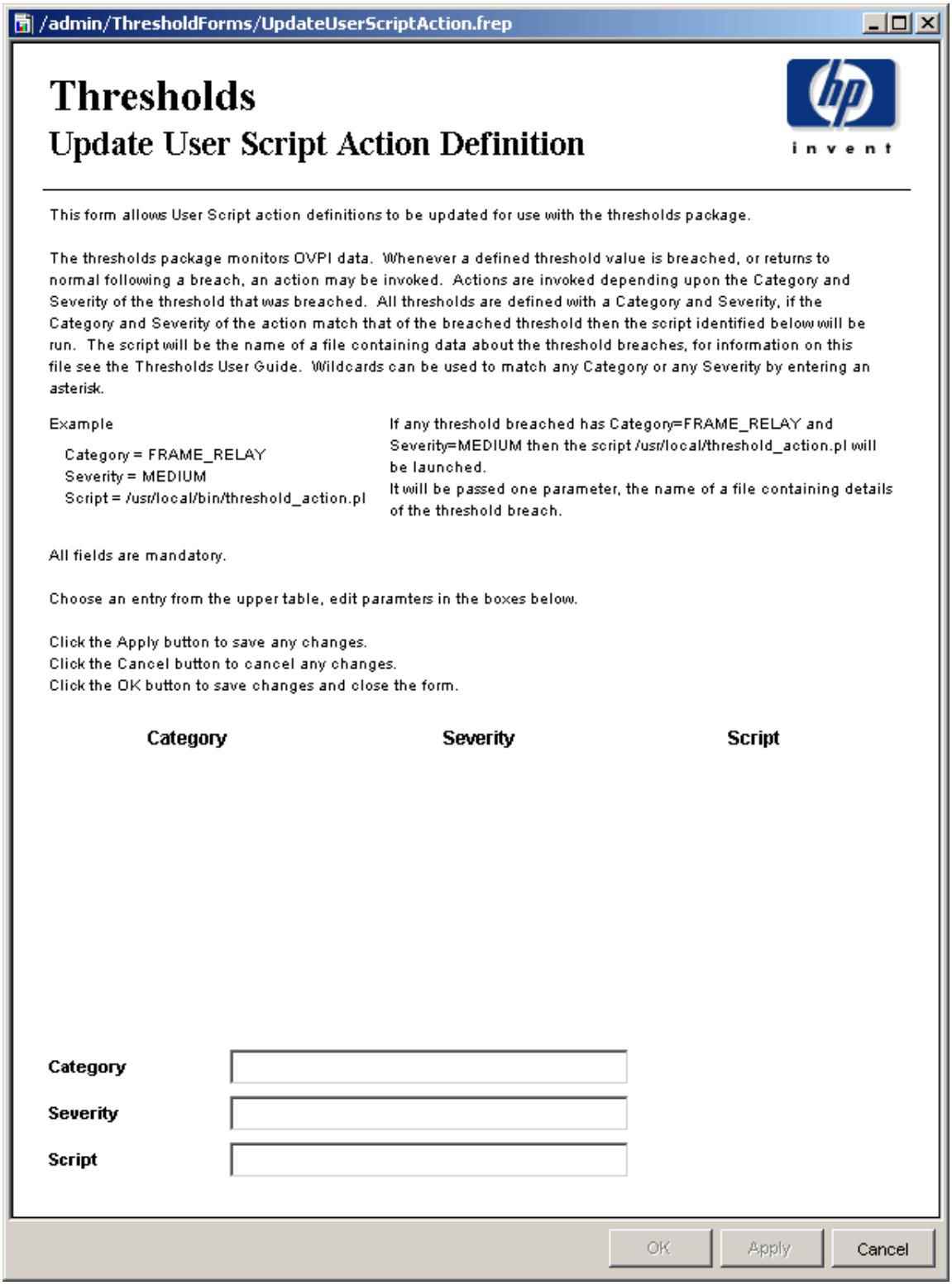
1. In the Management Console, click the **Objects** icon.
2. Select an object so that the General Tasks pane is updated.

3 In the list of General Tasks, double-click **Update User Script Action Definition**. The form opens.

4 Click the desired action definition from the list of actions near the center of the form. The boxes in the bottom section of the form display the action definition parameters.

5 Modify the desired parameters.

6 When you finish making changes, click **OK**.


/admin/ThresholdForms/UpdateUserScriptAction.frep
Thresholds
Update User Script Action Definition
invent
This form allows User Script action definitions to be updated for use with the thresholds package.
The thresholds package monitors OVPI data. Whenever a defined threshold value is breached, or returns to normal following a breach, an action may be invoked. Actions are invoked depending upon the Category and Severity of the threshold that was breached. All thresholds are defined with a Category and Severity, if the Category and Severity of the action match that of the breached threshold then the script identified below will be run. The script will be the name of a file containing data about the threshold breaches, for information on this file see the Thresholds User Guide. Wildcards can be used to match any Category or any Severity by entering an asterisk.
Example
Category = FRAME_RELAY
Severity = MEDIUM
Script = /usr/local/bin/threshold_action.pl
If any threshold breached has Category=FRAME_RELAY and Severity=MEDIUM then the script /usr/local/threshold_action.pl will be launched.
It will be passed one parameter, the name of a file containing details of the threshold breach.
All fields are mandatory.
Choose an entry from the upper table, edit paramters in the boxes below.
Click the Apply button to save any changes.
Click the Cancel button to cancel any changes.
Click the OK button to save changes and close the form.
Category
Severity
Script
Category
Severity
Script
OK
Apply
Cancel

Disabling an Action

You can disable actions, but they will remain in the database in case you want to enable them in the future. Do the following to disable an action:

1. In the Management Console, click the **Objects** icon.
2. Select an object so that the General Tasks pane is updated.
3. In the list of General Tasks, double-click the desired Update Action Definition form. The form opens.
4. Click the desired action definition from the list of actions near the center of the form. The boxes in the bottom section of the form display the action definition parameters.
5. Change Category and/or Severity to a value that will not occur (for example, “NOT_IN_USE” or “RESERVED”) to ensure that the action will not take place.
6. Click **OK**.

4

Advanced Configuration

To configure the more advanced features of the Thresholds Module, it helps to be familiar with the components of the threshold sub-package. A threshold sub-package contains:

- A procedure file that calls the Threshold Module with appropriate configuration files
- trendtimer.sched file entries that control timing of threshold checking
- A threshold policy definition

Threshold Procedure File

A threshold procedure file is an OVPI procedure (`.pro` file) and typically consists of a single call to the Thresholds Module within a single block. A single procedure file could also be used to check multiple thresholds across multiple tables by simply inserting multiple calls to the Thresholds Module, either in the same block or another block. For more information about OVPI procedure files, refer to the *Performance Insight Reference Guide*.

A call to the Thresholds Module within a procedure file looks like this:

```
begin: checkThreshold
{DPIPE_HOME}/bin/perl {DPIPE_HOME}/scripts/thresholds.pl -f policy.xml
end: checkThreshold
```

`policy.xml` should be replaced with a full path to the desired configuration file.

Scheduling Threshold Checking

To check thresholds on a regular basis, you should set up an entry in the `trendtimer.sched` file to call an appropriate procedure file. You should check thresholds at a frequency that is less than or equal to the frequency at which data is inserted into the table you are checking. For example, if data is collected and inserted into the table every 15 minutes, you should not check thresholds more often than every 15 minutes. For more information about OVPI `trendtimer.sched` entries, refer to the *Performance Insight Reference Guide*.

Here is an example of a `trendtimer.sched` entry that calls a thresholds procedure every 15 minutes:

```
15 - - {DPIPE_HOME}/bin/trend_proc -f {DPIPE_HOME}/scripts/thresh.pro
```

Threshold Policy Definition File

Any call to the Thresholds Module must include a valid policy definition file. Policy definition files are written in XML, specifying the data to be checked and the threshold values for that data. The file also assigns a Category value and a Severity value to any threshold breaches (events). The structure and content of policy definition files are described in Defining Threshold Policies on page 33.

5

Defining Threshold Policies

This chapter covers the following topics:

Threshold Policy Definition Files

A threshold definition file establishes a threshold policy. It provides the rules necessary to construct queries against a single database table or view and an associated property table. A view may span multiple data and property tables.

Threshold configuration files are written in XML. To modify them you can use an XML editor or any text editor.

When modifying XML files, make sure that you use special characters correctly. For example, in XML the less-than (<) and greater-than (>) signs indicate the start and end of tags. If you want symbols for less-than and greater-than, use **`&lt`** and **`&gt`**. If you want to add a comment, use this format:

<!-- This is a comment -->

Most web browsers know when an XML file is correctly constructed. Load the edited file into your browser to verify it is well constructed.

The threshold policy definition file contains a number of clauses. Some are mandatory and some are optional, but the structure is fixed.

Threshold Policy Definition File Names

A threshold definition file name cannot exceed 27 characters in length (ignoring the final period and any extension following the period). The name of the threshold definition file is used to build an OVPI data table that stores data required by the Thresholds Module. Exceeding this character limit may cause errors when the data table is built and when the data table is used.

Threshold Policy Definition File Structure

The threshold policy definition file consists of a single all-encompassing OVPI clause. The OVPI clause contains a single “ThresholdPolicy” clause.

A “ThresholdPolicy” clause consists of several clauses; a “MaxAge” clause, a “DataTable” clause, a “Constraint” clause and a “Thresholds” clause. It may optionally include “Variables” and “UserDefs” clauses.

A “Constraint” clause contains a single “SQL” clause.

An “SQL” clause contains an optional “Name” clause, a “PropertyTable” clause, and an optional SQL constraint “Clause” clause.

A “Variables” clause contains a number of “Variable” clauses.

A “Variable” clause contains a “Data” clause.

A “UserDefs” clause contains up to five numbered “UserDefX” clauses.

A “Thresholds” clause consists of a number of “Threshold” clauses.

A “Threshold” clause contains a “Rule” clause, identified by a “Name” and a “Severity”. It may also optionally be identified as being an “SLA” and may optionally contain a “Display” clause.

A “Rule” clause contains a “Data” clause.

A “Display” clause contains a “Data” clause.

This is shown below:

```
<OVPI>
  <ThresholdPolicy Category="CATEGORY-NAME">
    <MaxAge>
      <DeltaTime Value="MAXIMUM-AGE" Units="HOURS"/>
    </MaxAge>
    <DataTable>tableName</DataTable>
    <Constraint Type="SQL">
      <SQL>
        <Name>CONSTRAINT-NAME</Name>
    <!-- The Name clause is optional -->
        <PropertyTable>PROPERTY-TABLE</PropertyTable>
        <Clause>SQL-CONSTRAINT</Clause>
```

```
<!-- The SQL constraint Clause clause is optional -->
  </SQL>
</Constraint>
<Variables>
  <Variable Name="VARIABLE-NAME">
    <Data>VARIABLE-SQL</Data>
  </Variable>
</Variables>
<UserDefs>
  <UserDef1>USERDEF-SQL</UserDef1>
   <!-- Include up to five USERDEF tags -->
</UserDefs>
<Thresholds>
  <Threshold Name="THRESHOLD-NAME" Severity="SEVERITY" SLA="SLA-FLAG">
    <Rule>
      <Data>THRESHOLD-SQL</Data>
    </Rule>
    <Display>
      <Data>DISPLAY-SQL</Data>
    </Display>
  </Threshold>
   <!-- Include as many additional Threshold tags as desired -->
</Thresholds>
</ThresholdPolicy>
</OVPI>
```

Required values, appearing in italics above, are defined below.

CATEGORY_NAME

The name of the category to which any events defined in this threshold policy belong. Category name is an arbitrary string value and can be set to any single word value, however do not use spaces. The use of special characters (for example, quotes or hash symbols) is not advised since these can have special meaning for third party software packages that integrate with the Thresholds Module. If you are integrating OVPI with NNM and wish to launch OVPI reports from NNM, you must set this value to a category that is registered with NNM.

MAXIMUM-AGE

The maximum age of data that will trigger an event. Must be entered in HOURS. This value can be used to suppress testing data that is “too old” which might in turn cause event storms.

The maximum age value will not normally be exceeded since only data which is more recent than the previous test will now be tested. For example, if data is inserted into a table on a fifteen minute polling cycle, and thresholds are checked every fifteen minutes, you might use a maximum age of one hour. The first time you invoke this threshold test, there is no previously tested data. So rather than testing all the data in the table, only data up to the maximum age is tested.

Set the parameter to at least one poll period. For heavily populated tables (“rate” tables, for example) keep the value as low as possible; for lightly populated tables it can be set higher since any impact is smaller.

DATA-TABLE

The data table to be checked. The table must be a valid OVPI data table or view.

CONSTRAINT-NAME

The name of the constraint applied to data to be checked. Constraint-name is an arbitrary string value and can be set to any single word value (i.e. do not use spaces). The use of special characters (e.g. quotes or hash symbols) is not advised. The constraint name does not get passed on from the thresholds module; thus, it is not externally visible. The name can be used to provide a description of what the constraint does, for example:

- “DOMESTIC-US-CIRCUITS-ONLY”
- “FRAME-RELAY-PORTS”

PROPERTY-TABLE

The property table that is being checked. This must be related to the DATA-TABLE and exist in OVPI’s dictionary tables.

SQL-CONSTRAINT

An SQL clause that constrains the query. The query built by the threshold module is ANDed with this clause. Columns from property and/or data tables may be used. Prefix columns from the property table with “**p.**”; prefix columns in the data table with “**d.**”. For example, if the property table being checked contained a column for if_type, it would be possible to check thresholds for a particular if_type by using a constraint clause similar to the following:

```
<Clause>d.if_type = 17</Clause>
```

SQL is checked only when it is passed to the database server. Invalid SQL clauses will result in errors being returned from the database, which in turn will be logged by the Thresholds Module.

VARIABLE-NAME

The name by which the variable will be known. Variable names must be unique within the definition file. Variables defined within this XML clause can be used in the DISPLAY-STRING (see below).

VARIABLE-SQL

An SQL clause that will be evaluated to provide a value for the variable. Columns from property and/or data tables may be used. Prefix columns from the property table with "**p.**"; prefix columns in the data table with "**d.**".

USERDEF-SQL

An SQL clause that will be evaluated and passed directly to output. Columns from property and/or data tables may be used. Prefix columns from the property table with "**p.**"; prefix columns in the data table with "**d.**".

Up to five user defined SQL clauses can be used and allow passing of data which is not directly part of the threshold query to third party systems via any actions defined (e.g. SNMP trap or SMTP mail).

SLA-FLAG

If this tag is present, the threshold is considered an SLA threshold which can be used to determine any breaches that affect a Service Level Agreement. The value itself is ignored, for example, the presence of SLA="Yes" or SLA="True" has the same effect. The tag should be omitted if the threshold does not form part of an SLA.

DISPLAY-SQL

An SQL clause that will be evaluated and passed to output. Columns from property and/or data tables may be used as well as variables (defined above). Prefix columns from the property table with "**p.**"; prefix columns in the data table with "**d.**", prefix variables with "**v**". The use of variables allows for some "nesting" of the results of queries which can be used to greatly simplify what is presented to the users via actions.

THRESHOLD NAME

The name of this threshold. Name is an arbitrary string value and can be set to any single word value (i.e. do not use spaces). The use of special characters (e.g. quotes or hash symbols) is not advised.

SEVERITY

The severity of the event defined in the particular threshold-policy. Severity is an arbitrary string value and can be set to any single word value (i.e. do not use spaces). The use of special characters (e.g. quotes or hash symbols) is not advised since these can have special meaning for third party software packages (e.g. SMTP servers) which integrate with the thresholds module. Using values that match with the severity levels used by other systems is recommended. For example, if you are sending traps to a network management system that assigns traps to severities CRITICAL, HIGH, MEDIUM, or LOW, use these values.

THRESHOLD-SQL

SQL clauses that constitute the main body of the threshold query. Columns from property and/or data tables may be used. Prefix columns from the property table with "**p.**"; prefix columns in the data table with "**d.**". For example, if the property table being checked contained a column for CIR, and the data table contained a column for bytes_transmitted, it would be possible to determine if the bytes_transmitted exceeded the CIR by using the following SQL clause:

```
<Data>d.bytes_transmitted &gt; p.cir</Data>
```

Examples of Threshold Policy Definitions

A number of examples of policy definition files are included with the thresholds module. You can find them in the following directories:

UNIX

```
$DPIPE_HOME/packages/Thresholds/ThresholdExamples.ap/xml
```

Windows

```
%DPIPE_HOME%\pacakges\Thresholds\ThresholdExamples.ap/xml
```

Understanding Policy Definitions

This section contains a sample policy definition and explanation.

Sample Definition

```
<OVPI>
  <ThresholdPolicy Category="THRESHOLD-EXAMPLE">

    <MaxAge>
      <DeltaTime Value="1" Units="HOURS"/>
    </MaxAge>

    <DataTable>R_threshEg</DataTable>

    <Constraint Type="SQL">
      <SQL>
        <PropertyTable>K_threshEg</PropertyTable>
      </SQL>
    </Constraint>

    <Variables>
      <Variable Name="utilisation">
        <Data>((d.ifinoctets * 8 * 1000) / (60 * (1+ d.delta_time)))</Data>
      </Variable>
    </Variables>

    <UserDefs>
      <UserDef1>d.received_usec</UserDef1>
    </UserDefs>

    <Thresholds>
      <Threshold Name="EXAMPLE1" Severity="HIGH" SLA="True">
```

```
        <Rule>
          <Data>(d.ifinoctets * 8 * 1000) / (60 * (1+ d.delta_time)))
                                                &gt; p.util_threshold)</Data>
        </Rule>

        <Display>
          <Data>Utilisation = v.utilisation, limit = p.util_threshold</Data>
        </Display>

      </Threshold>

    </Thresholds>
  </ThresholdPolicy>
</OVPI>
```

Explanation

The statements above define a threshold in the category THRESHOLD-EXAMPLE. The category is an arbitrary name that can be used (with Severity) to identify groups of thresholds. This mechanism is used to associate threshold breaches (or clears) with actions.

The maximum age of data that will cause an exception is set to one hour. Data samples are checked only once at most. If a sample is either older than the last sample checked (for a particular object) or the sample is older than the maximum age specified in this clause, it will be ignored.

Data from the table “R_threshEg” will be checked. The table has a related property table: “K_threshEg”.

A variable called “utilisation” is defined. Any variables defined can be used in “display” clauses (described below).

A user defined field is created. This is passed directly to output.

A single threshold rule, EXAMPLE1, is defined. The severity associated with this threshold is HIGH and, because the SLA tag is defined, any actions generated by this rule will have the SLA flag set to True.

The rule checks whether the calculated value for circuit utilisation is greater than the limit stored in the property table. Different objects can have different limits.

A display clause is defined and contains the variable defined above, some text, and the limit value from the property table. If the threshold is breached, the resulting string will look similar to this:

“Utilisation = 93, limit = 90”

6

Troubleshooting

This chapter explains how to:

- Troubleshoot error and warning messages
- Troubleshoot problems caused by the thresholds.pl file not running

In OVPI 5.0, the thresholds functionality logs to the website.log file. The perl script thresholds.pl will continue to log to the trend.log file, but you can usually obtain more detailed data from the website.log file.

Error and Warning Messages

The following table, sorted alphabetically by message, provides recommended responses to specific error messages.

Message	Type	Suggested Action
Cannot find system information Error code: 10	FATAL	Use the system manager component in the Management Console to identify a database system as the default collector database. Usually this is the local host.
Failed to lock rules file (another instance may be running) Error code: 11	FATAL	The requested policy is still in use. Wait and try again.
Invalid property table Error code: 12	FATAL	Make sure the key table specified in the policy file matches the key table defined in the database.

Message	Type	Suggested Action
Some threshold actions reported errors. See log file for more details. Error code: 99 Reason: The threshold action (SNMP, User-Script, or Mail) reported an error during processing	FATAL	You can find additional information in the `website.log` file. Verify that the thresholds policy file and threshold actions are correctly formatted and that the required statistics appear in the key and data tables.
Unknown error has occurred at <LOCATION> Error code: 99 This error code is usually followed by a reason message and line number that HP Technical Support can use to help you resolve the problem.	FATAL	You can find additional information in the `website.log` file. Verify that the thresholds policy file and threshold actions are correctly formatted and that the required statistics appear in the key and data tables.

Running the thresholds.pl File

On UNIX systems, check that execute permission has been granted to the files in the Scripts directory, located beneath the $DPIPE_HOME directory. Run the following command:

```
ls -l $DPIPE_HOME/scripts/thresholds.pl
```

If execute permission has been granted, a message similar to this message appears:

```
-rwxr-x--x 1 trendadm adm 25591 Aug 24 19:42 thresholds.pl
```

Execute permission for the current user is shown by the fourth letter in the permission string (“`-rwxr-x--x`” in the example above) and must be set to “`x`”.

Debugging

Log entries directly from the threshold module are written to trend.log, however, the module calls functions located in OVPI’s Java based engine. Any error logging from these calls is written to website.log.

If a threshold definition is not working as it should you should check the following:

- Is the OVPI server running?
  - For Unix systems check the daemon is running, on Windows check the service is running.
- Are all actions correctly defined?
  - Ensure that “category” and “severity” identifiers do not contain spaces or special characters (e.g. quotes or hash symbols).
  - Ensure that servers are identified using a valid IP address or resolvable name.
  - Ensure that validly formatted email addresses are used for both “from” and “to” parameters.

- Are all XML definitions correctly constructed?
  - Check that the XML file be loaded into an XML editor or browser
  - Ensure that all clauses, tags and values meet the requirements described in this document.

If after checking these you are still experiencing problems the following may help:

1. Comment out all thresholds entries in trendtimer.sched file.
2. Deactivate all actions using the “modify” forms to change the category to “NOT_IN_USE” or some other suitable string.
3. Identify any status tables used by the threshold module. These will all appear under the thresholds category and be named “RTH*”.
4. Delete any TEEL files associated with the “RTH*” tables identified above found in `$DPIPE_HOME/lib` (UNIX) or `%DPIPE_HOME%\lib` (Windows).
5. Drop the tables identified above using table manager from the OVPI console.
6. Truncate the E_threshExcept table using table manager from the OVPI console.
7. From the command line, start the thresholds module using the same command as found within the .pro which you commented out of trendtimer.sched.

If this is successful, you should restore desired actions one at a time, repeating steps 4 through 7 after each.

7

OVPI Exceptions

This chapter covers the following topics:

- OVPI Exception MIB
- OVPI Exception Mail
- OVPI Exception User Scripts
- OVPI Exception Content
  - Example: OVPI Exception Mail
  - Example: OVPI Traps Received by NNM

OVPI Exception MIB

The OVPI exception MIB defines the trap sent by the Thresholds Module. The MIB is included with the package. You do not have to install the MIB to send threshold traps.

```
OVPI-EXCEPTION DEFINITIONS ::= BEGIN
-- Version @(#) hpov-pi.mib /main/3 mcameron Tue Sep 16 06:11:20 2003 @(#)

IMPORTS
   MODULE-IDENTITY, OBJECT-IDENTITY, OBJECT-TYPE,
   NOTIFICATION-TYPE, enterprises
      FROM SNMPv2-SMI
   DisplayString,
      FROM SNMPv2-TC
   MODULE-COMPLIANCE, OBJECT-GROUP, NOTIFICATION-GROUP
      FROM SNMPv2-CONF;

hp              OBJECT IDENTIFIER ::= { enterprises 11 }
nm               OBJECT IDENTIFIER ::= { hp 2 }
```

```
openView                OBJECT IDENTIFIER ::= { nm 17 }
hpOVPerformanceInsight  OBJECT IDENTIFIER ::= { openView 14 }
ovpiEvents              OBJECT IDENTIFIER ::= { hpOVPerformanceInsight 0 }

ovpiVariables           OBJECT IDENTIFIER ::= { ovpiEvents 4 }

ovpiThreshold MODULE-IDENTITY
    LAST-UPDATED "200309150000Z"
    ORGANIZATION "HP OpenView PerformanceInsight"
    CONTACT-INFO
        "Name: Michael Cameron
         Addr: 10700 Parkridge Blvd.
         Reston, VA 20191 -- Tel: +44 (0)1563 822370
         Fax: +44 (0)1563 822611
         Email: Michael.Cameron@hp.com"

    DESCRIPTION
        "HP OpenView PerformanceInsight (OVPI) can be configured
         to send traps when defined threshholds are exceeded.
         These traps appear under this branch."
    ::= { hpOVPerformanceInsight 1 }

ovpiThresholdBreach    NOTIFICATION-TYPE
    OBJECTS {
            ovpiThresholdID,
            ovpiThresholdTargetName,
            ovpiThresholdTableKey,
            ovpiThresholdTaPeriod,
            ovpiThresholdCondition,
            ovpiThresholdExpression,
            ovpiThresholdCategory,
            ovpiThresholdSeverity,
            ovpiThresholdUserDef1,
            ovpiThresholdUserDef2,
            ovpiThresholdUserDef3,
            ovpiThresholdUserDef4,
```

```
            ovpiThresholdUserDef5,
            ovpiThresholdDisplayString,
            ovpiThresholdSLA
          }
    STATUS  current
    DESCRIPTION
     "Indicates a threshold exception has occured.  TRAP variables provide further details."
    ::= { ovpiEvents 2 }

ovpiThresholdClear    NOTIFICATION-TYPE
    OBJECTS {
            ovpiThresholdID,
            ovpiThresholdTargetName,
            ovpiThresholdTableKey,
            ovpiThresholdTaPeriod,
            ovpiThresholdCondition,
            ovpiThresholdExpression,
            ovpiThresholdCategory,
            ovpiThresholdSeverity,
            ovpiThresholdUserDef1,
            ovpiThresholdUserDef2,
            ovpiThresholdUserDef3,
            ovpiThresholdUserDef4,
            ovpiThresholdUserDef5,
            ovpiThresholdDisplayString,
            ovpiThresholdSLA
          }
    STATUS  current
    DESCRIPTION
     "Indicates a threshold exception has cleared.  TRAP variables provide further details."
    ::= { ovpiEvents 3 }
ovpiThresholdID OBJECT-TYPE
    SYNTAX        OCTET STRING
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
```

```
        "ID of the definition which caused the exception"
    ::= { ovpiVariables 1 }

ovpiThresholdTargetName OBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "target name of the object for which the exception occured"
    ::= { ovpiVariables 2 }

ovpiThresholdTableKey OBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "table key of the object for which the exception occured"
    ::= { ovpiVariables 3 }

ovpiThresholdTaPeriod OBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "ta_period of the data for which the exception occured"
    ::= { ovpiVariables 4 }

ovpiThresholdCondition OBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The exception condition"
    ::= { ovpiVariables 5 }

ovpiThresholdExpression OBJECT-TYPE
```

```
        SYNTAX        OCTET STRING
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "The values which caused the exception"
        ::= { ovpiVariables 6 }

    ovpiThresholdCategory OBJECT-TYPE
        SYNTAX        OCTET STRING
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "Category"
        ::= { ovpiVariables 7 }

    ovpiThresholdSeverity OBJECT-TYPE
        SYNTAX        OCTET STRING
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "Severity"
        ::= { ovpiVariables 8 }

    ovpiThresholdUserDef1 OBJECT-TYPE
        SYNTAX        OCTET STRING
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
           "UserDef1"
        ::= { ovpiVariables 9 }

    ovpiThresholdUserDef2 OBJECT-TYPE
        SYNTAX        OCTET STRING
        MAX-ACCESS  read-only
        STATUS      current
        DESCRIPTION
```

```
        "UserDef2"
    ::= { ovpiVariables 10 }

ovpiThresholdUserDef3 OBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "UserDef3"
    ::= { ovpiVariables 11 }

ovpiThresholdUserDef4 OBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "UserDef4"
    ::= { ovpiVariables 12 }

ovpiThresholdUserDef5 OBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "UserDef5"
    ::= { ovpiVariables 13 }

ovpiThresholdDisplayString OBJECT-TYPE
    SYNTAX      OCTET STRING
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "DisplayString"
    ::= { ovpiVariables 14 }

ovpiThresholdSLA OBJECT-TYPE
```

```
SYNTAX        OCTET STRING
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
   "SLA"
::= { ovpiVariables 15 }


END
```

OVPI Exception User Scripts

Exception files passed to user scripts consist of one row per exception. Fields are comma delimited. For details about content, see the table below.

OVPI Exception Mail

Mail messages consist of a single row header containing field names followed by one row per exception. Fields are comma delimited.

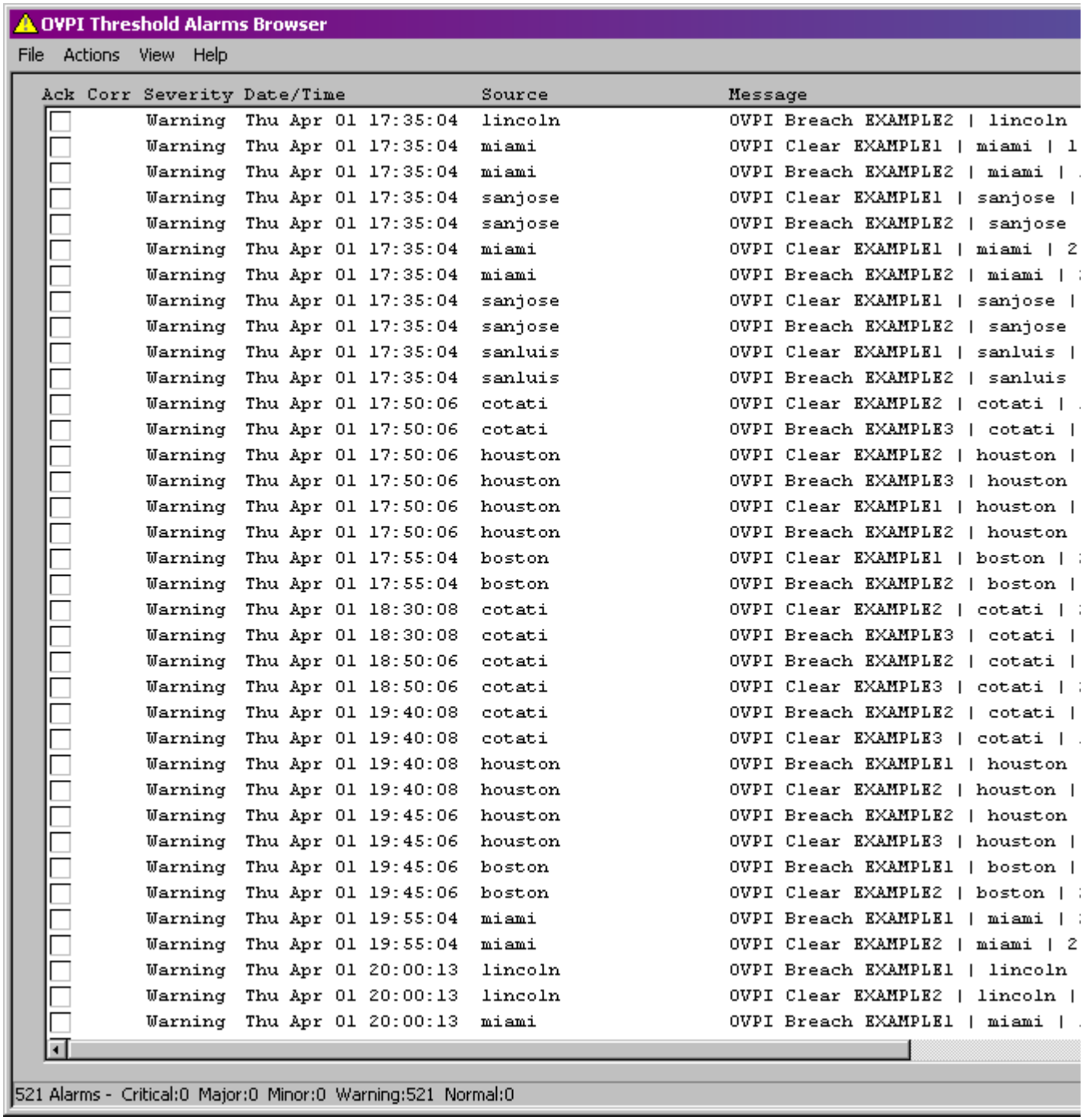
OVPI Exception Content

OVPI exceptions contain the following information:

Column Name	Contents
Status	0 for clear, 1 for breach
Threshold ID	The name of the rule that has been breached.
TargetName	The target name of the object that caused the breach.
TableKey	The table key of the object that caused the breach.
TaPeriod	The time period the data that caused the threshold relates to.
Condition	The threshold condition (from the rule).
Expression	The threshold condition with values substituted into it.
Category	The category the threshold belongs to.
Severity	The severity assigned to the threshold.
UserDef1	User-defined field.

Column Name	Contents
UserDef2	User-defined field.
UserDef3	User-defined field.
UserDef4	User-defined field.
UserDef5	User-defined field.
DisplayString	A string designed for presentation to users, which can include details of the threshold and the values that caused the exception.
SLA	If set to 1, this exception indicates that an SLA breach has occurred.

Example: OVPI Traps Received by NNM



OVPI Threshold Alarms Browser

File Actions View Help

Ack	Corr	Severity	Date/Time	Source	Message
☐		Warning	Thu Apr 01 17:35:04	lincoln	OVPI Breach EXAMPLE2 | lincoln
☐		Warning	Thu Apr 01 17:35:04	miami	OVPI Clear EXAMPLE1 | miami | 1
☐		Warning	Thu Apr 01 17:35:04	miami	OVPI Breach EXAMPLE2 | miami |
☐		Warning	Thu Apr 01 17:35:04	sanjose	OVPI Clear EXAMPLE1 | sanjose |
☐		Warning	Thu Apr 01 17:35:04	sanjose	OVPI Breach EXAMPLE2 | sanjose
☐		Warning	Thu Apr 01 17:35:04	miami	OVPI Clear EXAMPLE1 | miami | 2
☐		Warning	Thu Apr 01 17:35:04	miami	OVPI Breach EXAMPLE2 | miami |
☐		Warning	Thu Apr 01 17:35:04	sanjose	OVPI Clear EXAMPLE1 | sanjose |
☐		Warning	Thu Apr 01 17:35:04	sanjose	OVPI Breach EXAMPLE2 | sanjose
☐		Warning	Thu Apr 01 17:35:04	sanluis	OVPI Clear EXAMPLE1 | sanluis |
☐		Warning	Thu Apr 01 17:35:04	sanluis	OVPI Breach EXAMPLE2 | sanluis
☐		Warning	Thu Apr 01 17:50:06	cotati	OVPI Clear EXAMPLE2 | cotati |
☐		Warning	Thu Apr 01 17:50:06	cotati	OVPI Breach EXAMPLE3 | cotati |
☐		Warning	Thu Apr 01 17:50:06	houston	OVPI Clear EXAMPLE2 | houston |
☐		Warning	Thu Apr 01 17:50:06	houston	OVPI Breach EXAMPLE3 | houston
☐		Warning	Thu Apr 01 17:50:06	houston	OVPI Clear EXAMPLE1 | houston |
☐		Warning	Thu Apr 01 17:50:06	houston	OVPI Breach EXAMPLE2 | houston
☐		Warning	Thu Apr 01 17:55:04	boston	OVPI Clear EXAMPLE1 | boston |
☐		Warning	Thu Apr 01 17:55:04	boston	OVPI Breach EXAMPLE2 | boston |
☐		Warning	Thu Apr 01 18:30:08	cotati	OVPI Clear EXAMPLE2 | cotati |
☐		Warning	Thu Apr 01 18:30:08	cotati	OVPI Breach EXAMPLE3 | cotati |
☐		Warning	Thu Apr 01 18:50:06	cotati	OVPI Breach EXAMPLE2 | cotati |
☐		Warning	Thu Apr 01 18:50:06	cotati	OVPI Clear EXAMPLE3 | cotati |
☐		Warning	Thu Apr 01 19:40:08	cotati	OVPI Breach EXAMPLE2 | cotati |
☐		Warning	Thu Apr 01 19:40:08	cotati	OVPI Clear EXAMPLE3 | cotati |
☐		Warning	Thu Apr 01 19:40:08	houston	OVPI Breach EXAMPLE1 | houston
☐		Warning	Thu Apr 01 19:40:08	houston	OVPI Clear EXAMPLE2 | houston |
☐		Warning	Thu Apr 01 19:45:06	houston	OVPI Breach EXAMPLE2 | houston
☐		Warning	Thu Apr 01 19:45:06	houston	OVPI Clear EXAMPLE3 | houston |
☐		Warning	Thu Apr 01 19:45:06	boston	OVPI Breach EXAMPLE1 | boston |
☐		Warning	Thu Apr 01 19:45:06	boston	OVPI Clear EXAMPLE2 | boston |
☐		Warning	Thu Apr 01 19:55:04	miami	OVPI Breach EXAMPLE1 | miami |
☐		Warning	Thu Apr 01 19:55:04	miami	OVPI Clear EXAMPLE2 | miami | 2
☐		Warning	Thu Apr 01 20:00:13	lincoln	OVPI Breach EXAMPLE1 | lincoln
☐		Warning	Thu Apr 01 20:00:13	lincoln	OVPI Clear EXAMPLE2 | lincoln |
☐		Warning	Thu Apr 01 20:00:13	miami	OVPI Breach EXAMPLE1 | miami |

521 Alarms - Critical:0 Major:0 Minor:0 Warning:521 Normal:0

Example: OVPI Exception Email

From: ovpi@hp.com

Sent: 19 February 2004 16:22

To: admin@hp.com

Subject: Threshold exceptions

status,threshold_id,target_name,table_key,ta_period,condition,expression,category,severity,userdef1,userdef2,userdef3,userdef4,userdef5,displaystring,sla

1,EXAMPLE2,boston,1,2004-02-18 14:35:00.0,(2.6044664E7 > 10000000) AND (2.6044664E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(2.6044664E7 > 10000000) AND (2.6044664E7 <= 100000000),0

1,EXAMPLE3,cotati,1,2004-02-18 14:35:00.0,(6879778.0 <= 10000000),(d.ifinoctets <= 10000000),THRESHOLD-EXAMPLE,LOW,null,null,null,null,null,(6879778.0 <= 10000000),0

1,EXAMPLE3,houston,1,2004-02-18 14:35:00.0,(7095826.0 <= 10000000),(d.ifinoctets <= 10000000),THRESHOLD-EXAMPLE,LOW,null,null,null,null,null,(7095826.0 <= 10000000),0

1,EXAMPLE2,lincoln,1,2004-02-18 14:35:00.0,(5.0359343E7 > 10000000) AND (5.0359343E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(5.0359343E7 > 10000000) AND (5.0359343E7 <= 100000000),0

1,EXAMPLE2,miami,1,2004-02-18 14:35:00.0,(5.5268039E7 > 10000000) AND (5.5268039E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(5.5268039E7 > 10000000) AND (5.5268039E7 <= 100000000),0

1,EXAMPLE2,sanjose,1,2004-02-18 14:35:00.0,(5.2076429E7 > 10000000) AND (5.2076429E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(5.2076429E7 > 10000000) AND (5.2076429E7 <= 100000000),0

1,EXAMPLE2,sanluis,1,2004-02-18 14:35:00.0,(4.6607176E7 > 10000000) AND (4.6607176E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(4.6607176E7 > 10000000) AND (4.6607176E7 <= 100000000),0

1,EXAMPLE2,tulsa,1,2004-02-18 14:35:00.0,(2.6070098E7 > 10000000) AND (2.6070098E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(2.6070098E7 > 10000000) AND (2.6070098E7 <= 100000000),0

1,EXAMPLE2,boston,2,2004-02-18 14:35:00.0,(6.3396585E7 > 10000000) AND (6.3396585E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(6.3396585E7 > 10000000) AND (6.3396585E7 <= 100000000),0

1,EXAMPLE2,cotati,2,2004-02-18 14:35:00.0,(1.3291807E7 > 10000000) AND (1.3291807E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(1.3291807E7 > 10000000) AND (1.3291807E7 <= 100000000),0

1,EXAMPLE2,houston,2,2004-02-18 14:35:00.0,(4.1180538E7 > 10000000) AND (4.1180538E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(4.1180538E7 > 10000000) AND (4.1180538E7 <= 100000000),0

1,EXAMPLE2,miami,2,2004-02-18 14:35:00.0,(5.0321044E7 > 10000000) AND (5.0321044E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(5.0321044E7 > 10000000) AND (5.0321044E7 <= 100000000),0

1,EXAMPLE2,sanjose,2,2004-02-18 14:35:00.0,(5.3831815E7 > 10000000) AND (5.3831815E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(5.3831815E7 > 10000000) AND (5.3831815E7 <= 100000000),0

1,EXAMPLE2,sanluis,2,2004-02-18 14:35:00.0,(5.2821138E7 > 10000000) AND (5.2821138E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(5.2821138E7 > 10000000) AND (5.2821138E7 <= 100000000),0

1,EXAMPLE2,tulsa,2,2004-02-18 14:35:00.0,(3.9245362E7 > 10000000) AND (3.9245362E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(3.9245362E7 > 10000000) AND (3.9245362E7 <= 100000000),0

1,EXAMPLE2,boston,3,2004-02-18 14:35:00.0,(4.6342171E7 > 10000000) AND (4.6342171E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(4.6342171E7 > 10000000) AND (4.6342171E7 <= 100000000),0

1,EXAMPLE2,houston,3,2004-02-18 14:35:00.0,(6.683985E7 > 10000000) AND (6.683985E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(6.683985E7 > 10000000) AND (6.683985E7 <= 100000000),0

1,EXAMPLE2,miami,3,2004-02-18 14:35:00.0,(3.152363E7 > 10000000) AND (3.152363E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(3.152363E7 > 10000000) AND (3.152363E7 <= 100000000),0

1,EXAMPLE2,sanjose,3,2004-02-18 14:35:00.0,(3.1617636E7 > 10000000) AND (3.1617636E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(3.1617636E7 > 10000000) AND (3.1617636E7 <= 100000000),0

1,EXAMPLE2,tulsa,3,2004-02-18 14:35:00.0,(4.6056698E7 > 10000000) AND (4.6056698E7 <= 100000000),(d.ifinoctets > 10000000) AND (d.ifinoctets <= 100000000),THRESHOLD-EXAMPLE,MEDIUM,null,null,null,null,null,(4.6056698E7 > 10000000) AND (4.6056698E7 <= 100000000),0

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