

# HP Operations Smart Plug-in for Oracle Application Server

for HP Operations Manager for Windows®

Software Version: 6.10

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## Configuration Guide

Document Release Date: February 2009  
Software Release Date: October 2008



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# 1 Introduction

The HP Operations Smart Plug-in for Oracle Application Server (Oracle AS SPI) allows you to manage Oracle Application servers from an HP Operations Manager for Windows (HPOM) console. Oracle AS SPI adds monitoring capabilities otherwise unavailable to HPOM. For more information on HPOM, see the HPOM console online help.

From the HPOM console, you can monitor the availability, use, and performance of Oracle Application Servers running on HPOM managed nodes. You can integrate Oracle AS SPI with other HPOM products like HP Reporter and HP Performance Manager to get consolidated reports and graphs which help you analyze trends in server usage, availability, and performance.

The Oracle AS SPI online help provides valuable information about Oracle AS SPI concepts and other topics that will help you understand the product.

This guide covers the following topics:

- [Installing and Removing the Oracle AS SPI](#)
- [Configuring the Oracle AS SPI](#)
- [Customizing Oracle AS SPI Policies](#)
- [Integrating HPOM Reporting and Graphing Features with the Oracle AS SPI](#)
- [User-Defined Metrics](#)
- [Troubleshooting the Oracle AS SPI](#)



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## 2 Installing and Removing the Oracle AS SPI

### Installing the Oracle AS SPI

You must install the prerequisite software on your system before installing the Oracle AS SPI. A complete list of software requirements is given in the Smart Plug-in for Oracle Application Server Release Notes.

If HPOM is already installed, it is not necessary to stop the existing HPOM sessions before installing the Oracle AS SPI. To install the Oracle AS SPI on the management server, follow these steps:

- 1 Insert the HP Operations Smart Plug-ins DVD into the DVD drive of the management server system. The HP Operations Smart Plug-in InstallShield Wizard starts.
- 2 Click **Next**. The Program Maintenance window opens.
- 3 Select **Install Products**. The Product Selection window opens.
- 4 From the options listed (there are three Product Selection windows) select the **Oracle AS SPI** check box and click **Next**.

Complete the installation by following the instructions that appear as you proceed. For more information see the *HP Operations Smart Plug-ins DVD Installation and Upgrade Guide*.

# Upgrading the Oracle AS SPI

Detailed information about supported software, enhancements, fixes, and known problems and workarounds is available in the *HP Operations Smart Plug-in for Oracle Application Server Release Notes*, HP Operations Smart Plug-ins DVD, in `\Documentation\Releasenotes\Oracle_AppServer_Releasenotes.html`.

## Prerequisites

- 1 Make a backup of the existing Oracle AS SPI configuration file which is located at:  
`<OvOWShareInstallDir>\SPI-Share\wasspi\oas\conf\SiteConfig`  
On OVO for Windows 7.50, `<OvOWShareInstallDir>` can be `C:\Program Files\HP OpenView\Data\shared\`

- 2 Install the new version of the Oracle AS SPI by running the InstallShield Wizard (installer).

If the installer detects that an older version of the Oracle AS SPI is installed, it upgrades to the new version by doing the following:

- Renames the existing SPI for Oracle AS policy group to SPI for Oracle AS - Saved Policies. The default policies you customized in the SPI for Oracle AS policy group are available in the SPI for Oracle AS - Saved Policies policy group.
- Updates the Oracle AS SPI instrumentation on the management server.
- Installs new tools, policies, and a graph file on the management server.

## Upgrading the Oracle AS SPI

To upgrade the Oracle AS SPI to version 6.10, follow these steps:

- 1 Install the Oracle AS SPI version 6.10 software, See [Installing the Oracle AS SPI](#) on page 11.
- 2 Deploy new instrumentation to the SPI for Oracle Application Server node group:
  - a Right-click the **SPI for Oracle Application Server** node group.
  - b Select **All Tasks** → **Deploy instrumentation**.
  - c Select **SPI for Oracle AS**, **OASSPI Discovery**, and **SPI for JMX Application Servers**.
  - d Verify that the “Remove existing instrumentation before deploying new instrumentation” checkbox is clear.
  - e Click **OK**.



After upgrading the Oracle AS SPI if you add an instance of Oracle Application Server on a managed node, you must run the Discover Oracle AS tool on that node.

# Removing the Oracle AS SPI

To completely remove Oracle AS SPI, you must delete all Oracle AS SPI program components and policies. Then, complete the following tasks in the order given.

## Task 1: Remove all Oracle AS SPI Policies from the Managed Nodes


If you have customized policies (copies of Oracle AS SPI default policies) you must first remove them before starting this task. After removing the customized policies, follow these steps:

- 1 From the HPOM console tree, select **Policy management** → **Policy groups**.
- 2 Right-click **SPI for Oracle AS** and select **All Tasks** → **Uninstall from...** A node selection window opens.
- 3 Select the nodes on which the policies are installed. Click **OK**.
- 4 Click **Deployment jobs** under Policy management to verify if all policies are removed. There must be no policies listed under Deployment jobs.

Make sure you have removed *all* Oracle AS SPI policies before you start the next task.

## Task 2: Remove Oracle AS SPI Node Groups on the Management Server

If you created the SPI for Oracle Application Server node groups by (by running the Create OASSPI Node Groups tool or manually), you must remove this node group.

- 1 In the HPOM console tree, select **Nodes** → **SPI for Oracle Application Server**.
- 2 Open the Node Configuration editor.
  - a Select the Nodes folder in the console tree.
  - b Click the node icon  in the Configuration toolbar to open the editor. A node list appears.
- 3 Right-click the node group you want to delete and select **Delete**. You can also select the node group and press the **Delete** key. The Confirm Delete window opens.
- 4 Click **Yes**.
- 5 Click **OK** to close Configure managed nodes window.

## Task 3: Remove the Oracle AS SPI Software from the Management Server

- 1 Insert the HP Operations Smart Plug-ins DVD into the DVD drive of the management server. The HP Operations Manager InstallShield Wizard opens.
- 2 Click **Next**. The Program Maintenance window opens.
- 3 Click **Remove products**. The Product Selection window opens.
- 4 Select the **Oracle Application Server** check box and click **Next**.
- 5 To complete the removal, follow the instructions that appear as you proceed.



# 3 Configuring the Oracle AS SPI

This chapter explains how to configure the Oracle AS SPI for use with HP Operations Manager for Windows (HPOM). You must first complete the configuration prerequisites and the basic configuration, and then complete additional configuration based on your environment.

## Configuration Prerequisites

Complete the following tasks before configuring the Oracle AS SPI.

### Task 1: Add Managed Nodes

For each Oracle Application Server you want to manage from HPOM, ensure that all nodes on which the Oracle Application Servers are running are configured in HPOM as managed nodes.

To add a UNIX managed node, follow these steps:

- 1 Install the HP Operations agent on the node. For more information, see the topic Agent Installation on UNIX computers in the HPOM console online help.
- 2 Specify each Oracle Application Server node on UNIX to be managed. For more information, see the section Configuring managed nodes in the HPOM console online help.

To add a Windows managed node specify each Oracle Application Server node on Windows to be managed. The HP Operations agent is automatically installed when you complete this step. For more information see the section Configuring managed nodes in the HPOM console online help.

### Task 2: Verify the Application Server Status

You can verify if your Oracle Application Servers are running by checking the status of the server in the Oracle Application Server administrative console. You can see this console on the web browser by typing:

```
http://<machinename>:<port no>/emd/console
```

For example, `http://vmwasspiw9.india.hp.com:1156/emd/console`


The Oracle AS SPI discovery policies only discover application servers that are running.

As the following figure shows, in the console, colored arrows (in the status column) show the status of the server.

- Green arrow (pointing upwards): server is running.

- Red arrow (pointing downwards): server is not running. If the arrow is red, start the server.


### General



Stop All
Restart All

**Status** Up  
**Host** [vmwasspiw9.india.hp.com](#)  
**Version** 10.1.2.0.2  
**Installation Type** J2EE and Web Cache  
**Oracle Home** /home/oracleas/OraHome\_1

### CPU Usage



- Application Server (1%)
- Idle (92%)
- Other (7%)

---

### System Components

Enable/Disable

Start
Stop
Restart
Delete OC4J Instance

[Select All](#) | [Select None](#)

Select	Name	Status	Start Time
<input type="checkbox"/>	<a href="#">home</a>	↑	May 22, 2006 2:54:55 AM
<input type="checkbox"/>	<a href="#">HTTP_Server</a>	↑	May 22, 2006 2:54:55 AM
<input type="checkbox"/>	<a href="#">TestOC4JServer1</a>	↑	May 22, 2006 2:54:54 AM
<input checked="" type="checkbox"/>	<a href="#">Management</a>	↑	May 22, 2006 2:09:50 AM

**TIP** This table contains only the enabled components of the application server. Only components that are enabled are shown.

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### Related Links

- [Process Management](#)
- [All Metrics](#)

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[Home](#) | [J2EE Applications](#) | [Ports](#) | [Infrastructure](#) | [Backup/Recovery](#)

[Logs](#) | [Topology](#) | [Preferences](#) | [Help](#)

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[About Oracle Enterprise Manager 10g Application Server Control](#)

## Task 3: Collect Oracle AS Login Information

If security is enabled on the Oracle AS servers, collect the Oracle AS login and password for each OC4J/OHS server. If you do not want to use the existing login and password, create a new login and password. The Oracle AS SPI discovery process uses the login and password to gather basic configuration information, and the Oracle AS SPI data collector uses the login and password to collect metrics.



To simplify the Oracle AS SPI configuration, keep the login and password for both OC4J and OHS servers similar.

This feature is enabled only for Oracle AS SPI version 6.10. You can use the username and password for users/groups assigned to the administrator or operator role.



# Basic Oracle AS SPI Configuration

To complete the basic Oracle AS SPI configuration, complete the tasks given below in the specified order.

## Configuration Prerequisite

Before launching the Discover Oracle AS tool, deploy the following instrumentation files on the managed nodes:

- SHS Data Collector
- SPI Data Collector
- SPI for Oracle AS
- OASSPI Discovery

To deploy these instrumentation files, follow these steps:

- 1 From the HPOM console select **Operations Manager** → **Nodes**.
- 2 Right-click the managed node on which you want to run Discover Oracle AS tool.
- 3 Select **All Tasks** → **Deploy instrumentation**. The Deploy Instrumentation window opens.
- 4 Select SHS Data Collector, SPI Data Collector, SPI for Oracle AS, and OASSPI Discovery from the list of instrumentation files and click **OK**.

To verify that these files deployed successfully, check Deployment Jobs under Policy management. There should be no error messages.

## Task 1: Launch Discover Oracle AS

You must run the Discover Oracle AS tool to set the basic configuration properties required for the Oracle AS SPI to discover instances of the Oracle Application Server, deploy the Oracle AS SPI discovery policies, and update the service map.

To update the configuration, follow these steps:

- 1 From the HPOM console select **Operations Manager** → **Tools** → **SPI for Oracle AS** → **OASSPI Admin**.
- 2 Double-click **Discover Oracle AS**. The Edit Parameters window opens.
- 3 Select the managed nodes on which Oracle Application Servers are running and click **Launch**.

The Console Status window opens. After a few seconds the OASSPI Configure Tool: Introduction window opens. This window contains a brief information about the Discover Oracle AS tool.

- 4 Click **Next**. A second Introduction window opens. This window displays information about the properties that might be required for the discovery process to work.
- 5 Click **Next**. If you already set the LOGIN and PASSWORD properties, the configuration editor opens.

If you did not set the LOGIN and PASSWORD properties, the Set Access Info for Default Properties window opens.

Set the same LOGIN and PASSWORD properties as configured in the Oracle AS login and password in [Task 3: Collect Oracle AS Login Information](#) on page 16.

▶ The LOGIN and PASSWORD properties set in this window are used as the default Oracle AS login and password (they are set at the global properties level). That is, if no NODE level or server-specific LOGIN and PASSWORD properties are set, this Oracle AS login and password are used by the Oracle AS SPI to access all Oracle AS servers. For more information about the configuration structure, see the Oracle AS SPI online help.

- 6 Set the configuration properties using the configuration editor. For more information about the configuration properties, see the Oracle AS SPI online help.
- 7 Click **Next** to save any changes and exit the editor.. The Confirm Operation window opens. Verify the nodes on which the operation is to be performed.
- 8 Click **OK**.

Wait for the discover process to complete before going to the next task. The discover process may take several minutes to complete.

▶ If you click **Cancel** in the Confirm Operations window, the discovery policies are not deployed. However, the changes you made to the configuration remain in the management server's configuration. To make the changes to the selected managed nodes' configuration, you must launch the Discover Oracle AS tool, select those managed nodes, click **Next** in the configuration editor, and then click **OK** in the Confirm Operations window.

- 9 If the discovery is successful, the following message appears in the Discover OracleAS tools window:

```
Discovery started on node: <node>
Finished running the Discovery application
```

Click **OK** to close the message window.

Click **Close** to close the Console Status window.

- 10 If the Discover OracleAS tool does not complete successfully, the following message appears in the application window:

```
Failed to run discovery on node <node>
```

Scan the Console Status window for error messages. If there is an error message in the Console Status window, see [Troubleshooting the Discovery Process](#) on page 67.

## JMX Discovery for Oracle AS

Oracle AS SPI now supports JMX discovery for Oracle Application Server version 10gR3.

In your environment you may have different versions of Oracle Application Servers, for example, version 10gR3 or older, installed on the same node. In such a scenario, you may have to select whether you want to run classic discovery or the JMX discovery.

▶ For the older versions of Oracle Application Servers, Oracle AS SPI uses DMS tool for Discovery. This is referred to as *classic discovery* in this document.

There can be three scenarios:

**Scenario 1:** If only Oracle Application Server version 10gR3 is installed on the node.

By default, the JMX Discovery runs.

Scenario 2: If Oracle Application Server versions older than 10gR3 (for example 10gR1 and 10gR2) are installed on the node.

By default, the classic system of discovery runs.

Scenario 3: If different versions of Oracle Application Server (10gR3 along with 10gR1 or 10gR2) are installed on the node.

You can choose the method of discovery.

In the SPIConfig file, set the value of the `JMX_DISCOVERY` flag to `true` or `false`. By default, the value is `true`.

- If `JMX_DISCOVERY=true`, the JMX Discovery runs for OracleAS 10gR3 version only and all the older versions are not discovered.
- If `JMX_DISCOVERY=false`, the classic system of discovery is used for all the versions including 10gR3.

▶ If you set the `JMX_DISCOVERY` flag to `false`, the collection of JMX Metrics (belonging to the OASSPI-Metrics (JMX) template group) will fail. All metrics belonging to the OASSPI Metrics group will be collected with the exception of OASSPI\_0001, OASSPI\_0002, OASSPI\_0005, and OASSPI\_0245

## Discovering HTTP (OHS) Server

▶ The new JMX discovery will discover the HTTP server *only* if it is a part of a cluster.

There can be two discovery scenarios for HTTP (OHS) servers:

Scenario 1: HTTP (OHS) and OC4J servers are on the same system and have a common Oracle HOME.

The HTTP server is automatically discovered.

Scenario 2: HTTP (OHS) and OC4J servers are on different systems and /or have different Oracle HOME.

Follow these steps:

- 1 In the cluster, identify the OC4J instance that is connected to the OHS server.
- 2 In the Configuration Editor, right-click the node on which the OC4J server is installed and select **Add OC4J/OHS Server**. The OASSPI Discover Tool: Add App Server window opens.
- 3 Select the **HTTP Server** checkbox and click **OK**. The HTTP Server is added below the OC4J server.
- 4 Select the HTTP Server. In the Properties for OC4J/OHS Server: HTTP Server pane, the **NAME** and **TYPE** properties appear by default.
- 5 Clear the **Auto Discovery** checkbox and set the following properties—to set a property select the property from the Select a Property to Set dropdown menu and click **Set Property**. Double-click the empty space next to the property after the property appears in the list.:
  - **HOME**: Similar to the value set for the OC4J server.  
For example: `E:/product/10.1.3.1/OracleAS_1`

- JAVA\_HOME: Similar to the value set for the OC4J server.  
For example: `E:/product/10.1.3.1/OracleAS_1/jdk`
- LOGIN: Similar to the value set for the OC4J server.
- PASSWORD: Similar to the value set for the OC4J server.
- MAP\_KEY\_PREFIX: Any unique HTTP instance name
- URL\_PATH: Similar to the value set for the OC4J server. However, you must replace `/home` at the end of the URL with `/cluster`.  
For example: `/optmn://testsystem.com:6004/cluster`

To get the port no. in the URL, type the following command from the command prompt: `<directory> /product/10.1.3/OracleAS_1/opmn/bin> opmnctl status -port.`

- VERSION: 10.1 3

**Note** that there is a single space between 10.1 and 3 in the version.

- 6 Click **Next**. The OASSPI Discover Tool: Confirm Operation Window opens
- 7 Click **OK**.



There are two limitations in this scenario:

- 1 You must manually enter the information the SPI requires to monitor the HTTP server.
- 2 The information about the HTTP Server will not appear in the service map because this information was manually entered and not discovered.

## Task 2: Verify the Discovery Process

Depending on the number of managed nodes in your environment, verification may take several minutes to complete.

To verify if the discovery process is successfully completed, follow these steps:

- 1 Check if the following message appears in the message browser of the managed node:

```
INFO - Updating the OASSPI configuration data with discovered
information
```

It may take several minutes for this message to appear for all managed nodes, depending on the number of managed nodes in your environment.

If the Oracle AS SPI discovery policies are successfully deployed, this message appears and the letter “S” (for successful) appears in the ‘A’ column of the console.

If this message does not appear or if the message appears but the letter “F” appears in the ‘A’ column, check for error messages. To troubleshoot, see [Chapter 7, Troubleshooting the Oracle AS SPI](#).

- 2 From the HPOM console tree select **Operations Manager** → **Services** → **Applications** → **Oracle Application Servers**. The service map appears. It may take some time for the service map to appear completely.

- 3 Verify that the OC4J and OHS server instances are represented correctly.
  - ▶ After the discovery process is complete, the appropriate Oracle AS SPI group policies are deployed on the managed nodes. After the policies are deployed, an automatic procedure to set up a managed node for Oracle AS SPI operations starts.
- 4 Launch the Verify tool, 10 minutes after the service map appears, to verify if the installation is complete. To launch the Verify tool, follow these steps:
  - a From the HPOM console, select **Operations Manager** → **Tools** → **SPI for Oracle AS** → **OASSPI Admin**.
  - b Double-click **Verify**. Select where to launch this tool window opens.
  - c Select the nodes on which you want to run the Verify tool.
  - d Click **Launch**. The Tool Status window opens.
  - e In the Launched Tools field the status of the tool must appear as succeeded. In the Tool Output field the message `Installation is clean` must appear.  
If this message does not appear, see the Tool Output field for error messages.
  - f Click **Close**.

## Additional Oracle AS SPI Configuration

After you successfully complete the basic Oracle AS SPI configuration, you must finish Oracle AS SPI configuration by setting the properties that are not automatically discovered by the Discovery policies and install and configure additional components. Setting some of these properties and configuring additional components depends on your environment.

- If you installed HP Reporter (which must be purchased separately), for installation and configuration information, see [Integrating the Oracle AS SPI with HP Reporter](#) on page 40.
- If you installed HP Performance Manager (which must be purchased separately) and you want to view graphs, set the GRAPH\_URL property. For installation and configuration information see [Integrating the Oracle AS SPI with HP Performance Manager](#) on page 46.

To set additional properties, follow these steps:

- 1 From the HPOM console, select **Operations Manager** → **Tools** → **SPI for Oracle AS** → **OASSPI Admin**.
- 2 Double-click **Configure OASSPI**. The Edit Parameters window opens.
- 3 Select the managed nodes to configure.
- 4 Click **Launch**. The Console Status window and then the Introduction window opens.
- 5 Click **Next**. The configuration editor opens.
- 6 Set the properties.
- 7 Click **Next** to save and exit the configuration editor.

For a complete description of Oracle AS SPI properties and information about setting the properties using the configuration editor, see the section Configuration properties in the Oracle AS SPI online help.



## 4 Customizing Oracle AS SPI Policies

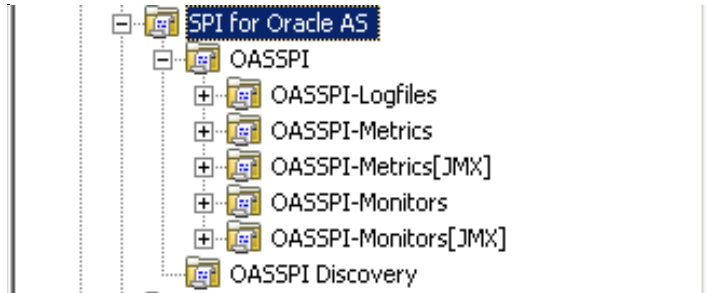
Oracle AS SPI policies help you monitor the Oracle Application Servers. You can customize these policies depending on the requirements of your IT environment. This chapter includes general guidelines about the Oracle AS SPI policies and explains how you can customize them. For more information see the Policies section in the Oracle AS SPI online help.

### Oracle AS SPI Policy Groups and Types

You can customize the Oracle AS SPI policies to suit the needs of your IT environment. However, these policies can also work without any modification. For more information, see the Policy Groups section in the Oracle AS SPI online help.

#### Oracle AS SPI Policy Groups

The Oracle AS SPI policies are organized under the top-level - SPI for Oracle AS policy group (as shown in the following figure.)



The parent policy group—SPI for Oracle AS— contains the OASSPI policy group and the OASSPI Discovery policy group.

The OASSPI policy group includes the following policy groups:

- **Logfiles:** Policies in this group generate messages according to logfile and error text detected in both the Oracle Application Server logfiles and in the Oracle AS SPI logfiles. The Logfiles policy group contains the following policies:
  - Oracle AS Logs: This policy monitors the Oracle AS log files.
  - OASSPI-Logfile-Monitor: This policy monitors the Oracle AS log files.  
Both OASSPI-Logfile-Monitor and Oracle AS Logs policies monitor Oracle AS log files.
  - OASSPI Error Log: This policy monitors the OASSPI error log.
- **Metrics:** The policies in this group generate messages according to threshold settings that monitor Oracle Application Server availability and performance metrics.

- **Monitors:** This group contains collector policies that pertain to all metrics scheduled to be collected in the specified collection interval. These policies are named according to collection intervals.

The Discovery policy group includes the following policies:

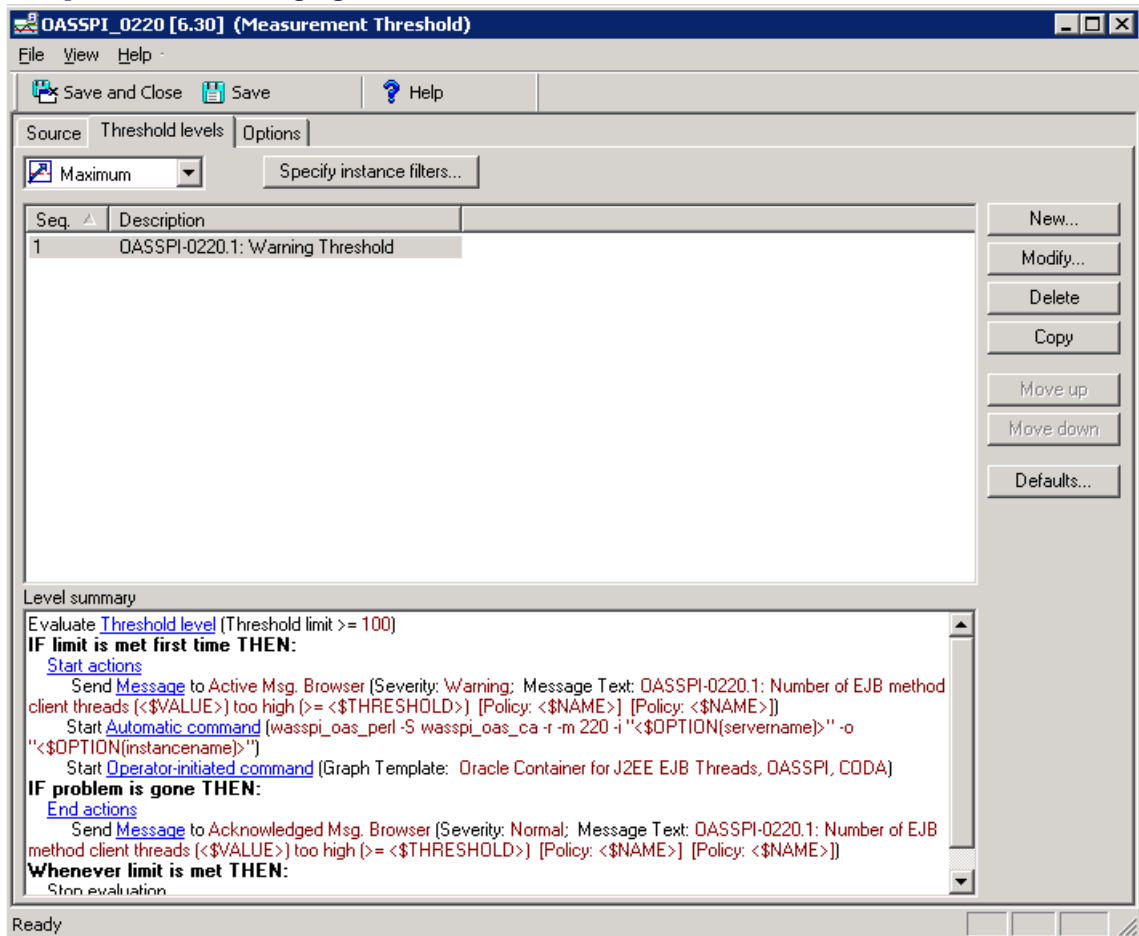
- **OASSPI Messages:** This policy intercepts Oracle AS SPI messages for the HPOM message browser.
- **OASSPI Service Discovery:** This policy gathers the information used by the management server to update the service map.

The Discovery policy automatically updates the Oracle Application Server configuration information in the service map. Clear the AUTO\_DISCOVER check box in the configuration editor if you do not want the discovery policy to automatically overwrite the configuration defined by you. For more information on the configuration editor see Configuring Oracle AS SPI section in the Oracle AS SPI online help.

## Oracle AS SPI Policy Types

*Metric policies* define how data is collected for the individual metric and set a threshold value. When this threshold is exceeded alerts/messages appear in the message browser. You can change the threshold within a policy by opening the policy (double-click the policy name), clicking the **Threshold levels** tab, and then clicking **Threshold level** in the Level Summary pane.

Incoming values for metric OASSPI-0220 are compared against its threshold limits. For example, in the following figure, the default threshold is set at 100.





*Collector policies* define all metrics for the Oracle Application Server that are scheduled for collection at a specified interval. The collector policy names include the collection interval (for example, OASSPI-OC4J-15min if the collection interval is 15 minutes).

You can open a collector policy (double-click the policy name) and see all the metrics (by number) collected within an interval. When you double-click the policy, the Measurement Threshold window opens. All the metrics collected appear in the Command box. The metrics are preceded by the `-m` option of the collector/analyzer command `wasspi_oas_ca`.

## Basic Policy Customizations

This section covers basic policy customizations like changing threshold values, scheduling or deleting a metric from data collection, opening a metric policy or collector policy and so on.

Before you begin to customize any of the policies, make copies of the original policies so that the default policies remain intact.

### Modifying Metric Policies

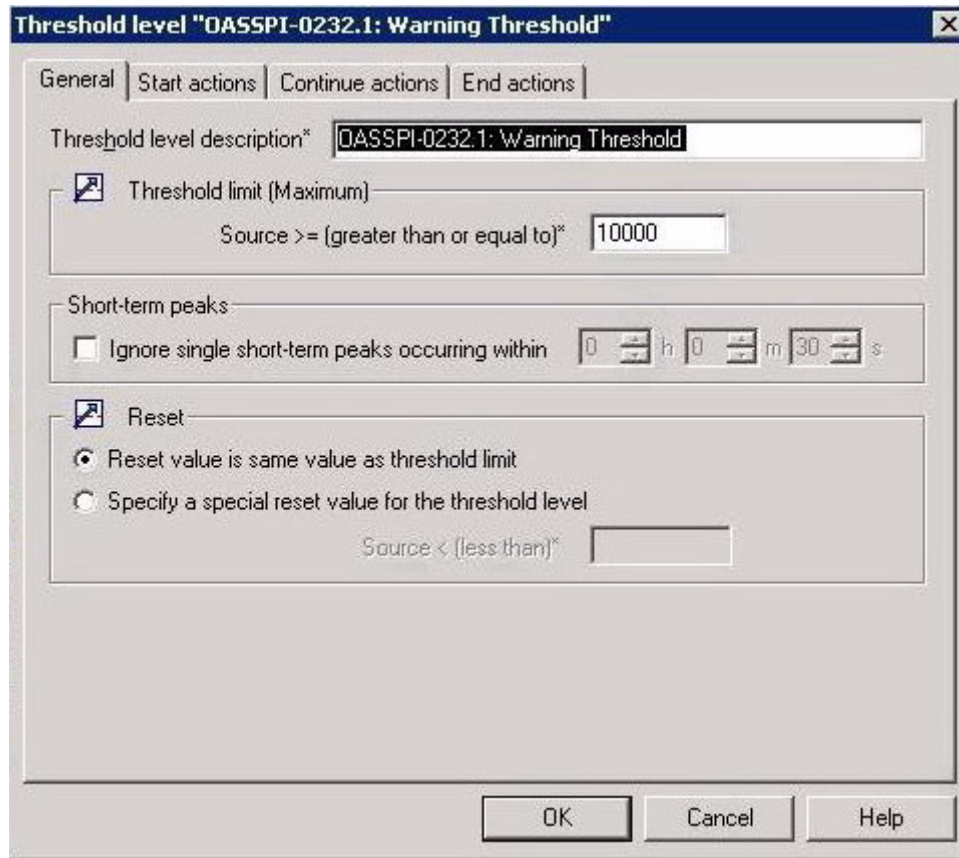
You can modify the metric attributes for all monitored instances of Oracle Application Server. Some of these attributes are defined in the Configuration Properties section in the Oracle AS SPI online help.

#### Threshold Level and Actions

To modify the threshold level and actions of a policy, follow these steps:

- 1 From the HPOM console go to **Operations Manager** → **Policy management** → **Policy groups** → **SPI for Oracle AS** → **OASSPI** → **Metrics**.
- 2 Double-click the policy for which you want to change the threshold value. The policy window opens.
- 3 Select the **Threshold Levels** tab and double-click the policy description in the window that opens. The Threshold Level window opens.

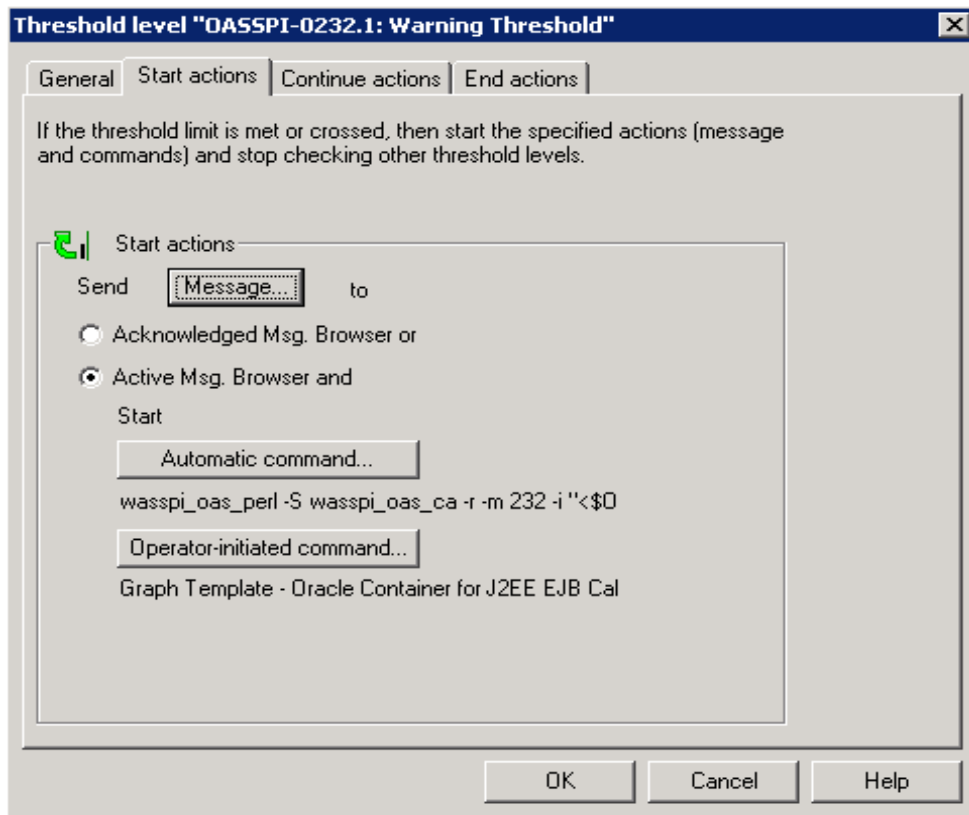
The following figure shows the Threshold Level window.



You can modify the following attributes from the Threshold Level window:

- *Threshold limit*: If the threshold limit is met or crossed the Oracle AS SPI triggers an alarm or message.
- *Short-term peaks*: Short-term peak is a minimum time period over which the monitored value must exceed or drop (for minimum thresholds) the threshold before a message is generated. When you set a short-term peak value then a message is sent only if the monitored value exceeds the threshold limit each time the value is measured during the duration of time you select. If the duration is set to 0 or the box is left empty, an alarm is generated as soon as HPOM detects that the threshold has been equaled or crossed.
- *Reset*: Reset is the limit below which the monitored value must drop or exceed (for minimum thresholds) to return the status of the monitored object to normal.

As the following figure shows, the Threshold Level window has the following three action tabs. You can click any of the action tabs to set the related actions.



- *Start actions:* Start actions are the actions carried out the first time the threshold is crossed.
- *Continue actions:* Continue actions are actions carried out at each subsequent polling interval if the monitored value did not attain the reset value
- *End Actions:* End actions are actions carried out after the monitored value crosses the reset value.

In each of the actions tabs, you can set the type of actions to perform.

The Oracle AS SPI lets you generate graphs and reports, or to add custom programs. You can generate the reports and graphs through:

- *Automatic command:* An automatic command runs when the rule is matched. The automatic command that is delivered with the Oracle AS SPI generates a snapshot report that shows the data values at the time the action was triggered because of an exceeded threshold. You can view the report in the message annotations.
- *Operator-initiated command:* An operator-initiated command is attached to the message that the rule sends to the message browser. You can run this command from the message browser. The operator-initiated command delivered with the Oracle AS SPI lets you click **Perform Action** in the Message Properties window to view a graph of the metric whose exceeded threshold generated the message, along with other related metric values.

## Message and Severity

To modify the message and severity of a policy, follow these steps:

- 1 From the HPOM console select **Operations Manager** → **Policy management** → **Policy groups** → **SPI for Oracle AS** → **OASSPI** → **Metrics**.

- 2 Double-click the policy for which you want to modify the severity and message text. The Measurement Threshold window opens.
- 3 Double-click the threshold level description. A new window opens. Click the **Start Actions** tab.
- 4 Click **Message**. The Outgoing Message window opens.
- 5 Click the **Message Attributes** tab and make the necessary modifications. Click **OK**.  
In the Outgoing message defaults window you can modify the following attributes:
  - *Severity*: Indicates the importance of the event that triggers this message.
  - *Message Text*: You can modify the text of the message but do *not* modify any of the parameters—beginning with \$ and surrounded by <> brackets—in a message.
- 6 Click **Save and Close** in the policy window to save the changes and exit.

## Advanced Policy Customizations

Advanced Policy customizations include making copies of default policy groups to customize a few settings and deleting whole groups of metrics within a policy's command line.

### Creating New Policy Group

You can keep the custom policies that you create separate from the original default policies by creating new policy groups. Before you create a new policy group you must first determine the metrics and policies you want to modify. To create a new policy group, follow these steps:

- 1 Create a new policy group:
  - a In the HPOM console select **Operations Manager** → **Policy management** → **Policy groups**.
  - b Right-click the policy group you want to copy and select **Copy**.  
For example, right-click the **Metrics** policy group under OASSPI and select **Copy**.
  - c Right-click the group under which this policy group is located and select **Paste**.  
For example, right-click **OASSPI** and select **Paste**.
  - d Right-click the new group and select **Rename**. Type in a new name.  
For example, right-click **Copy of Metrics** and select **Rename**.
- 2 Rename the original policies within the new policy group:
  - a Double-click the new policy group to get a list of the policies.
  - b Double-click a policy. The policy window opens.
  - c Click **File** → **Save As**. The Save As window opens.
  - d Type a new policy name and click **OK**.
  - e Click **File** → **Exit** to close the policy window.
- 3 Delete all original policies within the new policy group. To do this, select the policies and press the **Delete** key. The Confirm multiple delete window opens.

Click **Yes** to confirm delete; otherwise click **No**.

- 4 Alter the renamed policies within the new group as necessary.

## Oracle AS SPI Collector/Analyzer Command with Parameters

The `wasspi_oas_perl -S wasspi_oas_ca` command is used in every collector policy. You can view the default command line parameters within each collector policy in the Command box in HPOM console. Double-click the policy to open the policy window, the Command box is a part of this window.

### Basic Collector Command Parameters

The `wasspi_oas_ca` command is required to start the Oracle AS SPI data collection. You can add other parameters to this command. The following table lists the parameters used by the default collector policies.

**Table 1 Collector Command Parameters**

Parameter	Description	Syntax with Example
<code>-e</code>	(exclude) Allows you to exclude specific servers; may not be used with <code>-i</code> option.	<b>Syntax:</b> <code>-e &lt;server_name&gt;</code> <b>Example:</b> <code>-e server2,server4</code>
<code>-i</code>	(include) Allows you to list specific servers to monitor. This option may not be used with <code>-e</code> option.	<b>Syntax:</b> <code>-i &lt;server_name&gt;</code> <b>Example:</b> <code>-i server1,server3</code>
<code>-m</code>	(metric) Specifies the metric numbers or number ranges on which to collect data.	<b>Syntax:</b> <code>-m &lt;metric_number, metric_number_range&gt;</code> <b>Example:</b> <code>-m 1,3-5,9-11,15</code>
<code>-matchver</code>	(match version) Specifies the exact Oracle Application Server version to monitor. This option may not be used with the <code>-minver</code> or <code>-maxver</code> options. If no matching versions are found, the command does not run.	<b>Syntax:</b> <code>-matchver &lt;version_number&gt;</code> <b>Example:</b> <code>-matchver 6.1</code>
<code>-maxver</code>	(maximum version) Specifies the highest Oracle Application Server version to monitor. Use with <code>-minver</code> to specify a range of versions. If no matching versions are found, the command does not run.	<b>Syntax:</b> <code>-maxver &lt;version_number&gt;</code> <b>Example:</b> <code>-matchver 7</code>

**Table 1 Collector Command Parameters**

Parameter	Description	Syntax with Example
-minver	(minimum version) Specifies the lowest Oracle Application Server version to monitor. Use with -maxver to specify a range of versions. If no matching versions are found, the command does not run.	<b>Syntax:</b> -minver <version_number> <b>Example:</b> -matchver 6.1
-r	(report) Generates an ASCII report for the specified metrics.	<b>Syntax:</b> -r
-t	Allows you to create a new policy group by adding a prefix to an existing collector policy along with the metric numbers.	<b>Syntax:</b> wasspi_oas_ca <prefix>-<collector_policy> -m <metric_number> -type <prefix>- <b>Example:</b> wasspi_oas_ca -m 1,2,10,11 -t DEV
-type	Allows you to specify the type of Oracle Application Server (OC4J or OHS)	<b>Syntax:</b> <b>Example:</b> wasspi_oas_ca -m 1,2,5,10,11,260 -type ajp13
-x	Allows you to specify a property and value. <b>Syntax:</b> -x <property>=<property_value> <property> can be one of the following: <ul style="list-style-type: none"> <li>alarm: When off, overrides any default alarming defined for the metric. <b>Example:</b> -x alarm=off</li> <li>prefix: Default: JMXUDM_. Specify the prefix of the metric ID. <b>Example:</b> -x prefix=SALES_</li> <li>Print: When on, prints the metric name, instance name, and metric value to STDOUT in addition to any configured alarming or logging. <b>Example:</b> -x print=on</li> <li>graph: When off, prevents graphing function. <b>Example:</b> -x graph=off</li> <li>report: When off, prevents reporting function. <b>Example:</b> -x report=off</li> </ul>	

### Examples

- To collect specific data on all configured servers:  
wasspi\_oas\_ca -m 1,2,10,11 -minver 10.0
- To collect data from specific servers only:  
wasspi\_oas\_ca -m 1,2,10,11 -minver 10.0-i server1,server2
- To not collect data from specific servers:  
wasspi\_oas\_ca -m 1,2,10,11 -minver 10.0-e server1,server2

## Changing the Collection Interval for Scheduled Metrics

You can change the collection interval for all scheduled metrics by changing the Polling Interval in the respective collector policy. For example, to change the collection interval of default metrics from 5 minutes to 10 minutes for the Oracle AS SPI collector policy OASSPI-0C4J-05min, follow these steps:

- 1 From the HPOM console, select **Operations Manager** → **Policy management** → **Policy groups** → **SPI for Oracle AS** → **OASSPI** → **Monitor**.
- 2 Double-click the collector policy **OASSPI-0C4J-05min**. The Measurement Threshold window opens.
- 3 Click **File** → **Save As**. The Save As window opens.
- 4 Change the existing name in the Name box to **OASSPI-0C4J-10min**.
- 5 Set the new interval.
  - a Click the **Schedule** tab.
  - b From the Schedule Task drop-down list select “Once per interval”.
  - a Set the interval to 10 minutes.
- 6 Deploy the new policy.
  - a Right-click **OASSPI-0C4J-10min** and select **All Tasks** → **Deploy on....**
  - b Select the nodes on which to deploy the policy.
  - c Click **OK**.

## Changing the Collection Interval for Selected Metrics

You can change the collection interval of metrics, according to the requirements of your environment. For example, you can change the collection interval from 15 minutes to 10 minutes for metrics C108 and C109.



The following steps show how to change metrics C108 and C109 of collector policy OASSPI-OHS-15min, but you can change the collection interval of any metric using these steps.

To change the collection interval, follow these steps:

- 1 Rename the selected metrics to reflect the new interval.
  - a From the HPOM console, select **Operations Manager** → **Policy management** → **Policy groups** → **SPI for Oracle AS** → **OASSPI** → **Monitor**.
  - b Double-click the collector policy **OASSPI-OHS-15min**. The Measurement Threshold window opens.
  - c Click **File** → **Save As**. The Save As window opens.
  - d In the Name box change the existing name to **OASSPI-OHS-10min**. Click **OK** to confirm save or click **Cancel** to discard changes.
- 2 In the Command text box, delete all metrics after -m except 108, 109.
- 3 Set the new interval.
  - a Click the **Schedule** tab.

- b From the Schedule task drop down list, select “Once per interval” and set the interval to 10 minutes.
  - c Click **Save and Close** to confirm the changes and close the policy window.
- 4 Edit the original policy to remove the modified metrics.
    - a Double-click the default collector policy **OASSPI-OHS-15min**. The policy window opens.
    - b In the Command box, delete metrics 108, 109 after `-m`.
    - c Click **Save and Close** to save the changes.
  - 5 Deploy the modified policies.
    - a Right-click **OASSPI-OHS-10min** and select **All Tasks** → **Deploy on...**
    - b Select the nodes on which you want to deploy the policy.
    - c Click **OK**.
    - d Right-click **OASSPI-OHS-15min** and repeat steps b-d.

## Customizing the Threshold for Different Servers

You can set different threshold values for the same metrics on different servers according to your needs. For example, you could set the threshold value for metric C220 at 90 for SERVER\_1 but let the threshold be 100 for all other servers. To do this you can copy the existing condition and modify it to serve as the exception. Follow these steps:

- 1 Double-click the metric you want to customize (for example, double-click OASPI-0220). The Measurement Threshold window opens.
- 2 Select the **Threshold levels** tab.
- 3 Select the desired condition and click **Copy** to make a copy of the condition.
- 4 Name the condition **OASSPI-0220 . 2**.
- 5 Click **Specify instance filters...** The New Rule window opens.
- 6 Select the **Condition** tab and in the Object Pattern field, enter the following details:  
`<ServerName.var1>:<ServerPort.var2>:<NodeName.var3>:<*.var4>:<*.var5>:<*.var6>`  
 For Example: If you want to set threshold for the application server SERVER\_1, enter the following:  
`SERVER1:<*.var2>:<*.var3>:<*.var4>:<*.var5>:<*.var6>`  
*var1, var2, var3, var4, var5, and var6* are user defined variables. These variables must be different from the HPOM policy variables.
- 7 Click **OK**.
- 8 Double-click the condition **OASSPI-0212 . 2**. The Threshold Level window opens.
- 9 Change the threshold limit to 90. Click **OK**.
- 10 Click **Save and Close** in the Measurement Threshold window, to save the changes and exit.



## Creating Custom Tagged Policies

You can customize a policy by using the tag option (`-t` on the command line) that allows the collector/analyzer to recognize customized policies that have a tag attached to the name. This option gives you with the flexibility of using more than a single set of policies to define conditions pertaining to specific installations of Oracle Application Server.

When multiple nodes are managed by a number of groups, you can use this option to create specially tagged policies that are separate from your original setup. In such a case, you must make copies of the policies, rename them with the tag and rework the collector policy to pick up the tagged names, then assign the policies to the various groups.

For example, you could create a group of policies and change each policy name to include `CLIENT01` in it. You could name a metric policy as `CLIENT01-OASSPI-0001` (retain the name of the metric used). The collector policy could be named `FIRST_CLIENT-OHS-05min`. You could also set up another group for `SECOND_CLIENT` and change all those policies to include `CLIENT02` in the name.

### Create a New Tagged Policy Group

To create a new tagged policy group, follow these steps:

- 1 Copy the original policy group.
  - a Right-click the policy group you want to copy and select **Copy**.  
For example, right-click the **Metrics** policy group under **OASSPI** and select **Copy**.
  - b Right-click the group under which this policy group is located and select **Paste**.  
For example, right-click **OASSPI** and select **Paste**.
  - c Right-click **Copy of Metrics** and select **Rename**. Rename the new group to identify the new metric policies.  
For example, rename the group to `CLIENT01Metrics`.
  - d Select **File** → **Exit** to close the policy window.
- 2 Rename the original policies within the new policy group.

The names of the metric policies in the new group must contain the new name followed by the original metric number. For example, you can rename a copy of `OASSPI-0001` as `CLIENT01-OASSPI-0001`.

The name you give to the new collector policy must also contain the identifying name. You must modify the scheduled collection to include the new group by inserting the `-t` parameter in the Command box. The Command box is in the policy window that appears when you double-click the collector policy.

For example: `wasspi_oas_ca -m 1,12,16 -t CLIENT01-`

- a Double-click the policy. The policy window opens.
  - b Click **File** → **Save As**. The Save As window opens.
  - c Type a new policy name and click **OK**.
- 3 Select the original policies within the new policy group and press **Delete** to delete all the original policies. The Confirm multiple item delete window opens.
  - 4 Click **Yes** to confirm delete.

## Policy Variables

You can use the following variables when you create your own policies.

**Table 2 Policy Variables**

Name	Description
instancename	The instance for which the SPI reports the metric in case of multi-instance metrics. <b>Example:</b> /oc4j/Petstore/EJBs/shoppingcartEjb.jar/TheCart/ejbActivate
node	The node on which the OC4J/OHS server is running. <b>Example:</b> mool.hp.com
servername	The OC4J/OHS server name. This corresponds to the NAME configuration property. <b>Example:</b> my_server
service_key	The service ID used to light up the nodes in the service map.

## Restoring Default Oracle AS SPI Policies

To restore the default Oracle AS SPI policy groups on your HPOM management server, you must remove and then reinstall the Oracle AS SPI. See [Removing the Oracle AS SPI](#) on page 13 and [Installing the Oracle AS SPI](#) on page 11.

## Viewing Text-Based Reports

Some policies have actions defined with threshold violations or error conditions. These actions automatically generate reports. The reports are snapshots of data values collected from the server around the time the alarm occurred.



The reports discussed in this section are different from HP Reporter reports that show consolidated data generated as web pages in a management-ready presentation format. See [Integrating the Oracle AS SPI with HP Reporter](#) on page 40.

## Automatic Command Reports

Many metrics generate Automatic Command reports. These reports are generated as soon as an alarm is triggered in HPOM. Automatic Command reports are generated for a single Oracle Application Server instance with the exceeded threshold.

When an Automatic Command report is executed from HPOM, the server is queried for additional data. If you set the HPOM console message browser to display the SUIAON column, you can see an “S” under the “A” column (see the following figure). This indicates that a generated report is available in the Annotations area of the Message Properties.

Severity	Duplicates	S	U	I	A	O	N	Received	Created	Service
Normal		-	-	X	-	-	-	8/14/2008 12:59:17 PM	2/21/2009 1:00:13 PM	WLS5SPI_MSG_...
Warning		-	-	X	5	-	X	8/14/2008 4:59:40 PM	2/21/2009 4:59:12 PM	WLS_Servlets_...
Warning		-	-	X	5	-	X	8/14/2008 4:59:40 PM	2/21/2009 4:59:18 PM	WLS_Servlets_...
Warning		-	-	X	5	-	X	8/14/2008 4:59:40 PM	2/21/2009 4:59:30 PM	WLS_Servlets_...
Warning		-	-	X	5	-	X	8/14/2008 4:59:40 PM	2/21/2009 4:59:32 PM	WLS_Servlets_...
Warning		-	-	X	5	-	X	8/14/2008 4:59:40 PM	2/21/2009 4:59:32 PM	WLS_Servlets_...
Normal		-	X	-	-	-	-	8/15/2008 2:01:20 AM	2/22/2009 2:00:54 AM	
Normal		-	X	-	-	-	-	8/16/2008 2:01:11 AM	2/23/2009 2:00:59 AM	
Normal		-	X	-	-	-	-	8/17/2008 2:01:12 AM	2/24/2009 2:01:01 AM	
Normal		-	X	-	-	-	-	8/18/2008 2:00:57 AM	2/25/2009 2:00:54 AM	
Normal		-	-	X	-	-	-	8/18/2008 8:24:34 AM	2/25/2009 8:25:01 AM	WLS5SPI_MSG_...
Major		-	-	-	-	-	-	8/18/2008 12:29:47 PM	2/25/2009 12:29:38 PM	
Critical	1	-	-	-	-	-	-	9/9/2008 12:26:36 PM	9/9/2008 12:24:58 PM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:54:50 PM	9/9/2009 11:50:48 AM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:55:06 PM	9/9/2009 11:56:42 AM	Server
Warning	2	-	-	-	-	-	-	11/9/2008 1:55:08 PM	8/19/2008 12:51:39 PM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:55:26 PM	9/9/2009 12:01:02 PM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:55:27 PM	9/9/2009 12:01:12 PM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:55:31 PM	9/9/2009 12:01:22 PM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:55:33 PM	9/9/2009 12:01:32 PM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:55:33 PM	9/9/2009 12:01:43 PM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:55:34 PM	9/9/2009 12:01:53 PM	Server
Warning	3	-	-	-	-	-	-	11/9/2008 1:55:35 PM	9/9/2009 12:00:57 PM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:55:37 PM	9/9/2009 12:02:13 PM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:55:39 PM	9/9/2009 12:02:23 PM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:55:40 PM	9/9/2009 12:03:33 PM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:55:40 PM	9/9/2009 12:02:33 PM	Server
Warning	1	-	-	-	-	-	-	11/9/2008 1:55:40 PM	9/9/2009 12:02:43 PM	Server

To view Automatic Command reports, do one of the following:

- Double-click a message in the HPOM message browser. The Message Properties window opens. Select the Annotations tab.
- Right-click a message and select **Annotations**. The Message Properties window opens.

The reports are available in the Message Properties window. These reports show data values of a single server. Column descriptions in the window provide further information.

## Manually Generated Reports

Reports are generated for all Oracle Application Server instances configured on the managed node. In contrast to Automatic Command reports that are generated for a single Oracle Application Server instance, manually generated reports reflect the current state of all Oracle Application Servers on the managed node.

To manually generate a report, follow these steps:

- 1 From the HPOM console, select **Operations Manager** → **Tools** → **SPI for Oracle AS** → **OASSPI Reports**.
- 2 Double-click the report you want to see. The Select where to launch this tool window opens.
- 3 Select the managed node for which you want to see reports and Click **Launch**. The Tool Status window opens.
- 4 View the report in the tool output field.
- 5 Click **Close** to close the window.

## Sample Report

The following figure shows the format of a Oracle AS SPI report. This report is automatically generated (Automatic Command report).

**Tool Status**

Launched Tools:

Status	Action	Start/Finish Time	Node	Command
Succeeded	C005_JVMMem...	1/29/2006 3:28...	vmwassplw21.i...	wasspi_oas_perf -S wasspi_oas_co -r -m 5 -mc

Tool Output:

```

Report for Application Server home
Jan 29, 2006 2:27:57 AM
Metric C005_JVMMemUtilPet

JVM Data          Free Heap Memory (KB)    Heap Size (KB)          Active Threads          Up Time (msecs)
-----
/JVM              1,957                    4,700                   21                      166,490,782

No data available for server HTTP_Server.

```

Rerun Close Help

## Oracle AS SPI Graphs

Some policies have operator actions associated with them that allow you to generate a graph. To view these graphs, follow these steps:

- 1 Double-click a message in the HPOM message browser. The Message Properties window opens.
- 2 Click the **Commands** tab. You can generate a graph if an operator-initiated command is configured and data is collected.
- 3 Click **Start** to generate the graph.



# 5 Integrating HPOM Reporting and Graphing Features with the Oracle AS SPI

Oracle AS SPI can be integrated with the following HP products. These products must be purchased separately.

- **HP Reporter**

Reporter produces management-ready web page reports that show historical and trends related information.

After you integrate HP Reporter with Oracle AS SPI, Reporter generates a variety of reports, every night, that show consolidated information about the performance and availability of Oracle Application Server instances on configured managed nodes. See [Integrating the Oracle AS SPI with HP Reporter](#) on page 40.

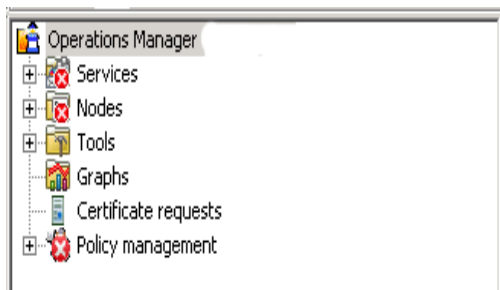
- **HP Performance Manager**

HP Performance Manager provides graphing capability.

You can view the graphs after integrating the Oracle AS SPI with HP Performance Manager. The graphs are available only if performance data is logged in the default performance subagent CODA or HP Performance Agent. CODA is automatically deployed on all HPOM managed nodes.

See [Integrating the Oracle AS SPI with HP Performance Manager](#) on page 46.

**Figure 1 The Management Server Console Tree**



## Integrating the Oracle AS SPI with HP Performance Agent

If your IT environment requires you to generate graphs and reports from historical data or to store large volumes of performance data, you may want to use the HP Performance Agent 8.10 to collect and store performance data. HP Performance Agent must be purchased separately.

The data collected by HP Performance Agent is used by HP Reporter and HP Performance Manager.

To configure the Oracle AS SPI data collector to use HP Performance Agent, follow these steps:

- 1 Create a `nocoda.opt` file on the managed node, in the following directory:

<b>Operating System</b>	<b>File Location</b>
HP-UX, Linux, Solaris	<code>/var/opt/OV/conf/dsi2ddf/</code>
AIX	<code>/usr/lpp/OV/conf/dsi2ddf/</code>
Windows (DCE)	<code>C:\Program Files\HP Openview\data\conf\dsi2ddf\</code>
Windows (HTTPS)	<code>C:\Documents and Settings\All Users\Application Data\HP\HP BTO Software\wasspi\oas\conf\dsi2ddf\</code>

If the directory `dsi2ddf` does not exist, create it.

- 2 Edit the `nocoda.opt` file to contain a single line:


**ALL**

- 3 Save the file.

## Integrating the Oracle AS SPI with HP Reporter

Before integrating the Oracle AS SPI with Reporter, you must configure the Oracle AS SPI by deploying the software, configuring server connection, and assigning or deploying policies on target managed nodes.

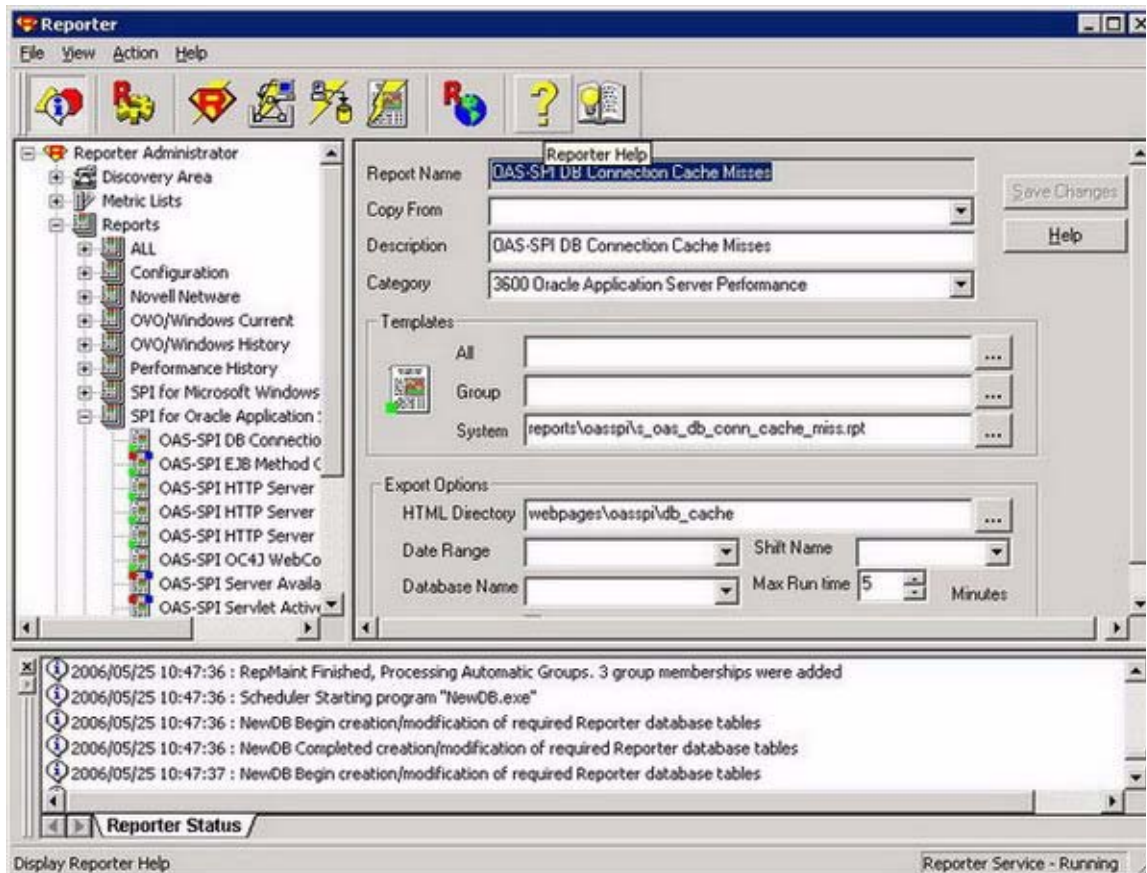
To integrate the Oracle AS SPI with Reporter, follow these steps:

- 1 Install the Oracle AS SPI report package on the Windows system running Reporter:
    - a Insert the HP Operations Smart Plug-ins DVD into the DVD drive of the Windows system running Reporter. The HP Operations Manager InstallShield Wizard opens.
    - b Click **Next**. The Program Maintenance window opens. Click **Install Products**. The Product Selection window opens.
    - c From the options listed (there are three Product Selection windows), select the **Reporter** option of Oracle AS SPI and click **Next**.
    - d Complete the installation by following the instructions that appear as you proceed.
-  On Windows 2000 managed nodes, when installing the Oracle AS SPI report package, you may get an error message indicating that the installer has detected an older version of the installer on your system. You can safely ignore the message and continue.



- 2 To see the Reporter window, click **Start → All Programs → HP OpenView → Reporter → Reporter**.
- 3 Check the Reporter window (see the illustration that follows) to note changes made in Reporter's configuration.

In the Reporter Status pane (at the bottom of the Reporter window), you can view information on programs that are running and any errors occurring on the managed nodes. You can check the status pane to see whether Reporter is updated with the Oracle AS SPI reports.



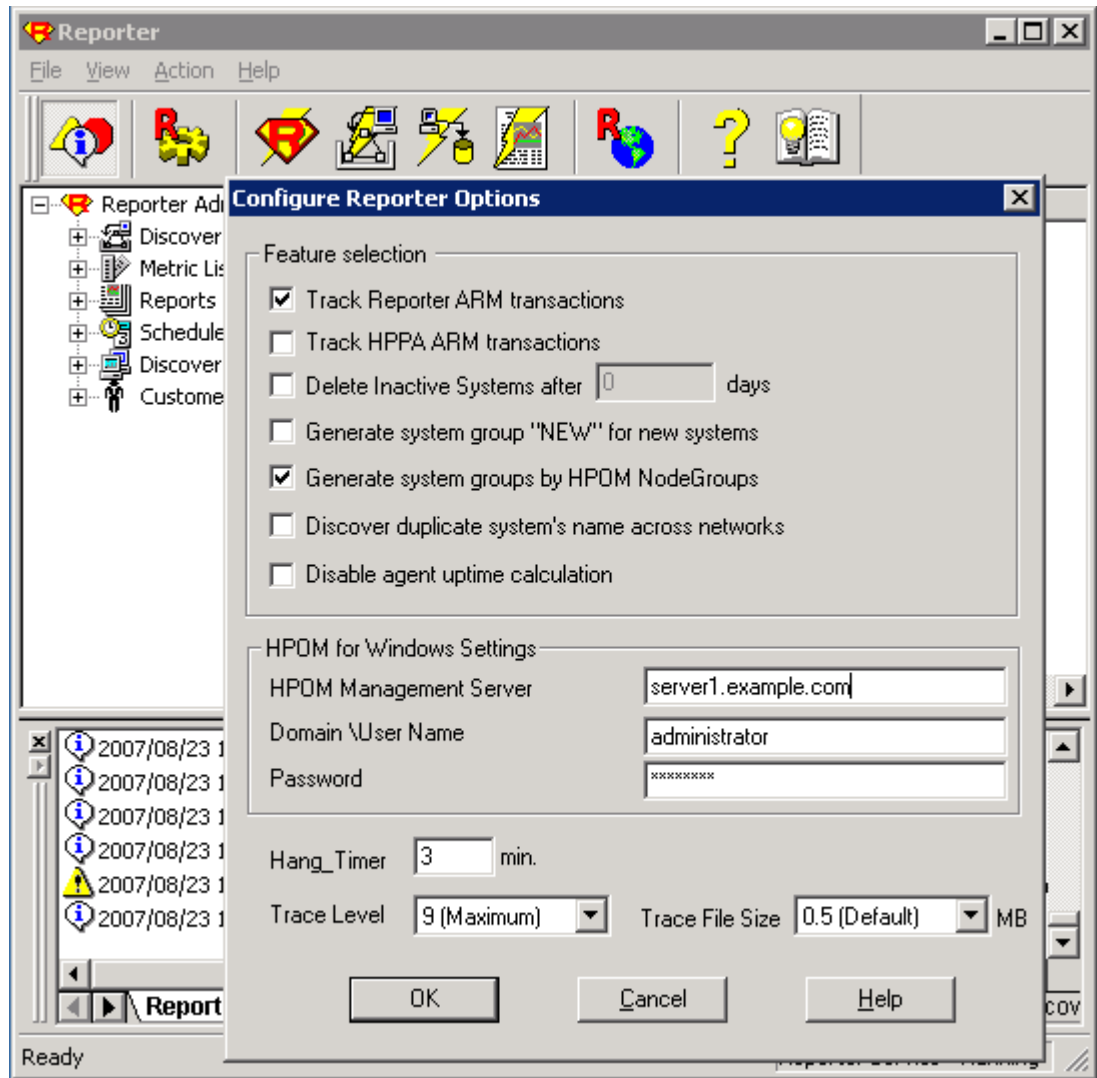
In the Reporter Help, you can find instructions for assigning Oracle AS SPI reports to the target nodes. To access Help, follow these steps:

- a Right-click **Reports** or **Discovered Systems** in the left panel of the Reporter main window.
  - b From the submenu, select **Report Help** or **Discovered Systems Help**.
  - c Read the topic, **To assign a report definition to a Discovered Systems Group**.
- 4 Add group and single system reports by assigning reports as desired. (For complete information, see the Reporter Help and the online *Concepts Guide*.)
- ▶ Group and single system Oracle AS SPI reports require that you identify systems by their full name. For example, *abc.xyz.com* is acceptable while *abc* is not.

## Viewing Reports from the HPOM Management Console

To view Oracle AS Reports from the HPOM Console, follow these steps:

- 1 Close the HPOM for Windows console (if it is open).
- 2 Open the HP Reporter window. Click **File** → **Configure** → **Options**. The Configure Reporter Options window opens.



- 3 In the HPOM for Windows Settings section, specify the name of the management server and user details. The user must be an HPOM administrator (a member of the HP-OVE-Admins group). Click **OK**.
- 4 From the menu bar again, click **Action** → **Run** → **Run All**.  
This will discover the node data from HPOM and generate the reports. This may take some time.
- 5 After the HP Reporter tasks complete, open the HPOM console. **Reports** will be visible in the console tree.

## Reports Generated by Reporter

The reports available through the integration of Reporter and the Oracle AS SPI show consolidated data on performance and availability of Oracle Application Server instances on the configured managed node (see [Sample Report](#) on page 45).

These reports are usually available one day after you install the Oracle AS SPI report package on the Reporter Windows system. See [Integrating the Oracle AS SPI with HP Reporter](#) on page 40 if you have not completed the report package installation.

After you integrate Oracle AS SPI with HP Reporter, you can see the list of reports under “Reports” section in the HPOM console.

The following tables show all pre-defined reports for groups (one or more managed nodes on which an Oracle Application Server instance is installed) and single systems.

**Table 3 Reports for All Systems - Oracle Application Server Performance**

<b>Title</b>	<b>Description</b>	<b>Oracle AS Version</b>
EJB Method Calls Process Rate - Top 20	Shows the number of all EJB method calls per minute for the top 20 servers. The top 20 servers are selected based on the highest average method calls per minute over the reporting period.	9.04, 10.1.2, 10.1.3
Servlet Active Threads - Top 20	Shows the average number of active servlet threads for the top 20 OC4Js. The top 20 OC4Js for the group are selected based on the highest average number of active threads over the reporting period.	9.04, 10.1.2, 10.1.3
Servlet Average Execution Time - Top 20	Shows the average servlet execution time for the top 20 OC4Js. The top 20 OC4Js for the group are selected based on the highest average servlet execution time over the reporting period.	9.04, 10.1.2, 10.1.3

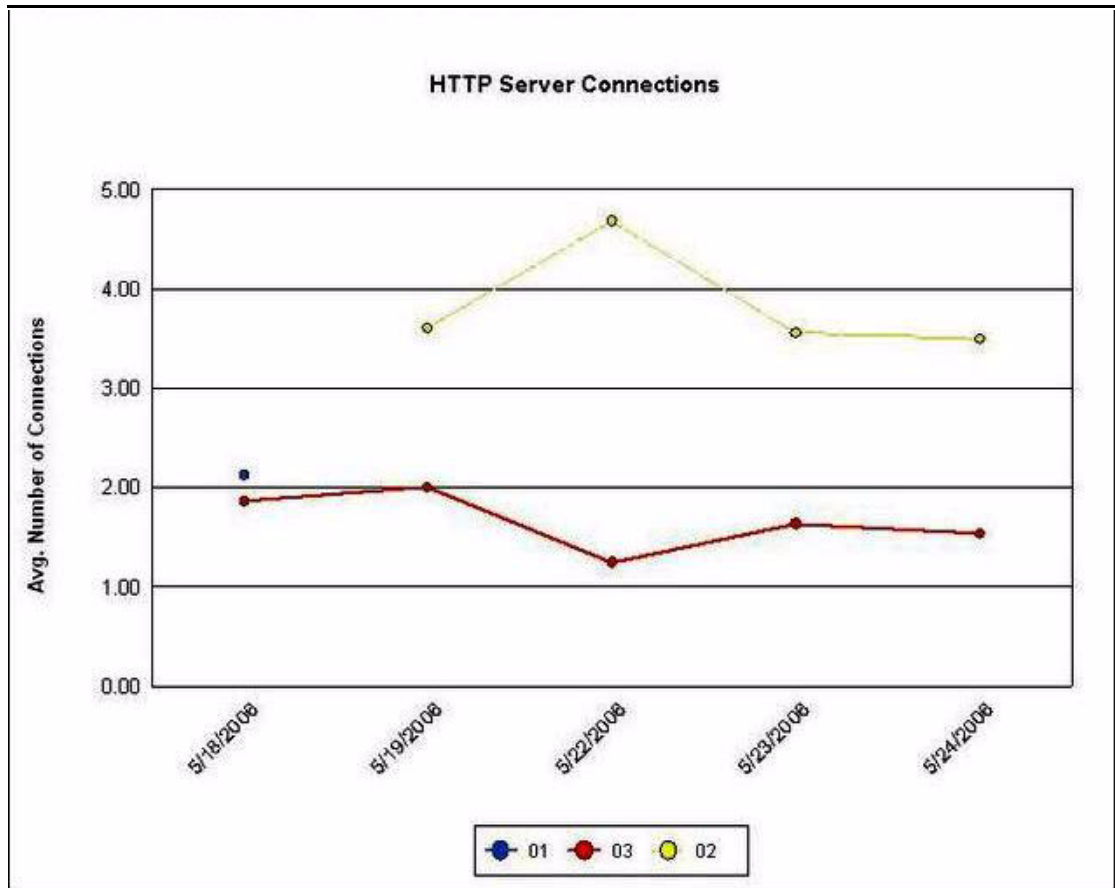
**Table 4 Reports for All Systems - Oracle Application Server Availability**

<b>Title</b>	<b>Description</b>	<b>Oracle AS Version</b>
Server Availability	Contains a daily histogram showing the percentage of uptime. In addition, a trendline provides the number of measurements performed, indicating how much data was available to determine availability. Uptime and downtime are measured by the Oracle AS SPI. A lower than expected trend line may indicate systems were unavailable or the data collection not running.	9.04, 10.1.2, 10.1.3

**Table 5 Reports for Single Systems**

<b>Title</b>	<b>Description</b>	<b>Oracle AS Version</b>
HTTP Server and OC4J Availability Details	<p>Contains spectrum graphs showing minutes of uptime by day and hour for the system. Uptime and downtime are measured by the Oracle AS SPI. "No Data" may include system downtime or data collection not running. Graphs are based on measured uptime and downtime only (that is, standby = down).</p> <p>The spectrum graphs use color to indicate the uptime percentage during each hour of each day.</p>	9.04, 10.1.2, 10.1.3
HTTP Server and OC4J System Resource Utilization	<p>Contains spectrum graphs showing CPU and system memory utilization day and hour for the system. Uptime and downtime are measured by the Oracle AS SPI. "No Data" may include system downtime or data collection not running. Graphs are based on measured uptime and downtime only (that is, standby = down).</p> <p>The spectrum graphs use color to indicate the uptime percentage during each hour of each day.</p>	9.04, 10.1.2, 10.1.3
HTTP Server Connections	Shows the average number of HTTP connections for each application server on the system	9.04, 10.1.2, 10.1.3
DB Connection Cache Utilization	<p>Contains spectrum graphs showing the percent DB connection cache utilization by day and hour for a system.</p> <p>"No Data" may include system downtime or data collection not running.</p>	9.04, 10.1.2, 10.1.3
OC4J WebContext Sessions	Shows the average number of WebContext sessions for each OC4J instance on the system.	9.04, 10.1.2, 10.1.3
EJB Method Calls Process Rate - Top 20	Shows the number of all EJB method calls per minute for the top 20 servers. The top 20 servers for the system are selected based on the highest average method calls per minute over the reporting period.	9.04, 10.1.2, 10.1.3
Servlet Average Execution Time - Top 20	Shows the average servlet execution time for the top 20 OC4Js. The top 20 OC4Js for the system are selected based on the highest average servlet execution time over the reporting period.	9.04, 10.1.2, 10.1.3

## Sample Report



## Removing the Oracle AS SPI Reporter Package

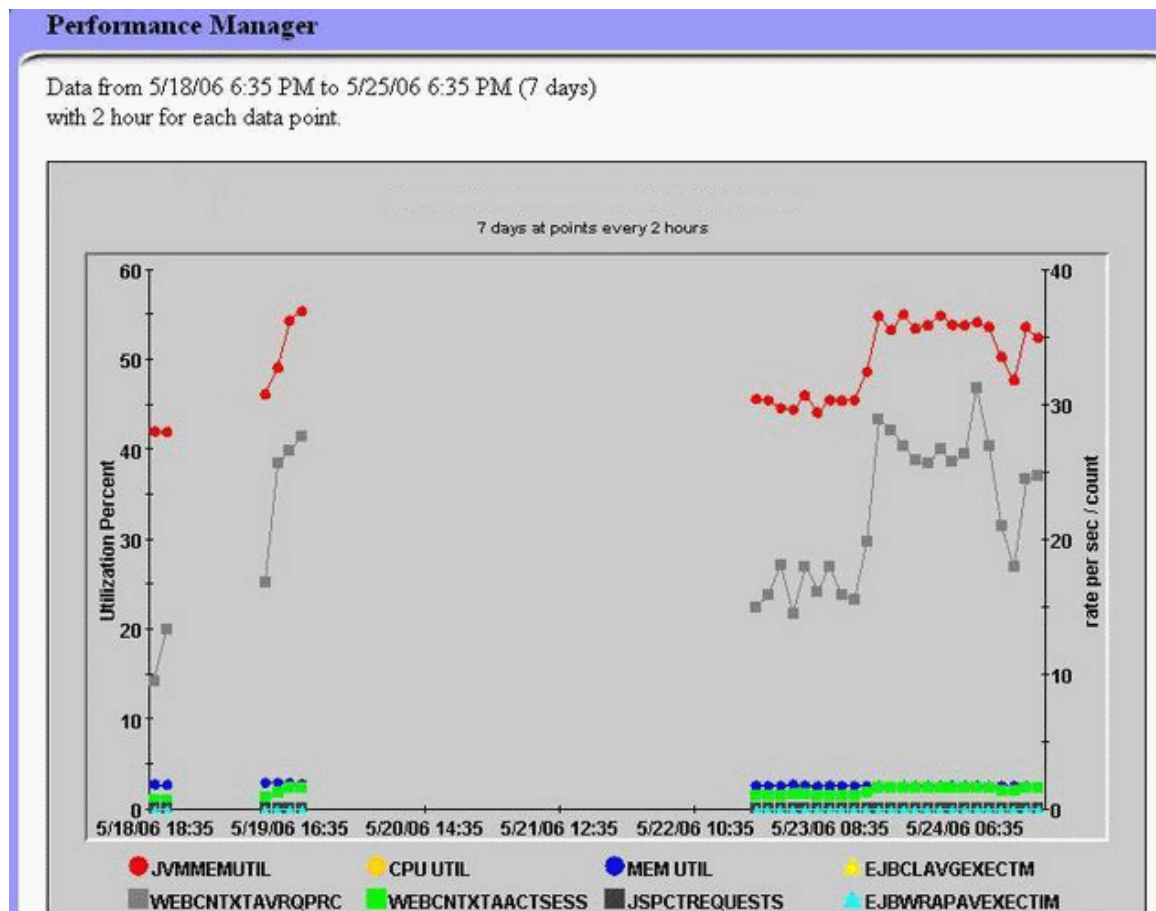
To remove the Oracle AS SPI Reporter Package, follow these step:

- 1 Insert the HP Operations Smart Plug-ins DVD into the DVD drive of the Windows system running Reporter. The HP Operations Manager InstallShield Wizard opens.
- 2 Click **Next**. The Program Maintenance window opens.
- 3 Click **Remove Products**. The Product Selection window opens.
- 4 From the options listed (there are three Product Selection windows) select the **Reports** option of Oracle AS SPI and click **Next** till the Remove the Selected Products window opens.
- 5 Click **Remove**.

# Integrating the Oracle AS SPI with HP Performance Manager

You must purchase and install HP Performance Manager separately. To integrate the Oracle AS SPI with HP Performance Manager, follow these steps:

- 1 Install the Oracle AS SPI graph package on the Windows system running HP Performance Manager:
  - a Insert the HP Operations Smart Plug-ins DVD into the DVD drive of the Windows system running Reporter. The HP Operations Manager InstallShield Wizard opens.
  - b Click **Next**. The Program Maintenance window opens. Click **Install Products**. The Product Selection window opens.
  - c From the options listed (there are three Product Selection windows), select the **Graph** option of Oracle AS SPI and click **Next**.
  - d Complete the installation by following the instructions as you proceed.
- 2 To graph any Oracle Application Server metric, use the data source name—OASSPI\_METRICS



## Viewing Graphs Associated with Alarm Conditions

For graphing purposes, the Oracle AS SPI organizes metrics according to type. When a message is generated for any metric, you can view a graph of that metric value along with related metric values.

To view a graph associated with an alarm condition (operator-initiated action must be defined with the Oracle AS SPI policy), follow these steps:

- 1 In the HPOM Message Browser, double-click the message for which you want to view the graph. The Message Properties window opens.
- 2 Click the **Commands** tab.
- 3 Click **Start** in the section Operator Initiated to start the operator-initiated command. The operator action launches your web browser, where you can view the graph.

## Viewing Graphs that Show Past or Current Conditions

To generate an available graph manually, follow these steps:


- 1 From the HPOM console, select **Operations Manager** → **Graphs** → **SPI for Oracle AS**.
- 2 Double-click the graph you want to generate. A new window opens.
- 3 Select the nodes from which you want to retrieve data. Select the date range and the granularity for the graph.
- 4 Click **Finish**.



**Graphs** appears in the HPOM console tree only if you install HP Performance Manager on the same system as the HPOM management server.

## Viewing Graphs from the HP Performance Manager Console

If you have not installed HP performance Manager on the same system as HPOM management server, you can view the Oracle Application Server SPI Graphs from the HP Performance Manager console. Follow these steps:

- 1 Click **Start** → **All Programs** → **HP** → **HP BTO Software** → **Performance Manager** → **Performance Manager**. The Performance Manager console opens.
- 2 From the Select Nodes pane, select the node for which you want to see graph. If the node is not listed in the list, add the node:
  - a Click **Admin** in the menu bar. The Manage Nodes window opens.
  - b Click the **Add a Node**  icon. The Add a Node Window opens.
  - c Enter the node name and click **Add**.
  - d Click **Home** on the menu bar.
- 3 From the Select a Graph pane, select **SPI for Oracle AS**.



- 4 Select the graph you want to see and click **Draw**.



If you have installed HP Performance Agent to collect performance data, you must select the **SPI for Oracle AS- OVPA <version>** from the list in the Select a Graph pane.

## Removing the Oracle AS SPI Grapher Package

To remove the Oracle AS SPI Grapher package follow these steps:

- 1 Insert the HP Operations Smart Plug-ins DVD into the DVD drive of the Windows system running Performance Manager. The HP Operations Manager InstallShield Wizard opens.
- 2 Click **Next**. The Program Maintenance window opens.
- 3 Click **Remove Products**. The Product Selection window opens.
- 4 From the options listed (there are three Product Selection windows), select the **Graphs** option of Oracle AS SPI and click **Next** till the Remove the Selected Products window opens.
- 5 Click **Remove**.



## 6 User-Defined Metrics

The Oracle AS SPI can collect data on roughly 55 metrics. However, you can expand that number by adding your own. The advantage of defining your own metrics is that you can monitor your own applications.

You can register application MBeans with the Oracle AS MBean server and create user-defined metrics (UDMs) that instruct the Oracle AS SPI to gather data from these MBeans.



A custom MBean must expose a “Name” attribute. The Oracle AS SPI uses this name as the identifying name for the MBean. If your custom MBean is a multi-instance MBean, each MBean instance must have a unique value in its “Name” attribute. For example, Oracle Application Server's ServletRuntime MBeans are multi-instance because a ServletRuntime MBean is instantiated by Oracle Application Server for each deployed servlet. The Name attribute of the MBean identifies the servlet that the MBean is monitoring.

See the JMX documentation for more information about creating MBeans. Also see the Oracle documentation for more information about registering MBeans.

You must understand the metric definitions DTD before creating UDMs. The sections that follow assume you are familiar with XML (extensible markup language) and DTDs (Document Type Definitions).

## Metric Definitions DTD

The `MetricDefinitions.dtd` file provides the structure and syntax for the XML file that you create. The Oracle AS SPI uses this DTD file to parse and validate the XML file you create. Following sections describe the `MetricDefinitions.dtd` file and provide an example XML file.

On a managed node, the `MetricDefinitions.dtd` file is located in the following directory:

### Operating System Directory

UNIX `/<OvAgentDir>/conf/oasspi`

Windows `\<OvAgentDir>\wasspi\oas\conf\`

For HPOM for Windows 8.10, `<OvAgentDir>` is typically is:

On Windows: `C:\Program Files\HP\HP BTO Software\` (for HTTPS managed nodes) or `C:\Program Files\HP OpenView\Installed Packages\{790C06B4-844E-11D2-972B-080009EF8C2A}` (for DCE managed nodes)

On UNIX: `/var/opt/OV/` or `/var/lpp/OV/`



Because the `MetricDefinitions.dtd` file is used at runtime, you should not edit, rename, or move it.

`MetricDefinitions.dtd` consists of the following elements:

- `MetricDefinitions`
- `Metric`
- `MBean`
- `FromVersion/ToVersion`
- `Calculation/Formula`

## The MetricDefinitions Element

The `MetricDefinitions` element is the top-level element within the `MetricDefinitions.dtd` file. It contains one collection of metrics, consisting of one or more metric definitions.

```
<!ELEMENT MetricDefinitions (Metrics)>
<!ELEMENT Metrics (Metric+)>
```

### Example

```
<MetricDefinitions>
  <Metrics>
    .
    .
    .
  </Metrics>
</MetricDefinitions>
```

## The Metric Element

The Metric element represents one metric. Each metric has a unique ID (for example, OASSPI\_0108). If a user-defined metric is an alarming, graphing, or reporting metric, the metric ID must be "OASSPI\_0XXX" where XXX must be a number from 700 through 799. Otherwise, if the metric is used only within the calculation of another metric, the metric ID must begin with a letter (case-sensitive) and can be followed by any combination of letters, numbers, and underscores (for example, "mbean1").

A Metric element contains one or more elements that represent the metric data source. Two data sources are supported: Mbeans and calculations. Each metric data source element is scanned for a FromVersion or ToVersion child element to determine which metric data source element to use for the version of the application server being monitored.

```
<!ELEMENT Metric (MBean+ | Calculation+)>
<!ATTLIST Metric id          ID          #REQUIRED
                  name        CDATA      ""
                  alarm        (yes | no)  "no"
                  report       (yes | no)  "no"
                  graph        (yes | no)  "no"
                  previous      (yes | no)  "yes"
                  description   CDATA      #IMPLIED >
```

The following table lists metric element attributes.

Attribute	Type	Required	Default	Description
id	ID	yes	--	The metric ID.
name	text	no	"no"	The metric name, used for graphing and reporting. The name can be up to 20 characters in length.
alarm	"yes" "no"	no	"no"	If yes, the metric value is sent to the agent through <code>opcmon</code> .
report	"yes" "no"	no	"no"	If yes, the metric value is logged for reporting.
previous	"yes" "no"	no	"yes"	If yes, the metric value is saved in a history file so that deltas can be calculated. If you are not calculating deltas on a metric, set this to "no" for better performance.
graph	"yes" "no"	no	"no"	If yes, the user-defined metric is graphed.
description	text	no	""	A description of the metric.

### Example

```
<Metric id="OASSPI_0100" name="ThreadPoolWaitCnt" alarm="yes">
.
.
.
.</Metric>
```

## The MBean Element

The MBean element is used when the data source of the metric is an attribute of a JMX MBean. The MBean element contains the following elements:

- **ObjectName** - the JMX-compliant object name of the MBean. The object name can include JMX-compliant pattern matching.
- **Attribute** - the MBean attribute name.
- **AttributeValueMapping** (optional) - numeric values that should be substituted for the values returned by the MBean attribute. This can be used to convert string attributes to numbers so they can be compared to a threshold. Each AttributeValueMapping contains one or more **Map** elements. Each Map element specifies one value to be mapped.
- **AttributeFilter** (optional) - provides basic filtering of MBeans based on MBean attribute values.
- **FromVersion/ToVersion** (optional) - the versions of the Oracle AS Server for which the MBean element is valid. See [FromVersion and ToVersion Elements](#) on page 54 for more information.

```
<!ELEMENT MBean (FromVersion?, ToVersion?, ObjectName,
                 Attribute,AttributeValueMapping?,
                 AttributeFilter*)>
<!ATTLIST MBean instanceType (single | multi) "single"
                 dataType      (numeric | string) "numeric" >

<!ELEMENT ObjectName (#PCDATA)>

<!ELEMENT Attribute (#PCDATA)>

<!ELEMENT AttributeValueMapping (Map+)>
<!ELEMENT Map EMPTY>
<!ATTLIST Map from CDATA #REQUIRED
               to   CDATA #REQUIRED >

<!ELEMENT AttributeFilter EMPTY>
<!ATTLIST AttributeFilter type (include | exclude) "include"
                           name      CDATA #REQUIRED
                           operator (initialSubString |
                                   finalSubString |
                                   anySubString | match |
                                   gt | geq | lt | leq | eq)
                           #REQUIRED
                           value     CDATA #REQUIRED >
```

The following table lists MBean element attributes.

Attribute	Type	Required	Default	Description
instanceType	"single" "multi"	No	"single"	Indicates if there are multiple instances of this MBean.
dataType	"numeric" "string"	no	"numeric"	Indicates if the value returned from the MBean attribute is a string or a numeric value.

The following table lists Map element attributes.

Attribute	Type	Required	Default	Description
from	text	yes	no default	The value that is to be mapped.
to	text	yes	no default	The new metric value to be returned in place of the mapped value.

The following table lists AttributeFilter element attributes.

Attribute	Type	Required	Default	Description
type	"include" "exclude"	no	"include"	Specifies if an MBean that matches this filter should be included or excluded from consideration by the data collector.
name	text	yes	no default	Specifies the MBean attribute on which to apply the filter.
operator	"initialSubString" "finalSubString" "anySubString" "match" "gt" "geq" "lt" "leq" "eq"	yes	no default	Specifies the filter to apply. "initialSubString", "finalSubString", "anySubString", and "match" can be used with MBean attributes that return text values. "gt", "geq", "lt", "leq", "eq" can be used for MBean attributes that return numeric values. See the JMX documentation for more information about filtering MBeans.
value	text or number	yes	no default	Specifies the value to compare. The metric definition creator is responsible for making sure the value data type matches the data type of the corresponding MBean attribute.

## Example

```
<MBean instanceType="multi">
  <FromVersion server="10.1" update="3"/>
  <ObjectName>*:*,j2eeType=ThreadPool</ObjectName>
  <Attribute>queueSize</Attribute>
</MBean>
```

The above example indicates that the collector collects metric data about the attribute `queueSize` of the Mbean `*:*,j2eeType=ThreadPool`. This data is collected only if the server version is 10.1 or above.

## FromVersion and ToVersion Elements

The FromVersion and ToVersion elements are used to specify the version of the Oracle Application Server for which the data source element is valid.

The following algorithm is used for determining which application server version is supported by each metric data source element within the Metric element.

- If a FromVersion element is not present, no lower limit exists to the server versions supported by this metric.
- If a FromVersion element is present, the server attribute indicates the lowest server version supported by this metric. If an update attribute exists, it qualifies the lowest server version supported by specifying the lowest service pack or patch supported for that version.
- If a ToVersion element is not present, no upper limit exists to the server versions supported by this metric.
- If a ToVersion tag is present, the server attribute indicates the highest server version supported by this metric. If an update attribute exists, it qualifies the server version supported by specifying the highest service pack or patch supported for that version.

```
<!ELEMENT FromVersion (EMPTY)>
<!ELEMENT ToVersion (EMPTY)>

<!ATTLIST FromVersion  server CDATA #REQUIRED
                        update CDATA  "*">
<!ATTLIST ToVersion   server CDATA #REQUIRED
                        update CDATA  "*">
```

The following table lists FromVersion and ToVersion element attributes.

Attribute	Type	Required	Default	Description
server	numeric string	yes	none	Specifies a primary server version; for example, <code>&lt;FromVersion server="6.0"/&gt;</code>
update	numeric string	no	"*"	Specifies a secondary server version, such as "1" for service pack 1. A "*" indicates that the metric is valid for all secondary server versions.

### Example

```
<FromVersion server="10.1"/>
<ToVersion server="10.3"/>
```

## Calculation and Formula Elements

The Calculation element is used when the data source of the metric is a calculation using other defined metrics. The Calculation element contains a Formula element whose content is a string that specifies the mathematical manipulation of other metric values to obtain the final metric value. The metrics are referred to in the calculation expression by their metric ID. The result of the calculation is the metric value.

```
<!ELEMENT Calculation (FromVersion?, ToVersion?,Formula)>
<!ELEMENT Formula (#PCDATA)>
```

## Syntax

Calculations must use the following syntax:

- Operators supported are +, -, /, \*, and unary minus.
- Operator precedence and associativity follows the Java model.
- Parentheses can be used to override the default operator precedence.
- Allowable operands are metric IDs and literal doubles.

A metric ID can refer to either an MBean metric or another calculated metric. Literal doubles can be specified with or without the decimal notation. The metric ID refers to the `id` attribute of the Metric element in the metric definitions document.

## Functions

The calculation parser also supports the following functions. All function names are lowercase and take a single parameter which must be a metric ID.

- `delta` returns the result of subtracting the previous value of the metric from the current value.
- `interval` returns the time in milliseconds that has elapsed since the last time the metric was collected.
- `sum` returns the summation of the values of all the instances of a multi-instance metric.
- `count` returns the number of instances of a multi-instance metric.

## Examples

```
<Formula>
  ((JVM_HeapSizeCurrent-JVM_HeapFreeCurrent)/JVM_HeapSizeCurrent)*100
</Formula>
```

## Sample 1

```
<Metric id="OASSPI_0100" name="ThreadPoolWaitCnt" alarm="yes">
  <MBean instanceType="multi">
    <FromVersion server="10.1" update="3" />
    <ObjectName>*:* ,j2eeType=ThreadPool</ObjectName>
    <Attribute>queueSize</Attribute>
  </MBean>
</Metric>
```

## Sample 2

The first two metrics in the following sample metrics illustrates how the final metric `OASSPI_100` is calculated using the “base” metrics – `JVM_HeapFreeCurrent` and `JVM_HeapSizeCurrent`.

```

<Metric "JVM_HeapFreeCurrent" alarm="no">
  <MBean instanceType="single">
    <FromVersion server="10.1" update="3" />
    <ObjectName>*:*,Type=JVM</ObjectName>
    <Attribute>freeMemory</Attribute>
  </MBean>
</Metric>

<Metric id=""JVM_HeapSizeCurrent" alarm="no">
  <MBean>
    <FromVersion server="10.1" update="3" />
    <ObjectName>*:*,Type=JVM</ObjectName>
    <Attribute>totalMemory</Attribute>
  </MBean>
</Metric>

<Metric id="OASSPI_0100" name="JVMMemUtilPct" alarm="yes" graph="yes">
  <Calculation>
    <FromVersion server="10.1" update="3" />
    <Formula>((JVM_HeapSizeCurrent-JVM_HeapFreeCurrent)/
    JVM_HeapSizeCurrent)*100
  </Formula>
</Calculation>
</Metric>

```

## Sample 3: Metric Definitions File

**The following sample metric definitions file illustrates how you may create your own user-defined metrics. This sample file also contains examples of calculated metrics.**

```

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE MetricDefinitions SYSTEM "MetricDefinitions.dtd">
<!-- sample UDM metrics configuration File -->
<MetricDefinitions>
  <Metrics>
    <!-- The following metrics illustrate some of the options available
    when creating user-defined metrics.
    -->
    <!-- The following metric uses an MBean that can have multiple
    instances in the MBean server. Note that JMX-compliant pattern-
    matching can be used in the MBean ObjectName tag.
    -->
    <Metric id="OASSPI_0100" name="ThreadPoolWaitCnt" alarm="yes">
      <MBean instanceType="multi">
        <FromVersion server="10.1" update="3" />
        <ObjectName>*:*,j2eeType=ThreadPool</ObjectName>
        <Attribute>queueSize</Attribute>
      </MBean>
    </Metric>
    <!-- The following 2 metrics are "base" metrics.They are used in the
    calculation of a "final" metric and are not alarmed, reported, or
    graphed themselves. Base metrics may have an 'id' that begins with a
    letter (case-sensitive) followed by any combination of letters,
    numbers, and underscore.
    -->

```



```

<Metric id="JVM_HeapFreeCurrent" alarm="no">
  <MBean instanceType="single">
    <FromVersion server="10.1" update="3" />
    <ObjectName>*:*,Type=JVM</ObjectName>
    <Attribute>freeMemory</Attribute>
  </MBean>
</Metric>
<Metric id="JVM_HeapSizeCurrent" alarm="no">
  <MBean instanceType="single">
    <FromVersion server="10.1" update="3" />
    <ObjectName>*:*,Type=JVM</ObjectName>
    <Attribute>totalMemory</Attribute>
  </MBean>
</Metric>
<!-- The following metric illustrates a calculated metric. The
calculation is based on the previous 2 "base" metrics.
-->
<Metric id="OASSPI_0101" name="JVMMemUtilPct" alarm="yes" graph="yes">
  <Calculation>
    <FromVersion server="10.1" update="3" />
    <Formula>((JVM_HeapSizeCurrent-JVM_HeapFreeCurrent)/
JVM_HeapSizeCurrent)*100
    </Formula>
  </Calculation>
</Metric>
<!-- The following metric illustrates a mapping from the actual
string value returned by the MBean attribute to a numeric value so
that an alarming threshold can be specified in a monitor template.
that the 'datatype' must be specified as 'string'.
-->
<Metric id="OASSPI_0102" name="State" alarm="yes" report="no">
  <MBean dataType="string">
    <ObjectName>*:*,Type=J2EEServer</ObjectName>
    <Attribute>eventProvider</Attribute>
    <AttributeValueMapping>
      <Map from="true" to="1" />
      <Map from="false" to="2" />
    </AttributeValueMapping>
  </MBean>
</Metric>
<!-- Metric IDs that are referenced from the collector command line
must have a prefix followed by four digits. The default prefix is
'OASSPI_'. The 'prefix' option must be used on the command line for
the following metric since this metric has a different prefix than
'OASSPI_'. Example: wasspi_oas_ca FIRST_CLIENT_OHS-05MIN -x
prefix=Testing_ -m 792 ...
-->
</Metric>
<Metric id="Testing_0103" alarm="no">
  <MBean>
    <ObjectName>*:*,Type=J2EEServer</ObjectName>
    <Attribute>node</Attribute>
  </MBean>
</Metric>
<!-- This metric is used in a subsequent JMX action calculation.

```

```

-->
<Metric id="ThreadPool_poolSize">
  <MBean instanceType="multi">
    <ObjectName>*:*,Type=ThreadPool</ObjectName>
    <Attribute>poolSize</Attribute>
  </MBean>
</Metric>
<!-- The Following metric defines a JMX action wich will modify
maximum messages on all JMS server instances.A 'Get' element is
defined only for validation.
-->
<Metric id="TestUDM_1000" alarm="yes">
  <MBean instanceType="multi">
    <ObjectName>*:*,Type=ThreadPool</ObjectName>
    <Attribute>queueCapacity</Attribute>
  </MBean>

  <JMXActions>
    <JMXAction>
      <JMXCalls>
        <ObjectName>*:*,j2eeType=ThreadPool</ObjectName>
        <!-- Set a new value.
ThreadPool_poolSize is defined in UDM file oas_UDMMetrics-
sample
Therefore, UDM configuration needs to specify oas_UDMMetrics-
sample
-->
        <Set>
          <Attribute>maxPoolSize</Attribute>
          <Value>
            <Numeric>
              <Formula>ThreadPool_poolSize + (5)
            </Formula>
            </Numeric>
          </Value>
        </Set>
        <Get>
          <Attribute>maxPoolSize</Attribute>
        </Get>
      </JMXCalls>
    </JMXAction>
  </JMXActions>
</Metric>

<!-- The Following metric defines a JMX action which demonstrates an
operation invoke.
-->
<Metric id="TestUDM_1001" alarm="yes">
  <MBean instanceType="multi">
    <ObjectName>*:*,Type=J2EEApplication</ObjectName>
    <Attribute>applicationRootDirectoryPath</Attribute>
  </MBean>
  <JMXActions>
    <JMXAction>
      <JMXCalls>

```

```
<ObjectName>*:* ,j2eeType=JVM</ObjectName>
<!-- Invoke an operation to set the value of a given system
property : For demonstration only.
-->
<Invoke>
  <Operation>setproperty</Operation>
  <Parameters>
    <Parameter>
      <String key="TestVariable" />
    </Parameter>
    <Parameter>
      <String value="test1" />
    </Parameter>
  </Parameters>
</Invoke>
</JMXCalls>
</JMXAction>
</JMXActions>
</Metric>
<Metrics>

<MetricDefinitions>
```

# Creating User-Defined Metrics

To create UDMs, complete the following tasks in the specified order.

## Task 1: Disable Graphing (if Enabled)

If graphing is enabled, disable it:

- 1 From the HPOM console, select **Operations Manager** → **Nodes**.
- 2 Right-click the node on which you want to disable UDM graphing and select **All Tasks** → **Launch Tool** → **UDM Graph Disable**.

## Task 2: Create a Metric Definitions File

The metrics definition file you create must be an XML file that follows the format defined by the metric definitions DTD file described in [Metric Definitions DTD](#) on page 50.



Do not edit, rename, or move the `MetricDefinitions.dtd` file installed with the Oracle AS SPI.

A sample metric definitions file is installed on the managed node:

UNIX	<code>/&lt;OvAgentDir&gt;/conf/oasspi/UDMMetrics-sample.xml</code>
Windows	<code>\&lt;OvAgentDir&gt;\wasspi\oas\conf\UDMMetrics-sample.xml</code>

For HPOM for Windows 8.10, `<OvAgentDir>` is typically is:

**On Windows:** `C:\Program Files\HP\HP BTO Software\` (for HTTPS managed nodes) or `C:\Program Files\HP OpenView\Installed Packages\{790C06B4-844E-11D2-972B-080009EF8C2A}` (for DCE managed nodes)

**On UNIX:** `/var/opt/OV/` or `/var/lpp/OV/`

## Task 3: Configure the Metric Definitions File Name and Location

For the UDM data collection to occur, the Oracle AS SPI configuration must include the name and location of the metric definitions file, as shown below:

```
UDM_DEFINITIONS_FILE = <full path of user metric definitions file>
```

The path name should use only forward slashes (“/”).

To add the UDM file name and its location to the Oracle AS SPI configuration, follow these steps:

- 1 From the HPOM console, select **Operations Manager** → **Tools** → **SPI for Oracle AS** → **OASSPI Admin**.
- 2 Double-click **Configure OASSPI**.
- 3 Select the managed nodes on which the metrics definition file exists and click **Launch**. The Console Status window opens.

After some time the Introduction window opens. Read the information and click **Next**. The configuration editor opens.

- 4 If the metrics definition file uses the same name and location on all managed nodes, configure the UDM\_DEFINITIONS\_FILE property at the Defaults (global properties) level. Otherwise, set the property for each managed node selected in step 3:
  - a Click **Default Properties** at the Defaults level or for a node.
  - b Click the **Set Configuration Properties** tab.
  - c From the Select a Property to Add dropdown menu, select **UDM\_DEFINITIONS\_FILE** and click **Add Property**.
  - d Type the value (metric definitions file name and its absolute path name, using forward slashes in only the path name).
  - e Click **Save** to save the changes.
  - f Click **Next**. The Confirm Operation window opens.
  - g Click **OK** to save changes and exit the configuration editor.

The changes you made to managed nodes that were not selected are saved to the configuration on the management server. However, to configure those managed nodes, you must deploy the OASSPI Service Discovery policy on these nodes.

## Task 4: Create a UDM Policy Group and Policies

To run the UDM data collection and establish thresholds for alarming, create a UDM policy group and policies:

- 1 Copy an existing Oracle AS SPI policy group:
  - a From the HPOM console, select **Operations Manager** → **Policy management** → **Policy groups** → **SPI for Oracle AS** → **OASSPI**.
  - b Right-click the policy group you want to use as a starting point, and select **Copy**.
  - c Right-click **OASSPI** and select **Paste**.
- 2 Rename the new policy group depending on how you want to identify the new metric and collector policies. For example, you could include UDM in the name to clearly indicate that the group consists of custom metric monitors.
  - a Right-click the policy group and select **Rename**.
  - b Type the new name.
- 3 Edit and rename each policy in the new group:
  - a Double-click the policy you want to use.
  - b Configure the collector policy command line (in the Command text box) to include the policy name and UDM metric number. For more information, see [Advanced Policy Customizations](#) on page 28.
  - c Configure thresholds in the policy, as appropriate. For more information, see [Advanced Policy Customizations](#) on page 28.
  - d Click **File** → **Save As**, and rename the policy according to the naming scheme.  
 The name you assign to the new metric policy in the group may contain each new UDM number. For example, a copy of OASSPI\_0001 can be called OASSPI\_0701.  
 The name you assign to the new collector policy must also contain the identifying name.
- 4 Select all the original policies from the new group and press the **Delete** key.

## Task 5: Deploy the Policy Group

- 1 Right-click the new policy group and select **All Tasks** → **Deploy on**.
- 2 Select the nodes on which you want to deploy the policy group.
- 3 Click **OK**.

## Task 6: Enable Graphing

If you are using the graphing product HP Performance Manager, enable data collecting for UDM graphing:

- 1 From the HPOM console, select **Operations Manager** → **Nodes**.
- 2 Right-click the node on which you want to enable UDM graphing and select **All Tasks** → **Launch Tool** → **UDM Graph Enable**.

Allow sufficient collection intervals before attempting to view graphs.

---

# 7 Troubleshooting the Oracle AS SPI

This chapter covers basic troubleshooting for Oracle AS SPI. The Error messages section of the Oracle AS SPI online help lists error messages by number.

## The Self-Healing Info Tool

The Self-Healing Info tool gathers troubleshooting information about the SPI and stores it in a file that you can submit to HP support for assistance. For more information about this tool, see the OASSPI Admin tools section under Tools in the Oracle AS SPI online help.



The file created by the Self-Healing Info tool may be hidden on some Windows managed nodes. If you do not see the file, open Windows Explorer and from the **Tools** menu, select **Folder Options**. Click the **View** tab. Under Hidden files and folders, select **Show hidden files and folders**.

# Log and Trace Files

Log and trace files are maintained on the managed nodes. You can gather troubleshooting information about the Oracle AS SPI from the data logged in these log and trace files.

## UNIX Managed Nodes

The following log and trace files are maintained on UNIX managed nodes (typically, */<OvAgentDir>/* is */var/opt/OV/* or */var/lpp/OV/*):

<b>File Type</b>	Log
<b>Filename</b>	<i>/&lt;OvAgentDir&gt;/log/oasspi/config.log</i>
<b>Description</b>	Output from the Oracle AS SPI configuration scripts is recorded in this log file.

<b>File Type</b>	Log
<b>Filename</b>	<i>/&lt;OvAgentDir&gt;/log/oasspi/errorlog</i>
<b>Description</b>	Oracle AS SPI logs the error messages in this file. This log file is monitored by Oracle AS SPI policies.

<b>File Type</b>	Log
<b>Filename</b>	<i>/&lt;OvAgentDir&gt;/log/oasspi/wasspi_oas_discovery.log</i>
<b>Description</b>	Output from the Oracle AS SPI discovery process is recorded in this log file.

<b>File Type</b>	Trace
<b>Filename</b>	<i>/&lt;OvAgentDir&gt;/log/oasspi/wasspi_oas_discovery.trc</i>
<b>Description</b>	Discovery binary trace file used by your HP support representative. By default, tracing to this file is enabled. To disable tracing, in <i>&lt;OvAgentDir&gt;/bin/instrumentation/wasspi_oas_discovery.pl</i> , set the <i>\$trace_on</i> variable to 0. To enable this trace, set the <i>\$trace_on</i> to 1. When instrumentation is deployed, the <i>wasspi_oas_discovery.pl</i> file is overwritten (therefore, if you disable tracing, it becomes enabled when instrumentation is deployed). Five archived versions are kept. A new trace file is created when the discovery policy is run.



**File Type** Trace

**Filename** /<OvAgentDir>/log/oasspi/trace.log (archived files have a three digit number appended to the filename)

**Description** Trace file used by your HP support representative. This file gives information about the CollectorServer, regardless of whether the Collector is set to PERSISTANT or TRANSIENT mode in the SPIConfig file. The default value of the Collector Mode is 'PERSISTENT'.

By default, tracing to this file is disabled. To enable this tracing, use the Start Tracing application.

**File Type** Trace

**Filename** /<OvAgentDir>/log/oasspi/traceCollectorClient.log (archived files have a three digit number appended to the filename)

**Description** Trace file used by your HP support representative. This file gives information about the CollectorClient when the Collector is set to 'PERSISTENT' mode in the SPIConfig file. The default value of the Collector Mode is 'PERSISTENT'.

By default, tracing to this file is disabled. To enable this tracing, use the Start Tracing application.

## Windows Managed Nodes

The following log and trace files are maintained on the Windows managed nodes.

<OvAgentDir> typically is C:\Documents and Settings\All Users\Application Data\HP\HP BTO Software\wasspi\oas\log on HTTPS managed nodes (Windows) for HPOM for Windows 8.10.

<OvAgentDir> typically is C:\Program Files\HP OpenView\Installed Packages\{790C06B4-844E-11D2-972B-080009EF8C2A} on DCE managed nodes (Windows) for HPOM for Windows 8.10.

**File Type** Log

**Filename** \<OvAgentDir>\wasspi\oas\log\config.log

**Description** Output from configuration scripts is recorded in this log file.

**File Type** Log

**Filename** \<OvAgentDir> \wasspi\oas\log\errorlog

**Description** Oracle AS SPI logs the error messages in this file. This log file is monitored by Oracle AS SPI policies.

**File Type** Trace

**Filename** \*OvAgentDir*>\wasspi\oas\log\wasspi\_oas\_discovery.trc  
(archived files have a three digit number appended to the filename)

**Description** Discovery binary trace file used by your HP support representative. By default, tracing to this file is enabled. To disable tracing, in \*InstallDir*>\bin\instrumentation\wasspi\_oas\_discovery.pl, set the \$trace\_on variable to 0. To enable this trace, set the \$trace\_on to 1. When instrumentation is deployed, the wasspi\_oas\_discovery.pl file is overwritten (therefore, if you disable tracing, it becomes enabled when instrumentation is deployed). Five archived versions are kept. A new trace file is created when the discovery policy is run.

**File Type** Trace

**Filename** \*OvAgentDir*>\wasspi\oas\log\trace.log (archived files have a three digit number appended to the filename)

**Description** Trace file used by your HP support representative. This file gives information about the CollectorServer, regardless of whether the Collector is set to PERSISTANT or TRANSIENT mode in the SPIConfig file. The default value of the Collector Mode is 'PERSISTENT'.

By default, tracing to this file is disabled. To enable this tracing, use the Start Tracing application.

**File Type** Trace

**Filename** \*OvAgentDir*>\wasspi\oas\log\traceCollectorClient.log  
(archived files have a three digit number appended to the filename)

**Description** Trace file used by your HP support representative. This file gives information about the CollectorClient when the Collector is set to 'PERSISTENT' mode in the SPIConfig file. The default value of the Collector Mode is 'PERSISTENT'.

By default, tracing to this file is disabled. To enable this tracing, use the Start Tracing application.

# Troubleshooting the Discovery Process

## Problem

The OASSPI Discovery policy does not automatically discover and update the Oracle AS SPI configuration.

## Solutions

To troubleshoot the discovery process, do one or more of the following (as applicable):

- Check if there are any messages, in the message browser about managed nodes not being discovered. If there are any messages, follow the instruction text related to that error message.
- Check for errors in the `<ovAgentDir>/wasspi/oas/log/wasspi_oas_discovery.trc` file on the managed node.
- Ensure that the OASSPI Discovery policies are being deployed:

From the HPOM console, select **Operations Manager** → **Policy management** → **Deployment jobs**.

- If the state of a OASSPI Discovery policy is `Active`, the policy is still being deployed. Wait until the policy is deployed.
- If the state of a OASSPI Discovery policy is `Suspended` or `Error`, check for related error messages in the message browser and troubleshoot the problem by following the information given in the rest of this section
- If the OASSPI Discovery policies are not listed, check the message browser for the following messages:.

```
WASSPI-602: Updating OAS-SPI configuration in HPOM server
WASSPI-603: Updated OracleAS spi configuration in HPOM server
```

These messages will appear after the OASSPI Discovery policies are deployed successfully. If these messages do not appear, either the policies are not deployed or the `AUTO_DISCOVER` check box in the configuration editor is not selected.

Follow the steps given in the rest of this section to continue troubleshooting.

- Check if an Oracle OC4J/OHS server is installed on the managed node. If no OC4J/OHS server is installed, install an OC4J/OHS server, and complete the configuration tasks listed in [Chapter 3, Configuring the Oracle AS SPI](#).
- Ensure that the Oracle Application Server is running. See [Task 2: Verify the Application Server Status](#) on page 15.
- Verify the Java home directory. See [Verifying the Java Home Directory](#) on page 69.
- Ensure that the discovery agent is running on the managed node:

Run the command `opcagt -status`. The following message appears:

```
Service Discovery Agent OvSvcDiscAgent.cmd (1084) is running.
```

If this message does not appear, the agent is not running. Run the following command to start the agent:

```
opcagt -start -id 13
```

- Remove and redeploy the discovery policies:
  - a From the HPOM console tree, select **Operations Manager** → **Policy management** → **Policy groups** → **SPI for Oracle AS**.
  - b Right-click **OASSPI Discovery** and select **All Tasks** → **Uninstall from...** The Uninstall policies on... window opens.
  - c Select the nodes from which you want to remove the policies and click **OK**.
  - d Follow the steps given in the section [Manually Deploying the Discovery Policies](#) on page 69 to redeploy the discovery policies. Deploy the policies in the order mentioned and not as a group. If you deploy the policies as a group, the policies may not be deployed in the correct order.
- Ensure that the Configure OASSPI tool is not running or a configuration is not open in an editor. Because only one process can access a configuration at a time, if a configuration is open, other processes that must access the configuration (like the discovery policy) hang until the file becomes available.

## Other Discovery Related Problems

<b>Problem</b>	The OASSPI Discovery policies add inaccurate information to the configuration.
<b>Solutions</b>	<p>To troubleshoot, do one of the following:</p> <ul style="list-style-type: none"> <li>• Verify the Java home directory. For more information, see <a href="#">Verifying the Java Home Directory</a>.</li> <li>• Update the configuration and clear the AUTO_DISCOVER check box in the configuration editor to prevent the OASSPI Discovery policy from overwriting the configuration information.</li> </ul>
<b>Problem</b>	<p>The following error message appears:</p> <pre>(PMD51) Error: Unable to deploy instrumentation files from directory &lt;directory_name&gt;: (NUL16389E) Unspecified error (0x80004005). Please check the error log on the managed node.</pre>
<b>Solution</b>	<p>To troubleshoot, follow these steps:</p> <ol style="list-style-type: none"> <li>1 From the HPOM console, select <b>Operations Manager</b> → <b>Policy management</b> → <b>Deployment jobs</b>.</li> <li>2 Find the jobs that are in the <code>Error</code> state.</li> <li>3 Right-click each job you want to restart and select <b>All Tasks</b> → <b>Restart job</b>.</li> </ol>

- Problem**                    The property of critical error messages in the HPOM console is:  
Errors occurred during the distribution of the monitors.  
Solve the problems and distribute the monitors again.  
(OpC30-1030) .
- Solution**                    To troubleshoot, follow these steps:
- 1 From the HPOM console, select **Operations Manager** → **Policy management** → **Deployment jobs**.
  - 2 Find the jobs that are in the `ERROR` state.
  - 3 Right-click each job you want to restart and select **All Tasks** → **Restart job**.

## Manually Deploying the Discovery Policies

If the OASSPI Discovery policies are not deployed successfully when you run the Discover Oracle AS tool, you can manually deploy the policies on the managed nodes on which the Oracle OC4J/OHS Servers are running (you *must* deploy the policies in the given order only):

- 1 From the HPOM console, select **Operations Manager** → **Policy management** → **Policy groups** → **SPI for Oracle AS** → **OASSPI Discovery**.
- 2 Right-click **OASSPI-Messages** and select **All Tasks** → **Deploy on...**The Deploy Policies on... window opens.
- 3 Select the nodes on which you want to deploy the auto-discovery policies and click **OK**.
- 4 Right-click **OASSPI Service Discovery** and select **All Tasks** → **Deploy on....**The Deploy Policies on... window opens.
- 5 Select the nodes on which you want to deploy the auto-discovery policies and click **OK**.

## Verifying the Java Home Directory

The Oracle AS SPI Collector is dependant on the Java home directory information. Collector will not work if the Java Home directory information is inaccurate or not available. The Java Home directory must, therefore, be configured properly on both Windows and UNIX managed nodes.

For the Collector to work properly, ensure one of the following:

- **JAVA\_HOME** is correctly defined in the configuration. To edit or view the configuration, run the Configure OASSPI tool:
  - a From the HPOM console, select **Operations Manager** → **Tools** → **SPI for Oracle AS** → **OASSPI Admin**.
  - b Double-click **Configure OASSPI**. The Edit Parameters window opens.
  - c Select the nodes to configure and click **Launch**. The Console Status window and then the configuration editor opens.
  - d In the configuration editor, set the **JAVA\_HOME** property. For more information about setting the property, see the Configuring OASSPI section in the Oracle AS SPI online help.

- e Run the Discover OracleAS tool on the managed nodes on which the JAVA\_HOME property was added or edited. Running the Discover OracleAS tool updates the service map.
- The JAVA\_HOME system variable is correctly defined.  
On a Windows manage node, follow these steps:
  - a Select **Start** → **Settings** → **Control Panel**.
  - b Double-click **System**.
  - c Select the **Advanced** tab.
  - d Select **Environment Variables...**
  - e Scroll through the System variables list. Verify the JAVA\_HOME value. If JAVA\_HOME does not exist, it is not defined.

On a UNIX manage node, type:

```
echo $JAVA_HOME.
```

Verify the output. If no output is returned, JAVA\_HOME is not defined.

## Troubleshooting the Configuration

<b>Problem</b>	The OASSPI Discovery policy overwrites the configuration with inaccurate information.
<b>Solution</b>	Update the configuration and clear the AUTO_DISCOVER check box in the configuration editor to prevent the OASSPI Discovery policy from overwriting the configuration information.

## Troubleshooting the Tools

<b>Problem</b>	When launching the tools, the tools hang or there is no output.
<b>Solution</b>	The tools will not work if the memory is low. Check the performance of the node and the management server. The physical memory available must be more than 500 MB.
<b>Problem</b>	Configuration variable <code>SERVER&lt;n&gt;_START_CMD</code> missing for the server—Default Server.
<b>Solution</b>	Before you can successfully run the Start Oracle AS tool, you must set the <code>START_CMD</code> and <code>USER</code> properties. Set these properties using the Configure OASSPI tool. For more information about this tool, see the Tools group section in the OASSPI Oracle AS SPI online help.
<b>Problem</b>	Configuration variable <code>SERVER&lt;n&gt;_STOP_CMD</code> missing for server—Default Server.
<b>Solution</b>	You must set the <code>STOP_CMD</code> and <code>USER</code> properties to run the Stop Oracle AS tool successfully. You can set these properties using the Configure OASSPI tool. For more information about this tool, see the Oracle AS SPI online help.
<b>Problem</b>	Verify tool lists files and directories related to the management server as missing; for example: <pre> /MGMT_SERVER/SPI-Share/wasspi/oas/bin/parseDefs.pl  /MGMT_SERVER/SPI-Share/wasspi/oas/bin/  processWASSPIDiscovMsg.pl  /MGMT_SERVER/SPI-Share/wasspi/oas/conf</pre>
<b>Solution</b>	This is a known problem. The verify tool lists management server related files if you install the Oracle Application Server on the management server itself. This problem occurs if both the managed node and the management server are the same.

**Problem** When launched, the Verify tool gives improper output.  
**Solution** Before you launch the Verify tool ensure that you have installed the latest version of Self-Healing Service (SHS) component from the SPI DVD.

**Problem** When launched, the Self-Healing Info tool gives improper output.  
**Solution** Ensure that you have installed the latest version of Self-Healing Service (SHS) component from the SPI DVD.



---

# Glossary

**agent**

A program or process running on a remote device or computer system that responds to management requests, performs management operations, or sends performance and event notification. An agent can provide access to managed objects and MIB variables, interpret policy for resources and configure resources.

**application**

Packaged software that provides functionality designed to accomplish a set of related tasks. An application is generally more complex than a tool.

**ASCII**

American Standard Code for Information Interchange.

**assigned policy**

A policy assigned to one or more resources in the computing environment but not yet deployed or installed on those resources.

**automatic action**

A pre-configured program or script executed in response to an event, message, or a change in information in the management database. without operator intervention.

**client**

When the context is network systems, a computer system on a network that accesses a service from another computer (server). When the context is software, a program or executable process that requests a service from a server.

**client console**

An instance of the user interface that appears on the client system while the application runs on a server.

**command**

An instruction to a computer program that causes a specified operation to be carried out. Commands are typically typed by users on a command line.

**configuration**

In a network context, the complete set of inter-related systems, devices and programs that make up the network. For example the components of a network may include computer systems, routers, switches, hubs, operating systems and network software. The configuration of the network determines the way that it works and the way that it is used. In a software context, the combination of settings of software parameters and attributes that determine the way the software works, the way it is used, and how it appears.

**configuration file**

A file that contains specifications or information that can be used for determining how a software program should look and operate.

**connection**

A representation of a logical or physical relationship between objects.

**console**

An instance of the user interface from which the user can control an application or set of applications.

**customization**

The process of designing, constructing or modifying software to meet the needs and preferences of a particular customer or user.

**data type**

A particular kind of data; for example database A repository of data that is electronically stored. Typically databases are organized so that data can be retrieved and updated.

**deploy**

To install and start software, hardware, capabilities, or services so that they work in the business environment.

**deployed application**

An application and its components that have been installed and started to work in the business environment.

**deployed policy**

A policy that is deployed on one or more resources in the computing environment.

**deployment**

The process of installing and activating software, hardware, capabilities or services so that they work in the business environment.

**deployment package**

A software package that can be deployed automatically and installed on a managed node.

**error log**

An output file containing error messages.

**event**

An unsolicited notification such as an SNMP trap or WMI notification generated by an agent or process in a managed object or by a user action. An event usually indicates a change in the state of a managed object or cause an action to occur.

**Hypertext Transfer Protocol (HTTP).**

The protocol that World Wide Web clients and servers use to communicate.

**HTTPS**

Hypertext Transfer Protocol Secure.

**icon**

An on-screen image that represents objects that can be monitored or manipulated by the user or actions that can be executed by the user.

**managed object**

A network, system, software or service object that is both monitored for performance, status and messages and is manipulated by means of actions in the management software.

**management console**

An instance of the user interface from which the user can control the management application or set of management applications. The console may be on the system that contains the management software or it may be on another system in the management domain.

**management server**

A server that provides management services, processes, or a management user interface to clients. A management server is a type of management station.

**message**

A structured, readable notification that is generated as a result of an event, the evaluation of one or more events relative to specified conditions, or a change in application, system, network, or service status.

**message browser**

A graphical user interface that presents notifications that are generated as a result of an event, the evaluation of one or more events relative to specified conditions or a change in application, system, network, or service status.

**message description**

Detailed information about an event or message.

**message key**

A message attribute that is a string used to identify messages that were triggered from particular events. The string summarizes the important characteristics of the event. Message keys can be used to allow messages to acknowledge other messages, and allows for the identification of duplicate messages.

**message severity level**

A property of a message indicating the level of impact of the event or notification that initiated the message. See also severity level.

**metadata**

Data that defines data.

**metric**

A measurement that defines a specific operational or performance characteristic.

**module**

A self-contained software component that performs a specific type of task or provides for the presentation of a specific type of data. Modules can interact with one another and with other software.

**node**

When the context is network, a computer system or device (for example, printer, router, bridge) in a network. When the context is a graphical point to point layout, a graphical element in a drawing that acts as a junction or connection point for other graphical elements.

**parameter**

A variable or attribute that may be given an arbitrary value for use during an execution of either a computer program or a procedure within a program.

**parameter type**

An abstraction or categorization of a parameter that determines the particular kind of data that is valid for the parameter. For example a parameter type could be IP Address which indicates that parameter values must have four numbers separated by decimals with the value for each number being in the range of 0 to 255.

**parameter value**

A value given to a variable.

**policy**

A set of one or more specifications rules and other information that help automate network, system, service, and process management. Policies can be deployed to various targets (for example, managed systems, devices, network interfaces) providing consistent, automated administration across the network.

**policy management**

The process of controlling policies (for example, creating, editing, tracking, deploying, deleting) for the purposes of network, system or service management.

**policy type**

An abstraction or categorization of policies based on the function of the policy or the services that the policy supports.

**port**

If the context is hardware, a location for passing information into and out of a network device. If the context is ECS, a location for passing information into and out of a correlation node.

**server**

If the context is hardware plus software, a computer system that provides a service (for example, management capabilities, file storage capabilities) to other computer systems (clients) on the network. If the context is a software component, a program or executable process that responds to and services requests issued by clients.

**severity level**

A property of an object indicating the status of the object. Severity level is based on the impact of events or messages associated with the object.

**Smart Plug-in (SPI)**

Prepackaged software that installs into a management console and provides management capabilities specific to a given type of business application, database, operating system, or service.

**trace log**

An output file containing records of the execution of application software



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