

HP Operations Smart Plug-in for Virtualization Infrastructure

Software Version: 12.03

Windows®, HP-UX, Linux, and Solaris operating systems

User Guide

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Chapter 1: Conventions Used in this Document

The following conventions are used in this document:

Convention	Description
HPOM for UNIX	<p>HPOM for UNIX is used in the document to imply HPOM on HP-UX, Linux, and Solaris.</p> <p>Wherever required distinction is made for a specific operating system as:</p> <ul style="list-style-type: none">• HPOM on HP-UX• HPOM on Linux• HPOM on Solaris
Infrastructure SPIs	<p>HP Operations Smart Plug-ins for Infrastructure. The software suite includes three Smart Plug-ins:</p> <ul style="list-style-type: none">• HP Operations Smart Plug-in for Systems Infrastructure• HP Operations Smart Plug-in for Virtualization Infrastructure• HP Operations Smart Plug-in for Cluster Infrastructure
SI SPI	HP Operations Smart Plug-in for Systems Infrastructure
VI SPI	HP Operations Smart Plug-in for Virtualization Infrastructure
CI SPI	HP Operations Smart Plug-in for Cluster Infrastructure

Chapter 2: Introduction

The HP Operations Smart Plug-in for Virtualization Infrastructure (VI SPI) enables you to manage and monitor virtual infrastructure on various technologies from an HP Operations Manager (HPOM) console. VI SPI adds monitoring capabilities otherwise unavailable to HPOM. For more information about HPOM, see the *HP Operations Manager for UNIX Concepts Guide*.

The VI SPI monitors the performance, capacity, utilization, availability, and resource consumption of the host machines, virtual machines, and resource pools.

For information about which vendor versions are supported by the VI SPI, see the *HP Operations Smart Plug-in for Virtualization Infrastructure Release Notes*.

The VI SPI is a part of the HP Operations Smart Plug-ins for Infrastructure suite (Infrastructure SPIs). The other components in the suite include the Systems Infrastructure Smart Plug-ins (SI SPI), the Cluster Infrastructure Smart Plug-ins (CI SPI), the Report pack and the Graph pack. Installation of SI SPI is mandatory while installing other components from the Infrastructure SPIs media.

Note: HP Reporter 4.0 is supported on 64-bit Windows operating system.

The VI SPI also integrates with other HPOM products such as HP Performance Manager, HP Performance Agent, and HP Reporter.

VI SPI Monitoring Solution for Virtualization Technologies

Virtualization Infrastructure Smart Plug-ins 12.03 supports virtualization technologies from the following vendors:

- HP Integrity Virtual Machines (HPVM)
- IBM LPAR and WPAR
- Oracle Solaris Zones

To monitor these technologies, ensure that the following software is installed on the node (host/monitoring system):

- HP Operations agent 12.03
- (Optional) HP Performance Manager 8.20 (or higher) if you want to view graphs
- (Optional) HP Reporter 3.80 (or higher) if you want to view reports

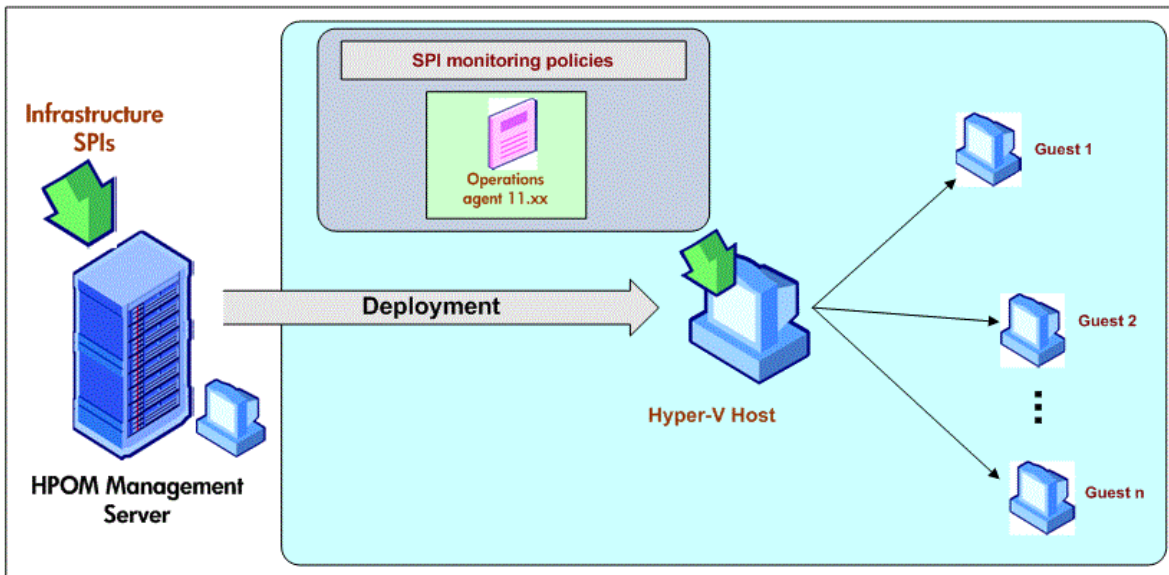
Monitoring HPVM

You must deploy VI SPI, for the HPVM environment, on the HPVM host. VI SPI enables you to monitor the availability and performance of HPVM hosts and the guest machines running on the hosts.

VI SPI sends alert messages to the HPOM console based on the threshold values set in the HPVM specific policies.

HP Operations Agent 12.03 and the VI SPI are deployed on the HPVM host.

The following illustration shows a typical HPVM environment with VI SPI deployed on an HPVM host:



Monitoring IBM AIX LPAR and WPAR

VI SPI, for IBM AIX LPARs, is deployed on an LPAR within a frame. This LPAR can be called as a monitoring LPAR because it monitors other LPARs within the frame. Each frame must contain at least one monitoring LPAR. If you want to monitor the availability of all the LPARs and Frames in a Hardware Monitoring Console (HMC) environment, make one monitor LPAR as Configuration LPAR.

VI SPI sends alerts to the HPOM console based on the threshold values set in the IBM Frame, LPAR, and WPAR specific policies.

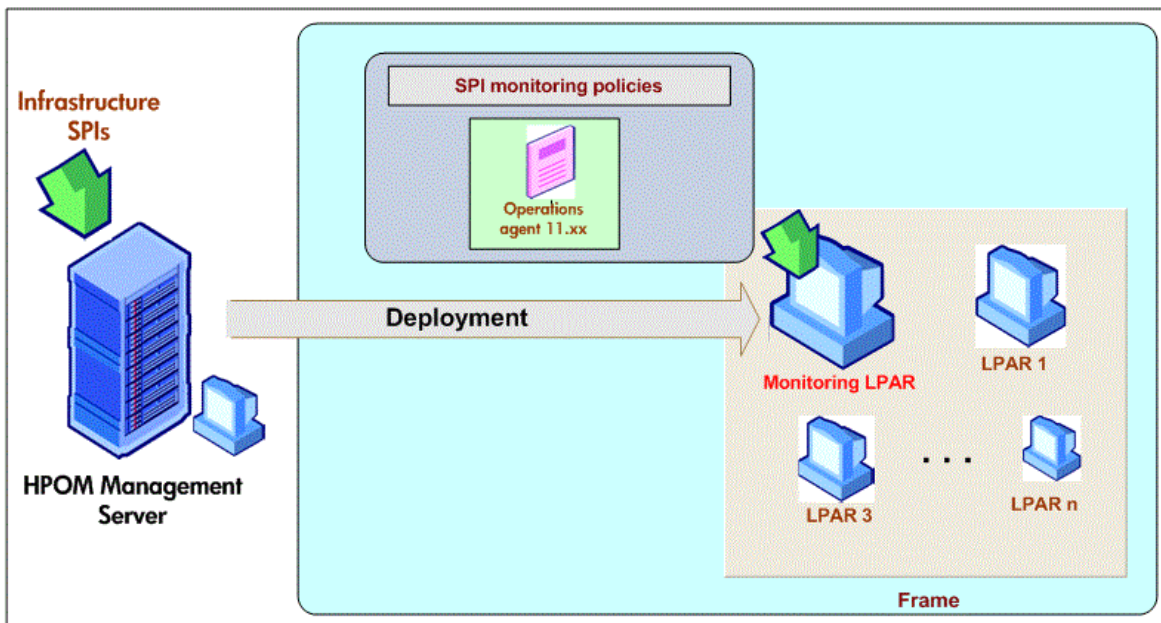
You can also configure VI SPI to monitor the HMCs connected with the frames.

Scenario 1: Monitoring the LPARs, Frame, and WPARs

VI SPI, deployed on the monitoring LPAR, monitors the availability and performance of the monitoring LPAR. VI SPI also enables you to monitor the availability and performance of the frame, other LPARs within the frame, and the WPARs running on the monitoring LPAR (VI SPI monitors only the WPARs created on the monitoring LPAR.)

HP Operations Agent 12.03 and the VI SPI are deployed on the monitoring LPAR.

The following illustration shows a typical AIX LPAR environment with the monitoring solution deployed on an LPAR within a frame:



Scenario 2: Monitoring the LPARs, Frame, WPARs, and HMCs

You can configure VI SPI to collect state related (of LPARs and frames) and configuration metrics from the HMCs connected to frames. VI SPI discovers the LPARs where HP Operations agent is deployed and also the other LPARs which is connected to the same frame. The information gathered from the HMC is used for reporting and graphing. It is also used for state monitoring.

Note: VI SPI will not discover other LPARs which are connected to other frames.

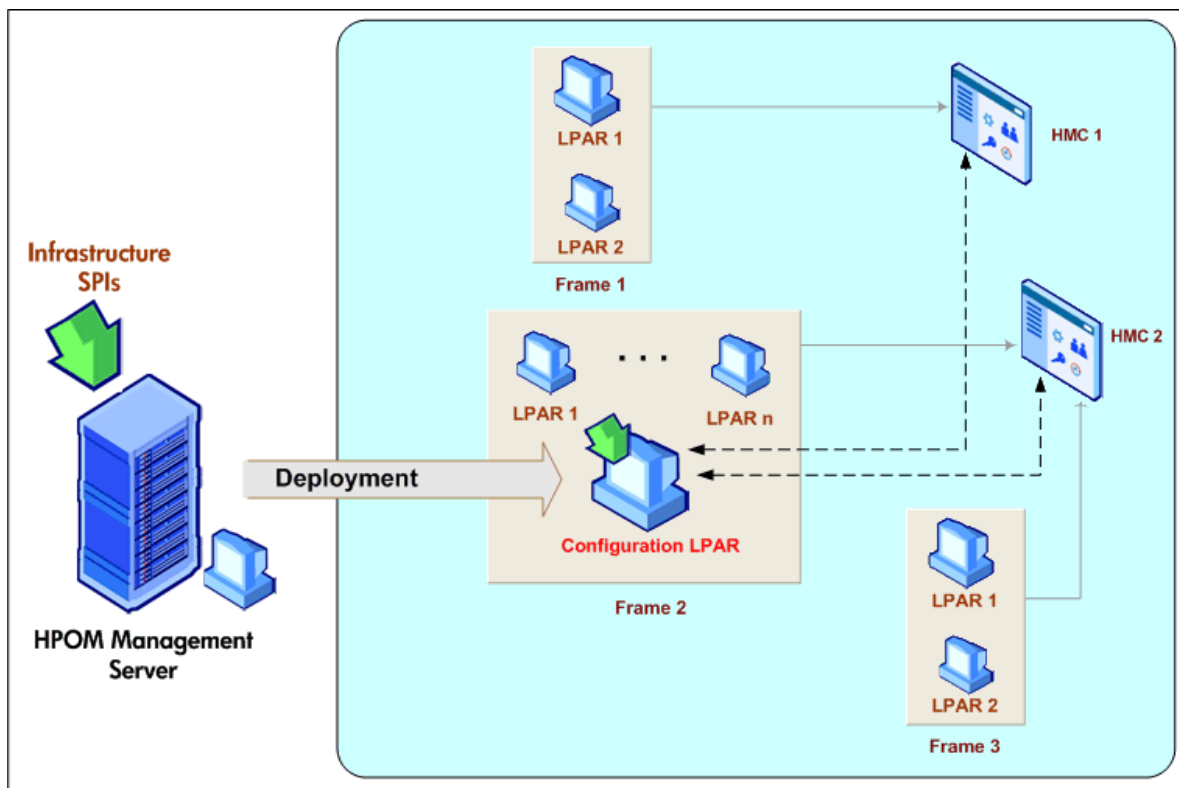
VI SPI is deployed on the LPAR to which the HMCs are connected. This LPAR can be called as a configuration LPAR. The configuration LPAR monitors:

- The WPARs running within the configuration LPAR.
- The state of all the frames and LPARs connected to the HMCs.
- Configuration information of all the frames and LPARs connected to the HMCs.

After deploying the VI SPI, run the *getSSHAuthentication.pl* script on the monitor/configuration LPAR connected to the HMC. This script is located under the */var/opt/OV/bin/instrumentation* directory on the LPAR.

The *getSSHAuthentication.pl* script provides you password-less authentication to access the configuration information on the HMC.

The following illustration shows a typical setup where different frames are managed by HMCs. These HMCs are in turn connected to the configuration LPAR.



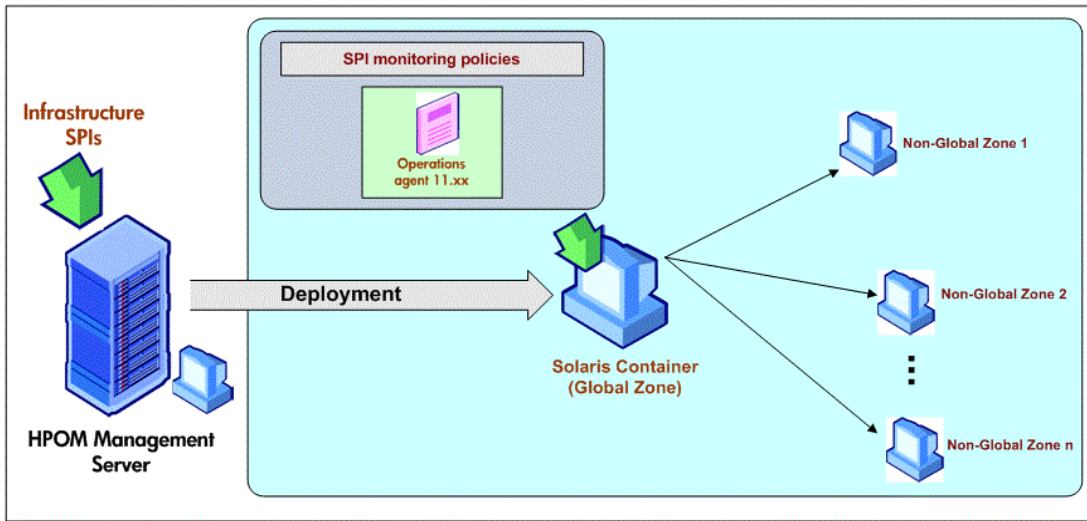
Monitoring Oracle Solaris Zones

You must deploy VI SPI, for the Solaris Zones environment, on the Solaris global zone. VI SPI enables you to monitor the availability and performance of the global zone, and the local zones running on the global zone.

VI SPI sends alert messages to the HPOM console based on the threshold values set in the Oracle Solaris Zones specific policies.

HP Operations Agent 12.03 and the VI SPI are also deployed on the Solaris container.

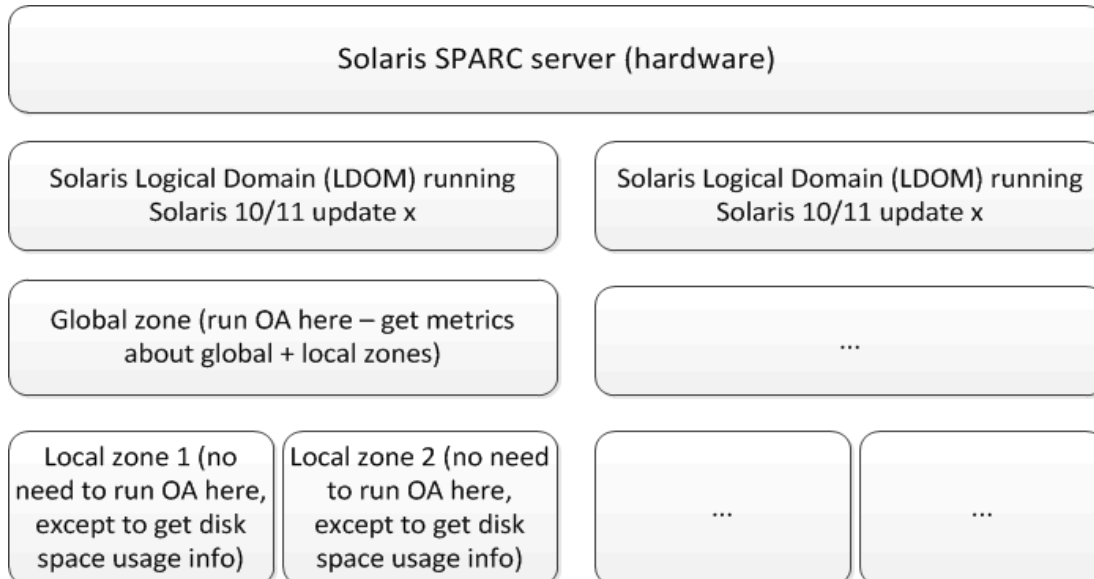
The following illustration shows a typical Solaris Zones environment with VI SPI deployed on a global zone:



VI SPI installation is only supported on global zone. The installation discovers and monitors only the global and non-global zones associated with it.

Note: VI SPI is not aware of LDOMs.

The following illustration shows VI SPI policies deployed on a global zone on a LDOM server.



Virtualization Infrastructure SPI Components

The Virtualization Infrastructure SPI provides preconfigured policies and tools for monitoring the operations, availability, and performance of host servers, virtual machines, and resource pools. These policies and tools, along with discovery, enable you to quickly gain control of the essential elements of your virtual IT infrastructure.

Map View on HPOM for Windows

After installing VI SPI, if you add nodes to the HPOM server with the *AutoDeployConfig* turned on, the Systems Infrastructure SPI (SI SPI) service discovery policy is automatically deployed to the node.

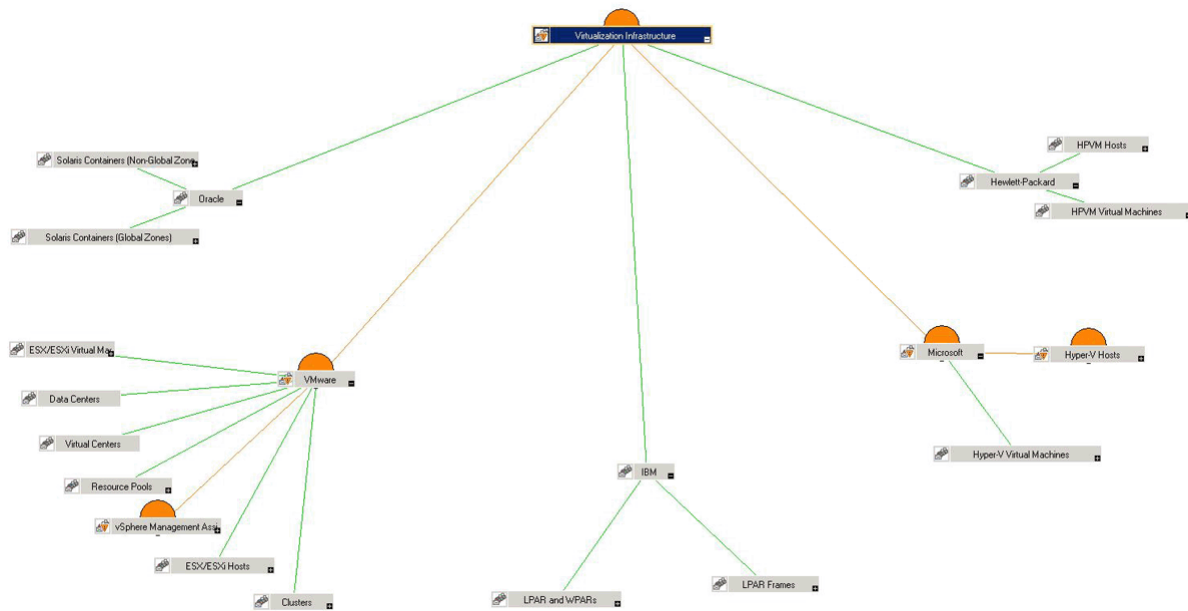
Note: If you added the nodes before installing the VI SPI, you must manually deploy the SI SPI service discovery to the nodes except HP Operations Agent Virtual Appliance node.

After the discovery policy identifies the node as a HPVM host, Solaris container, AIX frame, it triggers the auto-deployment of the VI SPI discovery policy. The VI SPI discovery adds discovered information to the HPOM Services area. This information is used to populate the VI SPI map view for the managed nodes.

The map view displays the real-time status of your infrastructure environment. To see the map view select **Services** from the console tree and click **Virtualization Infrastructure**. The map view graphically represents the structural view of your virtualization infrastructure or node hierarchy in the infrastructure environment.

The graphical representation of discovered elements in the service views enables speedy diagnosis of problems on your virtualized systems.

- To see the root cause of any problem indicated in your message browser, click **View**→ **Root Cause**.
- To display the services and system components affected by a problem, click **View**→ **Impacted**.



The icons and lines in your map are color-coded to indicate the severity levels of items in the map and to show status propagation. Use the map view to drill down to the level in your node or service hierarchy where a problem is occurring.

Map View on HPOM for UNIX

The map view displays the real-time status of your virtual infrastructure environment. To ensure that the operator can see the service map in the HPOM for UNIX (HP-UX, Linux, and Solaris) Operational interface, run the following commands on the management server:

```
opcservice -assign <operator name> AutoDiscovery
```

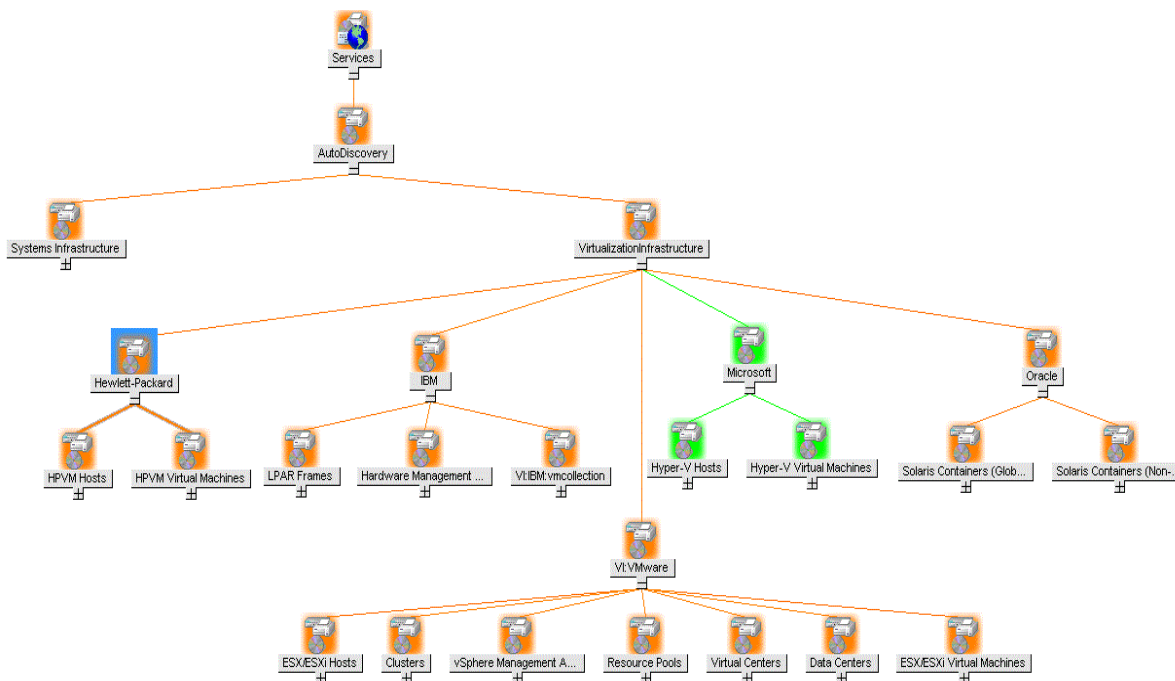
In this instance, *<operator name>* is the operator (for example, *opc_adm* or *opc_op*) to which you want to assign the service.

The service discovery policy does not automatically deploy policies to the nodes. You can manually deploy them.

The map view displays the real-time status of your virtual infrastructure environment.

To see the map view, follow these steps:

1. Launch the HPOM Operational interface.
2. Log on using your user name and password.
3. Select **Services**→**Virtualization Infrastructure**→**Show Graph**, to see the map view.



The map view graphically represents the structural view of your virtualization infrastructure hierarchy in the infrastructure environment.

Policies

On HPOM for Windows, several default policies are automatically deployed on the supported managed nodes during installation. These can be used as-is to begin receiving virtualized infrastructure related data and messages from the environment. You can choose to turn off automatic deployment of policies when services are discovered. In addition, you can modify and save preconfigured policies with new names to create custom policies for your own specialized purposes. For information about deploying policies from the management server, see ["Deploying VI SPI Policies from HPOM for Windows Management Server" on page 53.](#)

On HPOM for UNIX (HP-UX, Linux, or Solaris) the discovery policy does not automatically deploy policies to the nodes. You can manually deploy them. For information about deploying policies from the management server, see ["Deploying VI SPI Policies from HPOM for UNIX Management Server" on page 55.](#)

The policy types are as follows:

- **Service/Process Monitoring policies** provide a means for monitoring system services and processes.
- **Measurement Threshold policies** define conditions for each metric so that the collected metric values can be interpreted and alert messages can be displayed in the message browser. Each measurement threshold policy compares the actual metric value against the specified/auto threshold. If the actual value meets or exceeds the threshold, it generates message and instruction text that help you resolve a situation.
- **Service Discovery policy** discovers individual system nodes and resource group instances and builds a map view for all Virtualization Infrastructure SPI discovered instances.

The Virtualization Infrastructure SPI provides a set of pre-configured policies to help the system administrators efficiently monitor the virtual infrastructure. The VI SPI policies begin with **VI** for easy identification and modification.

These policies can be customized to suit specific needs. For information about the policies provided by Virtualization Infrastructure SPI, see ["Virtualization Infrastructure SPI Policies" on page 22.](#)

Graphs

The VI SPI enables you to see and trace out the root cause of any discrepancy in the normal behavior of an element being monitored. HPOM is integrated with HP Performance Manager, a web-based analysis tool that helps you to see, evaluate, and compare performance between virtual systems. Using HP Performance Manager you can see any of the following:

- Graphs such as line, bar or area
- Tables for data such as process details
- Baseline graphs
- Dynamic graphs in Java format that allow you to turn off display of individual metrics or hover over a point on a graph and see the values displayed

You can see the data represented graphically, for quick and easy analysis of a serious or critical error message reported. For more information about the graphs provided by Virtualization Infrastructure SPI, see "[Virtualization Infrastructure SPI Graphs](#)" on page 58.

Reports

You can integrate the VI SPI by installing the HP Reporter to generate web-based reports on metric data.

If HP Reporter is installed on the HPOM management server for Windows, you can view reports from the console. To see a report, expand **Reports** in the console tree, and then double-click individual reports.

If HP Reporter is installed on a separate system connected to the HPOM management server (for Windows, UNIX, Linux, or Solaris operating system), you can see the reports on HP Reporter system. For more information about integration of HP Reporter with HPOM, see *HP Reporter Installation and Special Configuration Guide*.

For information about the reports provided by Virtualization Infrastructure SPI, see "[Virtualization Infrastructure SPI Reports](#)" on page 56.

Chapter 3: Getting Started

After you install the infrastructure SPIs on the HPOM for Windows management server or HPOM for UNIX management server, you must complete the tasks required to manage your infrastructure.

The deployment checklist summarizes the tasks that you must complete before you start deploying the policies.

Deployment Checklist

Complete (Y/N)	Tasks
	Verify that you have installed HPOM 9.10 on the management server. In addition, verify that HP Operations Agent version 11.00 or above is installed. Make sure that you have installed all the available patches and hotfixes for HPOM and HP Operations agent.
	Verify that you have Performance Manager and HP Reporter installed to generate the graphs and reports.
	Make sure that you give sufficient time to HP Operations agent to collect the metrics before you start deploying the monitoring policies.

On HPOM for Windows

Follow the steps:

Starting the VI SPI

To get started with discovering the virtualized infrastructure, the first step is to run the SI SPI discovery.

Prerequisites for Installing VI SPI Policies

Before deploying the VI SPI policies, ensure the following:

- Install the latest HPOM patches. Make sure to check if you have installed OMW_000120 or higher patches.
- HP Operations Agent 12.03 is installed and running.
 - a. *On UNIX hosts,*
go to the directory `/var/opt/perf` and open the `parm` file.
On Windows hosts,
go to the directory `%ovdatadir%` and open the `parm` file.

b. *On Windows, Linux, UNIX or Solaris*

Locate the line starting with 'log'.

Typically the line must be similar to:

```
log global application process device=disk,cpu,filesystem transaction
```

Append the text **logicalsystem** at the end of this line:

```
log global application process device=disk,cpu,filesystem transaction logicalsystem
```

Note: Logical system is supported on Solaris 10 or above.

On AIX

Locate the line starting with 'log'.

Typically the line must be similar to:

```
log global application process device=disk,cpu,filesystem transaction
```

Append the text **logicalsystems** at the end of this line:

```
log global application process device=disk,cpu,filesystem transaction logicalsystems
```

For enabling LPAR logging, set `logicalsystems=lpar`

For enabling WPAR logging, set `logicalsystems=wpar`

For enabling both LPAR and WPAR logging, set

`logicalsystems=lpar,wpar` or `logicalsystems=wpar,lpar` or `logicalsystems=all`

Note: Logical system is supported for LPAR on AIX 5L V5.3 ML3 or above and WPAR on AIX 6.1 TL2 global environment only.

c. Restart HP Operations Agent 12.03. Run the following command:

On Windows

```
%ovinstalldir%bin\ovpacmd REFRESH COL
```

On HP-UX, Linux, or Solaris

```
/opt/perf/bin/ovpa -restart oacore
```

Note: You can use the command `/opt/perf/bin/ovpa -restart scope` to restart the Performance Collection Component. This command is retained only for backward compatibility after you upgrade from earlier versions to the HP Operations Agent 12.03.

On AIX

```
/usr/lpp/perf/bin/ovpa -restart oacore
```

Note: You can use the command `/usr/lpp/perf/bin/ovpa -restart scope` to restart the Performance Collection Component. This command is retained only for backward compatibility after you upgrade from earlier versions to the HP Operations Agent 12.03.

Wait for 10 to 15 minutes for collection to start.

Run the following command to check if BYLS data is being collected:

On Windows

```
ovcodautl -dumpds scope | findstr BYLS
```

On UNIX

```
ovcodautl -dumpds scope | grep BYLS
```

- g. On the node, run the command to update the instance deletion threshold value :

```
ovconfchg -ns agtrep -set
```

```
INSTANCE_DELETION_THRESHOLD 3
```

```
ovconfchg -ns agtrep -set
```

```
RESEND_RELATIONSHIP_INSTANCES TRUE
```

By default, the threshold value is set to 5.

- h. On the server, to update and increase the action agent timeout value, run the following command:

```
ovconfchg -ns eaagt -set OPC_KILL_AUTO_ACTION_TIMEOUT 4000
```

By default, the value is set to 600.

For more information about the commands, see *HPOM Online Help*.

- The Agent settings available under **Infrastructure Management**→**Settings and Thresholds** are deployed on the virtualized nodes (hypervisors and managed proxies).
- Infrastructure SPI messages from the messages policy groups are deployed on the virtualized nodes (hypervisors and managed proxies).
- Make sure that HP Performance Manager is installed (to view graphs) on the HPOM server.

Deploying Quick Start Policies from HPOM for Windows

After the SI SPI discovery runs successfully, the discovered nodes are automatically added to the relevant Infrastructure SPI node groups.

By default, QuickStart policies are assigned to these node groups. When a node is added to the node group, these QuickStart policies get automatically deployed to the managed nodes (if policy autodeployment is enabled).

After the infrastructure is discovered and the service map is populated on the HPOM for Windows management server, the QuickStart policies are automatically deployed to the managed nodes (if policy autodeployment is enabled). Available for all three Infrastructure SPIs, QuickStart policies get you started immediately without having to spend much time customizing settings. Autodeployment of policies is enabled by default. You can choose to turn off automatic deployment of policies when services are discovered. In addition, you can modify and save preconfigured policies with new names to create custom policies for your own specialized purposes.

The advanced policies are used in specific scenarios. You can manually deploy these policies as required.

If you turned off autodeployment of policies, you can manually deploy the QuickStart policies by accessing either of the two policies grouping provided by the Infrastructure SPIs. The groupings are based on monitored aspects and vendor and operating system. The monitored aspects based grouping helps you to access and deploy policies to monitor performance, availability, capacity, logs, and security aspects across multiple operating systems.

The **Policies grouped by Vendor** help you to quickly access the policies relevant to your operating system at one place. For example, to access VI-IBMLPARFrameCPUUtilMonitor policy for deploying it on a managed node, expand:

Infrastructure Management→<language>→**Virtualization Infrastructure**→**Policies grouped by Vendor**→**IBM LPAR**→**QuickStart**→**VI-IBMLPARFrameCPUUtilMonitor**

On HPOM for UNIX

Follow the steps for getting started with the Infrastructure SPIs on HPOM for UNIX (HP-UX, Linux, and Solaris):

Before you start, make sure that you have installed the latest patches and hotfixes.

List of the Patches

HPOM for HP-UX	HPOM for Linux	HPOM for Solaris
PHSS_43123	OML_00057	ITOSOL_00779

Running the Discovery Policies on the Virtualized Infrastructure

To get started with discovering the virtualized infrastructure, the first step is to deploy the SI-SystemDiscovery policy on the nodes. As VI SPI discovery policies are not auto deployed, one or more auto messages are sent to HPOM. These messages include the auto action to add the nodes to InfraSPI node groups. For example, for IBM AIX, the Auto-Add messages add the virtualization nodes (eg, FRAME, LPAR, WPAR and HMC) to Virtualization node group. The node is added as FRAMES, LPAR and WPAR, HMC, and so on.

The vendor specific QuickStart policies are auto-assigned on those nodes. After the nodes are added to these node groups, you have to deploy the auto-assigned policies on the nodes. Also, deploy VI discovery policy on the node. The virtual machines running on those nodes are added under the respective Virtualization Infrastructure node group.

The discovered managed nodes are regrouped in the console tree as **Nodes**→**Virtualization**→<vendor name>.

The VI SPI discovery policy adds the discovered elements to the HPOM service map. The service map graphically represents the discovered virtual infrastructure.

Note: If the discovery map for virtualization is not appearing, see [Problem: Discovery map for VI SPI is not appearing.](#)

Deploying Quick Start Policies from HPOM for UNIX

After the SI SPI discovery runs successfully, the discovered nodes are automatically added to the relevant Infrastructure SPI node groups.

By default, QuickStart policies are assigned to these node groups. When a node is added to the node group, these QuickStart policies get assigned to the node automatically. You must then deploy these policies manually on the node by selecting **Deploy Configuration** from the **Actions** menu in the Admin GUI.

Available for all three Infrastructure SPIs, QuickStart policies get you started immediately without having to spend much time customizing settings. Automatic assignment of policies is enabled by default.

The groupings are based on *monitored aspects* and *operating systems/vendor*. The monitored aspects based grouping helps you to access and deploy policies to monitor performance, availability, capacity, logs, and security aspects across multiple operating systems.

The policies grouped by operating system and vendor help you to quickly access the policies relevant to your operating system at one place. For example, to access VI-VMwareEventMonitor policy for deploying it on a managed node, select:

/ Policy Bank / Infrastructure Management / en / Virtualization Infrastructure / Policies grouped by Vendor / IBM LPAR - QuickStart

Policies grouped by operating system include two sub groups: QuickStart and Advanced. The QuickStart group includes the policies that are used most often. The advanced policies like the disk utilization policy and the disk capacity monitor policy are used in specific scenarios. The following figure shows the policies grouped by vendor and the subgroups for QuickStart and Advanced policies.

Viewing Reports and Graphs

To generate and view reports and graphs from data collected by the Infrastructure SPIs, you must use HP Reporter and HP Performance Manager, respectively, in conjunction with HPOM. The Infrastructure SPIs collect and store reporting and graphing data in a data store. The data store can be CODA (HP Operations agent's data store—also known as embedded performance component) or HP Performance Agent.

For VI SPI reporting and graphing, HP Performance Agent must be installed on the managed node.

To view graphs on HPOM for HP-UX, Linux, or Solaris you need to first integrate HP Performance Manager with the HPOM management server.

Integrating HP Performance Manager with HPOM for UNIX

To integrate HPOM for UNIX (HP-UX, Linux, or Solaris) server with HP Performance Manager, follow these steps:

- If HP Performance Manager is installed on the HPOM server, run the following command:

```
# /opt/OV/contrib/OpC/OVPM/install_OVPM.sh
```

```
install_OVPM.sh <nodename>:<port>
```

Example: `install_OVPM.sh test.ovtest.com:8081`
- If HP Performance Manager is installed on a remote system connected to the HPOM server, follow these steps:
 - a. Copy the graph templates from the remote system where HP Performance Manager is installed to the HPOM server. To learn about the graph types and their location on the system, see *HP Performance Manager Administrator Guide*.
 - b. Run the following command on the HPOM server:

```
# /opt/OV/contrib/OpC/OVPM/install_OVPM.sh
```

```
install_OVPM.sh <nodename>:<port>
```

Example: `install_OVPM.sh test.ovtest.com:8081`

These steps set the host system configuration for HP Performance Manager, that is used when launching graphs from events in the HPOM operator GUI.

Updating Reports after Upgrading the SPI

After the upgrade, the existing report files are replaced with the new report files. Run the following command to update the reports.

1. Go to the **Start** menu.
2. Select **Run**.
3. At the prompt, type the command **repcrys** and click **Ok**.

Confirm that all the reports on the management server are in sync with the reports on the HP Reporter GUI. Click the **Reporter Status** tab in the Reporter GUI to check for the number reports sent to the console and also for any error message.

Chapter 4: Virtualization Infrastructure SPI Policies and Tools

The Virtualization Infrastructure SPI (VI SPI) provides a wide range of policies and tools to help manage your infrastructure. The policies help you monitor systems in virtualized environments and the tools display data collected for these systems.

Virtualization Infrastructure SPI Policies

A policy is a rule or set of rules that helps you automate monitoring. The VI SPI policies help you to monitor in Windows and UNIX environments. Most policies are common to all environments, but there are some policies that are relevant only to a particular environment and must be deployed only on the relevant platform. Deployment of policy to an unsupported platform may lead to an unexpected behavior or cause the policy to fail.

The folder Infrastructure Management group contains a subgroup arranged according to language. For example, the subgroup for English policies is **en**, for Japanese language is **ja**, and for Simplified Chinese language is **zh**.

In the console tree, the VI SPI policies are listed at the following location:

Policy management→**Policy groups**→**Infrastructure Management**→**v12.0** →
<language>→**Virtualization Infrastructure**.

For information about deploying policies from the HPOM for Windows management server, see ["Deploying VI SPI Policies from HPOM for Windows Management Server" on page 53](#).

For HPOM for UNIX (HP-UX, Linux, or Solaris), the policy group on the console/ Administration interface is:

Policy Bank→**Infrastructure Management**→**v12.0**→**<language>**→ **Virtualization Infrastructure**

For information about deploying policies from the HPOM for UNIX (HP-UX, Linux, or Solaris) management server, see ["Deploying VI SPI Policies from HPOM for UNIX Management Server" on page 55](#).

Auto Discovery Policy

The Virtualization Infrastructure SPI discovers virtual machines and resource pools that are available on host server nodes and automatically configures the service hierarchy. After you add a node to the HPOM server **with auto deployment enabled**, the Systems Infrastructure SPI service discovery policy is automatically deployed to the nodes. Once the Systems Infrastructure SPI discovery identifies the system as a node that hosts virtual machines, it automatically triggers the auto-deployment of the VI-Discovery policy. The Virtualization Infrastructure SPI discovery adds discovered information to the HPOM Services area.

Note: The Service Discovery policy is auto-deployed only on HPOM for Windows. This policy must be manually assigned and deployed to the nodes on HPOM for UNIX (HP-UX, Linux and Solaris).

Discovering Services Manually

In the console tree, the auto discovery policy is listed at the following location:

Infrastructure Management→**v12.0**→<language>→ **Virtualization Infrastructure**→ **Auto Discovery**

To deploy the Discovery policy manually, follow these steps:

1. Select the **VI-Discovery** policy.
2. Right-click and select **All tasks** →**Deploy on...**
3. Select the nodes on which you want to deploy the policy.
4. Click **OK**.

Note: The *VI-Discovery* policy does not automatically deploy the preconfigured policies. You must manually deploy the policies.

Availability Policies

Availability monitoring helps to ensure adequate availability of resources. The availability policies compute and compare current load on virtualized infrastructure with threshold levels and sends an alert message to HPOM console if there is any shortfall in resource availability.

In the console tree, the Availability policies are listed at the following location:

Infrastructure Management→**v12.0**→<language>→**Virtualization Infrastructure**→**Availability**

Performance Agent Processes Monitor Policy

VI-PerfAgentProcessMonitor

The VI-PerfAgentProcessMonitor policy is a measurement threshold policy that monitors the performance agent processes running on the nodes. It first checks if *CODA* (for HP Operations agent) or *SCOPE* (for HP Performance Agent) is enabled on the node and then checks its status.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management**→**v12.0**→<language>→ **Virtualization Infrastructure**→ **Availability**
- **Infrastructure Management**→ **v12.0**→<language>→**Virtualization Infrastructure**→**Policies Grouped by Vendor** →<platform>- **QuickStart**

If any of the performance agent processes stop running, this policy sends an alert message of severity *Major* to the HPOM console. This policy has an automatic action associated with it that starts the process internally. After the process starts and the *start* command for the services is successful, the alert message is moved to the Acknowledge message window.

If all the services are up and running, the alert message gets acknowledged with a *Normal* alert message during the next run of the policy.

The default polling interval for this policy is 5 minutes. You can modify the polling interval based on your requirements.

Note: Ensure that you do *not* set the polling interval below 30 seconds or the policy will not work.

Metrics Used	GBL_LS_TYPE
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State Monitor Policy for HPVM Guests

VI-HPVMStateMonitor

The VI-HPVMStateMonitor policy monitors and reports on the state of HPVM guests. It sends alert messages of severity Major or Warning to the HPOM console based on the state of the virtual machine being monitored.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Availability** → **HPVM**
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor HPVM - QuickStart**

The VI-HPVMStateMonitor policy alerts on the following states:

Major Alert	Warning Alert		Normal Alert
Critical States	Warning States	Down States	Normal State
<ul style="list-style-type: none"> • Hung • Crash 	<ul style="list-style-type: none"> • Unknown • Invalid • Other 	<ul style="list-style-type: none"> • Down • Boot • Shutdown 	<ul style="list-style-type: none"> • Up

The VI-HPVMStateMonitor policy alerts on transient states only if the virtual machine is in transient state for more than 30 minutes. This policy does not report on the state of the host machines.

Metrics Used	<ul style="list-style-type: none"> • BYLS_LS_STATE • BYLS_LS_NAME • BYLS_DISPLAY_NAME • GBL_LS_TYPE
Supported Platforms	HPVM
Script-Parameter	Description
<i>AlertOnPlannedOutage</i>	The value of AlertOnPlannedOutage is set to FALSE by default. You can change it to TRUE or hh:mm:ss-hh:mm:ss format for time-bound alerting. To receive alerts for all the states listed under the Down category, set the value to TRUE or the specified time format.

<i>MessageGroup</i>	Message group for outgoing messages.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 5 minutes. You can modify the polling interval based on your requirements.

State Monitor Policy for IBM Frame and LPAR

VI-IBMFrameAndLPARStateMonitor

The VI-IBMFrameAndLPARStateMonitor policy monitors IBM Frames and LPARs on those Frames. It sends alert messages of severity `Major` or `Warning` to the HPOM console based on the state of the Frames and LPARs being monitored.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Availability** → **IBM LPAR**
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **IBM LPAR - Advanced**

This policy collects the following information about the frames and LPARs and logs it in CODA under two classes: `FRAME` and `LPAR`

- *FRAME Class*:
 - HMC Name
 - Frame Name
 - Frame State
- *LPAR Class*:
 - HMC Name
 - Frame Name
 - LPAR ID
 - LPAR Name
 - LPAR State

The policy alerts on the following Frame states:

Major Alert	Warning Alert			Normal Alert
<i>Critical States</i>	<i>Warning State</i>	<i>Down State</i>	<i>Transient States</i>	<i>Normal State</i>

Major Alert	Warning Alert			Normal Alert
<ul style="list-style-type: none"> • Error • Error - Dump in Progress • Error - Terminated 	<ul style="list-style-type: none"> • Incomplete • Failed Authentication • Pending Authentication - Password Updates Required • Recovery • No Connection • On Demand Recovery 	<ul style="list-style-type: none"> • Power off 	<ul style="list-style-type: none"> • Initializing 	<ul style="list-style-type: none"> • Operating

The VI-IBMFrameAndLPARStateMonitor policy alerts on the following LPAR states:

Major Alert	Warning Alert			Normal Alert
<i>Critical States</i>	<i>Warning State</i>	<i>Down State</i>	<i>Transient States</i>	<i>Normal State</i>
<ul style="list-style-type: none"> • Not Available 	<ul style="list-style-type: none"> • Error 	<ul style="list-style-type: none"> • Not Activated 	<ul style="list-style-type: none"> • Starting • Migrating - Running • Shutting Down • Hardware Discovery • Migrating - Not Activated 	<ul style="list-style-type: none"> • Running

This policy alerts on transient states only if the virtual machine is in transient state for more than 30 minutes. It does not report on the state of the host machines.

Metrics Used	<ul style="list-style-type: none"> • HMC_NAME • FRAME_NAME • FRAME_STATE • HMC_NAME • FRAME_NAME
Supported Platforms	IBM Frame and LPAR
Script-Parameter	Description
<i>AlertOnPlannedOutage</i>	The value of <i>AlertOnPlannedOutage</i> is set to FALSE by default. You can change it to TRUE or hh:mm:ss-hh:mm:ss format for time-bound alerting. To receive alerts for all the states listed under the Down category, set the value to TRUE or the specified time format.

<i>MessageGroup</i>	Message group for outgoing messages.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 5 minutes. You can modify the polling interval based on your requirements.

State Monitor Policy for IBM WPAR

VI-IBMWPARStateMonitor

The VI-IBMWPARStateMonitor policy monitors and reports on the state of IBM WPARs. It sends alert messages of severity Major or Warning to the HPOM console based on the state of the WPARs being monitored.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management**→v12.0→<language>→**Virtualization Infrastructure**→**Availability**→**IBM LPAR**
- **Infrastructure Management**→v12.0→<language>→**Virtualization Infrastructure**→**Policies Grouped by Vendor**→**IBM LPAR - QuickStart**

The VI-IBMWPARStateMonitor policy alerts on the following states:

Major Alert	Warning Alert			Normal Alert
<i>Critical States</i>	<i>Warning State</i>	<i>Down State</i>	<i>Transient States</i>	<i>Normal State</i>
<ul style="list-style-type: none"> • Broken • Error 	<ul style="list-style-type: none"> • Frozen 	<ul style="list-style-type: none"> • Paused 	<ul style="list-style-type: none"> • Transitional • Defined • Loaded 	<ul style="list-style-type: none"> • Active

The VI-IBMWPARStateMonitor policy alerts on transient states only if the virtual machine is in transient state for more than 30 minutes. This policy does not report on the state of the host machines.

Metrics Used	<ul style="list-style-type: none"> • BYLS_LS_STATE • BYLS_LS_NAME • BYLS_LS_TYPE • BYLS_DISPLAY_NAME
Supported Platforms	IBM WPAR
Script-Parameter	Description
<i>AlertOnPlannedOutage</i>	The value of <i>AlertOnPlannedOutage</i> is set to FALSE by default. You can change it to TRUE or hh:mm:ss-hh:mm:ss format for time-bound alerting. To receive alerts for all the states listed under the

	Down category, set the value to TRUE or the specified time format.
<i>MessageGroup</i>	Message group for outgoing messages.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 5 minutes. You can modify the polling interval based on your requirements.

State Monitor Policy for Oracle Solaris Zones

VI-OracleSolarisStateMonitor

The VI-OracleSolarisStateMonitor policy monitors and reports on the state of Solaris zones. It sends alert messages of severity `Warning` to the HPOM console based on the state of the zones being monitored.

In the console tree, the policy is listed at the following locations:

Infrastructure Management → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Availability** → **Oracle Containers**

Infrastructure Management → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **Oracle Containers - QuickStart**

The VI-OracleSolarisStateMonitor policy alerts on the following states:

Warning Alert		Normal Alert
<i>Down State</i>	<i>Transient States</i>	<i>Normal State</i>
<ul style="list-style-type: none"> Down 	<ul style="list-style-type: none"> Configured Incomplete Installed Ready Shutting Mounted 	<ul style="list-style-type: none"> Running

The VI-OracleSolarisStateMonitor policy alerts on transient states only if the virtual machine is in transient state for more than 30 minutes. This policy does not report on the state of the host machines.

Metrics Used	<ul style="list-style-type: none"> BYLS_LS_STATE BYLS_LS_NAME BYLS_DISPLAY_NAME GBL_LS_TYPE
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Supported Platforms	Oracle Solaris Zones
Script-Parameter	Description
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.
<i>AlertOnPlannedOutage</i>	The value of <i>AlertOnPlannedOutage</i> is set to FALSE by default. You can change it to TRUE or hh:mm:ss-hh:mm:ss format for time-bound alerting. To receive alerts for all the states listed under the Down category, set the value to TRUE or the specified time format.

The default polling interval for this policy is 5 minutes. You can modify the polling interval based on your requirements.

Process Monitoring Policy for HPVM

VI-HPVMDaemonsMonitor

The VI-HPVMDaemonsMonitor policy monitors the processes/daemons running on HPVM and sends Minor alert messages when any of the processes or daemons stop.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Availability** → **HPVM**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **HPVM - QuickStart**.

This VI-HPVMDaemonsMonitor policy monitors the following HPVM processes/daemons:

Daemon Name	Function
<i>hvvmmonlogd</i>	Copies the monitor output from the driver memory to the <i>hvvm_mon_log</i> file and rotates the log files as required.
<i>hvvmctrlld</i>	Manages distributed guests.
<i>hvvmnetd</i>	Manages a specified virtual switch.
<i>vm_fssagt</i>	Computes fair shares for virtual machines.

The alert messages are automatically acknowledged when the processes/daemons start.

The default polling interval for this policy is 5 minutes. You can modify the polling interval based on your requirements.

Process Monitoring Policies for Oracle Solaris Zones

VI-OracleSolarisRcapdProcessMonitor

The VI-OracleSolarisRcapdProcessMonitor policy monitors the **resource capping daemon (rcapd)** running on Solaris zones and sends an alert message with severity `Minor` to the HPOM console when rcapd stops.

If you have configured the zones with memory caps, the rcapd enables you to regulate physical memory consumption by the zones. When the resident set size (RSS) of a collection of processes exceeds its cap, rcapd reduces the RSS of the collection.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Availability** → **Oracle Containers**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **Oracle Containers - Advanced**.

The alert messages are automatically acknowledged when rcapd starts.

The default polling interval for this policy is 5 minutes. You can modify the polling interval based on your requirements.

VI-OracleSolarisFmdProcessMonitor

The VI-OracleSolarisFmdProcessMonitor policy monitors the **fault manager daemon (fmd)** running on Solaris zones and sends an alert message with severity `Minor` to the HPOM console when fmd stops.

The fmd diagnoses and pro-actively resolves (for example, by disabling faulty components) any system software problem on the Solaris system on which it is running.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Availability** → **Oracle Containers**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **Oracle Containers - QuickStart**.

The alert messages are automatically acknowledged when fmd starts.

The default polling interval for this policy is 5 minutes. You can modify the polling interval based on your requirements.

Performance Policies

Performance monitoring helps to identify potential performance disruptions and take pro-active steps to resolve them before they threaten service quality.

In the console tree, the Performance policies are listed at the following location:

Infrastructure Management → *<language>* → **Virtualization Infrastructure** → **Performance**

You can use performance data to correlate events across the virtualized infrastructure in order to identify the root cause of a developing performance issue.

Host CPU Utilization Monitor Policy for HPVM

VI-HPVMHostCPUUtilMonitor

The VI-HPVMHostCPUUtilMonitor policy monitors the CPUs on the host servers (managed nodes) for HPVMs and sends an alert message in case the performance goes below the set threshold.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **HPVM**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **HPVM - QuickStart**.

The VI-HPVMHostCPUUtilMonitor policy provides information about the following:

- Host level CPU utilization
- VMs utilizing the maximum CPU (in descending order)

The alert messages are generated based on the values of the script parameters mentioned in the above table. The alert messages are automatically acknowledged when the values of host CPU utilization reach normal.

The default polling interval for this policy is 5 minutes. You can modify the threshold settings and polling interval in the policy depending on your requirements.

Host CPU Utilization Monitor Policy for IBM LPAR

VI-IBMLPARFrameCPUUtilMonitor

The VI-IBMLPARFrameCPUUtilMonitor policy monitors the CPUs on the frames (managed nodes) for IBM AIX LPARs and sends an alert message in case the performance goes below the set threshold.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **IBM LPAR**
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **IBM LPAR - QuickStart**.

The VI-IBMLPARFrameCPUUtilMonitor policy provides information about the following:

- Frame level CPU utilization
- LPARs utilizing the maximum CPU (in descending order)

The policy calculates the frame level CPU utilization with respect to the available CPU's in a frame. However, when generating the list of LPARs utilizing the maximum CPU, the policy calculates the CPU utilization of the LPARs based on BYLS_CPU_PHYS_TOTAL_UTIL metric. This metric provides the CPU utilization information based on the CPUs available in the pool to which the LPAR belongs.

Note: You must deploy this policy on the host machine.

The alert messages are generated based on the values of the script parameters mentioned in the above table. The alert messages are automatically acknowledged when the values of host CPU utilization reach normal.

The default polling interval for this policy is 5 minutes and 14 seconds. You can modify the threshold settings and polling interval in the policy depending on your requirements.

Host CPU Utilization Monitor Policy for Oracle Solaris Zones

VI-OracleSolarisHostCPUUtilMonitor

The VI-OracleSolarisHostCPUUtilMonitor policy monitors the CPUs on the host servers (managed nodes) for Solaris zones and sends an alert message in case the performance goes below the set threshold.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **Oracle Containers**
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **Oracle Containers - QuickStart**.

The VI-OracleSolarisHostCPUUtilMonitor policy provides information about the following:

- Host level CPU utilization
- Zones utilizing the maximum CPU (in descending order)

The alert messages are generated based on the values of the script parameters mentioned in the above table. The alert messages are automatically acknowledged when the values of host CPU utilization reach normal.

The default polling interval for this policy is 5 minutes. You can modify the threshold settings and polling interval in the policy depending on your requirements.

Total Frame CPU Utilization Monitor Policy for IBM LPAR

VI-IBMLPARFrameCPUUtilMonitor-AT

The VI-IBMLPARFrameCPUUtilMonitor-AT policy calculates the total CPU utilization of frame.

The threshold values for this policy are automatically calculated based on the previous CPU utilization by the LPARs.

When the threshold values are reached or exceeded, the policy sends an alert message to the HPOM console. The message severity can be major, minor, or warning depending upon the level of threshold violated.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **IBM LPAR**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **IBM LPAR - Advanced**.

Metrics Used	<ul style="list-style-type: none">• BYLS_CPU_TOTAL_UTIL• BYLS_LS_TYPE• BYLS_LS_HOSTNAME
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Supported Platform	IBM LPAR
Script-Parameter	Description
<i>MessageObject</i>	Application for outgoing messages.
<i>DataSource</i>	Displays the data source name as SCOPE.
<i>DataObject</i>	Displays the data object name as LOGICAL.
<i>DataMetric</i>	Displays the metric name as BYLS_CPU_TOTAL_UTIL .
<i>BaselinePeriod</i>	Type the time period you want to define as a baseline period, such as '3600 seconds'. This period moves with the current time. The most recent 3600-second (1-hour) period becomes the current baseline period.
<i>MinimumValue</i>	Displays the minimum value of the CPU utilization as indicated by the metric.
<i>MaximumValue</i>	Displays the maximum value of the CPU utilization as indicated by the metric.
<i>WarningDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as 5.
<i>MinorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>WarningDeviations</i> . To disable the parameter, set value as 5.
<i>MajorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>MinorDeviations</i> . To disable the parameter, set value as 5.
<i>WarningHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .

<i>WarningLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MessageGroup</i>	Message group for outgoing messages.
<i>LPARFrameCPUUtilCutOff</i>	Set a value below which you do not want to monitor CPU utilization.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 30 minutes. You can modify the threshold settings and polling interval in the policy depending on your requirements.

After the values return within normal levels, the alert messages are automatically acknowledged.

CPU Entitlement Utilization Monitor Policy for HPVM

VI-HPVMGuestCPUEntlUtilMonitor-AT

The VI-HPVMCPUEntlUtilMonitor-AT policy calculates the current CPU utilization (in percentage) of HPVM guests. It indicates the logical system's CPU utilization against the minimum entitled CPU. Entitled CPU is the number of guaranteed processing units allocated to a logical system.

The threshold values for this policy are automatically calculated based on the previous CPU utilization by the guests.

When the threshold values are reached or exceeded, the policy sends an alert message to the HPOM console. The message severity can be major, minor, or warning depending upon the level of threshold violated.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **HPVM**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **HPVM - Advanced**.

Metrics Used	<ul style="list-style-type: none"> • BYLS_CPU_ENTL_UTIL • BYLS_LS_NAME • BYLS_DISPLAY_NAME • GBL_LS_TYPE
Supported Platform	HPVM
Script-Parameter	Description
<i>MessageObject</i>	Application for outgoing messages.
<i>DataSource</i>	Displays the data source name as SCOPE.
<i>DataObject</i>	Displays the data object name as LOGICAL.
<i>DataMetric</i>	Displays the metric name as BYLS_CPU_ENTL_UTIL.
<i>BaselinePeriod</i>	Type the time period you want to define as a baseline period, such as <i>3600 seconds</i> . This period moves with the current time. The most recent 3600-second (1-hour) period becomes the current baseline period.
<i>MinimumValue</i>	Displays the minimum value of the CPU utilization as indicated by the metric.
<i>MaximumValue</i>	Displays the maximum value of the CPU utilization as indicated by the metric.
<i>WarningDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as 5.
<i>MinorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>WarningDeviations</i> . To disable the parameter, set value as 5.
<i>MajorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>MinorDeviations</i> . To disable the parameter, set value as 5.
<i>WarningHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MinorDeviations</i> . To disable the

	parameter, set value as <i>none</i> .
<i>MajorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>WarningLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MessageGroup</i>	Message group for outgoing messages.
<i>CPUEntlUtilCutOff</i>	Set a value below which you do not want to monitor CPU utilization.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 30 minutes. You can modify the threshold settings and polling interval in the policy depending on your requirements.

After the values return within normal levels, the alert messages are automatically acknowledged.

CPU Entitlement Utilization Monitor Policy for IBM LPAR

VI-IBMLPARCPUEntlUtilMonitor-AT

This policy calculates the current CPU utilization (in percentage) of AIX LPARs. It indicates the logical system's CPU utilization against the minimum entitled CPU. Entitled CPU is the number of guaranteed processing units allocated to a logical system.

The threshold values for this policy are automatically calculated based on the previous CPU utilization by the LPARs.

When the threshold values are reached or exceeded, the policy sends an alert message to the HPOM console. The message severity can be major, minor, or warning depending upon the level of threshold violated.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → v12.0 → <language> → **Virtualization Infrastructure** → **Performance** → **IBM LPAR**.
- **Infrastructure Management** → v12.0 → <language> → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **IBM LPAR - Advanced**.

Note: This policy does not monitor the WPARs running on the LPAR. To monitor the WPARs deploy the VI-IBMWPARCPUEntlUtilMonitor-AT policy. See "[CPU Entitlement Utilization Monitor Policy for IBM WPAR](#)" on the next page.

Metrics Used	<ul style="list-style-type: none"> • BYLS_CPU_ENTL_UTIL • BYLS_LS_NAME • BYLS_DISPLAY_NAME • BYLS_LS_TYPE
Supported Platform	IBM LPAR
Script-Parameter	Description
<i>MessageObject</i>	Application for outgoing messages.
<i>DataSource</i>	Displays the data source name as SCOPE.
<i>DataObject</i>	Displays the data object name as LOGICAL.
<i>DataMetric</i>	Displays the metric name as BYLS_CPU_ENTL_UTIL.
<i>BaselinePeriod</i>	Type the time period you want to define as a baseline period, such as <i>3600 seconds</i> . This period moves with the current time. The most recent 3600-second (1-hour) period becomes the current baseline period.
<i>MinimumValue</i>	Displays the minimum value of the CPU utilization as indicated by the metric.
<i>MaximumValue</i>	Displays the maximum value of the CPU utilization as indicated by the metric.
<i>WarningDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as 5.
<i>MinorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>WarningDeviations</i> . To disable the parameter, set value as 5.
<i>MajorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value

	for <i>MinorDeviations</i> . To disable the parameter, set value as <i>5</i> .
<i>WarningHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>WarningLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MessageGroup</i>	Message group for outgoing messages.
<i>CPUEntlUtilCutOff</i>	Set a value below which you do not want to monitor CPU utilization.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 30 minutes. You can modify the threshold settings and polling interval in the policy depending on your requirements.

After the values return within normal levels, the alert messages are automatically acknowledged.

CPU Entitlement Utilization Monitor Policy for IBM WPAR

VI-IBMWPARCPUEntlUtilMonitor-AT

This policy calculates the current CPU utilization (in percentage) of AIX WPARs. It indicates the logical system's CPU utilization against the minimum entitled CPU. Entitled CPU is the number of guaranteed processing units allocated to a logical system.

The threshold values for this policy are automatically calculated based on the previous CPU utilization by the WPARs.

When the threshold values are reached or exceeded, the policy sends an alert message to the HPOM console. The message severity can be major, minor, or warning depending upon the level of threshold violated.

Note: The VI-IBMWPARCHPUEntUtilMonitor-AT policy monitors only the WPARs that are created in an LPAR on which PA 5.0 is running.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **IBM LPAR**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **IBM LPAR - Advanced**.

Metrics Used	<ul style="list-style-type: none"> • BYLS_CPU_ENTL_UTIL • BYLS_LS_NAME • BYLS_DISPLAY_NAME • BYLS_LS_TYPE
Supported Platform	IBM WPAR
Script-Parameter	Description
<i>MessageObject</i>	Application for outgoing messages.
<i>DataSource</i>	Displays the data source name as SCOPE.
<i>DataObject</i>	Displays the data object name as LOGICAL.
<i>DataMetric</i>	Displays the metric name as BYLS_CPU_ENTL_UTIL.
<i>BaselinePeriod</i>	Type the time period you want to define as a baseline period, such as <i>3600 seconds</i> . This period moves with the current time. The most recent 3600-second (1-hour) period becomes the current baseline period.
<i>MinimumValue</i>	Displays the minimum value of the CPU utilization as indicated by the metric.
<i>MaximumValue</i>	Displays the maximum value of the CPU utilization as indicated by the metric.
<i>WarningDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter,

	set value as 5.
<i>MinorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>WarningDeviations</i> . To disable the parameter, set value as 5.
<i>MajorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>MinorDeviations</i> . To disable the parameter, set value as 5.
<i>WarningHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>WarningLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MessageGroup</i>	Message group for outgoing messages.
<i>CPUEntlUtilCutOff</i>	Set a value below which you do not want to monitor CPU utilization.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 30 minutes. You can modify the threshold settings and polling interval in the policy depending on your requirements.

After the values return within normal levels, the alert messages are automatically acknowledged.

CPU Entitlement Utilization Monitor Policy for Oracle Solaris Zones

VI-OracleSolarisZoneCPUEntlUtilMonitor-AT

This policy calculates the current CPU utilization (in percentage) of Solaris zones. It indicates the logical system's CPU utilization against the minimum entitled CPU. Entitled CPU is the number of guaranteed processing units allocated to a logical system.

The threshold values for this policy are automatically calculated based on the previous CPU utilization by the zones.

When the threshold values are reached or exceeded, the policy sends an alert message to the HPOM console. The message severity can be major, minor, or warning depending upon the level of threshold violated.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **Oracle Containers**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **Oracle Containers - Advanced**.

Metrics Used	<ul style="list-style-type: none"> • BYLS_CPU_ENTL_UTIL • BYLS_LS_NAME • BYLS_DISPLAY_NAME • GBL_LS_TYPE
Supported Platform	Oracle Solaris Zones
Script-Parameter	Description
<i>MessageObject</i>	Application for outgoing messages.
<i>DataSource</i>	Displays the data source name as SCOPE.
<i>DataObject</i>	Displays the data object name as LOGICAL.
<i>DataMetric</i>	Displays the metric name as BYLS_CPU_ENTL_UTIL.
<i>BaselinePeriod</i>	Type the time period you want to define as a baseline period, such as <i>3600 seconds</i> . This period moves with the current time. The most recent 3600-second (1-hour) period becomes the current baseline period.
<i>MinimumValue</i>	Displays the minimum value of the CPU utilization as indicated by the metric.

<i>MaximumValue</i>	Displays the maximum value of the CPU utilization as indicated by the metric.
<i>WarningDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as 5.
<i>MinorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>WarningDeviations</i> . To disable the parameter, set value as 5.
<i>MajorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>MinorDeviations</i> . To disable the parameter, set value as 5.
<i>WarningHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>WarningLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MessageGroup</i>	Message group for outgoing messages.
<i>CPUEntlUtilCutOff</i>	Set a value below which you do not want to monitor CPU

	utilization.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 30 minutes. You can modify the threshold settings and polling interval in the policy depending on your requirements.

After the values return within normal levels, the alert messages are automatically acknowledged.

Memory Entitlement Utilization Monitor Policy for IBM LPAR

VI-IBMLPARMemoryEntlUtilMonitor-AT

The VI-IBMLPARMemoryEntlUtilMonitor-AT policy calculates the current memory utilization (in percentage) of all IBM LPARs in ACTIVE state. It indicates the LPAR's memory utilization against the minimum entitled memory.

Entitled memory is the amount of guaranteed memory allocated to a logical system.

The threshold values for this policy are automatically calculated based on the previous memory utilization by the LPARs.

When the threshold values are reached or exceeded, the policy sends an alert message to the HPOM console. The message severity can be major, minor, or warning depending upon the level of threshold violated.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **IBM LPAR**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **IBM LPAR - Advanced**.

Metrics Used	<ul style="list-style-type: none"> • BYLS_MEM_ENTL_UTIL • BYLS_LS_NAME • BYLS_LS_STATE • BYLS_DISPLAY_NAME • GBL_LS_TYPE
Supported Platform	IBM LPAR
Script-Parameter	Description
<i>MessageObject</i>	Application for outgoing messages.
<i>DataSource</i>	Displays the data source name as SCOPE.
<i>DataObject</i>	Displays the data object name as LOGICAL.

<i>DataMetric</i>	Displays the metric name as BYLS_MEM_ENTL_UTIL.
<i>BaselinePeriod</i>	Type the time period you want to define as a baseline period, such as <i>3600 seconds</i> . This period moves with the current time. The most recent 3600-second (1-hour) period becomes the current baseline period.
<i>MinimumValue</i>	Displays the minimum value of the entitled memory utilization as indicated by the metric.
<i>MaximumValue</i>	Displays the maximum value of the entitled memory utilization as indicated by the metric.
<i>WarningDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as <i>5</i> .
<i>MinorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>WarningDeviations</i> . To disable the parameter, set value as <i>5</i> .
<i>MajorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>MinorDeviations</i> . To disable the parameter, set value as <i>5</i> .
<i>WarningHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>WarningLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MinorDeviations</i> . To disable

	the parameter, set value as <i>none</i> .
<i>MajorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MessageGroup</i>	Message group for outgoing messages.
<i>MEMEntlUtilCutOff</i>	Set a value below which you do not want to monitor memory utilization.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 30 minutes. You can modify the threshold settings and polling interval in the policy depending on your requirements.

After the values return within normal levels, the alert messages are automatically acknowledged.

Memory Entitlement Utilization Monitor Policy for IBM WPAR

VI-IBMWPARMemoryEntlUtilMonitor-AT

The VI-IBMWPARMemoryEntlUtilMonitor-AT policy calculates the current memory utilization (in percentage) of IBM WPARs (running on the monitoring LPAR) in ACTIVE state. It indicates the WPAR’s memory utilization against the minimum entitled memory.

Entitled memory is the amount of guaranteed memory allocated to a logical system.

The threshold values for this policy are automatically calculated based on the previous memory utilization by the WPARs.

When the threshold values are reached or exceeded, the policy sends an alert message to the HPOM console. The message severity can be major, minor, or warning depending upon the level of threshold violated.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **IBM LPAR**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **IBM LPAR - Advanced**.

Metrics Used	<ul style="list-style-type: none"> • BYLS_MEM_ENTL_UTIL • BYLS_LS_NAME • BYLS_LS_STATE • BYLS_DISPLAY_NAME • GBL_LS_TYPE
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Supported Platform	IBM WPAR
Script-Parameter	Description
<i>MessageObject</i>	Application for outgoing messages.
<i>DataSource</i>	Displays the data source name as SCOPE.
<i>DataObject</i>	Displays the data object name as LOGICAL.
<i>DataMetric</i>	Displays the metric name as BYLS_MEM_ENTL_UTIL.
<i>BaselinePeriod</i>	Type the time period you want to define as a baseline period, such as <i>3600 seconds</i> . This period moves with the current time. The most recent 3600-second (1-hour) period becomes the current baseline period.
<i>MinimumValue</i>	Displays the minimum value of the entitled memory utilization as indicated by the metric.
<i>MaximumValue</i>	Displays the maximum value of the entitled memory utilization as indicated by the metric.
<i>WarningDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as 5.
<i>MinorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>WarningDeviations</i> . To disable the parameter, set value as 5.
<i>MajorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>MinorDeviations</i> . To disable the parameter, set value as 5.
<i>WarningHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .

<i>WarningLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MessageGroup</i>	Message group for outgoing messages.
<i>MEMEntlUtilCutOff</i>	Set a value below which you do not want to monitor memory utilization.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 30 minutes. You can modify the threshold settings and polling interval in the policy depending on your requirements.

After the values return within normal levels, the alert messages are automatically acknowledged.

Memory Entitlement Utilization Monitor Policy for Oracle Solaris Zones

VI-OracleSolarisMemoryEntlUtilMonitor-AT

The VI-OracleSolarisMemoryEntlUtilMonitor-AT policy calculates the current memory utilization (in percentage) of all Solaris zones in RUNNING state. It indicates the zone's memory utilization against the minimum entitled memory.

Entitled memory is the amount of guaranteed memory allocated to a logical system.

The threshold values for this policy are automatically calculated based on the previous memory utilization by the zones.

When the threshold values are reached or exceeded, the policy sends an alert message to the HPOM console. The message severity can be major, minor, or warning depending upon the level of threshold violated.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **Oracle Containers**.

• **Infrastructure Management → v12.0 → <language> → Virtualization Infrastructure → Policies Grouped by Vendor → Oracle Containers - Advanced.**

Metrics Used	<ul style="list-style-type: none"> • BYLS_MEM_ENTL_UTIL (This is calculated against capped memory value if zone is capped and against total physical memory if zone is uncapped.) • BYLS_LS_NAME • BYLS_LS_STATE • BYLS_DISPLAY_NAME • GBL_LS_TYPE
Supported Platform	Oracle Solaris Zones
Script-Parameter	Description
<i>MessageObject</i>	Application for outgoing messages.
<i>DataSource</i>	Displays the data source name as SCOPE.
<i>DataObject</i>	Displays the data object name as LOGICAL.
<i>DataMetric</i>	Displays the metric name as BYLS_MEM_ENTL_UTIL.
<i>BaselinePeriod</i>	Type the time period you want to define as a baseline period, such as <i>3600 seconds</i> . This period moves with the current time. The most recent 3600-second (1-hour) period becomes the current baseline period.
<i>MinimumValue</i>	Displays the minimum value of the entitled memory utilization as indicated by the metric.
<i>MaximumValue</i>	Displays the maximum value of the entitled memory utilization as indicated by the metric.
<i>WarningDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as 5.
<i>MinorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>WarningDeviations</i> . To disable the parameter, set value as 5.
<i>MajorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>MinorDeviations</i> . To disable the parameter, set value as 5.
<i>WarningHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data

	average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>WarningLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MessageGroup</i>	Message group for outgoing messages.
<i>MEMEntlUtilCutOff</i>	Set a value below which you do not want to monitor memory utilization.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

Note: For a zone with memory cap there is a slight deviation between the values generated by the metrics and that of the value given by system command **prstat -Z**.

The default polling interval for this policy is 30 minutes. You can modify the threshold settings and polling interval in the policy depending on your requirements.

After the values return within normal levels, the alert messages are automatically acknowledged.

Frame Memory Utilization Monitor Policy for IBM LPAR

VI-IBMLPARFrameMemoryUtilMonitor

The VI-IBMLPARFrameMemoryUtilMonitor policy monitors the memory utilization of the IBM AIX frames and alerts on any abnormal growth in physical memory utilization of AIX frames.

When the threshold values are reached or exceeded, the policy sends an alert message to the HPOM console. The message severity can be major, minor, or warning depending upon the level of threshold violated. The alert message contains the following information:

- Names of the LPARs in the frame.
- The percentage of memory utilized by the LPAR with respect to entitlement.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **IBM LPAR**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **IBM LPAR- QuickStart**.

Metrics Used	<ul style="list-style-type: none"> • BYLS_MEM_ENTL_UTIL • BYLS_MEM_ENTL • BYLS_LS_HOSTNAME • BYLS_LS_TYPE
Supported Platform	IBM AIX Frames
Script-Parameter	Description
<i>MessageGroup</i>	Message group for outgoing messages.
<i>MemUtilMajorThreshold</i>	If the memory utilization is more than the specified threshold value, the policy generates an alert message with severity Major.
<i>MemUtilMinorThreshold</i>	If the memory utilization is more than the specified threshold value, the policy generates an alert message with severity Minor.
<i>MemUtilWarningThreshold</i>	If the memory utilization is more than the specified threshold value, the policy generates an alert message with severity Warning.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 5 minutes and 20 seconds. You can modify the threshold settings and polling interval in the policy depending on your requirements.

Physical Memory Utilization Monitor Policy for Oracle Solaris Zones

VI-OracleSolarisHostMemoryUtilMonitor

The VI-OracleSolarisHostMemoryUtilMonitor policy monitors the memory utilization on Solaris zones. When the threshold values are reached or exceeded, the policy sends an alert message to the HPOM

console. The message severity can be major, minor, or warning depending upon the level of threshold violated.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **Oracle Containers**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **Oracle Containers- QuickStart**.

Metrics Used	<ul style="list-style-type: none"> • GBL_MEM_UTIL • GBL_MEM_FREE • BYLS_MEM_ENTL_UTIL • BYLS_MEM_ENTL • BYLS_DISPLAY_NAME
Supported Platform	Oracle Solaris Zones
Script-Parameter	Description
<i>MessageGroup</i>	Message group for outgoing messages.
<i>MemUtilMajorThreshold</i>	If the memory utilization is more than the specified threshold value and the free memory available (in megabytes) is less than the specified threshold value, the policy generates an alert message with severity <code>Major</code> .
<i>FreeMemAvailMajorThreshold</i>	
<i>MemUtilMinorThreshold</i>	If the memory utilization is more than the specified threshold value and the free memory available (in megabytes) is less than the specified threshold value, the policy generates an alert message with severity <code>Minor</code> .
<i>FreeMemAvailMinorThreshold</i>	
<i>MemUtilWarningThreshold</i>	If the memory utilization is more than the specified threshold value and the free memory available (in megabytes) is less than the specified threshold value, the policy generates an alert message with severity <code>Warning</code> .
<i>FreeMemAvailWarningThreshold</i>	
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 5 minutes. You can modify the threshold settings and polling interval in the policy depending on your requirements.

Swap Utilization Monitor Policy for Oracle Solaris Zones

VI-OracleSolarisZoneSwapUtilMonitor-AT

The VI-OracleSolarisZoneSwapUtilMonitor policy monitors the swap utilization on Solaris zones. When the threshold values are reached or exceeded, the policy sends an alert message to the HPOM

console. The message severity can be major, minor, or warning depending upon the level of threshold violated.

In the console tree, the policy is listed at the following locations:

- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Performance** → **Oracle Containers**.
- **Infrastructure Management** → **v12.0** → *<language>* → **Virtualization Infrastructure** → **Policies Grouped by Vendor** → **Oracle Containers- Advanced**.

Metrics Used	<ul style="list-style-type: none"> • BYLS_LS_NAME • BYLS_MEM_SWAP_UTIL
Supported Platform	Oracle Solaris Zones
Script-Parameter	Description
<i>MessageObject</i>	Application for outgoing messages.
<i>DataSource</i>	Displays the data source name as SCOPE.
<i>DataObject</i>	Displays the data object name as LOGICAL.
<i>DataMetric</i>	Displays the metric name as BYLS_MEM_SWAP_UTIL.
<i>BaselinePeriod</i>	Type the time period you want to define as a baseline period, such as <i>3600 seconds</i> . This period moves with the current time. The most recent 3600-second (1-hour) period becomes the current baseline period.
<i>MinimumValue</i>	Displays the minimum value of the swap utilization as indicated by the metric.
<i>MaximumValue</i>	Displays the maximum value of the swap utilization as indicated by the metric.
<i>WarningDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as 5.
<i>MinorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>WarningDeviations</i> . To disable the parameter, set value as 5.
<i>MajorDeviations</i>	Displays the number of standard deviation away from normal, at which the policy sends a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for <i>MinorDeviations</i> . To disable the parameter, set value as 5.

<i>WarningHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorHighSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or exceeds the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>WarningLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>WarningDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MinorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MinorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MajorLowSeverity</i>	Displays the severity of the alert messages to be sent to HPOM console in case the current data meets or falls below the sample data average by the value specified in <i>MajorDeviations</i> . To disable the parameter, set value as <i>none</i> .
<i>MessageGroup</i>	Message group for outgoing messages.
<i>SwapUtilCutOff</i>	Set a value below which you do not want to monitor CPU utilization.
<i>Debug</i>	Set the value as 0 to disable trace messages, as 1 to receive trace messages on the console, and as 2 to log the messages in the trace file on the managed node.

The default polling interval for this policy is 30 minutes. You can modify the threshold settings and polling interval in the policy depending on your requirements.

After the values return within normal levels, the alert messages are automatically acknowledged.

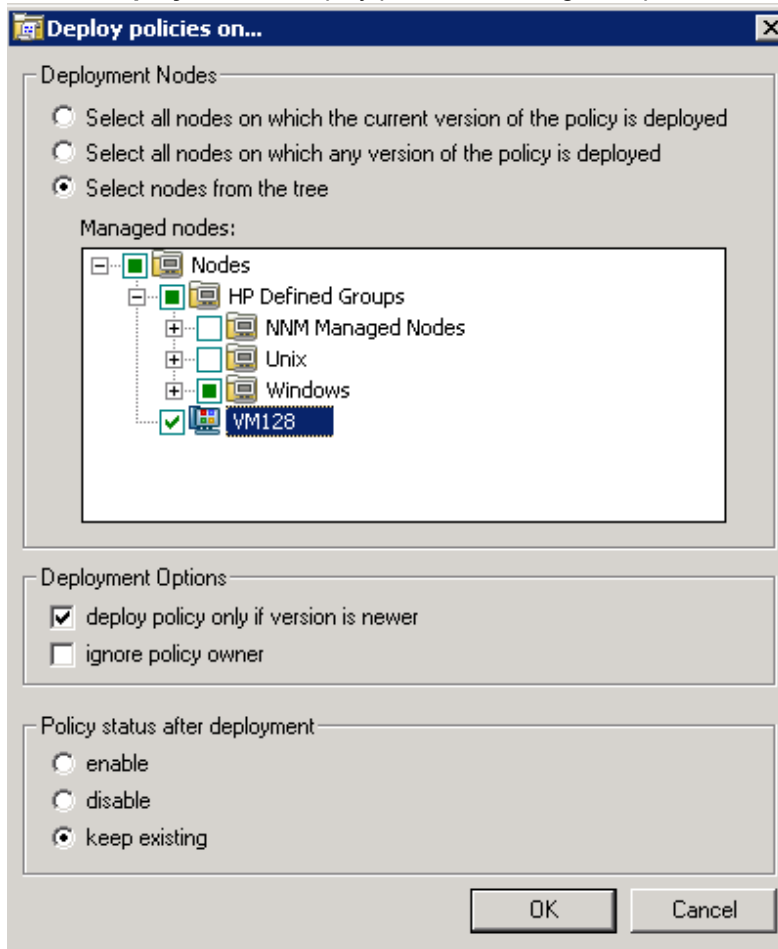
Deploying VI SPI Policies from HPOM for Windows Management Server

To enable auto deployment of policies, follow these steps:

1. To enable auto deployment on the server, run the following command:
/opt/OV/contrib/OpC/autogranting/enableAutoGranting.sh
2. To enable auto deployment for Infra SPI using XPL config change, run the following command:
ovconfchg -ns infraspi -set AUTODEPLOYMENT true
3. To activate the node, run the following command on the management server:
opcactivate -srv <HPOM Server> -cert_srv <HPOM Server> -f
4. Grant the certificates.
5. Add the node to the SI-Deployment node group.
6. Deploy configuration.
7. Check whether the node is added to the appropriate node group.
8. Verify auto deployment of policies to the node.

To manually deploy policies from the management server, follow these steps:

1. Right-click the policy you want to deploy.
2. From the menu, select **All Tasks**.
3. Select **Deploy on**. The Deploy policies on dialog box opens.



4. Select the option **Select nodes from the tree**. From the list of managed nodes, select the nodes where you want to deploy the policy.
5. Click **OK**.

Deploying VI SPI Policies from HPOM for UNIX Management Server

Before you deploy policies, make sure that the nodes have been added to the management server and have HP Operations Agent software installed. For more information about how to add nodes to the management server, see *HP Operations Manager for Unix Online Help*.

To deploy policies from the management server for HPOM for UNIX (HP-UX, Linux, or Solaris) follow these steps:

Task 1: Assign Policy or Policy group

1. Log on to HPOM as the administrator. The HPOM Administration interface appears.
2. Click **Policy Bank** under the Objects Bank category. The Policy Bank window opens.
3. In the Policy Bank window, select the policy or policy groups you want to assign to a node or a node group.
4. Select **Assign to Node/Node group...** from the **Choose an Action** drop-down box and click submit. The select window opens.
5. Select the node or the node groups and click **OK**. The selected policies are assigned to the nodes.

Task 2: Deploy Policies

1. From the HPOM Administration interface, click **Node Bank** under the Objects Bank category. The Node Bank window opens.
2. In the Node Bank window, select the nodes or node groups on which you want to deploy policies.
3. Select **Deploy Configuration...** from the **Choose an Action** drop-down box and click submit. The selector window opens.
4. Select the **Distribute Policies** check box and click **OK**. The policies are deployed on the selected nodes.

Chapter 5: Virtualization Infrastructure SPI Reports and Graphs

You can integrate the Virtualization Infrastructure SPI with HP Reporter to generate reports based on collected metric data from the managed nodes. The reports provide an overall picture of virtual resources. You can also generate graphs to analyze the metric data collected. To generate and view reports and graphs from data collected by the Virtualization Infrastructure SPI, use HP Reporter and HP Performance Manager with HPOM.

Virtualization Infrastructure SPI Reports

The reports provide an overall picture of virtual resources. You can integrate the Virtualization Infrastructure SPI with HP Reporter to generate reports based on collected metric data from the managed nodes.

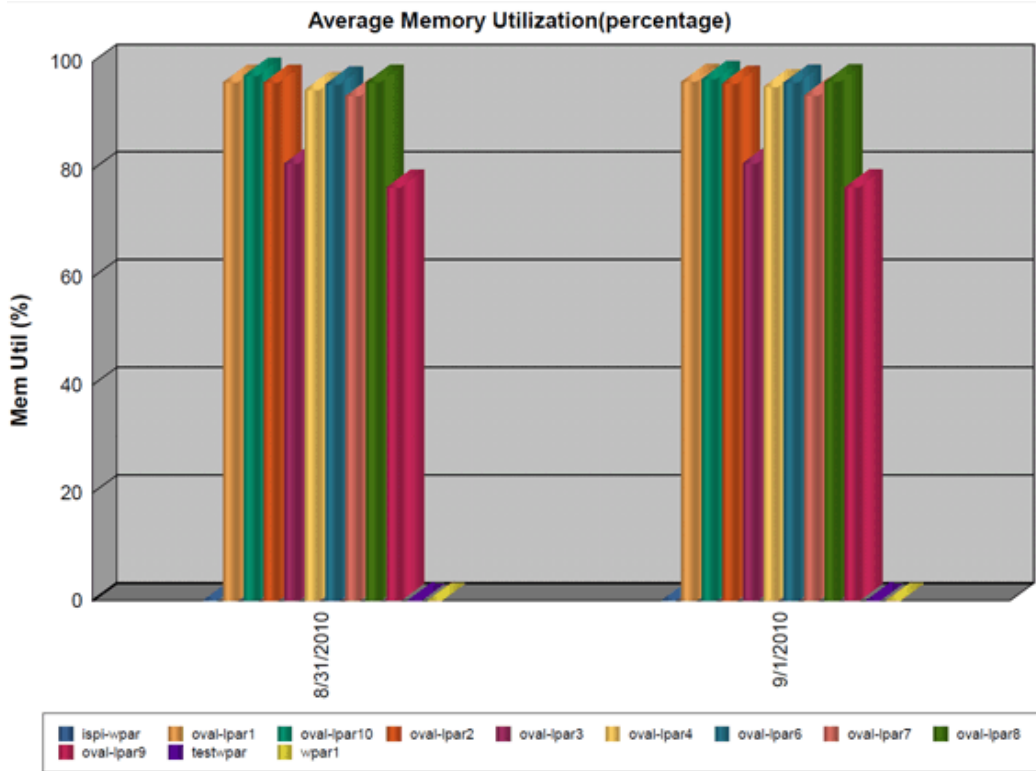
You can access Virtualization Infrastructure SPI reports from the HPOM console. To install HP Reporter package, see *Infrastructure SPI Installation Guide*.

To view reports for Virtualization Infrastructure SPI from HPOM for Windows, expand **Reports** → **Virtualization Infrastructure** in the console tree. To display a report, select the desired report, right-click, and then select **Show report**.

The Virtualization Infrastructure SPI Reports folder is not created until data is collected on nodes and the Service Reporter consolidation process has run, which is usually 24 hours after a node becomes managed.

If HP Reporter is installed on a separate system connected to the HPOM management server (for Windows, UNIX, Linux, Solaris operating system), you can view the reports on HP Reporter system. For more information about integration of HP Reporter with HPOM, see *HP Reporter Installation and Special Configuration Guide*.

Figure 1: Sample Report



The SPI for Virtualization Infrastructure provides the following reports:

Table 1: Virtualization Infrastructure SPI Reports

Report/ Report Title	Purpose	Platform
HPVM Configuration	This report displays the configuration information of the HPVM hosts. You can use this report to view and compare the configuration details for HPVM hosts.	HPVM
HPVM CPU Utilization	This report displays the physical CPU utilization details of the HPVM hosts. You can use this report to view and compare the CPU utilization of the HPVM hosts.	HPVM
IBM LPAR Configuration	This report displays the configuration information of the IBM LPARs. You can use this report to view and compare the configuration details for IBM LPARs.	IBM LPAR
IBM LPAR CPU Utilization	This report displays the physical CPU utilization details of the IBM LPARs. You can use this report to view and compare the CPU utilization of the IBM LPARs.	IBM LPAR

Report/ Report Title	Purpose	Platform
IBM LPAR Memory Utilization	This report displays the physical memory utilization information of IBM LPARs. You can use this report to view and compare the physical memory utilization of IBM LPARs.	IBM LPAR
Oracle Containers Configuration	This report displays the configuration information of Oracle Containers. You can use this report to view and compare the configuration details for Oracle Containers.	Oracle Solaris Zones
Oracle Containers CPU Utilization	This report displays the physical CPU utilization details of Oracle Containers. You can use this report to view and compare the CPU utilization of Oracle Containers.	Oracle Solaris Zones

Virtualization Infrastructure SPI Graphs

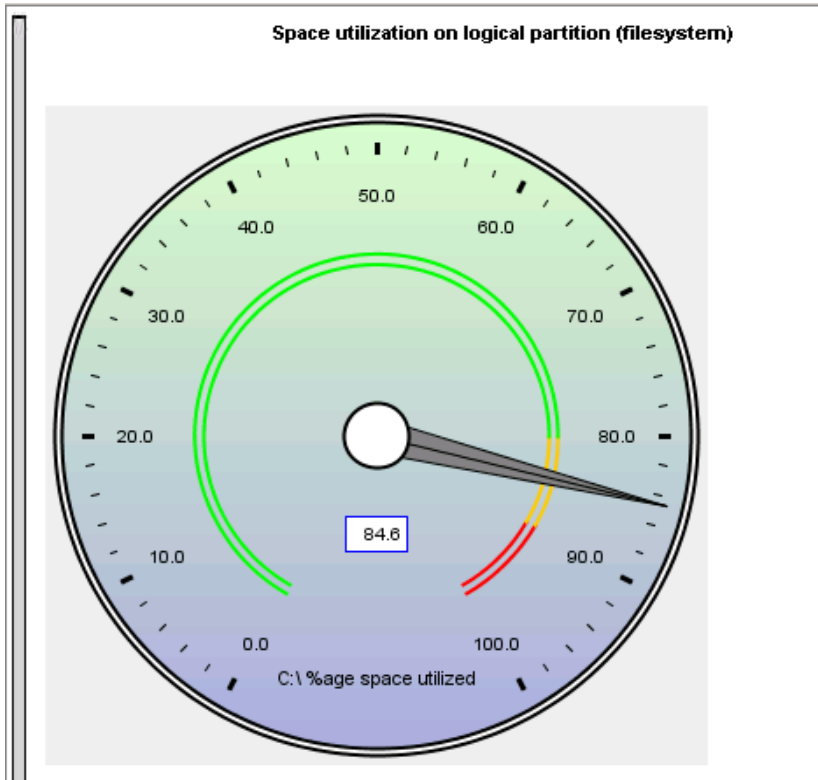
You can generate graphs to analyze the metric data collected. To generate and view graphs from data collected by the Virtualization Infrastructure SPI, use HP Performance Manager with HPOM. HP Performance Manager generates graphs from near real-time data gathered from the managed nodes. You can access these graphs from the HPOM console if you install HP Performance Manager on an HPOM management server.

The Virtualization Infrastructure SPI comes with a set of pre-configured graphs. They are located on the HPOM console tree in the Graphs folders. You can access this Graphs folder only if you install HP Performance Manager on the HPOM management server. The following is an example graph.

To access the graphs on HPOM for Windows, select **Graphs** → **Infrastructure Performance** → **Virtualization**.

To access the graphs on HPOM for UNIX (HP-UX, Linux, and Solaris), select the active message, open the Message Properties window, and click **Actions**. Under the Operator initiated action section, click **Perform**. Alternatively you can, right-click active message, select **Perform/Stop Action** and click **Perform Operator-Initiated Action**.

Figure 2: Sample Graph



The SPI for Virtualization Infrastructure provides the following graphs:

- Global History
- Global Run Queue Baseline
- Global Details
- Multiple Global Forecasts
- CPU Summary
- CPU Utilization Summary
- CPU Utilization Baseline
- Individual CPUs
- CPU Comparison
- CPU Gauges
- CPU Details
- Global CPU Forecast
- Seasonal CPU Forecast
- Disk Summary
- Disk Throughput
- Disk Space
- Disk Space (Pie Chart)
- Disk Details
- Disk Utilization

- Swap Space Utilization
- Network Summary
- Individual Networks
- Network Interface Details
- Memory Summary
- Physical Memory Utilization
- System Configuration
- Configuration Details
- Transaction Health
- Transaction History
- Transaction Details
- Transaction Response Forecasts
- Filesystem Details
- Application CPU Gauges
- Application CPU Forecasts
- Application History
- Application Details
- Process Details
- Virtualization Configuration
- VM Status
- CPU Entitlement by Logical Systems
- Percentage Utilization of CPU Entitlement by Logical Systems
- Percentage Utilization of Total Physical CPU by Logical Systems
- Percentage Utilization of Physical CPU by LPAR Frame
- LPAR Frame Memory Utilization
- CPU Details of Logical System
- CPU Summary by Logical Systems
- Percentage Utilization of Memory Entitlement by Logical Systems
- Memory Summary by Logical Systems
- CPU Entitlement Utilization Baseline
- Percentage Utilization of Swap by Zones
- Percentage Utilization of Memory by Zones
- Solaris Container Host CPU Utilization
- MSHyper-V Host CPU Utilization
- HPVM Host CPU Utilization
- LPAR Frame level CPU Utilization
- LPAR Frame CPU Utilization
- Guests - CPU entitlement Utilization

- LinuxVirt Network Byte Rate Baseline
- LinuxVirt Physical Disk Byte Rate Baseline
- Percentage Utilization of Total CPU by Logical Systems
- CPU Summary by Logical Systems

Chapter 6: Troubleshooting

This chapter offers an overview of the Virtualization Infrastructure SPI limitations and issues and covers basic troubleshooting information.

Discovery

Problem	VI Discovery does not work. Service map does not appear on the HPOM server and auto-addition of VMs is not triggered.
Solution	Restart the discovery agent on the node. Type the following command at the command prompt: <code>ovc -restart agtrep</code>

Problem	Discovery procedures and data collection gives error with non-English names.
Cause	<p>The virtual infrastructure configurations with non-English machine names and resource group names are not supported by Virtualization Infrastructure SPI.</p> <p>The Virtualization Infrastructure SPI can be deployed successfully on a non-English HP Operations Manager. However, using non-English names for virtual systems gives an error as they are not recognized by the StoreCollection OvPerl APIs in the HP Operations agent.</p>

Policies

Problem	<p>Warning/error messages on the HPOM console:</p> <p><i>Check the following errors and take corrective actions.</i> <i>(OpC30-797) Error during evaluation of threshold level "CPU Spikes level Critical" (OpC30-728) Execution of threshold script failed. (OpC30-712) Perl Script execution failed: Can't locate OvTrace.pm in @INC (@INC contains:</i> <i>/usr/lpp/OV/lib/eaagt/perl /usr/lpp/OV/lib/eaagt/perl /var/opt/OV/bin/instrumentation</i> <i>/usr/lpp/OV/nonOV/perl/a/lib/5.8.8/aix-thread-multi</i></p>
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	<pre> /usr/lpp/OV/nonOV/perl/a/lib/5.8.8 /usr/lpp/OV/nonOV/perl/a/lib/site_perl/5.8.8/aix-thread-multi /usr/lpp/OV/nonOV/perl/a/lib/site_perl/5.8.8 /usr/lpp/OV/nonOV/perl/a/lib/site_perl.) at PerlScript line 136. BEGIN failed--compilation aborted (in cleanup) Can't locate OvTrace.pm in @INC (@INC contains: /usr/lpp/OV\bin\eaagt\perl /usr/lpp/OV/lbin/eaagt/perl /var/opt/OV/bin/instrumentation /usr/lpp/OV/nonOV/perl/a/lib/5.8.8/aix-thread-multi /usr/lpp/OV/nonOV/perl/a/lib/5.8.8 /usr/lpp/OV/nonOV/perl/a/lib/site_perl/5.8.8/aix-thread-multi /usr/lpp/OV/nonOV/perl/a/lib/site_perl/5.8.8 /usr/lpp/OV/nonOV/perl/a/lib/site_perl.) at PerlScript line 136. BEGIN failed--compilation aborted at PerlScript line 136. . (OpC30-750) </pre>
<p>Cause</p>	<p>This error occurs on any policy and any *.pm file when the instrumentation is not deployed on the node correctly.</p>
<p>Solution</p>	<p>Forcefully deploy the instrumentation on the node.</p>

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