HP Operations Smart Plug-in for Virtualization Infrastructure

For HP Operations Manager for Windows®

Software Version: 1.00

PDF version of the online help

This document is a PDF version of the online help that is available in the Virtualization Infrastructure SPI. It is provided to allow you to print the help, should you want to do so. Note that some interactive topics are not included because they will not print properly, and that this document does not contain hyperlinks.

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Overview

HP Operations Manager (HPOM) provides a service-driven approach for performance management of business-critical enterprise systems, applications, and services. Through the Smart Plug-in for Virtualization Infrastructure, the HPOM monitors, controls, and reports the health of your virtual infrastructure. The Virtualization Infrastructure SPI consists of pre configured policies and tools to help the system administrators efficiently monitor virtual infrastructure on the network.

The *HP Smart Plug-in for Virtualization Infrastructure online help* covers the following topics:

- Discovering Infrastructure

- Autodeployment of Infrastructure Policies

- Automatic Threshold Determination

- Overriding Thresholds

- Infrastructure SPI Messages Policy

- Virtualization Infrastructure Policies

- Systems Infrastructure Policies

- Virtualization Infrastructure Tools

Related Topics:

- For More Information…

Discovering Infrastructure

The Virtualization Infrastructure SPI discovers services that are available on ESX server nodes and automatically configures the service hierarchy . The Discover Services process runs automatically when a node becomes managed by HP Operations Manager and checks for service instances.

The graphical representation of services in the service views enables speedy diagnosis of problems on your systems. See the cause of any problem indicated in your message browser through the Root Cause view, or display the services and system components affected by a problem through the Impacted Services view.

The Virtualization Infrastructure SPI discovers virtual machines hosted on the VMware servers.

The service map graphic shows the services discovered on a VMware server:
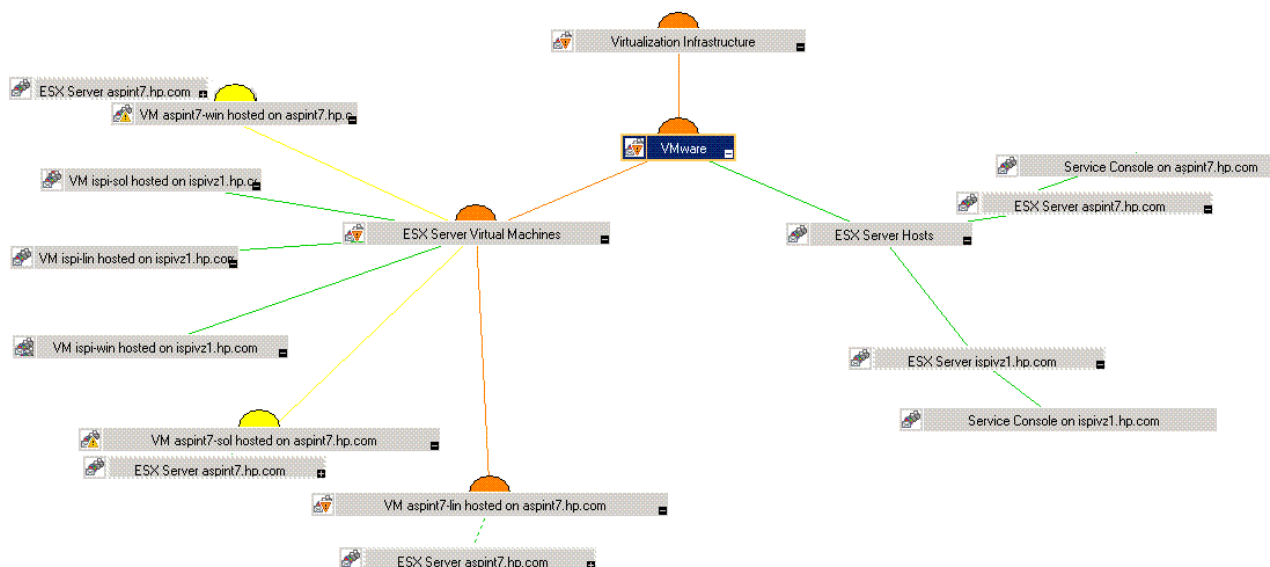
To discover the Virtualization Infrastructure SPI hierarchy correctly, you must include all nodes with the host ESX in each discovery execution.

Discovering services manually

The discovery policy VI-Discovery discovers services that are available on the ESX server nodes. The policy is located in Policy management ⇢ Policy Groups ⇢ SPI for Infrastructure ⇢ Virtualization Infrastructure ⇢ Vmware ⇢ Auto Discovery on the console tree. The VI-Discovery policy discovers the

virtual machines and VMware servers on the network.

To deploy the Discovery policy manually:

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 .

Related Topics:

- For more information

Autodeployment of Infrastructure Policies

An autodiscovery process uses discovery modules that are installed on the various HP Operations managed nodes when you deploy the SI_Discovery policy for the first time. These modules discover the systems infrastructure and services on the node. When SI_Discovery policy succeeds on the managed node, the Systems Infrastructure SPI policies are autodeployed. In case SI_Discovery policy fails on the managed node you can deploy the SI_Discovery policy manually.

To deploy the Service Discovery policy manually:

1. Select the SI_Discovery policy.

2. Right-click and select All tasks-> Deploy on...

3. Select the nodes you want the policy to discover.

4. Click OK .

If the managed node is an ESX server and the node is configured to run VMs, the Systems Infrastructure SPI autodiscovery policy triggers the autodeployment of Virtualization Infrastructure SPI discovery policy.The Virtualization Infrastructure SPI discovery autodeploys policies for availability and performance monitoring. The logfile monitoring policies are not autodeployed. You can manually deploy logfile monitoring policies to the ESX servers.

NOTE:
If you want Infrastructure SPI to automatically deploy updated policies and packages to the node, make sure autodeployment is enabled. Go to the node properties and select Enable Auto Deployment checkbox.

Related Topics:

- Discovering Infrastructure

- Virtualization Infrastructure SPI Policies

- Systems Infrastructure SPI Policies

Automatic Threshold Determination

Virtualization Infrastructure SPI policies use automatic threshold determination to calculate and set the thresholds automatically. Automatic thresholds are calculated using adaptive threshold concept. Since the distributed systems environments generally follow predictable trends over time, the calculation is based on historic records for performance characteristics and usage patterns of infrastructure resources. Automatic threshold determination helps to automatically calculate the threshold values based on the available performance data for previous days. This eliminates the need to set threshold values manually for each policy to suit a different environment.

When policies using adaptive threshold are deployed on managed nodes, the adaptive threshold script establishes a baseline from the historic samples. The HP Embedded Performance Component or HP Performance Agent collects the historic samples to identify previous trends in Infrastructure performance. Based on these trends the threshold values are automatically calculated. Once the automatic threshold values are set, comparing the current performance data with the adaptive thresholds indicates if the current infrastructure resource utilization is normal or not. An alert is generated when abnormal behavior is detected.

NOTE:
The policies that use automatic threshold determination, rely on historical data. For accurate results, deploy this policy only after a week of data has been collected by the HP Embedded Performance Component (EPC).

Related Topics:

- Virtual Machine CPU Entitlement Utilization Variance Monitor Policy

- Virtualization Overhead in Memory Usage Variance Monitor Policy

- Virtual Machine Memory Usage Variance Monitor Policy

- Virtual Machine Memory Reclaimed Monitor Policy

- Disk Device Bottleneck Diagnosis Policy

- Network Interface InByte Rate Policy

- Network Interface OutByte Rate Policy

- Per CPU Utilization Policy

- Per Disk Utilization Policy

- Swap Utilization Policy

- Memory Utilization Policy

Overriding Thresholds

HP Virtualization Infrastructure SPI lets you override the set of thresholds for Infrastructure policies on a managed node. You can use the *ThresholdOverrides* policy to configure the thresholds for multiple polices on the managed node. The default policy group for this policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure >

To set the overriding threshold values:

1. Double-click the policy ThresholdOverrides

2. Specify the overriding threshold values in the following format:
   `<parameter name> <overriding threshold value>`
   The Script-Parameter tab in a policy displays the `parameter names` for the thresholds. These parameter names are case-sensitive.

3. After specifying the overriding thresholds, make sure that you deploy the policy to the managed nodes.

4. To deploy the policy:

   a. Select the policy in the HP Operations details pane.

   b. Right-click and select All Tasks , and then click Deploy on...

   c. Select the managed node on which you want to deploy the policy from the Deploy Policies on... dialog box.

   d. Click OK .

These steps help you to override the threshold settings for the policies on a particular managed node. You can create copies of this policy to set different sets of values on other managed nodes.

 NOTE:
ThresholdOverrides policy is of the type `Node Info` . These polices do not generate and send messages to the HPOM console.

Related Topics:

- Virtualization Infrastructure SPI Policies

- Systems Infrastructure SPI Policies

Infrastructure SPI Messages Policy

The InfraSPI-Messages policy sends diagnostic messages to the HPOM console. This policy intercepts other Infrastructure policies to collect information regarding integration of the SPI with other HP software components. The default policy group for this policy is as follows:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Messages

The InfraSPI-Messages policy contains conditions for intercepting error or diagnostic messages from the Infrastructure SPI policies running on the managed nodes. The policy checks for the following states:

- Prerequisites check for HP Operations Agent version.

- Prerequisites check for HP Performance Agent version.

- Errors connecting to HP Embedded Performance Component (EPC).

- Errors connecting to HP Performance Agent.

In case any of the states is identified the InfraSPI-Messages policy sends an alert message to the HPOM console.

Related Topics:

- Virtualization Infrastructure SPI Policies

- Systems Infrastructure SPI Policies

Virtualization Infrastructure Policies

During Virtualization Infrastructure SPI installation, the VI SPI policy groups and policies are uploaded to the HP Operations database. You can use these policies to effectively monitor virtual machines and ESX servers configured as managed nodes. VI SPI policies generate messages about the status of managed nodes and processes, the health of which are crucial for the stability of the operating system.

The policies provided with the Virtualization Infrastructure SPI can be categorized into the following general areas under Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Virtualization Infrastructure > VMware > as shown in the graphic below:

```
SPI for Infrastructure
   Messages
   Systems Infrastructure
   Virtualization Infrastructure
      VMware
         AutoDiscovery
         Availability
         Capacity
         Logs
         Performance
```
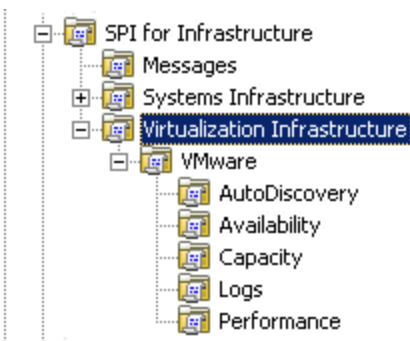
Related Topics:

- Virtual Machine CPU Entitlement Utilization Variance Monitor Policy

- Hostd Logfile Monitor Policy

- Host Service Monitor Policy

- Virtualization Overhead in Memory Usage Variance Monitor Policy

- Virtual Machine Memory Usage Variance Monitor Policy

- VM Kernel Logfile Monitor Policy

- VM State Monitor Policy

- VPXA Logfile Monitor Policy

- Proxy Logfile Monitor Policy

- VM Memory Reclaimed Monitor Policy

- VMFS Utilization Monitor Policy

Virtual Machine Memory Reclaimed Monitor Policy

The default policy group for VI-VMMemReclaimedMonitor-AT policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Virtualization Infrastructure > VMware > Performance

VI-VMMemReclaimedMonitor-AT policy monitors the memory that the VMware ESX server forcibly reclaims from the guest virtual machines. Under extreme memory pressure the VMware ESX server reclaims the memory entitled to the guest virtual machines by paging out to an ESX Server swap area on disk, without any guest involvement. The policy uses the *automatic threshold determination* to automatically calculate threshold values according to the memory reclaimed on previous days.

NOTE:
This policy relies on historical data. For accurate results, deploy the policy only after a week of data has been collected by the HP Embedded Performance Component (EPC).

Metrics Used	BYLS_MEM_SWAPPED BYLS_LS_ID BYLS_LS_NAME BYLS_DISPLAY_NAME BYLS_LS_UUID
Supported Platforms for Virtualized Environment	VMware ESX Server

For information on the BYLS metrics used by this policy, see the *Dictionary of Operating System Performance Metrics* .

Script-Parameter	Functionality
MessageApplication	Enter an appropriate value that may help you to identify the messages sent by *VI-VMMemReclaimedMonitor-AT* policy to the management console.
DataSource	Displays the data source name as SCOPE.
DataObject	Displays the data object name as LOGICAL.

DataMetric	Displays the metric name as BYLS_MEM_SWAPPED.
BaselinePeriod	Enter 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.
MinimumValue	Displays the minimum value of the memory consumption as indicated by the BYLS_MEM_SWAPPED metric.
MaximumValue	This script parameter displays the maximum value of the memory consumption as indicated by the BYLS_MEM_SWAPPED metric.
WarningDeviations	Set the value for standard deviations away from normal to generate a warning message
MinorDeviations	Set the number of standard deviations (greater than WarningDeviations) from normal for a minor message.
MajorDeviations	Set the number of standard deviations (greater than MinorDeviations) from normal for major message.
WarningHighSeverity	If the WarningDeviations is violated above normal, the policy generates a warning high severity message.
MinorHighSeverity	If the MinorDeviations is violated above normal, the policy generates a minor high severity message.
MajorHighSeverity	If the MajorDeviations is violated above normal, the policy generates a major high severity message.
WarningLowSeverity	If the WarningDeviations is violated below normal, the policy generates a warning low severity message.
MinorLowSeverity	If the MinorDeviations is violated below normal, the policy generates a minor low severi message.
MajorLowSeverity	If the MajorDeviations is violated below normal, the policy generates a major low severity message.
MessageGroup	Message group for outgoing messages.
DebugLevel	Set the value to 1 to start receiving debug messages.

Related Topics:

- Automatic Threshold Determination

- Virtualization Infrastructure SPI Policies

VPXA Logfile Monitor Policy

The VI-VPXALogMonitor policy monitors the vpxa.log file in the `/var/log/vmware/vpx` directory. The vpxa.log file contains information about the agent that communicates with the VirtualCenter.

The default policy group for this policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Virtualization Infrastructure > VMware > Logs

This policy uses the following conditions to monitor the log file.

Condition	Description
Memory Checker	Checks if there is sufficient memory for the ESX service console operations. This condition uses the `<*>error<*><#.errorcode><*.msg>` pattern to check for memory usage. If the pattern matches suggesting insufficient memory, this condition sends a message with critical severity to the HPOM console.
Invalid Login	Checks for errors that occurred during VMware cloning. This condition uses the `<*>vim.fault.invalidlogin<*>` pattern. If the pattern matches, the condition sends a message with critical severity to the HPOM console.
Communication Error During Cloning	Checks for any communication errors that occurred during cloning. This condition uses the `<*>(<*.vmname>)Unexpected exception (vmodl.fault.HostCommunication) during clone.<*>` pattern to check for any communication errors and sends a message with critical severity to the HPOM console.
Heartbeat Fails	Checks for the failure of the heartbeat port. This condition uses the `<*>heartbeat failed<*>` pattern to check for failure. In the event of a failure, the condition sends a message with critical severity to the HPOM console.
General Error	Checks for any general system error that occurred during the VPXA update. This condition uses the `A General system error occurred: pending vpxa update` pattern to check for errors and sends a message with warning status to the HPOM console.

You can deploy this policy on the console operating system on a VMware ESX server. The policy supports the following message severity states:

- *Critical*
- *Warning*

- *Major*

- *Minor*

- *Normal*

Related Topics:

- Virtualization Infrastructure SPI Policies

VMFS Utilization Monitor Policy

The default policy group for the VI-VMFSUtilizationMonitor policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure >
Virtualization Infrastructure > VMware > Capacity

The VI-VMFSUtilizationMonitor policy monitors the disk space utilization on the Virtual Machine File System (VMFS). VMFS represents the data storage volumes on which the VMware guest disk files are stored. This policy is deployed on the console operating system on a VMware ESX server.

You can change the default threshold values for this policy at the *Threshold levels* tab in the policy.

Threshold Level	Functionality
VMFSUsageCriticalThreshold	If the disk space utilization is above the specified threshold value, the policy generates a critical severity message.
VMFSUsageMajorThreshold	If the disk space utilization is above the specified threshold value, the policy generates a major severity message.
VMFSUsageMinorThreshold	If the disk space utilization is above the specified threshold value, the policy generates a minor severity message.
VMFSUsageWarningThreshold	If the disk space utilization is above the specified threshold value, the policy generates a warning severity message.

Related Topics:

- Virtualization Infrastructure SPI Policies

VM Kernel Logfile Monitor Policy

This policy monitors the following log files for messages with `alert` or `warning` status:

- VMkernel log file in the `/var/log/vmkernel` directory.

- VMkernel Warning log file in the `/var/log/vmkwarning` directory.

The default policy group for this policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Virtualization Infrastructure > VMware > Logs

This policy supports the following conditions:

- Match all "Alert" messages with error code: When this condition is matched, the policy generates a message that contains the actual message in the log file.

- Match all "Alert" messages without error codes.

- Match all "Warning" messages with error code.

- Match all "Warning" messages without error codes.

- Match all messages with error codes.

Based on the matched condition, the policy sends a message to the HPOM console that contains the actual message.

You can deploy this policy on the console operating system on a VMware ESX server. This policy sends the following types of message alerts:

- *Critical*

- *Major*

- *Warning*

- *Minor*

- *Normal*

Related Topics:

- Virtualization Infrastructure SPI Policies

Hostd Logfile Monitor Policy

The VI-HostdLogMonitor policy monitors the `hostd.log` file in `/var/log/Vmware`. This log file contains information about the agent that manages and configures the ESX Server host and its virtual machines.

The default policy group for this policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Virtualization Infrastructure > VMware > Logs

This policy uses the following conditions.

Condition	Description
Match all Error Conditions in the hostd.log	Checks for error conditions that match the `<*.source> <*.error_number> error\\]<*.msg>` pattern in the log file. If any matches are found, this condition sends a message with critical severity to the HPOM console with the appropriate message attributes.
Match all Warning Conditions in the hostd.log	Checks for warning conditions that match the `<*.source> <*.error_number> warning\\]<*.msg>` pattern in the log file. If any matches are found, this condition sends a message with warning status to the HPOM console with the appropriate message attributes.
Match all Information/Verbose Conditions in the hostd.log	Checks for information or verbose conditions that match the `<*.source> <*.error_number> verbose\\]<*.msg>` pattern in the log file. If any matches are found, this condition sends a message with Info status to the HPOM console with the appropriate message attributes.

You can deploy this policy on the console operating system on a VMware ESX server. It monitors the hostd logs on the virtual machine. This policy sends the following types of message alerts:

- *Critical*

- *Major*

- *Warning*

- *Minor*

- *Normal*

- *Info*

Message Attributes

This policy supports the following message attributes:

- ServiceID: denotes VI:VMware:ESX Server

- Message Key: denotes the <$LOGPATH>_<error_number>_<source>

- Message Group: denotes the VISPI

- Application: denotes the ESX Server

- Object: denotes the <$SOURCE>

- Message Text: denotes the [Event Group ID- <error_number>]<msg>

Related Topics:

- Virtualization Infrastructure SPI Policies

Proxy Logfile Monitor Policy

The *VI-PROXYLogMonitor* policy monitors the Tomcat error log file (proxy.log) in `/var/log/Vmware/webAccess/`. This file contains information about invalid login attempts using the VMware web interface.

The default policy group for this policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Virtualization Infrastructure > VMware > Logs

This policy uses the `Incorrect Login` condition. This condition uses the `<*>Login failed due to a bad username or password<*>` pattern to check for any invalid login attempts.

You can deploy this policy on the console operating system on a VMware ESX server. This policy supports the *Major* message severity state.

Related Topics:

■ Virtualization Infrastructure SPI Policies

VM State Monitor Policy

The default policy group for the VI-VMStateMonitor policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Virtualization Infrastructure > VMware > Availability

The VI-VMStateMonitor policy is deployed on the console operating system on a VMware ESX server. The policy monitors and reports the state of a guest virtual machine. It sends following message alerts:

- *Critical* alert message if the virtual machine state is 'stuck', 'crash', or 'hung'.

- *Warning (issue)* alert message if the virtual machine state is unknown, invalid, or other. It sends repetitive alerts in case of any of the stated issues.

- *Warning (non-issue)* alert message if the virtual machine state is off, down, boot, suspended, or shut down.

- *Normal* message if the virtual machine state is on or up.

Metrics Used	BYLS_LS_ID BYLS_LS_STATE BYLS_LS_NAME BYLS_DISPLAY_NAME BYLS_LS_UUID
Supported Platforms	VMware ESX Server

For information on the BYLS metrics used by this policy, see the *Dictionary of Operating System Performance Metrics* .

Script-Parameter	Functionality
MessageGroup	Message group for outgoing messages.
Debug	Set the value to 1 to start receiving debug messages.

Related Topics:

- Virtualization Infrastructure SPI Policies

Host Service Monitor Policy

The default policy group for the VI-HostServiceMonitor policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Virtualization Infrastructure > VMware > Availability

The VI-HostServiceMonitor policy monitors the availability of services on the host operating system of the VMware ESX server. The policy monitors the following services:

- VMware Host Agent

    service name: `mgmt-vmware`

    It provides remote command and administrative control of the ESX server.

- VMware webAccess Agent

    service name: `vmware-webAccess`

    This management agent provides control functionality to virtual machine clients that want to use a VMware Server.

- VMware Virtual Center Agent

    service name: `vmware-vpxa`

    It allows the Virtual Center to manage that ESX server.

- VMware Authentication Agent

    service name: `vmware-vmkauthd`

If any service is not running, an alert is sent to the HPOM management server with an associated operator-initiated action to start the affected service. The message severity by default is Critical for all services.

Metrics Used	GBL_LS_TYPE

Related Topics:

- Virtualization Infrastructure SPI Policies

Virtual Machine CPU Entitlement Utilization Variance Monitor Policy

The default policy group for the VI-VMCpuEntitlementUtilizationMonitor-AT policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Virtualization Infrastructure > VMware > Performance

The VI-VMCpuEntitlementUtilizationMonitor-AT policy calculates (as a percentage) the current CPU utilization against the minimum CPU entitlement utilization of VMware ESX servers. The policy uses *automatic threshold determination* to automatically calculate threshold values according to the memory utilization of the VMware ESX servers on previous days.

 NOTE:
Make sure that a virtual machine is *granted a minimum CPU cycles reservation* . HP Performance Agent requires this value to calculate the BYLS_CPU_ENTL_UTIL metric.

Metrics Used	BYLS_CPU_ENTL_UTIL BYLS_LS_ID BYLS_LS_NAME BYLS_DISPLAY_NAME BYLS_LS_UUID
Supported Platforms	VMware ESX Server

For information on the BYLS metrics used by this policy, see the *Dictionary of Operating System Performance Metrics* .

Script-Parameter	Functionality
MessageApplication	Enter an appropriate value that may help you to identify the messages sent by the VI-VMCpuEntitlementUtilizationMonitor-AT policy to the management console.
DataSource	Displays the HP Embedded Performance Component (EPC) data source name as CODA.
DataObject	Displays the HP Embedded Performance Component (EPC) data object name as Global.

DataMetric	Displays the HP Embedded Performance Component (EPC) metric name as GBL_MEM_UTIL.
BaselinePeriod	Enter 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.
MinimumValue	Displays the minimum value of the memory consumption as indicated by the metric.
MaximumValue	Displays the maximum value of the memory consumption as indicated by the metric.
WarningDeviations	Set the value for standard deviations away from normal to generate a warning message
MinorDeviations	Set the number of standard deviations (greater than *WarningDeviations*) from normal for a minor message.
MajorDeviations	Set the number of standard deviations (greater than *MinorDeviations*) from normal for major message.
WarningHighSeverity	If the *WarningDeviations* is violated above normal, the policy generates a warning high severity message.
MinorHighSeverity	If the *MinorDeviations* is violated above normal, the policy generates a minor high severity message.
MajorHighSeverity	If the *MajorDeviations* is violated above normal, the policy generates a major high severity message.
WarningLowSeverity	If the *WarningDeviations* is violated below normal, the policy generates a warning low severity message.
MinorLowSeverity	If the MinorDeviations is violated below normal, the policy generates a minor low severi message.
MajorLowSeverity	If the MajorDeviations is violated below normal, the policy generates a major low severity message.
DebugLevel	Set the value to 1 to start receiving debug messages.
MessageGroup	Message group for outgoing messages.

Related Topics:

- Automatic Threshold Determination

- Virtualization Infrastructure SPI Policies

Virtualization Overhead in Memory Usage Variance Monitor Policy

The default policy group for the VI-VMMemoryOverheadMonitor-AT policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Virtualization Infrastructure > VMware > Performance

The VI-VMMemoryOverheadMonitor-AT policy monitors and maintains information about memory usage overhead of each guest virtual machine on the VMware ESX server (managed node). The policy uses *automatic threshold determination* to automatically calculate threshold values according to the memory usage by guest virtual machines on previous days.

Metrics Used	BYLS_MEM_OVERHEAD
	BYLS_LS_ID
	BYLS_LS_NAME
	BYLS_DISPLAY_NAME
	BYLS_LS_UUID
Supported Platforms	VMware ESX Server

For information on the BYLS metrics used by this policy, see the *Dictionary of Operating System Performance Metrics* .

Script-Parameter	Functionality
MessageApplication	Enter an appropriate value that will help you identify the messages sent by the VI-VMMemoryOverheadMonitor-AT policy to the management console.
DataSource	Displays the HP Embedded Performance Component (EPC) data source name as CODA.
DataObject	Displays the HP Embedded Performance Component (EPC) data object name as Global.
DataMetric	Displays the HP Embedded Performance Component (EPC) metric name as GBL_MEM_UTIL.
BaselinePeriod	Enter 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.

MinimumValue	Displays the minimum value of the memory consumption as indicated by the metric.
MaximumValue	Displays the maximum value of the memory consumption as indicated by the metric.
WarningDeviations	Set the value for standard deviations away from normal to generate a warning message
MinorDeviations	Set the number of standard deviations (greater than *WarningDeviations*) from normal for a minor message.
MajorDeviations	Set the number of standard deviations (greater than *MinorDeviations*) from normal for major message.
WarningHighSeverity	If the *WarningDeviations* is violated above normal, the policy generates a warning high severity message.
MinorHighSeverity	If the *MinorDeviations* is violated above normal, the policy generates a minor high severity message.
MajorHighSeverity	If the *MajorDeviations* is violated above normal, the policy generates a major high severity message.
WarningLowSeverity	If the *WarningDeviations* is violated below normal, the policy generates a warning low severity message.
MinorLowSeverity	If the MinorDeviations is violated below normal, the policy generates a minor low severi message.
MajorLowSeverity	If the MajorDeviations is violated below normal, the policy generates a major low severity message.
DebugLevel	Set the value to 1 to start receiving debug messages.
MessageGroup	Message group for outgoing messages.

Related Topics:

- Automatic Threshold Determination

- Virtualization Infrastructure SPI Policies

Virtual Machine Memory Utilization Variance Monitor Policy

The default policy group for the VI-VMMemUtilizationMonitor-AT policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Virtualization Infrastructure > VMware > Performance

The VI-VMMemUtilizationMonitor-AT policy monitors how much of the host operating system memory is being used by the guest virtual machines in MB. The policy uses *automatic threshold determination* to automatically calculate the threshold values according to the host memory usage by guest virtual machines on previous days.

Metrics Used	BYLS_MEM_PHYS_UTIL
	BYLS_LS_ID
	BYLS_LS_NAME
	BYLS_DISPLAY_NAME
	BYLS_LS_UUID
Supported Platforms	VMware ESX Server

For information on the BYLS metrics used by this policy, see the *Dictionary of Operating System Performance Metrics* .

Script-Parameter	Functionality
MessageApplication	Enter an appropriate value that will help you identify the messages sent by the VI-VMMemUtilizationMonitor-AT policy to the management console.
DataSource	Displays the HP Embedded Performance Component (EPC) data source name as CODA.
DataObject	Displays the HP Embedded Performance Component (EPC) data object name as Global.
DataMetric	Displays the HP Embedded Performance Component (EPC) metric name as GBL_MEM_UTIL.
BaselinePeriod	Enter 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.

|	
MinimumValue	Displays the minimum value of the memory consumption as indicated by the metric.
MaximumValue	Displays the maximum value of the memory consumption as indicated by the metric.
WarningDeviations	Set the value for standard deviations away from normal to generate a warning message
MinorDeviations	Set the number of standard deviations (greater than *WarningDeviations*) from normal for a minor message.
MajorDeviations	Set the number of standard deviations (greater than *MinorDeviations*) from normal for major message.
WarningHighSeverity	If the *WarningDeviations* is violated above normal, the policy generates a warning high severity message.
MinorHighSeverity	If the *MinorDeviations* is violated above normal, the policy generates a minor high severity message.
MajorHighSeverity	If the *MajorDeviations* is violated above normal, the policy generates a major high severity message.
WarningLowSeverity	If the *WarningDeviations* is violated below normal, the policy generates a warning low severity message.
MinorLowSeverity	If the MinorDeviations is violated below normal, the policy generates a minor low severi message.
MajorLowSeverity	If the MajorDeviations is violated below normal, the policy generates a major low severity message.
DebugLevel	Set the value to 1 to start receiving debug messages.
MessageGroup	Message group for outgoing messages.

Related Topics:

■ Automatic Threshold Determination

■ Virtualization Infrastructure SPI Policies

Systems Infrastructure Policies

During installation, the Systems Infrastructure SPI policies are uploaded to the HP Operations database along with Virtualization Infrastructure SPI policies. You can use these policies to monitor hardware resources, operating system attributes, and applications on the managed nodes. SI SPI policies generate messages about the status of managed nodes and processes, the health of which is crucial for the stability of the operating system.

The policies provided for the Systems Infrastructure SPI can be categorized into AutoDiscovery, Capacity, and Performance as seen in the graphic below.
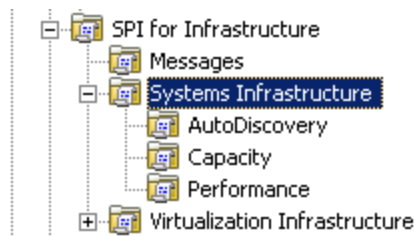
Related Topics:

- Memory Utilization Policy

- Swap Utilization Policy

- Network Interface InByte Rate Policy

- Network Interface OutByte Rate Policy

- Swap Capacity Monitor Policy

- Per CPU Utilization Policy

- Per Disk Utilization Policy

- Network Usage And Performance Policy

- Memory Bottleneck Diagnosis Policy

- Disk Device Bottleneck Diagnosis Policy

- Disk Capacity Monitor Policy

- CPU Spike Check Policy

- CPU Bottleneck Diagnosis Policy

Memory Utilization Policy

The default policy group for the SI-MemoryUtilization-AT policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure >
Systems Infrastructure > Capacity

The SI-MemoryUtilization-AT policy monitors the overall memory usage by operating systems. The policy
uses the *automatic threshold determination* to automatically calculate the threshold values according to the
memory usage on previous days.

> **NOTE:**
> This policy relies on historical data. For accurate results, deploy the policy only after a week of data has
> been collected by the HP Embedded Performance Component (EPC).

Metrics Used	GBL_MEM_UTIL
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
MessageApplication	Enter an appropriate value that will help you identify the messages sent by the SI-MemoryUtilization-AT policy to the management console.
DataSource	Displays the HP Embedded Performance Component (EPC) data source name as CODA.
DataObject	Displays the HP Embedded Performance Component (EPC) data object name as Global.
DataMetric	Displays the HP Embedded Performance Component (EPC) metric name as GBL_MEM_UTIL.
BaselinePeriod	Enter 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.
MinimumValue	Displays the minimum value of memory consumption as indicated by the metric.
MaximumValue	Displays the maximum value of memory consumption as indicated by the metric.

WarningDeviations	Set the value for standard deviations away from normal to generate a warning message
MinorDeviations	Set the number of standard deviations (greater than *WarningDeviations*) from normal for a minor message.
MajorDeviations	Set the number of standard deviations (greater than *MinorDeviations*) from normal for major message.
WarningHighSeverity	If the *WarningDeviations* is violated above normal, the policy generates a warning high severity message.
MinorHighSeverity	If the *MinorDeviations* is violated above normal, the policy generates a minor high severity message.
MajorHighSeverity	If the *MajorDeviations* is violated above normal, the policy generates a major high severity message.
WarningLowSeverity	If the *WarningDeviations* is violated below normal, the policy generates a warning low severity message.
MinorLowSeverity	If the MinorDeviations is violated below normal, the policy generates a minor low severity message.
MajorLowSeverity	If the MajorDeviations is violated below normal, the policy generates a major low severity message.
DebugLevel	Set the value to 1 to start receiving debug messages.
MessageGroup	Message group for outgoing messages.

Related Topics:

■ Automatic Threshold Determination

■ Systems Infrastructure SPI Policies

Swap Utilization Policy

The default policy group for the SI-SwapUtilization-AT policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure >
Systems Infrastructure > Performance

The SI-SwapUtilization-AT policy monitors the overall swap space used by the systems on the managed node. The policy uses *the automatic threshold determination* to automatically calculate the threshold values according to the swap space usage on previous days.

> **NOTE:**
> This policy relies on historical data. For accurate results, deploy the policy only after a week of data has been collected by the HP Embedded Performance Component (EPC).

Metrics Used	GBL_SWAP_SPACE_USED
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
MessageApplication	Enter an appropriate value that may help you to identify the messages sent by the SI-SwapUtilization-AT policy to the management console.
DataSource	Displays the HP Embedded Performance Component (EPC) data source name as CODA.
DataObject	Displays the HP Embedded Performance Component (EPC) data object name as Global.
DataMetric	Displays the HP Embedded Performance Component (EPC) metric name as GBL_SWAP_SPACE_USED.
BaselinePeriod	Enter 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.
MinimumValue	Displays the minimum value of the swap utilization or consumption as indicated by the metric.

MaximumValue	Displays the maximum value of the swap utilization or consumption as indicated by the metric.
WarningDeviations	Set the value for standard deviations away from normal to generate a warning message
MinorDeviations	Set the number of standard deviations (greater than *WarningDeviations*) from normal for a minor message.
MajorDeviations	Set the number of standard deviations (greater than *MinorDeviations*) from normal for major message.
WarningHighSeverity	If the *WarningDeviations* is violated above normal, the policy generates a warning high severity message.
MinorHighSeverity	If the *MinorDeviations* is violated above normal, the policy generates a minor high severity message.
MajorHighSeverity	If the *MajorDeviations* is violated above normal, the policy generates a major high severity message.
WarningLowSeverity	If the *WarningDeviations* is violated below normal, the policy generates a warning low severity message.
MinorLowSeverity	If the MinorDeviations is violated below normal, the policy generates a minor low severi message.
MajorLowSeverity	If the MajorDeviations is violated below normal, the policy generates a major low severity message.
DebugLevel	Set the value to 1 to start receiving debug messages.
MessageGroup	Message group for outgoing messages.

Related Topics:

- Automatic Threshold Determination

- Systems Infrastructure SPI Policies

Network Interface InByte Rate Policy

The default policy group for the SI-PerNetifInbyteBaseline-AT policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Systems Infrastructure > Performance

The SI-PerNetifInbyteBaseline-AT policy monitors the network interface inbyte rate for a network interface in a given interval. It monitors the incoming bytes on each network interface on the managed node individually. This policy processes each instance of network interfaces separately for every interval. The policy uses the *automatic threshold determination* to automatically calculate the threshold values according to the network interface inbyte rate on previous days.

> NOTE:
> This policy relies on historical data. For accurate results, deploy the policy only after a week of data has been collected by the HP Embedded Performance Component (EPC).

Metrics Used	BYNETIF_IN_BYTE_RATE
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
MessageApplication	Enter an appropriate value that will help you identify the messages sent by the SI-PerNetifInbyteBaseline-AT policy to the management console.
DataSource	Displays the HP Embedded Performance Component (EPC) data source name as CODA.
DataObject	Displays the HP Embedded Performance Component (EPC) data object name as NETIF.
DataMetric	Displays the HP Embedded Performance Component (EPC) metric name as BYNETIF_IN_BYTE_RATE.
BaselinePeriod	Enter 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.
MinimumValue	Displays the minimum value of the inbyte rate as indicated by the metric.

MaximumValue	Displays the maximum value of the inbyte rate as indicated by the metric.
WarningDeviations	Set the value for standard deviations away from normal to generate a warning message
MinorDeviations	Set the number of standard deviations (greater than *WarningDeviations*) from normal for a minor message.
MajorDeviations	Set the number of standard deviations (greater than *MinorDeviations*) from normal for major message.
WarningHighSeverity	If the *WarningDeviations* is violated above normal, the policy generates a warning high severity message.
MinorHighSeverity	If the *MinorDeviations* is violated above normal, the policy generates a minor high severity message.
MajorHighSeverity	If the *MajorDeviations* is violated above normal, the policy generates a major high severity message.
WarningLowSeverity	If the *WarningDeviations* is violated below normal, the policy generates a warning low severity message.
MinorLowSeverity	If the MinorDeviations is violated below normal, the policy generates a minor low severi message.
MajorLowSeverity	If the MajorDeviations is violated below normal, the policy generates a major low severity message.
DebugLevel	Set the value to 1 to start receiving debug messages.
MessageGroup	Message group for outgoing messages.

Related Topics:

- Automatic Threshold Determination

- Systems Infrastructure SPI Policies

Network Interface OutByte Rate Policy

The default policy group for the SI-PerNetifOutbyteBaseline-AT policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Systems Infrastructure > Performance

The SI-PerNetifOutbyteBaseline-AT policy monitors the network interface outbyte rate for a network interface in a given interval. It monitors the outgoing bytes on each network interface on the managed node, individually. This policy processes each instance of network interfaces separately for every interval. The policy uses *automatic threshold determination* to automatically calculate the threshold values according to the network interface outbyte rate on previous days.

> **NOTE:**
> This policy relies on historical data. For accurate results, deploy the policy only after a week of data has been collected by the HP Embedded Performance Component (EPC).

Metrics Used	BYNETIF_OUT_BYTE_RATE
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
MessageApplication	Enter an appropriate value that may help you to identify the messages sent by the SI-PerNetifOutbyteBaseline-AT policy to the management console.
DataSource	Displays the HP Embedded Performance Component (EPC) data source name as CODA.
DataObject	Displays the HP Embedded Performance Component (EPC) data object name as NETIF.
DataMetric	Displays the HP Embedded Performance Component (EPC) metric name as BYNETIF_OUT_BYTE_RATE.
BaselinePeriod	Enter 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.
MinimumValue	Displays the minimum value of the inbyte rate as indicated by the metric.

MaximumValue	Displays the maximum value of the inbyte rate as indicated by the metric.
WarningDeviations	Set the value for standard deviations away from normal to generate a warning message
MinorDeviations	Set the number of standard deviations (greater than *WarningDeviations*) from normal for a minor message.
MajorDeviations	Set the number of standard deviations (greater than *MinorDeviations*) from normal for major message.
WarningHighSeverity	If the *WarningDeviations* is violated above normal, the policy generates a warning high severity message.
MinorHighSeverity	If the *MinorDeviations* is violated above normal, the policy generates a minor high severity message.
MajorHighSeverity	If the *MajorDeviations* is violated above normal, the policy generates a major high severity message.
WarningLowSeverity	If the *WarningDeviations* is violated below normal, the policy generates a warning low severity message.
MinorLowSeverity	If the MinorDeviations is violated below normal, the policy generates a minor low severi message.
MajorLowSeverity	If the MajorDeviations is violated below normal, the policy generates a major low severity message.
DebugLevel	Set the value to 1 to start receiving debug messages.
MessageGroup	Message group for outgoing messages.

Related Topics:

- Automatic Threshold Determination

- Systems Infrastructure SPI Policies

Swap Capacity Monitor Policy

The default policy group for the SI-SwapCapacityMonitor policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure >
Systems Infrastructure > Capacity

This policy monitors swap space utilization of the system.

Metrics Used	GBL_SWAP_SPACE_AVAIL GBL_SWAP_SPACE_UTIL GBL_SWAP_SPACE_USED
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
SwapSpaceUtilCriticalThreshold	Displays the percentage (0 to 100%) of swap space utilization on the node. Set the threshold for minimum swap space utilized on the disk to the value at which you want to receive a critical severity message.
SwapSpaceUtilMajorThreshold	Set the threshold for minimum swap space utilized on the disk to the value at which you want to receive a major severity message.
SwapSpaceUtilMinorThreshold	Set the threshold for minimum space utilized on the disk to the value at which you want to receive a minor severity message.
SwapSpaceUtilWarningThreshold	Set the threshold for minimum space utilized on the disk to the value at which you want to receive a warning severity message.
FreeSwapSpaceAvailCriticalThreshold	Displays the free swap space (in MB) available on the disk. Set the threshold for minimum free space on the disk to the value at which you want to receive a critical severity message.
FreeSwapSpaceAvailMajorThreshold	Set the threshold for minimum free swap space on the disk to the value at which you want to receive a major severity message.
FreeSwapSpaceAvailMinorThreshold	Set the threshold for minimum free swap space on the disk to the value at which you want to receive a minor severity message.

FreeSwapSpaceAvailWarningThreshold	Set the threshold for minimum free swap space on the disk to the value at which you want to receive a warning severity message.
UseScriptedParameterForUnix	If you want to use scripted parameters on the UNIX nodes instead of thresholds specified in fsmon configuration files, enable this field by setting the value to 1.
MessageGroup	Message group for outgoing messages.
Debug	Set the value to 1 to start receiving debug messages.

Related Topics:

- Systems Infrastructure SPI Policies

Per Disk Utilization Policy

The default policy group for the SI-PerDiskUtilization-AT policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Systems Infrastructure > Performance

The SI-PerDiskUtilization-AT policy monitors utilization for each disk on the managed node. This policy processes each disk instance separately for every interval. The policy uses the *automatic threshold determination* to automatically calculate the threshold values according to the disk utilization on previous days.

NOTE:
This policy relies on historical data. For accurate results, deploy the policy only after a week of data has been collected by the HP Embedded Performance Component (EPC).

Metrics Used	BYDSK_UTIL
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
MessageApplication	Enter an appropriate value that may help you identify the messages sent by the SI-PerDiskUtilization-AT policy to the management console.
DataSource	Displays the data source name as SCOPE.
DataObject	Displays the data object name as DISK.
DataMetric	Displays the metric name as BYDSK_UTIL.
BaselinePeriod	Enter 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.
MinimumValue	Displays the minimum value of swap utilization or consumption as indicated by the metric.

MaximumValue	Displays the maximum value of the swap utilization or consumption as indicated by the metric.
WarningDeviations	Set the value for standard deviations away from normal to generate a warning message.
MinorDeviations	Set the number of standard deviations (greater than *WarningDeviations*) from normal for a minor message.
MajorDeviations	Set the number of standard deviations (greater than *MinorDeviations*) from normal for major message.
WarningHighSeverity	If the *WarningDeviations* is violated above normal, the policy generates a warning high severity message.
MinorHighSeverity	If the *MinorDeviations* is violated above normal, the policy generates a minor high severity message.
MajorHighSeverity	If the *MajorDeviations* is violated above normal, the policy generates a major high severity message.
WarningLowSeverity	If the *WarningDeviations* is violated below normal, the policy generates a warning low severity message.
MinorLowSeverity	If the MinorDeviations is violated below normal, the policy generates a minor low severity message.
MajorLowSeverity	If the MajorDeviations is violated below normal, the policy generates a major low severity message.
InstanceSource	Do not rename the policy name. The policy uses its name to retrieve the source.
DebugLevel	Set the value to 1 to start receiving debug messages.
MessageGroup	Message group for outgoing messages.

Related Topics:

- Automatic Threshold Determination

- Systems Infrastructure SPI Policies

Per CPU Utilization Policy

The default policy group for the SI-PerCPUUtilization-AT policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Systems Infrastructure > Performance

The SI-PerCPUUtilization-AT policy monitors the utilization for each CPU on the managed node. This policy processes each CPU instance separately for every interval. The policy uses *automatic threshold determination* to automatically calculate the threshold values according to the CPU utilization on previous days.

> ℹ️ NOTE:
> This policy relies on historical data. For accurate results, deploy the policy only after a week of data has been collected by the HP Embedded Performance Component (EPC).

Metrics Used	BYCPU_CPU_TOTAL_UTIL
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
MessageApplication	Enter an appropriate value that may help you to identify the messages sent by the SI-PerCPUUtilization-AT policy to the management console.
DataSource	Displays the HP Embedded Performance Component (EPC) data source name as CODA.
DataObject	Displays the HP Embedded Performance Component (EPC) data object name as CPU.
DataMetric	Displays the HP Embedded Performance Component (EPC) metric name as BYCPU_CPU_TOTAL_UTIL.
BaselinePeriod	Enter 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.
MinimumValue	Displays the minimum value of swap utilization or consumption as indicated by the metric.

MaximumValue	Displays the maximum value of swap utilization or consumption as indicated by the metric.
WarningDeviations	Set the value for standard deviations away from normal to generate a warning message
MinorDeviations	Set the number of standard deviations (greater than *WarningDeviations*) from normal for a minor message.
MajorDeviations	Set the number of standard deviations (greater than *MinorDeviations*) from normal for major message.
WarningHighSeverity	If the *WarningDeviations* is violated above normal, the policy generates a warning high severity message.
MinorHighSeverity	If the *MinorDeviations* is violated above normal, the policy generates a minor high severity message.
MajorHighSeverity	If the *MajorDeviations* is violated above normal, the policy generates a major high severity message.
WarningLowSeverity	If the *WarningDeviations* is violated below normal, the policy generates a warning low severity message.
MinorLowSeverity	If the MinorDeviations is violated below normal, the policy generates a minor low severi message.
MajorLowSeverity	If the MajorDeviations is violated below normal, the policy generates a major low severity message.
InstanceSource	Do not rename the policy name. The policy uses its name to retrieve the source.
DebugLevel	Set the value to 1 to start receiving debug messages.
MessageGroup	Message group for outgoing messages.

Related Topics:

- Automatic Threshold Determination

- Systems Infrastructure SPI Policies

Network Usage And Performance Policy

The default policy group for the SI-NetworkUsageAndPerformance policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure >
Systems Infrastructure > Performance

This policy monitors the network usage of the system and shows error rates and collisions to identify
potential network bottlenecks.

Metrics Used	BYNETIF_IN_PACKET BYNETIF_ID BYNETIF_OUT_PACKET BYNETIF_ERROR BYNETIF_COLLISION BYNETIF_OUT_BYTE_RATE BYNETIF_IN_BYTE_RATE
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
NICByteRateCriticalThreshold	Monitors the average number of bytes transferred every second and sends a critical severity message if the value exceeds the threshold. Set a threshold value at which you want to receive the message.
NICByteRateMajorThreshold	Set a threshold for average number of bytes transferred every second, to the value at which you want to receive a major severity message.
NICByteRateMinorThreshold	Set a threshold for average number of bytes transferred every second, to the value at which you want to receive a minor severity message.
NICByteRateWarningThreshold	Set a threshold for average number of bytes transferred every second, to the value at which you want to receive a warning severity message.
NICErrPktRatePctCriticalThreshold	Monitors the packet error rate and sends a critical severity message if the value exceeds the threshold. Packet error rate is the ratio in percentage of the number of packets not successfully transmitted to the total number of packets sent. Set a threshold for packet error rate, to the value at which you want to receive a critical severity message.

NICErrPktRatePctMajorThreshold	Set a threshold for packet error rate, to the value at which you want to receive a major severity message.
NICErrPktRatePctMinorThreshold	Set a threshold for packet error rate, to the value at which you want to receive a minor severity message.
NICErrPktRatePctWarningThreshold	Set a threshold for packet error rate, to the value at which you want to receive a warning severity message.
NICCollisionRatePctCriticalThreshold	Monitors the ratio in percentage of collision packets to the total number of packets transmitted. Set a threshold value for collision error rate, at which you want to receive a critical severity message.
NICCollisionRatePctMajorThreshold	Set a threshold value for collision error rate, to the value at which you want to receive a major severity message.
NICCollisionRatePctMinorThreshold	Set a threshold value for collision error rate, to the value at which you want to receive a minor severity message.
NICCollisionRatePctWarningThreshold	Set a threshold value for collision error rate, to the value at which you want to receive a warning severity message.

Related Topics:

■ Systems Infrastructure SPI Policies

Memory Bottleneck Diagnosis Policy

The default policy group for the SI-MemoryBottleneckDiagnosis policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Systems Infrastructure > Performance

This policy monitors physical memory utilization and bottlenecks.

Metrics Used	GBL_MEM_UTIL GBL_MEM_PAGEOUT_RATE GBL_MEM_PHYS GBL_CPU_SYS_MODE_UTIL GBL_MEM_PAGEIN_RATE GBL_SYSCALL_RATE GBL_MEM_QUEUE GBL_CSWITCH_RATE
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
FreeMemAvailCriticalThreshold	The free physical memory (in MB) available on the node. Set the threshold value for minimum free memory on the node, to the value at which you want to receive a critical severity message.
FreeMemAvailMajorThreshold	Set the threshold value for minimum free memory on the node, to the value at which you want to receive a major severity message.
FreeMemAvailMinorThreshold	Set the threshold value for minimum free memory on the node, to the value at which you want to receive a minor severity message.
FreeMemAvailWarningThreshold	Set the threshold value for minimum free memory on the node, to the value at which you want to receive a warning severity message.
MemUtilCriticalThreshold	The percentage (0 to 100%) of physical memory utilization on the node. Set the threshold value for minimum memory utilized on the node, to the value at which you want to receive a critical severity message.

MemUtilMajorThreshold	Set the threshold value for minimum memory utilized on the node, to th value at which you want to receive a major severity message.
MemUtilMinorThreshold	Set the threshold value for minimum memory utilized on the node, to th value at which you want to receive a minor severity message.
MemUtilWarningThreshold	Set the threshold value for minimum memory utilized on the node, to th value at which you want to receive a warning severity message.
MemQueueCriticalThreshold	The average number of processes blocked on the memory waiting for virtual memory disk accesses to complete. Set the threshold value for minimum number of processes blocked on the memory, to the value at which you want to receive a critical severity message.
MemQueueMajorThreshold	Set the threshold value for minimum number of processes blocked on th memory, to the value at which you want to receive a major severity message.
MemQueueMinorThreshold	Set the threshold value for minimum number of processes blocked on th memory, to the value at which you want to receive a minor severity message.
MemQueueWarningThreshold	Set the threshold value for minimum number of processes blocked on th memory, to the value at which you want to receive a warning severity message.
MemPageOutRateCriticalThreshold	The total number of pages swapped out from the physical memory to th disk per second. Set the threshold value for pages swapped out to the value at which you want to receive a critical message.
MemPageOutRateMajorThreshold	Set the threshold for pages swapped out to the value at which you want to receive a major message.
MemPageOutRateMinorThreshold	Set the threshold for pages swapped out to the value at which you want to receive a minor message.
MemPageOutRateWarningThreshold	Set the threshold for pages swapped out to the value at which you want to receive a warning message.
MemPageInRateCriticalThreshold	The total number of pages swapped in from the physical memory to the disk per second. Set the threshold value for pages swapped in to the value at which you want to receive a critical message.
MemPageInRateMajorThreshold	Set the threshold for pages swapped in to the value at which you want t receive a major message.

MemPageInRateMinorThreshold	Set the threshold for pages swapped in to the value at which you want t receive a minor message.
MemPageInRateWarningThreshold	Set the threshold for pages swapped in to the value at which you want t receive a warning message.
CPUSysModeUtilCriticalThreshold	The total percentage of CPU time spent in system mode. Set the threshold value for the time spent in system mode by CPU, to the value at which you want to receive a critical message.
CPUSysModeUtilMajorThreshold	Set the total percentage of time spent in system mode by CPU, to the value at which you want to receive a major message.
CPUSysModeUtilMinorThreshold	Set the total percentage of time spent in system mode by CPU, to the value at which you want to receive a minor message.
CPUSysModeUtilWarningThreshold	Set the total percentage of time spent in system mode by CPU, to the value at which you want to receive a warning message.
ContextSwitchRateCriticalThreshold	The total number of context switches that happen during the sampled interval. Set the threshold value for total context switch, to the value at which you want to receive a critical message.
ContextSwitchRateMajorThreshold	Set the threshold value for total context switch, to the value at which yc want to receive a major message.
ContextSwitchRateMinorThreshold	Set the threshold value for total context switch, to the value at which yc want to receive a minor message.
ContextSwitchRateWarningThreshold	Set the threshold value for total context switch, to the value at which yc want to receive a warning message.
MessageGroup	Message group for outgoing messages.
Debug	Set the value to 1 to start receiving debug messages.

Related Topics:

- Systems Infrastructure SPI Policies

Disk Device Bottleneck Diagnosis Policy

The default policy group for the SI-DiskDeviceBottleneckDiagnosis-AT policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Systems Infrastructure > Performance

The SI-DiskDeviceBottleneckDiagnosis-AT policy detects disk bottlenecks. The policy uses the *automatic threshold determination* to automatically calculate the threshold values depending upon the disk bottlenecks identified on previous days. The policy compares the average of the current sampled data against the set threshold values, and reports if there is a disk bottleneck.

NOTE:
This policy relies on historical data. For accurate results, deploy the policy only after a week of data has been collected by the HP Embedded Performance Component (EPC).

Metrics Used	BYDSK_UTIL BYDSK_DEVNAME
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
MessageApplication	Enter an appropriate value that may help you identify the messages sent by the SI-DiskBottleneck-Diagnosis-AT policy to the management console.
BaselinePeriod	Enter the time period you want to define as a baseline period, such as '3600 seconds'. This period advances with the current time. The most recent 3600-second (1-hour) period becomes the current baseline period.
WarningDeviations	Set the value for standard deviations away from normal to generate a warning message
MinorDeviations	Set the number of standard deviations (greater than *WarningDeviations*) from normal for a minor message.
MajorDeviations	Set the number of standard deviations (greater than *MinorDeviations*) from normal for major message.

WarningHighSeverity	If the *WarningDeviations* is violated above normal, the policy generates a Warning High severity message.
MinorHighSeverity	If the *MinorDeviations* is violated above normal, the policy generates a minor high severity message.
MajorHighSeverity	If the *MajorDeviations* is violated above normal, the policy generates a major high severity message.
WarningHighSeverity	If the *WarningDeviations* is violated above normal, the policy generates a warning high severity message.
MinorHighSeverity	If the *MinorDeviations* is violated above normal, the policy generates a minor high severity message.
MajorHighSeverity	If the *MajorDeviations* is violated above normal, the policy generates a major high severity message.
WarningLowSeverity	If the *WarningDeviations* is violated below normal, the policy generates a warning low severity message.
MinorLowSeverity	If the MinorDeviations is violated below normal, the policy generates a minor low severity message.
MajorLowSeverity	If the MajorDeviations is violated below normal, the policy generates a major low severity message.
DebugLevel	Set the value to 1 to start receiving debug messages.
MessageGroup	Message group for outgoing messages.

Related Topics:

- Automatic Threshold Determination

- Systems Infrastructure SPI Policies

Disk Capacity Monitor Policy

The default policy group for the SI-DiskCapacityMonitor policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Systems Infrastructure > Capacity

This policy monitors capacity parameters of the disks (or logical file systems) on the managed node. For each disk, the policy checks for space utilization, inode utilization (on unix nodes only), and free space available on the system against the specified thresholds.

Metrics Used	FS_INODE_UTIL FS_MAX_SIZE FS_SPACE_USED FS_SPACE_UTIL FS_DIRNAME
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
SpaceUtilCriticalThreshold	The space utilized on the disk. Set the threshold value for maximum space utilized on the disk, to the value at which you want to receive a critical messag
SpaceUtilMajorThreshold	Set the threshold value for maximum space utilized on the disk, to the value at which you want to receive a major message.
SpaceUtilMinorThreshold	Set the threshold value for maximum space utilized on the disk, to the value at which you want to receive a minor message.
SpaceUtilWarningThreshold	Set the threshold value for minimum space utilized on the node, to the value a which you want to receive a warning message.
InodeUtilCriticalThreshold	The percentage (0 to 100%) of Inode utilization on the system. Set the threshold value for minimum space utilized on the node, to the value at which you want to receive a critical message.
InodeUtilMajorThreshold	Set the threshold value for minimum space utilized on the node, to the value a which you want to receive a major message.

InodeUtilMinorThreshold	Set the threshold value for minimum space utilized on the node, to the value a which you want to receive a minor message.
InodeUtilWarningThreshold	Set the threshold value for minimum space utilized on the node, to the value a which you want to receive a warning message.
FreeSpaceCriticalThreshold	The free space (in MB) available on the disk/filesystem. Set the threshold value for minimum free space on the disk, to the value at which you want to receive critical message.
FreeSpaceMajorThreshold	Set the threshold value for minimum free space on the disk/filesystem, to the value at which you want to receive a major message.
FreeSpaceMinorThreshold	Set the threshold value for minimum free space on the disk/filesystem, to the value at which you want to receive a minor message.
FreeSpaceWarningThreshold	Set the threshold value for minimum free space on the disk/filesystem, to the value at which you want to receive a warning message.
UseScriptedParameterForUnix	To use scripted parameters on the UNIX nodes instead of the thresholds specified in the fsmon configuration files, enable this field by setting the value 1.
IncludeFilter	Returns the source object instance including only values specified. You can specify the pattern to include. Specify NULL if no matching is required. Patterns should be valid HP Operations pattern-matching expressions.
ExcludeFilter	You can specify the pattern to exclude. Specify NULL if no matching is required Patterns should be valid HP Operations pattern-matching expressions.
Debug	Set the value to 1 to start receiving debug messages.
MessageGroup	Message group for outgoing messages.

Related Topics:

■ Systems Infrastructure SPI Policies

CPU Spike Check Policy

The default policy group for the SI-CPUSpikeCheck policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Systems Infrastructure > Performance

The SI-CPUSpikeCheck policy is a processor performance monitoring policy. It monitors CPU spikes per CPU busy time in system mode, per CPU busy time in user mode, and total busy time per CPU. A system experiences CPU spike when there is a sharp rise in the CPU usage immediately followed by a decrease in the CPU usage.

Metrics Used	BYCPU_CPU_USER_MODE_UTIL BYCPU_CPU_SYS_MODE_UTIL BYCPU_ID BYCPU_CPU_TOTAL_UTIL BYCPU_INTERRUPT_RATE
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
TotalCpuUtilCriticalThreshold	The total CPU time when it was busy (the total CPU utilization time). It comprises of total CPU time spent in user mode and system mode. Set the threshold value for minimum total CPU utilization time to the value at which you want to receive a critical severity message.
TotalCpuUtilMajorThreshold	Set the threshold value for minimum total CPU utilization time to the value at which you want to receive a major severity message.
TotalCpuUtilMinorThreshold	Set the threshold value for minimum total CPU utilization time to the value at which you want to receive a minor severity message.
TotalCpuUtilWarningThreshold	Set the threshold value for minimum total CPU utilization time to the value at which you want to receive a warning severity message.
UsermodeCriticalThreshold	The percentage (0 to 100%) of CPU time that was busy in user mode. Set the threshold value for minimum CPU busy time in user mode, to the value at which you want to receive a critical severity message.

UsermodeMajorThreshold	Set the threshold value for minimum CPU busy time in user mode, to the value at which you want to receive a major severity message.
UsermodeMinorThreshold	Set the threshold value for minimum CPU busy time in user mode, to the value at which you want to receive a minor message.
UsermodeWarningThreshold	Set the threshold value for minimum CPU busy time in user mode, to the value at which you want to receive a warning message.
SysmodeCriticalThreshold	The threshold is expressed as the percentage (0 to 100%) of CPU time that was busy in system mode. Set the threshold value for minimum CPU busy time in system mode, to the value at which you want to receive a critical severity message.
SysmodeMajorThreshold	Set the threshold value for minimum CPU busy time in system mode, to the value at which you want to receive a major severity message.
SysmodeMinorThreshold	Set the threshold value for minimum CPU busy time in system mode, to the value at which you want to receive a minor message.
SysmodeWarningThreshold	Set the threshold value for minimum CPU busy time in system mode, to the value at which you want to receive a warning message.
InterruptRateCriticalThreshold	The threshold is expressed as the average number of device interrupts per second for the CPU during the sampling interval. Set the threshold value for minimum CPU interrupt rate at which you want to receive a critical severity message.
InterruptRateMajorThreshold	Set the threshold value for minimum CPU interrupt rate at which you want to receive a major severity message.
InterruptRateMinorThreshold	Set the threshold value for minimum CPU interrupt rate at which you want to receive a minor severity message.
InterruptRateWarningThreshold	Set the threshold value for minimum CPU interrupt rate at which you want to receive a warning severity message.
MessageGroup	Message group for outgoing messages.
Debug	Set the value to 1 to start receiving debug messages.

Related Topics:

- Systems Infrastructure SPI Policies

CPU Bottleneck Diagnosis Policy

The default policy group for the SI-CPUBottleneckDiagnosis policy is:

Operations Manager > Policy management > Policy groups > SPI for Infrastructure > Systems Infrastructure > Performance

This policy detects CPU bottlenecks such as exceeding the thresholds for CPU utilization percentage, processor queue length, total number of CPUs on the system, and operating system platforms.

Metrics Used	GBL_CPU_TOTAL_UTIL GBL_RUN_QUEUE GBL_NUM_CPU GBL_OSNAME GBL_INTERRUPT_RATE GBL_CSWITCH_RATE
Supported Platforms for Virtualized Environment	VMware ESX Server

Script-Parameter	Functionality
GlobalCpuUtilCriticalThreshold	The summarized CPU utilization. Set the threshold value for minimum summarized CPU utilization, to the value at which you want to receive a critical message.
GlobalCpuUtilMajorThreshold	Set the threshold value for minimum summarized CPU utilization, to the value at which you want to receive a major message.
GlobalCpuUtilMinorThreshold	Set the threshold value for minimum summarized CPU utilization, to the value at which you want to receive a minor message.
GlobalCpuUtilWarningThreshold	Set the threshold value for minimum summarized CPU utilization, to the value at which you want to receive a warning message.
ContextSwitchRateCriticalThreshold	The threshold is expressed as the rate of total number of context switches on the system. Set the threshold value for total context switch to the value at which you want to receive a critical message.

ContextSwitchRateMajorThreshold	Set the threshold value for total context switch, to the value at which you want to receive a major message.
ContextSwitchRateMinorThreshold	Set the threshold value for total context switch, to the value at which you want to receive a minor message.
ContextSwitchRateWarningThreshold	Set the threshold value for total context switch, to the value at which you want to receive a warning message.
InterruptRateThreshold	The rate of interrupts on the processor. Set the value to receive a message whenever the interrupts reach the threshold value.
RunQueueOverNumCpus	The number of processes waiting for CPU time in surplus of the number of CPUs on the system. Set the threshold value to receive a message whenever the number of processes in the queue for CPU time reaches the threshold.
MessageGroup	Message group for outgoing messages.
DebugLevel	Set the value to 1 to start receiving debug messages.

Related Topics:

■ Systems Infrastructure SPI Policies

Virtualization Infrastructure SPI Tools

The Virtualization Infrastructure SPI provides a number of pre-configured tools that help you manage the virtualized infrastructure. You can find them under Tools > Virtualization Infrastructure > VMware in the console tree.

Related Topics:

- ESX Server - Launch Remote Web Console Tool

- ESX Server Availability Report Tool

- Download VMware Infrastructure Client Tool

- Launch Online Help Tool

Launch Online Help Tool

The tool group for VISPI Online Help tool is:

Operations Manager > Tools > Virtualization Infrastructure > VMware

The VISPI Online Help tool launches the online help for the Virtualization Infrastructure SPI. To launch the online help, double-click the tool.

Related Topics:

- Virtualization Infrastructure SPI Tools

ESX Server - Launch Remote Web Console Tool

The tool group for the ESX Server - Launch Remote Web Console tool is:

Operations Manager > Tools > Virtualization Infrastructure > VMware

The ESX Server - Launch Remote Web Console tool launches the remote web console login page. To log on to the web server:

1. Double-click the tool.

   The Edit Parameters window opens.

2. Under the Select the nodes/services to replace $OPC parameters with section, select the ESX server node to launch the remote web console.

    NOTE:
   Select only one node to launch the remote web console. To launch the remote console on another node, run the tool again.

3. Click Launch.

   This opens the Web Access login page.

4. Enter your credentials to log on to the web console.

Related Topics:

■ Virtualization Infrastructure SPI Tools

Download VMware Infrastructure Client Tool

The tool group for the Download VMware Infrastructure Client tool is:

Operations Manager > Tools > Virtualization Infrastructure > VMware

The Download VMware Infrastructure Client tool helps you download the VMware Infrastructure Client. To download the VMware Infrastructure Client:

1. Double-click the tool.

   The Edit Parameters window opens.

2. Under the Select the nodes/services to replace $OPC parameters with section, select the ESX server node where you want to download the VMware Infrastructure Client.

3. Click Launch .

   The File Download window opens.

4. Click Run .

   A popup window appears with the following text: Do you want to run this software?

5. Click Run to continue downloading the VMware Infrastructure Client.

Related Topics:

■ Virtualization Infrastructure SPI Tools

ESX Server Availability Report Tool

The tool group for the ESX Server - Availability Report tool is:

Operations Manager > Tools > Virtualization Infrastructure > VMware

The ESX Server Availability Report tool checks for the availability of ESX servers and displays an analysis report. To check for the availability of ESX servers:

1. Double-click the tool.

   The Select where to launch this tool window opens.

2. Under the Select one or more node/node group/service section, select the ESX server nodes to launch the tool.

3. Click Launch.

   This opens the Tool Status window. The window lists the selected nodes and displays their availability report in the Tool Output section.

Related Topics:

- Virtualization Infrastructure SPI Tools