HP Operations Smart Plug-in for Systems Infrastructure

for HP Operations Manager for Windows®, UNIX, and Linux operating systems

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User Guide

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1 Introduction

The HP Operations Smart Plug-in for Systems Infrastructure (Systems Infrastructure SPI) is a software application that integrates with HP Operations Manager (HPOM) and extends HPOM's management scope to include monitoring for the enterprise wide distributed infrastructure on Microsoft Windows and Linux systems.

You can use the Systems Infrastructure SPI to monitor the availability and manage the functionality of the systems and associated software and hardware. For more information about the operating system versions supported by the Systems Infrastructure SPI, see the *HP Operations Smart Plug-in for Systems Infrastructure Release Notes*.

The Systems Infrastructure SPI integrates with other HPOM products and their components, such as HP Performance Manager, HP Performance Agent, and Embedded Performance Component (EPC) of HP Operations Agent. The integration provides policies, tools, and the additional perspective of Service Views. Service Views help identify the root cause of alerts reported on operating systems, associated software services, and, essential hardware elements such as CPU, memory, swap space, and so on.

The Systems Infrastructure SPI is configured such that it can be used by other HP Operations Smart Plug-ins. It is integrated with the Virtualization Infrastructure SPI and Cluster Infrastructure SPI to provide an automatic service discovery feature in cluster and virtualized environments.

Like other SPIs, the Systems Infrastructure SPI adds to the monitoring capabilities of HPOM by collecting single system infrastructure data that is targeted and gathered according to rules and schedule specifications contained within policies. Data collection also relies on the programs contained within the HPOM and Systems Infrastructure SPI packages.

After completing the Systems Infrastructure SPI installation on the HPOM management server, you must configure and deploy the Systems Infrastructure SPI to individual servers that you want to monitor. Systems Infrastructure SPI policies define rules for interpreting data, and schedules for collecting data.

2 Systems Infrastructure SPI Components

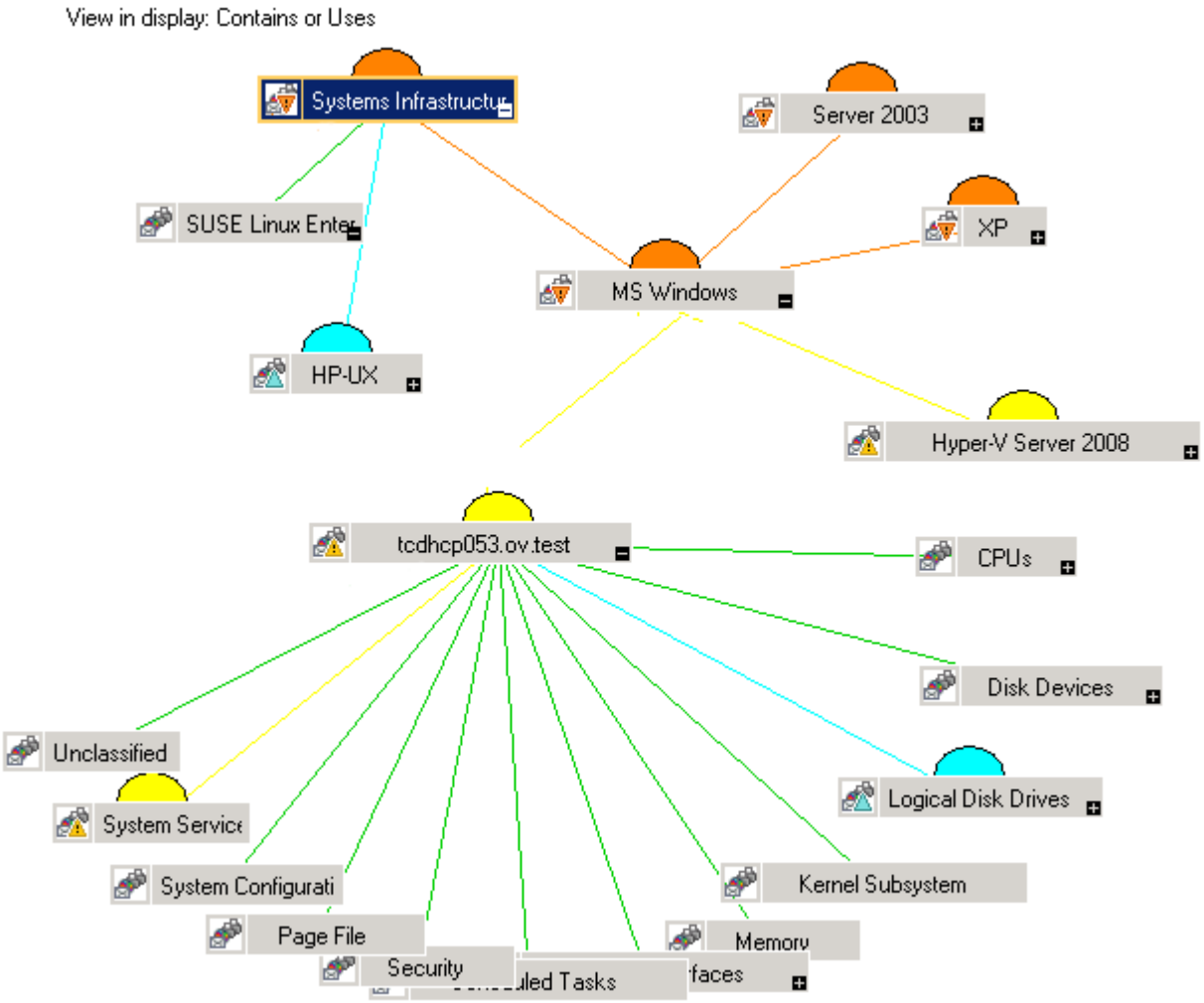
The Systems Infrastructure SPI provides preconfigured policies and tools for monitoring the operations, availability, and performance of the managed nodes. These policies and tools, along with discovery, enable you to quickly gain control of the essential elements of your IT infrastructure.The SPI installation/configuration adds the following components to the HPOM console.

Map View on HPOM for Windows

After you add a node to the HPOM console, the Systems Infrastructure SPI service discovery policy is automatically deployed to the nodes and adds discovered information to the HPOM Services area. This information is used to populate the Systems Infrastructure SPI map view for nodes and services.

The map view displays the real-time status of your infrastructure environment. To view select **Services** from the HPOM console, and click **Systems Infrastructure**. Map view graphically represents the structural view of your entire service or node hierarchy in the infrastructure environment including any subsystems or subservices.

Figure 1 Map view on HPOM for Windows



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.

To help you determine the root cause of a problem, HPOM provides root cause analysis to take you quickly to the service or node that is not performing. Root cause analysis starts at the level of your selected node or service, stops at the level where the cause of the problem lies, and draws a map that shows the source of the problem and the nodes or services affected.

Map View on HPOM for UNIX/ Linux

The map view displays the real-time status of your infrastructure environment. To ensure that the operator can view the service map in the HPOM for UNIX and HPOM for Linux Operational UI, run the following commands on the management server:

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

where operator name is the operator (for example, opc_adm or opc_op) to which you want to assign the service.

The Systems Infrastructure SPI service discovery policy does not automatically deploy policies to the nodes. You can manually deploy these.

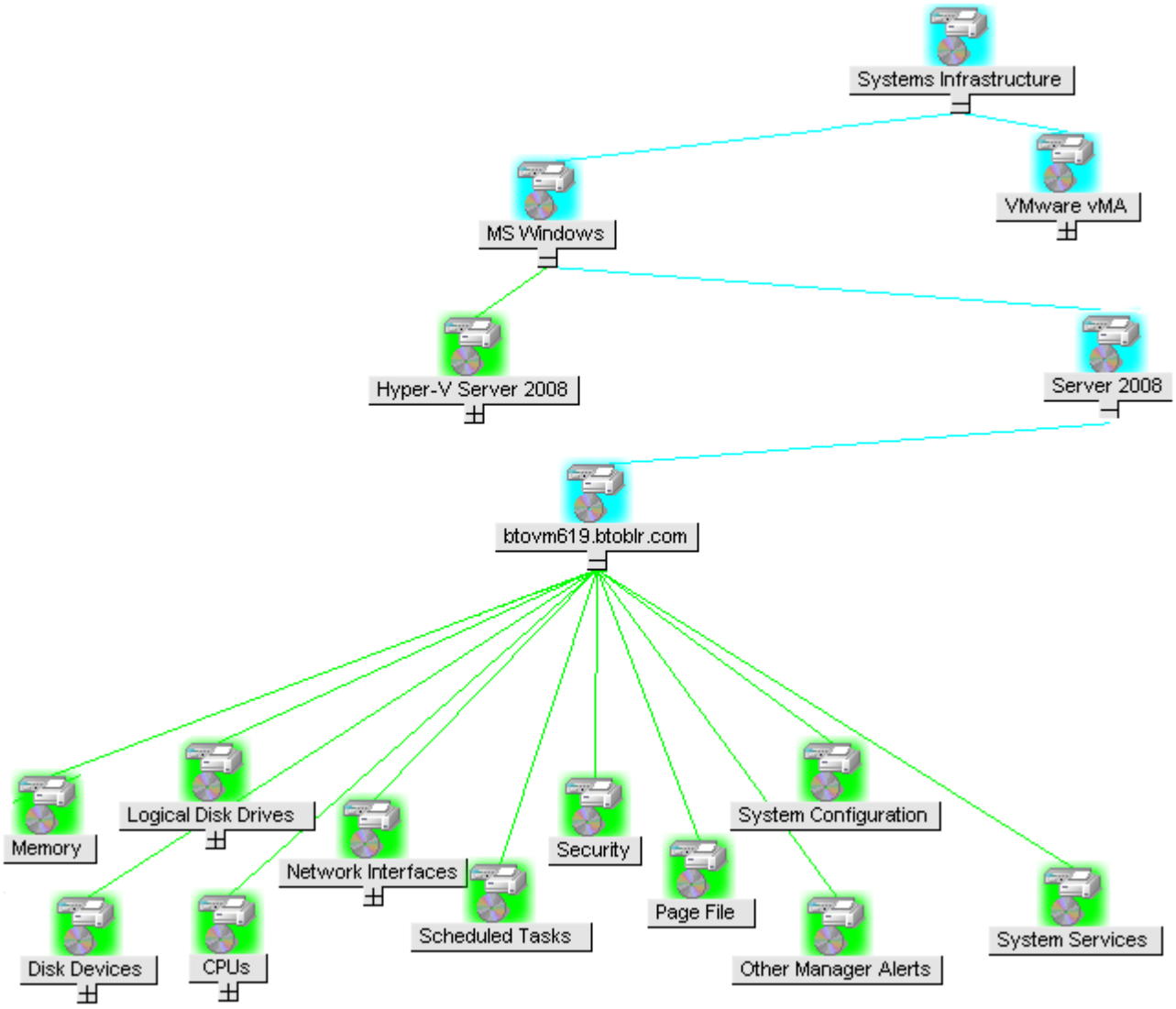
To view the map view:

1 Launch the HPOM Operational UI.

2 Log on using your user name and password.

3 Select **Services** → **Systems Infrastructure** → **Show Graph**, to view the map view.

Figure 2 Map view on HPOM for UNIX/ Linux



The map view graphically represents the structural view of your entire service or node hierarchy in the infrastructure environment including any subsystems or subservices.

Tools

The Systems Infrastructure SPI tools display data collected for a particular managed node. For more information about the tools provided by System Infrastructure SPI, see Systems Infrastructure SPI Tool.

Policies

In case of 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 system 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.

In case of HPOM for UNIX/Linux, the Systems Infrastructure SPI service discovery policy does not automatically deploy policies to the nodes. You can manually deploy them.

For information on how to deploy policies from HPOM for Windows, UNIX, and Linux, refer to the Appendix A.

The Systems Infrastructure SPI policies begin with SI for easy identification and modification. The policy types are as follows:

- **Service/ProcessMonitoring policies** provide a means for monitoring system services and processes.
- **Logfile Entry policies** capture status/error messages generated by the system nodes.
- **Measurement Threshold policies** define conditions for each metric so that the collected metric values can be interpreted and alerts/messages can be displayed in the message browser. Each measurement threshold policy compares the actual metric value against the specified/auto threshold. A mismatch between the threshold and the actual metric value generates message and instruction text that help you resolve a situation.
- **Scheduled Task policies** determine what metric values to collect and when to start collecting metric. The policies define the collection interval. The collection interval indicates how often data is collected for a specific group. The scheduled task policy has two functions: to run the collector/analyzer at each collection interval on a node and to collect data for all metrics listed within the polices' Command text box.
- **Service Discovery policy** discovers individual system nodes instances and builds a map view for all Systems Infrastructure SPI discovered instances.

For more information about the policies provided by Systems Infrastructure SPI, see Systems Infrastructure SPI Policies.

Graphs

The Systems Infrastructure SPI enables you to view 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 evaluate system performance, look at usage trends, and compare performance between 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 view 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 Systems Infrastructure SPI, see Systems Infrastructure SPI Graphs.

Reports

You can integrate the Systems Infrastructure 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 view 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, or Linux operating system), you can view the reports on HP Reporter system. For more information on integration of HP Reporter with HPOM, see *HP Reporter Installation and Special Configuration Guide*.

For information about the reports provided by Systems Infrastructure SPI, see Systems Infrastructure SPI Reports.

3 Systems Infrastructure SPI Policies and Tools

The Systems Infrastructure SPI provides a wide range of policies and tools to help manage your infrastructure. The policies help you monitor systems and the tools display data collected for these systems.

Systems Infrastructure SPI Policies

A policy is a rule or set of rules that helps you automate monitoring. It helps you monitor systems in Windows and Linux 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 unexpected behavior or cause the policy to fail.

The folder SPI for Infrastructure group contains a subgroup *en* arranged according to language English.

To access the policies on HPOM for Windows, select the following:

Policy management → Policy groups → SPI for Infrastructure → en → Systems Infrastructure

To access the policies on console/ Administration UI for HPOM for UNIX/ Linux, select the following:

Policy Bank → SPI for Infrastructure → en → Systems Infrastructure

Discovery Policy

The SI-SystemDiscovery policy gathers service information from the managed nodes such as hardware resources, operating system attributes, and applications.

Whenever a Windows or Linux node is added to the HPOM console, the discovery modules deployed along with the SI-SystemDiscovery policy run service discovery on the node. These service discovery modules gather and send back the information to HPOM in the form of XML snippets. These snippets generate a service tree that provides a snapshot of services deployed on managed nodes at the time the Systems Infrastructure SPI discovery process runs. After the first deployment, the autodiscovery policy is set to run periodically. Each time the discovery agent runs, it compares the service information retrieved with the results of the previous run. If the discovery agent finds any changes or additions to the services running on the managed node since the previous run, it sends a message to the HPOM management server, which updates the service view with the changes. The default policy group for this policy is:

SPI for Infrastructure → en → Systems Infrastructure → AutoDiscovery

Availability Policies

Availability monitoring helps to ensure adequate availability of resources. It is important to identify unacceptable resource availability levels. The current load on IT infrastructure is computed and compared with threshold levels to see if there is any shortfall in resource availability.

As the usage of IT resources changes, and functionality evolves, the amount of disk space, processing power, memory, and other parameters also change. It is essential to understand the current demands, and how they change over time. Monitoring these aspects over a period of time is beneficial in understanding the impact on IT resource utilization.

A server role describes the primary function of the server such as fax server, email server and so on. A system can have one single server role or multiple server roles installed. Each server role can include one or more role services, described as sub-elements of a role. The availability policies monitor the availability of role services on the managed nodes.

The preconfigured availability policies are automatically installed if the role services managed by these policies are discovered on the selected node by the Systems Infrastructure SPI. The default policy group for these policies is:

SPI for Infrastructure → en → Systems Infrastructure → Availability

DHCP Server Availability Policy

SI-MSWindowsDHCPServerRoleMonitor

This policy monitors the availability of the system services required for the DHCP server role service and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default policy group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → DHCP Server → MS Windows

DNS Server Availability Policy

SI-MSWindowsDNSServerRoleMonitor

This policy monitors the availability of the system service required for the Microsoft Windows DNS server role service and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → DNS Server → MS Windows

E-mail Service Availability Policy

SI-LinuxSendmailProcessMonitor

This policy monitors the sendmail daemon required for implementing the SMTP protocol for Linux systems. The policy monitors the status of the email service and its corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → E-mail Service → Linux

Fax Services Availability Policy

SI-MSWindowsFaxServerRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows Fax server role service. It monitors the status of the Spooler and Fax role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Fax Service → MS Windows

File Services Availability Policy

The default group for the policies is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → File Services → MS Windows

SI-MSWindowsFileServerRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows File server role service.

The policy monitors the status of the lanmanserver role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes.

SI-MSWindowsDFSRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows DFSR role services and their corresponding processes that are running on the managed node. The policy sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes.

SI-MSWindowsWin2k3FileServicesRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows Win2k3 Files Services role service. It monitors the status of the NtFrs and CISVC role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes.

SI-MSWindowsNFSRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows NFS role services and their corresponding processes that are running on the managed node. The policy sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes.

Internet Service Availability Policy

SI-LinuxXinetdProcessMonitor

This policy monitors the xinetd processes that are running on the managed node. These processes are required for handling the startup of the network related protocols on the Linux systems. The policy sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Internet Service → Linux

Network Services Availability Policy

Systems Infrastructure SPI monitors the availability of network services on Windows and Linux systems.

SI-MSWindowsRRAServicesRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows Routing and Remote Access Services role service.

The policy monitors the status of the RAsMan and RemoteAccess role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Network Services → Windows

SI-MSWindowsNetworkPolicyServerRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows Network Policy Server role service.

The policy monitors the status of the IAS role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Network Services → Windows

SI-LinuxSmbServerProcessMonitor

This policy monitors the availability of the smb daemon processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Network Services → Linux

SI-LinuxNfsServerProcessMonitor

This policy monitors the state of the nfs daemon processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Network Services → Linux

Print ServiceAvailability Policy

Systems Infrastructure SPI monitors the availability of print services on Windows and Linux systems.

SI-MSWindowsPrintServicesRoleMonitor

This policy monitors the availability of the print services required for the Microsoft Windows Print Services role service.

The policy monitors the status of the Spooler role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Print Service → Windows

SI-LinuxCupsProcessMonitor

This policy monitors the availability of the print services required for the Linux systems.

The policy monitors the status of the cups daemon processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Print Service → Linux

Scheduled Job Service Availability Policy

Systems Infrastructure SPI monitors the availability of scheduled job services on Linux, for RHEL and SLES systems.

SI-RHELCronProcessMonitor

This policy monitors the availability of the cron daemon processes that are running on the RHEL managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Schedule Job Service → Linux → RHEL

SI-SLESCronProcessMonitor

This policy monitors the availability of the cron daemon processes that are running on the SLES managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy on *SLES* is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Schedule Job Service → Linux → SLES

Secure Login Service Availability Policy

SI-LinuxSshdProcessMonitor

This policy monitors the availability of the sshd daemon processes that are running on the Linux managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Secure Login Service → Linux

System Logger Availability Policy

Systems Infrastructure SPI monitors the availability of system logger services on Linux, for RHEL and SLES systems.

SI-RHELSyslogProcessMonitor

This policy monitors the availability of the syslog daemon processes on the RHEL systems.

The policy monitors the status of the syslog processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → Systems Infrastructure → Availability → System Logger → Linux → RHEL

SI-SLESSyslogProcessMonitor

This policy monitors the availability of the syslog daemon processes on the SLES systems.

The policy monitors the status of the syslog processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes. The default group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → System Logger → Linux → SLES

Terminal Services Availability Policy

Systems Infrastructure SPI monitors the availability of terminal services on Microsoft Windows systems. The default group for the policies is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Terminal Services → MS Windows

SI-MSWindowsTerminalServerRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows Terminal Server role service.

The policy monitors the status of the TermService role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes.

SI-MSWindowsTSLicensingRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows TS Licensing role service.

The policy monitors the status of the TermServLicensing role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes.

SI-MSWindowsTSGatewayRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows TS Gateway role service.

The policy monitors the status of the IAS, RPCHTTPLBS, and TSGateway role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes.

SI-MSWindowsTSWebAccessRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows TS Gateway role service.

The policy monitors the status of the IISADMIN and W3SVC role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes.

Web Server Availability Policy

Systems Infrastructure SPI monitors the availability of web server services on Microsoft Windows systems. The default group for the policies is:

SPI for Infrastructure → en → Systems Infrastructure → Availability → Web Server → MS Windows

SI-MSWindowsWebServerRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows Web Server role service.

The policy monitors the status of the AppHostSvc, IISADMIN, W3SVC, and WAS role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes.

SI-MSWindowsFTPServiceRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows the FTP Publishing Service role service.

The policy monitors the status of the MSFTPSVC role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes.

SI-MSWindowsWebMgmtToolsRoleMonitor

This policy monitors the availability of the system services required for the Microsoft Windows Web Management Tools role service.

The policy monitors the status of the WMSvc role services and their corresponding processes that are running on the managed node and sends a message when the status of the service changes (for example, from running to stopped or disabled). You can define the status to monitor and the action to take if the status changes.

Capacity Policies

Capacity monitoring helps to deliver performance at the required service level and cost. It ensures that the capacity of the IT infrastructure corresponds to the evolving demands of the business. It helps identify the under-utilized and over-utilized resources. Monitoring these aspects over a period of time is beneficial in understanding the impact on IT resource utilization. You can analyze current and historical performance of systems resources to accurately predict future capacity needs. The default policy group for these policies is:

SPI for Infrastructure → en → Systems Infrastructure → Capacity

Disk Capacity Monitor Policy

SI-DiskCapacityMonitor

This policy monitors capacity parameters of the disks (also referred to as logical file systems) on the managed node. For each disk, the policy checks for space utilization and free space available. It also checks for inode utilization on the Linux nodes. In case the free space availability, space utilization, or inode utilization exceeds the threshold values specified, the policy sends out an alert to the HPOM console.

Metrics Used	FS_MAX_SIZE FS_SPACE_USED FS_SPACE_UTIL FS_DIRNAME FS_INODE_UTIL (Linux systems only)
Supported Platforms	Microsoft Windows Red Hat Enterprise Linux Suse Linux Enterprise Server

Script-Parameter	**Description**
SpaceUtilCriticalThreshold	The threshold is expressed as the space utilized on the disk. Set the threshold value at which you want to receive a critical message.
SpaceUtilMajorThreshold	Set the threshold value at which you want to receive a major message.
SpaceUtilMinorThreshold	Set the threshold value at which you want to receive a minor message.
SpaceUtilWarningThreshold	Set the threshold value at which you want to receive a warning message.

InodeUtilCriticalThreshold	The threshold is expressed as the percentage (0 to 100%) of inode utilization on the Linux systems. Set the threshold value, at which you want to receive a critical message.
InodeUtilMajorThreshold	Set the threshold value for minimum space utilized on the node, at which you want to receive a major message.
InodeUtilMinorThreshold	Set the threshold value at which you want to receive a minor message.
InodeUtilWarningThreshold	Set the threshold value at which you want to receive a warning message.
FreeSpaceCriticalThreshold	The threshold is expressed as the free space (in MBs) available on the disk/filesystem. Set the threshold value for minimum free space on the disk, below which you want to receive a critical message.
FreeSpaceMajorThreshold	Set the threshold value for minimum free space on the disk, below which you want to receive a major message.
FreeSpaceMinorThreshold	Set the threshold value for minimum free space on the disk, below which you want to receive a minor message.
FreeSpaceWarningThreshold	Set the threshold value for minimum free space on the disk, below which you want to receive a warning message.
MessageGroup	Message group for outgoing messages.
Debug	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.

You can set different thresholds for the drives/ filesystems on the managed node. The policy parameters can take multiple comma separated values for setting these thresholds. These are described in the following examples:

- **`FreeSpaceMinorThreshold 45`**

In this example, the threshold value is set at 45 MB for all disks/filesystems on the managed node. If the free space available on disks/filesystems falls below the threshold value, the policy sends a minor severity alert.

- **`SpaceUtilCriticalThreshold /=65,95,c:=65`**

In this example, the threshold values are set at 65% for the '/' and '*C:*' drives, and 95% for all other drives/filesystems on the managed node. If the system utilization for these drives/ filesystems exceeds the threshold values, the policy sends out a critical alert.

- **`InodeUtilCriticalThreshold /opt=85,/=88`**

In this example, the threshold values are set at 85% for '*/opt*' drive and 88% for '/' drive. If the inodes utilization exceeds the threshold values, the policy sends out a critical alert. The policy will not monitor the remaining drives/ filesystems on the managed node.

- **`FreeSpaceMajorThreshold E:=200,256,F:=512,c:=1024,/=1024`**

In this example, the threshold values are set at 200 for '*E:*' drive, 512 for '*F:*' drive, 1024 for '*C:*' drive, 1024 for '/' drive and 256 for the remaining drives on the managed node. If the free space available falls below the threshold values, the policy sends a major alert.

- **`InodeUtilCriticalThreshold <null>`**

```
InodeUtilMajorThreshold <null>
InodeUtilMinorThreshold <null>
InodeUtilWarningThreshold <null>
```

In this example, there are no threshold values set for the drives/ filesystems. The policy will not monitor any of the drives/ filesystems for inode utilization.

Swap Capacity Monitor Policy

SI-SwapCapacityMonitor

This policy monitors the swap space utilization of the system.

Metrics Used	GBL_SWAP_SPACE_AVAIL GBL_SWAP_SPACE_UTIL GBL_SWAP_SPACE_USED
Supported Platforms	Microsoft Windows Red Hat Enterprise Linux Suse Linux Enterprise Server
Script-Parameter	**Description**
SwapSpaceUtilCriticalThreshold	The threshold is expressed as the percentage (0 to 100%) of swap space utilization on the node. Set the threshold value for minimum free swap space on the disk, at which you want to receive a critical severity message.
SwapSpaceUtilMajorThreshold	Set the threshold value for minimum swap space utilized on the node, at which you want to receive a major severity message.
SwapSpaceUtilMinorThreshold	Set the threshold value for minimum space utilized on the node, at which you want to receive a minor severity message.
SwapSpaceUtilWarningThreshold	Set the threshold value for minimum space utilized on the node, at which you want to receive a warning severity message.
FreeSwapSpaceAvailCriticalThreshold	The threshold is expressed as the free swap space (in MBs) available on the disk/filesystem. Set the threshold value for minimum free space on the disk, at which you want to receive a critical severity message.
FreeSwapSpaceAvailMajorThreshold	Set the threshold value for minimum free swap space on the disk, at which you want to receive a major severity message.
FreeSwapSpaceAvailMinorThreshold	Set the threshold value for minimum free swap space on the disk, at which you want to receive a minor severity message.

FreeSwapSpaceAvailWarningThreshold	Set the threshold value for minimum free swap space on the disk, 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. These messages are displayed on the console with normal severity.

Memory Utilization Monitor Policy

SI-MemoryUtilization-AT

This 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.

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

Metrics Used	GBL_MEM_UTIL
Supported Platforms	Microsoft Windows Red Hat Enterprise Linux Suse Linux Enterprise Server
Script-Parameter	**Description**
MessageApplication	Enter an appropriate value that helps you identify the messages sent by the 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	Displays the number of standard deviation away form normal, at which the policy will send a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as *5*.
MinorDeviations	Displays the number of standard deviation away form normal, at which the policy will send a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for WarningDeviations. To disable the parameter, set value as *5*.
MajorDeviations	Displays the number of standard deviation away form normal, at which the policy will send a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for MinorDeviations. To disable the parameter, set value as *5*.
WarningHighSeverity	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 *WarningDeviations*. To disable the parameter, set value as *none*.
MinorHighSeverity	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 *MinorDeviations*. To disable the parameter, set value as *none*.
MajorHighSeverity	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 *MajorDeviations*. To disable the parameter, set value as *none*.
WarningLowSeverity	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 *WarningDeviations*. To disable the parameter, set value as *none*.
MinorLowSeverity	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 *MinorDeviations*. To disable the parameter, set value as *none*.
MajorLowSeverity	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 *MajorDeviations*. To disable the parameter, set value as *none*.
InstanceSource	Do not edit the parameter value.

MemUtilCutOff	Set a value below which you do not want to monitor memory utilization.
DebugLevel	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.
MessageGroup	Message group for outgoing messages.

Swap Utilization Monitor Policy

SI-SwapUtilization-AT

This 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.

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

Metrics Used	GBL_SWAP_SPACE_USED
Supported Platforms	Microsoft Windows Red Hat Enterprise Linux Suse Linux Enterprise Server
Script-Parameter	**Description**
MessageApplication	Enter an appropriate value that helps you identify the messages sent by the 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 swap space usage as indicated by the metric.
MaximumValue	Displays the maximum swap space usage as indicated by the metric.

WarningDeviations	Displays the number of standard deviation away form normal, at which the policy will send a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as *5*.
MinorDeviations	Displays the number of standard deviation away form normal, at which the policy will send a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for WarningDeviations. To disable the parameter, set value as *5*.
MajorDeviations	Displays the number of standard deviation away form normal, at which the policy will send a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for MinorDeviations. To disable the parameter, set value as *5*.
WarningHighSeverity	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 *WarningDeviations*. To disable the parameter, set value as *none*.
MinorHighSeverity	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 *MinorDeviations*. To disable the parameter, set value as *none*.
MajorHighSeverity	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 *MajorDeviations*. To disable the parameter, set value as *none*.
WarningLowSeverity	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 *WarningDeviations*. To disable the parameter, set value as *none*.
MinorLowSeverity	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 *MinorDeviations*. To disable the parameter, set value as *none*.
MajorLowSeverity	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 *MajorDeviations*. To disable the parameter, set value as *none*.
InstanceSource	Do not edit the parameter value.

DebugLevel	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.
MessageGroup	Message group for outgoing messages.
SwapUtilCutOff	Set a value below which you do not want to monitor swap utilization.

Per CPU Utilization Monitor Policy

SI-PerCPUUtilization-AT

This 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.

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

Metrics Used	BYCPU_CPU_TOTAL_UTIL
Supported Platforms	Microsoft Windows Red Hat Enterprise Linux Suse Linux Enterprise Server
Script-Parameter	**Description**
MessageApplication	Enter an appropriate value that helps you 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 Global.
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 CPU consumption as indicated by the metric.
MaximumValue	Displays the maximum value of CPU consumption as indicated by the metric.

WarningDeviations	Displays the number of standard deviation away form normal, at which the policy will send a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as *5*.
MinorDeviations	Displays the number of standard deviation away form normal, at which the policy will send a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for WarningDeviations. To disable the parameter, set value as *5*.
MajorDeviations	Displays the number of standard deviation away form normal, at which the policy will send a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for MinorDeviations. To disable the parameter, set value as *5*.
WarningHighSeverity	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 *WarningDeviations*. To disable the parameter, set value as *none*.
MinorHighSeverity	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 *MinorDeviations*. To disable the parameter, set value as *none*.
MajorHighSeverity	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 *MajorDeviations*. To disable the parameter, set value as *none*.
WarningLowSeverity	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 *WarningDeviations*. To disable the parameter, set value as *none*.
MinorLowSeverity	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 *MinorDeviations*. To disable the parameter, set value as *none*.
MajorLowSeverity	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 *MajorDeviations*. To disable the parameter, set value as *none*.
InstanceSource	Do not edit the parameter value.

DebugLevel	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.
MessageGroup	Message group for outgoing messages.
CPUUtilCutOff	Set a value below which you do not want to monitor CPU utilization.

Remote Drive Space Utilization Monitor Policy

SI-MSWindowsRemoteDriveSpaceUtilization

The SI-MSWindowsRemoteDriveSpaceUtilization policy monitors space utilization level for remote drives on Microsoft Windows platform. The default policy group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Capacity → Windows

Source Type	WMI
Supported Platforms	Microsoft Windows
Script-Parameter	**Description**
SpaceUtilCriticalThreshold	The threshold is expressed as the percentage (0 to 100%) of space utilization on the monitored remote drive. Set the threshold value for minimum free space on the drive, at which you want to receive a critical severity message.
SpaceUtilMajorThreshold	Set the threshold value for minimum free space on the drive, at which you want to receive a major severity message.
SpaceUtilMinorThreshold	Set the threshold value for minimum free space on the drive, at which you want to receive a minor severity message.
SpaceUtilWarningThreshold	Set the threshold value for minimum free space on the drive, 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. These messages are displayed on the console with normal severity.
AssignMessageToRemoteHost	Set the value to 1 to display the source of the alert message as the remote host. By default, the messages are assigned to the managed node from which the message is sent out.

Remote Drive Space Utilization Monitor Policy for NFS filesystems

SI-LinuxNfsUtilizationMonitor

The SI-LinuxNfsUtilizationMonitor policy monitors space utilization level for NFS remote filesystems on Linux platforms. The default policy group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Capacity → Linux

Supported Platforms	Red Hat Enterprise Linux Suse Linux Enterprise Server
Script-Parameter	**Description**
SpaceUtilCriticalThreshold	The threshold is expressed as the percentage (0 to 100%) of space utilization on the monitored remote filesystem. Set the threshold value for minimum free space on the filesystem, at which you want to receive a critical severity message.
SpaceUtilMajorThreshold	Set the threshold value for minimum free space on the filesystem, at which you want to receive a major severity message.
SpaceUtilMinorThreshold	Set the threshold value for minimum free space on the filesystem, at which you want to receive a minor severity message.
SpaceUtilWarningThreshold	Set the threshold value for minimum free space on the filesystem, at which you want to receive a warning severity message.
NfsFileSystemType	Specify the filesystem type that you would like to monitor for space utilization level. For example, if you specify NFS, the policy will monitor all NFS remote filesystems for space utilization level.
AssignMessageToRemoteHost	Set the value to 1 to display the source of the alert message as the remote host. By default, the messages are assigned to the managed node from which the message is sent out.
MessageGroup	Message group for outgoing messages.
Debug	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.
Trace	Set a non-zero value to enable tracing.

Remote Drive Space Utilization Monitor Policy for CIFS filesystems

SI-LinuxCifsUtilizationMonitor

The SI-LinuxCifsUtilizationMonitor policy monitors space utilization level for CIFS remote filesystems on Linux platforms. The default policy group for the policy is:

Supported Platforms	Red Hat Enterprise Linux Suse Linux Enterprise Server
Script-Parameter	**Description**
SpaceUtilCriticalThreshold	The threshold is expressed as the percentage (0 to 100%) of space utilization on the monitored remote filesystem. Set the threshold value for minimum free space on the filesystem, at which you want to receive a critical severity message.
SpaceUtilMajorThreshold	Set the threshold value for minimum free space on the filesystem, at which you want to receive a major severity message.
SpaceUtilMinorThreshold	Set the threshold value for minimum free space on the filesystem, at which you want to receive a minor severity message.
SpaceUtilWarningThreshold	Set the threshold value for minimum free space on the filesystem, at which you want to receive a warning severity message.
CifsFileSystemType	Specify the filesystem type that you would like to monitor for space utilization level. For example, if you specify CIFS, the policy will monitor all CIFS remote filesystems for space utilization level. The policy can be used to monitor *cifs* and *smb* file system types.
AssignMessageToRemoteHost	Set the value to 1 to display the source of the alert message as the remote host. By default, the messages are assigned to the managed node from which the message is sent out.
MessageGroup	Message group for outgoing messages.
Debug	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.
Trace	Set a non-zero value to enable tracing.

Log Policies

Systems Infrastructure SPI provides logfile policies to monitor crucial logs for the managed nodes. The default policy group for these policies is:

SPI for Infrastructure → en → Systems Infrastructure → Logs

Linux System Services Logfile Policies

The Linux system services logfile policies monitor the crucial system service logs for Red Hat and Suse enterprise Linux editions. The default policy group for these policies is:

SPI for Infrastructure → en → Systems Infrastructure → Logs → Linux

Boot Log Policy

SI-LinuxBootLog

This policy monitors the boot log file `/var/log/boot.log` and alerts in case of any system boot errors. The default polling interval is 5 minute.

This policy checks for the following conditions:

Condition	Description
Service startup failed	Checks for error conditions that match the `<*> <@.service>: <@.daemon> startup failed` pattern in the boot log file. If any matches are found, this condition sends a message with minor severity to the HPOM console with the appropriate message attributes.
Service failed	Checks for error conditions that match the `<*> <@.service>: <*.msg> failed` 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.

Secure Log Policy

SI-LinuxSecureLog

This policy monitors the log file in `/var/log/secure and /var/log/messages,` and alerts in case of any secure login failure. The default polling interval is 5 minute.

This policy checks for the following condition:

Condition	Description
Authentication failure	Checks for error conditions that match the `<*> sshd\[<#>\]: Failed password for <@.user> from <*.host> port <#> ssh2` pattern in the secure log file. If any matches are found, this condition sends a message with minor severity to the HPOM console with the appropriate message attributes.

Kernel Log Policy

SI-LinuxKernelLog

This policy monitors the kernel log file `/var/log/messages` and alerts in case of any kernel service failure. The default polling interval is 5 minute.

This policy checks for the following condition:

Condition	Description
Kernel service failure	Checks for error conditions that match the `<*> kernel: <@.service>: <*.msg> failed` pattern in the kernel log file. If any matches are found, this condition sends a message with minor severity to the HPOM console with the appropriate message attributes.

Windows System Services Logfile Policies

The Windows Server logfile policies monitor the crucial system service logs for Microsoft Windows 2008 or later versions. The default policy group for these policies is:

SPI for Infrastructure → en → Systems Infrastructure → Logs → MS Windows Server

NFS Log Policy

SI-MSWindowsServer_NFSWarnError

This policy monitors the NFS log file for the NFS server processes and forwards the errors to the HPOM console with a severity level of warning or error. The default polling interval is 1 minute. The policy looks for the following errors recorded in the NFS log file:

- The NFS server detected a low disk space condition and has stopped recording audits
- The audit log has reached its maximum file size
- The NFS server could not register with RPC Port Mapper
- The NFS driver failed during phase 2 initialization

DNS Log Policy

SI-MSWindowsServer_DNSWarnError

This policy monitors the log file for the Microsoft DNS server service and its corresponding process and forwards the error log entries to the HPOM console with a severity level of warning or error. The default polling interval is 1 minute. The policy looks for the following errors recorded in the DNS log file:

- The DNS server could not allocate memory for the resource record
- The DNS server was unable to service a client request due a shortage of available memory
- The DNS server could not create a zone transfer thread
- The DNS server encountered an error while writing to a file
- The DNS server could not initialize the remote procedure call (RPC) service

Windows Logon Policy

SI-MSWindowsServer_WindowsLogonWarnError

This policy monitors the Windows logon and initialization event logs and forwards the error log entries to the HPOM console with a severity level of warning or error. The default polling interval is 1 minute. The policy looks for the following errors recorded in the Windows log file:

- Windows license is invalid
- Windows license activation failed
- The Windows logon process has failed to switch the desktop
- The Windows logon process has unexpectedly terminated
- The Windows logon process has failed to spawn a user application
- The Windows logon process has failed to terminate currently logged on user's processes
- The Windows logon process has failed to disconnect the user session

Terminal Service Log Policy

SI-MSWindowsServer_TerminalServiceWarnError

This policy monitors the log file for Windows Terminal service and its corresponding process and forwards the error log entries to the HPOM console with a severity level of warning or error. The default polling interval is 1 minute. The policy looks for the following errors recorded in the Windows Terminal service log file:

- A connection request was denied because the terminal server is currently configured to not accept connections
- Auto-reconnect failed to reconnect the user to the session because authentication failed
- Terminal service failed to start
- The terminal server received large number of incomplete connections

Windows Server DHCP Error

SI-MSWindowsServer_DHCPWarnError

This policy monitors the log file for DHCP server and client services and their corresponding processes, and forwards the error log entries to the HPOM console with a severity level of warning or error. The default polling interval is 1 minute. The policy looks for the following errors recorded in the Windows Terminal service log file:

- Iashlpr cannot contact the NPS service
- There are no IP addresses available for BOOTP clients in the scope or superscope
- The DHCP server is unable to reach the NPS server for determining the client's NAP access state
- There are no IP addresses available for lease in the scope or superscope
- The DHCP/BINL service on the local computer has determined that it is not authorized to start
- The DHCP service failed to initialize the audit log
- The DHCP/BINL service on this workgroup server has encountered another server with IP Address
- The DHCP service failed to restore the DHCP registry configuration
- The DHCP service was unable to read the global BOOTP file name from the registry
- The DHCP service is not servicing any clients because there are no active interfaces.
- There is no static IP address bound to the DHCP server
- The DHCP server service failed to register with Service Controller
- The DHCP server service failed to initialize its registry parameters

Performance Policies

Performance monitoring helps to preempt performance disruption and identify when the infrastructure issues can threaten service quality. You can use the collected performance data to correlate events across the entire infrastructure of servers, operating systems, network devices, and applications in order to prevent or identify the root cause of a developing performance issue.

The default policy group for these policies is:

SPI for Infrastructure → en → Systems Infrastructure → Performance

Network Usage and Performance Policy

SI-NetworkUsageAndPerformance

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

The policy does not monitor performance data for package collision on the Windows operating system, because the BYNETIF_COLLISION metric is not available on it.

Metrics Used	BYNETIF_IN_PACKET BYNETIF_ID BYNETIF_OUT_PACKET BYNETIF_ERROR BYNETIF_COLLISION (not available on Microsoft Windows) BYNETIF_OUT_BYTE_RATE BYNETIF_IN_BYTE_RATE
Supported Platforms	Microsoft Windows Red Hat Enterprise Linux Suse Linux Enterprise Server

Script-Parameter	**Description**
NICByteRateCriticalThreshold	This parameter monitors the average number of bytes transferred every second and sends a critical severity message if the value exceeds the threshold. You can set a threshold value, at which you want to receive the message.
NICByteRateMajorThreshold	You can set a threshold value for average number of bytes transferred every second, at which you want to receive a major severity message.
NICByteRateMinorThreshold	You can set a threshold value for average number of bytes transferred every second, at which you want to receive a minor severity message.
NICByteRateWarningThreshold	You can set a threshold value for average number of bytes transferred every second, at which you want to receive a warning severity message.
NICErrPktRatePctCriticalThreshold	Packet error rate is the ratio, in percentage, of the number of packets not successfully transmitted, to the total number of packets sent. This parameter monitors the packet error rate and sends a critical severity message if the value exceeds the threshold.
NICErrPktRatePctMajorThreshold	You can set a threshold value for packet error rate, at which you want to receive a major severity message.
NICErrPktRatePctMinorThreshold	You can set a threshold value for packet error rate, at which you want to receive a minor severity message.
NICErrPktRatePctWarningThreshold	You can set a threshold value for packet error rate, at which you want to receive a warning severity message.

NICCollisionRatePctCriticalThreshold	This parameter monitors the ratio, in percentage, of collision packets to the total number of packets transmitted. You can set a threshold value for collision error rate, at which you want to receive a critical severity message.
NICCollisionRatePctMajorThreshold	You can set a threshold value for collision error rate, at which you want to receive a critical major message.
NICCollisionRatePctMinorThreshold	You can set a threshold value for collision error rate, at which you want to receive a minor severity message.
NICCollisionRatePctWarningThreshold	You can set a threshold value for collision error rate, at which you want to receive a warning severity message.
MessageGroup	You can enter an appropriate value that helps you to identify the messages sent by this policy. Whenever a threshold is violated, the policy appends the value from this parameter in the message before sending it to the management console.
Debug	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.

Memory Bottleneck Diagnosis Policy

SI-MemoryBottleneckDiagnosis

This policy monitors the physical memory utilization and the bottlenecks. Memory bottleneck condition occurs when the memory utilization is high and the available memory is very low. It causes the system to slow down affecting overall performance. Factors that can result in high memory consumption are excessive page outs, high page scan rate, swap-out byte rate, and page request rate.

In case of violation of multiple threshold values indicating a high utilization, the policy sends a message to the HPOM console with appropriate message attributes. The message also displays a list of top 10 memory hogging processes.

The multiple metrics used to evaluate a memory bottleneck condition use different threshold values on various platforms. To enable the right threshold values for a specific platform, deploy the threshold overrides policies onto the managed node.

ThresholdOverrides_Linux defines appropriate threshold values for the memory metrics on a Linux platform.

ThresholdOverrides_Windows defines appropriate threshold values for the memory metrics on a Windows platform.

Metrics Used	GBL_MEM_UTIL GBL_MEM_PAGEOUT_RATE GBL_MEM_PAGEOUT_BYTE_RATE GBL_MEM_PAGE_REQUEST_RATE GBL_MEM_CACHE_FLUSH_RATE GBL_MEM_PG_SCAN_RATE GBL_MEM_PHYS
Supported Platforms	Microsoft Windows Red Hat Enterprise Linux Suse Linux Enterprise Server
Script-Parameter	**Description**
MemPageOutRateCriticalThreshold	The threshold is expressed as the total number of pages swapped out from the physical memory to the disk per second. Set the threshold value for pages swapped out at which you want to receive a critical message.
MemPageOutRateMajorThreshold	Set the threshold value for pages swapped out at which you want to receive a major message.
MemPageOutRateMinorThreshold	Set the threshold value for pages swapped out at which you want to receive a minor message.
MemPageOutRateWarningThreshold	Set the threshold value for pages swapped out at which you want to receive a warning message.
MemUtilCriticalThreshold	The threshold is expressed as the percentage (0 to 100%) of physical memory utilization on the node. Set the threshold value for minimum memory utilized on the disk, at which you want to receive a critical severity message.
MemUtilMajorThreshold	Set the threshold value for minimum memory utilized on the node, at which you want to receive a major severity message.
MemUtilMinorThreshold	Set the threshold value for minimum memory utilized on the node, at which you want to receive a minor severity message.
MemUtilWarningThreshold	Set the threshold value for minimum memory utilized on the node, at which you want to receive a warning severity message.
MemPageScanRateCriticalThreshold	The threshold is expressed as the total number of pages swapped in from the physical memory to the disk per second. Set the threshold value for pages swapped in at which you want to receive a critical message.

MemPageScanRateMajorThreshold	Set the threshold value for pages swapped in at which you want to receive a major message.
MemPageScanRateMinorThreshold	Set the threshold value for pages swapped in at which you want to receive a minor message.
MemPageScanRateWarningThreshold	Set the threshold value for pages swapped in at which you want to receive a warning message.
MemPageReqRateHighThreshold	Set the threshold value for the number of page requests from disk per second.
MemCacheFlushRateHighThreshold	Set the threshold value for the rate at which the file system cache flushes its contents to disk.
FreeMemAvailCriticalThreshold	The threshold is expressed as the free physical memory (in MBs) available on the disk/ filesystem. Set the threshold value for minimum free memory on the disk, at which you want to receive a critical severity message.
FreeMemAvailMajorThreshold	Set the threshold value for minimum free memory on the disk, at which you want to receive a major severity message.
FreeMemAvailMinorThreshold	Set the threshold value for minimum free memory on the disk, at which you want to receive a minor severity.
FreeMemAvailWarningThreshold	Set the threshold value for minimum free memory on the disk, at which you want to receive a warning severity.
MemSwapoutByteRateCriticalThreshold	The threshold is expressed as the number of pages scanned per second by the pageout daemon (in MBs). Set the threshold value for minimum free memory on the disk, at which you want to receive a critical severity message.
MemSwapoutByteRateMajorThreshold	Set the threshold value for minimum free memory on the disk, at which you want to receive a major severity message.
MemSwapoutByteRateMinorThreshold	Set the threshold value for minimum free memory on the disk, at which you want to receive a minor severity.

MemSwapoutByteRateWarningThreshold	Set the threshold value for minimum free memory on the disk, at which you want to receive a warning severity.
MessageGroup	You can enter an appropriate value that helps you to identify the messages sent by this policy. Whenever a threshold is violated, the policy appends the value from this parameter in the message before sending it to the management console.
Debug	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.

CPU Spike Check Policy

SI-CPUSpikeCheck

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

Metrics Used	BYCPU_CPU_USER_MODE_UTIL BYCPU_CPU_SYS_MODE_UTIL BYCPU_ID BYCPU_CPU_TOTAL_UTIL
Supported Platforms	Microsoft Windows Red Hat Enterprise Linux Suse Linux Enterprise Server
Script-Parameter	**Description**
CpuUtilCriticalThreshold	The threshold is expressed as the total CPU time when the CPU is busy. In other words, the total CPU utilization time. It consists of total CPU time spent in user mode and system mode. Set the threshold value for minimum total CPU utilization time at which you want to receive a critical severity message.
CpuUtilMajorThreshold	Set the threshold value for minimum total CPU utilization time at which you want to receive a major severity message.
CpuUtilMinorThreshold	Set the threshold value for minimum total CPU utilization time at which you want to receive a minor severity message.
CpuUtilWarningThreshold	Set the threshold value for minimum total CPU utilization time at which you want to receive a warning severity message.

CpuUtilUsermodeCriticalThreshold	The threshold is expressed as the percentage (0 to 100%) of CPU time when CPU is busy in user mode. Set the threshold value for minimum CPU busy time at which you want to receive a critical severity message.
CpuUtilUsermodeMajorThreshold	Set the threshold value for minimum CPU busy time in user mode, at which you want to receive a major severity message.
CpuUtilUsermodeMinorThreshold	Set the threshold value for minimum CPU busy time in user mode, at which you want to receive a minor message.
CpuUtilUsermodeWarningThreshold	Set the threshold value for minimum CPU busy time in user mode, at which you want to receive a warning message.
CpuUtilSysmodeCriticalThreshold	The threshold is expressed as the percentage (0 to 100%) of CPU time when CPU is busy in system mode. Set the threshold value for minimum CPU busy time at which you want to receive a critical severity message.
CpuUtilSysmodeMajorThreshold	Set the threshold value for minimum CPU busy time in system mode, at which you want to receive a major severity message.
CpuUtilSysmodeMinorThreshold	Set the threshold value for minimum CPU busy time in system mode, at which you want to receive a minor message.
CpuUtilSysmodeWarningThreshold	Set the threshold value for minimum CPU busy time in system mode, 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. These messages are displayed on the console with normal severity.

CPU Bottleneck Diagnosis Policy

SI-CPUBottleneckDiagnosis

This policy detects CPU bottlenecks like exceeding the thresholds for CPU utilization percentage, processor queue length, total number of CPU on the system, and operating systems.

If the threshold for CPU utilization is violated along with threshold for number of processes in the queue waiting for CPU time, the policy sends a message to the HPOM console with the appropriate message attributes. The message displays a list of the top 10 CPU hogging processes.

The first instance of CPU bottleneck on HPOM for Linux does not report the CPU hogging processes. From the second instance onwards the message sent out from the policy displays the top 10 CPU hogging processes list.

Metrics Used	GBL_CPU_TOTAL_UTIL GBL_RUN_QUEUE GBL_NUM_CPU GBL_OSNAME GBL_INTERRUPT_RATE GBL_CSWITCH_RATE
Supported Platforms	Microsoft Windows Red Hat Enterprise Linux Suse Linux Enterprise Server
Script-Parameter	**Description**
GlobalCpuUtilCriticalThreshold	The threshold is expressed as the summarized CPU utilization. Set the threshold value for minimum summarized CPU utilization, at which you want to receive a critical message.
GlobalCpuUtilMajorThreshold	Set the threshold value for minimum summarized CPU utilization, at which you want to receive a major message.
GlobalCpuUtilMinorThreshold	Set the threshold value for minimum summarized CPU utilization, at which you want to receive a minor message.
GlobalCpuUtilWarningThreshold	Set the threshold value for minimum summarized CPU utilization, at which you want to receive a warning message.
RunQueueLengthCriticalThreshold	The threshold is expressed as the process queue length. In other words it is the number of processes waiting for CPU time. Set the threshold value for minimum number of processes in the queue at which you want to receive a critical severity message.

RunQueueLengthMajorThreshold	Set the threshold value for minimum number of processes in the queue at which you want to receive a major severity message
RunQueueLengthMinorThreshold	Set the threshold value for minimum number of processes in the queue at which you want to receive a minor severity message
RunQueueLengthWarningThreshold	Set the threshold value for minimum number of processes in the queue at which you want to receive a warning severity 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, at which you want to receive a critical message.
ContextSwitchRateMajorThreshold	Set the threshold value for total context switch, at which you want to receive a major message.
ContextSwitchRateMinorThreshold	Set the threshold value for total context switch, at which you want to receive a minor message.
ContextSwitchRateWarningThreshold	Set the threshold value for total context switch, at which you want to receive a warning message.
InterruptRateCriticalThreshold	The threshold is expressed as the average number of processor 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	You can enter an appropriate value that helps you to identify the messages sent by this policy. Whenever a threshold is violated, the policy appends the value from this parameter in the message before sending it to the management console.
Debug	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.

Per Disk Utilization-AT policy

SI-PerDiskUtilization-AT

This 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.

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

Metrics Used	BYDSK_UTIL
Supported Platforms	Microsoft Windows Red Hat Enterprise Linux Suse Linux Enterprise Server
Script-Parameter	**Description**
MessageApplication	Enter an appropriate value that helps you identify the messages sent by the SI-PerDiskUtilization-AT policy to the management console.
DataSource	Displays the HP Embedded Performance Component (EPC) data source name as SCOPE.
DataObject	Displays the HP Embedded Performance Component (EPC) data object name as DISK.
DataMetric	Displays the HP Embedded Performance Component (EPC) 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 disk utilization as indicated by the metric.
MaximumValue	Displays the maximum value of disk utilization as indicated by the metric.
WarningDeviations	Displays the number of standard deviation away form normal, at which the policy will send a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as *5*.
MinorDeviations	Displays the number of standard deviation away form normal, at which the policy will send a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for WarningDeviations. To disable the parameter, set value as *5*.

MajorDeviations	Displays the number of standard deviation away form normal, at which the policy will send a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for MinorDeviations. To disable the parameter, set value as *5*.
WarningHighSeverity	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 *WarningDeviations*. To disable the parameter, set value as *none*.
MinorHighSeverity	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 *MinorDeviations*. To disable the parameter, set value as *none*.
MajorHighSeverity	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 *MajorDeviations*. To disable the parameter, set value as *none*.
WarningLowSeverity	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 *WarningDeviations*. To disable the parameter, set value as *none*.
MinorLowSeverity	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 *MinorDeviations*. To disable the parameter, set value as *none*.
MajorLowSeverity	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 *MajorDeviations*. To disable the parameter, set value as *none*.
InstanceSource	Do not edit the parameter value.
Debug	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.
MessageGroup	Message group for outgoing messages.
DiskUtilCutOff	Set a value below which you do not want to monitor disk utilization.

Network Interface Outbyte Rate Policy

SI-PerNetifOutbyteBaseline-AT

This 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 interface 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.

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

Metrics Used	BYNETIF_OUT_BYTE_RATE
Supported Platforms	Microsoft Windows Red Hat Enterprise Linux Suse Linux Enterprise Server
Script-Parameter	**Description**
MessageApplication	Enter an appropriate value that helps you 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 network interface outbyte rate as indicated by the metric.
MaximumValue	Displays the maximum value of network interface outbyte rate as indicated by the metric.
WarningDeviations	Displays the number of standard deviation away form normal, at which the policy will send a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as *5*.
MinorDeviations	Displays the number of standard deviation away form normal, at which the policy will send a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for WarningDeviations. To disable the parameter, set value as *5*.

MajorDeviations	Displays the number of standard deviation away form normal, at which the policy will send a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for MinorDeviations. To disable the parameter, set value as *5*.
WarningHighSeverity	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 *WarningDeviations*. To disable the parameter, set value as *none*.
MinorHighSeverity	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 *MinorDeviations*. To disable the parameter, set value as *none*.
MajorHighSeverity	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 *MajorDeviations*. To disable the parameter, set value as *none*.
WarningLowSeverity	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 *WarningDeviations*. To disable the parameter, set value as *none*.
MinorLowSeverity	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 *MinorDeviations*. To disable the parameter, set value as *none*.
MajorLowSeverity	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 *MajorDeviations*. To disable the parameter, set value as *none*.
Debug	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.
MessageGroup	Message group for outgoing messages.
ByNetifOutByteCutOff	Set a value below which you do not want to monitor the outbyte rate.

Network Interface Inbyte Rate Policy

SI-PerNetifInbyteBaseline-AT

This 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 interface 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.

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

Metrics Used	BYNETIF_IN_BYTE_RATE
Supported Platforms	Microsoft Windows Red Hat Enterprise Linux Suse Linux Enterprise Server
Script-Parameter	**Description**
MessageApplication	Enter an appropriate value that helps you identify the messages sent by the 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 network interface inbyte rate as indicated by the metric.
MaximumValue	Displays the maximum value of network interface inbyte rate as indicated by the metric.
WarningDeviations	Displays the number of standard deviation away form normal, at which the policy will send a warning message to HPOM console. Set an appropriate value for the parameter. To disable the parameter, set value as *5*.
MinorDeviations	Displays the number of standard deviation away form normal, at which the policy will send a minor message to HPOM console. Set an appropriate value for the parameter greater than the specified value for WarningDeviations. To disable the parameter, set value as *5*.

MajorDeviations	Displays the number of standard deviation away form normal, at which the policy will send a major message to HPOM console. Set an appropriate value for the parameter greater than the specified value for MinorDeviations. To disable the parameter, set value as *5*.
WarningHighSeverity	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 *WarningDeviations*. To disable the parameter, set value as *none*.
MinorHighSeverity	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 *MinorDeviations*. To disable the parameter, set value as *none*.
MajorHighSeverity	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 *MajorDeviations*. To disable the parameter, set value as *none*.
WarningLowSeverity	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 *WarningDeviations*. To disable the parameter, set value as *none*.
MinorLowSeverity	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 *MinorDeviations*. To disable the parameter, set value as *none*.
MajorLowSeverity	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 *MajorDeviations*. To disable the parameter, set value as *none*.
Debug	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.
MessageGroup	Message group for outgoing messages.
ByNetifInByteCutOff	Set a value below which you do not want to monitor the inbyte rate.

Sample Performance Policies

Systems Infrastructure SPI provides sample performance policies that can be used to monitor the performance of processes running on a system. You can use these policies as template to create copies and modify them as per your requirements.

Script-Parameter	Description
ProcessName	Enter the name of the process that you want to monitor.
ProcessArguments	Enter the process arguments if any.
MessageGroup	Message group for outgoing messages.
CPUUsageHighWaterMark or MemoryUsageHighWaterMark	Enter a threshold value for process CPU or memory usage above which you want to receive an alert.
Debug	Set the value to 1 to start receiving debug messages. These messages are displayed on the console with normal severity.

The sample policies provided are:

- **SI-JavaProcessMemoryUsageTracker** policy monitors memory usage for Java process running on your system. The default policy group for the policy is:

  SPI for Infrastructure → en → Systems Infrastructure → Performance → Process Resource Usage Monitor Samples

- **SI-JavaProcessCPUUsageTracker** policy monitors the CPU usage for the Java process running on your system. The default policy group for the policy is:

  SPI for Infrastructure → en → Systems Infrastructure → Performance → Process Resource Usage Monitor Samples

- **SI-MSWindowsSvchostCPUUsageTracker** policy monitors the CPU usage for the svchost processes running on your system. The default policy group for the policy is:

  SPI for Infrastructure → en → Systems Infrastructure → Performance → Process Resource Usage Monitor Samples → Windows

- **SI-MSWindowsSvchostMemoryUsageTracker** policy monitors the memory usage for the svchost processes running on your system. The default policy group for the policy is:

  SPI for Infrastructure → en → Systems Infrastructure → Performance → Process Resource Usage Monitor Samples → Windows

Security Policies

Suppose an unauthorized user tried to break into your system by entering different combinations of username and password, or by deploying an automated script to do this. Such attempts may result in too many login failures. To identify and preempt such a risk, you can deploy the System Infrastructure security policies to periodically check the number of failed logins on your system. These policies collect failed login data and send alerts in case of too many attempts.

Failed Login Collector Policy for Windows

SI-MSWindowsFailedLoginsCollector

This is a scheduled task policy that checks for the number of failed login attempts on Microsoft Windows. It check for invalid logins, either due to unknown username or incorrect password on the managed node. The policy logs individual instances of failed login into the GBL_NUM_FAILED_LOGINS metric in Embedded Performance Component (EPC) at definite time intervals. By default, the time interval is 1 hour. The recorded information stored in EPC can be used to send an alert to the console or generate reports for the number of invalid logins over a period of time. The default policy group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Security → Windows

Last Logon Collector Policy for Windows

SI-MSWindowsLastLogonsCollector

This is a scheduled task policy that checks for the logon details for all active local user accounts on Microsoft Windows. The policy logs individual instances of user logon into the SECONDS_SINCE_LASTLOGIN metric in Embedded Performance Component (EPC) at definite time intervals. By default, the time interval is 1 hour. The recorded information stored in EPC can be used to send an alert to the console or generate reports for the number of user logons over a period of time. The default policy group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Security → Windows

Failed Login Collector Policy for Linux

SI-UNIXFailedLoginsCollector

This is a scheduled task policy that checks for the number of failed login attempts on RHEL and SLES Linux systems. The policy checks for invalid logins, either due to unknown username or incorrect password on the managed node. The policies log individual instances of failed login into the GBL_NUM_FAILED_LOGINS metric in Embedded Performance Component (EPC) at definite time intervals. By default, the time interval is 1 hour. The recorded information stored in EPC can be used to send an alert to the console or generate reports for the number of invalid logins over a period of time. The default policy group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Security → Linux

Last Logon Collector Policy for Linux

SI-LinuxLastLogonsCollector

This is a scheduled task policy that checks for the logon details for all active local user accounts on RHEL and SLES Linux systems. The policy logs individual instances of user logon into the SECONDS_SINCE_LASTLOGIN metric in Embedded Performance Component (EPC) at definite time intervals. By default, the time interval is 1 hour. The recorded information stored in EPC can be used to send an alert to the console or generate reports for the number of user logons over a period of time. The default policy group for the policy is:

SPI for Infrastructure → en → Systems Infrastructure → Security → Linux

Systems Infrastructure SPI Tool

Tools enable you to manage services on managed nodes and view a list of data collected for a particular managed node.

To access the Systems Infrastructure tool on HPOM for Windows, select the following:

Tools → Systems Infrastructure

To access the tool on console/ Administration UI for HPOM for UNIX/ Linux, select the following:

Tool Bank → Systems Infrastructure

Users Last Login Tool

When launched on a managed node, the Users Last Login tool displays a list of all active users along with their last login details. Before launching the tool, make sure you have deployed the corresponding last logon collector policy. To know more about the last logon collector policies, see Last Logon Collector Policy for Windows and Last Logon Collector Policy for Linux.

4 Systems Infrastructure SPI Reports and Graphs

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

Systems Infrastructure SPI Reports

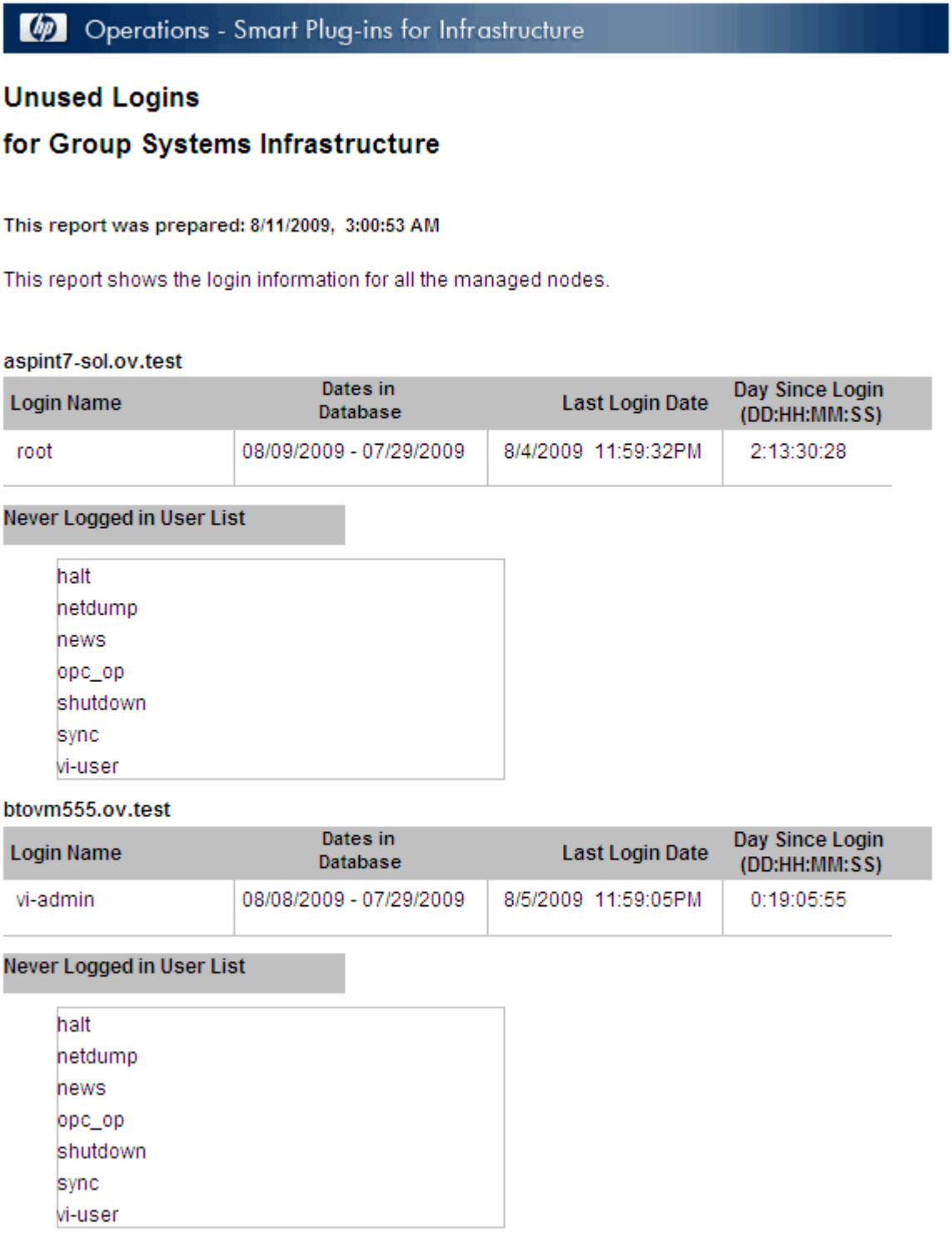
You can access Systems Infrastructure SPI reports from the HPOM for Windows console. To install HP Reporter package for Systems Infrastructure SPI, see *HP Operations Smart Plug-in for Infrastructure Installation Guide.*

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

If HP Reporter is installed on a separate system connected to the HPOM management server for Windows, UNIX, or Linux operating system, you can view the reports on HP Reporter system.

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

Figure 3 Example report for Systems Infrastructure SPI



Operations - Smart Plug-ins for Infrastructure

Unused Logins

for Group Systems Infrastructure

This report was prepared: 8/11/2009, 3:00:53 AM

This report shows the login information for all the managed nodes.

aspint7-sol.ov.test

Login Name	Dates in Database	Last Login Date	Day Since Login (DD:HH:MM:SS)
root	08/09/2009 - 07/29/2009	8/4/2009 11:59:32PM	2:13:30:28

Never Logged in User List

halt
netdump
news
opc_op
shutdown
sync
vi-user

btovm555.ov.test

Login Name	Dates in Database	Last Login Date	Day Since Login (DD:HH:MM:SS)
vi-admin	08/08/2009 - 07/29/2009	8/5/2009 11:59:05PM	0:19:05:55

Never Logged in User List

halt
netdump
news
opc_op
shutdown
sync
vi-user

The Systems Infrastructure SPI provides the following reports:

Report/ Report Title	Purpose
Last Logins/ Unused Logins	This report displays the date when a particular login was last used on the managed node. It also displays a list of users who have never logged in. The information is sorted by day and time. You can use this information to identify the unused or obsolete user accounts.
Failed Login	This report displays a list of all failed login attempts on the managed node. You can use this information to identify unauthorized users repeatedly trying to login the managed node.

Systems Infrastructure SPI Graphs

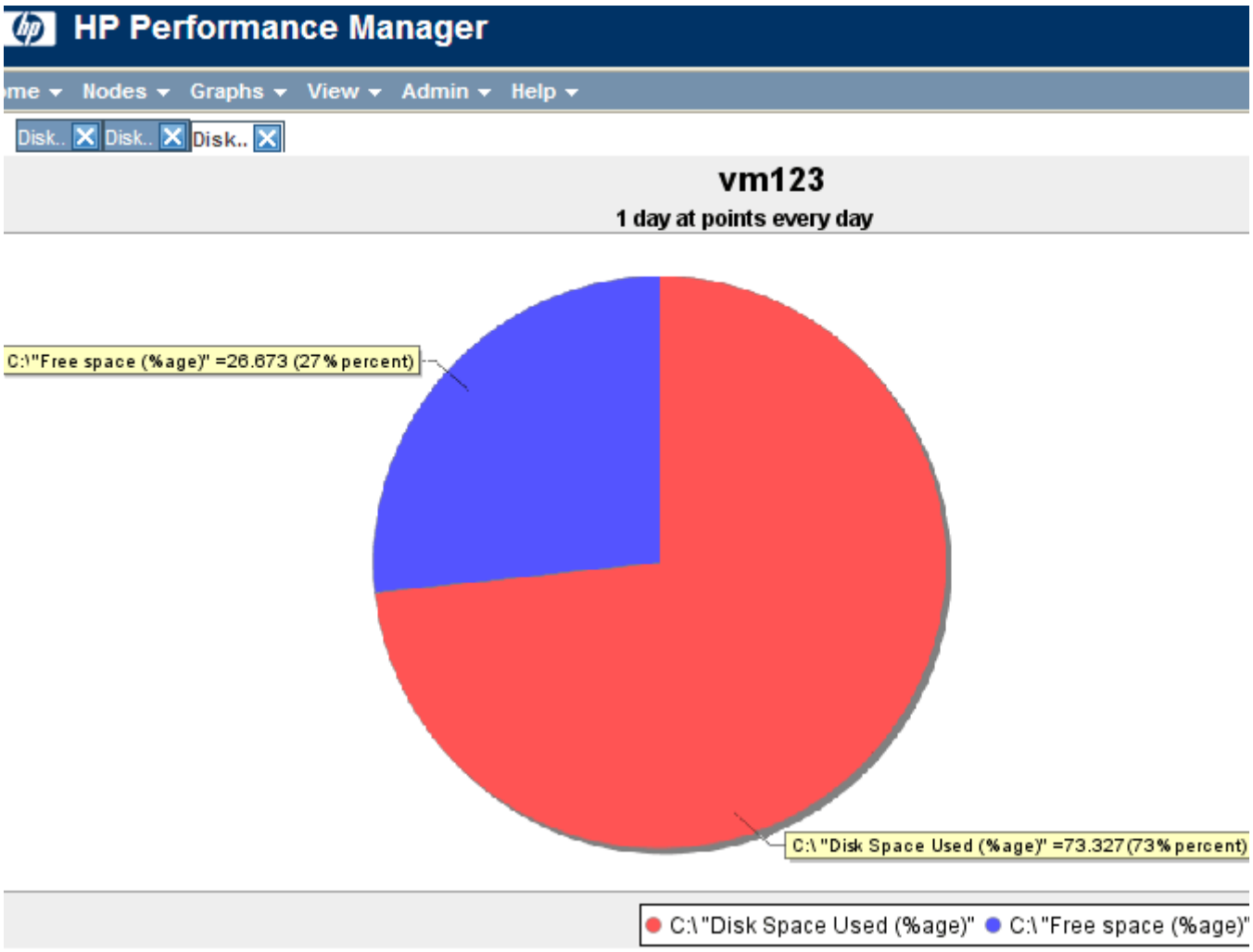
You can generate graphs using HP Performance Manager for near real-time data gathered from the managed nodes. You can access these graphs from the HPOM console if you install HP Performance Manager on an HPOM management server.

The Systems Infrastructure SPI provides 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→ InfraSPI → Systems.**

To access the graphs on HPOM for UNIX/ Linux, 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 4 Example graph for Systems Infrastructure SPI



The SPI for Systems Infrastructure provides the following graphs:

Graph/ Graph Title	Purpose
Disk Utilization	This graph shows the percentage of space utilized on the disk (filesystem).
Disk Space	This graph shows the percentage of space utilized in comparison with the space availability of the disk (filesystem). The graph displays a pie-chart for the space utilization.
Swap Space Utilization	This graph shows the percentage of swap space utilization on the system.
Physical memory utilization	This graph shows the percentage of physical memory utilization on the system.
CPU Utilization Summary	This graph shows the summary of CPU utilization on the system.

5 Troubleshooting

This chapter provides an overview of the Systems Infrastructure SPI limitations and issues and covers basic troubleshooting scenarios.

Auto-addition of guest virtual machines fails

Cause: The AutoAdd_Guests parameter in InfraSPI-ServerSettings policy is set to false by default. This is to prevent a lot of guest virtual machines from getting added automatically causing the console GUI to freeze.

Solution: You can set the parameter **`AutoAdd_Guests=true`** in InfraSPI-ServerSettings policy and then re-deploy the policy. To access the policy, select **SPI for Infrastructure → Settings and Thresholds → Server Settings**.

Advanced Monitoring policies modified in HPOM for UNIX Administrator GUI fail to run after deployment to managed nodes.

Cause: When advanced monitoring policies are edited in GUI mode in HPOM for UNIX policy editor, syntax errors are induced into the Perl code module. This causes the policy to fail to execute. Errors such as the following appear:

```
An error occurred in the processing of the policy
'SI-LinuxSshdProcessMonitor'. Please check the following errors and take
corrective actions. (OpC30-797)

Error during evaluation of threshold level "Processes - Fill Instance list"
(OpC30-728)

Execution of instance filter script failed. (OpC30-714)

Perl Script execution failed: syntax error at PerlScript line 11, near "1


#BEGIN_PROCESSES_LIST

#ProcName=/usr/sbin/sshd

#Params=

#Params=

#MonMode=>=

#ProcNum=1

#END_PROCESSES_LIST

@ProcNames"

Missing right curly or square bracket at PerlScript line 17, within string

syntax error at PerlScript line 17, at EOF

. (OpC30-750)
```

The un-edited advanced monitoring policies (Measurement Threshold type) work fine when deployed from HPOM for UNIX.

Solution: To edit the settings in the Measurement Threshold policy, use 'Edit in Raw mode' feature of the HPOM for UNIX Administrator GUI to change the policy contents. This requires you to know the syntax of the policy data file.

Discovery procedures and data collection gives error with non-English names.

Cause: Although the Systems Infrastructure SPI can be deployed successfully on a non-English HP Operations Manager, using non-English names for a system results in error. This happens because non-English names are not recognized by the store collection PERL APIs in the HP Operations Agent.

Solution: Make sure that the names for clusters and resource groups are in English.

Alert Messages while System Discovery automatically adds nodes.

Cause: While automatically adding nodes for cluster and virtualized environments, the system discovery policy generates alert messages with normal severity. These messages take a while to get acknowledged as the auto-addition feature of the policy takes time to populate the node bank.

Solution: Disable the Auto-addition feature by changing the following default values in the XPL configuration parameters:

Configuration Parameters	Default Value	Value to disable auto addition
AutoAdd_ClusterNode	true	false
AutoAdd_Cluster_RG_IP	true	false
AutoAdd_HypervisorNode	true	false
AutoAdd_Guests	false	true

Warning/error messages on the HPOM console:

```
An error occurred in the processing of the policy 'SI-PerDiskUtilization-AT'.
Please check the following errors and take corrective actions. (OpC30-797)

Initialization of collection source "DoNotRename" failed. (OpC30-724)

Cannot find object 'DISK' in Coda object list. (OpC30-761)

Searching for 'data source: SCOPE' in the DataSourceList failed. (OpC30-766))
```

Cause: This error occurs when the SI-PerDiskUtilization-AT policy is deployed to a node that does not have the HP Performance Agent installed on the node. The SI-PerDiskUtilization-AT policy uses metrics provided by SCOPE for the calculations, and requires HP Performance Agent for proper functioning.

Solution: Install the HP Performance Agent on the managed node for the policy to function properly.

Failure of operator initiated commands for launching the Systems Infrastructure SPI graphs from HPOM for UNIX (version 9.00) operator console

Solution: Run the following command on the HPOM server:

```
/opt/OV/contrib/OpC/OVPM/install_OVPM.sh <OMUServerName>:8081
```

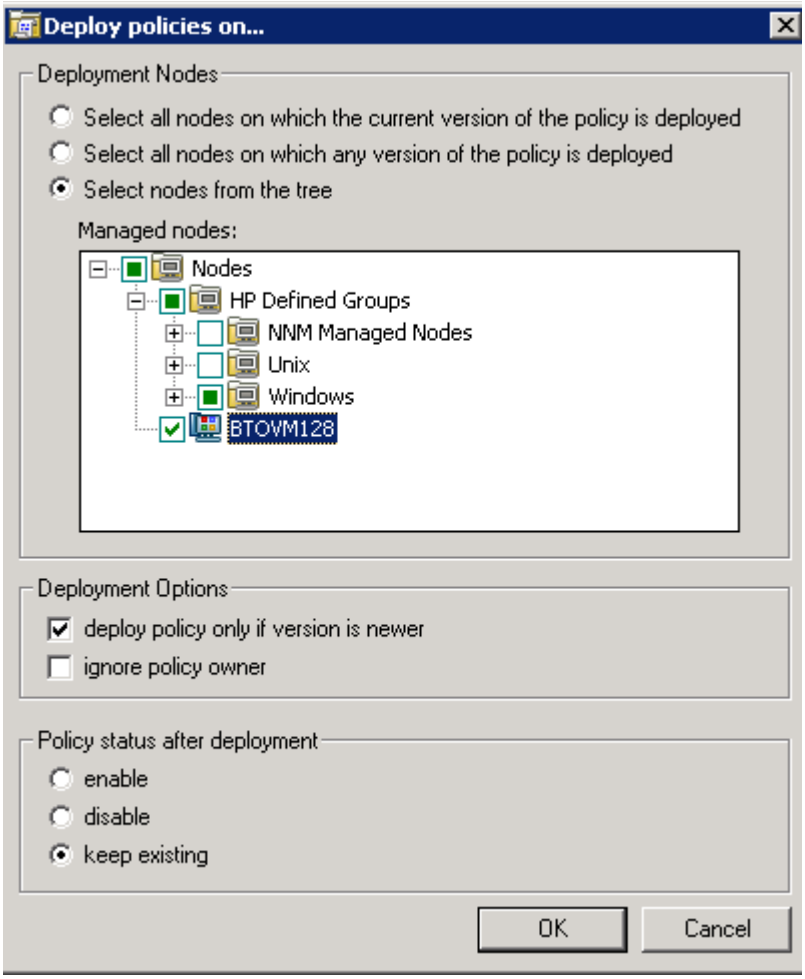
A Appendix: Policies and Tools

Deploying Systems Infrastructure SPI Policies from HPOM for Windows Server

To manually deploy policies from HPOM for Windows, 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**.

Figure 5 Deploy policies on dialog box



Deploying Systems Infrastructure SPI policies from HPOM for UNIX/Linux 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 on how to add nodes to the management server, refer to the *HP Operations Manager for Unix Online Help*.

To deploy policies from HPOM for UNIX/ Linux follow these steps:

Task 1: Assign Policy or Policy group

1. Log on to HPOM as the administrator. The HPOM Administration UI 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 policy(s) is assigned to the node(s).

Task 2: Deploy Policy(s)

1. From the HPOM Administration UI, 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 policy(s).
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 policy(s) is deployed on the selected node(s).

Launching Systems Infrastructure SPI tools from HPOM for Windows server

To launch the tool, follow these steps:

1. From the console tree **Tools** folder, select the **Systems Infrastructure** folder.
2. Select the <*tool name*> tool from the details pane and right-click to open the shortcut menu.
3. Select **All Tasks→Launch Tool...** to open the **Select where to launch this tool** dialog box.

   The dialog box displays a list of the managed nodes on which the selected tool can be launched.
4. Select the check box for each node to which you want to apply the tool. Selecting the **Nodes** folder selects the entire group of tools the folder contains.
5. Click **Launch**

   The **Tool Status** dialog box opens to display the results of the launch operation.

You can save the results of the apply tool operations. Select one or more lines in the **Launched Tools** box and click **Save**. The output is saved in text format.

Launching Systems Infrastructure SPI tools on HPOM for UNIX/ Linux server

To launch the tool, follow these steps:

1. Select **Tool Bank** → **Systems Infrastructure** in the Administration UI.
2. Right-click the <*tool name*> tool, select **Start Customized**.

   Start Tool - Customized Wizard window opens.
3. Under the nodes list, select the host server node to launch the tool.
4. On the wizard, click **Get Selections.**

   The node is added to the Selected Nodes list.
5. Click **Next.**
6. On the page Specify additional information needed to run the tool, you can specify the additional information or leave the fields blank.
7. Click **Finish**.

   The tool output is displayed.

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