



BMC® Performance Manager Express for Hardware by Sentry Software™ Reference Guide



Supporting

BMC® Performance Manager Express for Hardware version 2.3.00
by Sentry Software™

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Overview

BMC® Performance Manager Express for Hardware by Sentry Software™ is an agent-less Performance Manager which enables you to ensure the availability of your heterogeneous hardware systems, while providing a centralized view of your enterprise within the BMC® Portal environment. It allows administrators to monitor the hardware of different server brands: IBM®, HP®, DELL®, Sun Microsystems®, NEC®, and Fujitsu-Siemens® amongst many others.

This document describes the **application classes** and their **parameters** in detail, explains the system of **thresholds** and gives you in-depth information about **connectors** that are vital for the functioning of BMC Performance Manager Express for Hardware.

Application Classes

This section familiarizes you with all the application classes used by BMC® Performance Manager Express for Hardware on BMC® Portal. It gives a detailed view of each application class describing its function and parameters.

Please note that icons, menu commands, or info-boxes are not a part of the BMC® Portal interface, and are consequently unavailable for BMC® Performance Manager Express for Hardware.

SEN_HW_BLADE

Each instance of the SEN_HW_BLADE class represents a blade server inside a blade enclosure. The *Status* parameter of SEN_HW_BLADE objects represents the global status of the blade, as reported by the main enclosure.

Parameters

Name	Type	Description	Alert Conditions
Status	Text	Text parameter that gives the overall blade status. When all is fine, it just shows "OK", and when there is a problem, Status shows "WARNING!" or "ALARM!!" with a detailed description of the issue. Example: "OK" or "ALARM!! The blade is missing"	"!" = Warning; "!!" = Alarm
Collection Information	Text	Displays the name of the connector used to monitor the Blade Specifies "No information is available..." for the parameter for which no data is available	n/a

Note: *Status* is a text parameter that gives the overall status of the corresponding device or sensor. An alert condition describes in symbolic terms what occurs in the *Status* parameter when thresholds are breached: one exclamation mark triggers a warning; two exclamation marks raise an alarm.

Example: if BPM Express for Hardware detects that a blade has exceeded manufacturer-specified thresholds, the *Status* parameter will report "WARNING!" or "ALARM!! The blade is missing", or as the case may be. On clicking the history graph, you can see the exact details of the problem, its consequences and the recommended actions.

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. *Collection Information* will specify the parameters for which no data is available.

SEN_HW_CONNECTOR

Each instance of the `SEN_HW_CONNECTOR` class represents a connector currently used by BMC® Performance Manager Express for Hardware in order to discover and monitor the hardware components of the server.

Connectors are continuously monitored to ensure that the underlying technology used by BPM Express for Hardware to discover and monitor the hardware functions properly.

If something goes wrong with the hardware instrumentation layer (but not with the hardware itself), an alert is raised by the *Status* parameter of the corresponding `SEN_HW_CONNECTOR` instance. In this case, hardware components that were discovered and monitored through this connector will no longer be monitored. Check the *TestReport* parameter to have more details about the connector failure.

Parameters

Name	Type	Description	Alert Conditions
TestReport	Text	Text describing the tests performed to evaluate the status of the connector	n/a
Status	Text	Text parameter that gives the overall connector status. When all is fine, it just shows "OK", and when there is a problem, Status shows "WARNING!" or "ALARM!!" with a detailed description of the issue.. Example: "OK" or "ALARM!! This connector is not working anymore"	"!" = Warning; "!!" = Alarm
Collection Information	Text	Displays the name of the connector currently used Specifies "No information is available..." for the parameter for which no data is available	n/a

Note: *Status* is a text parameter that describes the overall status of the corresponding device or sensor. Alert conditions describe in symbolic terms what occurs in the *Status* parameter when thresholds are breached: one exclamation mark triggers a warning; two exclamation marks raise an alarm.

Example: If BPM Express for Hardware detects that a connector has exceeded a manufacturer-specified threshold, the *Status* parameter will report "Alarm! This connector is not working anymore." On clicking the history graph, you can see the exact details of the problem, its consequences and the recommended actions.

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. *Collection Information* will specify the parameters for which no data is available.

SEN_HW_CPU

Each instance of the SEN_HW_CPU class represents a physical processor of the server. On high-range servers, the *Status* parameter will raise an alert "on the fly" as soon as a processor fails. On most servers however, a failed processor causes a server crash. Upon reboot, the processor is likely to be automatically disabled by the BIOS which will then raise an alert in Hardware Sentry because the processor is "missing".

The *CorrectedErrorCount* and *PredictedFailure* parameters (available only for a few high-end processors) will help administrators intervene before such a crash occurs.

Note: The *Status* parameter will report an ALARM if the *CorrectedErrorCount* parameter is greater than zero (that is: the disk encountered some errors). Since the counter is reset every 24th hour, the corresponding alert on the *Status* parameter will be automatically cleared after 24 hours. This mechanism has been implemented to let BPM Express for Hardware/Portal report pure event-driven alerts with no need for manual acknowledgement from the operators.

Parameters

Name	Type	Description	Alert Conditions
CorrectedErrorCount	Integer	Number of detected and corrected errors	n/a
PredictedFailure	Text	This parameter will trigger a warning if a CPU failure is predicted to happen Values : OK; Predicted Failure	n/a
Status	Text	Text parameter that gives the overall CPU status. When all is fine, it just shows "OK", and when there is a problem, Status shows "WARNING!" or "ALARM!!" with a detailed description of the issue. Example: "OK" or "WARNING! Failure of the CPU is predicted"	"!" = Warning; "!!" = Alarm
Collection Information	Text	Displays the name of the connector currently used to monitor the CPU Specifies "No information is available..." for the parameter for which no data is available	n/a

Note: *Status* is a text parameter that describes the overall status of the corresponding device or sensor. Alert conditions describe in symbolic terms what occurs in the *Status* parameter when thresholds are breached: one exclamation mark triggers a warning; two exclamation marks raise an alarm.

Example: If BPM Express for Hardware detects that manufacturer-specified thresholds have been breached for a CPU, the *Status* parameter will report "WARNING! Problem: This processor is degraded or about to fail." Or "ALARM!! This processor is not detected anymore", or as may be the case. On clicking the history graph, you can see the exact details of the problem, its consequences and the recommended actions.

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. *Collection Information* specifies the parameters for which no data is available.

SEN_HW_DISKCONTROLLER

The purpose of the Disk Controller instance is to display the status of the disk controller battery and the status of the disk controller. In addition, some information regarding the disk controllers, like its brand, model or driver version, may be displayed.

Parameters

Name	Type	Description	Alert Conditions
BatteryStatus	Text	This parameter triggers an alert to predict that the disk controller battery will be unable to support the controller in the event of a power failure. Values :Ok; Degraded ; Failed Example "OK" or "WARNING! Failure of the disk controller battery is predicted"	"!" = Warning; "!!" = Alarm
ControllerStatus	Text	This parameter displays the status of the disk controller Values :Ok; Degraded ; Failed	"!" = Warning; "!!" = Alarm
Collection Information	Text	Displays the name of the connector currently used to monitor the Disk Controller Specifies "No information is available..." for the parameter for which no data is available	n/a

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. *Collection Information* specifies the parameters for which no data is available.

SEN_HW_ENCLOSURE

Basically, each `SEN_HW_ENCLOSURE` instance represents a box with some hardware components inside. This class is used to represent the computer's main chassis, but also external disk array enclosures or blade enclosures.

The `IntrusionStatus` parameter, when available, raises an alert when the chassis is opened.

The `Status` parameter is mostly used only to report a disk array that would be "unplugged" from the network or from the server.

Parameters

Name	Type	Description	Alert Conditions
IntrusionStatus	Text	Values :OK ; Intrusion detected	n/a
Status	Text	Text parameter that gives the Overall Enclosure Status. When all is fine, it just shows "OK", and when there is a problem, Status shows "WARNING!" or "ALARM!!" with a detailed description of the issue. Example: "OK" or "ALARM!! The enclosure is open"	"!" = Warning; "!!" = Alarm
Collection Information	Text	Displays the name of the connector currently used to monitor the enclosure Specifies "No information is available..." for the parameter for which no data is available	n/a

Note: `Status` is a text parameter that describes the overall status of the corresponding device or sensor. Alert conditions describe in symbolic terms what occurs in the `Status` parameter when thresholds are breached: one exclamation mark triggers a warning; two exclamation marks raise an alarm.

Example: If BPM Express for Hardware detects that an enclosure has exceeded a manufacturer-specified threshold, the `Status` parameter will report "WARNING! The enclosure is open or has been removed" or "ALARM!! This enclosure is not detected anymore.", as the case may be. On clicking the history graph, you can see the exact details of the problem, the consequences and recommended actions.

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. `Collection Information` will specify the parameters for which no data is available.

SEN_HW_FAN

This class creates monitoring objects for each cooling sensor it discovers. Depending on the system and the data available, one or more parameters will be associated to the fan monitoring. Critical devices like processors, power supplies etc, have fans to avoid overheating. Monitoring fans is important because they ensure a proper temperature for the system to work efficiently.

Depending on the available information, the *Speed* and/or *Status* parameters will be displayed for each detected fan device:

The *Speed* parameter represents the speed of the corresponding fan (in rotations/minute). An alert is raised through *Status* if the fan speed is too low for proper functioning.

The *SpeedPercent* parameter represents the speed of the corresponding fan in percentage of its maximal speed.

The *Status* parameter represents the overall status of the fan. An alert is triggered if the fan stops spinning or does not spin fast enough.

Parameters

Name	Type	Description	Alert Conditions
Speed	Integer	Fan Speed Unit: Rotation Per Minute (RPM)	n/a
SpeedPercent	Text	Speed of the fan as a percentage of its maximal speed Unit = Percent of maximal speed	n/a
Status	Text	Text parameter that gives the overall fan status. When all is fine, it just shows "OK", and when there is a problem, status shows "WARNING!" or "ALARM!!" with a detailed description of the issue. Example: "OK" or "ALARM!! This fan is not detected anymore"	"!" = Warning; "!!" = Alarm
Collection Information	Text	Displays the name of the connector currently used to monitor the fans Specifies "No information is available..." for a parameter for which no data is available	n/a

Note: *Status* is a text parameter that describes the overall status of the corresponding device or sensor. Alert conditions describe in symbolic terms what occurs in the *Status* parameter when thresholds are breached: one exclamation mark triggers a warning; two exclamation marks raise an alarm.

Example: If BPM Express for Hardware detects that a fan has breached manufacturer-specified thresholds, the *Status* parameter will report "WARNING! This fan is degraded/is about to fail" or "ALARM!! This fan is not detected anymore", as may be the case. The history graph shows the exact details of the problem, its consequences and recommended actions.

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. *Collection Information* will specify the parameters for which no data is available.

SEN_HW_LOGICALDISK

This class creates instances for each logical disk discovered. Logical disks are often a group of physical disks, configured as an array (RAID 0, 1, 5, etc.) and exposed to the operating system as a single physical volume.

The status of a logical disk typically corresponds to the status of a RAID array (on-line, degraded, rebuilding, etc.). For each logical disk discovered, the *Status* parameter is displayed.

The *ErrorCount* parameter represents number of errors encountered by the LOGICAL disk since the last counter reset. The error count is automatically reset every 24th hour (by default; this setting is configurable).

The *Status* parameter represents the overall status of the logical disk. An alert is triggered when the logical disk is not fully operational (degraded, rebuilding, etc.) or not available at all. It triggers an alert if the logical disk missing or if any of the other parameters have breached their thresholds. It is only *Status* that will trigger and display the alerts. When all is fine, *Status* shows "OK", and when there is a problem, it shows "WARNING!" or "ALARM!!" with a detailed description of the issue, its consequences and recommended actions. The alert conditions for *Status* are: "!="=WARNING; "!!"=ALARM

Example: "OK" or "ALARM!!" This logical disk is no longer detected."

Note 1: For non-RAID disk controllers (as most of IDE controllers, for example), no logical disk will be displayed.

Note 2: The *Status* parameter will report an ALARM if the *ErrorCount* parameter is greater than zero (that is: the disk encountered some errors). Since the counter is reset every 24th hour, the corresponding alert on the *Status* parameter will be automatically cleared after 24 hours. This mechanism has been implemented to let BPM Express for Hardware/Portal report pure event-driven alerts with no need for manual acknowledgement from the operators.

Parameters

Name	Type	Description	Alert Conditions
Status	Text	Text parameter that gives the overall Logical disk status. When all is fine, it just shows "OK", and when there is a problem, Status shows "WARNING!" or "ALARM!!" with a detailed description of the issue. Example: "OK" or "ALARM!! This logical disk is no longer detected"	"!" = Warning; "!!" = Alarm
ErrorCount	Integer	Number of errors encountered by the logical disk since last counter reset (every 24hrs by default) Unit: Errors	n/a
Attached to	Text	Text parameter that states which disk-controller the logical disk is attached to. Example: Attached to: Disk Controller: PERC 4/SC #1 etc.	n/a
Collection Information	Text	Displays the name of the connector used to monitor the Logical Disk Specifies "No information is available..." for a parameter for which no data is available	n/a

Note 3: *Status* is a text parameter that describes the overall status of the corresponding device or sensor. Alert conditions describe in symbolic terms what occurs in the *Status* parameter when thresholds are breached: one exclamation mark triggers a warning; two exclamation marks raise an alarm.

Example: If BPM Express for Hardware detects that manufacturer-specified thresholds for the logical disk have been breached, the *Status* parameter will report "WARNING! This logical disk is degraded/is about to fail" or "ALARM!! This logical disk is not detected anymore", or as may be the case. The history graph shows the exact details of the problem, its consequences and recommended actions.

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. Collection *Information* will specify the parameters for which no data is available.

SEN_HW_MAIN

The `SEN_HW_MAIN` class is responsible for the initialization of all the subclasses (i.e. `SEN_HW_Fan`, `SEN_HW_LOGICALDISK`, `SEN_HW_CPU` etc). This class has just one parameter called *Machine Status*.

Machine Status is a text parameter that reports whether BMC Performance Manager Express for Hardware on the RSM is able to communicate with the targeted remote element. It detects whether or not the remote element is accessible for monitoring i.e. whether or not the remote element is up & running and can be monitored. Values for this parameter are: "OK" and "WARNING".

Example for OK: "<hostname> is alive. Detected as <OS>. Available protocols: (SNMP/WBEM/Telnet/SSH)

If this parameter reports that BPM Express for Hardware cannot communicate with this host, it could be due to any of the following reasons:

- a firewall prevents communication between the RSM and the managed server
- the WMI layer has not been installed or is disabled (Windows only)
- neither SSH nor telnet connections are allowed on the managed server (UNIX and Linux only)
- the supplied credentials are incorrect
- the SNMP community string is wrong
- none of the connectors match the platform of the remote element

Some examples of possible "Warning!" alerts:

- The remote element is down.

Example: "<hostname> is down. Problem: Either the remote element is not currently running or the firewall is preventing access to the element."

- The remote element is up and running, but none of the connectors match the platform of the remote element.

Example: "<hostname> is alive. Problem: None of the connectors match this platform."

- The remote element is up and running, but the host platform cannot be detected.

Example: "<hostname> is alive. Problem: Host platform cannot be detected."

On clicking on the *History* icon, you can see the details about the problem, its consequences and the recommended actions.

Important: The warning *Machine Status* triggers in case of a problem, is not related to any hardware issue; all it indicates is that BMC Performance Manager Express for Hardware cannot perform the detection, discovery or collection processes on this remote element.

Note: If one or several connectors are not detected as valid for the targeted server, you need to enable the debug mode of BPM Express for Hardware and check the debug output for the reason that led BPM Express for Hardware to exclude those connectors. (See Connector Reference Table for list of connectors)

SEN_HW_MEMORY

Each instance of the SEN_HW_MEMORY module represents a memory module in the server.

The *Status* parameter will raise an "on the fly" alert on servers that can dynamically handle failed memory modules or, most often, for modules that have been disabled by the BIOS upon reboot (the module is then flagged as "missing").

The *ErrorCount* parameter represents the number of errors that have been fixed by ECC-enabled memory modules.

In some case, the *PredictedFailure* parameter is used to alert administrators that the memory module is about to fail.

The use of the *ErrorCount*, or *PredictedFailure* parameter depends on the technology being used to report the health of memory modules.

Note 1: The *Status* parameter reports an ALARM if the *ErrorCount* parameter is greater than zero (that is: the disk encountered some errors). Since the counter is reset every 24th hour, the corresponding alert on the *Status* parameter will automatically be cleared after 24 hours. This mechanism enables BPM Express for Hardware/Portal to report pure event-driven alerts with no need for manual acknowledgement from the operators.

Parameters

Name	Type	Description	Alert Conditions
ErrorCount	Integer	Number of errors encountered since last counter reset (every 24hrs by default) Unit: Errors	n/a
PredictedFailure	Text	This parameter will get <i>Status</i> to trigger a warning if a memory failure is predicted	n/a
Status	Text	Text parameter that gives the overall memory status. When all is fine, it shows "OK", and when there is a problem, Status shows "WARNING!" or "ALARM!!" with a detailed description of the issue. Example: "OK" or "WARNING! This memory module encountered an abnormal number of internal errors"	"!" = Warning; "!!" = Alarm
Collection Information	Text	Displays the name of the connector used to monitor the memory module Specifies "No information is available..." for a parameter for which no data is available	n/a



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SEN_HW_NETWORK

Each SEN_HW_NETWORK instance represents a network adapter in the server.

The *LinkStatus* reports whether or not the adapter is properly linked to the network from a pure hardware cable perspective (it will not report a bad IP configuration for example). By default, the *LinkStatus* parameter raises an alert (through *Status*) only for previously connected network adapters that are no longer linked to the network.

The *ErrorPercent* parameter represents the percentage of sent and received network packets that were in error. A high percentage of errors often means that the network link is improperly configured or that the network card is functioning erratically and thus needs to be replaced.

The *Status* parameter displays the overall status of the instance. It raises an alert if any of the other parameters breach their thresholds. Alerts are triggered only through the *Status* parameter.

Parameters

Name	Type	Description	Alert Conditions
LinkStatus	Text	This parameter will trigger a warning if the network interface is not connected (i.e. cable unplugged).	n/a
ErrorPercent	Integer	Percentage of transmitted and received packets in error between 2 collects. Unit: % 10-30 = Warning; 30-100=Alarm	n/a
Status	Text	Text parameter that gives the overall Network interface status. When all is fine, it shows "OK", and when there is a problem, Status shows "WARNING!" or "ALARM!!" with a detailed description of the issue. Example: "OK" or "ALARM!! This network adapter is not detected anymore"	"!" = Warning; "!!" = Alarm
Collection Information	Text	Displays the name of the connector used to monitor the Network interface Specifies "No information is available..." for a parameter for which no data is available	n/a

Note: *Status* is a text parameter that describes the overall status of the corresponding device or sensor. Alert conditions describe in symbolic terms what occurs in the *Status* parameter when thresholds are breached: one exclamation mark triggers a warning; two exclamation marks raise an alarm.

Example: If BPM Express for Hardware detects that manufacturer-specified thresholds for the network interface have been breached, the *Status* parameter will report "WARNING! This network adapter has degraded", or, "ALARM!! This network adapter is not detected anymore" or as may be the case. The history graph shows the exact details of the problem, its consequences and recommended actions.

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. *Collection Information* will specify the parameters for which no data is available.

SEN_HW_OTHERDEVICE

This class is typically used to monitor devices that do not relate to the other classes and can rarely be monitored on servers. The device definition is given by the connector file and the device is monitored just as any other in any other class.

This represents hardware components that do not fall into other predefined categories i.e. other than processors, memory modules, temperature sensors, fans, voltage sensors, power supplies, network cards, disk controllers, physical disks and logical disks.

Parameters

Name	Type	Description	Alert Conditions
Status	Text	Text parameter that gives the overall Otherdevice status. When all is fine, it shows "OK", and when there is a problem, Status shows "WARNING!" or "ALARM!!" with a detailed description of the issue. Example: "OK" or "ALARM!! This device is no longer detected"	"!" = Warning; "!!" = Alarm
Collection Information	Text	Displays the name of the connector used to monitor the Other Device Specifies "No information is available..." for a parameter for which no data is available	n/a

Note: *Status* is a text parameter that describes the overall status of the corresponding device or sensor. Alert conditions describe in symbolic terms what occurs in the *Status* parameter when thresholds are breached: one exclamation mark triggers a warning; two exclamation marks raise an alarm.

Example: If BPM Express for Hardware detects that manufacturer-specified thresholds for the "other device" have been breached, the *Status* parameter will report "WARNING! This device has degraded." or "ALARM!! This device is no longer detected", or as may be the case. The history graph shows the exact details of the problem, its consequences and recommended actions.

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. *Collection Information* will specify the parameters for which no data is available.

SEN_HW_PHYSICALDISK

Each instance of this class represents a hard drive detected on the platform by BMC® Performance Manager for Hardware. Its purpose is to monitor the status of each hard drive and possibly detect an incoming failure.

Physical disks must be monitored to avoid loss of data, un-availabilities and performance degradation. When available, S.M.A.R.T. technology will be used to predict a disk failure before it occurs. Depending on the available information, the *PredictedFailure* and/or *Status* parameters will be displayed for each discovered physical disk:

The *PredictedFailure* parameter uses S.M.A.R.T. technology to predict physical disk failures. An alert will be triggered if it is predicted that the Physical Disk will soon break down. The *Status* parameter represents the current status of the physical disk. An alert is triggered if the physical disk is not available for proper operation.

The *ErrorCount* parameter is incremented each time an error occurs on this physical disk. An alert is raised by the *Status* parameter from the first detected error. The *Status* parameter represents the overall status of the physical disk and triggers an alert is triggered if the physical disk is not available for proper operation or if any of the other parameters breach their thresholds.

The *Status parameter* represents the overall status of the physical disk. It triggers an alert if the physical disk missing or if any of the other parameters have breached their thresholds. It is only *Status* that will trigger and display the alerts. When all is fine, *Status* shows "OK", and when there is a problem, it shows "WARNING!" or "ALARM!!" with a detailed description of the issue, its consequences and recommended actions. The alert conditions for *Status* are: "!"=WARNING; "!!"=ALARM

Note 1: The *Status* parameter reports an ALARM if the *ErrorCount* parameter is greater than zero (that is: the disk encountered some errors). Since the counter is reset every 24th hour, the corresponding alert on the *Status* parameter will automatically be cleared after 24 hours. This mechanism enables BPM Express for Hardware/Portal to report pure event-driven alerts with no need for manual acknowledgement from the operators.

Parameters

Name	Type	Description	Alert Conditions
PredictedFailure	Text	Informs if a failure is predicted to happen or not	n/a
ErrorCount	Integer	Number of errors encountered by the physical disk. Unit: errors	n/a
Status	Text	Text parameter that gives the overall physical disk status. When all is fine, it shows "OK", and when there is a problem, Status shows "WARNING!" or "ALARM!!" with a detailed description of the issue. Example: "OK" or "ALARM!! This disk is not detected anymore"	"!" = Warning; "!!" = Alarm
Attached to	Text	Text parameter that states which disk-controller the physical disk is attached to. Example: Attached to: Disk Controller: PERC 4/SC #1 etc.	n/a
Collection Information	Text	Displays the name of the connector used to monitor the physical disk Specifies "No information is available..." for a parameter for which no data is available	n/a

Note 2: *Status* is a text parameter that describes the overall status of the corresponding device or sensor. Alert conditions describe in symbolic terms what occurs in the *Status* parameter when thresholds are breached: one exclamation mark triggers a warning; two exclamation marks raise an alarm.

Example: If BPM Express for Hardware detects that manufacturer-specified thresholds for the physical disk have been breached, the *Status* parameter will report "WARNING! This physical disk is degraded/is about to fail" or "ALARM! This disk is not detected anymore", or as the case may be. The history graph shows the exact details of the problem, its consequences and recommended actions.

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. *Collection Information* will specify the parameters for which no data is available.

SEN_HW_POWERSUPPLY

Each instance of this class represents a power supply in the system. It is used to monitor their status and to indicate when a power supply is malfunctioning and needs attention.

Power supply is critical and should never fail, which is why servers often have redundant power supplies. Monitoring power supplies allows the operators to be alerted when a power supply fails, or in some cases when a power supply is overloaded.

Depending on the information available, the *UsedCapacity* and/or *Status* parameters will be displayed for each power supply or power unit device:

The *UsedCapacity* parameter represents the power supply's power currently in use in percentage. An alert is triggered if the computer uses too much power than it can be supplied.

The *Status* parameter represents the current status of the power supply. An alert is triggered if an error occurs with the power supply.

Parameters

Name	Type	Description	Alert Conditions
UsedCapacity	Integer	Percentage of the Power Supply power currently in use if available Unit: Percentage (%)	n/a
Status	Text	Text parameter that gives the overall Power supply status. When all is fine, it shows "OK", and when there is a problem, Status shows "WARNING!" or "ALARM!!" with a detailed description of the issue. Example: "OK" or "ALARM!! The power consumed by the system is out of the supported range"	"!" = Warning; "!!" = Alarm
Collection Information	Text	Displays the name of the connector used to monitor the Power Supply Specifies "No information is available..." for a parameter for which no data is available	n/a

Note: *Status* is a text parameter that describes the overall status of the corresponding device or sensor. Alert conditions describe in symbolic terms what occurs in the *Status* parameter when thresholds are breached: one exclamation mark triggers a warning; two exclamation marks raise an alarm.

Example: If BPM Express for Hardware detects that manufacturer-specified thresholds for power supply have been breached, the *Status* parameter will report "WARNING! Problem: This power supply is in degraded state, or about to fail" or "ALARM!! The power consumed by the system is out of the supported range", or as may be the case. The history graph shows the exact details of the problem, its consequences and recommended actions.

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. *Collection Information* will specify the parameters for which no data is available.

SEN_HW_TEMPERATURE

BMC® Performance Manager Express for Hardware detects the temperature probes on the motherboard or devices and creates an instance of this class for each of them. Their location in the platform is described in the instance's label if it is available.

When a temperature reading can be performed, temperature thresholds are automatically set and an alert will be triggered if the temperature rises to a dangerous level. Even in the case that no reading can be made, the *Status* parameter will display the condition of the temperature in the system.

Parameters

Name	Type	Description	Alert Conditions
Temperature	Integer	Temperature reading Unit: Celsius degrees (C°)	n/a
Status	Text	Text parameter that gives the overall temperature status. When all is fine, it shows "OK", and when there is a problem, Status shows "WARNING!" or "ALARM!!" with a detailed description of the issue. Example: "OK" or "ALARM!! The temperature is critically high"	"!" = Warning; "!!" = Alarm
Collection Information	Text	Displays the name of the connector used to monitor the temperature Specifies "No information is available..." for a parameter for which no data is available	n/a

Note: *Status* is a text parameter which describes the overall status of the corresponding device or sensor. An alert condition describes in symbolic terms what occurs when thresholds are breached.

Example: If BPM Express for Hardware detects that manufacturer-specified thresholds have been breached for temperature, the *Status* parameter will report "WARNING! The temperature is too high (67°C)" or, "ALARM!! The temperature is critically high" or, as may be the case. There is a complete hardware health report for this temperature sensor. The actual temperature value (when available) is reported by the *Temperature* parameter but alert thresholds are not directly set on this parameter. The history graph will display details about the problem, its consequences and the recommended actions.

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. *Collection Information* will specify the parameters for which no data is available.

SEN_HW_VOLTAGE

The purpose of this class is to monitor power supply voltages. For each voltage sensor (+5V, +12V, -5V, etc.), an instance is created in a container with a label describing its type.

If the computer's configuration allows a reading of the voltages, the values will be available in the *Voltage* parameter and an alert will be triggered if they do not meet the automatically set thresholds. Otherwise, the *Status* parameter will inform you if a problem occurs with one of the voltages.

Parameters

Name	Type	Description	Alert Conditions
Voltage	Integer	Voltage reading Unit : m/v	n/a
Status	Text	Text parameter that gives the overall voltage status. When all is fine, it shows "OK", and when there is a problem, Status shows "WARNING!" or "ALARM!!" with a detailed description of the issue. Example: "OK" or "ALARM!! This voltage sensor is no longer detected"	"!" = Warning; "!!" = Alarm
Collection Information	Text	Displays the name of the connector used to monitor the voltage Specifies "No information is available..." for a parameter for which no data is available	n/a

Note: *Status* is a text parameter that describes the overall status of the corresponding device or sensor. Alert conditions describe in symbolic terms what occurs in the *Status* parameter when thresholds are breached: one exclamation mark triggers a warning; two exclamation marks raise an alarm.

Example: If BPM Express for Hardware detects that manufacturer-specified thresholds for voltage have been breached, the *Status* parameter will report "WARNING! Although still not critical, the voltage level is out of the normal range." or "ALARM!! This voltage sensor is no longer detected", or as may be the case. The history graph shows the exact details of the problem, its consequences and recommended actions.

Important: Depending on your system, all parameters may not be used. Only one of the parameters may be visible. This will not affect the proper monitoring of the device. *Collection Information* will specify the parameters for which no data is available.



BMC® Performance Manager Express for Hardware version 2.3.00

Thresholds

BMC® Performance Manager Express for Hardware dynamically sets the thresholds on all of its parameters, depending on the platform it is running on. This is why a recapitulative table of the alert thresholds of BMC Performance Manager Express for Hardware cannot be provided. It takes the manufacturer-set thresholds for each component and sets alert rules accordingly.

As you have seen in the previous section, it is *Status*, the text parameter that displays alert conditions. BPM Express for Hardware assigns the pre-set thresholds to its symbolic conditions of exclamation marks.

For instance, when a manufacturer-set threshold reaches warning level, BPM Express for Hardware translates it to "Warning!" with one exclamation mark, which triggers a Warning alert in Portal; and for an alarm-level breach, the *Status* parameter is set to "Alarm!!" with two exclamation marks, which triggers an Alarm alert in Portal. When a problem occurs, the *Status* parameter reports "WARNING!" or "ALARM!!" followed by a full description of the encountered problem, its possible consequences and the recommended action.

Nevertheless, it is possible to modify these pre-set thresholds via the **Configure** tab in BMC® Portal. You must however remember that you have to deactivate the thresholds for the *Status* parameter (which will otherwise continue to consider pre-set thresholds), and instead directly assign threshold values against individual parameters of that class.

Connectors

This section deals with connectors provided with 2.3.00 version of BMC® Performance Manager Express for Hardware. As BPM Express for Hardware works along with vendor-specific agents of the platforms to first collect information and then monitor hardware components, it provides brand-specific connectors for practically all platforms/environments.

A table gives you a quick overview of these connectors with their corresponding filenames and applicable environments (i.e. type of computers, servers, operating systems).

Next, the section deals with detailed information on each of these connectors - stating the target, typical platforms, the pre-requisites in order for BMC Performance Manager Express for Hardware to function optimally, technology used, and what BMC Performance Manager Express for Hardware will discover (stating precise application class names) and then, most importantly, what it will monitor.

To know more about the connectors for your systems, just identify your platforms/environments in the Connector Reference Table, and then read the corresponding details under Connector Details.

Connector Reference Table

The following table shows all the connectors provided with the 2.3.00 version of BMC Performance Manager Express for Hardware. Each connector is a file with the .hdf extension. These HDF files are stored in a .jar format under %RSM_HOME%/RSM/server/rsm/temp/deploy

Connector filename	Connector for	Applicable to
SEN_HW_AAC.hdf	Adaptec Storage Manager Web Edition (AAC)	Computers with an Adaptec RAID controller
SEN_HW_DptStorageManager.hdf	Adaptec Storage Manager (DPT)	Computers with an Adaptec RAID controller
SEN_HW_IOManager.hdf	Adaptec IOManager	Computers with an Adaptec RAID controller
SEN_HW_DellArrayManager.hdf	Dell OpenManage Array Manager	Dell PowerEdge computers
SEN_HW_DellOpenManage.hdf	Dell OpenManage Server Administrator	Dell PowerEdge computers
SEN_HW_DellStorageManager.hdf	Dell OpenManage Storage Manager	Dell PowerEdge computers
SEN_HW_FujitsuSiemensBlade.hdf	Fujitsu-Siemens Management Blade (BX Blade Servers)	Fujitsu-Siemens Blade servers (remotely)
SEN_HW_ServerviewNT.hdf	Fujitsu-Siemens Serverview	Fujitsu-Siemens Primergy computers
SEN_HW_HPBladeSystem.hdf	HP BladeSystem Enclosure	HP Blade Systems
SEN_HW_CpqDriveArrayNT.hdf	HP Insight Management Agent - Drive Array	HP ProLiant computers
SEN_HW_CpqFCADriveArray.hdf	HP Insight Management Agent - Fiber Array	HP/Compaq ProLiant, AlphaServer, Integrity, rx2600, rx4600 and SuperDome servers
SEN_HW_CpqIDEDriveArray.hdf	HP Insight Management Agent - IDE Storage	HP ProLiant computers
SEN_HW_CpqSCSIDriveArray.hdf	HP Insight Management Agent - SCSI Storage	HP ProLiant computers running Linux and HP AlphaServer
MS_HW_HPiLO.hdf	HP Integrated Lights-Out Management Card	HP Integrity, HP 9000, HP 3000 and PA-RISC-based SuperDome systems running HP-UX
SEN_HW_HPTopToolsNT.hdf	HP TopTools Agent	HP NetServer computers
SEN_HW_HpNetRaidController.hdf	HP TopTools NetRaid SNMP Sub-Agent	HP NetServer computers
SEN_HW_HPUX.hdf	HP-UX – Common	HP 9000 computers running HP-UX
SEN_HW_HPUXDisk.hdf	HP-UX – Disks	HP 9000 computers running HP-UX
SEN_HW_IBMAIXChrpMachstat.hdf	IBM AIX – CHRP Environment	IBM CHRP-based servers running AIX 5.x (IBM pSeries and IBM eServer p5 servers)
SEN_HW_IBMAIX.hdf	IBM AIX – Common	IBM RS/6000, pSeries and eServer p5 computers running AIX
SEN_HW_IBMAIXUeSensor.hdf	IBM AIX – Environment	IBM RS/6000, pSeries and eServer p5 computers running AIX
SEN_HW_IBMAIXDisk.hdf	IBM AIX - SCSI disks	IBM RS/6000, pSeries and eServer p5 computers running AIX
SEN_HW_IBMBlade.hdf	IBM BladeCenter Management Module	IBM BladeCenter servers (remotely)

Connector filename	Connector for	Applicable to
SEN_HW_Director3NT.hdf	IBM Director Agent 3.x - Windows	IBM xSeries and Netfinity computers
SEN_HW_Director4Linux.hdf	IBM Director Agent 4.x - Linux	IBM xSeries and Netfinity computers running Linux
SEN_HW_Director4NT.hdf	IBM Director Agent 4.x - Windows	IBM xSeries and Netfinity computers running Windows
SEN_HW_Director5Linux.hdf	IBM Director Agent 5.x - Linux	IBM xSeries and Netfinity computers running Linux
SEN_HW_Director5NT.hdf	IBM Director Agent 5.x - Windows	IBM xSeries and Netfinity computers running Windows
SEN_HW_IbmNetfinityManager.hdf	IBM Netfinity Manager 5.20.x – Normal	IBM Netfinity computers
SEN_HW_IbmNetfinityManagerBASIC.hdf	IBM Netfinity Manager 5.20.x – Basic	IBM Netfinity computers
SEN_HW_IbmNetfinityManagerRAID.hdf	IBM Netfinity Manager 5.20.x – Disks	IBM Netfinity computers
SEN_HW_IpmiTool.hdf	IPMI – In-band (IpmiTool)	IPMI-enabled servers running Linux or Sun Solaris.
SEN_HW_LinuxNetwork.hdf	Linux – Network	Computers running Linux
SEN_HW_LSI1030.hdf	LSI 1030-based Global Array Manager Server	Fujitsu-Siemens PRIMERGY servers with a LSI c1030-based disk controller
SEN_HW_LSI1030Alt.hdf	LSI 1030-based Global Array Manager Server	Fujitsu-Siemens PRIMERGY servers with a LSI c1030-based disk controller
SEN_HW_LSIUtilUNIX.hdf	LSI Logic - LsiUtil	Sun AMD Opteron-based servers running Linux or Sun Solaris (Sun Fire v20z, v40z, etc.)
SEN_HW_MegaRaidPowerConsole.hdf	LsiLogic MegaRAID PowerConsole	Computers with a LsiLogic RAID controller
SEN_HW_MBMNT.hdf	Motherboard Monitor	Unbranded PC running Windows
SEN_HW_MylexController.hdf	Mylex Global Array Manager Server	Computers with a Mylex RAID controller
SEN_HW_NECEsmPro.hdf	NEC ESMPro Agent	NEC Express5800 computers
MS_HW_PromiseFSC.hdf	Promise FastTrack SNMP Agent	Fujitsu-Siemens PRIMERGY with Promise FastTrack RAID controllers
SEN_HW_SmartMonLinux.hdf	SmartMon Tools	Linux servers with non-RAID IDE, ATA or SCSI disks
SEN_HW_StorageTekLSeries.hdf	StorageTek LSeries Tape Library	StorageTek LSeries Tape Library devices
SEN_HW_Sunlostata.hdf	Sun Solaris – Disks	Sun computers running Solaris
SEN_HW_SunPrtdiag.hdf	Sun Solaris – Environment	Sun computers running Solaris
MS_HW_SunCediag.hdf	Sun Solaris – Memory Modules	Sun SPARC-based computers running Solaris 8 or 9
SEN_HW_SunNetwork.hdf	Sun Solaris – Network	Sun computers running Solaris
SEN_HW_WBEMGenDiskNT.hdf	WBEM on Windows – Disks	Computers running Windows
SEN_HW_WBEMGenNetwork.hdf	WBEM on Windows – Network	Computers running Windows

Connector Details

Adaptec Storage Manager Web Edition (AAC)

Target: Adaptec AAC-based RAID controllers

Typical platform: Fujitsu-Siemens Primergy servers

Requires: Adaptec Storage Manager Web Edition

Technology: SNMP

Discovers:

- Adaptec AAC-based RAID disk controllers
- Physical disks attached to the Adaptec controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the Adaptec controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Physical disks failure prediction (SEN_HW_PHYSICALDISK / *PredictedFailure* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

Adaptec Storage Manager (DPT)

Target: Adaptec DPT-based RAID controllers

Typical platform: Fujitsu-Siemens Primergy servers

Requires: Adaptec Storage Manager

Technology: SNMP

Discovers:

- Adaptec DPT-based RAID disk controllers
- Physical disks attached to the Adaptec controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the Adaptec controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Physical disks failure prediction (SEN_HW_PHYSICALDISK / *PredictedFailure* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

Adaptec IOManager

Target: Adaptec U320 HostRAID controllers

Typical platform: Fujitsu-Siemens Primergy servers

Requires: Adaptec IOManager

Technology: SNMP

Discovers:

- Adaptec U320 HostRAID disk controllers

- Physical disks attached to the Adaptec controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the Adaptec controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Physical disks failure prediction (SEN_HW_PHYSICALDISK / *PredictedFailure* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

Dell OpenManage Array Manager

Target: DELL PERC RAID disk controllers

Typical platform: DELL PowerEdge

Requires: Dell OpenManage Array Manager (part of Dell OpenManage Server Administrator)

Technology: SNMP

Discovers:

- DELL PERC RAID disk controllers
- Physical disks attached to the DELL PERC RAID controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the DELL PERC RAID controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

Dell OpenManage Server Administrator

Target: DELL PowerEdge environment, power supplies, memory modules and processors.

Typical platform: DELL PowerEdge

Requires: Dell OpenManage Server Administrator

Technology: SNMP

Discovers:

- Computer model (SEN_HW_ENCLOSURE)
- Processors (SEN_HW_CPU)
- Memory modules (SEN_HW_MEMORY)
- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWERSUPPLY)
- Voltage sensors (SEN_HW_VOLTAGE)

Monitors:

- Status of the processors (SEN_HW_CPU / *Status* parameter)
- Status of the memory modules (SEN_HW_MEMORY / *Status* parameter)
- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed of the fans (SEN_HW_FAN / *Speed* parameter)

- Status of the power supplies (SEN_HW_POWER_SUPPLY / *Status* parameter)
- Voltage levels and/or status reported by the sensors (SEN_HW_VOLTAGE / *Voltage* and *Status* parameters)
- Opening of the main enclosure (SEN_HW_ENCLOSURE / *IntrusionStatus* parameter)

Note: On recent Dell servers, only the *Status* parameter of the SEN_HW_VOLTAGE instances is collected. The actual sensor reading is not available.

Dell OpenManage Storage Manager

Target: DELL PERC RAID disk controllers

Typical platform: DELL PowerEdge

Requires: Dell OpenManage Storage Manager (part of Dell OpenManage Server Administrator)

Technology: SNMP

Discovers:

- DELL PERC RAID disk controllers
- Physical disks attached to the DELL PERC RAID controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the DELL PERC RAID controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

Fujitsu-Siemens Management Blade (FSC BX Blade Servers)

Target: Fujitsu-Siemens Blade main enclosure environment

Typical platform: Fujitsu-Siemens BX300, BX600 and newer blade systems

Requires: Fujitsu-Siemens Management Blade with SNMP enabled

Technology: SNMP

Discovers:

- Blade enclosure model (SEN_HW_ENCLOSURE)
- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWER_SUPPLY)
- Blade servers within the main enclosure (SEN_HW_BLADE)

Monitors:

- Overall status of each blade server (SEN_HW_BLADE / *Status*)
- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed of the fans (SEN_HW_FAN / *Speed* parameter)
- Status of the power supplies (SEN_HW_POWER_SUPPLY / *Status* parameter)

Fujitsu-Siemens Serverview

Target: Fujitsu-Siemens Primergy environment

Typical platform: Fujitsu-Siemens Primergy computers

Requires: Fujitsu-Siemens Serverview agent

Technology: SNMP

Discovers:

- Computer model (SEN_HW_ENCLOSURE)
- Processors (SEN_HW_CPU)
- Memory modules (SEN_HW_MEMORY)
- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWER_SUPPLY)
- Voltage sensors (SEN_HW_VOLTAGE)

Monitors:

- Status of the processors (SEN_HW_CPU / *Status* parameter)
- Status and number of errors encountered by the memory modules (SEN_HW_MEMORY / *Status* and *ErrorCount* parameters)
- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed of the fans (SEN_HW_FAN / *Speed* parameter)
- Status of the power supplies (SEN_HW_POWER_SUPPLY / *Status* parameter)
- Voltage levels reported by the sensors (SEN_HW_VOLTAGE / *Voltage* parameter)

HP BladeSystem

Target: HP BladeSystem enclosures

Typical platform: HP Blade System

Requires: HP Insight Management Agent

Discovers:

- Chassis (MS_HW_ENCLOSURE)
- Power supplies (MS_HW_POWER_SUPPLY)
- Temperature sensors when available (MS_HW_TEMPERATURE)
- Fans when available (MS_HW_FAN)
- Fuses (MS_HW_OTHER_DEVICE)

Monitors:

- Power supplies status and used capacity (MS_HW_POWER_SUPPLY / *Status* and *UsedCapacity* parameters)
- Temperature when available (MS_HW_TEMPERATURE / *Temperature* and *Status* parameters)
- Fans status when available (MS_HW_FAN / *Status* parameter)
- Fuses state (MS_HW_OTHER_DEVICE / *Status* parameter)

HP Insight Management Agent - Drive Array

Target: HP (Compaq) Smart Array.disk controllers

Typical platform: HP ProLiant

Requires: HP Insight Management Agent – Storage Agent

Technology: SNMP

Discovers:

- HP (Compaq) Smart Array disk controllers
- Physical disks attached to the HP Smart Array controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the HP Smart Array controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Physical disks failure prediction (SEN_HW_PHYSICALDISK / *PredictedFailure* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

HP Insight Management Agent - Fiber Array

Target: Fibre-connected HP/Compaq StorageWorks Arrays

Typical platform: HP/Compaq ProLiant and AlphaServer servers

Requires: HP Insight Management Agent

Discovers:

- HP StorageWorks array model (SEN_HW_ENCLOSURE)
- Physical disks (SEN_HW_PHYSICALDISK)
- RAID Logical disks (SEN_HW_LOGICALDISK)
- Array controllers (SEN_HW_OTHERDEVICE)

Monitors:

- Physical disks status, failure prediction and number encountered errors (SEN_HW_PHYSICALDISK / *Status*, *PredictedFailure* and *ErrorCount* parameters)
- RAID Logical disks status (SEN_HW_LOGICALDISK / *Status* parameter)
- Array controllers status (SEN_HW_LOGICALDISK / *Status* parameter)

HP Insight Management Agent - IDE Storage

Target: HP (Compaq) IDE and ATA.disk controllers

Typical platform: HP ProLiant

Requires: HP Insight Management Agent – Storage Agent

Technology: SNMP

Discovers:

- HP (Compaq) IDE and ATA disk controllers
- Physical disks attached to the IDE and ATA controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the IDE and ATA controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Physical disks failure prediction (SEN_HW_PHYSICALDISK / *PredictedFailure* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

HP Insight Management Agent - SCSI Storage

Target: HP (Compaq) SCSI disk controllers (non-RAID)

Typical platform: HP ProLiant and AlphaServer

Requires: HP Insight Management Agent – Storage Agent

Technology: SNMP

Discovers:

- HP (Compaq) SCSI disk controllers
- Physical disks attached to the SCSI controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the SCSI controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Physical disks failure prediction (SEN_HW_PHYSICALDISK / *PredictedFailure* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

HP Insight Management Agent - Server

Target: Environment, power supplies, memory modules and processors on HP ProLiant, Integrity, rx2600, rx4600, SuperDome and AlphaServer.

Typical platform: HP ProLiant running Windows or Linux, HP AlphaServer running Tru64 UNIX, HP rx2600, rx4600, Integrity and SuperDome running Windows Server 2003 or Linux.

Requires: HP Insight Management Agents

Technology: SNMP

Discovers:

- Computer model (SEN_HW_ENCLOSURE)
- Processors (SEN_HW_CPU)
- Memory modules (SEN_HW_MEMORY)
- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWER_SUPPLY)

Note: No voltage sensor is discovered.

Monitors:

- Status of the processors (SEN_HW_CPU / *Status* parameter)
- Status of the memory modules (SEN_HW_MEMORY / *Status* parameter)
- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Status of the fans (SEN_HW_FAN / *Status* parameter)

- Status of the power supplies (SEN_HW_POWERSUPPLY / *Status* parameter)
- Power delivered by the power supply (SEN_HW_POWERUSPPPLY / *UsedCapacity* parameter)

HP Insight Management Agent - Server (Tru64)

Target: HP AlphaServer fans, power supplies, and physical network cards.

Typical platform: HP AlphaServer running Tru64 UNIX

Requires: HP Insight Management Agent – Server Agent

Technology: SNMP

Discovers:

- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWERSUPPLY)
- Network cards (SEN_HW_NETWORK)

Note: This complements the devices discovered by the HP Insight Management Agent – Server Agent connector.

Monitors:

- Status of the fans (SEN_HW_FAN / *Status* parameter)
- Status of the global power supply (SEN_HW_POWERSUPPLY / *Status* parameter)
- Status of the network cards (SEN_HW_NETWORK / *Status* parameter)
- Link status of the network card (SEN_HW_NETWORK / *LinkStatus* parameter)

HP TopTools Agent

Target: HP NetServer environment

Typical platform: HP NetServer running Windows

Requires: HP Instant TopTools

Technology: Specific TopTools CGI and WBEM

Discovers:

- Computer model (SEN_HW_ENCLOSURE)
- Processors (SEN_HW_CPU)
- Memory modules (SEN_HW_MEMORY)
- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWERSUPPLY)
- Voltage sensors (SEN_HW_VOLTAGE)

Monitors:

- Status of the processors (SEN_HW_CPU / *Status* parameter)
- Status of the memory modules (SEN_HW_MEMORY / *Status* parameter)
- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed and status of the fans (SEN_HW_FAN / *Status* and *Speed* parameters)

- Status of the power supplies (SEN_HW_POWERSUPPLY / *Status* parameter)
- Voltage levels reported by the sensors (SEN_HW_VOLTAGE / *Voltage* parameter)

HP TopTools NetRaid SNMP Sub-Agent

Target: HP NetRAID controllers

Typical platform: HP NetServer running Windows or Linux

Requires: HP Instant TopTools with the HP NetRAID SNMP sub-agent

Technology: SNMP

Discovers:

- HP NetRAID disk controllers
- Physical disks attached to the HP controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the HP controllers (SEN_HW_LOGICALDISK)

Monitors:

Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)

Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

HP-UX – Common

Target: HP 9000 network cards and processors

Typical platform: HP 9000 computer running HP-UX

Requires: Nothing

Technology: HP-UX command-line tools

Discovers:

- Computer model (SEN_HW_ENCLOSURE)
- Processors (SEN_HW_CPU)
- Network cards (SEN_HW_NETWORK)

Monitors:

- Status of the processors (SEN_HW_CPU / *Status* parameter)

- Status and percentage of errors of the network cards (SEN_HW_NETWORK / *Status* and *ErrorPercent* parameters)

HP-UX – Disks

Target: Standard SCSI disks monitoring on HP-UX computers

Typical platform: HP 9000 computers running HP-UX

Requires: Root privileges to run the /usr/sbin/diskinfo utility (may use "sudo")

Technology: HP-UX command-line tools

Discovers:

- Standard SCSI disk controllers
- Physical disks attached to the SCSI controllers (SEN_HW_PHYSICALDISK)

Monitors:

- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)

HP Integrated Lights-Out Management Card

Target: Environment and power supplies of HP Integrity, HP 9000, HP 3000 and PA-RISC-based SuperDome systems running HP-UX

Typical platform: HP Integrity, HP 9000, HP 3000 and PA-RISC-based SuperDome systems running HP-UX

Requires: HP Integrated Lights-Out Management Card (also known as “MP – Management Processor” or “GSP – Guardian Service Processor”) with TCP/IP network access

Technology: Telnet

Discovers:

- Computer model (MS_HW_ENCLOSURE)
- Temperature sensors (MS_HW_TEMPERATURE)
- Fans (MS_HW_FAN)
- Power supplies (MS_HW_POWER_SUPPLY)

Note: No voltage sensor is discovered.

Monitors:

- Status of the machine (powered on or off, MS_HW_ENCLOSURE / *Status* parameter)
- General temperature status reported by temperature sensors (MS_HW_TEMPERATURE / *Status* parameter)
- Status of the fans (MS_HW_FAN / *Status* parameter)
- Status of the power supplies (MS_HW_POWER_SUPPLY / *Status* parameter)

IBM AIX – CHRP Environment

Typical platform: IBM CHRP-based servers running AIX 5.x (IBM pSeries and IBM eServer p5 servers)

Requires: Nothing

Discovers:

- System Cooling (a single global MS_HW_FAN instance)
- System Power (a single global MS_HW_POWER_SUPPLY instance)

Monitors:

- The status of the system cooling (MS_HW_FAN / *Status* parameter)
- The power status of the system (MS_HW_POWER_SUPPLY / *Status* parameter)

IBM AIX – Common

Target: IBM RS/6000, pSeries and eServer p5 servers' network cards and processors

Typical platform: IBM RS/6000, pSeries and eServer p5 computers running IBM AIX 4.3 and 5.x

Requires: Nothing

Technology: IBM AIX command-line tools

Discovers:

- Computer model (SEN_HW_ENCLOSURE)
- Processors (SEN_HW_CPU)
- Network cards (SEN_HW_NETWORK)

Monitors:

- Status of the processors (SEN_HW_CPU / *Status* parameter)
- Status and percentage of errors of the network cards as well as the network *Link Status* (SEN_HW_NETWORK / *Status*, *ErrorPercent* and *LinkStatus* parameters)

IBM AIX – Environment

Target: IBM RS/6000, pSeries and eServer p5 servers' environment

Typical platform: IBM RS/6000, pSeries and eServer p5 computers running IBM AIX 4.3 and 5.x

Requires: The /usr/lpp/diagnostics/bin/uesensor command to provide environment information

Technology: IBM AIX command-line tools

Discovers:

- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWERSUPPLY)
- Voltage sensors (SEN_HW_VOLTAGE)

Monitors:

- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed of the fans (SEN_HW_FAN / *Speed* parameters)
- Status of the power supplies (SEN_HW_POWERSUPPLY / *Status* parameter)
- Voltage levels and status reported by the voltage sensors (SEN_HW_VOLTAGE / *Voltage* and *Status* parameters)

IBM AIX – SCSI disks

Target: Standard SCSI disks monitoring on IBM AIX computers

Typical platform: IBM RS/6000, pSeries and eServer p5 computers running IBM AIX 4.3 and 5.x

Requires: Nothing

Technology: IBM AIX command-line tools

Discovers:

- Standard SCSI disk controllers
- Physical disks attached to the SCSI controllers (SEN_HW_PHYSICALDISK)

Monitors:

- Status and reported errors of the physical disks (SEN_HW_PHYSICALDISK / *Status* and *ErrorCount* parameters)

IBM BladeCenter Management Module

Target: IBM BladeCenter main enclosure environment

Typical platform: IBM BladeCenter

Requires: IBM BladeCenter Management Module with SNMP enabled

Technology: SNMP

Discovers:

- Blade enclosure model (SEN_HW_ENCLOSURE)
- Temperature sensors (SEN_HW_TEMPERATURE)
- Blowers (SEN_HW_FAN)
- Power supplies (SEN_HW_POWERSUPPLY)
- Voltage sensors (SEN_HW_VOLTAGE)
- Blade servers within the main enclosure (SEN_HW_BLADE)

Monitors:

- Overall status of each blade server (SEN_HW_BLADE / *Status*)
- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed of the blowers as a percentage of the maximum speed (SEN_HW_FAN / *SpeedPercent* parameter)
- Status of the power supplies (SEN_HW_POWERSUPPLY / *Status* parameter)
- Voltage level reported by sensors (SEN_HW_VOLTAGE / *Voltage* parameter)

IBM Director Agent 3.x – Windows

Target: IBM xSeries and Netfinity servers.

Typical platform: IBM xSeries and Netfinity servers running Windows

Requires: IBM Director Agent version 3.x

Technology: WBEM

Discovers:

- Computer model (SEN_HW_ENCLOSURE)
- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWERSUPPLY)
- Voltage sensors (SEN_HW_VOLTAGE)
- IBM ServeRAID disk controllers

- Physical disks attached to the IBM ServeRAID controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the IBM ServeRAID controllers (SEN_HW_LOGICALDISK)

Monitors:

- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed of the fans (SEN_HW_FAN / *Status* parameter)
- Status of the power supplies (SEN_HW_POWERSUPPLY / *Status* parameter)
- Voltage levels reported by the sensors (SEN_HW_VOLTAGE / *Voltage* parameter)
- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

Note: Version 3 of IBM Director Agent is no longer supported by IBM.

IBM Director Agent 4.x – Linux

Target: IBM xSeries servers.

Typical platform: IBM xSeries servers running Linux

Requires: IBM Director Agent version 4.21 or greater

Technology: WBEM

Discovers:

- Computer model (SEN_HW_ENCLOSURE)
- Processors (SEN_HW_CPU)
- Memory modules (SEN_HW_MEMORY)
- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWERSUPPLY)
- Voltage sensors (SEN_HW_VOLTAGE)
- IBM ServeRAID disk controllers
- Physical disks attached to the IBM ServeRAID controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the IBM ServeRAID controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the processors (SEN_HW_CPU / *Status* parameter)
- Status of the memory modules (SEN_HW_MEMORY / *Status* parameter)
- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed of the fans (SEN_HW_FAN / *Status* parameter)
- Status of the power supplies (SEN_HW_POWERSUPPLY / *Status* parameter)
- Voltage levels reported by the sensors (SEN_HW_VOLTAGE / *Voltage* parameter)
- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

IBM Director Agent 4.x – Windows

Target: IBM xSeries and Netfinity servers.

Typical platform: IBM xSeries and Netfinity servers running Windows

Requires: IBM Director Agent version 4.x

Technology: WBEM

Discovers:

- Computer model (SEN_HW_ENCLOSURE)
- Processors (SEN_HW_CPU)
- Memory modules (SEN_HW_MEMORY)
- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWER_SUPPLY)
- Voltage sensors (SEN_HW_VOLTAGE)
- IBM ServeRAID disk controllers
- Physical disks attached to the IBM ServeRAID controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the IBM ServeRAID controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the processors (SEN_HW_CPU / *Status* parameter)
- Status of the memory modules (SEN_HW_MEMORY / *Status* parameter)
- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed of the fans (SEN_HW_FAN / *Status* parameter)
- Status of the power supplies (SEN_HW_POWER_SUPPLY / *Status* parameter)
- Voltage levels reported by the sensors (SEN_HW_VOLTAGE / *Voltage* parameter)
- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

IBM Director Agent 5.x – Linux

Target: IBM xSeries servers.

Typical platform: IBM xSeries servers running Linux

Requires: IBM Director Agent version 5.10 Update 2 or greater

Technology: WBEM

Discovers:

- Computer model (SEN_HW_ENCLOSURE)
- Processors (SEN_HW_CPU)
- Memory modules (SEN_HW_MEMORY)
- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWER_SUPPLY)

- Voltage sensors (SEN_HW_VOLTAGE)
- IBM ServeRAID disk controllers
- Physical disks attached to the IBM ServeRAID controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the IBM ServeRAID controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the processors (SEN_HW_CPU / *Status* parameter)
- Status of the memory modules (SEN_HW_MEMORY / *Status* parameter)
- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed of the fans (SEN_HW_FAN / *Status* parameter)
- Status of the power supplies (SEN_HW_POWERSUPPLY / *Status* parameter)
- Voltage levels reported by the sensors (SEN_HW_VOLTAGE / *Voltage* parameter)
- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

Note: This connector works with version 5.10 Update 2 and greater of the IBM Director Agent. It does not support versions 5.10 and 5.10 Update 1 of the IBM Director Agent due to serious bugs in these versions.

IBM Director Agent 5.x – Windows

Target: IBM xSeries and Netfinity servers.

Typical platform: IBM xSeries and Netfinity servers running Windows

Requires: IBM Director Agent version 5.10 Update 2 or greater

Technology: WBEM

Discovers:

- Computer model (SEN_HW_ENCLOSURE)
- Processors (SEN_HW_CPU)
- Memory modules (SEN_HW_MEMORY)
- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWERSUPPLY)
- Voltage sensors (SEN_HW_VOLTAGE)
- IBM ServeRAID disk controllers
- Physical disks attached to the IBM ServeRAID controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the IBM ServeRAID controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the processors (SEN_HW_CPU / *Status* parameter)
- Status of the memory modules (SEN_HW_MEMORY / *Status* parameter)
- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed of the fans (SEN_HW_FAN / *Status* parameter)

- Status of the power supplies (SEN_HW_POWERSUPPLY / *Status* parameter)
- Voltage levels reported by the sensors (SEN_HW_VOLTAGE / *Voltage* parameter)
- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

Note: This connector works with version 5.10 Update 2 or greater of the IBM Director Agent. It does not support versions 5.10 and 5.10 Update 1 of the IBM Director Agent due to serious bugs in these versions.

IPMI – In-band (IpmiTool)

Target: Environment (temperatures, fans and voltages) of IPMI-enabled servers.

Typical platform: Sun AMD Opteron-based servers (Sun Fire v20z, v40z, etc.) running Linux or Sun Solaris.

Technology: IPMI (in-band through the IpmiTool utility)

Requires: ipmitool 1.8.7 or greater with the OpenIPMI driver or Sun-provided IPMI driver on Solaris.

Discovers:

- computer model (SEN_HW_ENCLOSURE)
- temperature sensors (SEN_HW_TEMPERATURE)
- voltage sensors (SEN_HW_VOLTAGES)
- fans (SEN_HW_FANS)

Monitors:

- temperatures (SEN_HW_TEMPERATURE / *Temperature* parameter)
- voltages (SEN_HW_VOLTAGE / *Voltage* parameter)
- fan speed (SEN_HW_FAN / *Speed* parameter)

Linux – Network

Target: Network cards of computers running Linux

Typical platform: HP ProLiant, Dell PowerEdge, Fujitsu-Siemens Primergy, IBM xSeries running RedHat Linux

Requires: Nothing

Technology: Linux command-line tools

Discovers:

- Network cards (SEN_HW_NETWORK)

Monitors:

- Link status of the network cards (SEN_HW_NETWORK / *LinkStatus* parameter)
- Percentage of errors of the network cards (SEN_HW_NETWORK / *ErrorPercent* parameters)

LSI 1030-based Global Array Manager Server

Target: LSI c1030-based disk controllers

Typical platform: Fujitsu-Siemens PRIMERGY servers

Requires: LSI1030 SNMP sub-agent (provided by Fujitsu-Siemens)

Discovers:

- disk controllers
- physical disks (SEN_HW_PHYSICALDISK)
- logical disks (SEN_HW_LOGICALDISK)

Monitors:

- physical disk status (SEN_HW_PHYSICALDISK / *Status* parameter)
- logical disk status (SEN_HW_LOGICALDISK / *Status* parameter)

LSI Logic LsiUtil

Target: LSI c1030-based disk controllers

Typical platform: Sun AMD Opteron-based servers (Sun Fire v20z, v40z, etc.) running Sun Solaris or Linux

Technology: Based on the lsiutil command-line utility

Requires: LsiUtil 1.4 or greater (provided by LSI Logic)

Discovers:

- disk controllers
- physical disks (SEN_HW_PHYSICALDISK)

Monitors:

physical disks status (SEN_HW_PHYSICALDISK / *Status* parameter)

LsiLogic MegaRAID PowerConsole

Target: LsiLogic SCSI RAID controllers

Typical platform: Various

Requires: LsiLogic PowerConsole Plus

Technology: SNMP

Discovers:

- LsiLogic SCSI RAID disk controllers
- Physical disks attached to the LsiLogic controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the LsiLogic controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

Motherboard Monitor

Target: Generic x86 PC environment

Typical platform: Generic x86 PC (no-brand)

Requires: Motherboard Monitor

Technology: Motherboard Monitor-specific

Discovers:

- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Voltage sensors (SEN_HW_VOLTAGE)

Monitors:

- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed of the fans (SEN_HW_FAN / *Speed* parameter)
- Voltage levels reported by the sensors (SEN_HW_VOLTAGE / *Voltage* parameter)

Mylex Global Array Manager Server

Target: Mylex RAID controllers

Typical platform: Fujitsu-Siemens Primergy computers

Requires: Mylex GAM Server

Technology: SNMP

Discovers:

- Mylex RAID disk controllers
- Physical disks attached to the Mylex controllers (SEN_HW_PHYSICALDISK)
- Logical disks attached to the Mylex controllers (SEN_HW_LOGICALDISK)

Monitors:

- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameter)
- Status of the logical disks (SEN_HW_LOGICALDISK / *Status* parameter)

NEC ESM PRO Agent

Target: NEC Express5800 environment.

Typical platform: NEC Express5800 computers running Windows and Linux

Requires: NEC ESM PRO agent

Technology: SNMP

Discovers:

- Computer model (SEN_HW_ENCLOSURE)
- Processors (SEN_HW_CPU)
- Memory modules (SEN_HW_MEMORY)
- Temperature sensors (SEN_HW_TEMPERATURE)

- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWER_SUPPLY)
- Voltage sensors (SEN_HW_VOLTAGE)

Monitors:

- Status of the processors (SEN_HW_CPU / *Status* parameter)
- Status of the memory modules (SEN_HW_MEMORY / *Status* parameter)
- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Speed of the fans (SEN_HW_FAN / *Status* parameter)
- Status of the power supplies (SEN_HW_POWER_SUPPLY / *Status* parameter)
- Voltage levels reported by the sensors (SEN_HW_VOLTAGE / *Voltage* parameter)

Promise FastTrack

Target: Promise FastTrack RAID controllers

Typical platform: Fujitsu-Siemens Primergy servers

Requires: Promise FastTrack SNMP agent

Technology: SNMP

Discovers:

- Promise FastTrack disk controllers (MS_HW_DISKCONTROLLER)
- Physical disks attached to the Promise controllers (MS_HW_PHYSICALDISK)
- Logical disks attached to the Promise controllers (MS_HW_LOGICALDISK)

Monitors:

- Status of the battery of the disk controller (MS_HW_DISKCONTROLLER / *BatteryStatus* parameter)
- Status of the physical disks (MS_HW_PHYSICALDISK / *Status* parameter)
- Physical disks failure prediction (MS_HW_PHYSICALDISK / *PredictedFailure* parameter)
- Status of the logical disks (MS_HW_LOGICALDISK / *Status* parameter)

SmartMon Tools

Target: S.M.A.R.T-enabled non-RAID physical disks in Linux servers

Typical platform: Any Linux server with simple (non-RAID) IDE, ATA or SCSI disks

Technology: S.M.A.R.T through the smartd and smartctl commands

Requires: SmartMon Tools (included in most Linux distributions)

Discovers:

- S.M.A.R.T.-enabled physical disks (SEN_HW_PHYSICALDISK)
- Temperature sensors within previously discovered disks (SEN_HW_TEMPERATURE)

Monitors:

- Physical disks failure prediction (SEN_HW_PHYSICALDISK / *PredictedFailure* parameter)
- Disks temperature (SEN_HW_TEMPERATURE / *Temperature* parameter)

StorageTek LSeries Tape Library

Target: StorageTek LSeries Tape Library devices

Requires: Access to the StorageTek Library SNMP agent.
The /SENTRY/HARDWARE/remoteMonitor needs to be set with the IP address of the StorageTek LSeries library.

Discovers:

- Tape library model (SEN_HW_ENCLOSURE)
- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWER_SUPPLY)
- Tape drives (SEN_HW_OTHER_DEVICE)
- Cartridge access ports (SEN_HW_OTHER_DEVICE)

Monitors:

- Temperature (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Fan status (SEN_HW_FAN / *Status* parameter)
- Power supplies status (SEN_HW_POWER_SUPPLY / *Status* parameter)
- Drives status (SEN_HW_OTHER_DEVICE / *Status* parameter)
- Cartridge access ports status (SEN_HW_OTHER_DEVICE / *Status* parameter)

Sun Solaris – Disks

Target: Standard SCSI disks monitoring on Sun computers

Typical platform: Sun computers running Solaris

Requires: Nothing

Technology: Sun Solaris command-line tools (iostat)

Discovers:

- Standard SCSI disk controllers
- Physical disks attached to the SCSI controllers (SEN_HW_PHYSICAL_DISK)

Monitors:

- Reported errors on each physical disks (SEN_HW_PHYSICAL_DISK / *ErrorCount* parameter)
- Physical disks failure prediction (SEN_HW_PHYSICAL_DISK / *PredictedFailure* parameter)

Sun Solaris – Environment

Target: Environment of Sun SPARC-based computers running Solaris

Typical platform: Sun SPARC-based computers running Solaris (no support for partitionable servers like Sun Fire E10000, F12K, F15K, etc.)

Requires: Nothing

Technology: Sun Solaris command-line tools (prtdiag, lom)

Discovers:

- Computer model (SEN_HW_ENCLOSURE)

- Temperature sensors (SEN_HW_TEMPERATURE)
- Fans (SEN_HW_FAN)
- Power supplies (SEN_HW_POWER_SUPPLY)
- Voltage sensors (SEN_HW_VOLTAGE)
- Processors (SEN_HW_CPU)

Monitors:

- Temperature reported by temperature sensors (SEN_HW_TEMPERATURE / *Temperature* parameter)
- Status of the fans (SEN_HW_FAN / *Status* parameters)
- Status of the power supplies (SEN_HW_POWER_SUPPLY / *Status* parameter)
- Voltage levels and status reported by the voltage sensors (SEN_HW_VOLTAGE / *Voltage* and *Status* parameters)
- Status of the processors (SEN_HW_CPU / *Status* parameter)

Sun Solaris – Memory modules

Target: Memory modules of Sun computers running Solaris

Typical platform: Sun SPARC-based computers running Solaris 8 or 9

Requires: The cediag package available from Sun: <http://sunsolve.sun.com/pub-cgi/show.pl?target=cediag>. Also, root privileges to execute /usr/SUNWcest/bin/cestat and /usr/SUNWcest/bin/cediag (may use sudo)

Technology: Sun Solaris command-line tools (cestat, cediag)

Discovers:

- Memory modules (MS_HW_MEMORY)
- An "Overall" instance is also created to report errors encountered by the whole memory subsystem

Monitors:

- Status of the memory module (MS_HW_MEMORY / *Status* parameter)
- Whether or not a failure is imminent on memory modules (MS_HW_MEMORY / *PredictedFailure* parameter)

Sun Solaris – Network

Target: Network cards of Sun computers running Solaris

Typical platform: Sun computers running Solaris

Requires: In some cases, root privileges to execute /usr/sbin/ndd (may use sudo)

Technology: Sun Solaris command-line tools (ndd, kstat)

Discovers:

- Network cards (SEN_HW_NETWORK)

Monitors:

- Link status of the network cards (SEN_HW_NETWORK / *LinkStatus* parameter)
- Percentage of errors of the network cards (SEN_HW_NETWORK / *ErrorPercent* parameter)

- Overall status of the network cards (SEN_HW_NETWORK / *Status* parameter)

WBEM on Windows – Disks

Target: Standard SCSI, IDE and ATA disks monitoring on computers running Windows

Typical platform: Computers running Windows

Requires: Windows Management Instrumentation (WMI)

Technology: WBEM

Discovers:

- Standard SCSI, IDE and ATA (non-RAID) disk controllers
- Physical disks attached to the SCSI, IDE and ATA controllers (SEN_HW_PHYSICALDISK)

Monitors:

- Status of the physical disks (SEN_HW_PHYSICALDISK / *Status* parameters)
- Physical disks failure prediction (SEN_HW_PHYSICALDISK / *PredictedFailure* parameter)

WBEM on Windows – Network

Target: Network cards of computers running Windows

Typical platform: Computers running Windows

Requires: Windows Management Instrumentation (WMI)

Technology: WBEM

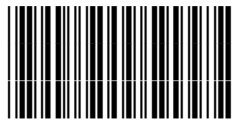
Discovers:

- Network cards (SEN_HW_NETWORK)

Monitors:

- Link status of the network cards (SEN_HW_NETWORK / *LinkStatus* parameter)
- Percentage of errors of the network cards (SEN_HW_NETWORK / *ErrorPercent* parameter)
- Overall status of the network cards (SEN_HW_NETWORK / *Status* parameter)

Notes



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