
1 HP Insight Management WBEM System Temperature Sensor Provider

Description The HP Insight Management Web-Based Enterprise Management (WBEM) Management System Temperature Sensor provider extends the management capability of referencing profiles by adding the capability to represent HP Management Processor on HP servers. This provider implements the following profiles and installs the necessary files:

Profile Name	Organization	Version
HP Sensor Profile	HP WBEM TC	1.0

For each hardware architecture listed, this provider requires the following distributions

Requirements

HP Integrity managed servers	SLES 10 and later RHEL 5.0 and later
HP ProLiant managed servers	SLES 11 and later RHEL 5.3 and later

Release History Initial release with HP Insight Management WBEM Providers for Linux v2.0.

1-1 Setting Up the Provider

Installing the Provider There are no special installation instructions for this provider. It is installed by default as part of the HP Insight Management WBEM providers.

Configuring the Provider This provider does not accept specific configuration adjustments beyond standard HP Insight Management WBEM support.

1-2 Using the Provider

Namespaces Supported by the Provider This provider returns instances in the `root/hpq` namespace.

Schema Supported by the Provider This provider supports the following classes:

- `SMX_NumericSensor`

- SMX_SensorCollection
- SMX_SystemSensor
- SMX_HostedSensorCollection
- SMX_MemberOfSensorCollection

The tables in the following sections describe the properties of the supported classes. The classes are categorized by the class or superclass that defines the property, the first column is the Property Name (including type and units) and the second column describes how the provider determines the properties implementation. When the Property Implementation value is a number, the number given is the default behavior and the Managed Object Format interpretation is within parenthesis. If other values are returned, a problem is indicated.

Unless otherwise noted, all of the property implementation values given are for HP ProLiant and HP Integrity (cellular and non-cellular) systems. The location related properties and implementation values are determined based on the server type so they may differ.

1-2-1 SMX_NumericSensor Class

The SMX_NumericSensor class implements the HP_NumericSensor and is used to model temperature sensors on servers.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_ManagedElement	
Caption	"Temperature Sensor <sensorID>" Where: <sensorID> is the name displayed by the MP or iLO. For example: Temperature Sensor Temp 1
Description	"Temperature Sensor <sensorID> detects for NumericSensorType.StatusDescription" Where: <sensorID> is the name displayed by the MP or iLO represents the number of the temperature sensor instance, NumericSensorType represents the value of NumericSensorType and StatusDescription represents the value of StatusDescriptions[0].
ElementName	"Temperature Sensor <sensorID>" Where: <sensorID> is the name displayed by the MP or iLO. For example: Temperature Sensor Temp 1
CIM_ManagedSystemElement	

Property Name	Property Implementation
OperationalStatus[0]	<p>2 (OK) – if temperature reported by the sensor is within normal operating range;</p> <p>2 (OK) – if temperature reported by the sensor has exceeded its non-critical threshold and has set fans to full speed;</p> <p>6 (Error) – if temperature reported by the sensor has exceeded its threshold and the system is gracefully shutting down.</p>
StatusDescriptions[0]	<p>Temperature reported by the sensor is within normal operating range – if temperature reported by the sensor is within normal operating range;</p> <p>Temperature reported by the sensor has exceeded its non-critical threshold and the fans have been set to full speed – if temperature reported by the sensor has exceeded its threshold and has set fans to full speed;</p> <p>Temperature reported by the sensor has exceeded its threshold and the system is gracefully shutting down – if OperationalStatus is 6 (Error)</p>
HealthState	<p>5 (OK) – if OperationalStatus[0] value is 2 (OK);</p> <p>20 (Major Failure) – if OperationalStatus[0] value is 6 (Error)</p>
Name	Temperature Sensor <i>n</i> where <i>n</i> represents the number of the temperature sensor instance(s).
CIM_LogicalDevice	
CreationClassName	SMX_NumericSensor
DeviceID	Unique identifier for this temperature sensor instance.
SystemCreationClassName	HP_ComputerSystem.CreationClassName
SystemName	HP_ComputerSystem.Name
CIM_EnabledLogicalElement	
EnabledDefault	2 (Enabled)
EnabledState	5 (Not Applicable)
RequestedState	12 (Not Applicable)
CIM_Sensor	
SensorType	2 (Temperature)

Property Name	Property Implementation
CurrentState	Normal – if OperationalStatus[0] is 2 (OK); Critical – if OperationalStatus[0] is 6 (Error);
PossibleStates	Array can contain any of the following values: PossibleStates[0] = Normal; PossibleStates[1] = Critical;
CIM_NumericSensor	
CurrentReading	Current reading of temperature sensor
BaseUnits	2 (Degrees C)
RateUnits	0 (None)
UnitModifier	0
SupportedThresholds	SupportedThresholds[0] = 1 (UpperThresholdNotCritical) if the system will set fans to full speed if the threshold is crossed; SupportedThresholds[0] = 3 (UpperThresholdCritical) set if the system will gracefully attempt to shutdown the system if the threshold is crossed; SupportedThresholds[0] = 5 (UpperThresholdFatal) if the system will immediately power down the system if the threshold is crossed.
SettableThresholds	empty
UpperThresholdNonCritical	Contains the threshold temperature that CurrentReading must exceed to be in a non-critical state. This is only set if the system will set fans to full speed if the threshold is crossed.
UpperThresholdCritical	Contains the threshold temperature that CurrentReading must exceed to be in a critical state. This is only set if the system will gracefully attempt to shutdown the system if the threshold is crossed.
UpperThresholdFatal	Contains the threshold temperature that CurrentReading must exceed to be fatal. This is only set if the system will immediately power down the system if the threshold is crossed.
HP_NumericSensor	
NumericSensorType	Enumeration describing the type of temperature sensor. Refer to the Managed Object Format.

1-2-2 SMX_SensorCollection Class

The `SMX_SensorCollection` class implements the `HP_SensorCollection` and is used to model temperature sensor collections on servers. There is one instance of this class on systems modeling sensors.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_ManagedElement	
Caption	Temperature Sensor Collection
Description	<p>This is a collection of temperature sensors. <i>GroupStatusDescription</i>.</p> <p>Where: <i>GroupStatusDescription</i> represents the value of the <i>GroupStatusDescriptions[0]</i> property.</p>
ElementName	Temperature Sensor Collection
CIM_SystemSpecificCollection	
InstanceID	Unique identifier for this sensor collection instance.
HP_GroupSystemSpecificCollection	
GroupOperationalStatus[0]	<p>Represents the most severe sensor group operational status:</p> <p>2 (OK) – if temperatures reported by the sensors are within normal operating range;</p> <p>2 (OK) – if temperatures reported by the sensors have exceeded their non-critical threshold and has set fans to full speed;</p> <p>6 (Error) – if temperatures reported by the sensors have exceeded their non-critical threshold and the system is gracefully shutting down.</p>
GroupStatusDescriptions[0]	<p>Temperatures reported by the sensors are operating within normal operating range if temperatures reported by the sensors are within normal operating range;</p> <p>Temperatures reported by the sensors have exceeded their non-critical threshold and the fans have been set to full speed if temperatures reported by the sensors have exceeded their threshold and has set fans to full speed;</p> <p>Temperatures reported by the sensors have exceeded their threshold and the system is gracefully shutting down if temperatures reported by the sensors have exceeded their threshold and the system is gracefully shutting down.</p>

1-2-3 SMX_MemberOfSensorCollection Class

The `SMX_MemberOfSensorCollection` class implements the `HP_MemberOfSensorCollection` class and is used to represent an association between the `SMX_NumericSensor` and `SMX_SensorCollection` classes.

The following table lists the properties implemented.

Property Name	Property Implementation
Collection	References <code>SMX_SensorCollection</code>
Member	References <code>SMX_NumericSensor</code>

1-2-4 SMX_HostedSensorCollection Class

The `SMX_HostedSensorCollection` class implements the `HP_HostedSensorCollection` class and is used to represent an association between the `SMX_SensorCollection` class and the computer system that contains the collection.

The following table lists the properties implemented.

Property Name	Property Implementation
Antecedent	References <code>SMX_ComputerSystem</code>
Dependent	References <code>SMX_SensorCollection</code>

1-2-5 SMX_SystemSensor Class

The `SMX_SystemSensor` class implements the `HP_SystemSensor` class and is used to represent an association between the `SMX_NumericSensor` class and the computer system that contains the sensor.

The following table lists the properties implemented.

Property Name	Property Implementation
GroupComponent	References <code>SMX_ComputerSystem</code>
PartComponent	References <code>SMX_NumericSensor</code>

1-3 Provider Indications

Indications Generated by the Provider

The following tables describe the SMX WBEM System Temperature Sensor Provider indications that are implemented for HP ProLiant server platforms where available.

1-3-1 HP_AlertIndication: Temperature Sensor Threshold Exceeded

Property Name	Property Implementation
CIM_Indication	
IndicationIdentifier	GUID string generated at the time of indication.
PerceivedSeverity	5 (Major)
IndicationTime	Time of indication.
CIM_AlertIndication	
Description	<p>A temperature sensor has detected that the temperature has exceeded the normal operating range. <i><SensorCaption></i></p> <p>Where: <i><SensorCaption></i> is the <i>SMX_NumericSensor.Caption</i> for the sensor that has failed.</p>
AlertingManagedElement	Wbem Path of the <i>SMX_NumericSensor</i> instance representing the temperature sensor detecting the exceeded threshold.
AlertingElementFormat	2 (CIMObjectPath)
AlertType	5 (Device Alert)
EventID	1
EventTime	Time of the event or time of the indication if event time unknown
ProviderName	HP Temperature
RecommendedActions	Ensure that the system is adequately ventilated. Check for proper room temperature and internal/external airflow. Add or repair fans and air baffling if necessary.
SystemName	<i>HP_ComputerSystem.Name</i>
SystemCreationClassName	<i>HP_ComputerSystem.CreationClassName</i>
HP_AlertIndication	
Summary	Temperature threshold exceeded detected
EventCategory	23 (System Cooling)
ProbableCause	51 (Temperature Unacceptable)
ProbableCauseDescription	Temperature Threshold Exceeded Detected

Property Name	Property Implementation
ProviderVersion	For example: 2.2.0.0
NetworkAddresses	Contains a list of all the IP addresses of the computer system generating the indication.
OSType	SMX_OperatingSystem.OSType
OSVersion	The operating system version of the computer system generating the indication in the following format: major.minor.build
SystemFirmwareVersion	Firmware version of the computer system generating the indication.
SystemSerialNumber	Serial number of the computer system generating the indication.
SystemProductID	Product ID of the computer system generating the indication.
SystemModel	Model name of the computer system generating the indication.
SystemGUID	Platform GUID of the computer system generating the indication.
VariableNames	Contains the temperature sensor threshold property name that sets a value: UpperThresholdNonCritical UpperThresholdCritical UpperThresholdFatal
VariableTypes	9 (sint32)
VariableValues	SMX_NumericSensor, UpperThresholdNonCritical, UpperThresholdCritical or UpperThresholdFatal property value that is set for the temperature sensor detecting the exceeded threshold.
ImpactedDomain	3 (Enclosure) for c-Class blade systems 4 (System) for all other systems Note: When ImpactedDomain is 3 (Enclosure) the properties indicated with (*) below will be populated.
BladeBay *	HP_BladeCSLocation.LocationInformation[0]
BladeName *	HP_ComputerSystem.Name
EnclosureName *	HP_BladeEnclosureCS.Name
RackName *	Rack name, if one exists.

Property Name	Property Implementation
RackUID *	Rack Unique Identifie, if one exists.
SystemVirtualSerialNumber	Conditional property containing the virtual system serial number string when running in a Virtual Connect environment.
SystemVirtualUUID	Conditional property containing the virtual system UUID when running in a Virtual Connect environment.

1-3-2 HP_AlertIndication: Temperature Sensor Recovery from Threshold Exceeded

Property Name	Property Implementation
CIM_Indication	
IndicationIdentifier	GUID string generated at the time of indication.
PerceivedSeverity	2 (Information)
IndicationTime	Time of indication.
CIM_AlertIndication	
Description	<p>A temperature sensor has detected that the temperature has returned to a normal operating range. <i><SensorCaption></i></p> <p>Where: <i><SensorCaption></i> is the <i>SMX_NumericSensor.Caption</i> for the temperature sensor detecting a recovered exceeded threshold.</p>
AlertingManagedElement	WBEM Path of <i>SMX__NumericSensor</i> instance representing the temperature sensor detecting a recovered exceeded threshold.
AlertingElementFormat	2 (CIMObjectPath)
AlertType	5 (Device Alert)
EventID	2
EventTime	Time of the event or time of the indication if event time unknown.
ProviderName	HP Temperature
RecommendedActions	No action is recommended.
SystemName	<i>HP_ComputerSystem.Name</i>
SystemCreationClassName	<i>HP_ComputerSystem.CreationClassName</i>

Property Name	Property Implementation
HP_AlertIndication	
Summary	Threshold exceeded condition recovery
EventCategory	23 (System Cooling)
ProbableCause	52 (Threshold Crossed)
ProbableCauseDescription	Threshold Exceeded Condition has Recovered
ProviderVersion	For example: 2.2.0.0
NetworkAddresses	Contains a list of all the IP addresses of the computer system generating the indication.
OSType	SMX_OperatingSystem.OSType
OSVersion	The operating system version of the computer system generating the indication in the following format: major.minor.build
SystemFirmwareVersion	Firmware version of the computer system generating the indication.
SystemSerialNumber	Serial number of the computer system generating the indication.
SystemProductID	Product ID of the computer system generating the indication.
SystemModel	Model name of the computer system generating the indication.
SystemGUID	Platform GUID of the computer system generating the indication.
ImpactedDomain	<p>3 (Enclosure) for c-Class blade systems 4 (System) for all other systems</p> <p>Note: When ImpactedDomain is 3 (Enclosure) the properties indicated with (*) below will be populated.</p>
BladeBay *	HP_BladeCSLocation.LocationInformation[0]
BladeName *	HP_ComputerSystem.Name
EnclosureName *	HP_BladeEnclosureCS.Name
RackName *	Rack name, if one exists.
RackUID *	Rack Unique Identifier, if one exists.
SystemVirtualSerialNumber	Conditional property containing the virtual system serial number string when running in a Virtual Connect environment.

Property Name	Property Implementation
SystemVirtualUUID	Conditional property containing the virtual system UUID when running in a Virtual Connect environment.