Temperature Sensor Instance Provider

provider overview

description

The Temperature Sensor Provider is a Web-Based Enterprise Management (WBEM) instance provider. On HP 9000 and HP Integrity ® systems running a supported version of HP-UX, the Temperature Sensor Provider retrieves information related to the ambient temperature in the system. The Temperature Sensor Provider allows any client program, compliant with the CIM 2.9 Schema, to query for information about the managed system's temperature sensors.

It implements the sensor related CIM classes, proposed in the DMTF CIM 2.9 revision. In addition to the properties that belong to the standard CIM classes, the Temperature Sensor Instance Provider provides information that is specific to HP Servers, by implementing HP-specific CIM classes, derived from the standard DMTF classes.

The following MOF class is handled by this Provider:

- HP_NumericSensor

In addition, the Temperature Sensor Provider also implements association classes to associate the instances of the CIM class mentioned above. These include:

- HP_SystemSensor: This class identifies which instance of HP_ComputerSystem contains which instance of HP_NumericSensor
- HP_MemberOfSystemTemperatureCollection: This Class identifies which instance of HP_NumericSensor is associated with which instance of Hp_SystemTemperatureCollection.

The MOF classes mentioned above (i.e. all MOF classes prefixed with "HP_") are HP-specific extensions to the CIM Schema, and are registered in the "root/cimv2" namespace.

For all the MOF classes mentioned above, the Temperature Sensor Provider supports the following standard CIM Operations:

- enumerateInstanceNames()
- enumerateInstances()
- getInstance()

The following CIM operations are not supported by the Temperature Sensor Provider:

- createInstance()
- deleteInstance()
- modifyInstance()

The Temperature Sensor Provider is not a CIM Method Provider, and does not support extrinsic method invocation on instances on any of the MOF classes mentioned above. The invocation of any of these methods will result in a CIM_ERR_NOT_SUPPORTED exception.

requirements

The Temperature Sensor provider is included in the SysFaultMgmt bundle. For the list of software requirements of SFM, see the SFM Release Notes at: http://docs.hp.com/en/diag

release history

This provider will be available in the March 2008 release of SysFaultMgmt.

supported managed resources

This provider provides information about ambient temperature sensors, and attributes for the same including details like the current temperature.

Please note that the Temperature Sensor Instance Provider provides only the information about the above resources. It does not provide any management, diagnostic or configuration capabilities for the above resources.

setting up this provider

installing this provider

The installation of the bundle SysFaultMgmt will set up this provider.

For the list of software requirements for using this provider, see the SFM Release Notes at:
http://docs.hp.com/en/diag

The complete installation procedure along with verification instructions are available at http://docs.hp.com/en/diag

On installation, the shared-library files, executable binaries, configuration files and MOF definition and registration files will be available in the /opt/sfm/ directory, as follows:

- The provider library is libsfmproviders.1. This is available in /opt/sfm/lib/, along with all the other libraries it uses to implement the Temperature Sensor Instance provider. A symbolic link is made in /opt/wbem/providers/lib/libsfmproviders.sl to link to the libsfmproviders.1 library in /opt/sfm/lib/.

- The CIM MOF files, containing the definitions of the HP-specific MOF classes, (namely HP_NumericSensor.mof) will be available in /opt/sfm/schemas/mof. This directory will also include the provider registration file, namely SFMProviderR.mof. Note: All the HP-specific MOF classes will be registered under the “root/cimv2” namespace.

- The /var/opt/sfm/conf/ directory will contain the (XML) configuration files of the SFM product.

- The /opt/sfm/msgcat/ directory will contain the catalog files for all the supported locales. (This is used for the localization of the message strings in Temperature Sensor Instance Provider).

- The /var/opt/sfm/log/ directory will contain log files generated during the execution of the Temperature Sensor Instance Provider.

For a list of supported platforms, see the SFM Release Notes at:
http://docs.hp.com/en/diag

Configuring this provider

Temperature Sensor Instance Provider uses a common configuration file along with other SFM providers. So editing the configuration file will affect the other providers as well. The configuration file can be found in – /var/opt/sfm/conf/FMLoggerConfig.xml

The file specifies the logging threshold severity and the location of the log-file. The contents of the file are as follows:

```
<SFMConfig>
    <LoggerConfig>
              <Severity> WARNING </Severity>
              <Target> /var/opt/sfm/log/sfm.log </Target>
       </LoggerConfig>
</SFMConfig>
```

In order to change the logging configuration, the following steps are to be

followed:

1. Edit the configuration file /var/opt/sfm/conf/FMLoggerConfig.xml to change the threshold logging level and/or target.

a) **Threshold**: Possible values are (in increasing severity)

INFORMATIONAL

WARNING

ERROR

CRITICAL

NOTE The INFORMATIONAL logging severity will generate a lot of log messages. It is strongly advised not to use this severity level for a long time, for the generated log files may use a lot of disk space. The default (and recommended) threshold in the runtime environment is WARNING.

b) **Target**: Possible values include:

(i) STDOUT: All log messages are delivered to console.

(ii) The complete path to the file where the log messages are to be written.

NOTE: The current implementation of the logging mechanism assumes that the path to the log file (target specified in the configuration file) already exists. i.e., if the target is specified as "/abc/def/ghi.log", the path "/abc/def/" should already exist, and should be writeable by root user.

2. Run /opt/sfm/bin/sfmconfig program to specify the changed configuration file. i.e.

$ /opt/sfm/bin/sfmconfig /var/opt/sfm/conf/FMLoggerConfig.xml

Note that the complete path of the configuration file must be provided to the smconfig program.

using this provider

schema supported by this provider

The “Description” section explains in brief the different MOF classes supported by the Temperature Sensor Instance Provider. The following tables list all the supported properties corresponding to these MOF classes, along with the properties inherited from the standard CIM MOF classes, as per CIM 2.9 schema specifications.

Note:

1. **All key properties corresponding to the CIM classes are supported by the Temperature Sensor Instance Provider.**
2. **All non-key properties that are not supported by the Temperature Sensor Instance Provider are not listed below**

Table 1: HP_NumericSensor Properties (Logical Information):
Table 1 describes the properties of the HP_NumericSensor CIM class. It has three columns. The first is the property name (including type and units), the second is the property inheritance (indicating which class or superclass defines the property), and the third is the property’s value and data source. Each row describes a property.

Property Name	**Property Inheritance**	**Property Value**
String Caption	Inherited from CIM_ManagedElement	“Temperature Sensor *n*” where *n* represents the number of the temperature sensor instance (The Sensor Number).
String Description	Inherited from CIM_ManagedElement	“Temperature Sensor *n* detects for *NumericSensorType*. *StatusDescription*.” where *n* represents the number of the temperature sensor instance, *NumericSensorType* represents the value of NumericSensorType and *StatusDescription* represents the value of StatusDescriptions[0].

String ElementName	Inherited from CIM_ManagedElement	"Temperature Sensor *n*" where *n* represents the Sensor Number
uint16 OperationalStatus[];	Inherited from CIM_ManagedSystemElement	2 (OK) – if temperature reported by the sensor is within normal operating range; 2 (OK) – if temperature reported by the sensor has exceeded its non-critical threshold and has set fans to full speed; 6 (Error) – if temperature reported by the sensor has exceeded its threshold and the system is gracefully shutting down
uint16 StatusDescriptions[0]	Inherited from CIM_ManagedSystemElement	"Temperature reported by the sensor is within normal operating range" – if temperature reported by the sensor is within normal operating range; "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; "Temperature reported by the sensor has exceeded its threshold and the system is gracefully shutting down" – if OperationalStatus is 6 (Error)
uint16 HealthState	Inherited from CIM_ManagedSystemElement	5 (OK) – if OperationalStatus[0] value is 2 (OK); 20 (Major Failure) – if OperationalStatus[0] value is 6 (Error)
String Name	Inherited from CIM_ManagedSystemElement	"Temperature Sensor *n*" where *n* represents the sensor number
String CreationClassName	Inherited from CIM_LogicalDevice	Is always set to "HP_NumericSensor
String DeviceID	Inherited from CIM_LogicalDevice	Contains the sensor record ID which is an Unique identifier for this temperature sensor instance
String SystemCreationClassName	Inherited from CIM_LogicalDevice	Is set to HP_ComputerSystem.CreationClassName
String SystemName	Inherited from CIM_LogicalDevice	Is set to the name of the server i. e. HP_ComputerSystem.Name
Uint16_t EnabledDefault	Inherited from CIM_EnabledLogicalElement	Is set to 2 indicating Enabled.
Uint16_t EnabledState	Inherited from CIM_EnabledLogicalElement	Is set to 5 indicating Not Applicable
Uint16_t RequestedState	Inherited from CIM_EnabledLogicalElement	Is set to 12 indicating not Available
uint16 HealthState	Inherited from CIM_ManagedSystemElement	5 (OK) – if OperationalStatus[0] value is 2 (OK); 20 (Major Failure) – if OperationalStatus[0] value is 6 (Error)
String Name	Inherited from CIM_ManagedSystemElement	"Temperature Sensor *n*" where *n* represents the sensor number
String CreationClassName	Inherited from CIM_LogicalDevice	Is always set to "HP_NumericSensor
String DeviceID	Inherited from CIM_LogicalDevice	Contains the sensor record ID which is an Unique identifier for this temperature sensor instance
String SystemCreationClassName	Inherited from CIM_LogicalDevice	Is set to HP_ComputerSystem.CreationClassName

String SystemName	Inherited from CIM_LogicalDevice	Is set to the name of the server i. e. HP_ComputerSystem.Name
Uint16_t EnabledDefault	Inherited from CIM_EnabledLogicalElement	Is set to 2 indicating Enabled.
Uint16_t EnabledState	Inherited from CIM_EnabledLogicalElement	Is set to 5 indicating Not Applicable
Uint16_t RequestedState	Inherited from CIM_EnabledLogicalElement	Is set to 12 indicating not Available
uint16 SensorType	Inherited from CIM_Sensor	Is set to 2 indicating type of sensor is Temperature Sensor
String CurrentState	Inherited from CIM_Sensor	Is set to “Normal” – if OperationalStatus[0] is 2 (OK); “Critical” – if OperationalStatus[0] is 6 (Error);
String[] PossibleStates	Inherited from CIM_Sensor	This array of strings can have the following values Array can contain any of the following values: PossibleStates[9] = ”Normal”; PossibleStates[3] = “Critical”;
Sint32 CurrentReading	Inherited from CIM_Sensor	Indicates Current reading of temperature sensor.
Uint16 BaseUnits	Inherited from CIM_Sensor	Indicates the Units in which the temperature reading in CurrentReading, lower critical etc should be interpreted. Value 2 indicates deg C 3 Indicates deg F 4 indicates deg K
Uint16 RateUnits	Inherited from CIM_Sensor	Is set to 0 indicating unspecified.
Sint32 UnitModifier	Inherited from CIM_Sensor	Is set to 0 indicating unspecified.
Uint16[] SupportedThresholds	Inherited from CIM_Sensor	SupportedThresholds[0] = 1 (UpperThresholdNonCritical) 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.
Uint16[] SettableThresholds	Inherited from CIM_Sensor	Is always empty
Sint32 UpperThresholdNonCritical	Inherited from CIM_Sensor	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.
Sint32 UpperThresholdCritical	Inherited from CIM_Sensor	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.
Sint32 UpperThresholdFatal	Inherited from CIM_Sensor	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.
Uint16 NumericSensorType	Part of HP_NumericSensor	Enumeration describing the type of temperature sensor 0:Unknown 1:Other 2:System Board 3: Host System board 4:I/O board 5:CPU board 6:Memory board 7:Storage bays 8:Removable Media Bays 9:Power Supply Bays 10:Ambient / External / Room 11:Chassis 12:Bridge Card 13:Management board 14:Remote Management Card 15:Generic Backplane 16:Infrastructure Network 17:Blade Slot in Chassis/Infrastructure 18:Front Panel 19:Back Panel 20:IO Bus 21:Peripheral Bay 22:Device Bay 23:Switch

Table 2: HP_SystemSensor properties
Table 2 describes the properties of the HP_SystemSensor class. It has three columns. The first is the property name (including type and units), the second is the property inheritance (indicating which class or superclass defines the property), and the third is the property's value and data source. Each row describes a property.

PropertyName	***Property Inheritance***	***(Property Value (and Data source)***
HP_ComputerSystem REF GroupComponent	Part of HP_SystemSensor	The instance of HP_ComputerSystem that contains this sensor
HP_NumericSensor REF PartComponent	Part of HP_SystemSensor	The HP_NumericSensor instance.

Table 3: HP_MemberOfSystemTemperatureCollection Properties (Logical Information):
Table 3 describes the properties of the HP_MemberOfSystemTemperatureCollection CIM class. It has three columns. The first is the property name (including type and units), the second is the property inheritance (indicating which class or superclass defines the property), and the third is the property's value and data source. Each row describes a property

PropertyName	***Property Inheritance***	***(Property Value (and Data source)***
HP_SystemTemperatureCollection REF Collection	Part of HP_MemberOfSystemTemperatureCollection	The Collection that aggregates members.
HP_NumericSensor REF Member	Part of HP_MemberOfSystemTemperatureCollection	The aggregated member of the Collection.

Links to more information

- WBEM information
  For a CIM tutorial, go to http://www.wbemsolutions.com/tutorials/CIM/

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