



hp WBEM solutions



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data sheet

SFM Indication Provider

Provider Overview

Common Information Model (CIM) indication provider delivers events generated by native Web Based Enterprise Management (WBEM) monitors.

Description

SFM Indication Provider is a CIM indication provider. SFM Indication Provider for WBEM provider enables CIM clients to subscribe for, and indication consumers to receive indications that are generated by native WBEM monitors.

When any event is generated by the native monitors, the SFM Indication Provider constructs an indication class from the data received in the event and delivers it as an indication through the Common Information Model Object Manager (CIMOM).

The SFM Indication Provider generates indications for events generated by the following native WBEM monitors.

For Itanium Processor Family servers

- CMC (CMC_IndicationProviderIA)
- Memory (MemoryIndicationProviderIA)
- Chassis Code (CPE_IndicationProviderIA)

Requirements

This provider generates indications of type HP_DeviceIndication.
The Provider requires HPUX WBEM Services version A.02.00.09 or later.

Release history

June 2006 release is the first release of this provider.

Supported managed resources

Provides Indications by processing the events from CMC_IndicationProviderIA, MemoryIndicationProviderIA and CPE_IndicationProviderIA

Setting up this provider

The installation scripts do all the necessary setup. No special setup is required.

Installing this provider

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

Ensure HPWBEM services V A.02.00.09

Use swinstall to install the product: "Swinstall -s *Fully_Qualified_Depot_Name* SysFaultMgmt"

The SFM Indication Provider is contained within the bundle chosen above as a product which includes:

- Schema MOF files: MOF classes HP_AlertIndication, HP_HardWareIndication and HP_DeviceIndication in /opt/sfm/schemas/mof/HP_DeviceIndication.mof
- Provider registration MOF file: SFMProviderR.mof in /opt/sfm/schemas/mof/.
- Provider module shared library: libsfmproviders.1 in /opt/sfm/lib, and is the target of the symbolic link – also a delivered file; in /opt/wbem/providers/lib.
- Provider catalog: SFMIndicationProvider.cat in /opt/sfm/msg/C/.
- Provider configuration file FMLoggerConfig.xml
- The SFM Provider is registered to support the "root/cimv2" namespace as an indication provider.

The thresholds for generating events are configurable for each client. All clients use the event thresholds specified in the throttling config files.

For more information see the System Fault Management Administration guide at <http://docs.hp.com/en/diag>

NOTE: SFM Indication Provider is one of the providers under SFMProviderModule.

Configuring this provider

SFM Indication Provider uses a common configuration file for logging along with other SFM providers. So editing the configuration file will affect the other two providers as well. The configuration file FMLoggerConfig.xml can be found in /opt/sfm/conf/.

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> <!-- Possible Values are INFORMATIONAL, WARNING, ERROR,
CRITICAL, STOPLOGGING -->
    <Target> /opt/sfm/log/sfm.log </Target>
    <FileSize> 20480 </FileSize> <!-- sets the max. file size in KB. Min allowed value 2KB, Max allowed
value , 1048576 KB (1 GB) -->
    <NBackupFiles> 3 </NBackupFiles> <!-- Number of files to roll over. Min allowed value 1, Max
allowed value 10 -->
  </LoggerConfig>
</SFMConfig>
```

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

1. Edit the configuration file /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 information. It is advisable not to use it for a long time as it may use a lot of disk space. The best threshold in the running environment will be ERROR. The default logging level 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

c) **FileSize:** This field defines the maximum size of the logging file to the logging subsystem.

d) **NBackupFiles:** When the logging file reaches the maximum file size defined by "FileSize" tag, the logging subsystem takes the backup of the current log file and then truncates it. This variable defines how many backup files will be preserved by logging subsystem.

2. Run /opt/sfm/bin/sfmconfig command, to specify the changed configuration file. For example

```
$ /opt/sfm/bin/sfmconfig -c /opt/sfm/conf/FMLoggerConfig.xml
```

Note that the complete path of the configuration file must be provided to the sfmconfig command.

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.

Using this provider

Any HP WBEM services 2.00.09 compliant client will be able to use the MOF classes supported by the provider.

Schema supported by this provider

This Provider services HP_DeviceIndication and is compliant with CIMSchema V2.7.2 Table 1 shows the properties of HP_DeviceIndication that are supported by the provider.

Clients are expected to subscribe to this provider using a CIMClient and also write an appropriate WBEM consumer to consume the indications generated by SFM Indication Provider.

Methods given by this provider

This Provider currently does not provide any method.

Indications generated by this provider.

HP_DeviceIndication.

Table 1: HP_DeviceIndication and base classes' supported properties. (Properties that are not supported are not mentioned.)

Property name	Property inheritance	Property value (and data source)
String IndicationIdentifier	Inherited from CIM_Indication	A unique identifier for the Indication similar to a key value in that it can be used for identification of the indication.
String[] CorrelatedIndications	Inherited from CIM_Indication	A list of IndicationIdentifiers whose notifications are correlated with (related to) this one.
Datetime IndicationTime	Inherited from CIM_Indication	The time and date of creation of the Indication.
String Description	Inherited from CIM_AlertIndication	A short description of the Indication.
String AlertingManagedElement	Inherited from CIM_AlertIndication	The identifying information of the entity (ie, the instance) for which this Indication is generated. <ul style="list-style-type: none"> 1. For cpu monitor the Alerting Managed Element is formed using the physical location of the processor chip. 2. For cpe monitor the Alerting Managed Element is null. 3. For memory monitor the Alerting Managed Element is formed using the physical location of the DIMM.
UInt16 AlertType	Inherited from CIM_AlertIndication	Primary classification of the Indication. <ul style="list-style-type: none"> 1 - Other 2 - Communications Alert 3 - Quality of Service Alert 4 - Processing Error 5 - Device Alert 6 - Environmental Alert 7 - Model Change 8 - Security Alert Indications from SFM Indication Provider belong to Device Alert.
String OtherAlertType	Inherited from CIM_AlertIndication	A string describing the Alert type - used when the AlertType property is set to 1(Other). This property is set to false.
UInt16 PerceivedSeverity	Inherited from CIM_AlertIndication	An enumerated value that describes the severity of the AlertIndication from the notifier's point of view. <ul style="list-style-type: none"> 0 - Unknown 1 - Other 2 - Information 3 - Degraded/Warning

		<p>4 - Minor</p> <p>5 - Major</p> <p>6 - Critical</p> <p>7 - Fatal/NonRecoverable</p>
String OtherSeverity	Inherited from CIM_AlertIndication	Holds the value of the user defined severity value when "PerceivedSeverity" is 1(Other).
UInt16 ProbableCause	Inherited from CIM_AlertIndication	An enumerated value that describes the probable cause of the situation which resulted in the AlertIndication.
String ProbableCauseDescription	Inherited from CIM_AlertIndication	Provides additional information related to the ProbableCause.
UInt16 Trending	Inherited from CIM_AlertIndication	<p>Provides information on trending.</p> <p>0 - Unknown</p> <p>1 - Trending Up</p> <p>2 - Trending down</p> <p>3 - No change</p> <p>This is set to False in SFM Indication Provider.</p>
String[] RecommendedActions	Inherited from CIM_AlertIndication	Free form descriptions of the recommended actions to take to resolve the cause of the notification.
String EventID	Inherited from CIM_AlertIndication	An instrumentation or provider specific value that describes the underlying "real-world" event represented by the Indication.
Datetime EventTime	Inherited from CIM_AlertIndication	The time and date the underlying event was first detected.
String SystemCreationClassName	Inherited from CIM_AlertIndication	The scoping System's CreationClassName for the Provider generating this Indication. This is set to "CIM_ComputerSystem"
String SystemName	Inherited from CIM_AlertIndication	The scoping System's Name for the Provider generating this Indication.
String ProviderName	Inherited from CIM_AlertIndication	<p>The name of the Provider generating this Indication. This property can have on of the following values:</p> <ol style="list-style-type: none"> 1. CMC_IndicationProviderIA 2. CPE_IndicationProviderIA 3. MemoryIndicationProviderIA
String Summary	Inherited from HP_AlertIndication	Short description of the reason for the indication.
String[] RelatedIndications	Inherited from HP_AlertIndication	The list of IndicationIdentifiers whose notifications are caused by this one. This indication is the root-cause of the indications in this list. This is set to False currently.
String[] RootCauseIndications	Inherited from HP_AlertIndication	The list of IndicationIdentifiers whose notifications are the root-cause of this indication. This is set to False

Uin32 EventCategory	Inherited from HP_AlertIndication	currently. Category for the event. This is a value map which is intended to be used by the consumer to group events. Some of the values for this are as follows: 0 - Unknown 1 - Other 2 - Processor 3 - Memory 4 - System Hardware And so on.
String OtherEventCategory	Inherited from HP_AlertIndication	A string defining other values for "EventCategory".
Uin32 EventSubCategory	Inherited from HP_AlertIndication	Sub-category for the event. This sub-category is intended to be used by the consumer in conjunction with "EventCategory" to provide additional granularity to group events. Some of the values for this are as follows: 0 - Unknown 1 - Other 2 - instruction cache 3 - data cache 4 - level 2 cache And so on.
String OtherEventSubCategory	Inherited from HP_AlertIndication	A string defining other values for "EventSubCategory".
Uin32 EventThreshold	Inherited from HP_AlertIndication	Identifies the number of indications that need to occur as part of the internal provider throttling configured for this event. The value for this is got from throttling config applicable for the event.
Uin32 EventTimeWindow	Inherited from HP_AlertIndication	Identifies the time window during which "EventThreshold" events need to occur as part of the internal provider throttling configured for this event. Time is in minutes. 0 means any amount of time. The value for this is got from throttling config applicable for the event.
Uin32 ActualEventThreshold	Inherited from HP_AlertIndication	Identifies the number of indications that have occurred to meet the internal provider throttling configured for this event. The value for this is got from throttling config applicable for the event.
Uin32 ActualEventTimeWindow	Inherited from HP_AlertIndication	Identifies the time window during which the "ActualEventThreshold" events have occurred to meet the internal provider throttling configured for this event. Time is in minutes. 0 means any amount of time.
String Query	Inherited from HP_AlertIndication	The query expression that defines the condition(s) that was met by this Indication. This is set to false currently.
Boolean ClusterWideEvent	Inherited from HP_AlertIndication	Indicates whether this event is of interest to all cluster members. This is set to false currently.

String ProviderVersion	Inherited from HP_AlertIndication	The version of the provider generating this indication. Same as the bundle version of SysFaultMgmt.
String InformationURL	Inherited from HP_AlertIndication	URL where the user should go for the latest information related to this indication. <ol style="list-style-type: none"> 1. For cpu monitor the url is http://docs.hp.com/hpux/content/hardware/ems/cmc_em.htm . This url lists the EMS events, which has a one-to-one mapping to the events generated by the cpu monitor. 2. For cpe monitor the url is http://docs.hp.com/hpux/content/hardware/ems/cpe_em.htm . This url lists the EMS events, which has a one-to-one mapping to the events generated by the cpe monitor. 3. For memory monitor the url is http://docs.hp.com/hpux/content/hardware/ems/memory_ia64.htm. This url lists the events, which has a one-to-one mapping to the events generated by the memory monitor.
String[] ActionURLs	Inherited from HP_AlertIndication	URLs where the user should go to launch tool that will provide information functionality that will allow the user to perform the recommended action for this indication. The tool most likely to help should be listed first in the array, then next most likely, and so on.
String[] ActionURLDescriptions	Inherited from HP_AlertIndication	Description of the URLs listed in the ActionURL.
UInt16 OSType	Inherited from HP_AlertIndication	The type of OS on the system generating the indication as a value-map. The value for this property is 8 (HP-UX).
String OSVersion	Inherited from HP_AlertIndication	Version of the OS on the system generating the indication.
String[] NetworkAddresses	Inherited from HP_AlertIndication	Array of ALL the network addresses of the system generating the indication.
String SystemFirmwareVersion	Inherited from HP_AlertIndication	Array of versions of firmware on the system generating the indication.
String SystemSerialNumber	Inherited from HP_AlertIndication	Serial number of the system generating the indication.
String SystemModel	Inherited from HP_AlertIndication	Model of the system generating the indication.
String UserComment	Inherited from HP_AlertIndication	User comment information associated with the indication This is set to false currently.
String[] VariableNames	Inherited from HP_AlertIndication	Array of variable names for information that is associated with this indication, but cannot be described by the other properties of the indication. The names are correlated with the variable's types and values in the "VariableTypes" and "VariableValues" arrays. Each

entry is related to the entries in the other arrays that are located at the same index.

1. For cpu monitor the following names are filled up in the variableNames array.
 - Number_Of_Errors - Number of errors on the processor(Int converted to string.)
 - Time_Window – The time window in minutes. (Int converted to string)
 - LID – Lid of the processor in error. (Uint64_t converted to string)
 - CompanionLid'n', n ranges from 0 - NumberOfCompanionLids
 - PhysicalLocation'n', n ranges from 0 – NumberOfCompanionLids. (physical location string)
 - NumberOfCompanionLids – number of companion cores. (int converted to string)

For Memory Monitor and for Double Bit Errors, additional fields of type string are filled for specifying the properties of the second DIMM. The names of the variables are

- 1) PhysicalLocation1
- 2) PartNumber1
- 3) SerialNumber1
- 4) Manufacturer1

UInt16[] VariableTypes

Inherited from
HP_AlertIndication

Array of variable types defined as an enumerated value.

- 1 - string
- 2 - datetime
- 3 - uint8
- 4 - uint16
- 5 - uint32
- 6 - uint64
- 7 - sint8
- 8 - sint16
- 9 - sint32
- 10 - sint64
- 11 - real32
- 12 - real64
- 13 - char16
- 14 – Boolean

1. For cpu monitor all values are of type string.

String[] VariableValues

Inherited from
HP_AlertIndication

Array of variable values to be used in conjunction with "VariableTypes" and "VariableNames" to reconstruct the information

UInt16 AlertingElementFormat

Inherited from
HP_AlertIndication

The format of the AlertingManagedElement property is interpretable based upon the value of this property.
0 – Unknown

		1 – Other 2 – CIMObjectPath This property is has the value 2 as AlertingManagedElement reported by SFM Indication Provider is a CIMObjectPath.
String OtherAlertingElementFormat	Inherited from HP_AlertIndication	A string defining other values for "AlertingElementFormat". This property is set to false currently.
String HWPartNumber	Inherited from HP_HardwareIndication	Part number for the hardware generating the indication.
String[] HWFirmwareVersion	Inherited from HP_HardwareIndication	Array of versions of firmware for the hardware associated with the indication.
String HWManufacturer	Inherited from HP_HardwareIndication	Manufacturer of the hardware associated with the indication.
String[] HWLogicalLocation	Inherited from HP_HardwareIndication	Array of ALL the logical locations of the hardware associated with the indication.
String HWPhysicalLocation	Inherited from HP_HardwareIndication	Physical location of the hardware associated with the indication.
String[] HWSerialNumber	Inherited from HP_HardwareIndication	Array of all the serial numbers of the hardware associated with the indication.
String DeviceModel	HP_DeviceIndication	Model of the device generating the indication.
String[] DeviceControllerLogicalLocation	HP_DeviceIndication	Array of ALL the logical locations of the controller of the device associated with the indication.
String DevicePermanentName	HP_DeviceIndication	The permanent, system unique, name of the device, encoded as a string parameter. The name string is formatted per the DevicePermanentNameFormat property.
Uint16 DevicePermanentNameFormat	HP_DeviceIndication	The format of the DevicePermanentName property is interpretable based upon the value of this property. 0 - Unknown 1 - Other 2 - WorldWideName 3 – MACAddress This property is set to value 2.
String OtherPermanentNameFormat	HP_DeviceIndication	A string defining other values for "DevicePermanentFormat". This property is set false currently.

For more information refer to the following:

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

- For information about HP WBEM Services for HP-UX, see <http://software.hp.com> and <http://www.hp.com> in Network and Systems Management.
- For an overview of the indication schema go to <http://www.openpegasus.org/uploads/40/3452/WBEMIndications.pdf>
- **For writing indication consumers go to** <http://www.openpegasus.org/pp/doc.tpl?CALLER=index.tpl&gid=3550>
- For writing Java clients go to <http://www.openpegasus.org/pp/doc.tpl?CALLER=index.tpl&gid=3314>
- For information see System Fault Management Administrator's guide available at <http://docs.hp.com/en/diag>

- **Managed resource documentation**
 - See event listings for supported native WBEM monitors under
 - **CMC_IndicationProviderIA:** http://docs.hp.com/hpux/onlinedocs/diag/ems/cmc_em.htm
 - MemoryIndicationProviderIA: http://docs.hp.com/hpux/onlinedocs/diag/ems/memory_ia64.htm
 - CPE_IndicationProviderIA: http://docs.hp.com/en/diag/ems/cpe_em.htm

- **Client information**

None.

- **Support contacts**

The SFM Indication Provider is supported as part of HP-UX SFM

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