



## EMSWrapper Provider

### provider overview

CIM Indication Provider for wrapping EMS events.

### Description

EMS wrapper provider is a CIM indication provider. EMS wrapper for WBEM provider enables WBEM clients to subscribe for, and indication consumers to receive indications, which wrap events that are generated by EMS monitors.

When any EMS event is generated, the EMS Wrapper provider constructs an indication class from the data received in the EMS event and delivers it as an indication through the HP-UX WBEM services.

The EMS to WBEM wrapper provider generates indications for Events generated by the following monitors.

For PA-RISC servers

- LPMC (lpmc\_em)
- Memory (dm\_memory)
- Core HW (dm\_Core\_hw and ia64\_core\_hw)
- Chassis Code (dm\_chassis)
- disk\_em (disk\_em)
- ha\_disk\_array (ha\_disk\_array)
- fpl\_em (fpl\_em)

For Itanium Processor Family servers

- CMC (cmc\_em)
- Memory (memory\_ia64)
- Core HW (ia64\_corehw)
- Chassis Code (cpe\_em)
- disk\_em (disk\_em )
- ha\_disk\_array (ha\_disk\_array)
- fpl\_em (fpl\_em)

### Requirements

This provider generates indications of type HP\_DeviceIndication.

The Provider requires

1. HP WBEM Services for hp-ux version A.02.00 or later.
2. OnlineDiag containing EMS V4.0 or later.

### Release history

This provider will be made available via web release in Aug 2004.

### Supported managed resources

Managed systems running Event Monitoring Service.

### 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 2.0+ and OnlineDiag containing EMS V 4.0+ are already installed.

Use swinstall to install the product: "Swinstall -s Fully\_Qualified\_Depot\_Name SysFaultMgmt"

The EMSWrapper 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: EMSWrapperProviderR.mof in /opt/sfm/schemas/mof/.
- Provider module shared library: libEMSWrapperProvider.1 in /opt/sfm/lib, and is the target of the symbolic link – also a delivered file: in /opt/wbem/providers/lib.
- Provider catalog: EMSWrapper.cat in /opt/sfm/msg/C/.
- Provider configuration files emswrapperconfig.xml and FMLoggerConfig.xml
- The EMSWrapper Provider is registered to support the “root/cimv2” namespace as an indication provider.
- Monitor Client Configuration File for EMS to WBEM Wrapper Provider (.clcfg)
  - /var/stm/config/tools/monitor/wbem\_disk\_em.clcfg
  - /var/stm/config/tools/monitor/wbem\_dm\_chassis.clcfg
  - /var/stm/config/tools/monitor/wbem\_dm\_core\_hw.clcfg
  - /var/stm/config/tools/monitor/wbem\_dm\_memory.clcfg
  - /var/stm/config/tools/monitor/wbem\_ha\_disk\_array.clcfg
  - /var/stm/config/tools/monitor/wbem\_lpmc\_em.clcfg
  - /var/stm/config/tools/monitor/wbem\_ia64\_corehw.clcfg
  - /var/stm/config/tools/monitor/wbem\_cpe\_em.clcfg
  - /var/stm/config/tools/monitor/wbem\_cmc\_em.clcfg
  - /var/stm/config/tools/monitor/wbem\_memory\_ia64.clcfg

The thresholds for generating events are not configurable for each client. All clients use the event thresholds specified in these clcfg files.

## Configuring this provider

EMSWrapper Indication Provider uses a common configuration file for logging along with CPU Instance Provider and Memory Provider. 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>
    <Target> /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 /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

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/fmControl program, to specify the changed configuration file. i.e.

```
$ /opt/sfm/bin/fmControl /opt/sfm/conf/FMLoggerConfig.xml
```

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

## Using this provider

Any HP WBEM services 2.0 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 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 (could be Java/C++ client or wbemexec) and also write an appropriate WBEM consumer to consume the indications generated by EMSWrapper.

Methods given by this provider      This Provider currently does not provide any method.

Indications generated by 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 <sup>1</sup> )
Properties of CIM_Indication		
IndicationIdentifier	String	A unique identifier for the Indication similar to a key value in that it can be used for identification.
CorrelatedIndications*	String[]	A list of IndicationIdentifiers whose notifications are correlated with (related to) this one.
IndicationTime	datetime	The time and date of creation of the Indication.
Properties of CIM_AlertIndication		
Description	String	A short description of the Indication. This property corresponds to "Description of Error" field in the event notification.
AlertingManagedElement*	String	The identifying information of the entity (ie, the instance) for which this Indication is generated. The property contains the path of an instance, encoded as a string parameter - if the instance is modeled in the CIM Schema. If not a CIM instance, the property contains some identifying string that names the entity for which the Alert is generated.
AlertType	Uint16	Primary classification of the Indication.  (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)

<sup>1</sup> Unless otherwise mentioned the source of the value is in the EMSWrapper itself.

OtherAlertType*	String	A string describing the Alert type - used when the AlertType property is set to 1(Other)
PerceivedSeverity	uint16	An enumerated value that describes the severity of the AlertIndication from the notifier's point of view.  (0 - Unknown, 1 - Other, 2 - Information, 3 - Degraded/Warning, 4 - Minor, 5 - Major, 6 - Critical, 7 - Fatal/NonRecoverable)
OtherSeverity*	String	Holds the value of the user defined severity value when "PerceivedSeverity" is 1(Other).
ProbableCause	uint16	An enumerated value that describes the probable cause of the situation which resulted in the AlertIndication.
ProbableCauseDescription	String	Provides additional information related to the ProbableCause. This property corresponds to the first sub-section of the "Probable Cause/Recommended Action" field in the EMS event notification.
Trending*	uint16	Provides information on trending.  (0 - Unknown, 1 - Trending Up, 2 - Trending down, 3 - No change)
RecommendedActions	String[]	Free form descriptions of the recommended actions to take to resolve the cause of the notification. This property corresponds to the sub-sections following the first sub-section in the "Probable Cause/Recommended Action" field in the EMS event notification.
EventID	String	An instrumentation or provider specific value that describes the underlying "real-world" event represented by the Indication.
EventTime	datetime	The time and date the underlying event was first detected. This property corresponds to the field "Event time" in the EMS event notification.
SystemCreationClassName	String	The scoping System's CreationClassName for the Provider generating this Indication.
SystemName	String	The scoping System's Name for the Provider generating this Indication. This property corresponds to the "System" field of the EMS event notification.
ProviderName	String	The name of the Provider generating this Indication.
Properties of HP_AlertIndication		
Summary	String	Short description of the reason for the indication. This property corresponds to the "Summary" field in the EMS event notification.
EventCategory	uint32	Category for the event. This is a value map which is intended to be used by the consumer to group events.
OtherEventCategory*	String	A string defining other values for "EventCategory".
EventSubCategory	uin32	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.
OtherEventSubCategory*	String	A string defining other values for "EventSubCategory".
EventThreshold*	uint32	Identifies the number of indications that need to occur as part of the internal provider throttling configured for this event.
EventTimeWindow*	uint32	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.
ActualEventThreshold	uint32	Identifies the number of indications that have occurred to meet the internal provider throttling configured for this event. This property corresponds to the "Number of Events" field, if present, in the EMS Event notification.
ActualEventTimeWindow	uint32	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. This property corresponds to the field "Event Notification" in the EMS event notification.
Query*	String	The query expression that defines the condition (s) that was met by this Indication.
ClusterWideEvent	Boolean	Indicates whether this event is of interest to all cluster members.
ProviderVersion	String	The version of the provider generating this indication.
InformationURL	String	URL where the user should go for the latest information related to this indication. This property corresponds to the "Latest information on this event" field in the EMS event notification.
OSType	uint16	The type of OS on the system generating the indication as a value-map.
OSVersion	String	Version of the OS on the system generating the indication. This property corresponds to the "OS Version" field in the EMS event notification.
NetworkAddresses	String[]	Array of ALL the network addresses of the system generating the indication.
SystemFirmwareVersion	String	Array of versions of firmware on the system generating the indication. This property corresponds to the "System Firmware Version" field in the EMS event notification.
SystemSerialNumber	String	Serial number of the system generating the indication. This property corresponds to the "System Serial Number" field in the EMS event notification.
SystemModel	String	Model of the system generating the indication. This property corresponds to the "System Model Number" field in the EMS event notification.
UserComment	String	User comment information associated with the indication

VariableNames*	String[]	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.
VariableTypes*	uint16[]	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)
VariableValues*	String[]	Array of variable values to be used in conjunction with "VariableTypes" and "VariableNames" to reconstruct the information
AlertingElementFormat	uint16	The format of the AlertingManagedElement property is interpretable based upon the value of this property. (0 - Unknown, 1 - Other, 2 - CIMObjectPath)
OtherAlertingElementFormat*	String	A string defining other values for "AlertingElementFormat".
Properties of HP_HardwareIndication		
HWPartNumber*	String	Part number for the hardware generating the indication.
HWFirmwareVersion	String[]	Array of versions of firmware for the hardware associated with the indication. This property corresponds to the "Firmware Version" field in the EMS event notification.
HWManufacturer	String	Manufacturer of the hardware associated with the indication. This property corresponds to the "Inquiry Vendor ID" field in the EMS event notification.
HWLogicalLocation	String[]	Array of ALL the logical locations of the hardware associated with the indication. This property corresponds to the "Physical Device Path" field in the EMS event notification.
HWPhysicalLocation*	String	Physical location of the hardware associated with the indication.
HWSerialNumber	String[]	Array of all the serial numbers of the hardware associated with the indication. This property corresponds to the "Serial Number" field in the EMS event notification.
Properties of HP_DeviceIndication		
DeviceModel	String	Model of the device generating the indication. This property corresponds to the "DeviceModel" field in the EMS event notification.
DeviceControllerLogicalLocation	String[]	Array of ALL the logical locations of the controller of the device associated with the indication. This property corresponds to the "Physical Device Path" field in the EMS event notification from the ha_disk_array monitor.
DevicePermanentName	String	The permanent, system unique, name of the device,

		encoded as a string parameter. The name string is formatted per the DevicePermanentNameFormat property. This property corresponds to the "World Wide Name" field in the EMS event notification.
DevicePermanentNameFormat	uint16	The format of the DevicePermanentName property is interpretable based upon the value of this property. (0 - Unknown, 1 - Other, 2 - WorldWideName, 3 - MACAddress)
OtherPermanentNameFormat* <sup>2</sup>	String	A string defining other values for "DevicePermanentFormat".

## links to more information

- WBEM information
  - For a CIM tutorial, go to <http://www.dmtf.org/education/cimtutorial.php>.
  - 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&gdid=3550>
  - For writing Java clients go to <http://www.openpegasus.org/pp/doc.tpl?CALLER=index.tpl&gdid=3314>
- Managed resource documentation
  - See EMS hardware monitors under the HP-Diagnostics page <http://docs.hp.com/hpux/diag/index.html>.
  - See event listings for supported monitors under
    - lpmc\_em: [http://docs.hp.com/hpux/onlinedocs/diag/ems/lpmc\\_em.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/lpmc_em.htm)
    - dm\_memory : [http://docs.hp.com/hpux/onlinedocs/diag/ems/dm\\_memory.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/dm_memory.htm)
    - dm\_core\_hw : [http://docs.hp.com/hpux/onlinedocs/diag/ems/dm\\_core\\_hw.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/dm_core_hw.htm)
    - dm\_chassis : [http://docs.hp.com/hpux/onlinedocs/diag/ems/dm\\_chassis.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/dm_chassis.htm)
    - disk\_em : [http://docs.hp.com/hpux/onlinedocs/diag/ems/disk\\_em.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/disk_em.htm)
    - ha\_disk\_array : [http://docs.hp.com/hpux/onlinedocs/diag/ems/ha\\_disk\\_array.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/ha_disk_array.htm)
    - fpl\_em: [http://docs.hp.com/hpux/onlinedocs/diag/ems/fpl\\_em.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/fpl_em.htm)
    - cmc\_em: [http://docs.hp.com/hpux/onlinedocs/diag/ems/cmc\\_em.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/cmc_em.htm)
    - memory\_ia64 : [http://docs.hp.com/hpux/onlinedocs/diag/ems/memory\\_ia64.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/memory_ia64.htm)
    - ia64\_corehw: [http://docs.hp.com/hpux/onlinedocs/diag/ems/ia64\\_corehw.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/ia64_corehw.htm)
    - cpe\_em: [http://callahan.rose.hp.com/FMT/Products/repository/ems/cpe\\_em/CPE\\_events\\_on\\_emleverest.txt](http://callahan.rose.hp.com/FMT/Products/repository/ems/cpe_em/CPE_events_on_emleverest.txt)
    - disk\_em: [http://docs.hp.com/hpux/onlinedocs/diag/ems/disk\\_em.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/disk_em.htm)
    - ha\_disk\_array: [http://docs.hp.com/hpux/onlinedocs/diag/ems/ha\\_disk\\_array.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/ha_disk_array.htm)
  - See data sheets for supported monitors under
    - lpmc\_em: [http://docs.hp.com/hpux/onlinedocs/diag/ems/emd\\_lpmc.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_lpmc.htm)
    - dm\_memory : [http://docs.hp.com/hpux/onlinedocs/diag/ems/emd\\_mem.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_mem.htm)
    - dm\_core\_hw: [http://docs.hp.com/hpux/onlinedocs/diag/ems/emd\\_core.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_core.htm)
    - dm\_chassis : [http://docs.hp.com/hpux/onlinedocs/diag/ems/emd\\_dm\\_chassis.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_dm_chassis.htm)
    - disk\_em : [http://docs.hp.com/hpux/onlinedocs/diag/ems/emd\\_disk.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_disk.htm)
    - ha\_disk\_array : [http://docs.hp.com/hpux/onlinedocs/diag/ems/emd\\_high.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_high.htm)
    - fpl\_em: [http://docs.hp.com/hpux/onlinedocs/diag/ems/emd\\_fpl.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_fpl.htm)
    - cmc\_em : [http://docs.hp.com/hpux/onlinedocs/diag/ems/emd\\_cmc.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_cmc.htm)
    - memory\_ia64 : [http://docs.hp.com/hpux/onlinedocs/diag/ems/emd\\_mem\\_ia64.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_mem_ia64.htm)
    - ia64\_corehw : [http://docs.hp.com/hpux/onlinedocs/diag/ems/emd\\_ia64core.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_ia64core.htm)
    - cpe\_em : [http://docs.hp.com/hpux/onlinedocs/diag/ems/emd\\_cpe\\_em.htm](http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_cpe_em.htm)

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<sup>2</sup> The '\*' sign after property names indicates that the property is not supported. Such values will be returned as CIMValue NULLs.

- Client information  
None.
- Support contacts  
The EMSWrapper provider is supported as part of hp-ux System Fault Management

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<http://www.hp.com>.

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