
1 HP Insight Manager WBEM Base Server Provider Overview

Description

The HP Insight Management Web-Based Enterprise Management (WBEM) Base Server provider implements and extends CIM classes described in this document to model the base server. These classes provide computational information and capabilities and serve as an aggregation point to associate one or more elements that make up a base server, such as: Fans, PowerSupplies, Processor and Memory (Volatile and/or NonVolatile Storage).

Profile Name	Organization	Version
HP Base Server Profile (P00105)	HP WBEM TC	1.1.0
HP Base Server Physical Asset Profile (P00114)	HP WBEM TC	1.1.0
HP Software Inventory (P00127)	HP WBEM TC	1.0.1

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_ComputerSystem`
- `SMX_ComputerSystemChassis`
- `SMX_ComputerSystemPackage`
- `SMX_OperatingSystem`
- `SMX_RunningOS`
- `SMX_InstalledOS`
- `SMX_BaseServerECTP`
- `SMX_SMXSoftwareIdentity`
- `SMX_SMXInstalledSoftwareIdentity`
- `SMX_SystemFirmware`
- `SMX_SystemInstalledFirmwareIdentity`
- `SMX_SystemElementFirmwareIdentity`

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_ComputerSystem Class

The `SMX_ComputerSystem` class implements the `HP_ComputerSystem` class to model the base server. There is only one instance of `SMX_ComputerSystem` instantiated on a server.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_ManagedElement	
Caption	Computer system DNS name returned by <code>uname</code> .
Description	Computer system DNS name returned by <code>uname</code> .
ElementName	Computer system DNS name returned by <code>uname</code> .
CIM_ManagedSystemElement	
Status	Same as <code>OperationalStatus[0]</code> .
OperationalStatus	<p><code>OperationalStatus[0]</code> contains the computer system consolidated status and indicates the worst status of any connected subsystem. <code>OperationalStatus[0]</code> will contain one of the following:</p> <ul style="list-style-type: none"> 0 (Unknown) 1 (Other) 2 (OK) 3 (Degraded) 6 (Error) 10 (Stopped) <p>The status values of the subsystems that make up the overall operational status are contained in <code>OperationalStatus[1-n]</code>. See the descriptions for <code>GroupOperationalStatus</code> for the list of possible values.</p>

Property Name	Property Implementation
StatusDescriptions	<p>StatusDescriptions[0] will contain one of the following corresponding to OperationalStatus[0]:</p> <p>One or more of the subsystems that make up this computer system have an OperationalStatus value of Unknown</p> <p>One or more of the subsystems that make up this computer system have an OperationalStatus value of Other</p> <p>One or more of the subsystems that make up this computer system have an OperationalStatus value of Degraded</p> <p>One or more of the subsystems that make up this computer system have an OperationalStatus value of Error</p> <p>One or more of the subsystems that make up this computer system have an OperationalStatus value of Stopped</p> <p>The status descriptions of the subsystems that make up the overall operational status are contained in OperationalStatus[1-n]. These will be set to:</p> <p>Unknown</p> <p>OK</p> <p>Error</p> <p>Stopped</p> <p>Predictive Failure</p>
HealthState	<p>0 (Unknown)</p> <p>5 (OK)</p> <p>10 (Degraded)</p> <p>20 (Major Failure)</p>
CIM_LogicalElement	
CIM_EnabledLogicalElement	
EnabledState	5 (Not Applicable)
RequestedState	12 (Not Applicable)
EnabledDefault	2 (Enabled)
CIM_System	
CreationClassName	SMX_ComputerSystem
Roles	Computer system roles string: initialized to not set.
CIM_ComputerSystem	

Property Name	Property Implementation
OtherIdentifyingInfo	<p>OtherIdentifyingInfo[0]: <i><GUID_String></i> Where: <i><GUID_String></i> is the computer system physical GUID string.</p> <p>OtherIdentifyingInfo[1]: <i><MAC_String></i> Where: <i><MAC_String></i> is the computer system MAC address.</p> <p>OtherIdentifyingInfo[2]: <i><Model_String></i>: Where: <i><Model_String></i> is the computer system model string; and <i>Serial_Number_String</i> is the computer system physical serial number string.</p> <p>OtherIdentifyingInfo[3]: <i><Tag_String></i> Where: <i><Tag_String></i> is the computer system asset tag string.</p> <p>OtherIdentifyingInfo[4]: <i><ID_String></i> Where: <i><ID_String></i> is the computer system physical GUID string.</p> <p>OtherIdentifyingInfo[5]: <i><ProductID_String></i> Where: <i><ProductID_String></i> is SMX_ComputerSystemChassis.ProductID.</p> <p>OtherIdentifyingInfo[6]: <i><Target_String></i> Where: <i><Target_String></i> is an opaque string used by the providers.</p>

Property Name	Property Implementation
IdentifyingDescriptions	IdentifyingDescriptions[0]: CIM:GUID IdentifyingDescriptions[1]: CIM:MAC IdentifyingDescriptions[2]: CIM:Model:SerialNumber IdentifyingDescriptions[3]: CIM:Tag IdentifyingDescriptions[4] CIM:CorrelatableID IdentifyingDescriptions[5] HPQ:ProductID IdentifyingDescriptions[6] HPQ:SMXTarget
Dedicated	0 (Not Dedicated)
HP_ComputerSystem	
Name	Computer system DNS name returned by uname .
NameFormat	DNSName
PrimaryOwnerName	Computer system primary owner name string; initialized to not set.
PrimaryOwnerContact	Computer system primary owner contact string; initialized to not set.
PrimaryOwnerPager	Computer system primary owner pager string; initialized to not set.
SecondaryOwnerContact	Computer system secondary owner contact string; initialized to not set.
SecondaryOwnerName	Computer system secondary owner name string; initialized to not set.
SecondaryOwnerPager	Computer system secondary owner pager string; initialized to not set.
LocationIndicator	State of the computer system Unit Identifier (UID) LED: 0 (Unknown) 2 (On) 3 (Off) 5 (Alternating)
SerialNumber	The computer system physical serial number string.

Property Name	Property Implementation
IdentifyingNumber	The computer system physical GUID string.
Model	The computer system model string.
SMX_ComputerSystem	

1-2-1-1 Implemented Methods for SMX_ComputerSystem Class

Method Name	Method Implementation
SendTestIndication	<p>Method Parameters:</p> <p>EventID, number of test event to send:</p> <p>101 - Send Information Test Indication</p> <p>102 - Send Warning Test Indication</p> <p>103 - Send Critical Test Indication</p> <p>Return Values:</p> <p>0 - request to send indication successful</p> <p>1 - method unsupported</p> <p>2 - request to send indication failed</p> <p>3 - provider is busy processing previously requested indication, try again</p> <p>4 - EventID is not one of the defined values</p> <p>Exception: CIM_ERR_INVALID_PARAMETER - EventID is the wrong type, does not exist or other internal error.</p>

1-2-2 SMX_ComputerSystemChassis Class

The `SMX_ComputerSystemChassis` class implements the `HP_ComputerSystemChassis` class to model the physical system chassis. There is only one instance of `SMX_ComputerSystemChassis` instantiated on a server.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_PhysicalElement	
Tag	<p>Unique value for instance.</p> <p>For example:</p> <p>1</p>
CreationClassName	<code>SMX_ComputerSystemChassis</code>
ElementName	Computer system product name (model) string.

Property Name	Property Implementation
Manufacturer	Computer manufacturer string.
Model	Computer system product name (model) string.
SerialNumber	Computer system physical serial number.
UserTracking	Computer system asset tag string (writable property; persistent across reboots).
Name	Computer system product name (model) string.
Status	OK
StatusDescriptions	Description of the state of the chassis, for example System is functional.
Description	General description of the chassis For example: Physical Package for this system.
OperationalStatus	2 (OK)
PoweredOn	TRUE
CIM_PhysicalPackage	
RemovalConditions	2 (Not Applicable)
PackageType	3 (Chassis/Frame)
CIM_PhysicalFrame	
CIM_Chassis	
ChassisPackageType	See MOF for definitions. This value is retrieved from SMBIOS.
ChassisTypeDescription	See MOF for definitions. This value is retrieved from SMBIOS
RackMountable	0 (Unknown) 1 (True) 2 (False)
HP_ComputerSystemChassis	
ProductID	Computer system product ID string For example: 123456-123.
VirtualUUID[]	If Synergy is enabled, this will contain the logical UUID for the system.

Property Name	Property Implementation
VirtualSerialNumber[]	If Synergy is enabled, this will contain the logical Serial Number for the system.
SMX_ComputerSystemChassis	

1-2-3 SMX_ComputerSystemPackage Class

The `SMX_ComputerSystemPackage` class implements the `HP_ComputerSystemPackage` class and associates instances of `SMX_ComputerSystem` and `SMX_ComputerSystemChassis`. There is only one instance of `SMX_ComputerSystemPackage` instantiated on a server.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_Dependency	
CIM_SystemPackaging	
CIM_ComputerSystemPackage	
PlatformGUID	Computer system physical UUID value from SMBIOS.
HP_ComputerSystemPackage	
Antecedent	References <code>SMX_ComputerSystemChassis</code>
Dependent	References <code>SMX_ComputerSystem</code>
SMX_ComputerSystemPackage	

1-2-4 SMX_OperatingSystem Class

The `SMX_OperatingSystem` class implements the `CIM_OperatingSystem` class to model the system operating system. There is only one instance of `SMX_OperatingSystem` instantiated on a server.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_ManagedElement	
???	On Linux, first line of <code>/etc/issue</code> . On ESXi, output of <code>vmware -v</code>
Description	Output of <code>uname -v</code> .
ElementName	Output of <code>uname -s</code> .
CIM_ManagedSystemElement	

Property Name	Property Implementation
OperationalStatus	2 (OK)
StatusDescriptions	StatusDescriptions[0] will contain the value map string corresponding to OperationalStatus[0]: For example: OK
Status	OK
HealthState	5 (OK)
PrimaryStatus	1 (OK)
CIM_LogicalElement	
CIM_EnabledLogicalElement	
EnabledState	2 (Enabled)
RequestedState	0 (Unknown)
EnabledDefault	2(Enabled)
TransitioningToState	12 (Not Applicable)
CIM_OperatingSystem	
CSName	SMX_ComputerSystem.Name
CSCreationClassName	SMX_ComputerSystem.CreationClassName
Name	Output of uname -s .
CreationClassName	SMX_OperatingSystem
Version	Output of uname -r .
OtherTypeDescription	On Linux, NULL On ESXi, Embedded
OSType	On Linux, 36 (Linux) On ESXi, 39 (VM)
LocalDateTime	Current time.
LastBootUpDateTime	Time when the operating system was last booted
SMX_OperatingSystem	

1-2-5 SMX_RunningOS Class

The SMX_RunningOS class implements the CIM_RunningOS class and associates the SMX_ComputerSystem instance and an SMX_OperatingSystem instance.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_RunningOS	
Antecedent	References CIM_OperatingSystem
Dependent	References CIM_ComputerSystem
SMX_RunningOS	

1-2-6 SMX_InstalledOS Class

The SMX_InstalledOS class implements the CIM_InstalledOS class and associates the SMX_ComputerSystem instance and a SMX_OperatingSystem instance.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_InstalledOS	
PartComponent	References CIM_OperatingSystem
GroupComponent	References CIM_ComputerSystem
SMX_InstalledOS	

1-2-7 SMX_BaseServerECTP Class

The SMX_BaseServerECTP class extends the CIM_ElementConformsToProfile class and associates the Base Server registered profile with the HP specific central class that defined the implementation of the profile.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_ElementConformsToProfile	
ConformantStandard	References CIM_RegisteredProfile
ManagedElement	References CIM_ManagedElement (HP_ComputerSystem for server and network profiles, the storage computer system for storage profiles)

HP_ElementConformsToProfile

SMX_BaseServerECTP

1-2-8 SMX_SMXSoftwareIdentity Class

The SMX_SMXSoftwareIdentity implements the HP_SoftwareIdentity class to model the SMX software identification information.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_ManagedElement	
Caption	Short description of the SMX product For example: HP Standards Management eXtensions (SMX).
Description	Description of the SMX product For example: HP Standards Management eXtensions (SMX) are WBEM Providers, using DMTF standard profiles.
ElementName	hp-smx
CIM_ManagedSystemElement	
OperationalStatus	2 (OK)
StatusDescriptions	Description of the installation status of the software identity For example: SMX is installed properly
Status	OK
HealthState	5 (OK)
CIM_LogicalElement	
CIM_SoftwareIdentity	
InstanceID	Opaque string using HPQ as OrgID For example: HPQ:SMX_SMXSoftwareIdentity-1.
MajorVersion	The first numeric value in the VersionString.
MinorVersion	The second numeric value in the VersionString.

Property Name	Property Implementation
RevisionNumber	The third numeric value in the VersionString.
VersionString	Version of SMX, for example: 02.00.00.
Manufacturer	Hewlett Packard Company
Classifications[0]	5 (Instrumentation)
IsEntity	TRUE
TargetOSTypes[0]	On Linux, 36. On ESXi, 39 (VM).
IdentityInfoType[]	IdentityInfoType[0] will contain the following: CIM:SoftwareFamily IdentityInfoType[1] will contain the following: HPQ:SoftwareCategory
IdentityInfoValue[]	IdentityInfoValue[0] will contain the following: HPQ:hp-smx IdentityInfoValue[1] will contain the following: System Management
HP_SoftwareIdentity	
SMX_SMXSoftwareIdentity	

1-2-9 SMX_SMXInstalledSoftwareIdentity Class

The SMX_SMXInstalledSoftwareIdentity class implements the CIM_InstalledSoftwareIdentity class and associates the SMX_ComputerSystem instance and a SMX_SMXSoftwareIdentity instance.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_InstalledSoftwareIdentity	
InstalledSoftware	References CIM_SoftwareIdentity
System	References CIM_ComputerSystem
SMX_SMXInstalledSoftwareIdentity	

1-2-10 SMX_SystemFirmware Class

The `SMX_SystemFirmware` class implements the `HP_SoftwareIdentity` class and describes the firmware found on the server system.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_ManagedElement	
Caption	A description of the firmware. For example, on HP ProLiant: <code>System ROM Firmware-<family_code>(<state>) ()</code> where <i>family_code</i> is the system ROM family code and <i>state</i> is either Active or Redundant. For example: <code>System ROM Firmware-P31 (Active)</code> <code>System ROM Firmware-P31 (Redundant)</code>
Description	A description of the firmware.
ElementName	A description of the firmware.
CIM_ManagedSystemElement	
Name	A name for the firmware.
OperationalStatus	2 (OK)
StatusDescriptions	StatusDescriptions[0] will contain the following corresponding to OperationalStatus[0]: <code>System Firmware Status: OK</code>
HealthState	5 (OK)
CIM_LogicalElement	
CIM_SoftwareIdentity	
InstanceID	Opaque string using HPQ as OrgID For example: <code>HPQ:SMX_SystemFirmware:<n></code> Where: <code><n></code> is used to identify the instance. For example: <code>HPQ:SMX_SystemFirmware:1</code>
MajorVersion	The firmware major version.
MinorVersion	The firmware minor version.

Property Name	Property Implementation
VersionString	The firmware version.
Manufacturer	HP
Classifications	11 (Bios/FCode)
ClassificationDescriptions	System Firmware
IdentityInfoValue	<p>On HP ProLiant, this will contain: HPQ:<family_code> Where: <family_code> is the system ROM family code. For example: HPQ:P31</p> <p>On HP Integrity, this will contain: HPQ:ElementName</p>
IdentityInfoType	CIM:SoftwareFamily
ReleaseDate	<p>YYYYMMDD*****.*****</p> <p>Where: YYYY is the 4 digit year, MM is the 2 digit month, and DD is the 2 digit day</p>
SMX_SystemFirmware	

1-2-11 SMX_SystemInstalledFirmwareIdentity Class

The HP_SystemInstalledFirmwareIdentity class extends the CIM_InstalledSoftwareIdentity class and associates the HP_ComputerSystem instance and a SMX_SystemFirmware instance.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_InstalledSoftwareIdentity	
SMX_SystemInstalledFirmwareIdentity	
InstalledSoftware	References SMX_SystemFirmware
System	References HP_ComputerSystem

1-2-12 SMX_SystemElementFirmwareIdentity Class

The HP_SystemElementFirmwareIdentity class implements the HP_ElementSoftwareIdentity class and associates the HP_ComputerSystem instance and SMX_SystemFirmware instances.

The following table lists the properties implemented.

Property Name	Property Implementation
CIM_Dependency	
CIM_ElementSoftwareIdentity	
UpgradeCondition	3 (Owner Upgradeable)
ElementSoftwareStatus	<p>The ElementSoftwareStatus array will contain the following if the Antecedent refers to an instance of an Active Firmware:</p> <p>ElementSoftwareStatus[0]:</p> <p>6 (Installed)</p> <p>ElementSoftwareStatus[1]:</p> <p>2 (Current)</p> <p>The ElementSoftwareStatus array will contain the following if the Antecedent refers to an instance of a Redundant Firmware:</p> <p>ElementSoftwareStatus[0]:</p> <p>6 (Installed)</p> <p>ElementSoftwareStatus[1]:</p> <p>4 (Fallback)</p>
SMX_SystemElementFirmwareIdentity	
Antecedent	References SMX_SystemFirmware
Dependent	References HP_ComputerSystem

1-3 Supported Indications

The following table describes the properties that are common to all of the SMX Base Server Provider indications that are implemented for server platforms, where available.

The following table lists the common properties implemented.

Property Name	Property Implementation
CIM_Indication	
IndicationIdentifier	GUID string generated at the time of the indication
IndicationTime	Time of indication
CIM_AlertIndication	
EventTime	Time of the event or time of the indication if event time unknown

Property Name	Property Implementation
SystemName	SMX_ComputerSystem.Name
SystemCreationClassName	SMX_ComputerSystem.CreationClassName
HP_AlertIndication	
ProviderVersion	Provider Version in the format <i>VV.UU.FF</i> . For example: 01.05.00
NetworkAddresses	Contains a list of all the IP addresses of the computer system generating the indication
OSType	On ESX, 39 (VM) On Linux, 36 (Linux)
OSVersion	The operating system version of the computer system generating the indication in the following format: <i><major>.<minor>.<build></i>
SystemFirmwareVersion	Array of firmware versions 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

1-3-1 HP_DeviceIndication:WBEM Providers Started

The following tables describe the SMX Base Server Provider indications that are implemented for all server platforms.

Property Name	Property Implementation
CIM_Indication	
PerceivedSeverity	2 (Informational)
CIM_AlertIndication	
Description	SMX WBEM Providers have started
AlertType	5 (Device Alert)
EventID	1
ProviderName	HP WBEM
RecommendedActions	No action is recommended.
HP_AlertIndication	

Property Name	Property Implementation
Summary	WBEM Providers started
ProbableCause	1 (Other)
ProbableCauseDescription	WBEM Providers Started

1-3-2 HP_DeviceIndication: WBEM Providers Informational Test Indication

Property Name	Property Implementation
CIM_Indication	
PerceivedSeverity	2 (Informational)
CIM_AlertIndication	
Description	This is an information test event.
AlertType	5 (Device Alert)
EventID	1
ProviderName	HP Test
RecommendedActions	No action is recommended.
HP_AlertIndication	
Summary	Test Event
ProbableCause	1 (Other)
ProbableCauseDescription	Test Indication

1-3-3 HP_DeviceIndication: WBEM Providers Warning Test Indication

Property Name	Property Implementation
CIM_Indication	
PerceivedSeverity	3 (Warning)
CIM_AlertIndication	
Description	This is a warning test event.
AlertType	5 (Device Alert)
EventID	2

Property Name	Property Implementation
ProviderName	HP Test
RecommendedActions	No action is recommended.
HP_AlertIndication	
Summary	Test Event
ProbableCause	1 (Other)
ProbableCauseDescription	Test Indication

1-3-4 HP_DeviceIndication: WBEM Providers Critical Test Indication

Property Name	Property Implementation
CIM_Indication	
PerceivedSeverity	6 (Critical)
CIM_AlertIndication	
Description	This is a Critical Test Event
AlertType	5 (Device Alert)
EventID	3
ProviderName	HP Test
RecommendedActions	No action is recommended.
HP_AlertIndication	
Summary	Test Event
ProbableCause	1 (Other)
ProbableCauseDescription	Test Indication

1-3-5 HP_DeviceIndication: ASR Reboot Occurred

Property Name	Property Implementation
CIM_Indication	
PerceivedSeverity	5 (Warning)
CIM_AlertIndication	
Description	The system has rebooted from an Automatic Server Recovery (ASR) event.

Property Name	Property Implementation
AlertType	5 (Device Alert)
EventID	1
ProviderName	HP Recovery
RecommendedActions	Determine the nature of the ASR event and take corrective action.
HP_AlertIndication	
Summary	ASR reboot occurred
EventCategory	16 (System Power)
ProbableCause	111 (Timeout)
ProbableCauseDescription	ASR reboot occurred

1-3-6 HP_DeviceIndication: Thermal Reboot Occurred

Property Name	Property Implementation
CIM_Indication	
PerceivedSeverity	5 (Warning)
CIM_AlertIndication	
Description	The system has rebooted from thermal shutdown event.
AlertType	5 (Device Alert)
EventID	2
ProviderName	HP Recovery
RecommendedActions	Replace any failed or removed fans. Insure the air flow into, out of, and within the system chassis is not obstructed.
HP_AlertIndication	
Summary	Thermal reboot occurred
EventCategory	16 (System Power)
ProbableCause	15 (Temperature Unacceptable)
ProbableCauseDescription	Thermal reboot occurred

1-3-7 HP_DeviceIndication: POST Occurred

Property Name	Property Implementation
CIM_Indication	
PerceivedSeverity	5 (Warning)
CIM_AlertIndication	
Description	Power-On Self-Test errors occurred during the last system startup.
AlertType	5 (Device Alert)
EventID	3
ProviderName	HP Recovery
RecommendedActions	Determine the nature of the POST error and take corrective action.
HP_AlertIndication	
Summary	POST errors occurred
EventCategory	4 (System Hardware)
ProbableCause	8 (Configuration/Customization Error)
ProbableCauseDescription	POST Errors occurred
VariableName	VariableNames[0]: POST Error Code VariableNames[1]: POST Error String
VariableType	VariableTypes[0]: 3 (uint8) VariableTypes[1]: 1 (string)
VariableValue	VariableValues[0]: The POST error code as specified by the System ROM VariableValues[1]: The POST error string as specified by the System ROM