



HP Serviceguard Cluster WBEM Provider

Provider Overview

Description

The HP Serviceguard Cluster WBEM Provider, referred to as the SGClusterProvider, will provide current Serviceguard cluster configuration, membership, and status information to CIM clients using HP WBEM Services on HP-UX platforms. The SGClusterProvider instruments the HP_SGCluster, HP_SGNode, HP_SGParticipatingCS, HP_SGNodeIdentity, and HP_SGClusterSoftware classes. These classes are sub-classes from the standard CIM classes defined by DMTF.

The SGClusterProvider protects unauthorized users from obtaining Serviceguard specific information by using the Access Control Policy in Serviceguard A.11.17.00 and later versions. The SGClusterProvider will extract the username from the CIM request and verify with Serviceguard that the user is authorized to retrieve cluster-related information. Only root users and users who are configured with "monitor access" and greater in Serviceguard's Access Control Policy will be allowed to obtain specific Serviceguard information from the SGClusterProvider. This is only true for HP_SGCluster, HP_SGNode, HP_SGParticipatingCS, and HP_SGNodeIdentity classes.

However, the SGClusterProvider will allow both non-root and root users to access Serviceguard product information with the HP_SGClusterSoftware class, without requiring "monitor access" within Serviceguard's Access Control Policy.

OperationalStatus and Status values returned by the SGClusterProvider have been defined to maintain some consistency between the colored status icons of the Serviceguard Manager product and other CIM clients who use the SGClusterProvider (such as HP System Insight Manager). There is a standard defined in HP SIM's mapping of Operational Status values to colored icons.

The current implementation is for HP-UX only.

Requirements

The SGClusterProvider provider requires HP WBEM Services 2.00.07 and HP-UX 11i v2 or later versions.

Localization support

This provider supports localization as follows:

1. Properties with string type - All return values are formatted the same as they are retrieved from Serviceguard. Those values might be formatted in a different locale than the one found in the CIM client request. This ensures accurate reflection of the localization of the Serviceguard product (which may differ from the localization of a CIM client).
2. Exception triggered only by intrinsic method calls: The message associated with the exception is formatted in the same locale found in the CIM client request. Please see the individual method descriptions for detail about the message associated with the exception.

Comments

This provider is not supported if you run Serviceguard on any non-HP platform.

Release history	A.01.00.00 release downloadable from <i>software.hp.com</i>
Supported managed resources	Managed systems running Serviceguard and HP WBEM Services on HP-UX.

Setting up this provider

installing this provider

The SGClusterProvider is contained within the SGProviders Module. The SGProviders Module will initially contain only the HP Serviceguard Cluster WBEM Provider for HP-UX including:

HP Cluster Schema MOF file	HP_Cluster11.mof
HP Serviceguard Cluster Schema MOF file	HP_SGCluster11.mof
Serviceguard Cluster Provider registration MOF file	HP_SGClusterR.mof
Serviceguard Cluster Provider Module shared libraries	<ul style="list-style-type: none"> • For IA32: libSGProviders.sl • For IA64: libSGProviders.so

The SGClusterProvider is registered in the `root/cimv2` namespace as an instance provider. There are no special installation instructions; the SGClusterProvider will be installed with the HP Serviceguard WBEM Providers as a standard SD depot on HP-UX.

configuring this provider

This provider does not accept specific configuration adjustments (beyond standard CIM support).

Using this provider

schema supported by this provider

The SGClusterProvider supports the following classes:

- HP_SGCluster
- HP_SGNode
- HP_SGParticipatingCS
- HP_SGNodeIdentity
- HP_SGClusterSoftware

These classes are sub-classes of standard CIM classes such as `CIM_Cluster`, `CIM_ComputerSystem`, etc

Tables 1 to 6 describe the classes and properties supported by the SGClusterProvider.

Table 1: HP_SGCluster properties.

Describes the properties of the HP_SGCluster class. It has three columns. The first is the property name (including type), the second is the property inheritance (indicating which class or super class defines the property), and the third is the property value or data source. Each row describes a property.

<i>Property name</i>	<i>Property inheritance</i>	<i>Property value and data source</i>
string Caption	Inherited from CIM_ManagedElement	<u>HP-UX</u> : returns "Serviceguard Cluster".
string Description	Inherited from CIM_ManagedElement	<u>HP-UX</u> : returns "Serviceguard Cluster that manages mission critical applications".
string ElementName	Inherited from CIM_ManagedElement	<u>HP-UX</u> : not implemented.
datetime InstallDate	Inherited from CIM_ManagedSystemElement	<u>HP-UX</u> : not implemented.
uint16 OperationalStatus[]	Inherited from CIM_ManagedSystemElement	<u>HP-UX</u> : array that returns cluster summary/roll-up status that depicts the high availability status of the entire Serviceguard cluster including nodes and packages: <ul style="list-style-type: none"> • "0" for "Unknown" if the cluster status is unknown or not retrievable. • "8" for "Starting" when the cluster is starting. • "2" for "OK" if the cluster is up and is highly available. • "3" for "Degraded" if cluster is up but not highly available • "13" for "Lost Communication" if the cluster is down.
string StatusDescriptions[]	Inherited from CIM_ManagedSystemElement	<u>HP-UX</u> : not implemented
string Status	Inherited from CIM_ManagedSystemElement	<u>HP-UX</u> : returns the values: <ul style="list-style-type: none"> • "Unknown" if the cluster status is unknown or not retrievable. • "Starting" when the cluster is starting. • "OK" if cluster is up and is highly available. • "Degraded" if cluster is up but not highly available. • "Lost Comm" if the cluster is down.
uint16 EnabledState	Inherited from CIM_EnabledLogicalElement	<u>HP-UX</u> : not implemented.
string OtherEnabledState	Inherited from CIM_EnabledLogicalElement	<u>HP-UX</u> : not implemented.
uint16 RequestedState	Inherited from CIM_EnabledLogicalElement	<u>HP-UX</u> : not implemented.
uint16 EnabledDefault	Inherited from CIM_EnabledLogicalElement	<u>HP-UX</u> : not implemented.
string CreationClassName [Key]	Inherited from CIM_System	<u>HP-UX</u> : returns "HP_SGCluster". This enables client applications to determine the type of cluster represented by this sub-class of CIM_Cluster.
string Name [Key]	Override in CIM_System Inherited from CIM_ManagedSystemElement	<u>HP-UX</u> : returns the text name for the Serviceguard cluster, which does NOT represent a pingable DNS hostname.
string PrimaryOwnerName	Inherited from CIM_System	<u>HP-UX</u> : not implemented.

string PrimaryOwnerContact	Inherited from CIM_System	HP-UX: not implemented
string Roles[]	Inherited from CIM_System	HP-UX: not implemented.
string NameFormat	Override in CIM_ComputerSystem Inherited from CIM_System	HP-UX: returns "Other".
string OtherIdentifyingInfo[]	Inherited from CIM_ComputerSystem	HP-UX: not implemented.
string IdentifyingDescriptions[]	Inherited from CIM_ComputerSystem	HP-UX: not implemented.
uint16 Dedicated[]	Inherited from CIM_ComputerSystem	HP-UX: not implemented.
string OtherDedicatedDescriptions[]	Inherited from CIM_ComputerSystem	HP-UX: not implemented.
string ResetCapability[]	Inherited from CIM_ComputerSystem	HP-UX: not implemented.
uint16 PowerManagementCapabilities[]	Inherited from CIM_ComputerSystem	HP-UX: not implemented.
uint32 SetPowerState	Inherited from CIM_ComputerSystem	HP-UX: not implemented.
uint32 PowerState	Inherited from CIM_ComputerSystem	HP-UX: not implemented.
string Interconnect	Inherited from CIM_Cluster	HP-UX: not implemented.
string InterconnectAddress	Inherited from CIM_Cluster	HP-UX: not implemented.
uint16 Types[]	Inherited from CIM_Cluster	HP-UX: array that returns "2" for "Failover".
uint32 MaxNumberOfNodes	Inherited from CIM_Cluster	HP-UX: not implemented.
uint16 ClusterState	Inherited from CIM_Cluster	HP-UX: returns: <ul style="list-style-type: none"> • "0" for "Unknown" if cluster state is unknown or not retrievable. • "2" for "On-line" if the cluster is up and is highly available • "3" for "Off-line" if the cluster is down or starting • "5" for "Degraded" if cluster is up but not highly available
uint32 MembershipIncarnation	Inherited from HP_Cluster	HP-UX: returns the current membership incarnation number that uniquely identifies the cluster membership. This number increases each time the cluster membership changes.
uint32 HeartbeatInterval	Local to HP_SGCluster	HP-UX: the interval, in microseconds for sending heartbeat messages to nodes in the Serviceguard cluster.
uint32 NodeTimeout	Local to HP_SGCluster	HP-UX: the maximum amount of time to wait for heartbeat messages before a node is considered down. Expressed in microseconds.
uint32 AutoStartTimeout	Local to HP_SGCluster	HP-UX: the maximum amount of time to wait for all nodes to join the cluster. Expressed in microseconds.
uint32 NetworkPollingInterval	Local to HP_SGCluster	HP-UX: the frequency LAN cards send a message to another LAN card in order to verify its health. Expressed in microseconds.

uint32 MaxConfiguredPackages	Local to HP_SGCluster	<u>HP-UX</u> : the maximum number of packages that can be configured in the cluster.
string ClusterID	Local to HP_SGCluster	<u>HP-UX</u> : a unique ID assigned to a cluster configuration by Serviceguard in the same network. Uniqueness of Cluster ID's are not guaranteed among Serviceguard clusters running on different subnets.

Table 2: HP_SGNode properties.

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

<i>Property name</i>	<i>Property inheritance</i>	<i>Property value and data source</i>
string Caption	Inherited from CIM_ManagedElement	<u>HP-UX</u> : returns "Serviceguard Node".
string Description	Inherited from CIM_ManagedElement	<u>HP-UX</u> : returns "A node participating in a Serviceguard Cluster".
string ElementName	Inherited from CIM_ManagedElement	<u>HP-UX</u> : not implemented.
Datetime InstallDate	Inherited from CIM_ManagedSystemElement	<u>HP-UX</u> : not implemented.
uint16 OperationalStatus[]	Inherited from CIM_ManagedSystemElement	<u>HP-UX</u> : array that returns node summary/roll-up status which depicts the high availability status of the Serviceguard node including packages: <ul style="list-style-type: none"> • "0" for "Unknown" if the node status is unknown or not retrievable; • "2" for "OK" if the node is up and participates in the cluster; • "3" for "Degraded" if the node is up, but not highly available; • "13" for "Lost Communication" if the node is down;
string StatusDescriptions[]	Inherited from CIM_ManagedSystemElement	<u>HP-UX</u> : not implemented.
string Status	Inherited from CIM_ManagedSystemElement	<u>HP-UX</u> : returns the status of the node: <ul style="list-style-type: none"> • "Unknown" if the node status is unknown or cannot be retrieved; • "OK" if the node is up and participates in the cluster; • "Degraded" if the node is up but not highly available; • "Lost Comm" if node in the cluster is halted;
uint16 EnabledState	Inherited from CIM_EnabledLogicalElement	<u>HP-UX</u> : not implemented.
string OtherEnabledState	Inherited from CIM_EnabledLogicalElement	<u>HP-UX</u> : not implemented.
uint16 RequestedState	Inherited from CIM_EnabledLogicalElement	<u>HP-UX</u> : not implemented.
uint16 EnabledDefault	Inherited from CIM_EnabledLogicalElement	<u>HP-UX</u> : not implemented.
string CreationClassName [Key]	Inherited from CIM_System	<u>HP-UX</u> : returns "HP_SGNode". This enables a client to differentiate among the various possible instances of CIM_ComputerSystem.

string Name [Key]	Override in CIM_System Inherited from CIM_ManagedSystemElement	<u>HP-UX</u> : returns the Serviceguard node name which represents a fully qualified pingable DNS hostname.
string PrimaryOwnerName	Inherited from CIM_System	<u>HP-UX</u> : not implemented.
string PrimaryOwnerContact	Inherited from CIM_System	<u>HP-UX</u> : not implemented.
string Roles[]	Inherited from CIM_System	<u>HP-UX</u> : not implemented.
string NameFormat	Override in CIM_ComputerSystem. Inherited from CIM_System	<u>HP-UX</u> : always returns "IP".
string OtherIdentifyingInfo[]	Inherited from CIM_ComputerSystem	<u>HP-UX</u> : not implemented.
string IdentifyingDescriptions[]	Inherited from CIM_ComputerSystem	<u>HP-UX</u> : not implemented.
uint16 Dedicated[]	Inherited from CIM_ComputerSystem	<u>HP-UX</u> : not implemented.
string OtherDedicatedDescriptions[]	Inherited from CIM_ComputerSystem	<u>HP-UX</u> : not implemented.
string ResetCapability[]	Inherited from CIM_ComputerSystem	<u>HP-UX</u> : not implemented.
uint16 PowerManagementCapabilities[]	Inherited from CIM_ComputerSystem	<u>HP-UX</u> : not implemented.
uint32 SetPowerState	Inherited from CIM_ComputerSystem	<u>HP-UX</u> : not implemented.
uint32 PowerState	Inherited from CIM_ComputerSystem	<u>HP-UX</u> : not implemented.
string MemberName	Inherited from HP_Node	<u>HP-UX</u> : returns the Serviceguard node name that's unique to the cluster. This differs from the "Name" property since it's NOT a fully qualified hostname.
uint32 MemberID	Inherited from HP_Node	<u>HP-UX</u> : returns the Serviceguard Node ID, which uniquely identifies each member of the cluster.

Table 3: HP_SGParticipatingCS properties

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

<i>Property name</i>	<i>Property inheritance</i>	<i>Property value and data source</i>
HP_SGNode REF Antecedent [Key]	Override locally in HP_SGParticipatingCS Override in HP_ParticipatingCS Override in CIM_ParticipatingCS Inherited from CIM_Dependency	<u>HP-UX</u> : returns the reference to an instance of HP_SGNode.
HP_SGCluster REF Dependent[Key]	Override locally in HP_SGParticipatingCS Override in HP_ParticipatingCS Override in CIM_ParticipatingCS Inherited from CIM_Dependency	<u>HP-UX</u> : returns the reference to an instance of HP_SGCluster.
uint32 StateOfNode	Inherited from CIM_ParticipatingCS	<u>HP-UX</u> : not implemented.
uint32 RoleOfNode	Inherited from CIM_ParticipatingCS	<u>HP-UX</u> : not implemented.

Table 4: HP_SGClusterSoftware properties

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

<i>Property name</i>	<i>Property inheritance</i>	<i>Property value and data source</i>
CIM_Product REF Antecedent [Key]	Override in HP_ClusterSoftware Inherited from CIM_Dependency	<u>HP-UX</u> : returns the reference to an instance of CIM_Product.
HP_SGNode REF Dependent [Key]	Override locally in HP_SGClusterSoftware Override in HP_ClusterSoftware Inherited from CIM_Dependency	<u>HP-UX</u> : returns the reference to an instance of HP_SGNode.
uint32 State	Local to HP_SGClusterSoftware	<u>HP-UX</u> : returns: <ul style="list-style-type: none"> • "0" for "Unknown" if the software state information can't be retrieved; • "1" for "Running" if Serviceguard product is installed and is currently running (Cluster is configured); • "2" for "Executable" if Serviceguard product is installed but is NOT currently running (Cluster is not configured);

Table 5: HP_SGNodeIdentity properties

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

<i>Property name</i>	<i>Property inheritance</i>	<i>Property value and data source</i>
CIM_ComputerSystem REF SystemElement [Key]	Override in HP_NodeIdentity Inherited from CIM_LogicalIdentity	<u>HP-UX</u> : returns the reference to an instance of CIM_ComputerSystem.
HP_SGNode REF SameElement [Key]	Override locally in HP_SGNodeIdentity Override in HP_NodeIdentity Inherited from CIM_LogicalIdentity	<u>HP-UX</u> : returns the reference to an instance of HP_SGNode.

Table 6: Intrinsic methods for all classes

Describes the intrinsic methods supported by this provider. It has three columns. The first is the method name, the second is a description of the provider's actions based on invoking that method, and the third is a list of any exceptions that could result from invoking the method. Each row describes a method. Note that this provider supports no extrinsic methods.

<i>Method name</i>	<i>Description</i>	<i>Exceptions thrown</i>
enumerateInstances	Returns all instances of class with all supported properties and their respective values. Properties "not implemented" will not be returned.	<ul style="list-style-type: none"> • CIM_ERR_INVALID_CLASS if class doesn't exist. • CIM_ERR_FAILED if an error occurs. Please examine the message associated with the exception. • CIM_ERR_ACCESS_DENIED if user does not have local root privileges or "monitor access" configured in Serviceguard's Access Control Policy.
enumerateInstanceNames	Returns object path of all instances of class.	<ul style="list-style-type: none"> • CIM_ERR_INVALID_CLASS if class doesn't exist. • CIM_ERR_FAILED if an error occurs. Please examine the message associated with the exception. • CIM_ERR_ACCESS_DENIED if user does not have local root privileges or "monitor access" configured in Serviceguard's Access Control Policy.
getInstance	Returns a particular instance of an object specified by the Name Property.	<ul style="list-style-type: none"> • CIM_ERR_INVALID_CLASS if class doesn't exist. • CIM_ERR_INVALID_PARAMETER if incorrect keys or wrong number of keys. • CIM_ERR_NOT_FOUND if no instance exists. • CIM_ERR_FAILED if an error occurs. Please examine the message associated with the exception. • CIM_ERR_ACCESS_DENIED if user does not have local root privileges or "monitor access" configured in Serviceguard's Access Control Policy.
deleteInstance	Not Supported	CIM_ERR_NOT_SUPPORTED
createInstance	Not Supported	CIM_ERR_NOT_SUPPORTED
modifyInstance	Not Supported	CIM_ERR_NOT_SUPPORTED
initialize/ terminate	Supported	None

Links to more information

- **Additional Provider Documentation**

There is currently no additional documentation for this provider beyond this information.

- **WBEM Information**

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

For information about HP WBEM Services, see software.hp.com and hp.com (the Network and Systems Management areas).

- **Managed Resource Documentation**

For information regarding Serviceguard, go to docs.hp.com, under "high availability".

- **Support Contacts**

The SGClusterProvider is supported as part of HP WBEM Services for HP-UX.

For additional information on HP products and services, visit us at www.hp.com

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For more information, contact any of our worldwide sales offices or HP Channel Partners (in the U.S. call 1 800 637 7740).

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