PCI Device Profile

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Contents

1. Scope 5
2. Normative References 5
3. Terms and Definitions 5
   3.1. Conditional 5
   3.2. Mandatory 5
   3.3. May 5
   3.4. Optional 5
   3.5. Referencing profile 5
   3.6. Shall 6
   3.7. FQDD 6
   3.8. Interop Namespace 6
   3.9. Implementation Namespace 6
   3.10. ENUMERATE 6
   3.11. GET 6
4. Symbols and Abbreviated Terms 6
   4.1. CIM 6
   4.2. iDRAC 6
   4.3. CMC 6
   4.4. WBEM 6
5. Synopsis 6
6. Description 7
7. Implementation Description 8
   7.1. PCI Device View 9
      7.1.1. Resource URIs for WinRM® 9
      7.1.2. Operations 9
      7.1.3. Properties 9
   7.2. PCI Device Profile Profile Registration 11
      7.2.1. Resource URIs for WinRM® 11
      7.2.2. Operations 11
      7.2.3. Properties 11
8. Methods 12
9. Use Cases 12
10. CIM Elements 12
11. Privilege and License Requirement
1. **Scope**

The DCIM PCI Device Profile describes the properties and interfaces for executing system management tasks related to the management of PCI devices within a system. The profile standardizes and aggregates the description for the PCI device properties into a PCI view representation as well as provides static methodology for the clients to query the PCI views without substantial traversal of the model.

2. **Normative References**

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- DMTF DSP1033, Profile Registration Profile 1.0.0
- DMTF DSP0226, Web Services for Management (WS-Management) Specification 1.1.0
- DMTF DSP0227, WS-Management CIM Binding Specification 1.0.0 Dell Lifecycle Controller Best Practices Guide 1.0,
- [http://en.community.dell.com/techcenter/extras/m/white_papers/20066173.aspx](http://en.community.dell.com/techcenter/extras/m/white_papers/20066173.aspx)
- Dell WSMAN Licenses and Privileges 1.0
  - DCIM_PCIDeviceView.mof
  - DCIM_LCEnumeration.mof
  - DCIM_LCRegisteredProfile.mof

3. **Terms and Definitions**

For the purposes of this document, the following terms and definitions apply.

3.1. **Conditional**

Indicates requirements to be followed strictly in order to conform to the document when the specified conditions are met

3.2. **Mandatory**

Indicates requirements to be followed strictly in order to conform to the document and from which no deviation is permitted

3.3. **May**

Indicates a course of action permissible within the limits of the document

3.4. **Optional**

Indicates a course of action permissible within the limits of the document

3.5. **Referencing profile**

Indicates a profile that owns the definition of this class and can include a reference to this profile in its “Related Profiles” table
3.6. **Shall**
Indicates requirements to be followed strictly in order to conform to the document and from which no deviation is permitted

3.7. **FQDD**
Fully Qualified Device Descriptor is used to identify a particular component in a system.

3.8. **Interop Namespace**
Interop Namespace is where instrumentation instantiates classes to advertise its capabilities for client discovery.

3.9. **Implementation Namespace**
Implementation Namespace is where instrumentation instantiates classes relevant to executing core management tasks.

3.10. **ENUMERATE**
Refers to WS-MAN `ENUMERATE` operation as described in Section 8.2 of DSP0226_V1.1 and Section 9.1 of DSP0227_V1.0

3.11. **GET**
Refers to WS-MAN `GET` operation as defined in Section 7.3 of DSP00226_V1.1 and Section 7.1 of DSP0227_V1.0

4. **Symbols and Abbreviated Terms**

4.1. **CIM**
Common Information Model

4.2. **iDRAC**
Integrated Dell Remote Access Controller – management controller for blades and monolithic servers

4.3. **CMC**
Chassis Manager Controller – management controller for the modular chassis

4.4. **WBEM**
Web-Based Enterprise Management

5. **Synopsis**
Profile Name: PCI Device
Version: 4.0.0
Organization: Dell
CIM Schema Version: 2.41 Final
Dell Schema Version: 1.0.0
Interop Namespace: root/interop Implementation Namespace: root/dcim Central Class: DCIM_PCIDeviceView Scoping Class: DCIM_ComputerSystem
The Dell PCI Device Profile is a component profile that contains the Dell specific implementation requirements for PCI Device view.

DCIM_PCIDeviceView shall be the Central Class.

Table 1 identifies profiles that are related to this profile.

<table>
<thead>
<tr>
<th>Profile Name</th>
<th>Organization</th>
<th>Version</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile Registration</td>
<td>DCIM</td>
<td>1.0</td>
<td>Reference</td>
</tr>
</tbody>
</table>

6. Description

The Dell PCI Device Profile describes platform’s PCI devices. Each PCI device’s information is represented by an instance of DCIM_PCIDeviceView class.

Figure 1 details the class diagram of the Dell PCI Device Profile.

![Class Diagram](image)

Figure 1. Class Diagram

Figure 2 details typical Dell PCI Device Profile implementation for a platform containing two PCI devices. In order for client to discover the instrumentation’s support of this profile, PCI Device Profile is instantiated in the Interop Namespace. PCI Device Profile instance describes the information about the implemented profile: most importantly, the name and version of the profile and the organization name that produced the profile.

PCI1 and PCI2 are the PCI device views representing the two PCI devices in the Implementation Namespace. They are associated to the Interop namespace’s PCIProfile instance.
7. Implementation Description

This section describes the requirements and guidelines for implementing Dell PCI Device Profile.

Table 2. Class Requirements: PCI Device Profile

<table>
<thead>
<tr>
<th>Element Name</th>
<th>Requirement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCIM_PCIDeviceView</td>
<td>Mandatory</td>
<td>The class shall be implemented in the Implementation Namespace. See section 7.1.</td>
</tr>
<tr>
<td>DCIM_LCEElementConformsToProfile</td>
<td>Mandatory</td>
<td>The class shall be implemented in the Implementation Namespace.</td>
</tr>
<tr>
<td>DCIM_LCEElementConformsToProfile</td>
<td>Mandatory</td>
<td>The class shall be implemented in the Interop Namespace.</td>
</tr>
<tr>
<td>DCIM_LCRegisteredProfile</td>
<td>Mandatory</td>
<td>The class shall be implemented in the Interop Namespace.</td>
</tr>
</tbody>
</table>

Indications

None defined in this profile
7.1. PCI Device View

This section describes the implementation for the DCIM_PCIDeviceView class. This class shall be instantiated in the Implementation Namespace.

The DCIM_ElementConformsToProfile association(s) shall reference the DCIM_PCIDeviceView instance(s).

7.1.1. Resource URIs for WinRM®

The class Resource URI shall be "http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_PCIDeviceView?cimnamespace=root/dcim"

The key property shall be the InstanceID.


7.1.2. Operations

The following table details the implemented operations on DCIM_PCIDeviceView.

Table 3. DCIM_PCIDeviceView - Operations

<table>
<thead>
<tr>
<th>Operation Name</th>
<th>Requirements</th>
<th>Required Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Get</td>
<td>Mandatory</td>
<td>Instance URI</td>
</tr>
<tr>
<td>Enumerate</td>
<td>Mandatory</td>
<td>Class URI</td>
</tr>
</tbody>
</table>

7.1.3. Properties

The following table details the implemented properties for DCIM_PCIDeviceView instance representing a PCI in a system. The “Requirements” column shall denote the implementation requirement for the corresponding property. If the column “Property Name” matches the property name, the property either shall have the value denoted in the corresponding column “Additional Requirement”, or shall be implemented according to the requirements in the corresponding column “Additional Requirement”.

Table 4. DCIM_PCIDeviceView - Properties

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Requirements</th>
<th>Type</th>
<th>Requirement and description</th>
</tr>
</thead>
<tbody>
<tr>
<td>InstanceID</td>
<td>Mandatory</td>
<td>string</td>
<td>The property value shall be the FQDD property value.</td>
</tr>
<tr>
<td>FQDD</td>
<td>Mandatory</td>
<td>string</td>
<td>A string containing the Fully Qualified Device Description, a user-friendly name for the object.</td>
</tr>
<tr>
<td>BusNumber</td>
<td>Mandatory</td>
<td>uint32</td>
<td>The bus number where the PCI device resides.</td>
</tr>
<tr>
<td>DeviceNumber</td>
<td>Mandatory</td>
<td>uint32</td>
<td>The device number assigned to the PCI device for this bus.</td>
</tr>
<tr>
<td>FunctionNumber</td>
<td>Mandatory</td>
<td>uint32</td>
<td>The function number for the PCI device.</td>
</tr>
<tr>
<td>PCIVendorID</td>
<td>Mandatory</td>
<td>string</td>
<td>The property contains a value assigned by the PCI SIG used to identify the manufacturer of the device.</td>
</tr>
<tr>
<td>PCISubVendorID</td>
<td>Mandatory</td>
<td>string</td>
<td>Subsystem vendor ID.</td>
</tr>
<tr>
<td>PCIDeviceID</td>
<td>Mandatory</td>
<td>string</td>
<td>The property contains a value assigned by the device manufacturer used to identify the type of device.</td>
</tr>
<tr>
<td>PCISubDeviceID</td>
<td>Mandatory</td>
<td>string</td>
<td>The property contains a value assigned by the vendor manufacturer used to identify the type of device.</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Mandatory</td>
<td>String</td>
<td>A string containing the Manufacturer name. The name of the organization responsible for producing the PCI Device.</td>
</tr>
<tr>
<td>Property Name</td>
<td>Requirements</td>
<td>Type</td>
<td>Requirement and description</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------</td>
<td>------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Description</td>
<td>Optional</td>
<td>string</td>
<td>Gives the description of the PCI Device</td>
</tr>
</tbody>
</table>
| DataBusWidth | Mandatory     | string | Data bus width of the PCI:  
  - "0001" - "Other",  
  - "0002" - "Unknown",  
  - "0003" - "8 bit",  
  - "0004" - "16 bit",  
  - "0005" - "32 bit",  
  - "0006" - "64 bit",  
  - "0007" - "128 bit",  
  - "0008" - "1x or x1",  
  - "0009" - "2x or x2",  
  - "000A" - "4x or x4",  
  - "000B" - "8x or x8",  
  - "000C" - "12x or x12",  
  - "000D" - "16x or x16",  
  - "000E" - "32x or x32" |
| SlotLength   | Mandatory     | string | Slot length of the PCI:  
  - "0001" - "Other"  
  - "0002" - "Unknown"  
  - "0003" - "Short Length"  
  - "0004" - "Long Length" |
| SlotType     | Mandatory     | string | PCI slot type:  
  - "0001" - "Other"  
  - "0002" - "Unknown"  
  - "0003" - "ISA"  
  - "0004" - "MCA"  
  - "0005" - "EISA"  
  - "0006" - "PCI"  
  - "0007" - "PC Card (PCMCIA)"  
  - "0008" - "VL-VESA"  
  - "0009" - "Proprietary"  
  - "000A" - "Processor Card Slot"  
  - "000B" - "Proprietary Memory Card Slot"  
  - "000C" - "I/O Riser Card Slot"  
  - "000D" - "NuBus"  
  - "000E" - "PCI - 66MHz Capable"  
  - "000F" - "AGP",  
  - "0010" - "AGP 2X"  
  - "0011" - "AGP 4X"  
  - "0012" - "PCI-X"  
  - "0013" - "AGP 8X"  
  - "00A0" - "PC-98/C20"  
  - "00A1" - "PC-98/C24"  
  - "00A2" - "PC-98/E"  
  - "00A3" - "PC-98/Local Bus"  
  - "00A4" - "PC-98/Card"  
  - "00A5" - "PCI Express (see below)"  
  - "00A6" - "PCI Express x1"  
  - "00A7" - "PCI Express x2" |
<table>
<thead>
<tr>
<th>Property Name</th>
<th>Requirements</th>
<th>Type</th>
<th>Requirement and description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LastSystemInventoryTime</td>
<td>Mandatory</td>
<td>string</td>
<td>This property provides the last time &quot;System &quot;Inventory Collection On Reboot(CSIOR)&quot; was performed. The value is represented as yyyymddHHMMSS.</td>
</tr>
<tr>
<td>LastUpdateTime</td>
<td>Mandatory</td>
<td>string</td>
<td>This property provides the last time the data was updated. The value is represented as yyyymddHHMMSS.</td>
</tr>
</tbody>
</table>

7.2. PCI Device Profile Profile Registration

This section describes the implementation for the DCIM_LCRegisteredProfile class. This class shall be instantiated in the Interop Namespace.

The DCIM_LCElementConformsToProfile association(s) shall reference the DCIM_LCRegisteredProfile instance.

7.2.1. Resource URIs for WinRM®

The class Resource URI shall be "http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_RegisteredProfile? cimnamespace=root/interop"

The key property shall be the InstanceID property.


7.2.2. Operations

The following table details the implemented operations on DCIM_LCRegisteredProfile.

<table>
<thead>
<tr>
<th>Operation Name</th>
<th>Requirements</th>
<th>Required Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Get</td>
<td>Mandatory</td>
<td>Instance URI</td>
</tr>
<tr>
<td>Enumerate</td>
<td>Mandatory</td>
<td>Class URI</td>
</tr>
</tbody>
</table>

7.2.3. Properties

The following table details the implemented properties for DCIM_LCRegisteredProfile instance representing PCI Device Profile implementation. The “Requirements” column shall denote the implementation requirement for the corresponding property. If the column “Name” matches the property name, the property either shall have the value denoted in the corresponding column “Additional Requirements”, or shall be implemented according to the requirements in the corresponding column “Additional Requirements”.

- “00A8” - "PCI Express x4"
- “00A9” - "PCI Express x8"
- “00AA” - "PCI Express x16"
- “00AB” - “PCI Express Gen 2 (see below)”
- “00AC” - "PCI Express Gen 2 x1"
- “00AD” - "PCI Express Gen 2 x2"
- “00AE” - "PCI Express Gen 2 x4"
- “00AF” - “PCI Express Gen 2 x8”
- “00B0” - “PCI Express Gen 2 x16”
- “00B1” - "PCI Express Gen 3"
- “00B2” - "PCI Express Gen 3 x1"
- “00B3” - "PCI Express Gen 3 x2"
- “00B4” - "PCI Express Gen 3 x4"
- “00B5” - “PCI Express Gen 3 x8”
- “00B6” - “PCI Express Gen 3 x16”
### Table 6. DCIM_LCRegisteredProfile

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Requirement</th>
<th>Type</th>
<th>Additional Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>InstanceID</td>
<td>Mandatory</td>
<td>String</td>
<td>DCIM:PCIDevice:4.0.0</td>
</tr>
<tr>
<td>RegisteredName</td>
<td>Mandatory</td>
<td>String</td>
<td>This property shall have a value of &quot;PCI Device&quot;.</td>
</tr>
<tr>
<td>RegisteredVersion</td>
<td>Mandatory</td>
<td>String</td>
<td>This property shall have a value of &quot;4.0.0&quot;.</td>
</tr>
<tr>
<td>RegisteredOrganization</td>
<td>Mandatory</td>
<td>Uint16</td>
<td>This property shall have a value of 1 (Other).</td>
</tr>
<tr>
<td>OtherRegisteredOrganization</td>
<td>Mandatory</td>
<td>String</td>
<td>The property value shall match &quot;DCIM&quot;.</td>
</tr>
<tr>
<td>AdvertisedTypes[]</td>
<td>Mandatory</td>
<td>Uint16</td>
<td>This property array shall contain [1(Other), 1 (Other)].</td>
</tr>
<tr>
<td>AdvertiseTypeDescriptions[]</td>
<td>Mandatory</td>
<td>String</td>
<td>This property array shall contain [&quot;WS-Identify&quot;, &quot;Interop Namespace&quot;].</td>
</tr>
<tr>
<td>ProfileRequireLicense[]</td>
<td>Mandatory</td>
<td>String</td>
<td>This property array shall describe the required licenses for this profile. If no license is required for the profile, the property shall have value NULL.</td>
</tr>
<tr>
<td>ProfileRequireLicenseStatus[]</td>
<td>Mandatory</td>
<td>String</td>
<td>This property array shall contain the status for the corresponding license in the same element index of the ProfileRequireLicense array property. Each array element shall contain: • &quot;LICENSED&quot; • &quot;NOT_LICENSED&quot; If no license is required for the profile, the property shall have value NULL.</td>
</tr>
</tbody>
</table>

### 8. Methods

This section details the requirements for supporting extrinsic methods for the CIM elements defined by this profile. No additional details specified.

### 9. Use Cases

See Lifecycle Controller (LC) Integration Best Practices Guide.

### 10. CIM Elements

No additional details specified.

### 11. Privilege and License Requirement

The following table describes the privilege and license requirements for the listed operations. For the detailed explanation of the privileges and licenses, refer to the Dell WSMAN Licenses and Privileges specification.

### Table 7. Privilege and License Requirements

<table>
<thead>
<tr>
<th>Class and Method</th>
<th>Operation</th>
<th>User Privilege Required</th>
<th>License Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCIM_PCIEDeviceView</td>
<td>ENUMERATE, GET</td>
<td>Login</td>
<td>LM_REMOTE_ASSET_INVENTORY</td>
</tr>
<tr>
<td>DCIM_LCRegisteredProfile</td>
<td>ENUMERATE, GET</td>
<td>Login</td>
<td>None.</td>
</tr>
<tr>
<td>DCIM_LCEElementConformsToProfile</td>
<td>ENUMERATE, GET</td>
<td>Login</td>
<td>None.</td>
</tr>
</tbody>
</table>