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7 Virtual Ethernet Switch Profile

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10 **Document Language: en-US**

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103   Foreword

104   This profile — the *Virtual Ethernet Switch Profile* (DSP1097) — was prepared by the System
105   Virtualization, Partitioning and Clustering Working Group of the DMTF.

106   DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems
107   management and interoperability. For information about the DMTF, see http://www.dmtf.org.

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129

Introduction

The information in this specification should be sufficient for a provider or consumer of this data to identify unambiguously the classes, properties, methods, and values that shall be instantiated and manipulated to represent and manage the components described in this document. The target audience for this specification is implementers who are writing CIM-based providers or consumers of management interfaces that represent the components described in this document.

136 **Virtual Ethernet Switch Profile**

1   Scope

138 This profile — the *Virtual Ethernet Switch Profile* — is an autonomous DMTF management profile that
139 defines the minimum object model needed to provide for the inspection of a virtualization system's
140 internal Ethernet switch and its components.

2   Normative references

142 The following referenced documents are indispensable for the application of this document. For dated or
143 versioned references, only the edition cited (including any corrigenda or DMTF update versions) applies.
144 For references without a date or version, the latest published edition of the referenced document
145 (including any corrigenda or DMTF update versions) applies.

146 DMTF DSP0004, *CIM Infrastructure Specification 2.5*,
147 http://www.dmtf.org/standards/published_documents/DSP0004_2.5.pdf

148 DMTF DSP0200, *CIM Operations over HTTP 1.3*,
149 http://www.dmtf.org/standards/published_documents/DSP0200_1.3.pdf

150 DMTF DSP0207, *WBEM URI Mapping 1.0*,
151 http://www.dmtf.org/standards/published_documents/DSP0207_1.0.pdf

152 DMTF DSP1001, *Management Profile Specification Usage Guide 1.0*,
153 http://www.dmtf.org/standards/published_documents/DSP1001_1.0.pdf

154 DMTF DSP1014, *Ethernet Port Profile 1.0*,
155 http://www.dmtf.org/standards/published_documents/DSP1014_1.0.pdf

156 DMTF DSP1033, *Profile Registration Profile 1.0*,
157 http://www.dmtf.org/standards/published_documents/DSP1033_1.0.pdf

158 DMTF DSP1035, *Host LAN Network Port Profile 1.0*,
159 http://www.dmtf.org/standards/published_documents/DSP1035_1.0.pdf

160 DMTF DSP1041, *Resource Allocation Profile 1.1*,
161 http://www.dmtf.org/standards/published_documents/DSP1041_1.1.pdf

162 DMTF DSP1042 *System Virtualization Profile 1.0*,
163 http://www.dmtf.org/standards/published_documents/DSP1042_1.0.pdf

164 DMTF DSP1043, *Allocation Capabilities Profile 1.0*,
165 http://www.dmtf.org/standards/published_documents/DSP1043_1.0.pdf

166 DMTF DSP1050, *Ethernet Port Resource Virtualization Profile 1.0*,
167 http://www.dmtf.org/standards/published_documents/DSP1050_1.0.pdf

168 DMTF DSP1052, *Computer System Profile 1.0*,
169 http://www.dmtf.org/standards/published_documents/DSP1052_1.0.pdf

170 DMTF DSP1057, *Virtual System Profile 1.0*,
171 http://www.dmtf.org/standards/published_documents/DSP1057_1.0.pdf

172

173   ISO/IEC Directives, Part 2, *Rules for the structure and drafting of International Standards*
174   http://isotc.iso.org/livelink/livelink.exe?func=ll&objId=4230456&objAction=browse&sort=subtype

175

3   Terms and definitions

177   In this document, some terms have a specific meaning beyond the normal English meaning. Those terms
178   are defined in this clause.

179   The terms "shall" ("required"), "shall not," "should" ("recommended"), "should not" ("not recommended"),
180   "may," "need not" ("not required"), "can" and "cannot" in this document are to be interpreted as described
181   in ISO/IEC Directives, Part 2, Annex H. The terms in parenthesis are alternatives for the preceding term,
182   for use in exceptional cases when the preceding term cannot be used for linguistic reasons. Note that
183   ISO/IEC Directives, Part 2, Annex H specifies additional alternatives. Occurrences of such additional
184   alternatives shall be interpreted in their normal English meaning.

185   The terms "clause," "subclause," "paragraph," and "annex" in this document are to be interpreted as
186   described in ISO/IEC Directives, Part 2, Clause 5.

187   The terms "normative" and "informative" in this document are to be interpreted as described in ISO/IEC
188   Directives, Part 2, Clause 3. In this document, clauses, subclauses, or annexes labeled "(informative)" do
189   not contain normative content. Notes and examples are always informative elements.

190   The terms defined in DSP0004, DSP0200, and DSP1001 apply to this document. The following additional
191   terms are used in this document.

192   **3.1**
193   **client**
194   an application that exploits facilities specified by this profile

195   **3.2**
196   **implementation**
197   a set of CIM providers that realize the classes specified by this profile

198   **3.3**
199   **virtualization platform**
200   virtualizing infrastructure provided by a host system that enables the deployment of virtual systems

4   Symbols and abbreviated terms

202   The abbreviations defined in DSP0004, DSP0200, and DSP1001 apply to this document. The following
203   additional abbreviations are used in this document.

204   **4.1**
205   **CIM**
206   Common Information Model

207   **4.2**
208   **CIMOM**
209   CIM object manager

210   **4.3**
211   **EASD**
212   CIM_EthernetPortAllocationSettingData

213   **4.4**
214   **RASD**
215   CIM_ResourceAllocationSettingData

216   **4.5**
217   **SLP**
218   service location protocol

219   **4.6**
220   **VESSP**
221   CIM_VirtualEthernetPortSettingData

222   **4.7**
223   **VS**
224   virtual system

225   **4.8**
226   **VSSD**
227   CIM_VirtualSystemSettingData

228   # 5   Synopsis

229   **Profile Name:** *Virtual Ethernet Switch*

230   **Version:** 1.0.0

231   **Organization:** DMTF

232   **CIM Schema Version:** 2.26

233   **Central Class:** CIM_ComputerSystem

234   **Scoping Class:** CIM_ComputerSystem

235   This profile is an autonomous profile that defines the minimum object model needed to provide for the
236   inspection of a virtual Ethernet Switch and its components.

237   The instance of the CIM_ComputerSystem class representing a virtual Ethernet switch shall be the
238   central instance and the scoping instance of this profile.

239   Table 1 lists DMTF management profiles on which this profile depends.

240   **Table 1 – Related profiles**

Profile Name	Organization	Version	Relationship	Description
Profile Registration	DMTF	1.0	Mandatory	The profile that specifies registered profiles
Virtual System	DMTF	1.0	Specializes	The autonomous profile that specifies the minimum object model needed to define a virtual system

6   Description

This profile specializes the autonomous *Virtual System Profile*. This profile defines the minimum top-level object model needed to define a virtualization system's internal Ethernet switch. The primary design objective applied by this profile is that a virtual Ethernet switch and its components appear to a client as a hosted virtual system with dedicated switch functionality. Typical management tasks such as enumerating, analyzing, controlling, or configuring an Ethernet switch should be enabled without requiring the client to understand specific aspects of an Ethernet switch.

6.1   DMTF management profile relationships

This profile is complementary to the *Virtual System Profile,* which it specializes, and to the *System Virtualization Profile*:

- The *Virtual Ethernet Switch Profile* focuses on specializing the use of the components specified in the *Virtual System Profile* to model the internal Ethernet Switches that are typically used to provide Ethernet connectivity within and outside of the virtualization platform.

- The *Virtual System Profile* focuses on virtualization aspects that relate to virtual systems and their virtual resources, such as modeling the *structure* of virtual systems and their resources. The profile introduces the concept of virtual system configurations allowing the inspection of virtual system configuration and state information.

- The *System Virtualization Profile* focuses on virtualization aspects that relate to host systems and their resources, such as modeling the *relationships* between host resources and virtual resources. Further, it addresses virtualization-specific tasks such as the creation or modification of virtual Ethernet switches and their configurations.

Figure 1 shows a structure of DMTF management profiles. For example, an implementation that instruments a virtualization platform may implement some of the following DMTF management profiles:

- The *Virtual Ethernet Switch Profile* enables the inspection and basic operations on a virtual Ethernet Switch.

- The *Virtual System Profile* enables the inspection of and basic operations on virtual systems.

- The *System Virtualization Profile* enables the inspection of host systems, their capabilities, and their services for creation and manipulation of virtual systems, including virtual Ethernet switches.

- Resource-type-specific profiles enable the inspection and operation of resources for one particular resource type. They apply to both virtual and host resources; they do not cover virtualization-specific aspects of resources. A client may exploit resource-type-specific management profiles for the inspection and manipulation of virtual and host resources in a similar manner.

- The *Ethernet Port Resource Virtualization Profile* is a specific resource allocation profile that enables the inspection and operation of resources for the two virtualization-specific uses of the CIM_EthernetPort class and the simple resource allocation used for the connection between an Ethernet adapter and an Ethernet switch port. This profile specializes the abstract *Resource Allocation Profile* and the abstract *Allocation Capabilities Profile* and is scoped by the *System Virtualization Profile*. A client may exploit this resource allocation profile to inspect all of the following:
  – the allocation of virtual Ethernet adapters and virtual Ethernet switch ports

  – the connection of an Ethernet adapter (virtual or physical) to a virtual Ethernet switch port

  – the allocation dependencies that the virtual resources have on host resources and resource pools

  – the capabilities describing possible values for the resource allocations

287   –   the capabilities describing the mutability of the resource allocations
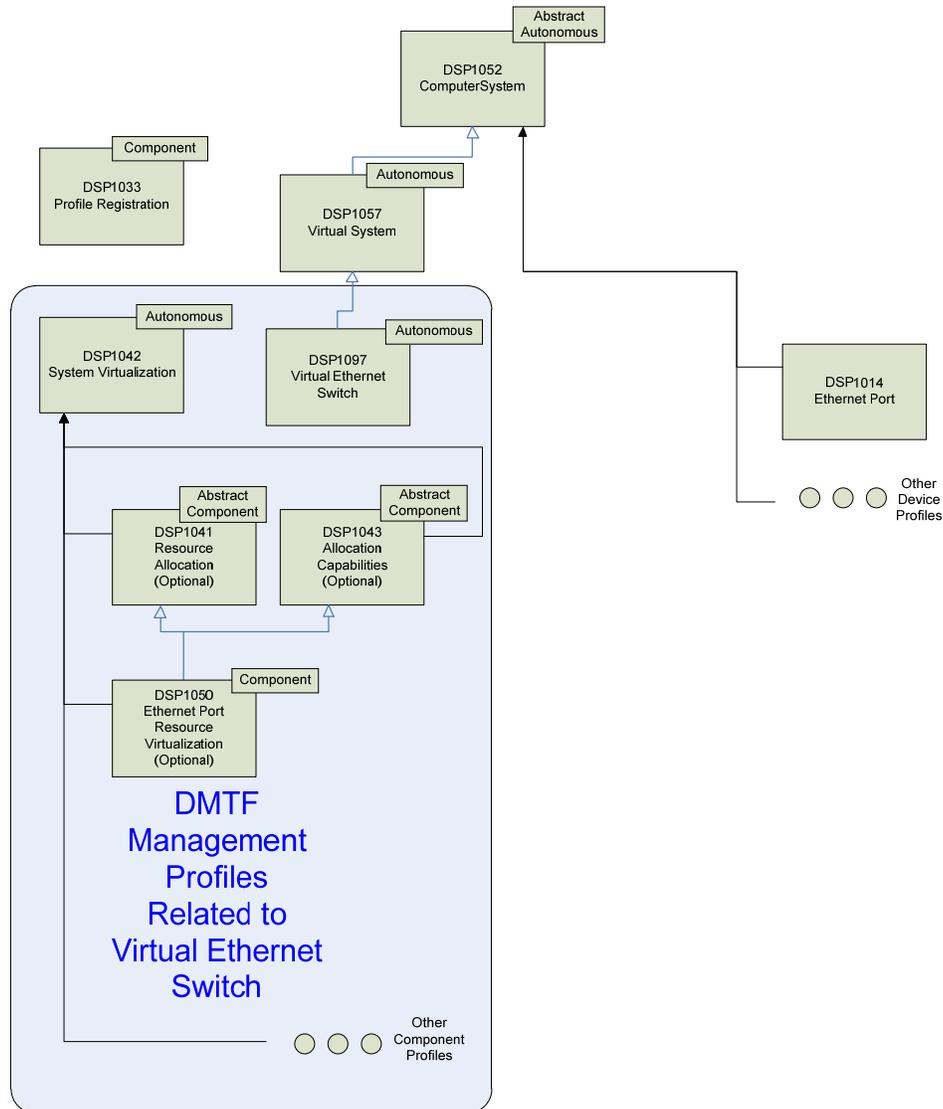
288

289   **Figure 1 – DMTF Management profiles related to the virtual Ethernet switch**

6.2   Virtual Ethernet switch class schema

291   Figure 2 shows the class schema of this profile. It outlines the elements that are owned or specialized by
292   this profile, as well as the dependency relationships between elements of this profile and other profiles.
293   For simplicity in diagrams, the *CIM_* prefix has been removed from class and association names.

294   The *Computer System Profile* references additional classes in its class diagram that outline relationships
295   with certain resources, services, and protocol endpoints. The *Virtual Ethernet Switch Profile* provides no
296   specialization of these dependencies. For that reason they are not shown in the class diagram. For
297   details, refer to the *Computer System Profile* and to the component profiles referenced there.
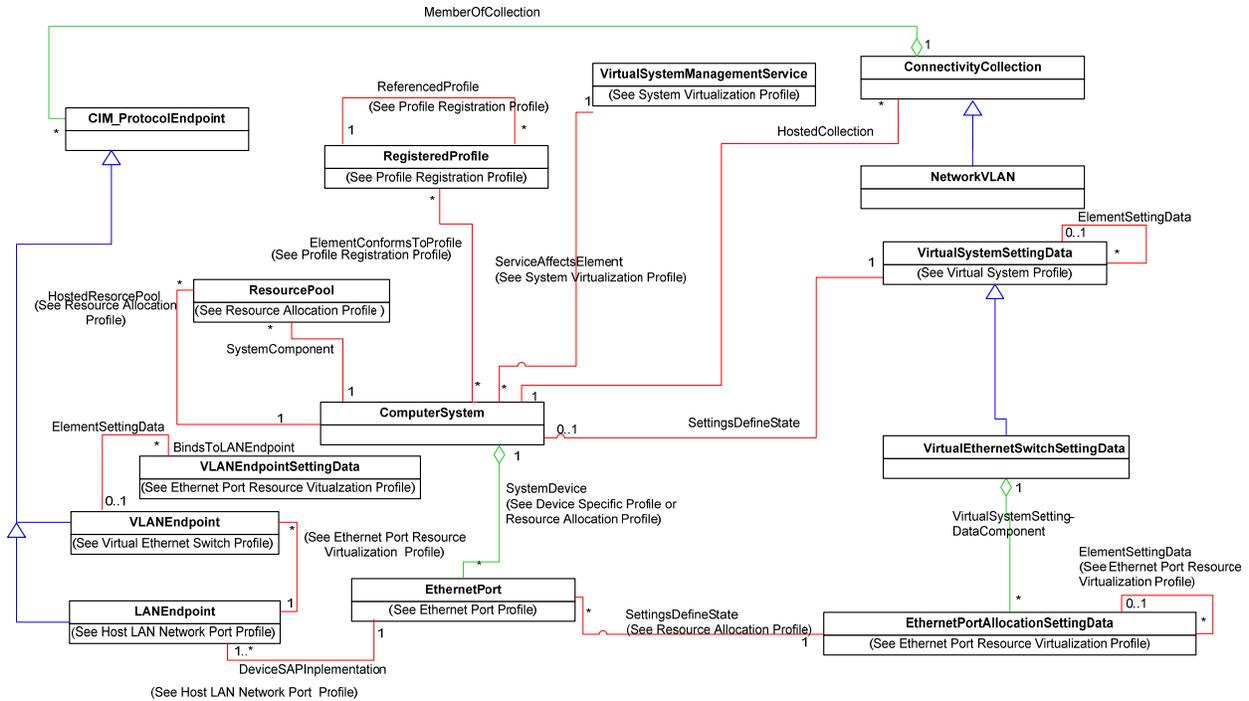
298

299   **Figure 2 – Virtual Ethernet Switch Profile: Class Diagram**

300   This profile specifies the use of the following classes and associations:

301   • the CIM_ComputerSystem class to represent a virtual Ethernet switch

302   • the CIM_RegisteredProfile class and the CIM_ElementConformsToProfile association to model
303   conformance with this profile

304   • The CIM_NetworkVLAN class represents a collection of VLAN endpoints that are members of
305   the same VLAN.

306   • The CIM_LANEndpoint class represents the Ethernet communication endpoint of the
307   CIM_EthernetPort that that represents an Ethernet switch port.

308   • The CIM_VLANEndpoint class represents an endpoint on a virtual Ethernet switch which is
309   assigned to a given VLAN or accepts traffic from one or more VLANs.

310   • The CIM_VLANEndPointSettingData class represents the configuration data for
311   CIM_VLANEndpoint instances.

312   • The CIM_ConnectivityCollection class represents a collection of LANEndpoints that are able to
313   communicate with each other.

314   • the CIM_VirtualEthernetSwitchSettingData class specializes the CIM_VirtualSwitchSettingData
315   class that specializes the CIM_VirtualSystemSettingData class to add Ethernet switch-specific
316   aspects of a virtual Ethernet switch

317   • The CIM_SystemComponent association is used to model the relationship between the
318   virtualization system's host resource pool of resource type 33 (Ethernet Connection) and the
319   Virtual Ethernet Switch represented by the CIM_ComputerSystem class to which the resource
320   pool's Ethernet connections can be made. Etherent Connection resource pools are used for the
321   allocation of a connection between an Ethernet port, that is typically part of a vitrual system, and
322   an Ethernet switch port.

323   • The CIM_HostedCollection association is used to model the relationship of the Virtual Ethernet
324   Switch represented by the CIM_ComputerSystem class to each CIM_NetworkVLAN instance
325   that represents a VLAN available in the switch. It is also used used to model the relationship of
326   the host system represented by the CIM_ComputerSystem class to each
327   CIM_ConnectivityCollection.

328   • the CIM_VirtualSystemSettingDataComponent association to model the aggregation of instan-
329   ces of the CIM_EtherentPortAllocationSettingData class to one instance of the CIM_Virtual-
330   EtherentSwitchSettingData class, forming a virtual Ethernet switch configuration

331   • the CIM_SettingsDefineState association to model the relationship between an instance of the
332   CIM_ComputerSystem class representing a virtual Ethernet Switch and an instance of the
333   CIM_VirtualEthernetSwitchSettingData class representing virtualization-specific aspects of that
334   virtual Ethernet switch

335   • the CIM_ElementSettingData association to model the relationship between an element and
336   configuration data applicable to the element

337   In general, any mention of a class in this document means the class itself or its subclasses. For example,
338   a statement such as "an instance of the CIM_LogicalDevice class" implies an instance of the CIM_Logi-
339   calDevice class or a subclass of the CIM_LogicalDevice class.

6.3   Ethernet switch states and transitions

341   The *Virtual Ethernet Switch Profile* adds no specialization to the states and transitions as specified in the
342   *Virtual System Profile*. Unlike the *Virtual System Profile* model's requirement to match a model of a
343   physical system, the virtual Ethernet switch model is solely intended for use in a virtualization system and
344   does not have a defined corresponding physical system model. Thus, the need for power and enabled
345   state transitions are minimal and most implementations will implement the minimum as described in the
346   *Virtual System Profile*.

7   Implementation

348   This clause details the requirements related to classes and their properties for implementations of this
349   profile. The CIM Schema descriptions for any referenced element and its sub-elements apply.

350   The list of all methods covered by this profile is provided in clause 8. The list of all properties covered by
351   this profile is provided in clause 10.

352   In references to CIM Schema properties that enumerate values, the numeric value is normative and the
353   descriptive text following it in parenthesis is informational. For example, in the statement "If an instance of
354   the CIM_VirtualSystemManagementCapabilities class contains the value 3 (DestroySystemSupported) in
355   an element of the SynchronousMethodsSupported[ ] array property", the "value 3" is normative text and
356   "(DestroySystemSupported)" is descriptive text.

357   Unless explicitly described, the text in this clause does not relax any of the implementation details
358   described in clause 7 of the *Virtual System Profile*.

7.1   Virtual Ethernet switch

360   The CIM_ComputerSystem class shall be used to represent virtual Ethernet switches. One instance of the
361   CIM_ComputerSystem class shall exist for each virtual Ethernet switch that is conformant to this profile,
362   regardless of its state.

363   This subclause and all secondary subclauses apply to instances of the CIM_ComputerSystem class that
364   represent virtual Ethernet switches in this profile and the virtual system in the *Virtual System Profile*.

7.1.1 CIM_ComputerSystem.Dedicated property

366 The Dedicated property shall be supported and set to match the value 38 (Ethernet Switch).

7.1.2 CIM_VirtualEthernetSwitchSettingData.VirtualSystemType

368 The VirtualSystemType property shall be supported and contain the value "DMTF:Virtual Ethernet
369 Switch".

370

7.1.3 CIM_VirtualEthernetSwitchSettingData.AssociatedResourcePool
372 The AssoicatedResourcePool property shall be supported when VirtualEternetSwitchSettingData is used
373 as an instance in a virtual system configuration as specified in the *Virtual System Profile*. The property
374 shall contain the list of host resource pools are associated with an Ethernet Switch for the purpose of the
375 allocation of Ethernet connections between a virtual machine and an Ethernet switch.

7.1.4 CIM_NetworkVLAN.TypeOfMedia

377 The TypeOfMedia property shall be set to the value 3 (Ethernet).

8 Methods

379 This profile does not define any extrinsic methods beyond those defined or referenced in the *Virtual*
380 *System Profile*.

8.1 Profile conventions for operations

382 The implementation requirements on operations for each profile class (including associations) are
383 specified in class-specific subclauses of this clause.

384 The default list of operations for all classes is:

385 • GetInstance( )

386 • EnumerateInstances( )

387 • EnumerateInstanceNames( )

388 For classes that are referenced by an association, the default list also includes

389 • Associators( )

390 • AssociatorNames( )

391 • References( )

392 • ReferenceNames( )

393 Implementation requirements on operations defined in the default list are provided in the class-specific
394 subclauses of this clause.

395 The implementation requirements for methods of classes listed in 8.1, but not addressed by a separate
396 subclause of this clause are specified by the "Methods" clauses of respective base profiles, namely
397 DSP1041 and DSP1043. These profiles are specialized by this profile; in these cases, this profile does
398 not add method specifications beyond those defined in its base profiles.

8.1.1   CIM_ComputerSystem

All operations in the default list in 8.1 shall be implemented as specified by DSP0200. In addition, the requirements of the CIM schema and other prerequisite specifications (including profiles) apply.

8.1.2   CIM_NetworkVLAN

All operations in the default list in 8.1 shall be implemented as specified by DSP0200. In addition, the requirements of the CIM schema and other prerequisite specifications (including profiles) apply.

8.1.3   CIM_ConnectivityCollection

All operations in the default list in 8.1 shall be implemented as specified by DSP0200. In addition, the requirements of the CIM schema and other prerequisite specifications (including profiles) apply.

8.1.4   CIM_ElementSettingData

All operations in the default list in 8.1 shall be implemented as specified by DSP0200. In addition, the requirements of the CIM schema and other prerequisite specifications (including profiles) apply.

8.1.5   CIM_HostedCollection

All operations in the default list in 8.1 shall be implemented as specified by DSP0200. In addition, the requirements of the CIM schema and other prerequisite specifications (including profiles) apply.

8.1.6   CIM_MemberOfCollection

All operations in the default list in 8.1 shall be implemented as specified by DSP0200. In addition, the requirements of the CIM schema and other prerequisite specifications (including profiles) apply.

8.1.7   CIM_RegisteredProfile

All operations in the default list in 8.1 shall be implemented as specified by DSP0200. In addition, the requirements of the CIM schema and other prerequisite specifications (including profiles) apply.

8.1.8   CIM_SystemComponent

All operations in the default list in 8.1 shall be implemented as specified by DSP0200. In addition, the requirements of the CIM schema and other prerequisite specifications (including profiles) apply.

8.1.9   CIM_VirtualEthernetSwitchSettingData

All operations in the default list in 8.1 shall be implemented as specified by DSP0200. In addition, the requirements of the CIM schema and other prerequisite specifications (including profiles) apply.

8.1.10 CIM_VirtualSystemSettingDataComponent

All operations in the default list in 8.1 shall be implemented as specified by DSP0200. In addition, the requirements of the CIM schema and other prerequisite specifications (including profiles) apply.

429   9   Use cases

430   The following use cases and object diagrams illustrate the use of this profile. They are for informational
431   purposes only and do not introduce behavioral requirements for implementations of the profile.

432   9.1   Virtual system detection and inspection

433   The *Virtual System Profile* includes a set of valid use cases that are not included in this document. This
434   document includes only those use cases that are specific to the understanding, discovery, and
435   management of a virtual Ethernet switch.

436   9.1.1   Example of virtual Ethernet switch and its relationship to a virtualization
437   platform's host system

438   Figure 3 shows an example of a Virtual Ethernet Switch (ES1) hosted by the virtualization platform (HS1).
439   Although the diagram is simplified, the virtual Ethernet switch as modeled is a compliant virtual system as
440   specified in the *Virtual System Profile* and this profile. This example switch has one Ethernet switch port
441   represented by the instance of the CIM_EthernetPort class ESP1. The allocation was from resource pool
442   RP1 and is a compliant Ethernet switch port allocation as specified in the *Ethernet Port Resource*
443   *Virtualization Profile* and the *System Virtualization Profile*. The Ethernet switch port is a member of the
444   connectivity collection CC1, as shown with the CIM_MemberOfCollection association between instances
445   LEP1:LANEndPoint and CC1:ConnectivityCollection. The *Ethernet Port Resource Virtualization Profile*
446   compliant Ethernet switch port in the example is VLAN aware, as shown through the VLANEndpoint
447   instance VEP1 and its membership in the NetworkVLAN collection NV1. ES1 has one Ethernet
448   Connection resource pool, RP2, that is used as specified in the *Ethernet Port Resource Virtualization*
449   *Profile* and is associated to ES1 with the SystemComponent association.
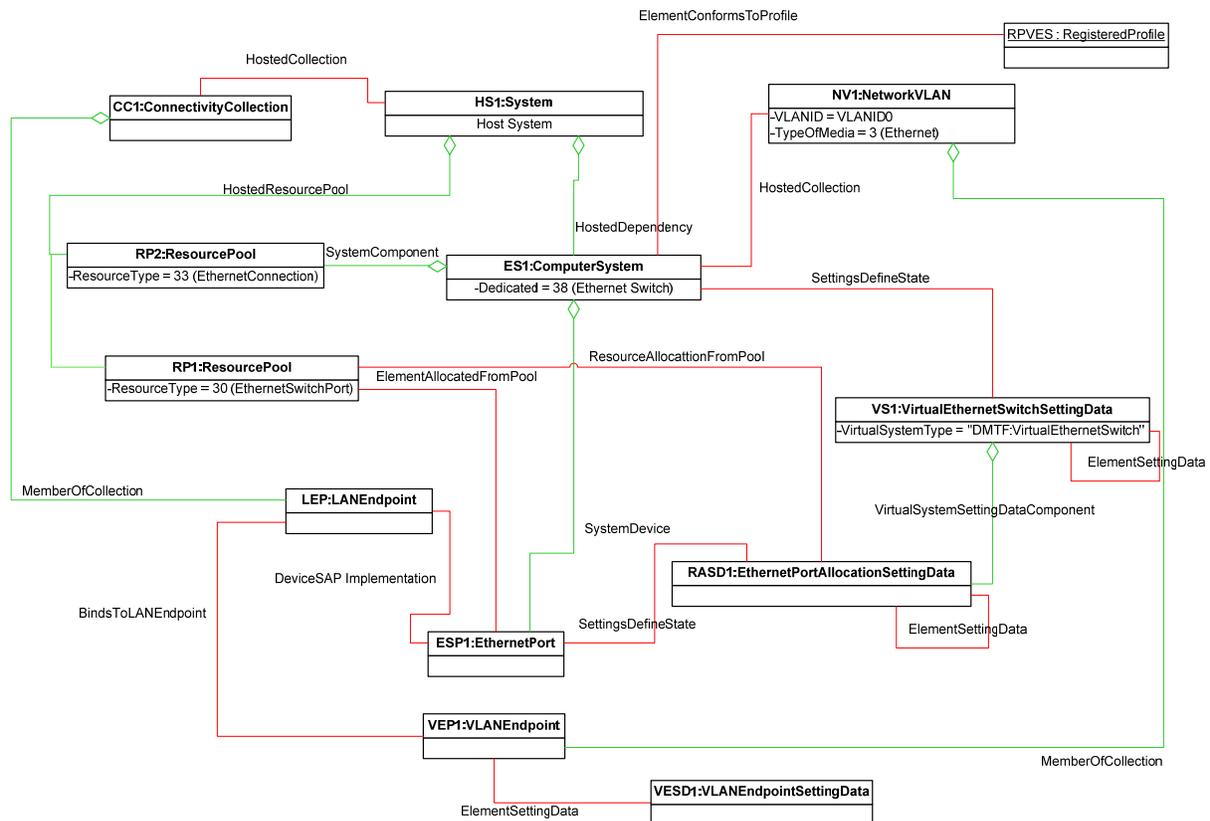
450

451   **Figure 3 – Basic example of virtual Ethernet switch**

452   **9.1.2   Discover conformant virtual Ethernet switches using SLP**

453   This use case describes how to locate instances of the CIM_ComputerSystem class that represent virtual
454   Ethernet Switches that are central instances of this profile (the *Virtual Ethernet Switch Profile*). This is a
455   two-step process:

456   1)   The service location protocol (SLP) is used to locate CIM object managers (CIMOMs) where
457   this profile is implemented. A CIMOM using SLP facilities provides information about itself to
458   SLP in the form of an SLP service template. The service template may contain information
459   about the set of DMTF management profiles that is implemented at the CIMOM.

460   2)   Normal CIM enumeration and association resolution is used to find instances of the CIM_Com-
461   puterSystem class that represent central instances of this profile.

462   **Assumption:** This profile is registered in at least one CIMOM that maintains a registration with an SLP
463   Directory Agent; the registration includes information about registered DMTF management profiles. The
464   client is able to make SLP calls and invoke intrinsic CIM operations.

465   A client can locate instances of the CIM_ComputerSystem class that represent virtual systems that are
466   central instances of this profile as follows:

467   1)   The client invokes the SLPFindSrvs( ) SLP function:

468   –   The value of the srvtype parameter is set to "service:wbem".

469   –   The value of the scopelist parameter is set to "default".

470   –   The value of the filter parameter is set to "(RegisteredProfilesSupported=DMTF:Virtual
471   Ethernet Switch Profile)".

472   The result is a list of URLs that identify CIMOMs where this profile (the Virtual Ethernet Switch
473   Profile) is implemented.

474   2)   The client contacts each of the CIMOMs and enumerates or queries the CIM_RegisteredProfile
475   class.

476   –   As input, the client needs to use the address information of one server obtained in step 1)
477   and issue the intrinsic EnumerateInstanceNames( ) CIM operation on the
478   CIM_RegisteredProfile class. Alternatively, the client may issue the intrinsic ExecuteQuery
479   CIM operation and specify a where clause that, for example, limits the value ranges for the
480   RegisteredName and RegisteredVersion properties of the CIM_RegisteredProfile class.

481   –   As a result, the client receives a list of references to instances of the
482   CIM_RegisteredProfile class that represent implementations of this profile (the *Virtual
483   Ethernet Switch Profile*) at the intended target location. On a query operation this list is
484   already limited according to the input selection criteria.

485   3)   The client selects one reference and resolves the CIM_ElementConformsToProfile association
486   from the instance of the CIM_RegisteredProfile class to instances of the CIM_ComputerSystem
487   class.

488   –   As input, the client needs to provide the reference to an instance of the CIM_Registered-
489   Profile class that was selected from the result set obtained in step 2).

490   –   As a result, the client receives a list of references referencing instances of the
491   CIM_ComputerSystem class that represents virtual Ethernet switches.

492   **Result:** The result is that the client knows a set of references referencing instances of the CIM_Compu-
493   terSystem class that represent virtual Ethernet Switches that are central instances of this profile.

494   **9.1.3   Locate virtual Ethernet switches hosted by a host system**

495   **Assumption:** The client knows a reference to an instance of the CIM_System class that is a central in-
496   stance of the *System Virtualization Profile* and represents a host system.

497   • The client invokes the intrinsic AssociatorNames( ) CIM operation for the list of virtual systems,
498   as follows:

499   – The value of the ObjectName parameter is set to refer to the instance of the CIM_System
500   class.

501   – The value of the AssocClass parameter is set to "CIM_HostedDependency".

502   – The value of the ResultClass parameter is set to "CIM_ComputerSystem".

503   The result is a list of references to instances of the CIM_ComputerSystem class.

504   • The resulting set of references to instances of the CIM_ComputerSystem class where the
505   property dedicated matches "38 (Ethernet Switch)" represent Ethernet switches that are hosted
506   by the host system. From this list the client invokes the intrinsic AssociatorNames( ) CIM
507   operation on each element for an associated CIM_VirtualEthernetSwitchSettingData , as
508   follows:

509   • The value of the ObjectName parameter is set to refer to the instance of the
510   CIM_ComputerSystem class received in the previous operation.

511   • The value of the AssocClass parameter is set to "CIM_SettingsDefineState".

512   • The value of the ResultClass parameter is set to "CIM_VirtualEthernetSwitchSettingData".

513

514   **Result:** Each ComputerSystem with an associated instance of CIM_VirtualEthernetSwitchSettingData
515   where the VirtualSystemType matches "DMTF:VirtualEthernetSwitch is a host virtual Ethernet switch.

10 CIM elements

517   Table 2 lists CIM elements that are defined or specialized for this profile. Each CIM element shall be
518   implemented as described in Table 2. The CIM Schema descriptions for any referenced element and its
519   sub-elements apply.

520   Clauses 7 ("Implementation") and 8 ("Methods") may impose additional requirements on these elements.

521   **Table 2 – CIM Elements: Virtual System Profile**

Element	Requirement	Notes
Classes		
CIM_ComputerSystem	Mandatory	See 10.1.
CIM_ConnectivityCollection	Optional	See 10.2.
CIM_ElementSettingData for CIM_VirtualEthernetSwitchSettingData	Mandatory	See 10.3.
CIM_ElementSettingData for CIM_VLANEndpointSetttingData	Conditional	See DMTF DSP1050
CIM_ElementSettingData for CIM_VirtualEthernetPortSettingData	Conditional	See DMTF DSP1050
CIM_HostedCollection	Optional	See 10.4.
CIM_MemberOfCollection	Optional	See 10.5.
CIM_NetworkVLAN	Optional	See 10.6.
CIM_RegisteredProfile	Mandatory	See 10.7.
CIM_SettingsDefineState	Mandatory	See 10.8.
CIM_SystemComponent	Conditional	See 10.9.

Element	Requireme nt	Notes
CIM_VirtualEthernetSwitchSettingData	Mandatory	See 10.10.
CIM_VirtualSystemSettingDataComponent	Conditional	See 10.11.
Indications		
None defined in this profile		

522 10.1 CIM_ComputerSystem

523 The use of the CIM_ComputerSystem class is specialized in the *Computer System Profile* and refined in
524 this profile.

525 The requirements in Table 3 are in addition to those mandated by the *Computer System Profile*.

526   **Table 3 – Class: CIM_ComputerSystem**

Elements	Requirement	Notes
Dedicated	Mandatory	See 7.1.1.

527 10.2 CIM_ConnectivityCollection (Optional)
528 An implementation may use an instance of the CIM_ConnectivityCollection class to represent a collection
529 of associated CIM_LANEndpoint instances that have current or potential connectivity between the
530 endpoints in this collection.

531 10.3 CIM_ElementSettingData (CIM_VirtualEthernetSwitchSettingData)

532 The CIM_ElementSettingData association associates the top-level instance of the
533 CIM_VirtualEthernetSwitchSettingData class in a "State" virtual Ethernet switch configuration and top-
534 level instances of the CIM_VirtualEthernetSwitchSettingData class in other virtual Ethernet Switch system
535 configurations. The use of the CIM_ElementSettingData class is specialized in the *Computer System*
536 *Profile* and refined in this profile.

537   Table 4 lists the requirements for this association.

538   **Table 4 – Association: CIM_ElementSettingData**

Element	Requirement	Notes
ManagedElement	Mandatory	**Key:** Reference to an instance of the CIM_VirtualEthernetSwitchSettingData class that represents the virtual-switch specific properties of the virtual Ethernet Switch **Cardinality:** 0..1
SettingData	Mandatory	**Key:** Reference to an instance of the CIM_VirtualEthernetSwitchSettingData class that represents a virtual Ethernet switch configuration **Cardinality:** *
IsDefault	Mandatory	None
IsCurrent	Unspecified	
IsNext	Mandatory	None
IsMinimum	Mandatory	Shall be set to 1 (Not Applicable)
IsMaximum	Mandatory	Shall be set to 1 (Not Applicable)
NOTE 1: The cardinality of the ManagedElement role is 0..1 (and not 1) because there are instances of the CIM_VirtualEthernetSwitchSettingData class that do not have an associated instance of the CIM_VirtualSystem-SwitchData class through the CIM_ElementSettingData association.		
NOTE 2: The cardinality of the SettingData role is * (and not 1) because there are instances of the CIM_VirtualEthernetSwitchSettingData class that do not have an associated instance of the CIM_VirtualEthernetSwitchSettingData class through the CIM_ElementSettingData association.		

539   ## 10.4 CIM_HostedCollection (optional)

540   The CIM_HostedCollection association may associate an instance of the CIM_ComputerSystem class
541   representing a virtual Ethernet Switch and an instance of CIM_NetworkVLAN or associates an instance of
542   the CIM_System class representing the host system and an instances of CIM_ConnectivityCollection.

543   Support of the CIM_HostedCollection association is conditional on the support of CIM_NetworkVLAN or
544   CIM_ConnectivityCollection.

545   Table 5 lists the requirements for this association.

546   **Table 5 – Association: CIM_HostedCollection**

Elements	Requirement	Notes
Antecedent	Mandatory	**Key:** Reference to an instance of the CIM_Computer-System class that represents a virtual Ethernet Switch or the instance of CIM_ComputerSystem class that represent the host. **Cardinality:** 1
Dependent	Mandatory	**Key:** Reference to an instance of CIM_NetworkVLAN or an instance of CIM_ConnectivityCollection **Cardinality:** *

547   **10.5 CIM_MemberOfCollection (optional)**

548   The CIM_MemberOfCollection association associates an aggregation of instances of the
549   CIM_ProtocolEndpoint class representing either a CIM_VLANEndpoint instances or CIM_LANEndpoint
550   instances to either an instance of CIM_ConnectivityCollection for LAN endpoints or NetworkVLAN for
551   VLAN endpoints.

552   Table 6 lists the requirements for this association.

553   **Table 6 – Association: CIM_MemberOfCollection**

Elements	Requirement	Notes
CIM_Collection	Mandatory	**Key:** Reference to an instance of the CIM_ProtocolEndpoint **Cardinality:** 1
CIM_ManagedElement	Mandatory	**Key:** Reference to an instance of CIM_NetworkVLAN or an instance of CIM_ConnectivityCollection **Cardinality:** *

554

555   **10.6 CIM_NetworkVLAN (optional)**

556   The CIM_NetworkVLAN class represents a collection of VLANEndpoints that are members of the VLAN.
557   When modeling switches with VLAN support there should be an instance of NetworkVLAN for every
558   VLAN available in a switch.

559   Table 7 contains the requirements for this association specific to this profile.

560   **Table 7 – Class: CIM_NetworkVLAN**

Element	Requirement	Notes
TypeOfMedia	Mandatory	See 7.1.3.

561   **10.7 CIM_RegisteredProfile**

562   The use of the CIM_RegisteredProfile class is specialized by the *Profile Registration Profile*. The
563   requirements denoted in Table 8 are in addition to those mandated by the *Profile Registration Profile*.

564   **Table 8 – Class: CIM_RegisteredProfile**

Elements	Requirement	Notes
RegisteredOrganization	Mandatory	Shall be set to 2 (DMTF)
RegisteredName	Mandatory	Shall be set to "Virtual Ethernet Switch"
RegisteredVersion	Mandatory	Shall be set to the version of this profile: "1.0.0"

565   **10.8 CIM_SettingsDefineState**

566   The CIM_SettingsDefineState association associates an instance of the CIM_ComputerSystem class
567   representing a virtual Ethernet Switch and an instance of the CIM_VirtualEthernetSwitchSettingData class
568   that represents the virtualization-specific properties of a virtual system and is the top-level instance of the
569   "State" virtual system configuration.

570   Table 9 contains the requirements for this association.

571   **Table 9 – Association: CIM_SettingsDefineState**

Elements	Requirement	Notes
ManagedElement	Mandatory	**Key:** Reference to an instance of the CIM_ComputerSystem class that represents a virtual Ethernet switch **Cardinality:** 0..1
SettingData	Mandatory	**Key:** Reference to an instance of the CIM_VirtualEthernetSwitchSettingData class that represents the virtualization-specific properties of a virtual system **Cardinality:** 1
NOTE: The cardinality of the ManagedElement role is 0..1 (and not 1) because there are instances of the CIM_VirtualEthernetSwitchSettingData class that do not have an associated instance of the CIM_ComputerSystem class through the CIM_SettingsDefineState association.		

10.9   CIM_SystemComponent (conditional)

573   The CIM_SystemComponent association associates an instance of the CIM_ComputerSystem class
574   representing a virtual Ethernet Switch and one or more instances of the CIM_ResourcePool class that
575   represent a pool of available Ethernet switch port connections for allocation to a virtual computer system.

576   Support of the CIM_SystemComponent association is conditional with respect to the support of the
577   allocation of Ethernet switch port connections between the associated virtual Ethernet switch to a virtual
578   computer system through the use of resource pools (see DMTF DSP1050.)

579   Table 10 lists the requirements for this association.

580   **Table 10 – Association: CIM_SystemComponent**

Elements	Requirement	Notes
GroupComponent	Mandatory	**Key:** Reference to an instance of the CIM_ComputerSystem class that represents a virtual Ethernet Switch **Cardinality:** 1
PartComponent	Mandatory	**Key:** Reference to an instance of the CIM_ResourcePool which represents a pool of allowable Ethernet Connection allocations **Cardinality:** *

10.10   CIM_VirtualEthernetSwitchSettingData

582   The CIM_VirtualEthernetSwitchSettingData class specializes the CIM_VirtualSystemSettingData class,
583   specified in the *Virtual System Profile*, by adding switch-specific properties.

584   The requirements in Table 11 are in addition to those mandated by the *Virtual System Profile*.

585   Table 11 contains the requirements for this class.

586   **Table 11 – Class: CIM_VirtualEthernetSwitchSettingData**

Element	Requirement	Notes
VirtualSystemType	Mandatory	See 7.1.2.

Element	Requirement	Notes
AssociatedResourcePool	Mandatory	See 7.1.3

587   10.11   CIM_VirtualSystemSettingDataComponent (conditional)

588   CIM_VirtualSystemSettingDataComponent is specialized in the *System Virtualization Profile*. The
589   requirements in Table 12 are in addition to those mandated by the *System Virtualization Profile*.

590   **Table 12 – Association: CIM_VirtualSystemSettingDataComponent**

Elements	Requirement	Notes
GroupComponent	Mandatory	**Key:** Reference to an instance of the CIM_VirtualEthernetSwitchSettingData class that represents the virtual aspects of a virtual Ethernet switch **Cardinality:** 1
PartComponent	Mandatory	**Key:** Reference to an instance of the CIM_ResourceAllocationSettingData class that represents virtual aspects of a virtual resource **Cardinality:** 0..*

591

592 **ANNEX A**
593 **(informative)**

594

595 **Change Log**

596

Version	Date	Description
1.0.0	2010-10-21	Released as DMTF Standard

597