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Ethernet Port Resource Virtualization Profile

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Foreword

The *Ethernet Port Resource Virtualization Profile* (DSP1050) was prepared by the System Virtualization, Partitioning and Clustering Working Group of the DMTF.

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Introduction

The information in this specification should be sufficient for a provider or consumer of this data to identify the classes, properties, methods, and values that shall be instantiated to subscribe, advertise, produce, or consume an indication using the DMTF Common Information Model (CIM) Schema.

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.

Document conventions

Typographical conventions

The following typographical conventions are used in this document:

- Document titles are marked in *italics*.
- Important terms that are used for the first time are marked in *italics*.

Ethernet Port Resource Virtualization Profile

1 Scope

This profile is a component DMTF management profile that extends the management capabilities of the referencing profile by adding the support to represent and manage the allocation of Ethernet ports to virtual systems.

2 Normative references

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

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

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

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

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

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

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

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

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

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

DMTF DSP1057, *Virtual SystemProfile 1.0*,
http://www.dmtf.org/standards/published_documents/DSP1057_1.0.pdf

DMTF DSP1097, *Virtual Ethernet Switch Profile 1.1*,
http://dmtf.org/sites/default/files/standards/documents/DSP1097_1.1.0_0.pdf

DMTF DSP2025, *Virtual Networking Management White Paper 1.0*,
http://www.dmtf.org/sites/default/files/standards/documents/DSP2025_1.0.0b.pdf

DMTF DSP8049*, Network Port Profile Schema,*
http://schemas.dmtf.org/ovf/networkportprofile/1/dsp8049_1.0.0.xsd

IEEE 802.1Qaz - Enhanced Transmission Selectionfor Bandwidth Sharing Between Classes.
http://www.ieee802.org/

IEEE 802.1Qbg - Virtual Bridged Local Area Networks - Amendment XX: Edge Virtual Bridging
http://www.ieee802.org/

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

3 Terms and definitions

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

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

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

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

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

3.1
client
an application that exploits facilities specified by this profile.

3.2
dynamic Ethernet connection allocation
an Ethernet connection in which a Ethernet switch port is dynamically allocated to connect a defined Ethernet adapter as part of an Ethernet connection allocation.

3.3
embedded switch (eSwitch)
an eSwitch is a virtual Ethernet switch that is embedded in a hardware Ethernet adapter that implements either the VEB or VEPA function.

3.4
Ethernet adapter
an EthernetPort, its associated LAN Endpoint(s) and, optionally, a VLAN Endpoint that models the Ethernet device on a virtual or host system.

3.5
Ethernet adapter allocation request
a request for an Ethernet adapter resource allocation to a virtual machine; represented as instance of CIM_EthernetPortAllocationSettingData.

3.6
Ethernet adapter resource allocation
the allocation of an Ethernet port to a virtual system.

3.7

Ethernet adapter resource pool

a resource pool that represents Ethernet adapters available as resources for a virtual computer system resource allocation.

3.8

Ethernet connection

the connection of two LAN endpoints where one LAN endpoint is implemented by an Ethernet adapter, and the other LAN endpoint is implemented by an Ethernet switch port, resulting in the connection of a virtual or host system Ethernet adapter to an Ethernet switch port.

3.9

Ethernet connection allocation request

an allocation request for a connection between a LAN Endpoint on an Ethernet adapter and a LAN Endpoint on an Ethernet switch port. An Ethernet connection allocation request may cause the implicit allocation of the entities that it connects, such as virtual Ethernet adapters and virtual switch ports. Ethernet connection allocation request is represented as instance of CIM_EthernetPortAllocationSettingData.

3.10

Ethernet connectionallocation

the allocation of an Ethernet connection between the LAN Endpoints of an Ethernet adapter and an Ethernet switch port.

3.11

Ethernet connection resource pool

a resource pool that represents available Ethernet connections on a virtual Ethernet switch for a virtual computer system.

3.12

Ethernet switch port

an Ethernet Port, its associated LAN Endpoint(s) and, optionally, a VLAN Endpoint that models the Ethernet port on an Ethernet switch.

3.13

Ethernet switch port allocation request

a request for an Ethernet switch port resource allocation; represented as instance of CIM_EthernetPortAllocationSettingData.

3.14

Ethernet switch port resource allocation

the allocation of an Ethernet port to a virtual Ethernet switch.

3.15

Ethernet switch port resource pool

a resource pool that represents Ethernet switch ports available as resources for a virtual Ethernet switch port resource allocation.

3.16

host system

the scoping system that contains Ethernet resources that may be allocated, virtualized, or both.

3.17

implementation

a set of CIM providers that realize the classes specified by this profile.

3.18

network interface controller (NIC)

a NIC is a component that connects a computer system or virtual computer system to a network. It is also referred to as a network adapter or adapter or Ethernet adapter in this specification.

3.19

network port profile

a network port profile is a DSP8049 compliant document that describes a set of networking attributes that can be applied to Ethernet ports and virtual Ethernet switches.

3.20

simple Ethernet connection

an Ethernet connection in which a dynamically allocated Ethernet switch port and an Ethernet adapter are instantiated as part of an Ethernet connection allocation.

3.21

static Ethernet connection allocation

an Ethernet connection allocation where a specific pre-existing Ethernet switch port is requested as part of the allocation request.

3.22

virtual computer system

the concept of a virtual system as applied to a computer system

Other common industry terms are *virtual machine*, *hosted computer*, *child partition*, *logical partition*, *domain*, *guest*, or *container*.

3.23

virtual Ethernet bridge (VEB)

a VEB is a frame relay service that supports local bridging between multiple VSIs and (optionally) the adjacent bridging environment. A VEB may be implemented in software as a vSwitch or as an eSwitch within a NIC. VEBs have access to vNIC configuration information that normally is not available to an 802.1Q bridge.

3.24

virtual Ethernet port aggregator (VEPA)

a virtual Ethernet port aggregator is a capability within a computer system that collaborates with an adjacent, external bridge to provide bridging support between multiple virtual computer systems and external networks. The VEPA collaborates by forwarding all computer system-originated frames to the adjacent bridge for frame processing and frame relay (including reflective relay forwarding) and by steering and replicating frames received from the VEPA uplink to the appropriate destinations. A VEPA may be implemented in software as a vSwitch or an eSwitch within a NIC. As in the case of VEBs, VEPAs have access to vNIC configuration information that normally is not available to an 802.1Q bridge.

3.25

virtual Ethernet switch

the concept of a virtual system as applied to a virtual Ethernet switch.

A virtual Ethernet switch provides internal and external network connectivity to the virtual computer systems attached to it. A virtual Ethernet switch implements either the VEB or VEPA function.

3.26

virtual network interface controller (vNIC)

an entity that performs the Media Access Control (MAC), Link Level Control (LLC), management and control functions needed to attach a VM to a network.

3.27
virtual station interface (VSI)

an entity comprised of a vNIC (modeled as an Ethernet port), its internal point-to-point Ethernet connection to a virtual Ethernet switch, and the Ethernet port of the virtual Ethernet switch that is connected to the vNIC. Each VSI carries a single MAC service instance.

3.28
virtualization platform
the virtualizing infrastructure provided by a host system that enables the deployment of virtual systems.

4 Symbols and abbreviated terms

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

4.1
CIM
Common Information Model

4.2
CIMOM
CIM object manager

4.3
EASD
CIM_EthernetPortAllocationSettingData

4.4
ESD
CIM_ElementSettingData

4.5
LLC
link level control

4.6
MAC
media access control

4.7
EVB
edge virtual bridging

4.8
RASD
CIM_ResourceAllocationSettingData

4.9
SDS
CIM_SettingsDefineState

4.10
SDC
CIM_SettingsDefineCapabilities

4.11
VEB
virtual Ethernet bridge

4.12
VEPA
virtual Ethernet port aggregator

4.13
VESSD
CIM_VirtualEthernetSwitchSettingData

4.14
VSSD
CIM_VirtualSystemSettingData

5 Synopsis

Profile Name: Ethernet Port Resource Virtualization

Profile Version: 1.1.0

Organization: DMTF

CIM Schema Version: 2.29

Central Class: CIM_ResourcePool

Scoping Class: CIM_System

This profile is a component profile that defines the minimum object model needed to provide for the CIM representation and management of the virtualization of Ethernet ports and connections.

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

Table 1 –Related profiles

Profile Name	Organization	Version	Requirement	Description
Resource Allocation	DMTF	1.1	Specializes	The abstract profile that describes the virtualization of resources See DSP1041.
Allocation Capabilities	DMTF	1.0	Specializes	The abstract profile that describes capabilities for resource allocation See DSP1043.
Profile Registration	DMTF	1.0	Mandatory	The profile that specifies registered profiles
Ethernet Port	DMTF	1.0	Optional	The profile that specifies the management of Ethernet Ports See DSP1014.

6 Description

This clause contains informative text only It introduces the management domain addressed by this profile and outlines the central modeling elements established for representation and control of the management domain.

6.1 General

In computer virtualization systems, virtual computer systems are composed of component virtual resources.This profile specializes the resource virtualization pattern as defined in DSP1041 (*Resource Allocation Profile*) and the allocation capabilities pattern as defined in DSP1043 (*Allocation Capabilities Profile*) for the representation and management of the following types of resources:

- Ethernet adapters, designated by resource type value 10 (Ethernet Adapter). Ethernet adapters are allocated to a virtual computer system.
- Ethernet switch ports, designated by resource type value 30 (Ethernet Switch Port). Ethernet switch ports are allocated to virtual Ethernet switches.
- Ethernet connections, designated by resource type value 33 (Ethernet Connection). Ethernet connections represent the connection (association CIM_ActiveConnection) between two CIM_LANEndpoint instances that are associated to the instances of CIM_EthernetPort representing either an Ethernet adapter or an Ethernet switch port.

This profile references additional or specialized CIM elements and extends constraints beyond those defined in the abstract profiles.

This version of the profile also includes the properties of the CIM_EthernetportAllocationSettingData, that are used in DSP8049. Refer to DSP2025 for a description of the use of DSP8049 and its relationship to this CIM profile.

6.2 Ethernet port resource virtualization class schema

Figure 1 shows the class schema of this profile. It outlines the elements that are referenced and in some cases further constrained by this profile, as well as the dependency relationships between elements of this profile and other profiles. For simplicity in diagrams, the *CIM_*prefix has been removed from class and association names. Inheritance relationships are shown only to the extent required in the context of this profile.

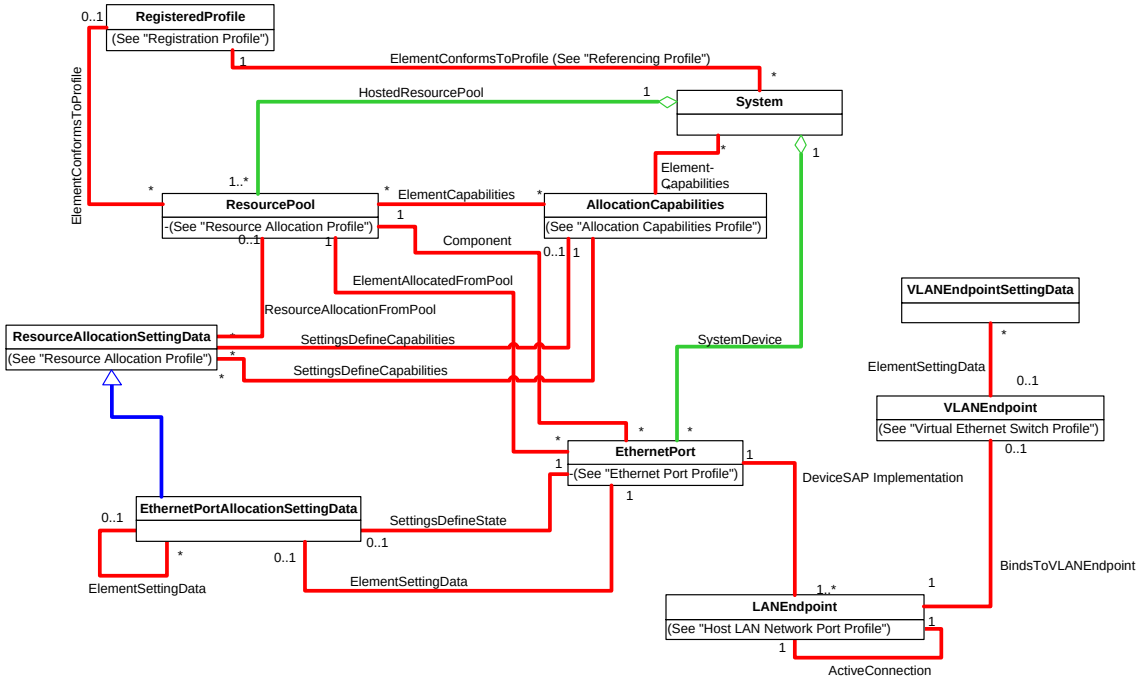


Figure 1 – Ethernet Port Resource Virtualization: Profile class diagram

This profile specializes DSP1041 and DSP1043 by defining more specific adaptations for the following classes and associations:

- The CIM_ResourcePool class models the resource pools for Ethernet resources.The resource pool is used to allocate the resources required to instantiate virtual Ethernet adapters and Ethernet switch ports that are modeled by the CIM_EthernetPort class.
- The CIM_ResourcePool class also models the resources required to describe a connection between the LAN endpoints of an Ethernet adapter and an Ethernet switch port.
- The CIM_Component association models the relationship between resource pools (with a type of either Ethernet adapters or Ethernet switch port) and host Ethernet ports as components of the resource pools.
- The CIM_ElementAllocatedFromPool association models the relationship between resource pools and the virtual Ethernet ports allocated from those pools.
- The CIM_ResourceAllocatedFromPool association models the relationship between a resource pool and the resource allocations provided by the resource pool.
- The CIM_HostedResourcePool association models the hosting dependency between a resource pool and its host system.
- The CIM_EthernetPort class models the following aspects of both an Ethernet adapter and an Ethernet switch port:
  - CIM_EthernetPort as a device in the scope of a system (computer system or virtual Ethernet switch), as modeled by the CIM_SystemDevice association

481 – CIM_EthernetPort as a result of anEthernet adapter or Ethernet switch port resource
482 allocation from a resource pool, as modeled by the CIM_ElementAllocatedFromPool
483 association

484 – CIM_EthernetPort as a component within Ethernet adapter or Ethernet switch port
485 resource pools, as modeled bythe CIM_Component association

486 • The CIM_EthernetPortAllocationSettingData class is a subclass of the
487 CIM_ResourceAllocationSettingData class and models

488 – Ethernet adapter resource allocations or allocation requests

489 – Ethernet switch port resource allocations or allocation requests

490 – Ethernet connection allocations or allocation requests. Ethernet connection resource
491 allocations or allocation requests represent an allocation request for the connection
492 between a pair of CIM_LANEndpoint instances or a current allocation of the described
493 connection.

494 • The CIM_ElementSettingData association between the classes CIM_EthernetPort and
495 CIM_EthernetPortAllocationSettingData models the relationship between an Ethernet adapter
496 represented by the class CIM_EthernetPort and an Ethernet connection allocation represented
497 by the class CIM_EthernetPortAllocationSettingData. This use of the association is in
498 compliance with a simple allocation as described in DSP1041.

499 • The CIM_AllocationCapabilities class and the CIM_ElementCapabilities association model:

500 – the resource allocation capabilities of the host system and/or a resource pool for resource
501 types 10 (Ethernet Adapter) or 30 (Ethernet Switch Port)

502 – the mutability of existing allocationsfor resource types 10 (Ethernet Adapter) or 30
503 (Ethernet Switch Port)

504 – the allocation capabilities of the host systems and/or resource pools for resource type 33
505 (Ethernet Connection)

506 – the mutability of existing allocations for resource type 33 (Ethernet Connection)

507 In general, any mention of a class in this document means the class itself or its subclasses. For example,
508 a statement such as “an instance of the CIM_LogicalDevice class” implies an instance of the
509 CIM_LogicalDevice class or a subclass of the CIM_LogicalDevice class.

510 6.3 Resource pools

511 This profile applies the concept of resource pools defined in DSP1041 to resource types 10 (Ethernet
512 Adapter), 30 (Ethernet Switch Port), and 33 (Ethernet Connection).

513 This profile uses the Ethernet port resource pool as the focal point for Ethernet adapter and Ethernet
514 switch port allocations. These are respectively allocated to virtual computer systems as defined in
515 DSP1057 and Ethernet switches as defined in DSP1097.

516 This profile uses Ethernet connection resource pools are the focal point for the allocation of Ethernet
517 connections. These are allocated to establish the connection between the LAN Endpoints associated to
518 an Ethernet adapter and that implemented by an Ethernet switch port.

519 6.3.1 General

520 This profile applies the concept of resource pools defined in clause 6.1.2 of DSP1041 to the following
521 resource types:

522 • Resource type 10 (Ethernet Adapter) designates Ethernet adapter resource pools that represent
523 resources for the allocation of Ethernet adapters for the use by virtual systems; allocated
524 Ethernet adapters are represented by CIM_EthernetPort instances.

- Resource type 30 (Ethernet Switch Port) designates Ethernet switch port resource pools that represent resources for the allocation of Ethernet switch ports for use by virtual Ethernet switches; allocated Ethernet switch ports are represented by CIM_EthernetPort instances.
- Resource type 33 (Ethernet Connection) designates Ethernet connection resource pools that represent resources for the allocation of connections between an Ethernet adapter that is a resource of a virtual system and an Ethernet switch port that is a resource of a virtual Ethernet switch.

The resource type of a resource pool governs the resource types that are allocated from the resource pool. The type of host resources that are aggregated by a resource pool may differ from the resource type of the pool. For example, a resource pool with a resource type of 10 (Ethernet Adapter) supports the allocation of virtual Ethernet adapters. However, the resources that are aggregated by that resource pool may be of a different type; for example, the resource pool might simply represent connectivity to an external network.

6.3.2 Representation of host resources

Resource pools for Ethernet adapters or Ethernet switch ports represent host resources that enable the allocation of respective virtual devices, namely virtual Ethernet adapters or virtual Ethernet switch ports; resource pools for Ethernet connections represent host resources that enable the allocation of virtual Ethernet connections. However, the explicit representation of the host resources aggregated by a resource pool is optional. In some cases, implementations may explicitly represent the host resources, such as host Ethernet adapters or host Ethernet switch ports. In other cases, implementations may choose not to explicitly represent the host resources aggregated by a resource pool. For example, an implementation for the representation and management of virtual Ethernet connections is not required to explicitly model the host resources that support the virtual Ethernet connections; instead, in this case,the resource pool is the sole model element that represents the Ethernet connection capacity assigned for the support of (allocated) virtual Ethernet connections and the capacity that is still available for the allocation of new Ethernet connections.

6.4 Resource allocation

This subclause describes how this profile models resource allocations and resource allocation requests for Ethernet resources.

6.4.1 General

This profile specializes the concept of *virtual resource allocation* defined in clause 6.3 of DSP1041 to resource types 10 (Ethernet Adapter) and 30 (Ethernet Switch Port), both modeled by the CIM_EthernetPort class.

This profile specializes the concept of *simple resource allocation* defined in clause 6.2 of DSP1041 to resource type 33 (Ethernet Connection). Simple resource allocation implies that the result of the allocation is not represented by a CIM_LogicalDevice instance.

6.4.2 Ethernet resource allocation for virtual Ethernet switches

Figure 2 shows an example of the allocation of an Ethernet switch port to a virtual switch. The upper part of Figure 2 shows a static allocation request of a virtual Ethernet switch port to a virtual Ethernet switch, applying the concept of virtual resource allocation as specified in clause 7.2 of DSP1041. The lower part of Figure 2 shows the virtual switch with the allocated Ethernet switch port.

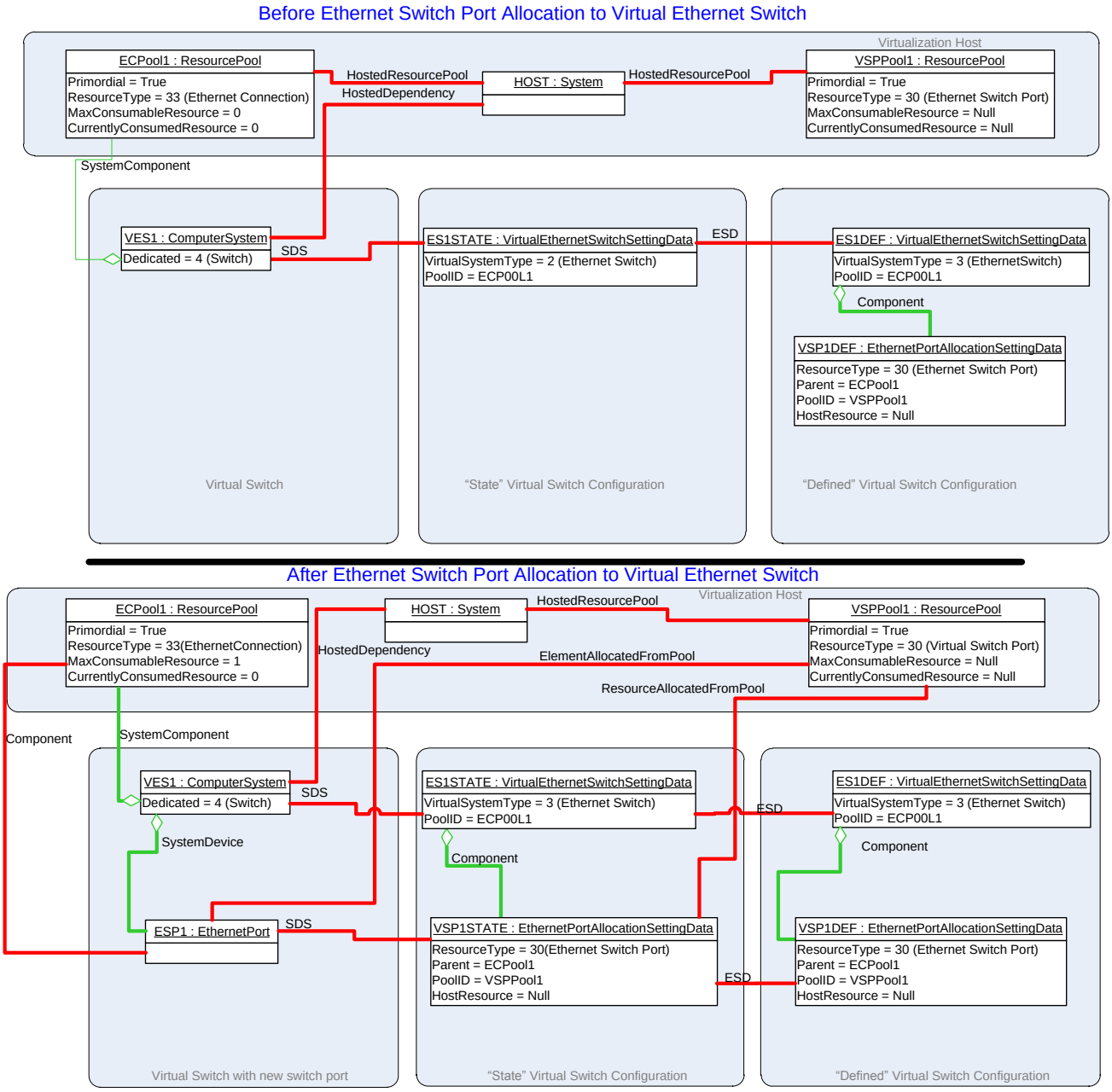


Figure 2 – Virtual Ethernet switch port allocation

In the example shown in Figure 2, the virtual Ethernet switch is represented by the CIM_ComputerSystem instance VES1, as specified in DSP1097. Once allocated, the Ethernet switch port is represented by the CIM_EthernetPort instance ESP1.

In the example shown in Figure 2, the CIM_EthernetPortAllocationSettingData instance VSP1DEF represents an allocation request of an Ethernet switch port (resource type 30 [Ethernet Switch Port]) from the resource pool represented by VSPPOOL1. The value of the Parent property in VSP1DEF identifies the Ethernet connection resource pool represented by ECPOOL1 to provide the connection at allocation time.

577 The result of the allocation is shown in the lower half of Figure 2. An Ethernet switch port represented by
578 the CIM_EthernetPort instance ESP1 has been allocated from the resource pool represented by
579 VSPPOOL1, as shown through the instance of the CIM_ElementAllocatedFromPool association. ESP1 is
580 associated with the CIM_ResourcePool instance ECPOOL1 through an instance of the
581 CIM_ConcreteComponent association. This association represents the availability of the switch port for
582 the allocation of Ethernet connections from the pool. Notice also that the addition of an Ethernet switch
583 port is reflected by incrementing the value of the MaxConsumableResource property.

584 6.4.3 Ethernet resource allocation for virtual systems

585 Figure 3 shows an example of the allocation of Ethernet resources to a virtual system. The upper part of
586 of Figure 3 shows allocation requests for an Ethernet adapter and a related static Ethernet connection for
587 a virtual system.The lower part of Figure 3 shows the virtual system with the allocated Ethernet adapter
588 and the allocated Ethernet connection. Note that the EthernetPortAllocationSettingData instance normally
589 associated with an Ethernet switch port, ESP1 in this diagram, is not shown. Refer to Figure 2 for an
590 example of an allocation of an Ethernet switch port.

591 NOTE This is a typical example; however, it is possible to request only an Ethernet Connection and receive an
592 implicitly allocated default Ethernet adapter as part of the Ethernet connection allocation. (See the use case for the
593 simple connection of a virtual machine described in 9.1.5 and Figure 10.)

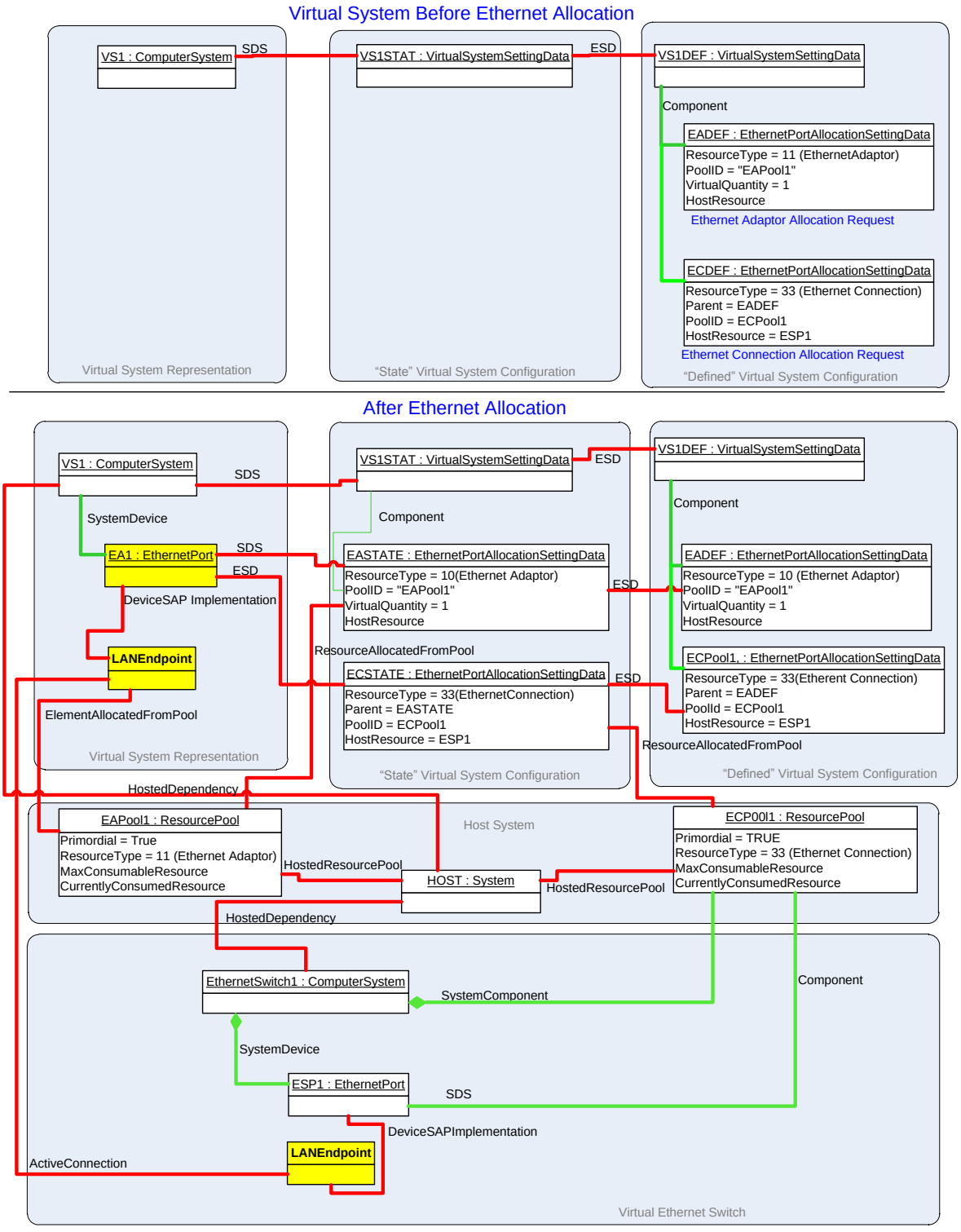


Figure 3 – Instance Diagram: Ethernet adapter and Ethernet connection resource allocations

6.4.4 Resource allocation request

The Ethernet connection and Ethernet adapter requirements of a virtual system are defined as part of its "defined" virtual system configuration; see DSP1057 for the specification of the "defined" virtual system configuration.

The "defined" virtual system configuration of a virtual system contains one or both of the following:

- Ethernet adapter resource allocation requests represented as EASD instances with the value of the ResourceType property set to 10 (Ethernet Adapter)
- Ethernet connection resource allocation requests represented as EASD instances with the value of the ResourceType property set to 33 (Ethernet Connection)

An example of the CIM representation of an Ethernet Adapter resource allocation request and a related Ethernet Connection resource allocation request is shown in the upper right part of Figure 3.

The Ethernet switch port requirements of a virtual system switch are defined as part of its "defined" virtual system configuration; see DSP1097 for the specification of the "defined" virtual system configuration of virtual Ethernet switches.

The "defined" virtual system configuration of a virtual Ethernet switch contains Ethernet switch port resource allocation requests represented as EASD instances with the value of the ResourceType property set to 30 (Ethernet Switch Port).

An example of the CIM representation of an Ethernet switch port resource allocation request is shown in the upper right part of Figure 2.

6.4.5 Resource allocation

As a virtual system is activated (or instantiated), Ethernet adapters and Ethernet connections need to be allocated as requested by Ethernet adapter and Ethernet connection resource allocation requests in the virtual system definition. These resource allocations are represented as EASD instances in the "state" virtual system configuration; see DSP1057 for the specification of the "state" virtual system configuration.

An example of the CIM representation of an Ethernet Adapter and Ethernet Connection resource allocation is shown in the center part of Figure 3.

As a virtual Ethernet switch is activated (or instantiated), Ethernet switch ports need to be allocated as requested by Ethernet port resource allocation requests in the virtual system definition. These resource allocations are represented as EASD instancesin the "state" virtual system configuration; see DSP1097 for the specification of the "state" virtual system configuration of virtual Ethernet switches.

An example of the CIM representation of an Ethernet switch port resource allocation is shown in the center part of Figure 2.

6.4.6 Virtual Ethernet adapter

A virtual Ethernet adapter is either the instantiation of the resources allocated from an Ethernet adapter resource pool or instantiated as a side effect of an Ethernet connection allocation. The Ethernet adapter is represented with an instance of CIM_EthernetPort associated to the virtual system with CIM_SystemDevice.

In the example shown in Figure 3, the virtual Ethernet adapter was allocated from EA_Pool1 and is represented by the CIM_EthernetPort instance EA1 as part of the virtual system (VS1) representation.

6.4.7 Ethernet connection

A virtual Ethernet connection is the instantiation of resources allocated from an Ethernet connection resource pool. The allocation represents an allocation to connect an Ethernet adapter to an Ethernet

switch port. A virtual Ethernet connection is not exposed to a virtual system through a logical device; however, a virtual Ethernet connection is represented by an instance of the CIM_ActiveConnection association between the CIM_LANEndpoint instance implemented by an Ethernet adapter and the CIM_LANEndpoint instance implemented by an Ethernet switch port. An Ethernet connection allocation can represent the connection between specific Ethernet adapter and Ethernet switch port instances, or the allocation could include the instantiation of an Ethernet adapter and/or an instantiation of an Ethernet switch port as part of the Ethernet connection allocation.

An example of the CIM representation of an Ethernet connection allocation is shown by the CIM_ActiveConnection association between the two CIM_LANEndpoint instances in Figure 3.

6.4.8 Virtual Ethernet switch port

A virtual Ethernet switch port is the instantiation of resources allocated from an Ethernet switch port resource pool or instantiated as part of an Ethernet connection allocation. The Ethernet switch port is represented with an instance of CIM_EthernetPort and associated to the CIM_ComputerSystem instance representing the virtual Ethernet switch with CIM_SystemDevice.

In the example shown in Figure 2, an allocated Ethernet switch port is represented by the CIM_EthernetPort instance ESP1 as part of the virtual Ethernet switch representation.

6.4.9 Network Port Profile

The 2.29 version of the DMTF CIM Schema includes an updated version of the CIM_EthernetPortAllocationSettingData class that includes a set of properties for the identification and configurations elements necessary to support DSP8049. These properties are described in the schema element and in clause 7 of this profile. The use of the Network Port Profile is described in detail in DSP2025. These properties represent Ethernet switch port properties and, as such, do not affect the above-described lifecycle operations in this subclause and in an effort to keep the diagrams simple are not shown in the above figures.

7 Implementation

This clause provides normative requirements related to the arrangement of instances and properties of instances for implementations of this profile.

7.1 Common requirements

The CIM Schema descriptions for any referenced element and its sub-elements apply.

In references to properties of CIM classes that enumerate values, the numeric value is normative and the descriptive text following it in parentheses is informative. For example, in the statement "The value of the ConsumerVisibility property shall be 3 (Virtualized)", the value "3" is normative text and "(Virtualized)" is informative text.

7.2 Resource types

This subclause specifies the resource types that are addressed by this profile.

This profile may be implemented for the allocation of two principal resource types: *Ethernet ports* and *Ethernet connections*. An Ethernet port is an Ethernet connection endpoint. Ethernet ports are further distinguished as *Ethernet adapters* and *Ethernet switch ports*. Ethernet adapters are Ethernet ports within virtual systems, and Ethernet switch ports are Ethernet ports within virtual switches.

7.3 Host resources

This subclause specifies requirements for the representation of host resources.

7.3.1 Host Ethernet adapters

The implementation of the representation of host Ethernet adapters is optional.

If implemented, the provisions in this subclause apply.

Each host Ethernet adapter shall be represented by exactly one CIM_EthernetPort instance. The CIM_EthernetPort instance shall be associated with the CIM_System instance that represents the host system through an instance of the CIM_SystemDevice association.

7.3.2 Host Ethernet switch ports

The implementationof the representation of host Ethernet switch ports is optional.

If implemented, the provisions in this subclause apply.

Each host Ethernet switch port shall be represented by exactly one CIM_EthernetPort instance. The CIM_EthernetPort shall be associated with either the CIM_System instance that represents the host system or the CIM_ComputerSystem instance that represents a virtual Ethernet switch hosted by the host system through an instance of the CIM_SystemDevice association.

7.4 Resource pool management feature

The implementation of the resource pool management feature is optional.

If implemented, the specifications of DSP1041 apply; this profile does not specify specializations or extensions of resource pool management beyond those defined by DSP1041.

7.5 Resource pools

This subclause adapts the CIM_ResourcePool class for the representation of Ethernet adapter resource pools, Ethernet switch port resource pools, and Ethernet connection resource pools.

7.5.1 ResourceType property

The value of the ResourceType property shall denote the type of resources that are provided by the resource pool, as follows:

- For resource pools supporting only the allocation of Ethernet adapters, the value of the ResourceType property shall be 10(Ethernet Adapter).
- For resource pools supporting only the allocation of Ethernet switch ports, the value of the ResourceType property shall be 30 (Ethernet Switch Port).
- For resource pools supporting only the allocation of Ethernet connections, the value of the ResourceType property shall be 33 (Ethernet Connection).

7.5.2 ResourceSubtype property

The implementation of the ResourceSubtype property is optional.

If the ResourceSubtype property is implemented, the provisions in this subclause apply.

The value of the ResourceSubtype property shall designate a resource subtype. The format of the value shall be as follows: "<org-id>:<org-specific>". The <org-id> part shall identify the organization that defined the resource subtype value; the <org-specific> part shall uniquely identify a resource subtype within the set of subtypes defined by the respective organization.

7.5.3 AllocationUnits property

If the allocation of Ethernet ports or Ethernet connections is based on bandwidth, the value of the AllocationUnits property shall be set to “bits per second” or a multiple thereof. The AllocationUnits property is a programmatic unit as specified in ANNEX C of DSP0004.

If the allocation of Ethernet ports is implemented based on the number of passed-through Ethernet ports, the value of the AllocationUnits property shall be set to "count" (the count of passed-through host Ethernet ports).

If the allocation of Ethernet connections is implemented based on the number of Ethernet connections, the value of the AllocationUnits property shall be set to "count" (the count of Ethernet connections).

7.5.4 Reserved property

The implementation of the Reserved property is optional.

If the Reserved property is implemented, the following provisions apply:

- If the value of the AllocationUnits property is (a multiple of) “bits per second the value of the Reserved property shall reflect the amount of Ethernet bandwidth that is actually reserved from the resource pool.
- If the value of the AllocationUnits property is "count", the value of the Reserved property shall denote the number of host Ethernet ports or the number of Ethernet connections that are actually reserved from the resource pool.

7.5.5 Capacity property

The implementation of the Capacity property is conditional.

Condition: The aggregation of host Ethernet ports into Ethernet port resource pools is implemented; see 7.4.

If the Capacity property is implemented, the following provisions apply:

- If the value of the AllocationUnits property is (a multiple of) "bits per second" (see DSP0004), the value of the Capacity property shall reflect the maximum aggregate amount of Ethernet bandwidth represented by the resource pool. If the resource pool has unlimited capacity, the value of the Capacity property shall be set to the largest value supported by the uint64 datatype.
- If the value of the AllocationUnits property is "count", the value of the Capacity property shall reflect the maximum number of host Ethernet ports or the maximum number of Ethernet connections represented by the resource pool.

7.5.6 MaxConsumableResource property

The implementation of the MaxConsumableResource property is conditional.

Condition: The resource pool supports the direct or exclusive allocation of a finite number of host resources.

If implemented, the value of the MaxConsumableResource property shall reflect the total number of virtual Ethernet adapters, virtual Ethernet switch ports,or virtual Ethernet connections that can be allocated in total from a resource pool.

7.5.7 ConsumedResourceUnits property

The implementation of the ConsumedResourceUnits property is conditional.

Condition: The MaxConsumableResource property or the CurrentlyConsumedResource property is implemented.

If implemented, the value of the ConsumedResourceUnits property shall be set to "count".

7.5.8 CurrentlyConsumedResource property

The implementation of the CurrentlyConsumedResource property is conditional.

Condition: The MaxConsumableResource property is implemented.

If implemented, the value of the CurrentlyConsumableResource shall reflect the total number of virtual Ethernet adapters, virtual Ethernet switch ports or virtual Ethernet connections that are currently allocated from the resource pool.

7.5.9 Instance requirements

Each Ethernet port resource pool shall be represented by exactly one CIM_ResourcePool instance. The CIM_ResourcePool instance shall be associated with the CIM_System instance representing the system hosting the resource pool through an instance of the CIM_HostedPool association.

7.5.10 Resource aggregation feature

The implementation of the resource aggregation feature is conditional.

Condition: The resource pool management feature is implemented; see 7.4.

Granularity: If implemented, the resource aggregation feature may be separately supported for each resource pool.

The preferred feature discovery mechanism is to resolve the CIM_Component association from the CIM_ResourcePool instance to CIM_ManagedElement instances representing aggregated resources of the storage resource pool. If the resulting set of CIM_ManagedElement instances is not empty, the feature is supported.

NOTE If the result set is empty, the feature may still be supported, but no resources are aggregated at that point in time; however, if aggregated resources for a particular resource pool were ever exposed, the feature is still supported even if at a later point in time no resources are aggregated.

7.6 Resource allocation

This subclause details requirements for the representation of resource allocation information.

7.6.1 General

NOTE DSP1041 specifies two alternatives for modeling resource allocation: simple resource allocation and virtual resource allocation.

Implementations of this profile shall implement the virtual resource allocation pattern as defined in subclause 7.2 of DSP1041 for resource types 10 (Ethernet Adapter) and30 (Ethernet Switch Port).

Implementations of this profile shall implement the simple resource allocation pattern as defined in subclause 7.3 of DSP1041 for resource types 33 (Ethernet Connection).

7.6.2 Adaptations of allocation settings data

Details about the various adaptations of allocation settings data are provided as follows:

- Resource allocation requests are described in 6.4.4.
- Resource allocations are described in 6.4.5.

- Settings that define the capabilities or mutability of managed resources are described in DSP1043, which specifies a capabilities model that conveys information about the capabilities and the mutability of managed resources in terms of RASD instances (or instances of subclasses of RASD such as EASD).
- Parameters in operations that define or modify any of the previous representations in this list are described in DSP1042, which specifies methods for the definition and modification of virtual resources. These methods use RASD instances (or instances of subclasses of RASD, such as EASD) for the parameterization of resource-allocation-specific properties.

Table 2 lists acronyms that are used in subclauses of 7.6 in order to designate EASD instances that represent various flavors of allocation settings data.

Table 2 – Acronyms for EASD adapted for the representation of various flavors of allocation data

Acronym	Flavor
Q_EASD	EASD adapted for the representation of Ethernet adapter resource allocation requests, Ethernet switch port resource allocation requests, or Ethernet connection resource allocation requests
R_EASD	EASD adapted for the representation of Ethernet adapter resource allocations, Ethernet switch port resource allocations, or Ethernet connection resource allocations
C_EASD	• EASD adapted for the representation of settings that define capabilities of systems or resource pools for Ethernet adapter resources, or that define the mutability of Ethernet adapter resource allocations or Ethernet adapter resource allocation requests • EASD adapted for the representation of settings that define capabilities of systems or resource pools for Ethernet switch port resources, or that define the mutability of Ethernet switch port allocations or of Ethernet switch port allocation requests • EASD adapted for the representation of settings that define capabilities of systems or resource pools, or that define the mutability of Ethernet connection resource allocations or Ethernet connection resource allocation requests
D_EASD	EASD adapted for the representation of new Ethernet adapter resource allocation requests in method parameter values,new Ethernet switch port resource allocation requests in method parameter values, or new Ethernet connection resource allocation requests in method parameter values as defined in DSP1042
M_EASD	EASD adapted for the representation of modified Ethernet adapter resource allocations or Ethernet adapter resource allocation requests, EASD adapted for the representation of modified Ethernet switch port resource allocations or Ethernet switch port resource allocation requests, or EASD adapted for the representation of modified Ethernet connection resource allocations or Ethernet connection resource allocation requests in method parameter values as defined in DSP1042

Subclauses of 7.6 detail implementation requirements for property values in EASD instances. In some cases requirements apply to only a subset of the flavors listed in Table 2; this is marked in the text through the use of respective acronyms.

7.6.2.1 CIM_EthernetPortAllocationSettingData properties

This subclause defines rules for values of properties in instances of the CIM_EthernetPortAllocationSettingData (EASD) class representing Ethernet port and Ethernet connection allocation information.

7.6.2.1.1 ResourceType property

The value of the ResourceType property shall denote the type of resources that are provided by the resource pool, as follows:

- For resource pools supporting the allocation of Ethernet adapters, the value of the ResourceType property shall be 10 (Ethernet Adapter).
- For resource pools supporting the allocation of Ethernet switch ports, the value of the ResourceType property shall be 30 (Ethernet Switch Port).
- For resource pools supporting the allocation of Ethernet connections, the value of the ResourceType property shall be 33 (Ethernet Connection).

7.6.2.1.2 ResourceSubType property

The implementation of the ResourceSubType property is optional.

If the ResourceSubType property is implemented, the provisions in this subclause apply.

The value of the ResourceSubType property shall designate a resource subtype. The format of the value shall be as follows: "<org-id>:<org-specific>". The <org-id> part shall identify the organization that defined the resource subtype value; the <org-specific> part shall uniquely identify a resource subtype within the set of subtypes defined by the respective organization.

7.6.2.1.3 PoolID property

The value of the PoolID property shall identify the current or desired resource pool. The special value NULL shall indicate the use of the host system's default resource pool for the selected resource type.

7.6.2.1.4 ConsumerVisibility property

The value of the ConsumerVisibility property shall denote either if a host resource is directly passed through to the virtual system as a virtual resource, or if the resource is virtualized. Values shall be set as follows:

- A value of 2 (Passed-Through) shall denote that the host resource is passed-through.
- A value of 3 (Virtualized) shall denote that the virtual resource is virtualized.
- Only in instances of { Q_RASD| D_RASD | M_RASD }, the special value NULL shall be used if the represented resource allocation request does not predefine which kind of consumer visibility (passed-through or virtualized) is requested.

Other values shall not be used.

7.6.2.1.5 AllocationUnits property

The value of the AllocationUnits property shall be set according to the rules defined in 7.5.3.

NOTE The units defined by the value of the AllocationUnits property apply to the values of the Reserved and Limit properties; the AllocationUnits property does not apply to the value of the VirtualQuantity property.

7.6.2.1.6 HostResource[ ] array property

The implementation of the HostResource[ ] array property is conditional.

Condition: One of the following:

- The implementation of the ResourceType property supports the value 33 (Ethernet Connection).
- The implementation of the ResourceType property supports the values 10 (Ethernet Adapter) or 30 (Ethernet Switch Port), together with values 3 (Dedicated), 4 (Soft Affinity), or 5 (Hard Affinity) for the MappingBehavior property.

If the HostResource[ ] array property is implemented, the provisions in this subclause apply.

If the value of the ResourceType property is 33 (Ethernet Connection), the value of the HostResource[ ] array property shall refer to one of the following:

- Exactly one CIM_EthernetPort instance that represents a specific target Ethernet switch port.
- Exactly one CIM_ComputerSystem instance that represents a specific target Ethernet switch.

If the value of the ResourceType property is 10 (Ethernet Adapter) or 30 (Ethernet switch port), in the cases of Q_EASD, C_EASD or M_EASD the following provisions apply:

- If the value of the MappingBehavior property is 3 (Dedicated), the value of the HostResource[ ] array property shall refer to one or more CIM_EthernetPort instances that represent host Ethernet adapter(s) or Ethernet switch port(s) that are exclusively dedicated to the virtual system or the virtual switch,respectively.
- If the value of the MappingBehavior property is 4 (Soft Affinity), the value of the HostResource[ ] array property shall refer to one or more CIM_EthernetPort instances that represent Ethernet adapter(s) or Ethernet switch port(s) preferably to be used for the allocation of the virtual Ethernet adapter or virtual Ethernet switch port.
- If the value of the MappingBehavior property is 5 (Hard Affinity), the value of the HostResource[ ] array property shall refer to one or more CIM_EthernetPort instances that represent Ethernet adapter(s) or Ethernet switch port(s) exclusively to be used for the allocation of the virtual Ethernet adapter or virtual Ethernet switch port.

If the value of the ResourceType property is 10 (Ethernet Adapter) or 30 (Ethernet switch port), in the cases of R_EASD the following provisions apply:

- If the value of the MappingBehavior property is 3 (Dedicated), 4 (Soft Affinity), or 5 (Hard Affinity), the value of the HostResource[ ] array property shall refer to one or more CIM_EthernetPort instances that represent the host Ethernet adapter or the host Ethernet switch port that support the allocated virtual Ethernet adapter or virtual Ethernet switch port.

7.6.2.1.7 VirtualQuantity property

If the value of the ResourceProperty is 10 (Ethernet Adapter) or 30 (Ethernet Switch Port), the value of the VirtualQuantity property shall be the "count" of virtual Ethernet adapters or virtual Ethernet switch ports that are requested (in the cases of Q_EASD, D_EASD or M_EASD), allocated (in the case of R_EASD), or allowed (in the case of C_EASD).

If the value of the ResourceProperty is 33 (Ethernet Connection), the value of the VirtualQuantity property shall be the "count" of virtual Ethernet connections that are requested (in the cases of Q_EASD, D_EASD or M_EASD), allocated (in the case of R_EASD), or allowed (in the case of C_EASD).

7.6.2.1.8 VirtualQuantityUnits property

The VirtualQuantityUnits property shall be set to “count”.

7.6.2.1.9 Reservation property

The implementation of the Reservation property is optional.

If the Reservation property is implemented, the value of the Reservation property shall denote the reserved amount; a requested reserve or a supported reserve amount of Ethernet transmit bandwidth; or the count of Ethernet switch ports, Ethernet adapters, or Ethernet connections requested or supported in units of AllocationUnits.

If the Reservation property is not supported, it shall have a value of NULL. This value indicates that an amount of host Ethernet bandwidth reserved for the use of the virtual system is not defined.

7.6.2.1.10 Limit property

The implementation of the Limit property is optional.

If the Limit property is implemented, the value of the Limit property shall denote either the maximum amount of Ethernet transmit bandwidth available or the count of Ethernet switch ports, Ethernet adapters, or Ethernet connections requested or supported with regard to a virtual system in units of AllocationUnits.

The special value NULL shall indicate that a limit is not imposed.

7.6.2.1.11 Weight property

The implementation of the Weight property is optional.

If the Weight property is implemented, its value shall denote the relative priority of a resource allocation in relation to other resource allocations from the same pool.

The special value NULL shall indicate that a relative priority does not apply.

7.6.2.1.12 Parent property

The implementation of the Parent property is optional.

If the Parent property is implemented, the provisions in this subclause apply.

If the value of the ResourceType property value is10 (Ethernet Adapter), the value of the Parent property shall refer to the parent entity of there source allocation, or shall be NULL. The special value NULL shall indicate that a parent entity of the resource allocation is not defined.

If the value of the ResourceType property is 30 (Ethernet Switch Port), the following provisions apply:

- The Parent property may reference the desired, requested, allocated or allowed Ethernet connection resource pool that the allocated Ethernet switch port should be associated to with the CIM_ConcreteComponent association. The non-Null value of the Parent property shall conform to the production WBEM_URI_UntypedInstancePath as defined in DSP0207.

If the ResourceType property is 33 (Ethernet Connection), the following rules apply:

- Q_EASD: If the Parent property is Null, on allocation the provider shall instantiate an instance of CIM_EthernetPort and any associated LAN and VLAN endpoints representing an Ethernet adapter to the associated virtual machine and an R_EASD instance with the ResourceType property value set 33 (Ethernet Connection). This R_EASD instance and the instantiated instance of CIM_EthernetPort shall be associated through an instance of CIM_ElementSettingData.

  Q_EASD: If the Parent property is not set to Null, it shall specify an existing instance of an Ethernet adapter Q_EASD. On allocation the provider shall instantiate an R_EASD instance with the ResourceType property set 33 (Ethernet Connection) with its Parent property denoting the corresponding allocated Ethernet Adapter R_EASD instance. Each non-Null value of the Parent property shall conform to the production WBEM_URI_UntypedInstancePath as defined in DSP0207.

- D_EASD: The parent property may contain a temporary ID string that is correlated to a temporary ID string in the InstanceID property of a separate instance of D_EASD, where the ResourceType property is 10 (EthernetAdapter), instantiated as embedded instances in the same ResourceSettings method parameter of a CIM_VirtualizationManagementService AddResourceSettings or DefineSystem method call. In this case the provider, as a result of the successful execution of the described method call, shall set the Parent property of the resultant Ethernet connection Q_EASD instance Parent property to reference the resultant Ethernet adapter Q_EASD instance. In this case, the Parent property shall conform to the production WBEM_URI_UntypedInstancePath as defined in DSP0207.

- R_EASD: If the Parent property is not Null, the value of the Parent property shall reference the R_EASD instance that represents the target virtual Ethernet Adapter. The non-Null value of the

940 Parent property shall conform to the production WBEM_URI_UntypedInstancePath as defined
941 in DSP0207.

942 **7.6.2.1.13 Address property**

943 The implementation of the Address property shall be mandatory for R_EASD adaptations of
944 CIM_EthernetPortAllocationSettingData. In all other adaptations of
945 CIM_EthernetPortAllocationSettingData the Address property is optional.

946 If the address property is implemented, the provision in this subclause applies. The value of the Address
947 property shall expose an address of the allocated resource that can be seen by the software running in
948 the virtual system (usually the guest operating system). That address shall be unique at least within each
949 resource type of a virtual system. That address may change over the lifetime of the allocated resource. A
950 non-null value in the address property shall represent an Ethernet port identifier, most often the
951 MAC_Address of the port.

952 If the ResourceType property is 10 (Ethernet Adapter), a non-null value of the Address property shall
953 contain an Ethernet port identifier (usually the MAC_Address) for a requested, defined, or allocated
954 Ethernet Adapter.

955 If the ResourceType property is 30 (Ethernet Switch Port), a non-null value of the Address property shall
956 contain an Ethernet port identifier (usually the MAC_Address) for a requested, defined, or allocated
957 Ethernet switch port.

958 If the ResourceType property is 33 (Ethernet Connection), a non-null value of the Address property shall
959 contain a network port identifier (usually the MAC_Address) for the target switch port.

960 The following rules apply:

961 • Q_EASD: If the Address property is Null, on allocation the provider shall provide a unique port
962 identifier in the Address property of the R_EASD instance that is instantiated as a result of the
963 allocation. If the parent property is not null, the provider shall use the value in the Address
964 property to set the Address property in the R_EASD instance that is instantiated as a result of
965 the allocation.

966 • R_EASD: The value of the Address property shall reference the network port identifier of the
967 target Ethernet port representing a virtual Ethernet adapter or virtual Ethernet switch.

968 • D_EASD, M_EASD: A non-null value of the Address property shall contain a string that is the
969 requested network port identifier for an Ethernet adapter, Ethernet switch port, or connection to
970 an Ethernet switch port.

971 **7.6.2.1.14 InstanceID property**

972 If CIM_EthernetPortAllocationSettingData property matches 10 (Ethernet Adapter), the following rule
973 applies:

974 D_EASD: The InstanceID property may contain a temporary ID string that is correlated to a
975 temporary ID string in the Parent property of a separate instance of D_EASD, where the
976 ResourceType property is 33 (EthernetConnection), instantiated as embedded instances in the same
977 ResourceSettings parameter of a CIM_VirtualizationManagementService AddResourceSettings or
978 DefineSystem method call.

979 NOTE The D_EASD only exists as an embedded instance in a CIM_VirtualizationManagementService
980 AddResourceSettings or DefineSystem method call.

981 **7.6.2.1.15 Connection [ ] array property**

982 The implementation of the Connection[ ] array property is optional.

983 If the Connection[ ] array property is implemented and the ResourceType property is set to 30 (Ethernet
984 Switch Port) or 33 (Ethernet Connection), its value shall identify one or mode VLANs through their

VLANIDs. The Connection[ ] array property shall contain exactly one VLANID if the value of the DesiredVLANEndPointMode property is 2(Access). The Connection[ ] array property shall contain zero or more VLANIDs if the value of the DesiredVLANEndPointMode property is 5 (Trunk).

7.6.2.1.16 MappingBehavior property

The implementation of the MappingBehavior property is optional.

If the MappingBehavior property is implemented, its value shall denote how host resources referenced by elements in the value of HostResource[ ] array property relate to the Ethernet port resource allocation. The following rules apply:

- R_EASD only:
  - A value of 3 (Dedicated) shall indicate that the represented resource allocation is provided by host resources, as referenced by the value of the HostResource[ ] array property, that are exclusively dedicated to the virtual system.
  - A value of 4 (Soft Affinity) or 5 (Hard Affinity) shall indicate that the represented resource allocation is provided using the host EthernetPort resource as referenced by the value of the HostResource[ ] array property.
  - Other values shall not be used.
- Q_EASD, D_EASD, M_EASD only:
  - A value of 0 (Unknown) shall indicate that the resource allocation request or modification does not require specific host resources.
  - A value of 3 (Dedicated) shall indicate that the resource allocation request or modification shall be provided by exclusively dedicated host resources as specified through the value of the HostResource[ ] array property.
  - A value of 4 (Soft Affinity) shall indicate that the resource allocation request or modification shall preferably be provided by host resources as specified through the value of the HostResource[ ] array property, but that other resources may be used if the requested resources are not available.
  - A value of 5 (Hard Affinity) shall indicate that the resource allocation request or modification shall preferably be provided by host resources as specified through the value of the HostResource[ ] array property and that other resources shall not be used if the requested resources are not available.
  - Other values shall not be used.

The special value NULL shall indicate that a further qualification of the value of the HostResource[ ] array property through the value of the MappingBehavior property is not defined.

7.6.2.1.17 DesiredVLANEndpointMode property

The implementation of the DesiredVLANEndpointMode property is optional.

If the DesiredVLANEndpointMode property is not supported, it shall have a value of NULL.

7.6.2.1.18 AllowedPriorities[]property

The implementation of the AllowedPriorities array property is optional.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and AllowedPriorites array property is non-NULL, the array should contain the set of IEEE802.1Q defined PCP values that this port is allowed to transmit.

If AllowedPriorities[] property is not supported, it shall have a value of NULL.

7.6.2.1.19 Promiscuous property

The Promiscuous property is optional.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and if Promiscuous property is set to True, AllowedToReceiveMACAddress and AllowedToReceiveVLANs shall be ignored.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and Promiscuous property is set to False, receive destination MAC filtering shall be performed as described in 7.6.2.1.20.

If the Promiscuous property is not supported, it shall have a value of NULL.

7.6.2.1.20 AllowedToReceiveMACAddresses and AllowedToReceiveVLANs indexed array properties

The implementation of the AllowedToReceiveMACAddresses and AllowedToReceiveVLANs indexed array properties are optional.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and the Promiscuous property is set to False, destination MAC filtering shall be performed based on the associated port's CIM_LANEndpoint.MACAddress, AllowedToReceiveMacAddresses array and the AllowedToReceiveVLANs arrays. The filtering shall be performed against a received packet's source MAC address and the packet's outermost VLAN tag respectivly. All traffic that does not pass one of the four conditions below shall be dropped.

- If both the AllowedToReceiveMACAddresses and AllowedToReceiveVLANs are NULL the implementation shall allow all receive traffic that matches the port's destination MAC address.
- If the AllowedToReceiveMACAddresses is non-NULL and AllowedToReceiveVLANs is NULL, the implementation shall allow all receive traffic that matches the associated port's CIM_LANEndpoint.MACAddress and the packet's source MAC address to one of the MAC addresses from AllowedToReceiveMACAddresses.
- If the AllowedToReceiveMACAddresses is NULL and AllowedToReceiveVLANs is non-NULL, the implementation shall allow all receive traffic that matches the port's destination MAC address and the packet's VLAN ID in the outermost VLAN tag to one of the VLAN IDs from the AllowedToReceiveVLANs array.
- If the AllowedToReceiveMACAddresses is non-NULL and AllowedToReceiveVLANs is non-NULL, the implementation shall allow all receive traffic that matches the port's destination MAC address and the packet's (source MAC address, outermost VLAN ID) to one of the (MAC address, VLAN ID) pairs from the arrays AllowedToReceiveMACAddresses and AllowedToReceiveVLANs.

7.6.2.1.21 SourceMACFilteringEnabled property

The implementation of the SourceMacFilteringEnabled property is optional.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and the SourceMacAddressFilteringEnabled property is set to True, outgoing network traffic shall be filtered:

- If both the AllowedToTransmitMACAddresses and the AllowedToTransmitVLANS are NULL no outgoing network traffic shall be transmitted.
- If AllowedToTransmitMACAddresses is non-NULL and AllowedToTransmitVLANs is NULL, only network traffic with a source MAC address that matches a valid MAC address in the AllowedToTransmitMACAddresses array shall be transmitted.

- If AllowedToTransmitMACAddresses is NULL and AllowedToTransmitVLANs is non-NULL, only network traffic with an outermost VLAN ID that matches a valid VLAN ID in the AllowedToTransmitVLANs array shall be transmitted.
- If AllowedToTransmitMACAddresses is non-NULL and AllowedToTransmitVLANs is non-NULL, only network traffic with a source MAC address and an outermost VLAN ID that matches to one of the (MAC address, VLAN) pairs from the AllowedToTransmitMACAddresses and the AllowedToTransmitVLANS arrays shall be transmitted.

If SourceMACFilteringEnabled is False or is NULL, the AllowedToTransmitMACAddresses and AllowedToTransmitVLANs properties shall be ignored.

If SourceMACFilteringEnabled is property is not supported, it shall have a value of NULL.

7.6.2.1.22 AllowedToTransmitMACAddresses and AllowedToTransmitVLANs indexed array properties

The implementation of the AllowedToTransmitMACAddresses and AllowedToTransmitVLANs indexed array properties are optional.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and if the SourceMACFilteringEnabled property is set to True, network transmit traffic shall be filtered on the values contained in the AllowedToTransmitMACAddresses and AllowedToTransmitVLANs indexed array properties as described in 7.6.2.1.21.

If either property is not supported, the unsupported property shall have a value of NULL.

7.6.2.1.23 DefaultPortVID property

The implementation of the DefaultPortVID property is optional.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and if implemented, DefaultPortVID should represent the default VLAN ID (VID) for the CIM_EthernetPort associated with this instance of CIM_EthernetPortAllocationSettingData. This value should be set to 1 to represent the typical default VID.

7.6.2.1.24 DefaultPriority property

The implementation of the DefaultPriority array property is optional.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and if implemented, the DefaultPriority property should represent the IEEE802.1Q PCP bits assigned to transmit packets.

7.6.2.1.25 GroupID property

The implementation of the GroupID array property is optional.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and if implemented, the GroupID should have the value of the ports VDP TLV VSI GroupID as specified in IEEE 802.1Qbg.

If the property is not supported, it shall have a value of NULL.

7.6.2.1.26 ManagerID property

The implementation of the ManagerID array property is optional.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and if implemented, the ManagerID should have the value of the ports VDP TLV VSI ManagerID as specified in IEEE 802.1Qbg.

If the property is not supported, it shall have a value of NULL.

7.6.2.1.27 NetworkPortProfileID property

The implementation of the NetworkPortProfileID array property is optional.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and if supported, the Network port profile ID identifies the DSP8049 conformant network port profile that applies to the associated CIM_EthernetPort.

7.6.2.1.28 NetworkPortProfileIDType property

The implementation of the NetworkPortProfileIDType property is conditional.

Condition: NetworkPortProfileID property is non-NULL; see 7.6.2.1.27.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and if supported, the NetworkPortPropertyIDType shall define the format of the value of the NetworkPortProfileID.

7.6.2.1.29 PortCorrelationID property

The implementation of the PortCorrelationID array property is optional.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and if the PortCorrelationID property is implemented, the property should contain the ports VSI instance Identifier as specified in IEEE 802.1Qbg.

If the property is not supported, it shall have a value of NULL.

7.6.2.1.30 PortVID property

The implementation of the PortVID array property is optional.

If the ResourceType property is 30 (Ethernet Switch Port) or if the ResourceType property is 33 (Ethernet Connection) and if implemented, the PortVID property should be set to the VLAN ID that is used to tag untagged traffic on this port.

If the property is not supported, it shall have a value of NULL.

7.6.2.1.31 ReceiveBandwidthReservation property

The implementation of the ReceiveBandwidthReservation property is optional.

If the ReceiveBandwidthReservation property is implemented, the value of the ReceiveBandwidthReservation property shall denote the reserved amount; a requested reserve; or a supported reserve amount of Ethernet receive bandwidth supported in units of AllocationUnits.

If the property is not supported, it shall have a value of NULL.

7.6.2.1.32 ReceiveBandwidthLimit property

The implementation of the ReceiveBandWidthLimit property is optional.

If the ReceiveBandwidthLimit property is implemented, the value of the ReceiveBandwidthLimit property shall denote the maximum amount of Ethernet receive bandwidth available in units of AllocationUnits.

The special value NULL shall indicate that a limit is not imposed.

7.6.2.2 Instance requirements

This subclause details resource allocation-related instance requirements.

7.6.2.2.1 Representation of resource allocation requests

Each Ethernet adapter resource allocation request shall be represented by a Q_EASD instance; the provisions of 10.9 apply.

Each Ethernet switch port resource allocation request shall be represented by a Q_EASD instance; the provisions of 10.19 apply.

Each Ethernet connection resource allocation request shall be represented by a Q_EASD instance; the provisions of 10.14 apply.

7.6.2.2.2 Representation of resource allocations

Each Ethernet adapter resource allocation shall be represented by an R_EASD instance; the provisions of 10.10 apply.

Each Ethernet switch port resource allocation shall be represented by an R_EASD instance; the provisions of 10.20 apply.

Each Ethernet connection resource allocation shall be represented by an R_EASD instance; the provisions of 10.15 apply.

The R_EASD instance shall be associated to the Q_EASD instance representing the corresponding resource allocation request (see 6.4.4) through an instance of the CIM_ElementSettingData association; the provisions of 10.5 apply.

The R_EASD instance shall be associated to the CIM_ResourcePool instance providing resources for the allocation (see 7.5) through an instance of the CIM_ResourceAllocationFromPool association; see DSP1041.

Implementations may represent a resource allocation request and the corresponding resource allocation by one EASD instance; in this case, the association requirements of this subclause apply correspondingly. Association instances that refer to the R_EASD instance only exist while the resource is allocated.

7.6.2.2.3 Representation of an Ethernet switch port Network Port Profile.

Each instantiated Ethernet switch port CIM_EthernetPort instance shall have an associated instance of CIM_EthernetPortAllocationSettingData using the CIM_SettingDefinesState association. For a statically allocated Ethernet switch, this instance shall be the R_EASD instance from the allocation of the Ethernet switch port. For a dynamic or simple Ethernet switch port allocation, this instance should be the R_EASD instance of the associated Ethernet connection allocation.

7.6.2.2.4 Representation of resource allocation capabilities

The allocation capabilities of a system or a resource pool shall be represented by a CIM_AllocationCapabilities instance that is associated to the CIM_System instance representing the system or to the CIM_ResourcePool instance representing the resource pool through an instance of the CIM_ElementCapabilities association; see DSP1043.

The settings that define the Ethernet adapter allocation capabilities of an Ethernet adapter resource pool or of a system shall be represented by C_EASD instances; the provisions of 10.11 apply.

The settings that define the Ethernet switch port allocation capabilities of an Ethernet switch port resource pool or of a system shall be represented by C_EASD instances; the provisions of 10.21 apply.

The settings that define the Ethernet connection allocation capabilities of an Ethernet connection resource pool or of a system shall be represented by C_EASD instances; the provisions of 10.16 apply.

7.6.2.2.5 Representation of resource allocation mutability

The mutability of a resource allocation or resource allocation request shall be represented by a CIM_AllocationCapabilities instance that is associated to the EASD instance representing the resource allocation or resource allocation request through an instance of the CIM_ElementCapabilities association; see DSP1043.

The settings that define the allocation mutability of an Ethernet adapter resource allocation or an Ethernet adapter resource allocation request shall be represented by C_EASD instances; the provisions of 10.11 apply.

The settings that define the allocation mutability of an Ethernet switch port resource allocation or an Ethernet switch port resource allocation request shall be represented by C_EASD instances; the provisions of 10.21 apply.

The settings that define the allocation mutability of an Ethernet connection resource allocation or an Ethernet connection resource allocation request shall be represented by C_EASD instances; the provisions of 10.16 apply.

7.7 Virtual resources

7.7.1 Virtual Ethernet adapter

Each allocated virtual Ethernet adapter shall be represented by one CIM_EthernetPort instance that is associated with the CIM_ComputerSystem instance that represents the virtual system through an instance of the CIM_SystemDevice association; the provisions of 10.29 apply.

The CIM_EthernetPort instance shall be associated with the CIM_ResourcePool instance from which it was allocated through the CIM_ElementAllocatedFromPool association; the provisions of 10.3 apply.

Each connection endpoint implemented by the Ethernet adapter shall be represented by a CIM_LANEndpoint instance that is associated to the CIM_EthernetPort instance through an instance of the CIM_DeviceSAPImplementation association as specified in DSP1014.

NOTE This profile does not attempt to specify the mapping of the characteristics or the implementation of the physical characteristics mandated by the dependency on DSP1014. For example, there are no physical characteristics or bandwidth requirements mandated by this specification to allow a provider to set the PortType property of CIM_EthernetPort to “1000BaseT”.

7.7.2 Virtual Ethernet switch port

Each allocated virtual Ethernet switch port shall be represented by one CIM_EthernetPort instance that is associated with the CIM_ComputerSystem instance that represents the virtual Ethernet switch through an instance of the CIM_SystemDevice association; the provisions of 10.29 apply.

The CIM_EthernetPort instance shall be associated with the CIM_ResourcePool instance from which it was allocated through the CIM_ElementAllocatedFromPool association; the provisions of 10.3 apply.

Each connection endpoint implemented by the Ethernet switch port shall be represented by a CIM_LANEndpoint instance that is associated to the CIM_EthernetPort instance through an instance of the CIM_DeviceSAPImplementation association as specified in DSP1014.

7.7.3 Virtual Ethernet connection

Each virtual Ethernet connection resource allocation shall be represented by one instance of the CIM_ActiveConnection association that associates the CIM_LANEndpoint instances representing the connection endpoints that are associated to the targeted virtual Ethernet adapter (see 7.7.1) and virtual Ethernet switch port (see 7.7.2).The provisions of 10.1 apply.

The CIM_LANEndpoint instance associated to the CIM_EthernetPort instance representing the Ethernet adapter shall be associated with CIM_ElementSettingData to the R_EASD instance representing the allocated connection resources.The provisions of 10.4 apply.

8 Methods

This clause details the requirements for supporting operations and methods for the CIM elements defined by this profile.

8.1 Profile conventions for operations

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

The default list of operations for all classes is:

- GetInstance( )
- EnumerateInstances( )
- EnumerateInstanceNames( )

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

- Associators( )
- AssociatorNames( )
- References( )
- ReferenceNames( )

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

The implementation requirements for methods of classes listed in clause 10, but not addressed by a separate subclause of this clause, are specified by the "Methods" clauses of respective base profiles, namely DSP1041 and DSP1043. These profiles are specialized by this profile, and in these cases, this profile does not add method specifications beyond those defined in its base profiles.

8.2 CIM_EthernetPort for host systems

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.

8.3 CIM_EthernetPort for virtual systems

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.

8.4 CIM_EthernetPortAllocationSettingData

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.

8.5 CIM_ResourcePool

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.

8.6 CIM_SystemDevice for host resources

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.

8.7 CIM_SystemDevice for virtual resources

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.

8.8 CIM_VLANEndpointSettingData

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.

9 Use cases

The use cases and object diagrams in this clause illustrate use of this profile. They are for informative purposes only and do not introduce behavioral requirements for implementations of the profile.

9.1 Instance diagrams

The following use cases represent three separate example implementation options of varying complexity:

- Static (3.21) represents the fully featured allocation model. It defines Ethernet connection allocations to existing Ethernet switch port instances that are aggregated host resources into an Ethernet connection resource pool. This implementation option allows for the separate management of the Ethernet switch ports as part of the virtual Ethernet switch. In this option, there are resource pools for all three EthernetPortAllocationSettingData resource types: Ethernet Connection, Ethernet Adapter and Ethernet Switch Port. Ethernet connection allocations are used to connect to an existing Ethernet switch port and a defined Ethernet adapter. If allowed by the implementation, the relevant properties in the Ethernet Connection request are used to override the values set in the Ethernet switch port allocation.
- Dynamic (3.2) simplifies the model by dynamically generating an Ethernet switch port instance on a virtual Ethernet switch at the time that the Ethernet connection allocation targeting a switch is made. Ethernet connection allocations are used to connect a defined Ethernet adapter to a dynamically allocated Ethernet switch port. If allowed by the implementation, the relevant properties in the Ethernet Connection request are used to override the default values for the corresponding settings in the Ethernet switch port.
- Simple (3.20) further simplifies the model using only an Ethernet connection allocation to create a complete network connection. On the allocation of an Ethernet Connection to a virtual machine targeting a virtual Ethernet switch, both an Ethernet adapter and an Ethernet switch port are dynamically allocated. If allowed by the implementation, the relevant properties in the Ethernet Connection request are used to override the default values for the corresponding settings in the Ethernet switch port.

The preceding three example implementations are not presented as any limitation of possible implementations; rather they illustrate the target models that lead the development of this profile.

9.1.1 Static Ethernet switch port and Ethernet connection resource pools with capabilities

Figure 4 is a CIM representation of a virtualization system (HOST) with a hosted virtual Ethernet switch (VSWITCH0) and resource pools for Ethernet switch ports (SP_POOL) and Ethernet connections (EC_POOL). Figure 4 also has a set of capabilities for the two resource pools.The system as represented supports static switch port allocations to an Ethernet switch.

SP_POOL represents a resource pool of unlimited capabilities for allocating virtualized Ethernet switch ports with a desired mode of either Trunk or Access. These capabilities are shown through the CIM_AllocationCapabilities instance (CAP_ESP) and two instances of the CIM_EthernetPortAllocationSettingData class (CAP_POINT0 and CAP_POINT1), associated through two instances of the CIM_SettingDefinesCapabilities association class.

CAP_POINT1 is a default capabilities instance. The value of the CAP_POINT1 DesiredVLANEndpointMode property is set to 2 (Access). Only virtual instances of Ethernet switch ports are supported from this pool as represented by the value 2 (Virtualized) of the ConsumerVisibility property.

The value of the CAP_POINT0 DesiredVLANEndpointMode property is set to 5 (Trunk), indicating that a Trunking Ethernet switch port can also be allocated from the resource pool SP_POOL. Again, only virtual instances of Ethernet switch port allocations are supported from this pool, as represented by the value 2 (Virtualized) for the ConsumerVisibility property.

The virtual Ethernet switch represented by an instance, VSWITCH0, of the CIM_ComputerSystem class as shown in Figure 4 has one associated Ethernet connection resource pool represented by the EC_POOLinstance of the CIM_ResourcePool class. EC_POOL represents a pool with 10 gigabits of bandwidth as shown by the value of the Capacity property (equal to 10,000 combined with the AllocationUnits property of “bits per second*2^20”). EC_POOL currently has no assigned Ethernet switch ports that are available for connection because the value of the MaxConsumableResource property is 0.

EC_POOL has an associated instance CAP_EC of the CIM_AllocationCapabilities class with a set of CIM_EthernetPortAllocationSettingData instances to describe the supported allocations from the pool when there are Ethernet switch ports available for connection. An examination of these instances of the CIM_EthernetPortAllocationSettingData class (CAP_EC_MIN, CAP_EC_MAX, CAP_EC_INC, CAP_EC_POINT0, and EC_POINT1) describe the capabilities of the EC_POOL resource pool:

- Only Dedicated allocations are allowed (MappingBehavior = 3 [Dedicated]) in all instances.
- The default allocation request is 1,000 megabytes of reserved bandwidth (Reserved = 1000) with 10,000 megabyte top limit of allowable bandwidth (Limit = 10000). The default allocation has VLAN support with the value of the DesiredVLANEndpointMode property set to “Access”. These values are shown in the CAP_EC_DEF instance of the CIM_EthernetPortAllocationSettingData class.
- The empty string value in the Parent property shows that the system supports the setting of the value of the Parent property, which is limited by this profile to be a reference URI to the Ethernet adapter request instance of the CIM_EthernetPortAllocationSettingData class.
- Allocation request reservation and limit values can be made in the range of 100 to 10,000 megabits per second of bandwidth, with an increment of 100 megabits per second. This range is shown in the CAP_EC_MAX, CAP_EC_MIN, and CAP_EC_INC instances of the CIM_EthernetPortAllocationSettingData class Reservation and Limit property values.
- VLAN is supported, and either Access or Trunk mode is supported. (See the DesiredVLANEndPointMode property values for the CAP_EC_POINT0 and CAP_EC_POINT1 instances.)
- The array of supported VLANID is represented in the value of the Connection array properties in the CAP_EC_POINT0 and CAP_EC_POINT1 instances.

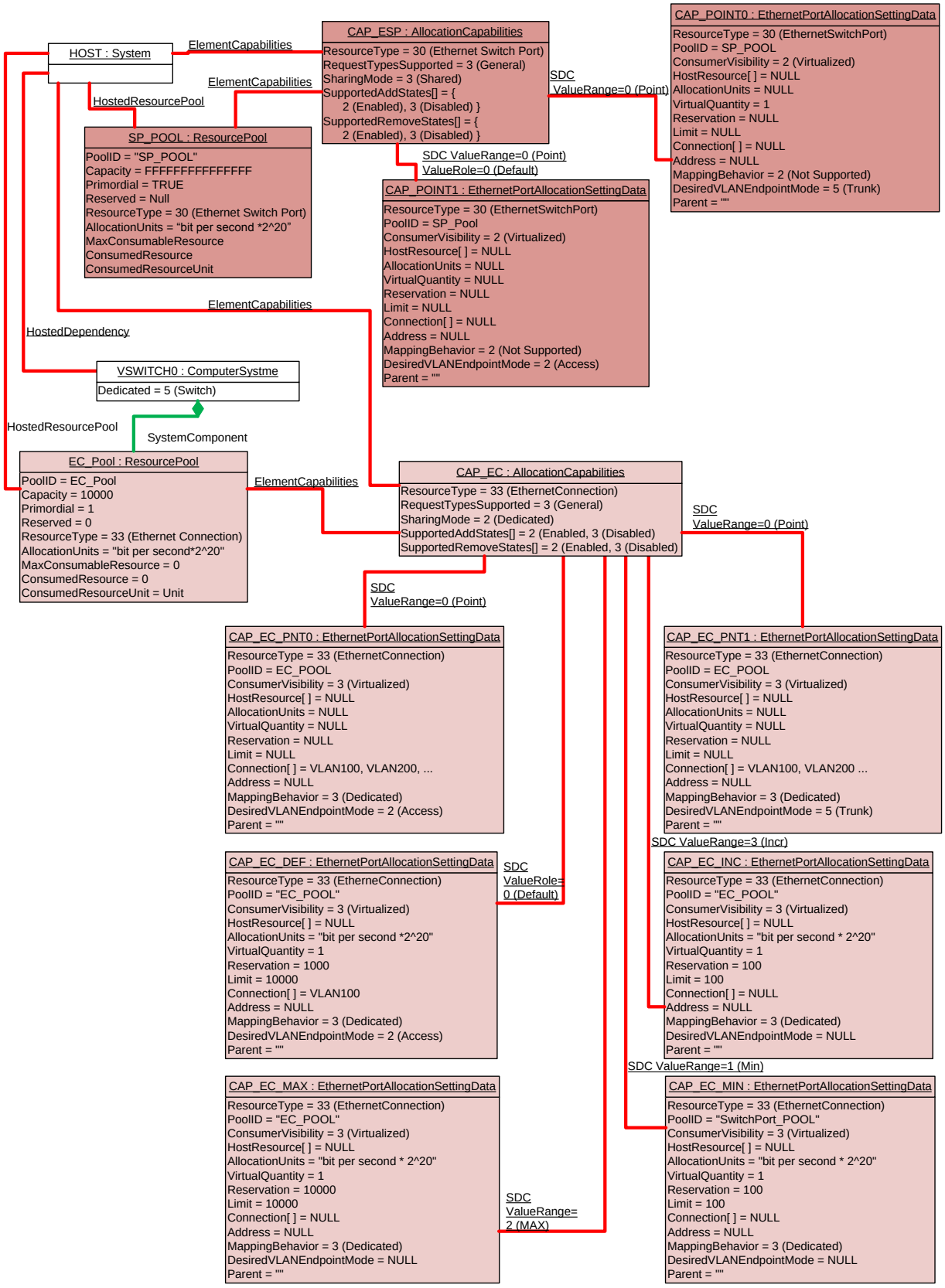


Figure 4 – Ethernet switch port and Ethernet connection resource pools

9.1.2 Static Ethernet switch port allocation to a virtual Ethernet switch

Figure 5 shows the same host system (HOST) and virtual Ethernet switch (VSWITCH0) as shown in Figure 4 with the resource pool allocation capabilities removed to simplify the drawing. Figure 5 is the CIM representation of the system after a static Ethernet switch port, represented as the instance ESP0 of the CIM_EthernetPort class, has been allocated to the virtual Ethernet switch VSWITCH0 from the instance of the host resource pool SP_POOL representing the CIM_ResourcePool class.

The allocation of ESP0 is a virtual resource allocation as described in DSP1041. Thus, it has an associated state instance of the CIM_EthernetPortAllocationSettingData class (ESAD_ESP0.) ESAD_ESP0 contains the DSP8049 properties as described in 7.6.2.2.3. In this use case, this same instance is also used as the request instance, as shown with the self-reference of the CIM_ElementSettingData association to EASD_ESP0.

An examination of values in the properties of EASD_ESP0 shows that a default allocation was used in the allocation request because the DesiredVLANEndpointMode is set to Access. The provider in this use case provided a MAC address (MAC_ADDRESS) and inserted the default VLANID for the associated virtual Ethernet switch port into the Connection property.

Associated to EASD_ESP0 is a CIM_AllocationCapabilities instance (MUT_ESP). Associated to MUT_ESP are two mutability instances of CIM_EthernetPortAllocationSettingData (MUT_POINT0 and MUT_POINT1), which shows that the DesiredVLANEndPointMode and Connection properties are mutable. The DesiredVLANENDPointMode property value can be changed to either 2 (Access) or 5 (Trunk). The VLANID Access property can be set to any of the values listed in the Connection property of instance MUT_POINT1.

Because the Parent property value of instance EASD_ESP0 was set to reference the resource pool instance EC_POOL, the allocated CIM_EthernetPort instance ESP0 is included in the CIM_Component aggregation to the EC_POOL resource pool. Also, note that the MaxConsumableResource property value has been incremented to 1 from the value shown in Figure 4 to show that a switch port is available for connection.

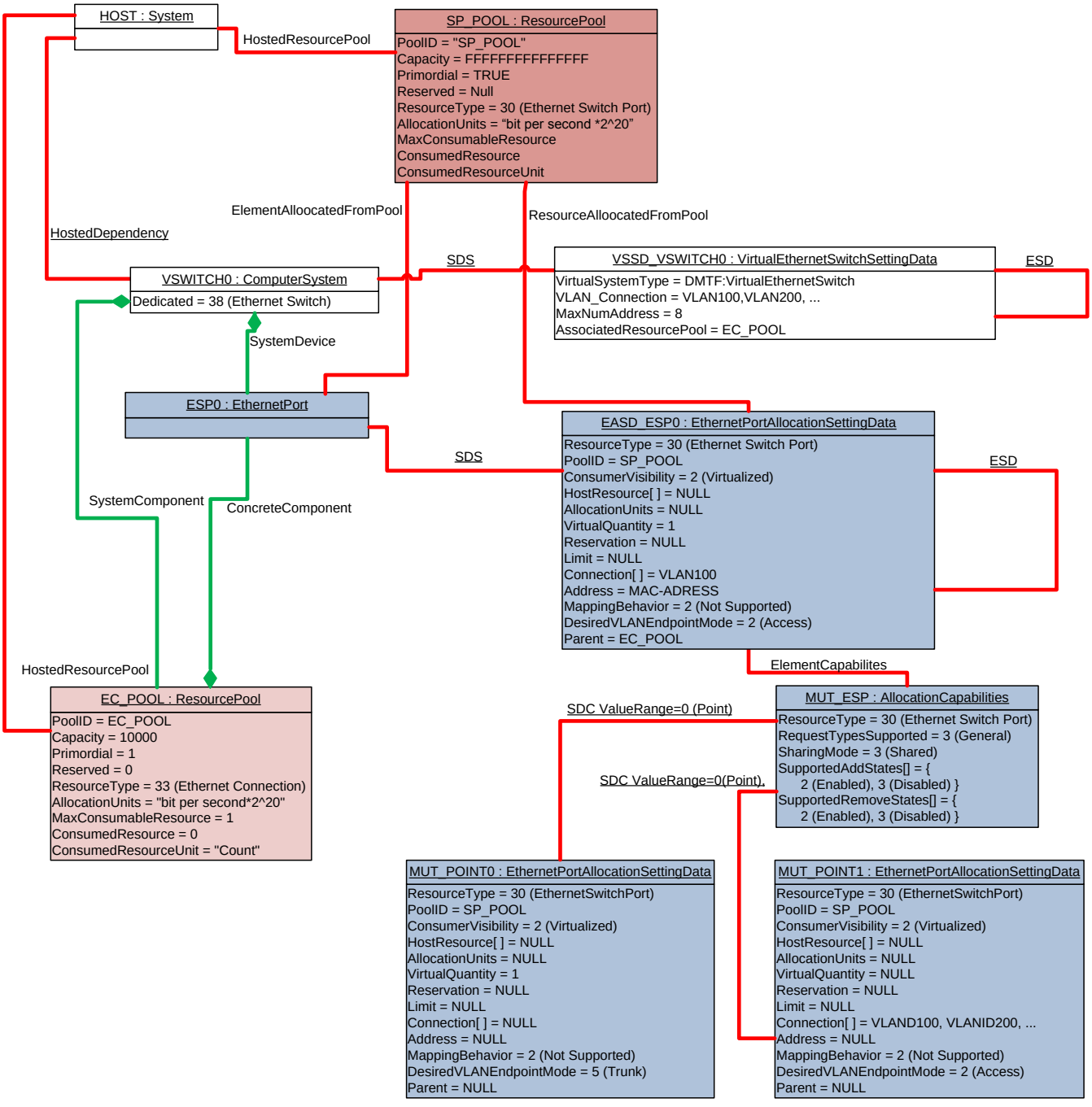


Figure 5 – Static Ethernet switch port allocation to a virtual Ethernet switch

9.1.3 Allocation and connection of an Ethernet adapter to a static switch port

Figure 6 shows the same virtualization system and virtual Ethernet switch shown in Figure 5 and Figure 4. This figure includes an instance of a virtual system (VM1) represented with the CIM_ComputerSystem class with allocation requests and a current device allocation for an Ethernet Adapter instance(EA) represented by the CIM_EthernetPort class and a simple allocation of an Ethernet connection to the Ethernet switch port ESP0. No allocation capabilities are shown in this figure, but the Allocation Capabilities for the Ethernet connection resource pool EC_POOL are as shown in Figure 4.

The Ethernet adapter request for VM1, the EA_REQ instance of the CIM_EthernetPortAllocationSettingData class, shows that this provider allows the allocation of synthetic Ethernet adapters with no host resource allocation. This capability is shown with the unlimited capacity of EA_POOL and the NULL values in the EA_REQ instance for the Reserve and Limit properties. This allocation is a basic virtual resource allocation with the purpose of allocating a logical device instance of the CIM_EthernetPort class. The provider populated the value in the Address property in the state instance (EA_STATE) of the CIM_EthernetPortAllocationSettingData class with a MAC address represented in Figure 6 as EA_MAC. The allocation is a virtual resource allocation as shown by the CIM_ElementAllocatedFromPool association between the resource pool EA_POOL and the EA instance of CIM_EthernetPort as well as the CIM_ResourceAllocatedFromPool association instance between EA_POOL and EA_State.

The Ethernet connection request for VM1, the EC_REQ instance of the CIM_EthernetPortAllocationSettingData class, specifies a request for a specific Ethernet switch port (ESP0), a reservation and limit of Bandwidth through the switch (VSWITCH0), and a set of VLAN property overrides of the default properties of the requested Ethernet switch port. The property values of EC_REQ define the request EASD as follows:

- PoolID=EC_POOL: This property selects the resources pool EC_POOL.
- Parent=EA_REQ: This property associates this Ethernet connection request with the Ethernet adapter request EA_REQ.
- HostResource[] = ESP0: This property requests that specific Ethernet switch port.
- MappingBehavior = 3 (Dedicated): This property identifies that this is an exclusive request for this resource.
- AllocationUnits=bits per second*2^20: This property specifies a bandwidth unit of 1 megabyte per second.
- Reservation=1000: This property requests to reserve 1 gigabit per second of Ethernet bandwidth.
- Limit=10000: This property sets a limit of 10 gigabits per second. In effect, there is no limit to the VM's use of available bandwidth because this value matches the maximum capacity of the request resource pool.
- Address=NULL: There is no request to override the MAC address of the switch port.
- DesiredVLANEndpointMode=Access: The request sets and maintains the desired VLANEndpointMode of the requested Ethernet switch port.
- Connection=VLAN200: This property is an override of the access VLANID for the switch port.
- VirtualQuantity=1: This property is a request for one connection.

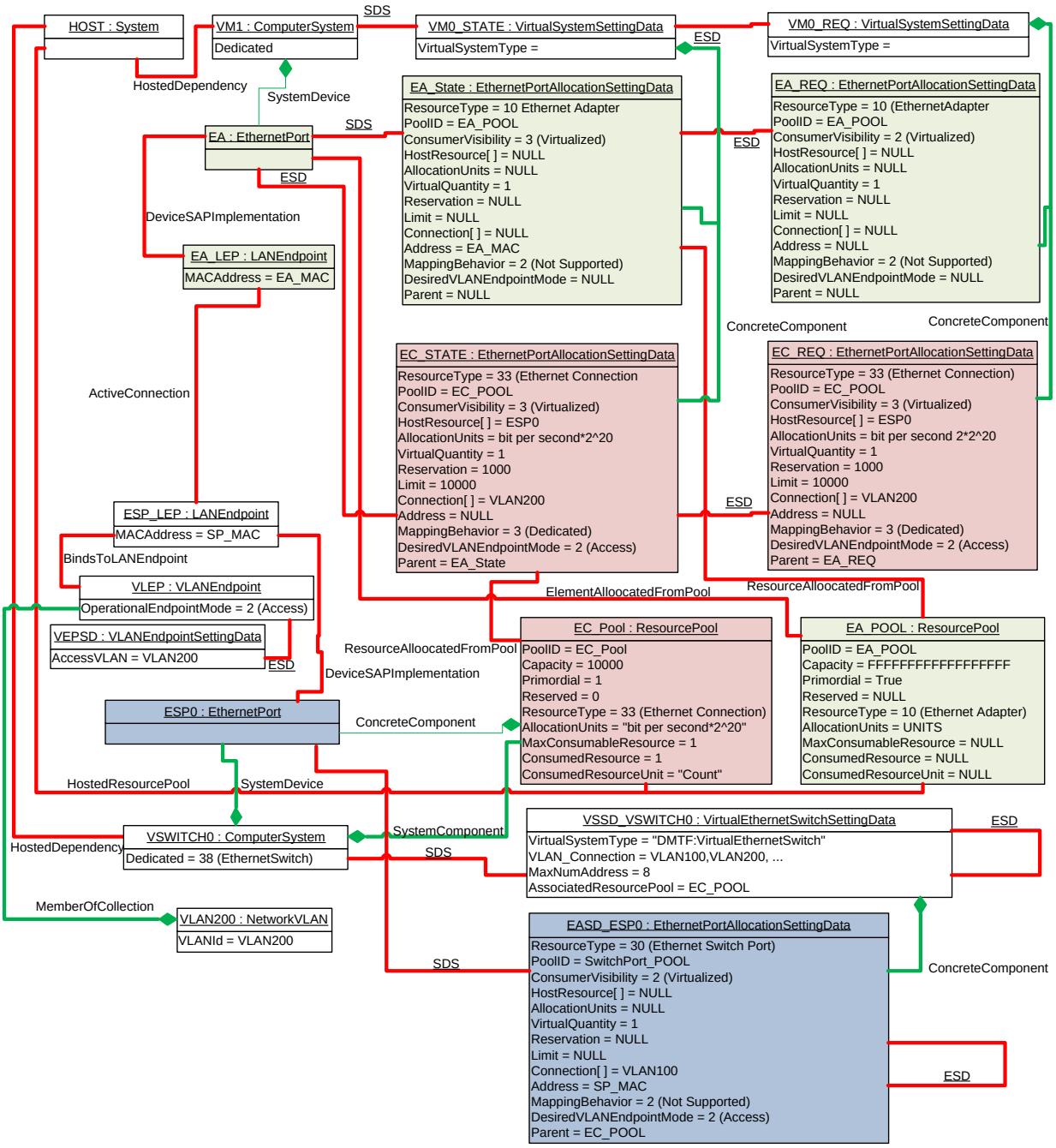
The Ethernet connection state instance EC_STATE represents the current allocation of the Ethernet connection described above. The only property value difference between the EC_STATE and EC_REQ is the value of the Parent property. The value of the Parent property is a reference to the Ethernet adapter's allocation instance EA_STATE represented with the CIM_EthernetPortAllocationSettingData class.

When VM1 was turned on, the Ethernet adapter (EA) and its associated CIM_LANEndpoint instance (EA_LEP) were instantiated based on the value of the request instance EA_REQ. Based on the Ethernet connection request instance (EC_REQ), the provider instantiated the Ethernet switch port's associated instance of CIM_LANEndpoint (ESP_LEP), the instance of CIM_VLANEndpoint(VLEP), and the instance of VLANEndpointSettingData(VEPSD). The property values shown in these instances are the corresponding properties described in the above description of EC_REQ.

The connection between the two CIM_LANEndpoint instances, EA_LEP and ESP_LEP, is shown with the association CIM_ActiveConnection.

1437 The connection to the Ethernet switch port, ESP0, is noted with the incremented value of the EC_POOL
1438 ConsumedResource property from the value shown in Figure 5.

1439 Lastly, the instantiated CIM_VLANEndpoint is associated to the corresponding VLAN200 instance of the
1440 CIM_NetworkVLAN class through a CIM_MemberOfCollection association.



1441
1442

1443 **Figure 6 – Ethernet adapter connection to static switch port**

9.1.4 Connection of an Ethernet adapter to an Ethernet switch (dynamic switch port allocation)

Figure 7 and Figure 8 are CIM instance diagrams that represent a virtualization system that supports dynamic or implied switch port allocation during the connection of an Ethernet adapter to a virtual Ethernet switch.

Figure 7 is a CIM representation of the allocation capabilities (CAP_EC) of an Ethernet connection resource pool (EC_POOL) associated with a virtual Ethernet switch (VSWITCH1).

The resource pool EC_POOL has a resource type of 33 (Ethernet Connection). The pool has a capacity of 10 gigabits of Ethernet bandwidth. This pool has no defined limits on the number of connections that can be made, as shown with NULL values for the MaxConsumableResource and ConsumedResource properties in EC_POOL.

The CIM_AllocationCapabilities instance CAP_EC has six associated instances of CIM_EthernetPortAllocationSettingData that are associated through the CIM_SettingDefinesCapabilities association:

- Instance CAP_EC_DEF shows that a connection to VSWITCH1 is made by requesting VSWITCH1 as a reference value in the HostResource property and EC_POOL in the PoolID property. This default request is a request for 1 gigabit of bandwidth as shown with a reserved property value of 1000 and the AllocationUnit property value of bits per second * 2^20. The default value for the DesiredVLANEndpointMode is Access with a VLANID of VLAN100. The empty string value in the Parent property shows that the system supports the modification of the Parent property. The use of the Parent property in this use is limited by this profile to be a reference to the Ethernet adapter request instance of the CIM_EthernetPortAllocationSettingData class.
- Instances CAP_EC_INC, CAP_EC_MAX, and CAP_EC_MIN define the valid range of values for the Reserve and Limit properties and the Increment value for those properties.
- The values in the DesiredVLANEndpointMode property of the CAP_EC_PNT1 and CAP_EC_PNT0 capabilities instances'show that either 2 (Access) or 5 (Trunk) can be requested. The values listed in the Connection property for both instances list the valid VLANIDs that can be requested in an allocation request.

Figure 8 shows the same virtualization system with a dynamic Ethernet connection allocation and an active Ethernet adapter allocation to VM1. The Ethernet adapter allocation is identical to the allocation shown in Figure 6 and described in 9.1.3.

The Ethernet connection request and allocation instances of CIM_EthernetPortAllocationSettingData (EC_REQ and EC_STATE) are for a dynamic Ethernet port allocation. As a side effect of the Ethernet connection allocation, an Ethernet switch port instance (ESP0), its associated LAN and VLAN endpoints (ESP_LEP and VLEP), and an instance of CIM_VLANEndpointSettingData (VEPSD) are instantiated.

The Ethernet connection request for VM1, the EC_REQ instance of the CIM_EthernetPortAllocationSettingData class, specifies a default Ethernet switch port from the virtual Ethernet switch VSWITCH0, a reservation and limit of bandwidth through the switch VSWITCH0, and a set of VLAN property values for the Ethernet switch port. The property values of EC_REQ define the request instance of EASD as follows:

- PoolID=EC_POOL: This property selects the resource pool EC_POOL.
- Parent=EA_REQ: This property associates this Ethernet connection request with the Ethernet adapter request EA_REQ.
- HostResource[] = VSWITCH1: This property requests that anEthernet switch port as defined by the allocation capabilities associated with the Ethernet connection resource pool EC_POOL be instantiated.

- MappingBehavior = 2 (Not Supported)
- AllocationUnits=bit per second*2^20: This property specifies a bandwidth unit of 1 megabyte per second.
- Reservation=1000: This property is a request to reserve 1 gigabit per second of Ethernet bandwidth.
- Limit=10000: This property sets a limit of 10 gigabits per second; in effect, there is no limit to the VM's use of available bandwidth because this value matches the maximum capacity of the request resource pool.
- Address=NULL: There is no request to override the provider-generated MAC address of the switch port.
- DesiredVLANEndpointMode=Access: This property requests the desired VLANEndpointMode of the requested Ethernet switch port.
- Connection=VLAN200: This property requests the access VLANID for the switch port.
- VirtualQuantity=1: This property is a request for one connection.

The Ethernet connection state EASD (EC_STATE) represents the current allocation of the Ethernet connection described above. The only different property value from the instance EC_REQ in this use case is for the Parent property, which reflects the Ethernet adapter allocation EA_STATE instead of EA_REQ. EC_STATE also represents the DSP8049 instance as described in 7.6.2.2.3.

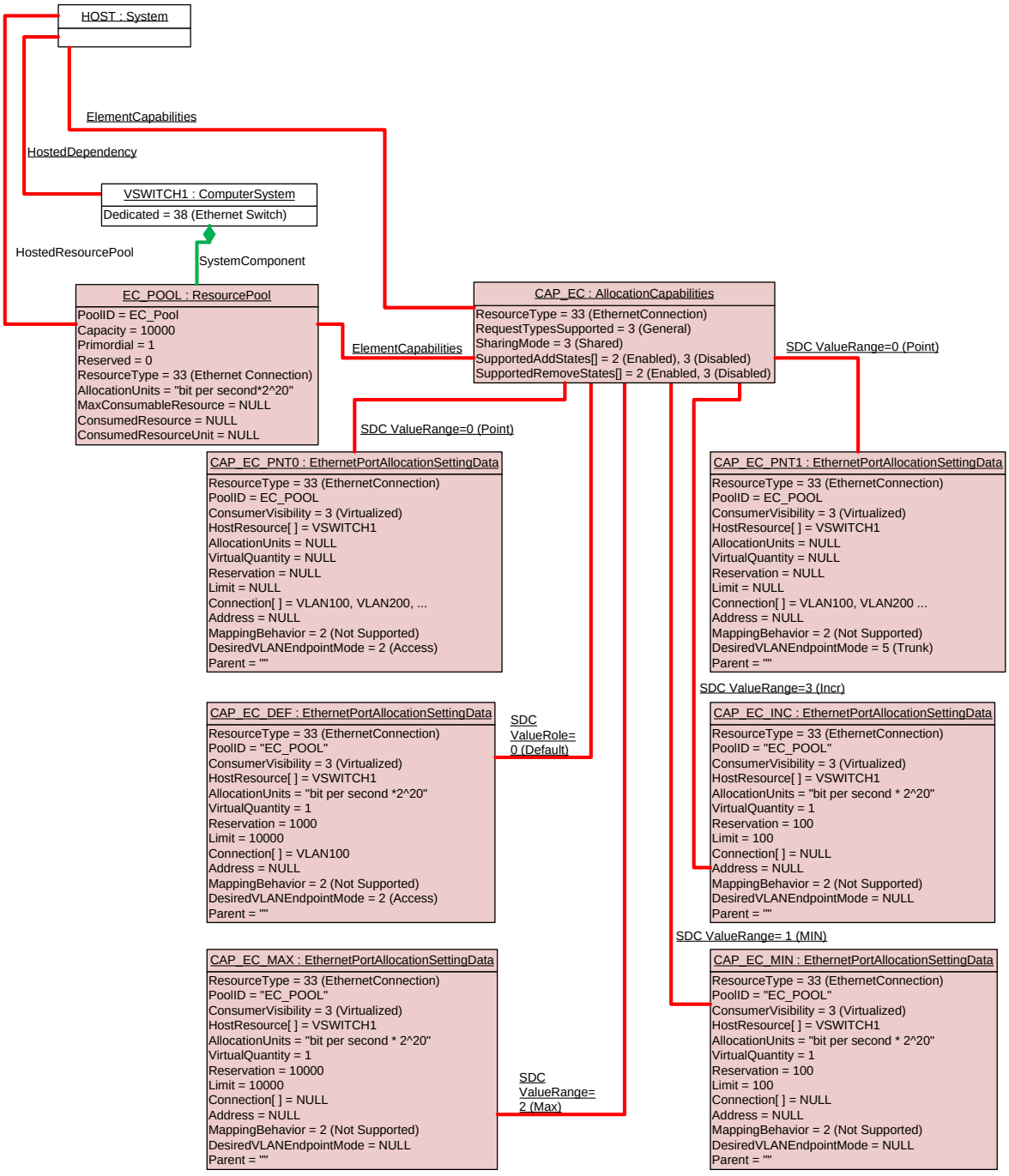


Figure 7 – Dynamic Ethernet switch port connection capabilities

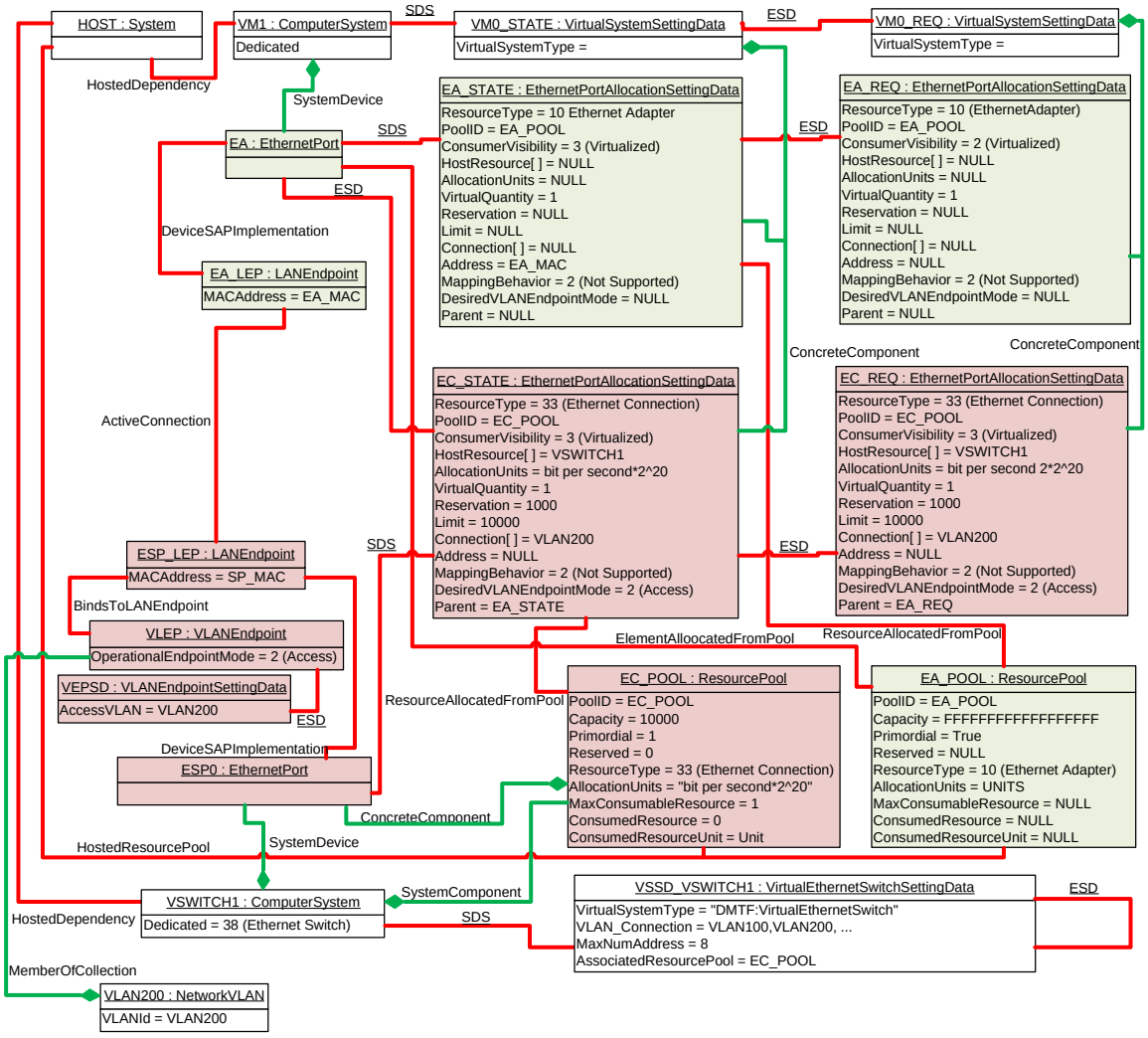


Figure 8 – Dynamic Ethernet switch port allocation

9.1.5 Ethernet connection of a virtual system to a virtual switch (simple switch port allocation)

Figure 9 and Figure 10 are CIM instance diagrams that represent a virtualization system that supports a simple connection of a VM to an Ethernet network. Both an implied Ethernet adapter and an Ethernet switch port CIM_EthernetPort instance are instantiated as a result of an Ethernet connection allocation.

Figure 9 is an instance diagram of the allocation capabilities (CAP_EC) of an Ethernet connection resource pool (EC_POOL) associated with a virtual Ethernet switch (VSWITCH2).

The resource pool EC_POOL is identical to the pool shown in Figure 7 and described in 9.1.4. The set of capabilities also closely matches the capabilities shown in Figure 7 and described in 9.1.4, but the one defining difference is that no valid value (NULL) for the Parent property is shown. Thus, a valid Ethernet connection request can be made without requiring the value of an existing Ethernet adapter request reference to be set in the Parent property.

As a side effect of an Ethernet connection allocation in response to the Ethernet connection request instance EC_REQ, an Ethernet adapter (EA) and an Ethernet switch port (ESP0) are instantiated. EA is associated to VM1 using the CIM_SystemDevice association. ESP0is associated to the VSWITCH2 using the CIM_SystemDevice association. An instance of CIM_LANEndpoint is instantiated for each of the

CIM_EthernetPort instances and associated through the CIM_ActiveConnection association. Also, an Instance of CIM_VLANEndpoint and CIM_VLANEndpointSettingData are instantiated with their properties populated as described in 9.1.4.

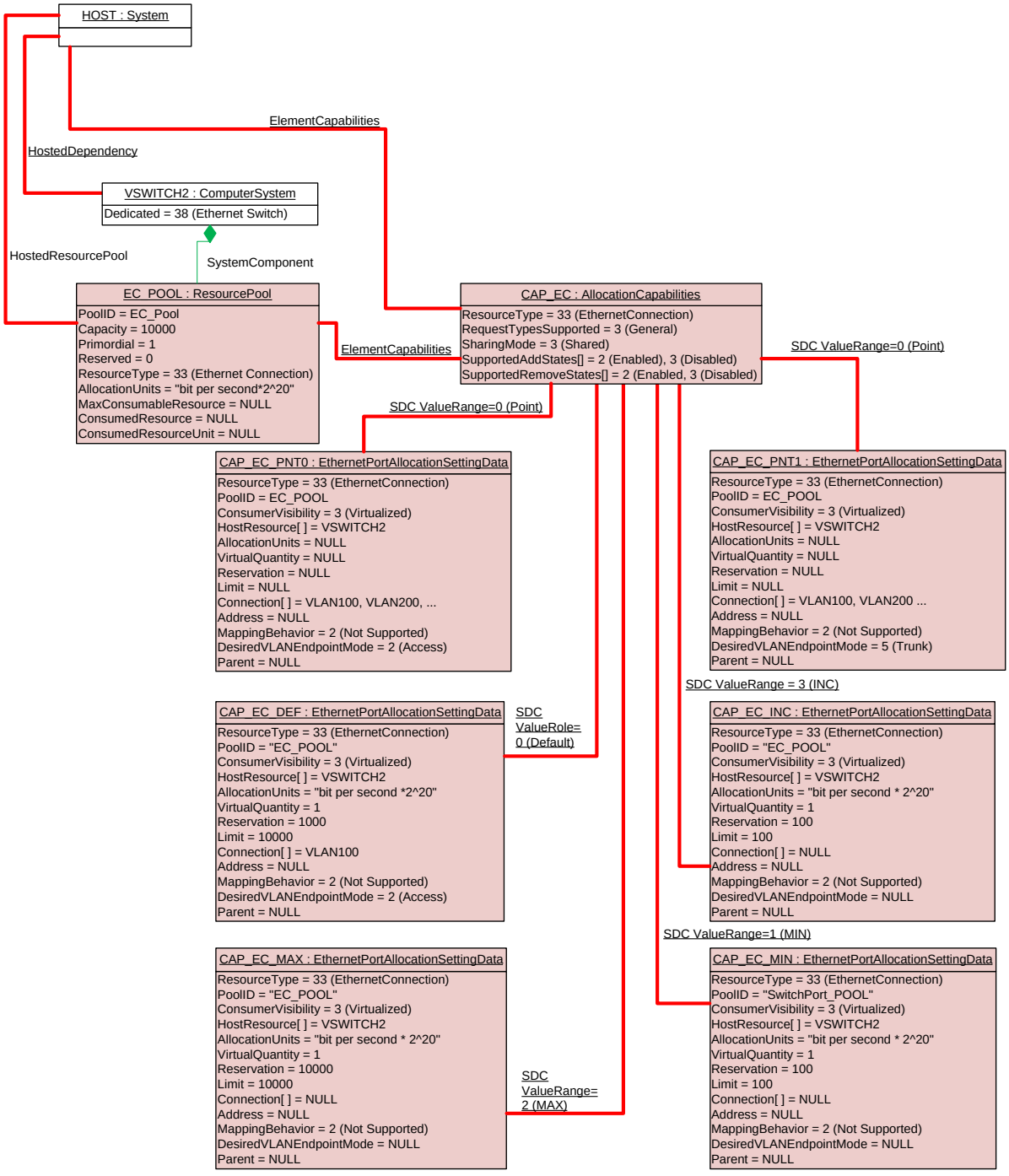


Figure 9 – Allocation capabilities for simple Ethernet connection

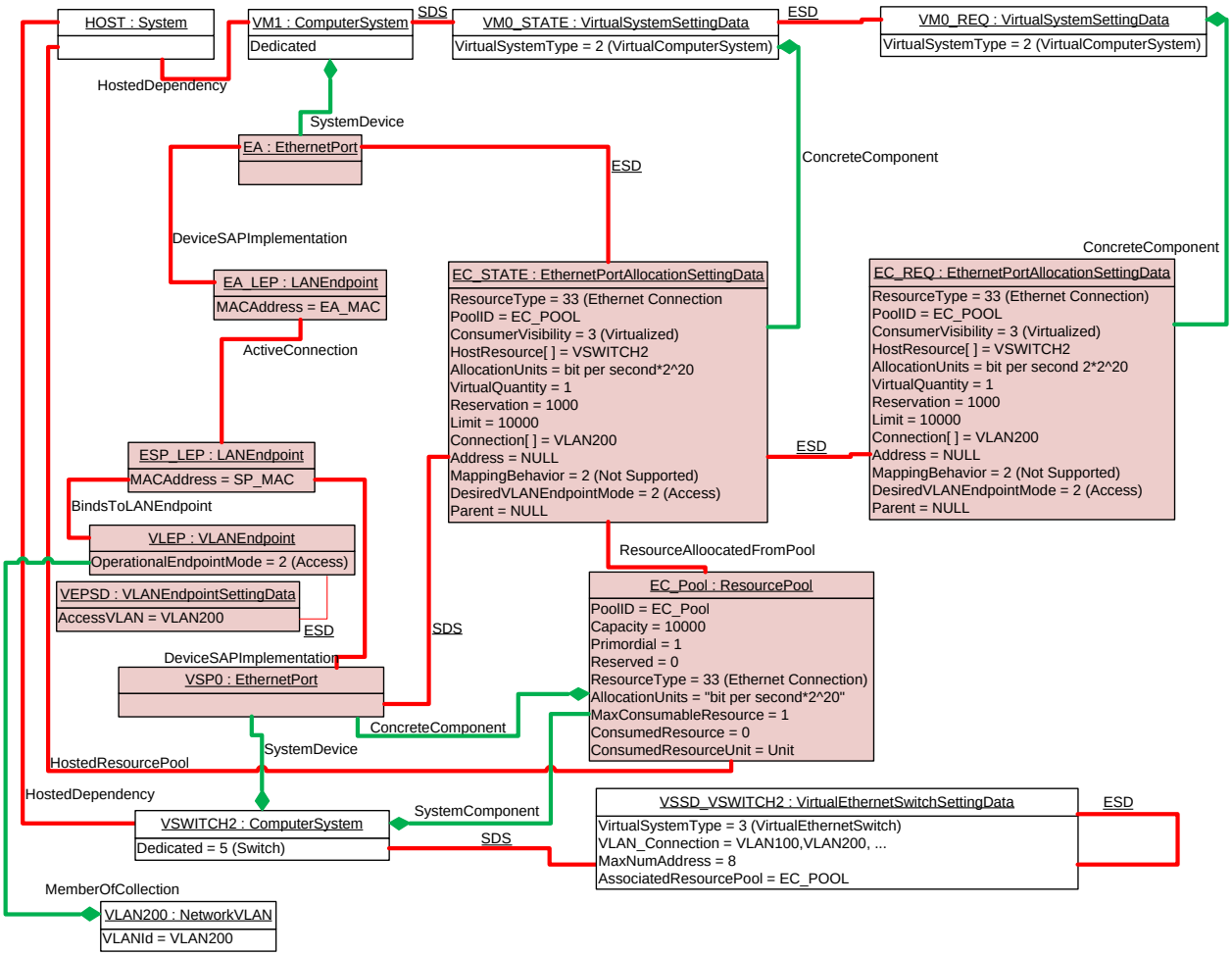


Figure 10 – Simple connection of virtual machine to Ethernet switch

9.1.6 Network Port Profile

An instance of EthernetAllocationSettingData where the ResourceType property matches 30 (Ethernet Switch Port) or 33 (Ethernet Connection) that is associated through an instance CIM_SettingDefinesState to an instance of CIM_EthernetPort representing an Ethernet switch port may contain the current value of the properties associated with this port's *Network Port Profile Schema*.

Figure 11 shows a switch port ESP0:EthernetPort that has been configured through the use of a Network Port Profile. The value in the NetworkPortProfileID property contains the identification of the port profile. In this use case, the value of the NetworkPortProfileID type shows the port profile was identified using the VSI Instance ID of switch port. The VSI instance ID is also being used for the PortCorrelationID.

The PortVID value 400 is the VLANID for this port while the VLANEndPointMode is Access.

The default traffic priority for this port is DefaultPriority = 0. Although the port would allow traffic on any of the traffic classes as the AllowedPriorities[] enumerates all of the traffic classes.

The port is not in Promiscuous mode, Promiscuous = False, thus the port will filter based on the port's MAC_Address (Address = "65432123456"), and contents of the AllowedToReceiveMACaddress

("654321123456" , NULL) and the AllowedToReceiveVLANs indexed arrays (1, 400). This port will accept traffic if the packet's destination MAC_Address matches the ports MAC address ("12345654321") and there is a match of the packet's source MAC_Address and outermost VLAN Tag with one of the following two cases from this example

- The source MAC address is "654321123456" and the outermost VLAN tag is 1 or
- Any MAC address if the outermost VLAN tag is 400.

SoureMACFilteringEnable match is true so transmit filtering is performed using the contents of the AllowedToTransmitMACAddress array ("123456654321", NULL) and the contents of the AllowedToTransmitVLAN array, (1,400). The indexed values show that only the port's MAC address, Address= "123456654321" , can be used on VLAN 1 and any MAC address can be used on VLAN 400.

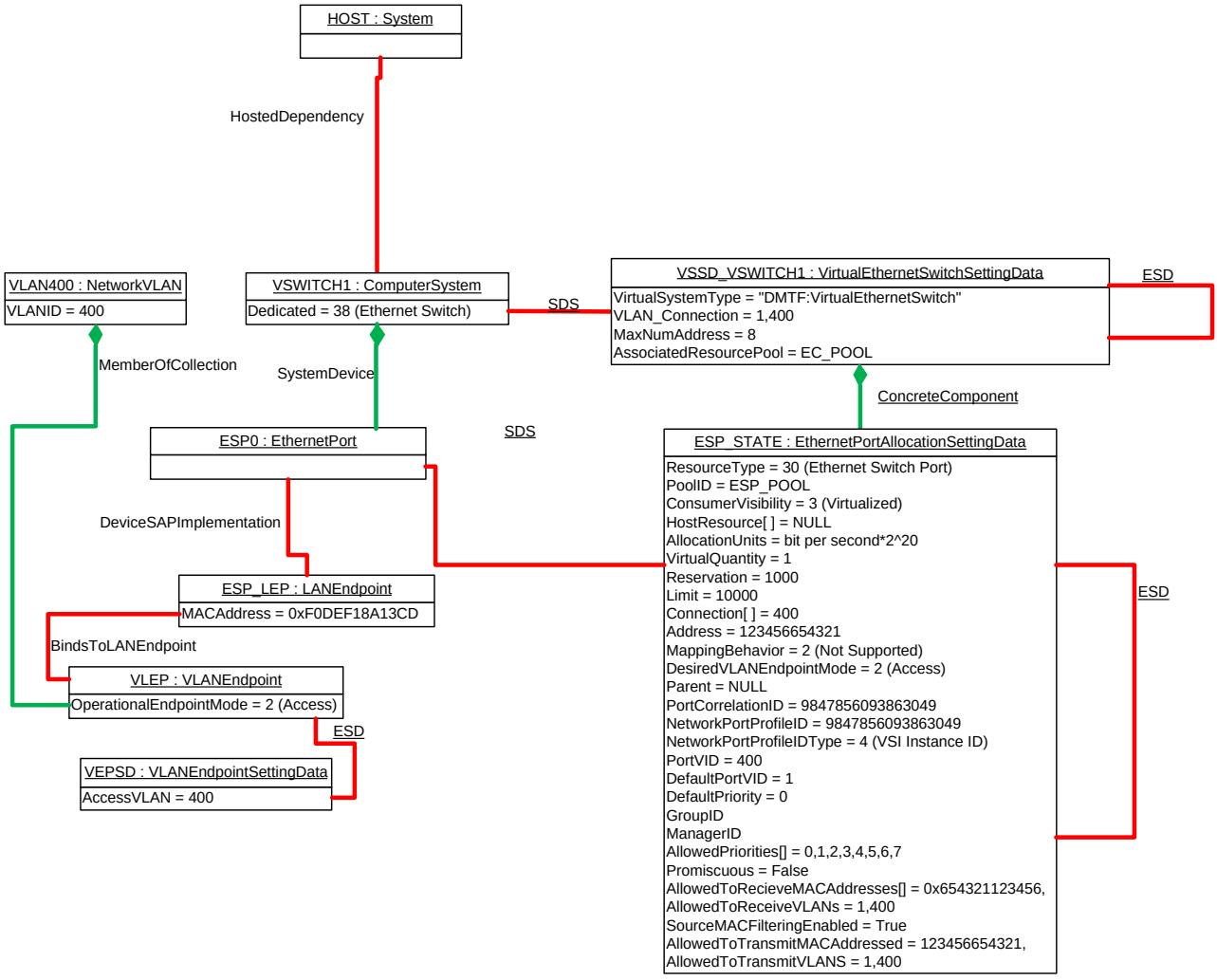


Figure 11– Network Port Profile properties.

9.2 Management

This set of use cases describes how to connect a virtual system to a virtual Ethernet switch. These management tasks are described in terms of a virtual system management service, as represented by a CIM_VirtualSystemManagementService instance.

9.2.1 Connection of an Ethernet adapter to a static Ethernet switch port

Preconditions

All of the following:

- The client knows a reference to the CIM_ComputerSystem instance that represents the virtual system.
- The client knows a reference to theCIM_VirtualSystemManagementService instance that represents the virtual system management service responsible for the virtual system.
- The client has performed the use case and knows the default allocation capabilities of the system.
- The client knows a reference to an available Ethernet switch port on the target virtual Ethernet switch.
- The client knows a reference to an Ethernet adapter request on the target virtual system.

Flow of activities

1) The client locally prepares an EASD instance with properties set as follows:

–	ResourceType:	33 (Ethernet Connection)	// Device type as seen by // consumer
–	ResourceSubtype:	NULL	// Implementation dependent
–	PoolID:	NULL	// Implies default pool
–	AllocationUnits:	"bits per second 2*2^20"	/// Units are in megabit per second // bandwidth
–	Reservation:	1000	// 1 gigabit per second bandwidth
–	VirtualQuantityUnits:	"count"	// Count of blocks; if value is // NULL, the effective value // is implied by pool capabilities
–	VirtualQuantity:	1	//One connection
–	Limit:	NULL	// Defaults to maximumlimit
–	Address:	NULL // switch port	// Optional; if not specified, the // implementation uses the current // MACaddress of the targeted
–	MappingBehavior:	3 (Dedicated)	// Selecting a specific switch port // for exclusive use
–	Parent:	REF to the EASD instance that represents the “defined” targeted Ethernet adapter configuration	
–	HostResource[ ]:	REF to the EASD instance that represents the “defined” targeted Ethernet switch port configuration	

– DesiredVLANEndpointMode: 2 (Access) // Set virtual Ethernet switch port to
// Access mode.

– Connection: VLAN200 //Desired Access VLANID

– Values of all other properties are not set (NULL), requesting a default behavior

2) The client invokes the AddResourceSettings( ) method of the virtual system management service, with parameters set as follows:

– AffectedConfiguration: REF to the VSSD instance that representsthe "defined" virtual system configuration

– ResourceSettings: One element with the embedded EASD instance prepared in step 1)

3) The implementation executes the AddResourceSettings() method.

– It is assumed that the method returns 0, indicating successful synchronous execution.

Post-conditions

The virtual Ethernet adapter is connected to the virtual Ethernet switch port, as requested (see Figure 5).

9.2.2 Connection of an Ethernet adapter to a dynamic Ethernet switch port

Preconditions

All of the following:

- The client knows a reference to the CIM_ComputerSystem instance that represents the virtual system.
- The client knows a reference to the CIM_VirtualSystemManagementService instance that represents the virtual system management service responsible for the virtual system.
- The client has performed the use case and knows the default allocation capabilities of the system.
- The client knows a reference to the target virtual Ethernet switch.
- The client knows a reference to an Ethernet adapter request on the target virtual system.

Flow of activities

The client locally prepares an EASD instance, with properties as specified in use case 9.1.4 with the following change:

HostResource[ ]: REF to the CIM_VirtualEthernetSwitchSettingData representing the “defined” configuration of the targeted virtual Ethernet switch

Post-conditions

The implementation creates an instance of CIM_EthernetPort and the required associated protocol endpoints representing an Ethernet switch port and connects the targeted Ethernet adapter to this Ethernet switch port (see Figure 8).

10 CIM elements

Table 3 lists CIM elements that are defined or specialized for this profile. Each CIM element shall be implemented as described in Table 3. The CIM Schema descriptions for any referenced element and its subelements apply.

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

Table 3 – CIM Elements: EthernetPort Resource VirtualizationProfile

Element	Requirement	Description
Classes		
CIM_ActiveConnection	Mandatory	See 10.1.
CIM_AllocationCapabilities for capabilities	Mandatory	See DSP1043.
CIM_AllocationCapabilities for mutability	Optional	See DSP1043.
CIM_Component for resource pool	Optional	See 10.2.
CIM_ElementAllocatedFromPool	Mandatory	See 10.3.
CIM_ElementSettingData for Ethernet port resource	Mandatory	See 10.4.
CIM_ElementSettingData Ethernet port resource allocation request	Mandatory	See 10.5.
CIM_ElementCapabilities for capabilities	Mandatory	See DSP1043.
CIM_ElementCapabilities for mutability	Conditional	See DSP1043.
CIM_ElementCapabilities for resource pool	Mandatory	See DSP1041.
CIM_ElementSettingData for connection resources	Mandatory	See 10.4.
CIM_ElementSettingData for CIM_EthernetPort resource allocation	Conditional	See 10.5.
CIM_ELementSettingData for CIM _VLANEndpointSetttingData	Conditional	See 10.6
CIM_EthernetPort for host systems	Conditional	See 10.7.
CIM_EthernetPort for virtual systems	Mandatory	See 10.8.
CIM_EthernetPortAllocationSettingData for Ethernet Adapter (Q_EASD)	Optional	See 10.9.
CIM_EthernetPortAllocationSettingData for Ethernet Adapter (R_EASD)	Optional	See 10.10.
CIM_EthernetPortAllocationSettingData for Ethernet Adapter (C_EASD)	Optional	See 10.11.
CIM_EthernetPortAllocationSettingData for Ethernet Adapter (D_EASD)	Optional	See 10.12.
CIM_EthernetPortAllocationSettingData for Ethernet Adapter (M_EASD)	Optional	See 10.13.
CIM_EthernetPortAllocationSettingData for Ethernet Connection (Q_EASD)	Mandatory	See 10.14.
CIM_EthernetPortAllocationSettingData for Ethernet Connection (R_EASD)	Mandatory	See 10.15.
CIM_EthernetPortAllocationSettingData for Ethernet Connection (C_EASD)	Mandatory	See 10.16.
CIM_EthernetPortAllocationSettingData for Ethernet Connection (D_EASD)	Mandatory	See 10.17.
CIM_EthernetPortAllocationSettingData for Ethernet Connection (M_EASD)	Mandatory	See 10.18.
CIM_EthernetPortAllocationSettingData for Ethernet Switch Port (Q_EASD)	Optional	See 10.19.
CIM_EthernetPortAllocationSettingData for Ethernet Switch Port(R_EASD)	Optional	See 10.20.
CIM_EthernetPortAllocationSettingData for Ethernet Switch Port(C_EASD)	Optional	See 10.21.
CIM_EthernetPortAllocationSettingData for Ethernet Switch Port(D_EASD)	Optional	See 10.22.
CIM_EthernetPortAllocationSettingData for Ethernet Switch Port(M_EASD)	Optional	See 10.23.

Element	Requirement	Description
CIM_ReferencedProfile	Mandatory	See 10.20.
CIM_RegisteredProfile	Mandatory	See 10.24.
CIM_ResourceAllocatedFromPool	Mandatory	See DSP1041.
CIM_ResourcePool Ethernet Adapter	Optional	See 10.25.
CIM_ResourcePool Ethernet Connection	Mandatory	See 10.26.
CIM_ResourcePool Ethernet Switch Port	Optional	See 10.27.
CIM_SettingsDefineState	Mandatory	See 10.28.
CIM_SystemDevice (Virtual EthernetPort)	Mandatory	See 10.29.
CIM_SystemDevice (Host EthernetPort)	Optional	See 10.30.
CIM_VLANEndpointSettingData	Optional	See 10.31.

10.1 CIM_ActiveConnection

An instance of the CIM_Connection association that associates two instances of the CIM_LANEndPointclass that represents an Ethernet connection between the two CIM_LANEndpoint instances.

Table 4 lists the requirements for elements of this association. These requirements are in addition to those specified in the CIM Schema.

Table 4 – Association: CIM_ActiveConnection

Elements	Requirement	Notes
Antecedent	Mandatory	**Key:** Value shall reference an instance of the CIM_LANEndpoint of an EthernetPort. **Cardinality:** 0..1
Dependent	Mandatory	Key: Value shall reference an instance of the CIM_LANEndpoint of an EthernetPort. **Cardinality:** 0..1
IsUnidirectional	Mandatory	False

10.2 CIM_Component for resource pool

The implementation of the CIM_Component association for the representation of the aggregation of host resources into resource pools is conditional.

Condition: The resource aggregation feature (see 7.5.10) is implemented.

The CIM_Component association is abstract; therefore, it cannot be directly implemented. For this reason, the provisions in this subclause shall be applied to implementations of subclasses of the CIM_Component association. However, note that clients may directly resolve abstract associations without knowledge of the concrete subclass that is implemented.

Table 5 lists the requirements for elements of this association. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

1667 **Table 5 – Association: CIM_Component for resource pool**

Elements	Requirement	Notes
GroupComponent	Mandatory	**Key:** Value shall reference the instance of the CIM_ResourcePool class that represents an EthernetPort resource pool. **Cardinality:** 0..1
PartComponent	Mandatory	**Key**: Value shall reference an instance of the CIM_EthernetPort class that represents an Ethernet adapter or Ethernet switch port aggregated into the pool. **Cardinality:** *

1668 ## 10.3 CIM_ElementAllocatedFromPool

1669 Table 6 lists the requirements for elements of this association. These requirements are in addition to
1670 those specified in the CIM Schema and in DSP1041.

1671 **Table 6 – Association: CIM_ElementAllocatedFromPool**

Elements	Requirement	Notes
Antecedent	Mandatory	**Key:** Value shall reference the instance of the CIM_ResourcePool class that represents an Ethernet adapter or Ethernet switch port resource pool. **Cardinality:** 1
Dependent	Mandatory	**Key:** Value shall reference the instance of the CIM_EthernetPort class that represents a virtual EthernetPort resulting from an Ethernet adapter or Ethernet switch port allocation from the pool. **Cardinality:** *

1672 ## 10.4 CIM_ElementSettingData for connection resources

1673 The CIM_ElementSettingData association associates an instance of the
1674 CIM_EthernetPortAllocationSettingData class that represents an Ethernet connection resource allocation
1675 and the instance of the CIM_LANEndPoint class associated to the CIM_EthernetPort that represents the
1676 targeted Ethernet adapter.

1677 Table 7 lists the requirements for elements of this class. These requirements are in addition to those
1678 specified in the CIM Schema and in DSP1041.

1679 **Table 7 – Association: CIM_ElementSettingData for connection resources**

Elements	Requirement	Notes
ManagedElement	Mandatory	**Key:** Value shall reference the instance of the CIM_LANEndpoint class that represents an associated CIMLANEndpoint of the target Ethernet adapter for a connection resource allocation. **Cardinality:** 1

Elements	Requirement	Notes
SettingData	Mandatory	**Key:** Value shall reference the instance of the CIM_EthernetPortAllocationSettingData class that represents a corresponding resource allocation request. **Cardinality:** 0..1

10.5 CIM_ElementSettingData for CIM_EthernetPort resource allocation

The use of the CIM_ElementSettingData association that is used to associate an instance of CIM_EthernetPortAllocationSettingData representing the allocation of an EthernetPort with a corresponding instance of CIM_EthernetPortAllocationSettingData that describes the same allocation for use as an allocation definition (see DSP1041) is conditional.

Condition: The support of the allocation of virtual Ethernet adapters or of virtual Ethernet switch ports.

Table 8 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in the DSP1041.

Table 8 – Association: CIM_ElementSettingDatafor CIM_EthernetPort resource allocation

Elements	Requirement	Notes
ManagedElement	Mandatory	**Key:** Value shall reference the instance of the CIM_EthernetPortAllocationSettingDataclass that represents an Ethernet Adapter or Ethernet switch port resource allocation. **Cardinality:** 1
SettingData	Mandatory	**Key:** Value shall reference the instance of the CIM_EthernetPortAllocationSettingData class that represents a corresponding resource allocation request. **Cardinality:** 0..1

10.6 CIM_ElementSettingData for CIM_VLANEndpointSettingData

This use of CIM_ElementSettingData is used to associate a VLAN endpoint's configuration data with an instance of CIM_VLANEndpoint.

Condition: The support for this use of the CIM_ElementSettingData is required if VLAN is supported for an Ethernet port's protocol endpoint.

Table 9 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema.

Table 9 – Association: CIM_ElementSettingData for CIM_EthernetPort resource allocation

Elements	Requirement	Notes
ManagedElement	Mandatory	**Key:** Value shall reference the instance of the CIM_VLANEndpoint class that represents a VLAN protocol endpoint. **Cardinality:** 1

Elements	Requirement	Notes
SettingData	Mandatory	**Key:** Value shall reference the instance of the CIM_VLANEndpointSettingData that represents the configuration data for the VLAN endpoint. **Cardinality:** 0..1

10.7 CIM_EthernetPort (host system)

The implementation of the CIM_EthernetPort class for the representation of host Ethernet adapter is conditional.

Condition: The support is required if the CIM_SystemDevice association is supported for the representation of a host Ethernet adapter or a host switch port; see 7.3.Table 10 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema.

Table 10 – Class: CIM_EthernetPort (host system)

Elements	Requirement	Notes
SystemCreationClassName	Mandatory	**Key**
CreationClassName	Mandatory	**Key**
SystemName	Mandatory	**Key**
Name	Mandatory	**Key**

10.8 CIM_EthernetPort (virtual system)

See 7.7.1 for detailed implementation requirements for this class if it is used for the representation of a virtual Ethernet adapter or an Ethernet switch port.

Table 11 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema.

Table 11 – Class: CIM_EthernetPort (virtual system)

Elements	Requirement	Notes
SystemCreationClassName	Mandatory	**Key**
CreationClassName	Mandatory	**Key**
SystemName	Mandatory	**Key**
Name	Mandatory	**Key**

10.9 CIM_EthernetPortAllocationSettingData for Ethernet adapter (Q_EASD)

See 7.6 for detailed implementation requirements for this class.

Table 12 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

1714 **Table 12 – Class: CIM_EthernetPortAllocationSettingDatafor Ethernet adapter (Q_EASD)**

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**; see 7.6.2.1.13.
ResourceType	Mandatory	Value shall be 10 (Ethernet Adapter). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Parent	Optional	See 7.6.2.1.12.
Address	Optional	See 7.6.2.1.13.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.

1715 ## 10.10 CIM_EthernetPortAllocationSettingData for Ethernet adapter (R_EASD)

1716 See 7.6 for detailed implementation requirements for this class.

1717 Table 13 lists the requirements for elements of this class. These requirements are in addition to those
1718 specified in the CIM Schema and in DSP1041.

1719 **Table 13 – Class: CIM_EthernetPortAllocationSettingData for Ethernet adapter (R_EASD)**

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**; see 7.6.2.1.13.
ResourceType	Mandatory	Value shall be 10 (Ethernet Adapter). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.

Elements	Requirement	Notes
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Mandatory	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.

10.11 CIM_EthernetPortAllocationSettingData for Ethernet adapter (C_EASD)

See 7.6 for detailed implementation requirements for this class.

Table 14 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

Table 14 – Class: CIM_EthernetPortAllocationSettingData for Ethernet adapter (C_EASD)

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**; see 7.6.2.1.13.
ResourceType	Mandatory	Value shall be 10 (Ethernet Adapter). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Optional	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.

10.12 CIM_EthernetPortAllocationSettingData for Ethernet adapter (D_EASD)

See 7.6 for detailed implementation requirements for this class.

Table 15 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

Table 15 – Class: CIM_EthernetPortAllocationSettingData for Ethernet adapter (D_EASD)

Elements	Requirement	Notes
InstanceID	Mandatory	Key; see 7.6.2.1.13.
ResourceType	Mandatory	Value shall be 10 (Ethernet Adapter). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Optional	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.

10.13 CIM_EthernetPortAllocationSettingData for Ethernet adapter (M_EASD)

See 7.6 for detailed implementation requirements for this class.

Table 16 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

Table 16 – Class: CIM_EthernetPortAllocationSettingData for Ethernet adapter (M_EASD)

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**; see 7.6.2.1.13.
ResourceType	Mandatory	Value shall be 10 (Ethernet Adapter). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.

Elements	Requirement	Notes
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Optional	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.

10.14 CIM_EthernetPortAllocationSettingData for Ethernet connection (Q_EASD)

See 7.6 for detailed implementation requirements for this class.

Table 17 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

Table 17 – Class: CIM_EthernetPortAllocationSettingData for Ethernet connection (Q_EASD)

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ResourceType	Mandatory	Value shall be 33 (Ethernet Connection). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Optional	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.

Elements	Requirement	Notes
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.
DesiredVLANEndpointMode	Optional	See 7.6.2.1.17.
AllowedPriorites	Optional	See 7.6.2.1.18.
AllowedToReceiveMACAddresses	Optional	See 7.6.2.1.20.
AllowedToReceiveVLANs	Optional	See 7.6.2.1.20.
AllowedToTransmitMACAddresses	Optional	See 7.6.2.1.22.
AllowedToTransmitVLANs	Optional	See 7.6.2.1.22.
DefaultPortVID	Optional	See 7.6.2.1.23.
DefaultPriority	Optional	See 7.6.2.1.24.
GroupID	Optional	See 7.6.2.1.25.
ManagerID	Optional	See 7.6.2.1.25.
NetworkPortProfileID	Optional	See 7.6.2.1.27.
NetworkPortProfileIDType	Conditional	See 7.6.2.1.28.
PortCorrelationID	Optional	See 7.6.2.1.29.
PortVID	Optional	See 7.6.2.1.30.
Promiscuous	Optional	See 7.6.2.1.19.
ReceiveBandwidthLimit	Optional	See 7.6.2.1.32.
ReceiveBandwidthReservation	Optional	See 7.6.2.1.31.
SourceMacFilteringEnabled	Conditional	See 7.6.2.1.21.

10.15 CIM_EthernetPortAllocationSettingData for Ethernet connection (R_EASD)

See 7.6 for detailed implementation requirements for this class.

Table 18 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

Table 18 – Class: CIM_EthernetPortAllocationSettingData for Ethernet connection (R_EASD)

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ResourceType	Mandatory	Value shall be 33 (Ethernet Connection). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.

Elements	Requirement	Notes
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Mandatory	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.
DesiredVLANEndpointMode	Optional	See 7.6.2.1.17.
AllowedPriorites	Optional	See 7.6.2.1.18.
AllowedToReceiveMACAddresses	Optional	See 7.6.2.1.20.
AllowedToReceiveVLANs	Optional	See 7.6.2.1.20.
AllowedToTransmitMACAddresses	Optional	See 7.6.2.1.22.
AllowedToTransmitVLANs	Optional	See 7.6.2.1.22.
DefaultPortVID	Optional	See 7.6.2.1.23.
DefaultPriority	Optional	See 7.6.2.1.24.
GroupID	Optional	See 7.6.2.1.25.
ManagerID	Optional	See 7.6.2.1.26.
NetworkPortProfileID	Optional	See 7.6.2.1.27.
NetworkPortProfileIDType	Conditional	See 7.6.2.1.28.
PortCorrelationID	Optional	See 7.6.2.1.29.
PortVID	Optional	See 7.6.2.1.30.
Promiscuous	Optional	See 7.6.2.1.19.
ReceiveBandwidthLimit	Optional	See 7.6.2.1.32.
ReceiveBandwidthReservation	Optional	See 7.6.2.1.31.
SourceMacFilteringEnabled	Conditional	See 7.6.2.1.21.

10.16 CIM_EthernetPortAllocationSettingData for Ethernet connection (C_EASD)

See 7.6 for detailed implementation requirements for this class.

Table 19 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

1750 **Table 19 – Class: CIM_EthernetPortAllocationSettingData for Ethernet connection (C_EASD)**

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ResourceType	Mandatory	Value shall be 33 (Ethernet Connection). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Optional	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.
DesiredVLANEndpointMode	Optional	See 7.6.2.1.17.
AllowedPriority	Optional	See 7.6.2.1.18.
AllowedToReceiveMACAddresses	Optional	See 7.6.2.1.20.
AllowedToReceiveVLANs	Optional	See 7.6.2.1.20.
AllowedToTransmitMACAddresses	Optional	See 7.6.2.1.22.
AllowedToTransmitVLANs	Optional	See 7.6.2.1.22.
DefaultPortVID	Optional	See 7.6.2.1.23.
DefaultPriorities	Optional	See 7.6.2.1.24.
GroupID	Optional	See 7.6.2.1.25.
ManagerID	Optional	See 7.6.2.1.26.
NetworkPortProfileID	Optional	See 7.6.2.1.27.
NetworkPortProfileIDType	Conditional	See 7.6.2.1.28.
PortCorrelationID	Optional	See 7.6.2.1.29.
PortVID	Optional	See 7.6.2.1.30.
Promiscuous	Optional	See 7.6.2.1.19.
ReceiveBandwidthLimit	Optional	See 7.6.2.1.32.
ReceiveBandwidthReservation	Optional	See 7.6.2.1.31.

Elements	Requirement	Notes
SourceMacFilteringEnabled	Conditional	See 7.6.2.1.21.

10.17 CIM_EthernetPortAllocationSettingData for Ethernet connection (D_EASD)

See 7.6 for detailed implementation requirements for this class.

Table 20 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema.

Table 20 – Class: CIM_EthernetPortAllocationSettingData for Ethernet connection (D_EASD)

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ResourceType	Mandatory	Value shall be 33 (Ethernet Connection). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Optional	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.
DesiredVLANEndpointMode	Optional	See 7.6.2.1.17.
AllowedPriorites	Optional	See 7.6.2.1.18.
AllowedToReceiveMACAddresses	Optional	See 7.6.2.1.20.
AllowedToReceiveVLANs	Optional	See 7.6.2.1.20.
AllowedToTransmitMACAddresses	Optional	See 7.6.2.1.22.
AllowedToTransmitVLANs	Optional	See 7.6.2.1.22.
DefaultPortVID	Optional	See 7.6.2.1.23.
DefaultPriority	Optional	See 7.6.2.1.24.
GroupID	Optional	See 7.6.2.1.25.

Elements	Requirement	Notes
ManagerID	Optional	See 7.6.2.1.26.
NetworkPortProfileID	Optional	See 7.6.2.1.27.
NetworkPortProfileIDType	Conditional	See 7.6.2.1.28.
PortCorrelationID	Optional	See 7.6.2.1.29.
PortVID	Optional	See 7.6.2.1.30.
Promiscuous	Optional	See 7.6.2.1.19.
ReceiveBandwidthLimit	Optional	See 7.6.2.1.32.
ReceiveBandwidthReservation	Optional	See 7.6.2.1.31.
SourceMacFilteringEnabled	Conditional	See 7.6.2.1.21.

10.18 CIM_EthernetPortAllocationSettingData for Ethernet connection (M_EASD)

See 7.6 for detailed implementation requirements for this class.

Table 21 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

Table 21 – Class: CIM_EthernetPortAllocationSettingData for Ethernet connection (M_EASD)

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ResourceType	Mandatory	Value shall be 33 (Ethernet Connection). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Optional	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.

Elements	Requirement	Notes
DesiredVLANEndpointMode	Optional	See 7.6.2.1.17.
AllowedPriorites	Optional	See 7.6.2.1.18.
AllowedToReceiveMACAddresses	Optional	See 7.6.2.1.20.
AllowedToReceiveVLANs	Optional	See 7.6.2.1.20.
AllowedToTransmitMACAddresses	Optional	See 7.6.2.1.22.
AllowedToTransmitVLANs	Optional	See 7.6.2.1.22.
DefaultPortVID	Optional	See 7.6.2.1.23.
DefaultPriority	Optional	See 7.6.2.1.24.
GroupID	Optional	See 7.6.2.1.25.
ManagerID	Optional	See 7.6.2.1.26.
NetworkPortProfileID	Optional	See 7.6.2.1.27.
NetworkPortProfileIDType	Conditional	See 7.6.2.1.28.
PortCorrelationID	Optional	See 7.6.2.1.29.
PortVID	Optional	See 7.6.2.1.30.
Promiscuous	Optional	See 7.6.2.1.19.
ReceiveBandwidthLimit	Optional	See 7.6.2.1.32.
ReceiveBandwidthReservation	Optional	See 7.6.2.1.31.
SourceMacFilteringEnabled	Conditional	See 7.6.2.1.21.

10.19 CIM_EthernetPortAllocationSettingDatafor Ethernet switch port (Q_EASD)

See 7.6 for detailed implementation requirements for this class.

Table 22 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

Table 22 – Class: CIM_EthernetPortAllocationSettingDatafor Ethernet switch port (Q_EASD)

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ResourceType	Mandatory	Value shall be 30 (Ethernet Switch Port). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.

Elements	Requirement	Notes
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Optional	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.
DesiredVLANEndpointMode	Optional	See 7.6.2.1.17.
AllowedPriorites	Optional	See 7.6.2.1.18.
AllowedToReceiveMACAddresses	Optional	See 7.6.2.1.20.
AllowedToReceiveVLANs	Optional	See 7.6.2.1.20.
AllowedToTransmitMACAddresses	Optional	See 7.6.2.1.22.
AllowedToTransmitVLANs	Optional	See 7.6.2.1.22.
DefaultPortVID	Optional	See 7.6.2.1.23.
DefaultPriority	Optional	See 7.6.2.1.24.
GroupID	Optional	See 7.6.2.1.25.
ManagerID	Optional	See 7.6.2.1.26.
NetworkPortProfileID	Optional	See 7.6.2.1.27.
NetworkPortProfileIDType	Conditional	See 7.6.2.1.28.
PortCorrelationID	Optional	See 7.6.2.1.29.
PortVID	Optional	See 7.6.2.1.30.
Promiscuous	Optional	See 7.6.2.1.19.
ReceiveBandwidthLimit	Optional	See 7.6.2.1.32.
ReceiveBandwidthReservation	Optional	See 7.6.2.1.31.
SourceMacFilteringEnabled	Conditional	See 7.6.2.1.21.

1767 10.20 CIM_EthernetPortAllocationSettingData for Ethernet switch port (R_EASD)

1768 See 7.6 for detailed implementation requirements for this class.

1769 Table 23 lists the requirements for elements of this class. These requirements are in addition to those
1770 specified in the CIM Schema and in DSP1041.

1771 **Table 23 – Class: CIM_EthernetPortAllocationSettingData for Ethernet switch port (R_EASD)**

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ResourceType	Mandatory	Value shall be 30 (Ethernet Switch Port). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.

Elements	Requirement	Notes
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Mandatory	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.
DesiredVLANEndpointMode	Optional	See 7.6.2.1.17.
AllowedPriorites	Optional	See 7.6.2.1.18.
AllowedToReceiveMACAddresses	Optional	See 7.6.2.1.20.
AllowedToReceiveVLANs	Optional	See 7.6.2.1.20.
AllowedToTransmitMACAddresses	Optional	See 7.6.2.1.22.
AllowedToTransmitVLANs	Optional	See 7.6.2.1.22.
DefaultPortVID	Optional	See 7.6.2.1.23.
DefaultPriority	Optional	See 7.6.2.1.24.
GroupID	Optional	See 7.6.2.1.25.
ManagerID	Optional	See 7.6.2.1.26.
NetworkPortProfileID	Optional	See 7.6.2.1.27.
NetworkPortProfileIDType	Conditional	See 7.6.2.1.28.
PortCorrelationID	Optional	See 7.6.2.1.29.
PortVID	Optional	See 7.6.2.1.30.
Promiscuous	Optional	See 7.6.2.1.19.
ReceiveBandwidthLimit	Optional	See 7.6.2.1.32.
ReceiveBandwidthReservation	Optional	See 7.6.2.1.31.
SourceMacFilteringEnabled	Conditional	See 7.6.2.1.21.

10.21 CIM_EthernetPortAllocationSettingData for Ethernet switch port (C_EASD)

See 7.6 for detailed implementation requirements for this class.

1774 Table 24 lists the requirements for elements of this class. These requirements are in addition to those
1775 specified in the CIM Schema and in DSP1041.

1776 **Table 24 – Class: CIM_EthernetPortAllocationSettingData for Ethernet switch port (C_EASD)**

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ResourceType	Mandatory	Value shall be 30 (Ethernet Switch Port). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Optional	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.
DesiredVLANEndpointMode	Optional	See 7.6.2.1.17.
AllowedPriorites	Optional	See 7.6.2.1.18.
AllowedToReceiveMACAddresses	Optional	See 7.6.2.1.20.
AllowedToReceiveVLANs	Optional	See 7.6.2.1.20.
AllowedToTransmitMACAddresses	Optional	See 7.6.2.1.22.
AllowedToTransmitVLANs	Optional	See 7.6.2.1.22.
DefaultPortVID	Optional	See 7.6.2.1.23.
DefaultPriority	Optional	See 7.6.2.1.24.
GroupID	Optional	See 7.6.2.1.25.
ManagerID	Optional	See 7.6.2.1.26.
NetworkPortProfileID	Optional	See 7.6.2.1.27.
NetworkPortProfileIDType	Conditional	See 7.6.2.1.28.
PortCorrelationID	Optional	See 7.6.2.1.29.
PortVID	Optional	See 7.6.2.1.30.
Promiscuous	Optional	See 7.6.2.1.19.

Elements	Requirement	Notes
ReceiveBandwidthLimit	Optional	See 7.6.2.1.32.
ReceiveBandwidthReservation	Optional	See 7.6.2.1.31.
SourceMacFilteringEnabled	Conditional	See 7.6.2.1.21.

10.22 CIM_EthernetPortAllocationSettingData for Ethernet switch port (D_EASD)

See 7.6 for detailed implementation requirements for this class.

Table 25 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

Table 25 – Class: CIM_EthernetPortAllocationSettingData for Ethernet switch port (D_EASD)

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ResourceType	Mandatory	Value shall be 30 (Ethernet Switch Port). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Optional	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.
DesiredVLANEndpointMode	Optional	See 7.6.2.1.17.
AllowedPriorites	Optional	See 7.6.2.1.18.
AllowedToReceiveMACAddresses	Optional	See 7.6.2.1.20.
AllowedToReceiveVLANs	Optional	See 7.6.2.1.20.
AllowedToTransmitMACAddresses	Optional	See 7.6.2.1.22.
AllowedToTransmitVLANs	Optional	See 7.6.2.1.22.
DefaultPortVID	Optional	See 7.6.2.1.23.

Elements	Requirement	Notes
DefaultPriority	Optional	See 7.6.2.1.24.
GroupID	Optional	See 7.6.2.1.25.
ManagerID	Optional	See 7.6.2.1.26.
NetworkPortProfileID	Optional	See 7.6.2.1.27.
NetworkPortProfileIDType	Conditional	See 7.6.2.1.28.
PortCorrelationID	Optional	See 7.6.2.1.29.
PortVID	Optional	See 7.6.2.1.30.
Promiscuous	Optional	See 7.6.2.1.19.
ReceiveBandwidthLimit	Optional	See 7.6.2.1.32.
ReceiveBandwidthReservation	Optional	See 7.6.2.1.31.
SourceMacFilteringEnabled	Conditional	See 7.6.2.1.21.

10.23 CIM_EthernetPortAllocationSettingData for Ethernet switch port (M_EASD)

See 7.6 for detailed implementation requirements for this class.

Table 26 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

Table 26 – Class: CIM_EthernetPortAllocationSettingData for Ethernet switch port (M_EASD)

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ResourceType	Mandatory	Value shall be 30 (Ethernet Switch Port). See 7.6.2.1.1.
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
PoolID	Mandatory	See 7.6.2.1.3.
ConsumerVisibility	Optional	See 7.6.2.1.4.
HostResource[ ]	Optional	See 7.6.2.1.6.
AllocationUnits	Mandatory	See 7.6.2.1.5.
VirtualQuantity	Mandatory	See 7.6.2.1.7.
Reservation	Optional	See 7.6.2.1.9.
VirtualQuantityUnits	Mandatory	See 7.6.2.1.8.
Limit	Optional	See 7.6.2.1.10.
Weight	Optional	See 7.6.2.1.11.
Address	Optional	See 7.6.2.1.13.
Parent	Optional	See 7.6.2.1.12.
Connection[ ]	Optional	See 7.6.2.1.15.
MappingBehavior	Optional	See 7.6.2.1.16.

Elements	Requirement	Notes
AutomaticAllocation	Optional	See DSP1041.
AutomaticDeallocation	Optional	See DSP1041.
DesiredVLANEndpointMode	Optional	See 7.6.2.1.17.
AllowedPriorites	Optional	See 7.6.2.1.18.
AllowedToReceiveMACAddresses	Optional	See 7.6.2.1.20.
AllowedToReceiveVLANs	Optional	See 7.6.2.1.20.
AllowedToTransmitMACAddresses	Optional	See 7.6.2.1.22.
AllowedToTransmitVLANs	Optional	See 7.6.2.1.22.
DefaultPortVID	Optional	See 7.6.2.1.23.
DefaultPriority	Optional	See 7.6.2.1.24.
GroupID	Optional	See 7.6.2.1.25.
ManagerID	Optional	See 7.6.2.1.25.
NetworkPortProfileID	Optional	See 7.6.2.1.27.
NetworkPortProfileIDType	Conditional	See 7.6.2.1.28.
PortCorrelationID	Optional	See 7.6.2.1.29.
PortVID	Optional	See 7.6.2.1.30.
Promiscuous	Optional	See 7.6.2.1.19.
ReceiveBandwidthLimit	Optional	See 7.6.2.1.32.
ReceiveBandwidthReservation	Optional	See 7.6.2.1.31.
SourceMacFilteringEnabled	Conditional	See 7.6.2.1.21.

10.24 CIM_RegisteredProfile

Table 27 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM schema and in DSP1033 (*Profile Registration Profile*).

Table 27 – Class: CIM_RegisteredProfile

Elements	Requirement	Notes
RegisteredOrganization	Mandatory	Value shall be 2 (DMTF).
RegisteredName	Mandatory	Value shall be "Ethernet Port Resource Virtualization".
RegisteredVersion	Mandatory	Value shall be "1.1.0".

10.25 CIM_ResourcePool (Ethernet adapter)

Instances of the CIM_ResourcePool class shall represent Ethernet adapter resource pools.

Table 28 lists the requirements for elements of this class. These requirements are in addition to those specified in the CIM Schema and in DSP1041.

1796 **Table 28 – Class: CIM_ResourcePool (Ethernet adapter)**

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
PoolID	Mandatory	See DSP1041.
Primordial	Mandatory	See DSP1041.
Capacity	Conditional	See 7.5.5.
Reserved	Optional	See 7.5.4.
ResourceType	Mandatory	Value shall be 10 (Ethernet Adapter).
ResourceSubType	Optional	See 7.6.2.1.2.
OtherResourceType	Mandatory	Value shall be NULL.
AllocationUnits	Mandatory	See 7.5.3.
MaxConsumableResource	Optional	See 7.5.6.
CurrentlyConsumedResource	Conditional	See 7.5.8.
ConsumedResourceUnits	Conditional	See 7.5.7.

1797 ## 10.26 CIM_ResourcePool (Ethernet connection)

1798 Instances of the CIM_ResourcePool class shall represent Ethernet connection resource pools.

1799 Table 29 lists the requirements for elements of this class. These requirements are in addition to those
1800 specified in the CIM Schema and in DSP1041.

1801 **Table 29 – Class: CIM_ResourcePool**

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
PoolID	Mandatory	See DSP1041.
Primordial	Mandatory	See DSP1041.
Capacity	Conditional	See 7.5.5.
Reserved	Optional	See 7.5.4.
ResourceType	Mandatory	Value shall be 33 (Ethernet Connection).
OtherResourceType	Mandatory	Value shall be NULL.
AllocationUnits	Mandatory	See 7.5.3.
MaxConsumableResource	Optional	See 7.5.6.
CurrentlyConsumedResource	Conditional	See 7.5.8.
ConsumedResourceUnits	Conditional	See 7.5.7.

1802 ## 10.27 CIM_ResourcePool (Ethernet switch port)

1803 Instances of the CIM_ResourcePool class shall represent Ethernet switch port resource pools.

1804 Table 30 lists the requirements for elements of this class. These requirements are in addition to those
1805 specified in the CIM Schema and in DSP1041.

1806 **Table 30 – Class: CIM_ResourcePool (Ethernet switch port)**

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ElementName	Optional	None
PoolID	Mandatory	See DSP1041
Primordial	Mandatory	See 7.5.2.
Capacity	Conditional	See 7.5.5.
Reserved	Optional	See 7.5.4.
ResourceType	Mandatory	Value shall be 30 (Ethernet Switch Port).
OtherResourceType	Mandatory	Value shall be NULL.
AllocationUnits	Mandatory	See 7.5.3
MaxConsumableResource	Optional	See 7.5.6.
CurrentlyConsumedResource	Conditional	See 7.5.8.
ConsumedResourceUnits	Conditional	See 7.5.7.

1807 ## 10.28 CIM_SettingsDefineState

1808 An instance of the CIM_SettingsDefineState association shall associate an instance of the
1809 CIM_EthernetPort class that represents a virtual Ethernet adapter or Ethernet switch port and the
1810 instance of the CIM_EthernetPortAllocationSettingData class that represents the resource allocation that
1811 yields the virtual CIM_EthernetPort instance.

1812 Table 31 lists the requirements for elements of this association. These requirements are in addition to
1813 those specified in the CIM Schema and in DSP1041.

1814 **Table 31 – Association: CIM_SettingsDefineState**

Elements	Requirement	Notes
ManagedElement	Mandatory	**Key:** Value shall reference an instance of the CIM_EthernetPort class. **Cardinality:** 0..1
SettingData	Mandatory	**Key:** Value shall reference the instance of the CIM_EthernetPortAllocationSettingData class. **Cardinality:** 0..1

1815 ## 10.29 CIM_SystemDevice (virtual EthernetPort)

1816 Table 32 lists the requirements for elements of this association.

1817 **Table 32 – Association: CIM_SystemDevice (Virtual EthernetPort)**

Elements	Requirement	Notes
GroupComponent	Mandatory	**Key:** Value shall reference an instance of the CIM_System class. **Cardinality:** 1
PartComponent	Mandatory	**Key:** Value shall reference the instance of the CIM_EthernetPort class. **Cardinality:** *

1818 10.30 CIM_SystemDevice (host EthernetPort)

1819 Support of the CIM_SystemDevice association for the representation of a host Ethernet adapteror host
1820 Ethernet switch is optional;

1821 NOTE Support is mandatory if DSP1014 (*EthernetPort Profile*) is implemented for the host system.

1822 If the CIM_SystemDevice association is supported for the representation of a host Ethernet adapter or a
1823 host Ethernet switch port, an instance of the CIM_SystemDevice association shall associate the instance
1824 of the CIM_System class that represents the scoping host system and each instance of the
1825 CIM_EthernetPort class that represents the host Ethernet adapter or switch port in the scope of the
1826 scoping host system.

1827 Table 33 lists the requirements for elements of this association. These requirements are in addition to
1828 those specified in the CIM Schema, in the DSP1041, and in DSP1033 if that is implemented.

1829 **Table 33 – Association: CIM_SystemDevice (host Ethernet adapter)**

Elements	Requirement	Notes
GroupComponent	Mandatory	**Key:** Value shall reference an instance of the CIM_System class. **Cardinality:** 1
PartComponent	Mandatory	**Key:** Value shall reference the instance of the CIM_EthernetPort class. **Cardinality:** *

1830 10.31 CIM_VLANEndpointSettingData

1831 The CIM_VLANEndPointSettingData class is optional and represents the configuration data for
1832 CIM_VLANEndpoint instances.

ANNEX A
(informative)

Change log

Version	Date	Description
1.0.0	2010-07-30	
1.1.0	2012-06-21	Released as DMTF Standard