Document Number: DSP1046

Date: 2014-04-03

Version: 1.0.0a

Network Management Profile

Information for Work-in-Progress version:

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It expires on: 2014-10-17

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Document Type: Specification

Document Status: Work in Progress

Document Language: en-US

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Foreword

The *Network Management Profile* (DSP1046) was prepared by the Network Services Management Working Group of the DMTF.

DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems management and interoperability.

Acknowledgments

The DMTF acknowledges the following individuals for their contributions to this document:

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- Hemal Shah – Broadcom Corporation
- Alex Zhdankin – Cisco Systems

Contributors:

- Steve Neely – Cisco Systems
- Shishir Pardikar – Citrix
- Romit Chattopadhyay – Microsoft Corporation
- John Parchem – DMTF Fellow
- John Parchem – Microsoft Corporation
- Lawrence Lamers – VMware
- Bhumip Khasnabish – ZTE

Introduction

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

Document conventions

Typographical conventions

The following typographical conventions are used in this document:

- Document titles are marked in *italics*.
- ABNF rules are in `monospaced font`.

196 # Network Management Profile

197 ## 1 Scope

198 The *Network Management Profile* is a base profile that specifies the CIM schema and use cases
199 associated with the common aspects of the Network and Network Services management. This profile
200 includes a specification of the Network Management Service, Network, Network Ports, Protocol Endpoints
201 and other classes necessary for representing the basic connectivity and administrative aspects of the
202 Network.

203 ## 2 Normative references

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

208 DMTF DSP0004, *CIM Infrastructure Specification 2.6*,
209 http://www.dmtf.org/standards/published_documents/DSP0004_2.6.pdf

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

212 DMTF DSP0223, *Generic Operations 1.0*,
213 http://www.dmtf.org/standards/published_documents/DSP0223_1.0.pdf

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

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

218 DMTF DSP1116, *IP Configuration Profile 1.0,*
219 http://www.dmtf.org/standards/published_documents/DSP1116_1.0.pdf

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

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

224 ## 3 Terms and definitions

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

227 The terms "shall" ("required"), "shall not", "should" ("recommended"), "should not" ("not recommended"),
228 "may," "need not" ("not required"), "can" and "cannot" in this document are to be interpreted as described
229 in ISO/IEC Directives, Part 2, Annex H. The terms in parenthesis are alternatives for the preceding term,
230 for use in exceptional cases when the preceding term cannot be used for linguistic reasons. Note that
231 ISO/IEC Directives, Part 2, Annex H specifies additional alternatives. Occurrences of such additional
232 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, DSP0223, and DSP1001 apply to this document. The following additional terms are used in this document.

3.1
conditional
indicates requirements to be followed strictly to conform to the document when the specified conditions are met

3.2
mandatory
indicates requirements to be followed strictly to conform to the document and from which no deviation is permitted

3.3
optional
indicates a course of action permissible within the limits of the document

3.4
pending configuration
indicates the configuration that will be applied to an IP network connection the next time the IP network connection accepts a configuration

3.5
referencing profile
indicates a profile that owns the definition of this class and can include a reference to this profile in its “Referenced Profiles” table

3.6
unspecified
indicates that this profile does not define any constraints for the referenced CIM element or operation

3.7
Network

TBD

3.8
VLAN Network

TBD

3.9
Contained Network

TBD

3.10
Dependent Network

TBD

3.11
Peer Network

TBD

3.12
Network Port

TBD

3.13
Network Port Group

TBD

4 Symbols and abbreviated terms

The abbreviations defined in DSP0004, DSP0223, and DSP1001 apply to this document. The following additional abbreviations are used in this document.

4.1
IP

Internet Protocol

4.2
VLAN

Virtual Local Area Network

5 Synopsis

Profile name: Network Management Profile

Version: 1.0.0

Organization: DMTF

CIM Schema version: 2.38

Central class: CIM_NetworkManagementService

Scoping class: CIM_System (HostingSystem)

The *Network Management Profile* is a base profile that specifies the CIM schema and use cases associated with the common aspects of the Network and Network Services management. This profile includes a specification of the Network Management Service, Network, Network Ports, Protocol Endpoints and other classes necessary for representing the basic connectivity and administrative aspects of the Network Services.

Table 1 identifies profiles on which this profile has a dependency.

Table 1 – Referenced profiles

Profile Name	Organization	Version	Requirement	Description
Profile Registration	DMTF	1.0	Mandatory	None
Ethernet Port	DMTF	1.0	Optional	None

6 Description

The *Network Management Profile* describes the common aspects of the Network management. This profile includes a specification of the Network Management Service, Network, Network Ports, Protocol Endpoints and other classes necessary for representing the basic connectivity and administrative aspects of the Network.

This profile enables many aspects of network management including but not limited to:

- Network topology discovery
- Network capabilities discovery
- Network monitoring and statistics collection
- Network configuration and control
- Network view (a snapshot of network)
- Network resources (ports, protocol endpoints, port groups, etc.) inventory
- Network resources configuration and control

The information in this specification should be sufficient for a provider or consumer of this data to identify unambiguously the classes, properties, methods, and values that must be instantiated and manipulated to represent and manage the networks and network resources modeled using the DMTF CIM core and extended model definitions.

6.1 Class diagram

Figure 1 represents the class schema for the *Network Management Profile*. For simplicity, the CIM_ prefix has been removed from the names of the classes.

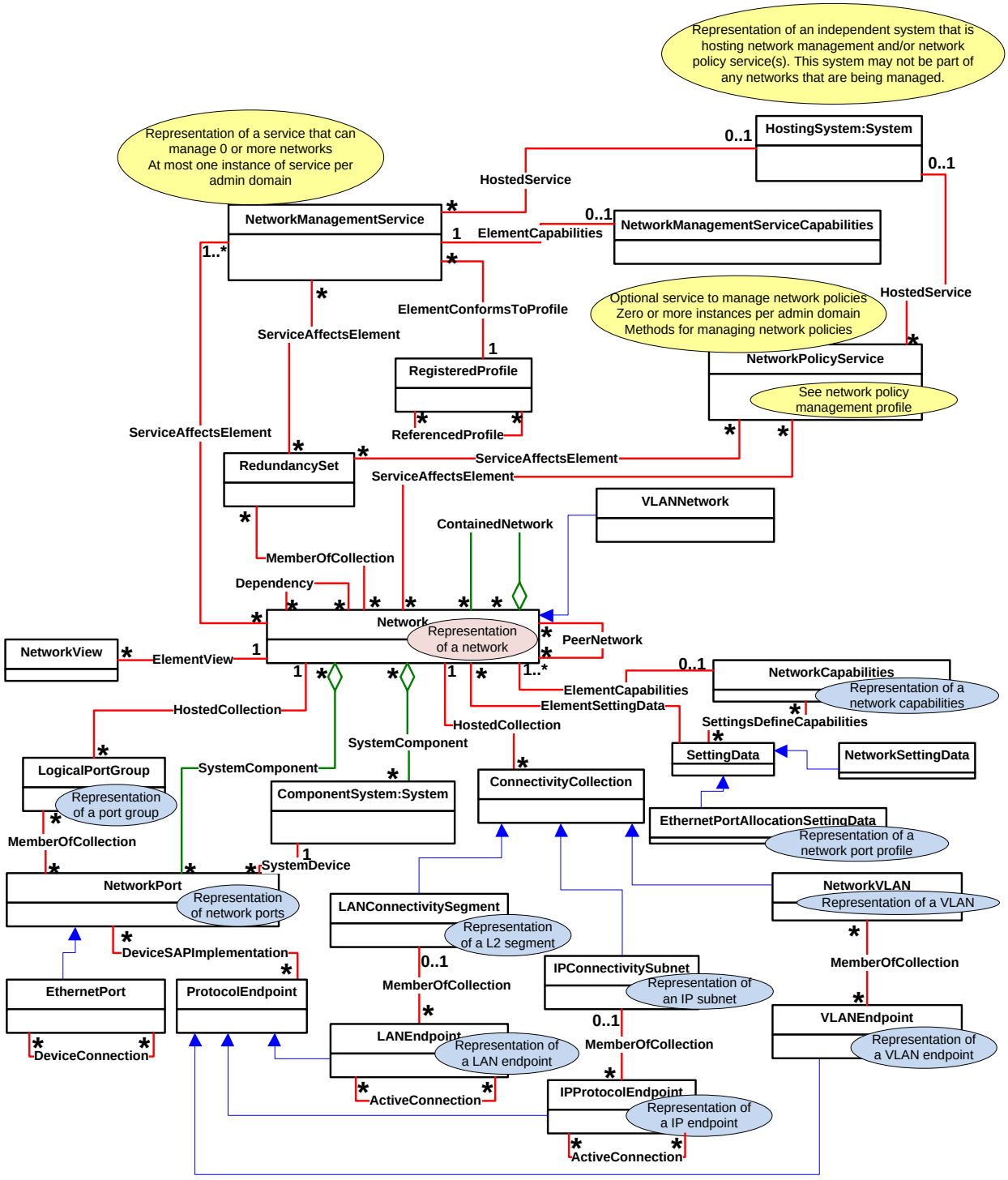


Figure 1 – Network Management Profile: Class diagram

NetworkManagementService is the central class. NetworkManagementService represents the service that is managing networks represented by *Network*. *NetworkManagementService* class supports extrinsic methods for creation, deletion, and modification of networks and network resources. *HostingSystem*

represents the system hosting the network management service. This relationship between *HostingSystem* and *NetworkManagementService* is represented by *HostedService*. The capabilities of the network management service are described by *NetworkManagementSerrviceCapabilities*. *NetworkManagementServiceCapabilities* is derived from the *EnabledLogicalElementCapabilities* class. *NetworkManagementServiceCapabilties* is associated with *NetworkManagementService* through *ElementCapabilities*. *ServiceAffectsElement* is used to represent the relationship between the *NetworkManagementService* and the resources managed by *NetworkManagementService*.

The *Network* class represents a logical, virtual, or physical network. *Network* supports a representation of a network. A network can be an independent network or a network contained within another network, or a network that is related to other networks. The relationship of a network contained within a network is represented by *ContainedNetwork*. The relationship between peer networks is represented by *PeerNetwork*. A VLAN network is represented by *VLANNetwork* that is derived from *Network*. *RedundancySet* is used to model failover and load balancing of networks.

Note: Add a new class ContainedNetwork. Add a new association class PeerNetwork.

A view of a network is represented by *NetworkView*. *NetworkView* is derived from the *View* class. *NetworkView* is associated with *Network* through *ElementView*.

The capabilities of a network are described by one or more instances of *NetworkCapabilities*. *NetworkCapabilities* is derived from the *EnabledLogicalElementCapabilities* class. *NetworkCapabilties* is associated with *Network* through *ElementCapabilities*.

The configuration of a network is described by one or more instances of the *SettingData*. *EthernetPortAllocationSettingData* represents a network port profile. Network port profiles provisioned on a network are represented by one or more instances of *EthernetPortAllocationSettingData*. *EthernetPortAllocationSettingData* is derived from the *SettingData*. *SettingData* is associated with Network through *ElementSettingData*.

The following network resources are represented.

1. *NetworkPort* represents a port of a network. *NetworkPort* is associated with *Network* through *SystemComponent*. *EthernetPort* is a derived class of *NetworkPort* that represents an Ethernet port. Connection between two *EthernetPort* is represented by *DeviceConnection*.

2. *ComponentSystem* represents a system within a network. *ComponentSystem* is associated with *Network* through *SystemComponent*. The relationship between *NetworkPort* and *ComponentSystem* is represented by *SystemDevice*.

3. *LogicalPortGroup* represents a port group within a network. *LogicalPortGroup* is associated with *Network* through *HostedCollection*.

4. *LANConnectivitySegment* represents a layer 2 segment or subnet within a network. *LANConnectivitySegment* is associated with *Network* through *HostedCollection*.

5. *IPConnectivitySubnet* represents a layer 2 segment or subnet within a network. *IPConnectivitySubnet* is associated with *Network* through *HostedCollection*.

6. *NetworkVLAN* represents a VLAN. *NetworkVLAN* is associated with *Network* through *HostedCollection*.

7. *ProtocolEndpoint* represents a protocol endpoint. *LANEndpoint* represents layer 2 protocol endpoint. *LANEndpoint* is derived from *ProtocolEndpoint*. The relationship of *LANEndpoint* with a specific *LANConnectivitySegment* is modeled by *MemberOfCollection. IPProtocolEndpoint* represents IP layer endpoint. *IPProtocolEndpoint* is also derived from *ProtocolEndpoint*. The relationship of *IPProtocolEndpoint* with a specific *IPConnectivitySubnet* is modeled by *MemberOfCollection. VLANEndpoint* represents layer 2 VLAN endpoint. *VLANEndpoint* is derived from *ProtocolEndpoint*. The relationship of *VLANEndpoint* with a specific *NetworkVLAN* is modeled by *MemberOfCollection. DeviceSAPImplementation* models the relationship between

NetworkPort and *ProtocolEndpoint*. Connectivity between LAN endpoints is modeled by *ActiveConnection*. Similarly, connectivity between IP protocol endpoints is modeled by *ActiveConnection*.

NetworkPolicyService represents the service that is managing network policies. *HostingSystem* represents the system hosting the network policy service. This relationship between *HostingSystem* and *NetworkPolicyService* is represented by *HostedService*. *ServiceAffectsElement* is used to represent the relationship between the *NetworkPolicyService* and the resources affected by *NetworkPolicyService*.

Support for the Network Management Profile is advertised by RegisteredProfile.

7 Implementation Requirements

This clause details the requirements related to the instantiations of instances and properties of instances for implementations of this profile.

7.1 Representing the Network Management Service

An instance of CIM_NetworkManagementService represents a network management service.

At least one instance of CIM_NetworkManagementService shall exist.

Each instance of the CIM_NetworkManagementService shall be associated to the scoping instance of CIM_System (HostingSystem) with CIM_HostedService association.

7.2 Representing the Network Management Service Capabilities

An instance of CIM_NetworkManagementServiceCapabilties represents network management service capabilities.

One or more instances of CIM_NetworkManagementServiceCapabilities may exist.

Each instance of the CIM_NetworkManagementServiceCapabilities shall be associated to exactly one instance of CIM_NetworkManagementService with CIM_ElementCapabilities association.

7.3 Representing the Network

7.3.1 CIM_Network

An instance of CIM_Network represents a network.

Zero or more instances of CIM_Network shall exist.

Each instance of the CIM_Network shall be associated to at least one instance of CIM_NetworkManagementService with one instance of CIM_ServiceAffectsElement association.

7.3.1.1 CIM_VLANNetwork

VLAN networks represent a specialization of networks modeled in general.

An instance of CIM_VLANNetwork shall represent a VLAN network of VLAN endpoints.

7.3.2 Networks contained within a network

If a network represented by an instance of CIM_Network is contained within a network represented by another instance of CIM_Network, then the instance of CIM_Network shall be associated to the other instance of CIM_Network with an instance of CIM_ContainedNetwork.

Example: A VLAN network within a L2 network.

Note: Show how an MPLS network can be modeled using the existing diagram.

Opens:

Should we have a derived class to represent tunneled networks (MPLS, IPsec, NVGRE, VXLAN, NGE, IP-in-IP, GRE, v4inv6, v6inv4…)?

Option 1: Add more types to Network. Easy and preserves the model.

Option 2: Create a new class TunneledNetwork that is derived from Network.

If we model a tunnel network separately, should we also model tunnel network capabilities separately?

Editor Note: Discussion on 12/19/2013 ended here with a follow on action item to define management aspects of overlay networks.

7.3.3 Network dependency

Networks can be dependent on each other. For example, an overlay L2 network that is dependent on several underlying L3 networks.

CIM_Dependency shall be used to show dependency between networks.

The dependency of one network represented by an instance of CIM_Network on another network represented by another instance of CIM_Network shall be represented by an instance of CIM_Dependency that associates these two instances of CIM_Network.

Example: An overlay L2 network that is dependent on several underlying L3 networks. Move it to use case section with an instance diagram.

7.3.4 Peer Networks

There are real life scenarios where two networks exhibit a peer relationship. For example, a network administrator trying to deploy a VM on a network finds out that the network does not have additional resources. In this case, the network administrator finds a peer network with available network resources and deploys the VM on the peer network.

CIM_PeerNetwork shall be used to show peer relationships between networks.

The peer relationship of a network represented by an instance of CIM_Network, that is a peer (neither contained nor dependent) to a network represented by another instance of CIM_Network, may be represented by an instance of CIM_PeerNetwork that associates these two instances of CIM_Network.

Peer networks mentioned in this section are described from the modeling relationship standpoint only. The modeling of peering points is out of the scope of this specification.

Example: A network administrator trying to deploy a VM on a network finds out that the network does not have additional resources. In this case, the network administrator finds a peer network with available network resources and deploys the VM on the peer network.

Example: A data center administrator is supporting multiple tenants each with its own set of resources including networks. Each tenant within its domain can administer movement of VMs and network resources. When a tenant network runs out of network resources, the data center administrator finds peer

453 networks with available network resources and reallocates network resources to the given tenant
454 network.

455 7.4 Representation of network ports

456 7.4.1 CIM_NetworkPort

457 An instance of CIM_NetworkPort shall represent a network port.

458 Zero or more instances of CIM_NetworkPort may exist.

459 An instance of CIM_NetworkPort shall be associated to at least one instance of CIM_Network with an
460 instance of CIM_SystemComponent.

461

462 7.4.2 CIM_LogicalPortGroup

463 An instance of CIM_LogicalPortGroup shall represent a network port group.

464 Zero or more instances of CIM_LogicalPortGroup may exist.

465 An instance of CIM_LogicalPortGroup shall be associated with one instance of CIM_Network through an
466 instance of CIM_ HostedCollection.

467 7.5 Representation of collections of protocol endpoints

468 7.5.1 CIM_LANConnectivitySegment

469 An instance of CIM_LANConnectivitySegment shall represent a collection of network layer 2 protocol
470 endpoints (see 7.6.1) that are connected within a network (see 7.3.1).

471 Zero or more instances of CIM_LANConnectivitySegment may exist.

472 Zero or more instances of CIM_LANEndpoint may be associated with an instance of
473 CIM_LANConnectivitySegment.

474 An instance of CIM_LANConnectivitySegment shall be associated to one instance of CIM_Network with
475 an instance of CIM_HostedCollection.

476 7.5.2 CIM_IPConnectivitySubnet

477 An instance of CIM_IPConnectivitySubnet shall represent a collection of network layer 3 protocol
478 endpoints (see 7.6.2) that are connected within a network (see 7.3.1).

479 Zero or more instances of CIM_IPConnectivitySubnet may exist.

480 Zero or more instances of CIM_IPProtocolEndpoint may be associated with an instance of
481 CIM_IPConnectivitySubnet.

482 An instance of CIM_IPConnectivitySubnet shall be associated to one instance of CIM_Network with an
483 instance of CIM_HostedCollection.

484 7.5.3 CIM_NetworkVLAN

485 An instance of CIM_NetworkVLAN shall represent a collection of VLAN endpoints (see 7.6.3) for a
486 specific VLAN within a network (see 7.3.1).

487 Zero or more instances of CIM_NetworkVLAN may exist.

Zero or more instances of CIM_VLANEndpoint may be associated with an instance of CIM_NetworkVLAN.

For each instance of CIM_NetworkVLAN, all instances of CIM_VLANEndpoint associated with the instance CIM_NetworkVLAN shall have the same value for the CIM_VLANEndpoint.VLANId and this value shall be same as the value of CIM_NetworkVLAN.VLANId.

An instance of CIM_NetworkVLAN shall be associated to one instance of CIM_VLANNetwork with an instance of CIM_HostedCollection.

7.6 Representation of protocol endpoints

7.6.1 CIM_LANEndpoint

An instance of CIM_LANEndpoint shall represent a network layer 2 protocol endpoint within a network (see 7.3.1).

Zero or more instances of CIM_LANEndpoint may exist.

An instance of CIM_LANEndpoint shall either be 1) associated to one instance of CIM_NetworkPort with one instance of CIM_DeviceSAPImplementation, or 2) associated to one instance of CIM_LANConnectivitySegment with one instance of CIM_MemberOfCollection, or 3) both.

7.6.2 CIM_IPProtocolEndpoint

An instance of CIM_IPProtocolEndpoint shall represent a network layer 3 protocol endpoint within a network.

Zero or more instances of CIM_IPProtocolEndpoint may exist.

An instance of CIM_IPProtocolEndpoint shall either be 1) associated to one instance of CIM_NetworkPort with one instance of CIM_DeviceSAPImplementation, or 2) associated to one instance of CIM_IPConnectivitySubnet with one instance of CIM_MemberOfCollection, or 3) both.

7.6.3 CIM_VLANEndpoint

An instance of CIM_VLANEndpoint shall represent a VLAN endpoint within a network.

Zero or more instances of CIM_VLANEndpoint may exist.

An instance of CIM_VLANEndpoint shall either be 1) associated to one instance of CIM_NetworkPort with one instance of CIM_DeviceSAPImplementation, or 2) associated to one instance of CIM_NetworkVLAN with one instance of CIM_MemberOfCollection, or 3) both.

An instance of CIM_VLANEndpoint may be associated to one instance of CIM_LANEndpoint with an instance of CIM_BindsTo. Note: This requirement should be moved to Ethernet Port Profile that needs to be revved.

Note: The relationships between these protocol endpoints are modeled by Ethernet Port Profile and IP Configuration Profile.

7.7 CIM_NetworkView

An instance of CIM_NetworkView represents a view of a network.

Zero or more instances of CIM_NetworkView may exist.

An instance of CIM_NetworkView shall be associated to an instance of CIM_Network with an instance of CIM_ElementView.

7.8 CIM_NetworkSettingData

An instance of CIM_NetworkSettingData represents a configuration of a network or a template network configuration.

An instance of CIM_NetworkSettingData shall be associated to an instance of CIM_Network or an instance of CIM_NetworkManagementServiceCapabilities or an instance of CIM_NetworkCapabilities.

An instance of CIM_NetworkSettingData representing a configuration of an existing network shall be associated to an instance of CIM_Network with an instance of CIM_ElementSettingData.

An instance of CIM_NetworkSettingData representing a template network configuration shall be associated to an instance of CIM_NetworkManagementServiceCapabilities with an instance of CIM_SettingsDefineCapabilities.

An instance of CIM_NetworkSettingData representing a template configuration of an existing network shall be associated to an instance of CIM_NetworkCapabilities with an instance of CIM_SettingsDefineCapabilities.

Fix the class diagram to show an association between CIM_NetworkManagementService and CIM_NetworkSettingData,

Define an extrinsic method on NetworkManagementService to create a network using a template configuration. This method creates an instance of Network as well as instances of CIM_NetworkSettingData that represent runtime configuration of the created network.

7.9 CIM_EthernetPortAllocationSettingData

An instance of CIM_EthernetPortAllocationSettingData represents a network port configuration.

An instance of CIM_EthernetPortAllocationSettingData shall be associated to an instance of CIM_NetworkPort or an instance of CIM_NetworkCapabilities.

An instance of CIM_EthernetPortAllocationSettingData representing a configuration of an existing network port shall be associated to an instance of CIM_NetworkPort with an instance of CIM_ElementSettingData.

An instance of CIM_EthernetPortAllocationSettingData representing a template network port configuration shall be associated to an instance of CIM_NetworkCapabilities with an instance of CIM_SettingsDefineCapabilities.

How do we relate a network port profile represented by DSP8049 using CIM_NetworkCapabilities?

8 Methods

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

8.1 Extrinsic Methods

8.1.1 CIM_NetworkManagementService

Create one or more networks

Create/Delete logical port groups of a network

Create/Delete logical ports of a network

Create/Delete IP subnets of a network

Create/Delete VLANs of a network

Create/Delete L2 segments of a network

Modify a logical port group of a network– add or delete one or more ports

Modify an IP subnet of a network – add or delete one or more IP protocol endpoints

Modify a VLAN of a network – add or delete member VLAN endpoints

Modify a L2 segment of a network – add or delete LAN endpoints

8.1.2 CIM_Network

Enumerate networks contained within a specific network

Create one or more networks within a network

Delete networks contained within a network

8.2 Profile conventions for operations

For each profile class (including associations), the implementation requirements for operations, including those in the following default list, are specified in class-specific subclauses of this clause.

The default list of operations is as follows:

- GetInstance
- EnumerateInstances
- EnumerateInstanceNames
- Associators
- AssociatorNames
- References
- ReferenceNames

8.3 CIM_NetworkManagementService

All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

8.4 CIM_NetworkManagementServiceCapabilties

593 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

594 8.5 CIM_NetworkPolicyService

595 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

596 8.6 CIM_RedundancySet

597 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

598 8.7 CIM_Network

599 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

600 8.8 CIM_VLANNetwork

601 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

602 8.9 CIM_NetworkView

603 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

604 8.10 CIM_NetworkCapabilities

605 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

606 8.11 CIM_NetworkSettingData

607 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

608 8.12 CIM_EthernetPortAllocationSettingData

609 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

610 8.13 CIM_NetworkPort

611 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

612 8.14 CIM_EthernetPort

613 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

614 8.15 CIM_System

615 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

616 8.16 CIM_ConnectivityCollection

617 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

618 8.17 CIM_LANConnectivitySegment

619 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

620 8.18 CIM_LANEndpoint

621 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

622

623 ## 8.19 CIM_IPConnectivitySubnet

624 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

625 ## 8.20 CIM_IPProtocolEndpoint

626 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

627 ## 8.21 CIM_NetworkVLAN

628 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

629 ## 8.22 CIM_VLANEndpoint

630 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

631 ## 8.23 CIM_RegisteredProfile

632 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

633 ## 8.24 CIM_ElementConformsToProfile

634 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

635 ## 8.25 CIM_HostedService

636 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

637 ## 8.26 CIM_ElementCapabilities

638 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

639 ## 8.27 CIM_ServiceAffectsElement

640 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

641 ## 8.28 CIM_ContainedNetwork

642 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

643 ## 8.29 CIM_MemberOfCollection

644 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

645 ## 8.30 CIM_HostedCollection

646 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

647 ## 8.31 CIM_Dependency

648 All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

8.32 CIM_ElementView

All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

8.33 CIM_PeerNetwork

All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

8.34 CIM_ElementSettingData

All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

8.35 CIM_SystemComponent

All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

8.36 CIM_SettingsDefineCapabilities

All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

8.37 CIM_SystemDevice

All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

8.38 CIM_DeviceConnection

All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

8.39 CIM_ActiveConnection

All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

8.40 CIM_DeviceSAPImplementation

All operations in the default list in 8.2 shall be implemented as defined in DSP0200.

9 Use cases

This clause contains object diagrams and use cases for the *Network Management Profile*.

9.1 Miscellaneous object diagrams

The object diagram in Figure 2 shows one possible method for advertising profile conformance.

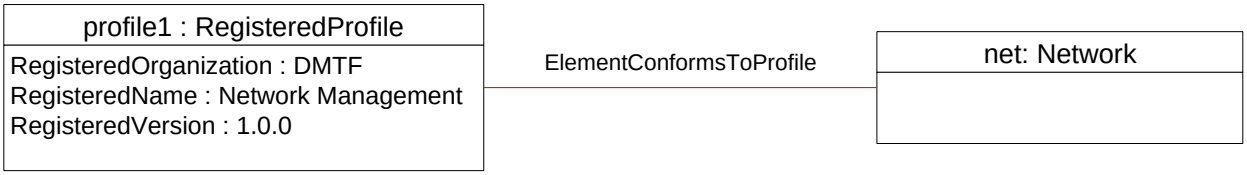


Figure 2 – Registered profile

9.2 Representing VLAN networks within an L2 network

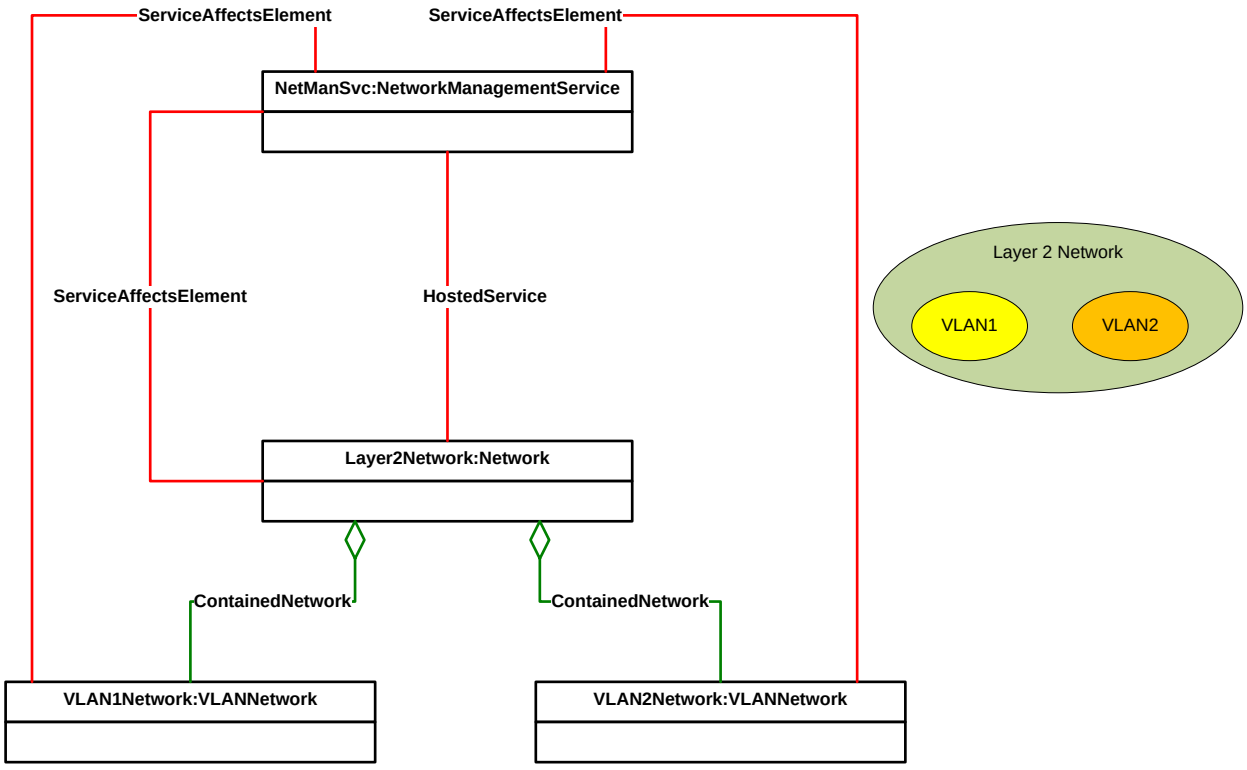
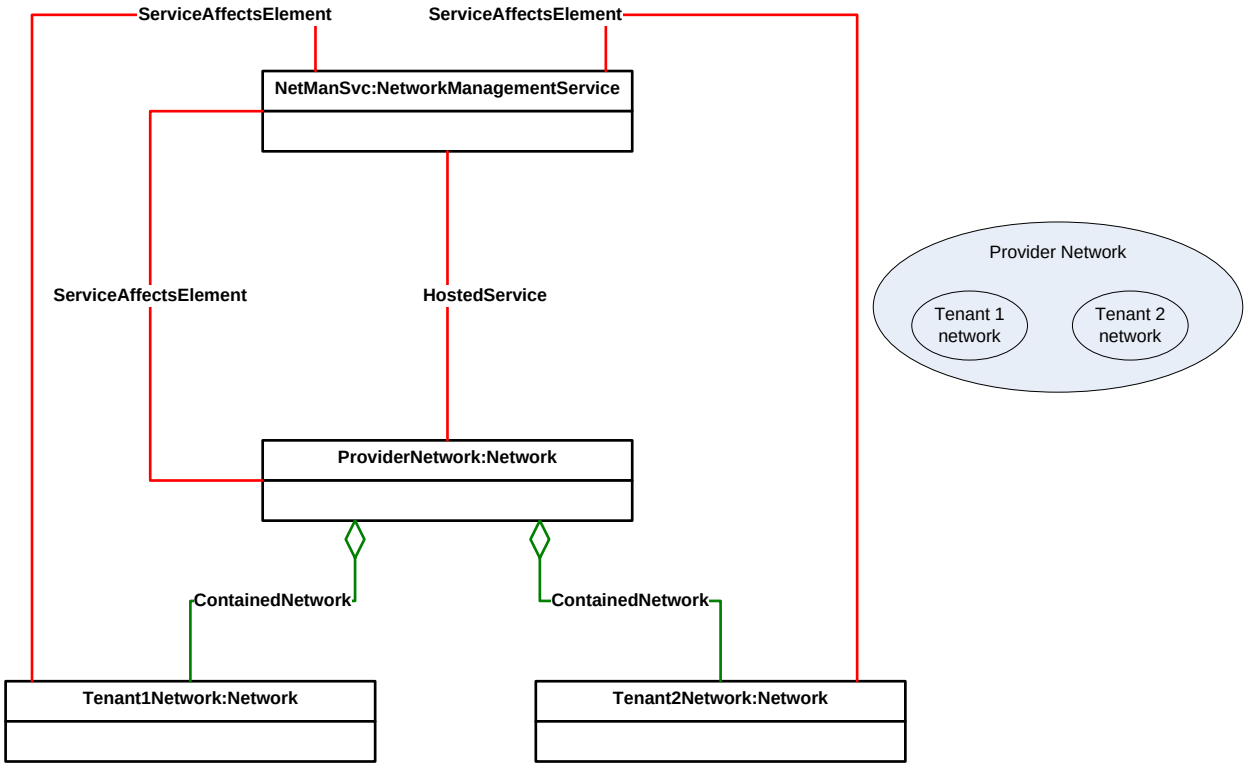


Figure 3 – Two VLAN networks within a Layer 2 network

677 In this example, two networks with their individual VLAN domains are instantiated inside a layer 2
678 network. The instance of layer 2 network *Layer2Network* is the parent of the instances *VLAN1Network*
679 and *VLAN2Network*. *NetManSvc* represents the service that is hosted on the layer 2 network. *NetManSvc*
680 manages all three networks as represented by *ServiceAffectsElement*.

681 9.3 Representing two tenant networks within a provider network



682

683 **Figure 4 – Two tenants networks within a provider network**

9.4 Representing Ethernet ports of tenant networks

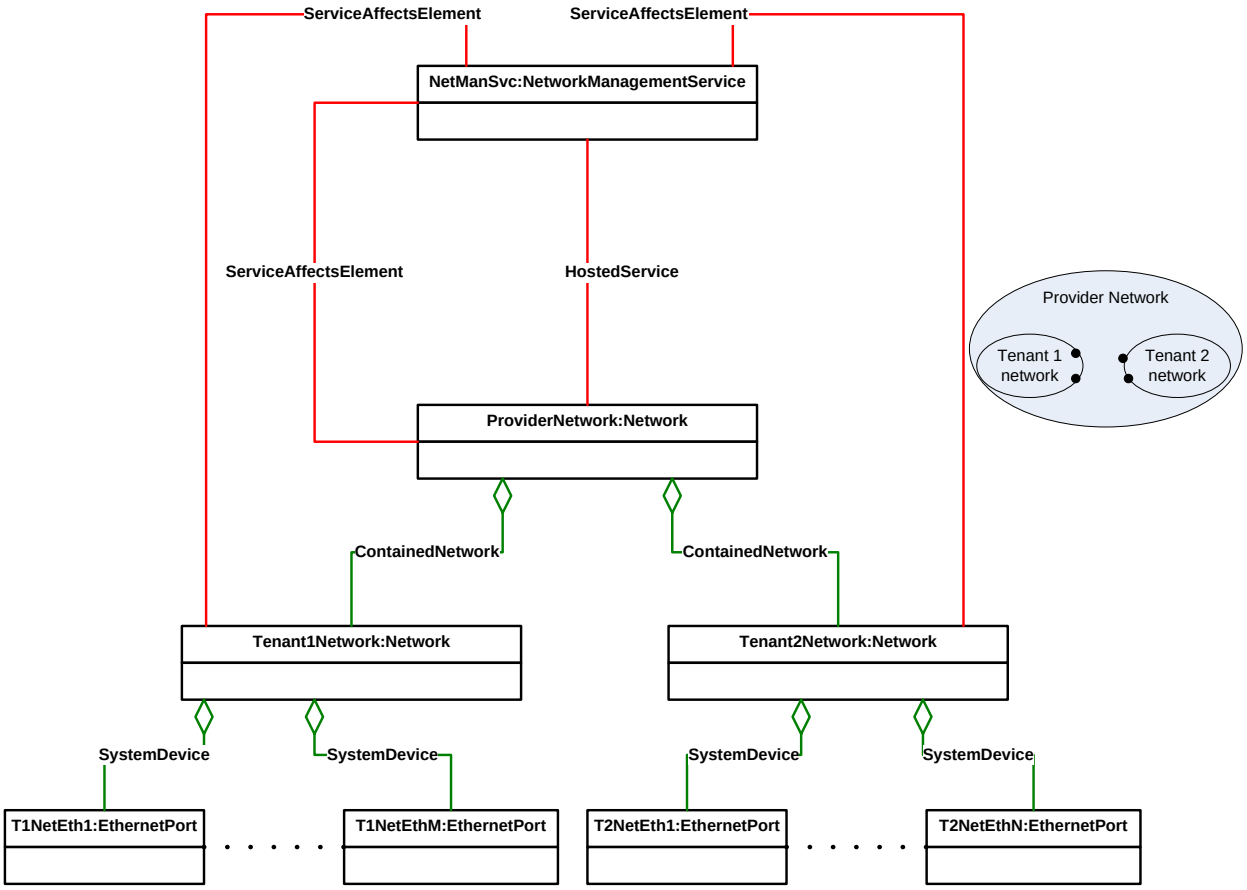
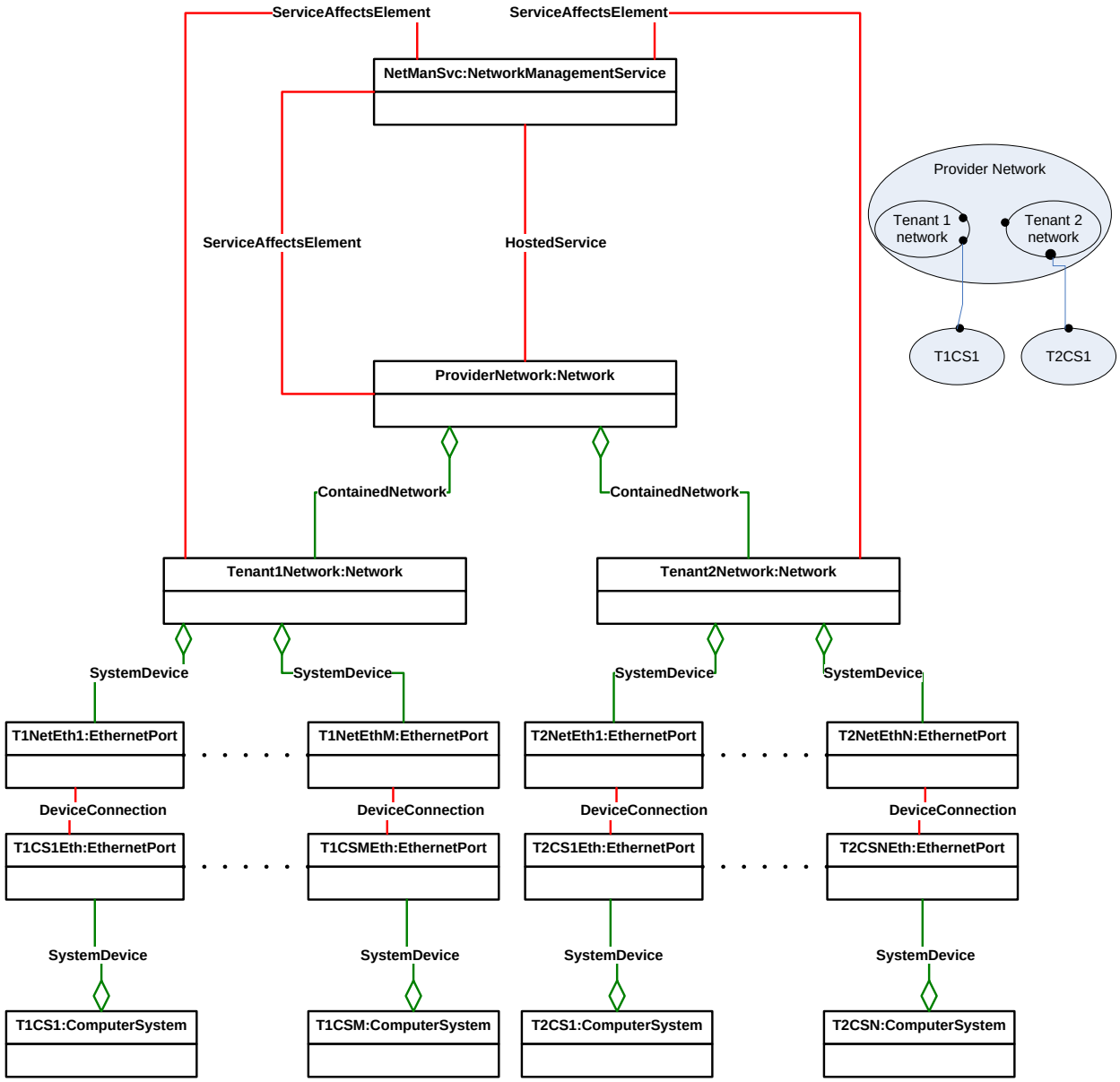


Figure 5 – Representing ethernet ports of two tenants networks within a provider network

687 9.5 Representing Systems Connected to Ethernet ports of tenant networks



688

689 **Figure 6 – Representing systems connected to ethernet ports of two tenants networks within a**
690 **provider network**

9.6 Representing a tunneled network connecting two ethernet networks

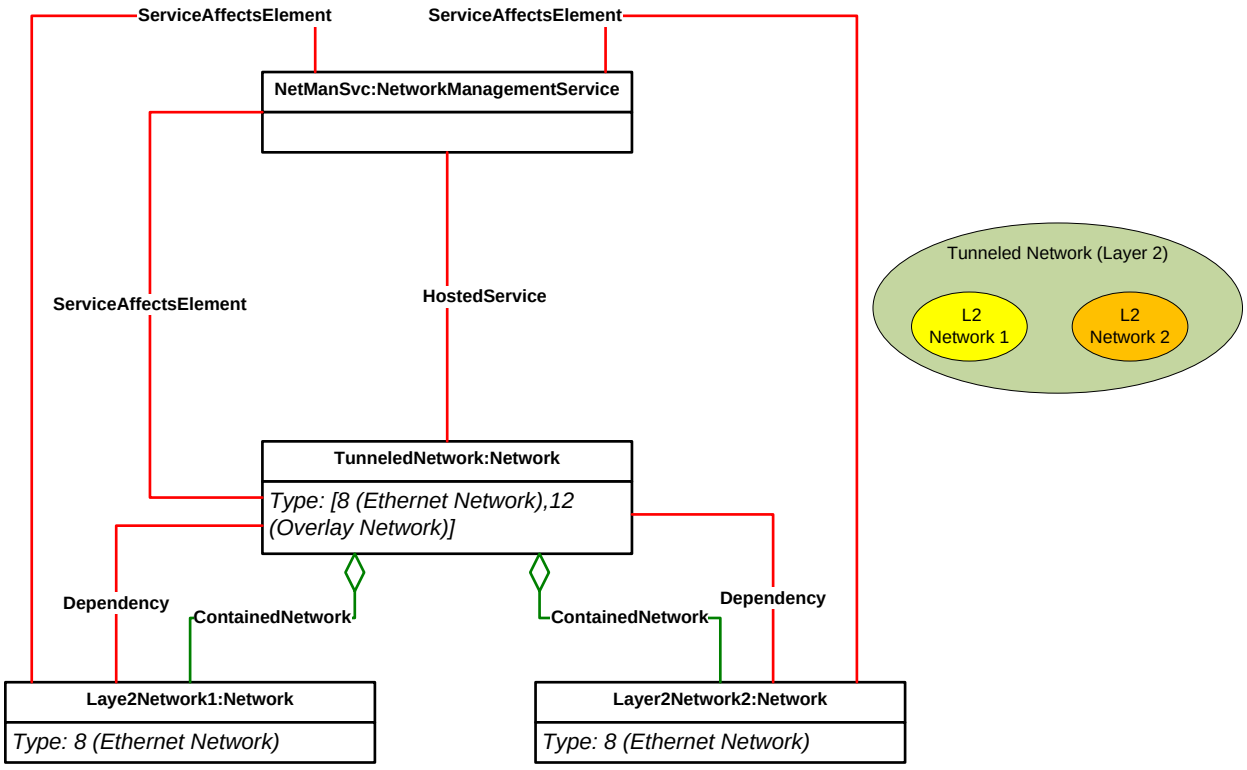


Figure 7 – Representing a tunneled network bridging two ethernet networks

9.7 Enumerate networks

A client can list all the networks by enumerating all instances of CIM_Network.

9.8 Enumerate contained networks within a specific network

A client can list all the networks contained within a network as follows:

1) Find all instances of CIM_Network that are associated with the given instance of CIM_Network through an instance of CIM_ContainedNetwork.

9.9 Create a Network

9.10 Create one or more Networks

A client can create one or more networks contained within a network as follows:

1) Extrinsic method on CIM_NetworkManagementService.

9.11 Create one or more Networks within a Network

A client can create one or more networks contained within a network as follows:

1) Extrinsic method on CIM_Network.

9.12 Delete a network

A client can delete an instance of CIM_Network.

9.13 Discover logical ports of a network

A client can discover all the ports within a network as follows:

1) Enumerate all instances of CIM_NetworkPort that are associated with the given instance of CIM_Network through an instance of CIM_SystemComponent.

9.14 Discover logical port groups of a network

A client can discover all the logical port groups within a network as follows:

1) Enumerate all instances of CIM_LogicalPortGroup that are associated with the given instance of CIM_Network through an instance of CIM_HostedCollection.

9.15 Discover IP subnets of a network

A client can discover all the logical port groups within a network as follows:

1) Enumerate all instances of CIM_IPConnectivitySubnet that are associated with the given instance of CIM_Network through an instance of CIM_HostedCollection.

9.16 Discover VLANs of a network

A client can discover all the VLANs within a network as follows:

1) Enumerate all instances of CIM_NetworkVLAN that are associated with the given instance of CIM_Network through an instance of CIM_HostedCollection.

2) For each instance of CIM_NetworkVLAN in 1, Enumerate all instances of CIM_VLANEndpoint that are associated with the given instance of CIM_NetworkVLAN through an instance of CIM_MemberOfCollection.

9.17 Discover L2 segments of a network

A client can discover all the logical port groups within a network as follows:

1) Enumerate all instances of CIM_LANConnectivitySegment that are associated with the given instance of CIM_Network through an instance of CIM_HostedCollection.

9.18 Discover systems within a network

A client can discover all the logical port groups within a network as follows:

1) Enumerate all instances of CIM_System that are associated with the given instance of CIM_Network through an instance of CIM_SystemComponent.

9.19 Create/Delete logical port groups of a network (extrinsic method of network management service)

9.20 Create/Delete logical ports of a network (extrinsic method of network management service)

9.21 Create/Delete IP subnets of a network (extrinsic method of network management service)

9.22 Create/Delete VLANs of a network (extrinsic method of network management service)

9.23 Create/Delete L2 segments of a network (extrinsic method of network management service)

9.24 Modify a logical port group of a network (extrinsic method of network management service) – add or delete one or more ports

9.25 Modify an IP subnet of a network (extrinsic method of network management service) – add or delete one or more IP protocol endpoints

9.26 Modify a VLAN of a network (extrinsic method of network management service) – add or delete member VLAN endpoints

9.27 Modify a L2 segment of a network (extrinsic method of network management service) – add or delete LAN endpoints

9.28 Create a network connection for a system (extrinsic method of network – creates network port and associations between the network/network port and the system)

9.29 Enumerate networks that a system is directly connected to (intrinsic method)

A client can discover all the logical port groups within a network as follows:

1) Enumerate all instances of CIM_Network that are associated with the given instance of CIM_System through an instance of CIM_SystemComponent.

10 CIM Elements

Table 2 shows the instances of CIM Elements for this profile. Instances of the CIM Elements shall be implemented as described in Table 2. Clauses 7 (“Implementation”) and 0 (“Methods”) may impose additional requirements on these elements.

771 **Table 2 – CIM Elements: Network Services Management Profile**

Element Name	Requirement	Description
Classes		
CIM_NetworkManagementService	Optional	See clause 7.1
CIM_NetworkManagementServiceCapabilities	Optional	See clause 7.2
CIM_NetworkPolicyService	Optional	
CIM_Network	Mandatory	See clause 7.2
CIM_NetworkView	Optional	See clause 7.7
CIM_NetworkCapabilities	Optional	See clause
CIM_NetworkSettingData	Optional	See clause 7.8
CIM_EthernetPortAllocationSettingData	Optional	See clause 7.9
CIM_RedundancySet	Optional	See clause
CIM_LogicalPortGroup	Optional	See clause 7.4.2
CIM_NetworkPort	Optional	See clause 7.4
CIM_EthernetPort	Optional	See clause
CIM_System	Optional	See clause
CIM_ConnectivityCollection	Optional	See clause
CIM_LANConnectivitySegment	Optional	See clause 7.5.1
CIM_LANEndpoint	Optional	See clause 7.6.1
CIM_IPConnectivitySubnet	Optional	See clause 7.5.2
CIM_IPProtocolEndpoint	Optional	See clause 7.6.2
CIM_NetworkVLAN	Optional	See clause 7.5.3
CIM_VLANEndpoint	Optional	See clause 7.6.3
CIM_RegisteredProfile	Mandatory	
Associations		
CIM_ElementConformsToProfile	Mandatory	
CIM_HostedService	Optional	
CIM_ElementCapabilities	Optional	
CIM_ServiceAffectsElement	Optional	
CIM_ContainedNetwork	Optional	
CIM_MemberOfCollection	Optional	
CIM_HostedCollection	Optional	
CIM_Dependency	Optional	
CIM_ElementView	Optional	
CIM_PeerNetwork	Optional	
CIM_ElementSettingData	Optional	
CIM_SystemComponent	Optional	

Element Name	Requirement	Description
CIM_SettingsDefineCapabilities	Optional	
CIM_SystemDevice	Optional	
CIM_DeviceConnection	Optional	
CIM_ActiveConnection	Optional	
CIM_DeviceSAPImplementation	Optional	
Indications		
None defined in this profile		

772

ANNEX A
(informative)

Change log

Version	Date	Description
1.0.0	2013-04-03	DMTF Work in Progress

Bibliography