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6 **Network Management Profile**

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CONTENTS

36	Foreword	6
37	Introduction.....	7
38	1 Scope	8
39	2 Normative references	8
40	3 Terms and definitions	8
41	4 Symbols and abbreviated terms.....	10
42	5 Synopsis	10
43	6 Description	12
44	6.1 Class diagram	12
45	7 Implementation Requirements	15
46	7.1 Representing the Network Management Service	15
47	7.2 Representing the Network Management Service Capabilities	15
48	7.3 Representing the Network	15
49	7.3.1 CIM_Network	15
50	7.3.2 Networks contained within a network	15
51	7.3.3 Network dependency	16
52	7.3.4 Peer Networks	16
53	7.4 Representation of network ports	16
54	7.4.1 CIM_NetworkPort.....	16
55	7.4.2 CIM_LogicalPortGroup	16
56	7.5 Representation of collections of protocol endpoints	16
57	7.5.1 CIM_LANConnectivitySegment	16
58	7.5.2 CIM_IPConnectivitySubnet	17
59	7.5.3 CIM_NetworkVLAN	17
60	7.6 Representation of protocol endpoints	17
61	7.6.1 CIM_LANEndpoint	17
62	7.6.2 CIM_IPProtocolEndpoint	17
63	7.6.3 CIM_VLANEndpoint.....	18
64	7.7 CIM_NetworkView	18
65	7.8 CIM_NetworkSettingData	18
66	7.9 CIM_EthernetPortAllocationSettingData.....	18
67	8 Methods.....	19
68	8.1 Extrinsic Methods.....	19
69	8.1.1 CIM_NetworkManagementService	19
70	8.1.2 CIM_Network	19
71	8.2 Profile conventions for operations	19
72	8.3 CIM_NetworkManagementService	20
73	8.4 CIM_NetworkManagementServiceCapabilities	20
74	8.5 CIM_NetworkPolicyService	20
75	8.6 CIM_RedundancySet.....	20
76	8.7 CIM_Network	20
77	8.8 CIM_VLANNetwork.....	20
78	8.9 CIM_NetworkView	20
79	8.10 CIM_NetworkCapabilities	20
80	8.11 CIM_NetworkSettingData	20
81	8.12 CIM_EthernetPortAllocationSettingData.....	20
82	8.13 CIM_NetworkPort.....	20
83	8.14 CIM_EthernetPort	21
84	8.15 CIM_System	21
85	8.16 CIM_ConnectivityCollection	21
86	8.17 CIM_LANConnectivitySegment	21
87	8.18 CIM_LANEndpoint	21

88	8.19	CIM_IPConnectivitySubnet	21
89	8.20	CIM_IPProtocolEndpoint	21
90	8.21	CIM_NetworkVLAN	21
91	8.22	CIM_VLANEndpoint	21
92	8.23	CIM_RegisteredProfile	21
93	8.24	CIM_ElementConformsToProfile	21
94	8.25	CIM_HostedService	21
95	8.26	CIM_ElementCapabilities	21
96	8.27	CIM_ServiceAffectsElement	21
97	8.28	CIM_ContainedNetwork	22
98	8.29	CIM_MemberOfCollection	22
99	8.30	CIM_HostedCollection	22
100	8.31	CIM_Dependency	22
101	8.32	CIM_ElementView	22
102	8.33	CIM_PeerNetwork	22
103	8.34	CIM_ElementSettingData	22
104	8.35	CIM_SystemComponent	22
105	8.36	CIM_SettingsDefineCapabilities	22
106	8.37	CIM_SystemDevice	22
107	8.38	CIM_DeviceConnection	22
108	8.39	CIM_ActiveConnection	22
109	8.40	CIM_DeviceSAPImplementation	22
110	9	Use cases	23
111	9.1	Miscellaneous object diagrams	23
112	9.2	Representing VLAN networks within an L2 network	23
113	9.3	Representing Underlay IP Networks within an L2 Overlay Network	24
114	9.4	Representing two Peer IP Networks	25
115	9.5	Representing Two Tenant Networks within a Provider Network	26
116	9.6	Representing Ethernet ports of tenant networks	27
117	9.7	Representing Systems Connected to Ethernet ports of tenant networks	28
118	9.8	Representing A Tunneled Network Connecting two Ethernet Networks	29
119	9.9	Enumerate networks	29
120	9.10	Enumerate contained networks within a specific network	29
121	9.11	Create a Network	29
122	9.12	Create one or more Networks	29
123	9.13	Create one or more Networks within a Network	29
124	9.14	Delete a network	30
125	9.15	Discover logical ports of a network	30
126	9.16	Discover logical port groups of a network	30
127	9.17	Discover IP subnets of a network	30
128	9.18	Discover VLANs of a network	30
129	9.19	Discover L2 segments of a network	30
130	9.20	Discover systems within a network	30
131	9.21	Create/Delete logical port groups of a network (extrinsic method of network management service)	31
132	9.22	Create/Delete logical ports of a network (extrinsic method of network management service)	31
133	9.23	Create/Delete IP subnets of a network (extrinsic method of network management service)	31
134	9.24	Create/Delete VLANs of a network (extrinsic method of network management service)	31
135	9.25	Create/Delete L2 segments of a network (extrinsic method of network management service)	31
136	9.26	Modify a logical port group of a network (extrinsic method of network management service) – add or delete one or more ports	31
137	9.27	Modify an IP subnet of a network (extrinsic method of network management service) – add or delete one or more IP protocol endpoints	31
138			
139			
140			
141			
142			
143			

144 9.28 Modify a VLAN of a network (extrinsic method of network management service) – add or
 145 delete member VLAN endpoints 31
 146 9.29 Modify a L2 segment of a network (extrinsic method of network management service) –
 147 add or delete LAN endpoints 31
 148 9.30 Create a network connection for a system (extrinsic method of network – creates
 149 network port and associations between the network/network port and the system) 31
 150 9.31 Enumerate networks that a system is directly connected to (intrinsic method) 31
 151 10 CIM Elements 31
 152 ANNEX A (informative) Change log 34
 153 Bibliography 35

154
 155 **Figures**

156 Figure 1 – Network Management Profile: Class diagram 13
 157 Figure 2 – Registered profile 23
 158 Figure 3 – Two VLAN networks within a Layer 2 network 23
 159 Figure 4 – Two IPv4 Underlay Networks Creating a Layer 2 Overlay Network 24
 160 Figure 5 – Two Peer Managed Networks 25
 161 Figure 6 – Two tenants networks within a provider network 26
 162 Figure 7 – Representing Ethernet Ports of Two tenants networks within a provider network 27
 163 Figure 8 – Representing Systems connected to Ethernet Ports of Two tenants networks within a provider
 164 network 28
 165 Figure 9 – Representing A Tunneled Network Bridging Two Ethernet Networks 29
 166

167 **Tables**

168 Table 1 – Referenced profiles 11
 169 Table 2 – CIM Elements: Network Services Management Profile 31

170

171

Foreword

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

174 DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems
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187

188

Introduction

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

194 **Document conventions**

195 **Typographical conventions**

196 The following typographical conventions are used in this document:

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

199

200

Network Management Profile

201 1 Scope

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

207 2 Normative references

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

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

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

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

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

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

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

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

226 DMTF DSP1048, *Network Policy Management Profile 1.0*,
227 http://www.dmtf.org/standards/published_documents/DSP1048_1.0.pdf

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

230 3 Terms and definitions

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

233 The terms "shall" ("required"), "shall not", "should" ("recommended"), "should not" ("not recommended"),
234 "may", "need not" ("not required"), "can" and "cannot" in this document are to be interpreted as described
235 in [ISO/IEC Directives, Part 2](#), Annex H. The terms in parenthesis are alternatives for the preceding term,
236 for use in exceptional cases when the preceding term cannot be used for linguistic reasons. Note that

- 237 [ISO/IEC Directives, Part 2](#), Annex H specifies additional alternatives. Occurrences of such additional
238 alternatives shall be interpreted in their normal English meaning.
- 239 The terms "clause", "subclause", "paragraph", and "annex" in this document are to be interpreted as
240 described in [ISO/IEC Directives, Part 2](#), Clause 5.
- 241 The terms "normative" and "informative" in this document are to be interpreted as described in [ISO/IEC](#)
242 [Directives, Part 2](#), Clause 3. In this document, clauses, subclauses, or annexes labeled "(informative)" do
243 not contain normative content. Notes and examples are always informative elements.
- 244 The terms defined in [DSP0004](#), [DSP0223](#), and [DSP1001](#) apply to this document. The following additional
245 terms are used in this document.
- 246 **3.1**
247 **conditional**
248 indicates requirements to be followed strictly to conform to the document when the specified conditions
249 are met
- 250 **3.2**
251 **mandatory**
252 indicates requirements to be followed strictly to conform to the document and from which no deviation is
253 permitted
- 254 **3.3**
255 **optional**
256 indicates a course of action permissible within the limits of the document
- 257 **3.4**
258 **pending configuration**
259 indicates the configuration that will be applied to an IP network connection the next time the IP network
260 connection accepts a configuration
- 261 **3.5**
262 **referencing profile**
263 indicates a profile that owns the definition of this class and can include a reference to this profile in its
264 "Referenced Profiles" table
- 265 **3.6**
266 **unspecified**
267 indicates that this profile does not define any constraints for the referenced CIM element or operation
- 268 **3.7**
269 **Network**
270 The term Network in this specification applies to a logical, virtual, or physical network that is managed as
271 an independent entity or an entity contained within another network, or an entity that is a peer to other
272 networks.
- 273 **3.8**
274 **VLAN Network**
275 A VLAN Network is a specific type of network representing a Virtual LAN.
- 276 **3.9**
277 **Contained Network**
278 A Contained Network is a specific type of network that is contained within another network. One or more
279 contained networks are aggregated by the containing network.

280 **3.10**

281 **Containing Network**

282 A Containing Network is a specific type of network that contains one or more networks. The containing
283 network aggregates one or more contained networks.

284 **3.11**

285 **Dependent Network**

286 A Dependent Network is a specific type of network whose existence depends on another network.

287 **3.12**

288 **Peer Network**

289 A Peer Network is a specific type of network that has a relationship with another peer network but it is
290 neither dependent nor contained in the peer network.

291 **3.13**

292 **Network Port**

293 A Network Port represents a managed entity for communication within a network.

294 **3.14**

295 **Network Port Group**

296 A Network Port Group represents a collection of network ports.

297 **3.15**

298 **Network Service**

299 A Network Service represents an operational function of a network. For example, DHCP Service in an IP
300 network.

301 **4 Symbols and abbreviated terms**

302 The abbreviations defined in [DSP0004](#), [DSP0223](#), and [DSP1001](#) apply to this document. The following
303 additional abbreviations are used in this document.

304 **4.1**

305 **IP**

306 Internet Protocol

307 **4.2**

308 **VLAN**

309 Virtual Local Area Network

310 **5 Synopsis**

311 **Profile name:** Network Management Profile

312 **Version:** 1.0.0

313 **Organization:** DMTF

314 **CIM Schema version:** 2.45

315 **Central class:** CIM_NetworkManagementService

316 **Scoping class:** CIM_System (HostingSystem)

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

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

323 **Table 1 – Referenced profiles**

Profile Name	Organization	Version	Requirement	Description
Profile Registration	DMTF	1.0	Mandatory	See DSP1033
Ethernet Port	DMTF	1.0	Optional	See DSP1014
Network Policy Management	DMTF	1.0	Optional	See DSP1048

324 6 Description

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

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

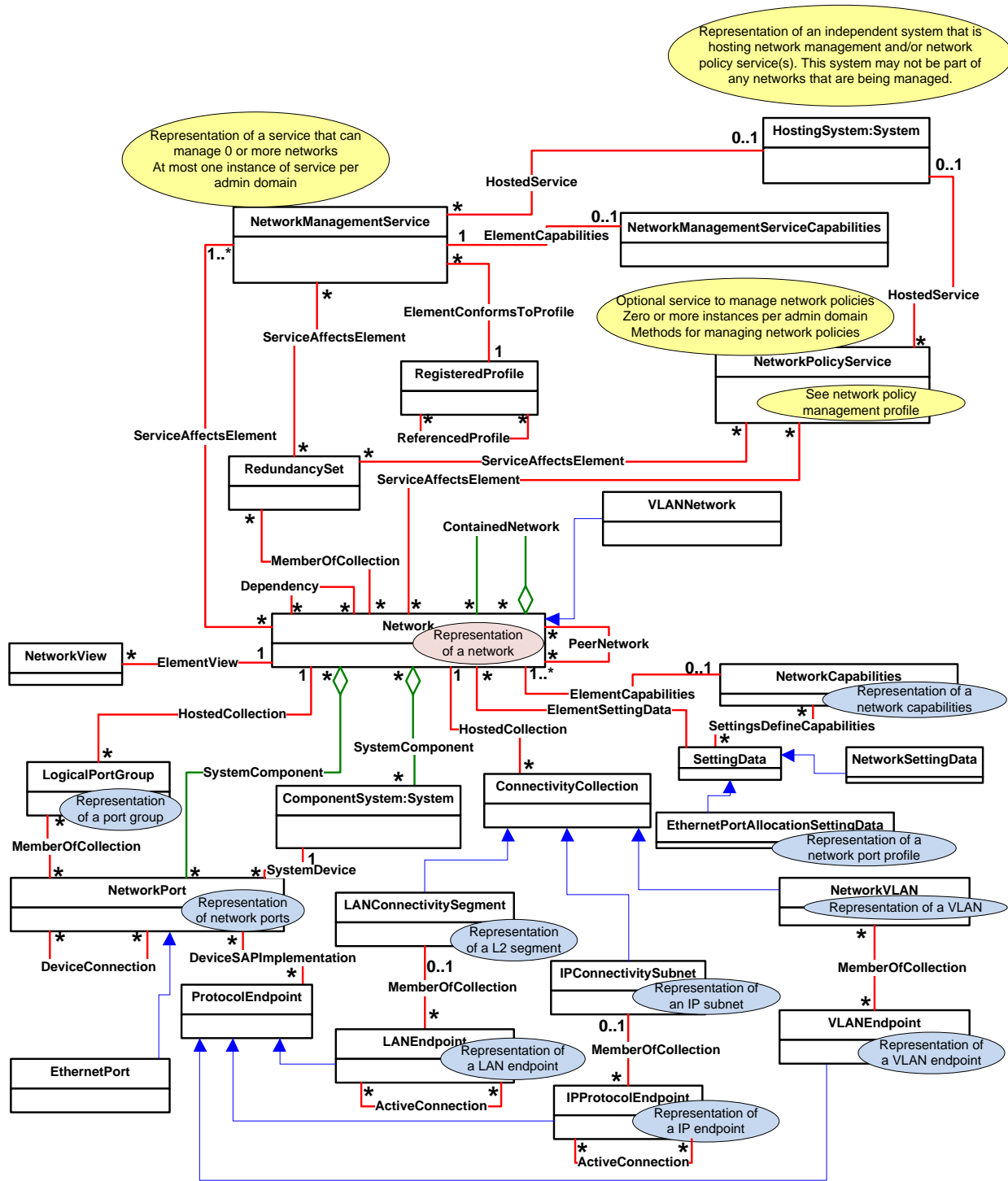
- 330 • Network topology discovery
- 331 • Network capabilities discovery
- 332 • Network monitoring and statistics collection
- 333 • Network configuration and control
- 334 • Network view (a snapshot of network)
- 335 • Network resources (ports, protocol endpoints, port groups, etc.) inventory
- 336 • Network resources configuration and control

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

341 6.1 Class diagram

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

344



345

346

Figure 1 – Network Management Profile: Class diagram

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

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

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

363 Note: Add a new association class *PeerNetwork*.

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

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

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

374 The following network resources are represented.

- 375 1. *NetworkPort* represents a port of a network. *NetworkPort* is associated with *Network* through
376 *SystemComponent*. *EthernetPort* is a derived class of *NetworkPort* that represents an Ethernet
377 port. Connection between two *NetworkPort* is represented by *DeviceConnection*.
- 378 2. *ComponentSystem* represents a system within a network. *ComponentSystem* is associated with
379 *Network* through *SystemComponent*. The relationship between *NetworkPort* and
380 *ComponentSystem* is represented by *SystemDevice*.
- 381 3. *LogicalPortGroup* represents a port group within a network. *LogicalPortGroup* is associated with
382 *Network* through *HostedCollection*.
- 383 4. *LANConnectivitySegment* represents a layer 2 segment or subnet within a network.
384 *LANConnectivitySegment* is associated with *Network* through *HostedCollection*.
- 385 5. *IPConnectivitySubnet* represents a layer 2 segment or subnet within a network.
386 *IPConnectivitySubnet* is associated with *Network* through *HostedCollection*.
- 387 6. *NetworkVLAN* represents a VLAN. *NetworkVLAN* is associated with *Network* through
388 *HostedCollection*.
- 389 7. *ProtocolEndpoint* represents a protocol endpoint. *LANEndpoint* represents layer 2 protocol
390 endpoint. *LANEndpoint* is derived from *ProtocolEndpoint*. The relationship of *LANEndpoint* with a
391 specific *LANConnectivitySegment* is modeled by *MemberOfCollection*. *IPProtocolEndpoint*
392 represents IP layer endpoint. *IPProtocolEndpoint* is also derived from *ProtocolEndpoint*. The
393 relationship of *IPProtocolEndpoint* with a specific *IPConnectivitySubnet* is modeled by
394 *MemberOfCollection*. *VLANEndpoint* represents layer 2 VLAN endpoint. *VLANEndpoint* is derived
395 from *ProtocolEndpoint*. The relationship of *VLANEndpoint* with a specific *NetworkVLAN* is

396 modeled by *MemberOfCollection*. *DeviceSAPImplementation* models the relationship between
397 *NetworkPort* and *ProtocolEndpoint*. Connectivity between LAN endpoints is modeled by
398 *ActiveConnection*. Similarly, connectivity between IP protocol endpoints is modeled by
399 *ActiveConnection*.

400

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

405 Support for the Network Management Profile is advertised by *RegisteredProfile*.

406 7 Implementation Requirements

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

409 7.1 Representing the Network Management Service

410 An instance of *CIM_NetworkManagementService* represents a network management service.

411 At least one instance of *CIM_NetworkManagementService* shall exist.

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

414 7.2 Representing the Network Management Service Capabilities

415 An instance of *CIM_NetworkManagementServiceCapabilities* represents network management service
416 capabilities.

417 One or more instances of *CIM_NetworkManagementServiceCapabilities* may exist.

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

420

421 7.3 Representing the Network

422 7.3.1 CIM_Network

423 An instance of *CIM_Network* represents a network.

424 Zero or more instances of *CIM_Network* shall exist.

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

427 7.3.1.1 CIM_VLANNetwork

428 VLAN networks represent a specialization of networks modeled in general.

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

430 7.3.2 Networks contained within a network

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

434 7.3.3 Network dependency

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

437 CIM_Dependency shall be used to show dependency between networks.

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

441 7.3.4 Peer Networks

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

446 CIM_PeerNetwork shall be used to show peer relationships between networks.

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

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

452

453 Open: Create a CR for *PeerNetwork* association.

454 7.4 Representation of network ports

455 7.4.1 CIM_NetworkPort

456 An instance of CIM_NetworkPort shall represent a network port.

457 Zero or more instances of CIM_NetworkPort may exist.

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

460 7.4.2 CIM_LogicalPortGroup

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

462 Zero or more instances of CIM_LogicalPortGroup may exist.

463 An instance of CIM_LogicalPortGroup shall be associated with one instance of CIM_Network through an
464 instance of CIM_HostedCollection.

465 7.5 Representation of collections of protocol endpoints

466 7.5.1 CIM_LANConnectivitySegment

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

469 Zero or more instances of CIM_LANConnectivitySegment may exist.

470 Zero or more instances of CIM_LANEndpoint may be associated with an instance of
471 CIM_LANConnectivitySegment.

472 An instance of CIM_LANConnectivitySegment shall be associated to one instance of CIM_Network with
473 an instance of CIM_HostedCollection.

474 **7.5.2 CIM_IPConnectivitySubnet**

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

477 Zero or more instances of CIM_IPConnectivitySubnet may exist.

478 Zero or more instances of CIM_IPProtocolEndpoint may be associated with an instance of
479 CIM_IPConnectivitySubnet.

480 An instance of CIM_IPConnectivitySubnet shall be associated to one instance of CIM_Network with an
481 instance of CIM_HostedCollection.

482 **7.5.3 CIM_NetworkVLAN**

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

485 Zero or more instances of CIM_NetworkVLAN may exist.

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

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

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

493 **7.6 Representation of protocol endpoints**

494 **7.6.1 CIM_LANEndpoint**

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

497 Zero or more instances of CIM_LANEndpoint may exist.

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

501 **7.6.2 CIM_IPProtocolEndpoint**

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

504 Zero or more instances of CIM_IPProtocolEndpoint may exist.

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

508 **7.6.3 CIM_VLANEndpoint**

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

510 Zero or more instances of CIM_VLANEndpoint may exist.

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

514 An instance of CIM_VLANEndpoint may be associated to one instance of CIM_LANEndpoint with an
515 instance of CIM_BindsTo.

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

518 **7.7 CIM_NetworkView**

519 An instance of CIM_NetworkView represents a view of a network.

520 Zero or more instances of CIM_NetworkView may exist.

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

523 **7.8 CIM_NetworkSettingData**

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

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

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

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

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

536 Open: Fix the class diagram to show an association between CIM_NetworkManagementService and
537 CIM_NetworkSettingData,

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

541 **7.9 CIM_EthernetPortAllocationSettingData**

542 An instance of CIM_EthernetPortAllocationSettingData represents a network port configuration.

- 543 An instance of CIM_EthernetPortAllocationSettingData shall be associated to an instance of
544 CIM_NetworkPort or an instance of CIM_NetworkCapabilities.
- 545 An instance of CIM_EthernetPortAllocationSettingData representing a configuration of an existing
546 network port shall be associated to an instance of CIM_NetworkPort with an instance of
547 CIM_ElementSettingData.
- 548 An instance of CIM_EthernetPortAllocationSettingData representing a template network port configuration
549 shall be associated to an instance of CIM_NetworkCapabilities with an instance of
550 CIM_SettingsDefineCapabilities.
- 551 Open: How do we relate a network port profile represented by DSP8049 using CIM_NetworkCapabilities?

552 **8 Methods**

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

555 **8.1 Extrinsic Methods**

556 **8.1.1 CIM_NetworkManagementService**

- 557 Create one or more networks
- 558 Create/Delete logical port groups of a network
- 559 Create/Delete logical ports of a network
- 560 Create/Delete IP subnets of a network
- 561 Create/Delete VLANs of a network
- 562 Create/Delete L2 segments of a network
- 563 Modify a logical port group of a network– add or delete one or more ports
- 564 Modify an IP subnet of a network – add or delete one or more IP protocol endpoints
- 565 Modify a VLAN of a network – add or delete member VLAN endpoints
- 566 Modify a L2 segment of a network – add or delete LAN endpoints
- 567 Open: The above extrinsic methods need to be defined.

568 **8.1.2 CIM_Network**

- 569 Enumerate networks contained within a specific network
- 570 Create one or more networks within a network
- 571 Delete networks contained within a network
- 572 Open: The above extrinsic methods need to be defined.

573 **8.2 Profile conventions for operations**

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

576 The default list of operations is as follows:

- 577 • GetInstance
- 578 • EnumerateInstances
- 579 • EnumerateInstanceNames
- 580 • Associators
- 581 • AssociatorNames
- 582 • References
- 583 • ReferenceNames

584 **8.3 CIM_NetworkManagementService**

585 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

586 **8.4 CIM_NetworkManagementServiceCapabilities**

587 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

588 **8.5 CIM_NetworkPolicyService**

589 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

590 **8.6 CIM_RedundancySet**

591 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

592 **8.7 CIM_Network**

593 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

594 **8.8 CIM_VLANNetwork**

595 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

596 **8.9 CIM_NetworkView**

597 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

598 **8.10 CIM_NetworkCapabilities**

599 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

600 **8.11 CIM_NetworkSettingData**

601 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

602 **8.12 CIM_EthernetPortAllocationSettingData**

603 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

604 **8.13 CIM_NetworkPort**

605 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

606 **8.14 CIM_EthernetPort**

607 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

608 **8.15 CIM_System**

609 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

610 **8.16 CIM_ConnectivityCollection**

611 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

612 **8.17 CIM_LANConnectivitySegment**

613 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

614 **8.18 CIM_LANEndpoint**

615 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

616 **8.19 CIM_IPConnectivitySubnet**

617 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

618 **8.20 CIM_IPProtocolEndpoint**

619 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

620 **8.21 CIM_NetworkVLAN**

621 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

622 **8.22 CIM_VLANEndpoint**

623 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

624 **8.23 CIM_RegisteredProfile**

625 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

626 **8.24 CIM_ElementConformsToProfile**

627 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

628 **8.25 CIM_HostedService**

629 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

630 **8.26 CIM_ElementCapabilities**

631 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

632 **8.27 CIM_ServiceAffectsElement**

633 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

634 **8.28 CIM_ContainedNetwork**

635 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

636 **8.29 CIM_MemberOfCollection**

637 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

638 **8.30 CIM_HostedCollection**

639 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

640 **8.31 CIM_Dependency**

641 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

642 **8.32 CIM_ElementView**

643 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

644 **8.33 CIM_PeerNetwork**

645 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

646 **8.34 CIM_ElementSettingData**

647 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

648 **8.35 CIM_SystemComponent**

649 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

650 **8.36 CIM_SettingsDefineCapabilities**

651 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

652 **8.37 CIM_SystemDevice**

653 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

654 **8.38 CIM_DeviceConnection**

655 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

656 **8.39 CIM_ActiveConnection**

657 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

658 **8.40 CIM_DeviceSAPImplementation**

659 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

660 **9 Use cases**

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

662 **9.1 Miscellaneous object diagrams**

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

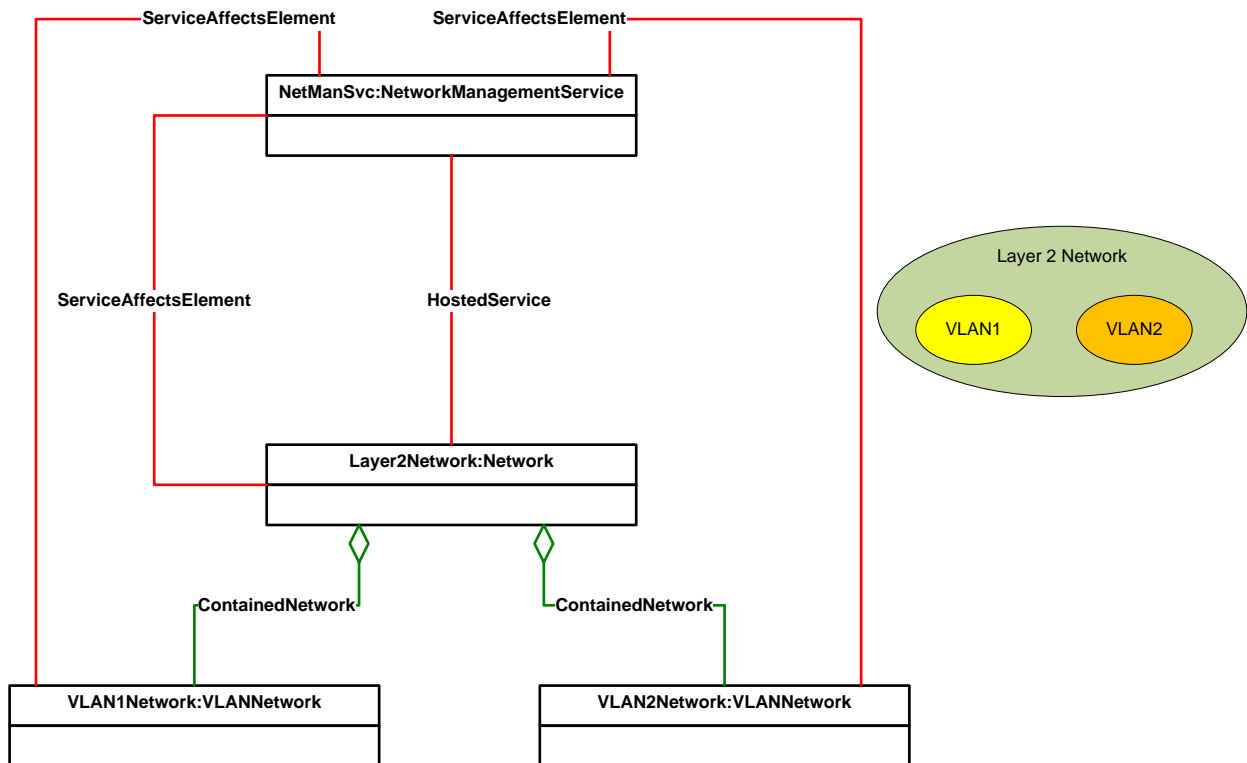
664



665

666 **Figure 2 – Registered profile**

667 **9.2 Representing VLAN networks within an L2 network**

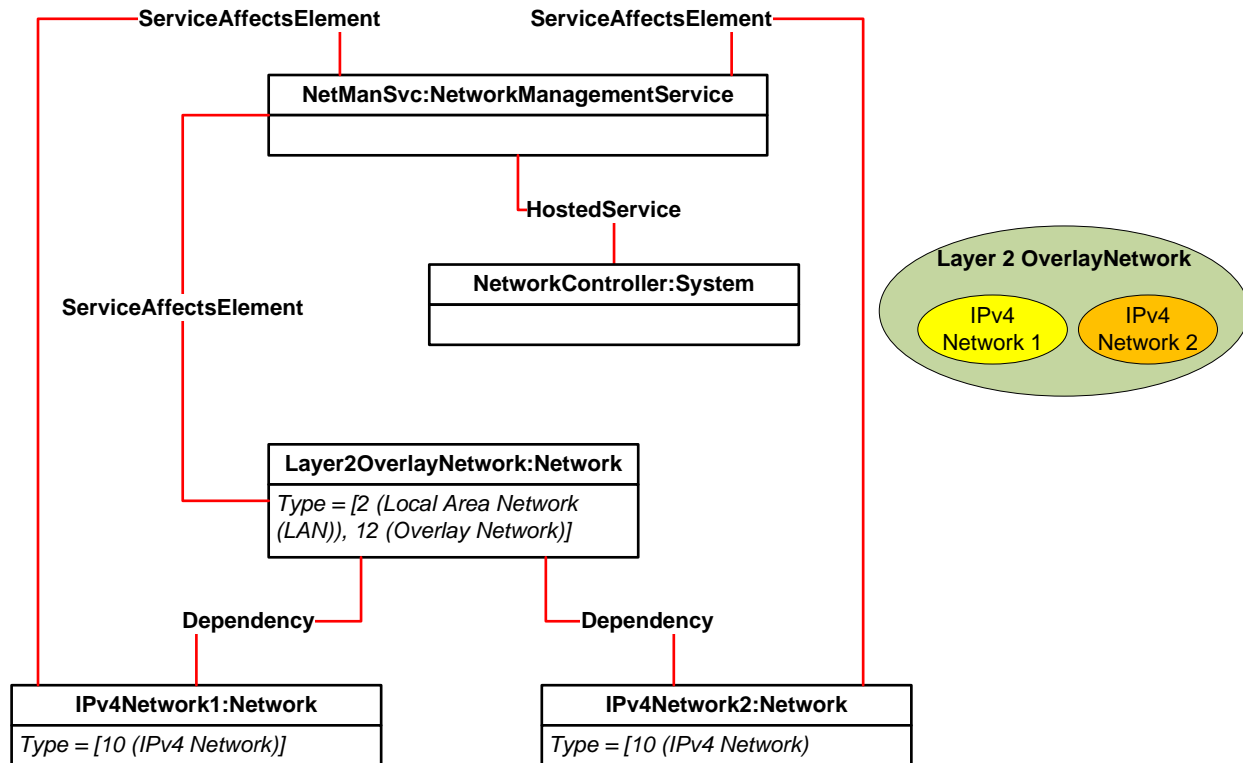


668

669 **Figure 3 – Two VLAN networks within a Layer 2 network**

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

674 **9.3 Representing Underlay IP Networks within an L2 Overlay Network**

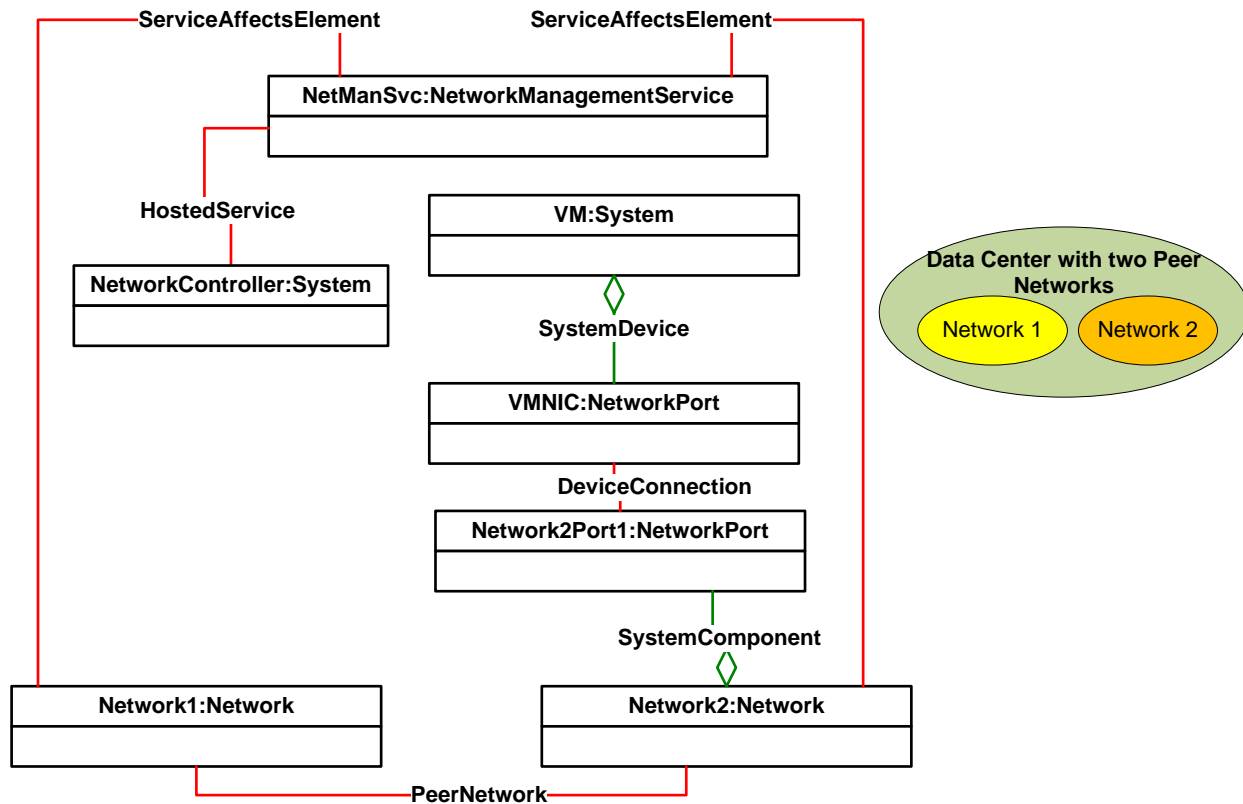


675

676 **Figure 4 – Two IPv4 Underlay Networks Creating a Layer 2 Overlay Network**

677 In this example, two IPv4 networks with their individual domains are instantiated to create a layer 2
 678 overlay network. The instance of layer 2 overlay network *Layer2OverlayNetwork* is dependent on the
 679 instances *IPv4Network1* and *IPv4Network2*. *NetManSvc* represents the service that is hosted on the
 680 *NetworkController* (e.g. an SDN controller). *NetManSvc* manages all three networks (one overlay network
 681 and two underlay networks) as represented by *ServiceAffectsElement*.

682 **9.4 Representing two Peer IP Networks**



683

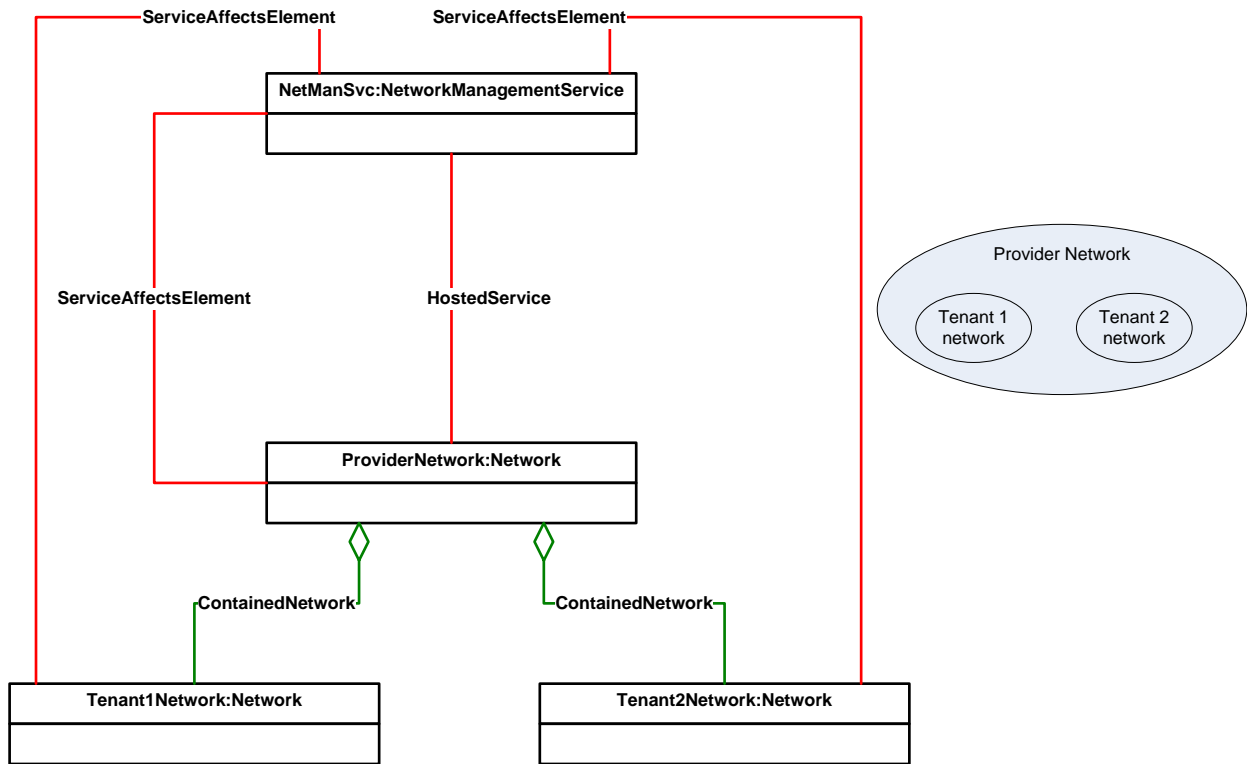
684 **Figure 5 – Two Peer Managed Networks**

685 A network administrator trying to deploy a VM on a network *Network1* finds out that *Network1* does not
 686 have additional resources. In this case, the network administrator finds a peer network *Network2* with
 687 available network resources and deploys the VM on the peer network *Network2*.

688 In this example, two peer networks are represented by two instances *Network1* and *Network2*. The
 689 instance of *PeerNetwork* shows relationship between *Network1* and *Network2*. *NetManSvc* represents
 690 the service that is hosted on a system *NetworkController*. *NetManSvc* manages both peer networks as
 691 represented by *ServiceAffectsElement*. The instance *VM* is connected to *Network2*. That connection is
 692 represented by *DeviceConnection* association between *VMNIC* and *Network2Port1*.

693 Future Example: A data center administrator is supporting multiple tenants each with its own set of
 694 resources including networks. Each tenant within its domain can administer movement of VMs and
 695 network resources. When a tenant network runs out of network resources, the data center administrator
 696 finds peer networks with available network resources and reallocates network resources to the given
 697 tenant network.

698 **9.5 Representing Two Tenant Networks within a Provider Network**

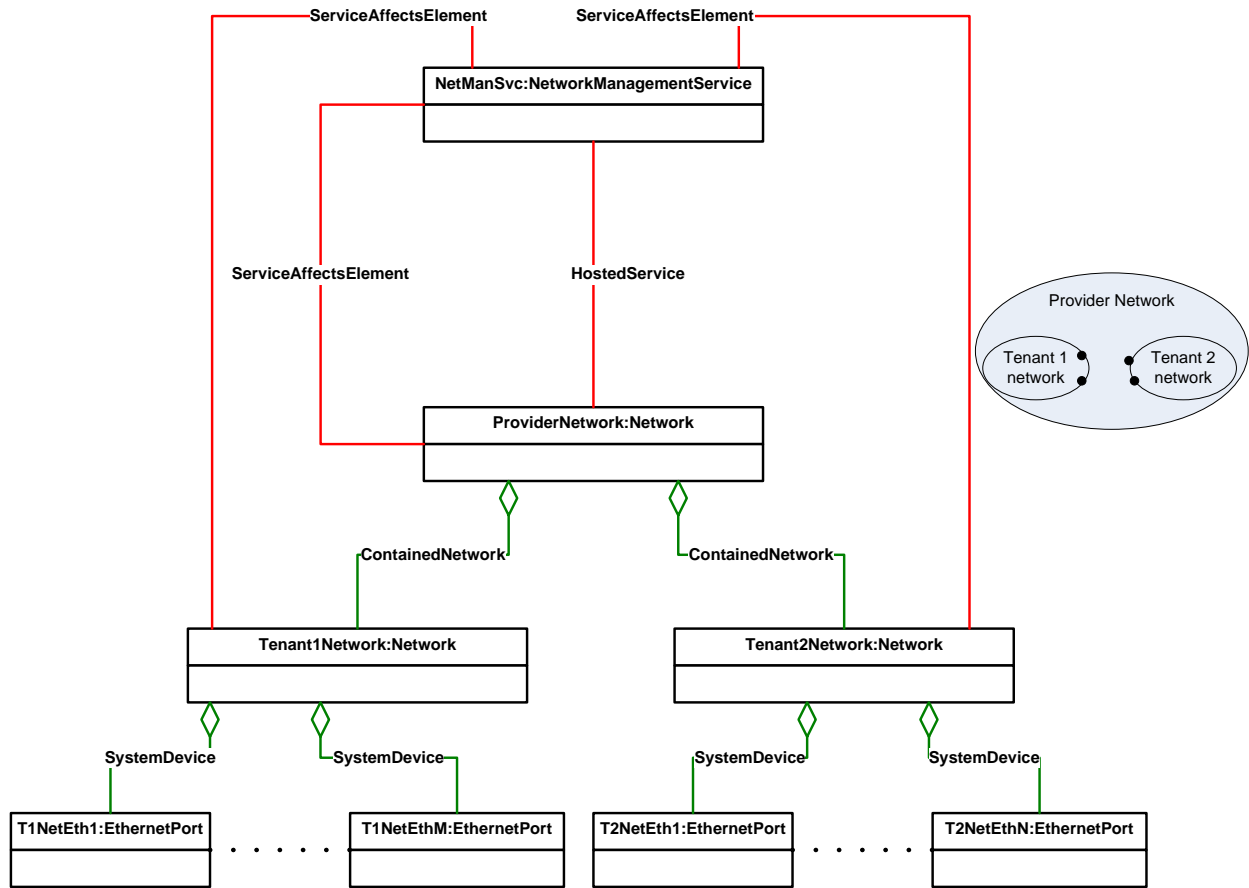


699

700

Figure 6 – Two tenants networks within a provider network

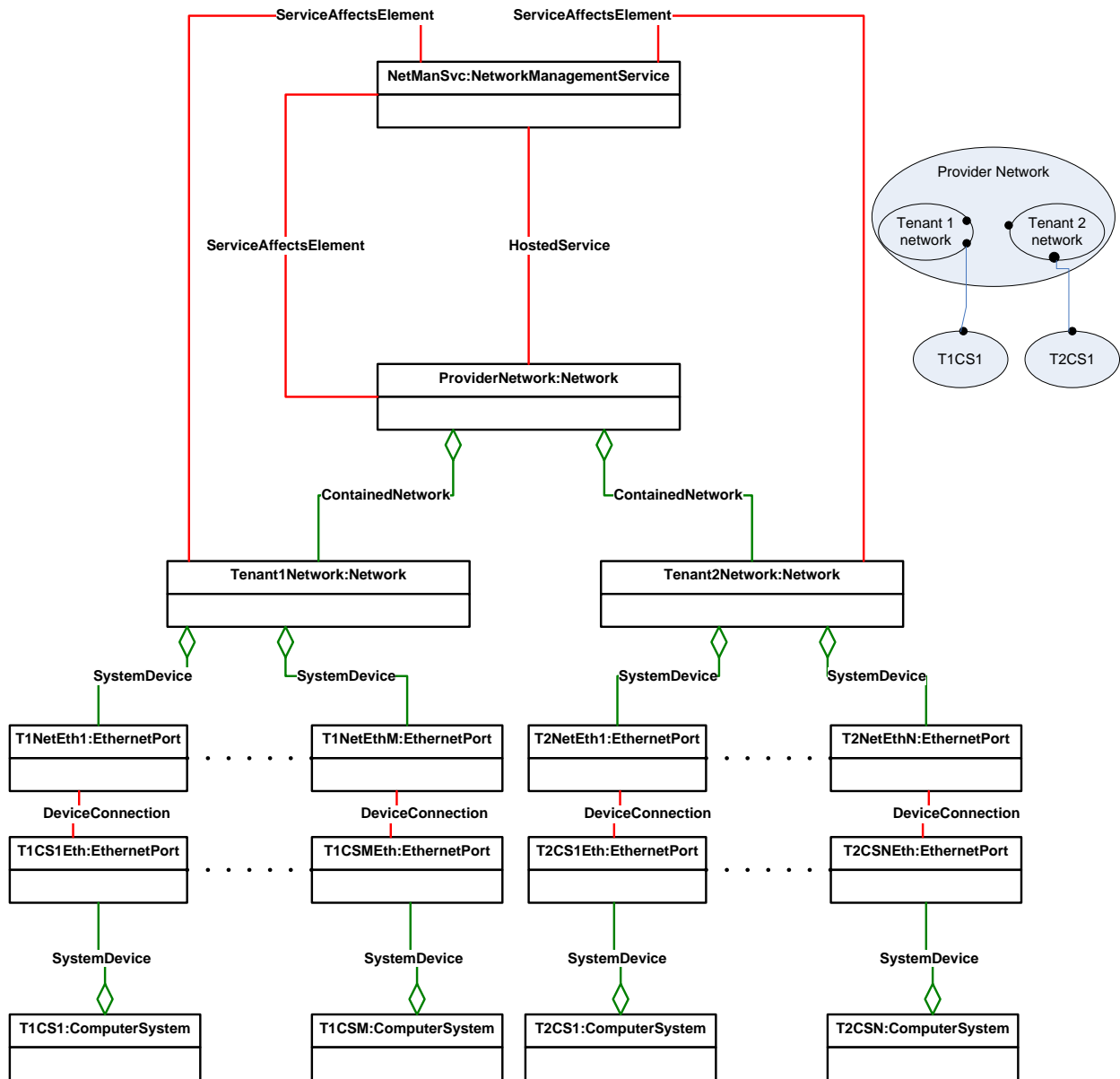
701 9.6 Representing Ethernet ports of tenant networks



702

703 Figure 7 – Representing Ethernet Ports of Two tenants networks within a provider network

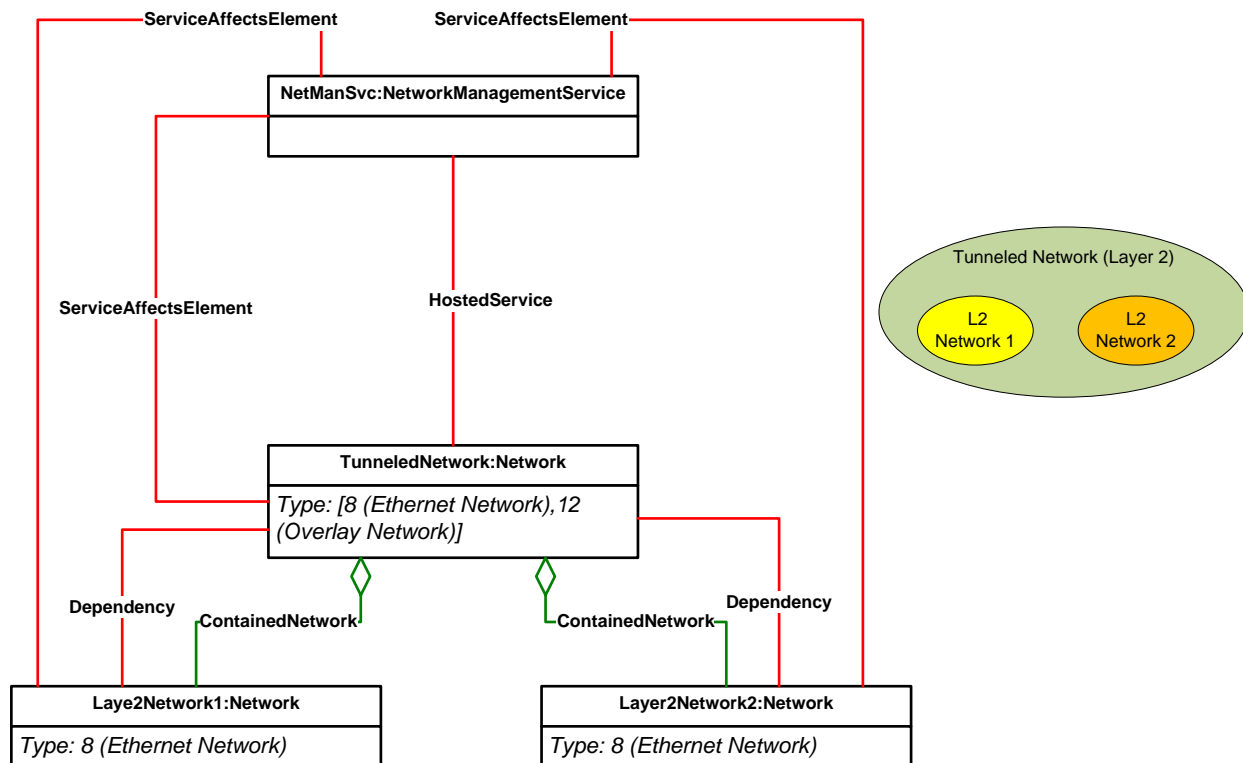
704 **9.7 Representing Systems Connected to Ethernet ports of tenant networks**



705

706 **Figure 8 – Representing Systems connected to Ethernet Ports of Two tenants networks within a**
 707 **provider network**

708 **9.8 Representing A Tunneled Network Connecting two Ethernet Networks**



709
710 **Figure 9 – Representing A Tunneled Network Bridging Two Ethernet Networks**

711 **9.9 Enumerate networks**

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

713 **9.10 Enumerate contained networks within a specific network**

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

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

717 **9.11 Create a Network**

718 **9.12 Create one or more Networks**

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

- 720 1) Extrinsic method on `CIM_NetworkManagementService`.

721 **9.13 Create one or more Networks within a Network**

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

- 723 1) Extrinsic method on `CIM_Network`.

724 9.14 Delete a network

725 A client can delete an instance of CIM_Network.

726 9.15 Discover logical ports of a network

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

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

730 9.16 Discover logical port groups of a network

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

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

734 9.17 Discover IP subnets of a network

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

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

738 9.18 Discover VLANs of a network

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

- 740 1) Enumerate all instances of CIM_NetworkVLAN that are associated with the given instance of
741 CIM_Network through an instance of CIM_HostedCollection.
- 742 2) For each instance of CIM_NetworkVLAN in 1, Enumerate all instances of CIM_VLANEndpoint
743 that are associated with the given instance of CIM_NetworkVLAN through an instance of
744 CIM_MemberOfCollection.

745 9.19 Discover L2 segments of a network

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

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

749 9.20 Discover systems within a network

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

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

- 753 **9.21 Create/Delete logical port groups of a network (extrinsic method of network**
- 754 **management service)**

- 755 **9.22 Create/Delete logical ports of a network (extrinsic method of network**
- 756 **management service)**

- 757 **9.23 Create/Delete IP subnets of a network (extrinsic method of network**
- 758 **management service)**

- 759 **9.24 Create/Delete VLANs of a network (extrinsic method of network management**
- 760 **service)**

- 761 **9.25 Create/Delete L2 segments of a network (extrinsic method of network**
- 762 **management service)**

- 763 **9.26 Modify a logical port group of a network (extrinsic method of network**
- 764 **management service) – add or delete one or more ports**

- 765 **9.27 Modify an IP subnet of a network (extrinsic method of network management**
- 766 **service) – add or delete one or more IP protocol endpoints**

- 767 **9.28 Modify a VLAN of a network (extrinsic method of network management**
- 768 **service) – add or delete member VLAN endpoints**

- 769 **9.29 Modify a L2 segment of a network (extrinsic method of network management**
- 770 **service) – add or delete LAN endpoints**

- 771 **9.30 Create a network connection for a system (extrinsic method of network –**
- 772 **creates network port and associations between the network/network port**
- 773 **and the system)**

- 774 **9.31 Enumerate networks that a system is directly connected to (intrinsic**
- 775 **method)**

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

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

779 **10 CIM Elements**

780 Table 2 shows the instances of CIM Elements for this profile. Instances of the CIM Elements shall be
 781 implemented as described in Table 2. Clauses 7 (“Implementation”) and 8 (“Methods”) may impose
 782 additional requirements on these elements.

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

Element Name	Requirement	Description
Classes		
CIM_NetworkManagementService	Optional	See clause 7.1

Element Name	Requirement	Description
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	
CIM_SettingsDefineCapabilities	Optional	
CIM_SystemDevice	Optional	
CIM_DeviceConnection	Optional	

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

784

785
786
787
788

ANNEX A (informative)

Change log

Version	Date	Description
1.0.0a	2013-04-03	DMTF Work in Progress
1.0.0b	2015-06-15	DMTF Work in Progress

789

790

Bibliography