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Foreword

The *IP Configuration Profile* (DSP1116) was prepared by the Server Desktop Mobile Platform 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 unambiguously the classes, properties, methods, and values that shall be instantiated and manipulated to represent and manage an IP interface and its 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`.

295 # IP Configuration Profile

296 ## 1 Scope

297 The *IP Configuration Profile* extends the management capability of referencing profiles by adding the
298 capability to represent an IP configuration of a managed system. This profile includes a specification of
299 the IP network connection, its associated configuration, support for managing configurations, and
300 dynamics of related end points.

301 ## 2 Normative references

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

306 DMTF DSP0004, *CIM Infrastructure Specification 2.6*,
307 https://www.dmtf.org/sites/default/files/standards/documents/DSP0004_2.6.pdf

308 DMTF DSP0200, *CIM Operations over HTTP 1.3,*
309 https://www.dmtf.org/sites/default/files/standards/documents/DSP0200_1.3.pdf

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

312 DMTF DSP1001, *Management Profile Specification Usage Guide 1.0*,
313 https://www.dmtf.org/sites/default/files/standards/documents/DSP1001_1.0.pdf

314 DMTF DSP1033, *Profile Registration Profile 1.0,*
315 https://www.dmtf.org/sites/default/files/standards/documents/DSP1033_1.0.pdf

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

318 DMTF DSP1080, *Enabled Logical Element Profile 1.0*,
319 https://www.dmtf.org/sites/default/files/standards/documents/DSP1080_1.0.pdf

320 IETF, RFC1208, *A Glossary of Networking Terms*, March 1991, http://www.ietf.org/rfc/rfc1208.txt

321 IETF, RFC4291, *IP Version 6 Addressing Architecture*, February 2006, http://www.ietf.org/rfc/rfc4291.txt

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

324 ## 3 Terms and definitions

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

327 The terms "shall" ("required"), "shall not", "should" ("recommended"), "should not" ("not recommended"),
328 "may", "need not" ("not required"), "can" and "cannot" in this document are to be interpreted as described
329 in ISO/IEC Directives, Part 2, Clause 7. The terms in parentheses are alternatives for the preceding term,
330 for use in exceptional cases when the preceding term cannot be used for linguistic reasons. Note that
331 ISO/IEC Directives, Part 2, Clause 7 specifies additional alternatives. Occurrences of such additional
332 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 6.

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

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
DHCP

Dynamic Host Configuration Protocol

4.2
DNS

Domain Name System

4.3
IP
Internet Protocol

5 Synopsis

Profile name: IP Configuration

Version: 1.0.0

Organization: DMTF

CIM Schema version: 2.34

Central class: CIM_IPNetworkConnection

Scoping class: CIM_ComputerSystem

The *IP Configuration Profile* extends the management capability of referencing profiles by adding the capability to describe the IP configuration of a managed system. This profile includes a specification of the IP network connection, its associated configuration, support for managing configurations, and dynamics of related end points.

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
Enabled Logical Element	DMTF	1.0	Specializes	See clause 7.1

6 Description

The *IP Configuration Profile* describes an IP network connection and associated IP configuration information in a managed system.

The *IP Configuration Profile* extends the management capability of referencing profiles by adding the capability to represent the IP configuration in a managed system. Functionality within the scope of this profile includes:

- settings for IP network connection
- settings for IP versions
- protocol endpoints for IP, DNS client, DHCP client

This profile represents the current configuration of an IP network connection, associated configurations that could be applied, the DNS client, and the DHCP client.

A computer system can have multiple IP network connections. An IP network connection is an aggregation point of IP layer settings. The application of the settings for the IP network connection results in the IP interface, consisting of the IP addresses, gateways, along with the DNS client configuration. Following represents the main methods for assignment of values for IP interface and DNS client configuration,

- static – configured values in the settings
- DHCP – from a DHCP server

- stateless – based on router advertisements
- link local – automatic IPv6 address assignment if IPv6 is enabled

A computer system and its networks support IPv4 and/or IPv6. The system can have multiple IP addresses, gateways and DNS servers configured.

DSP1116 provides an enhanced architecture model for IP configuration on a network interface (especially for IPv6). For IP configuration, DSP1116 is the architecture successor to *IP Interface Profile* (DSP1036), *DHCP Client Profile* (DSP1037), and *DNS Client Profile* (DSP1038).

6.1 Class diagram

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

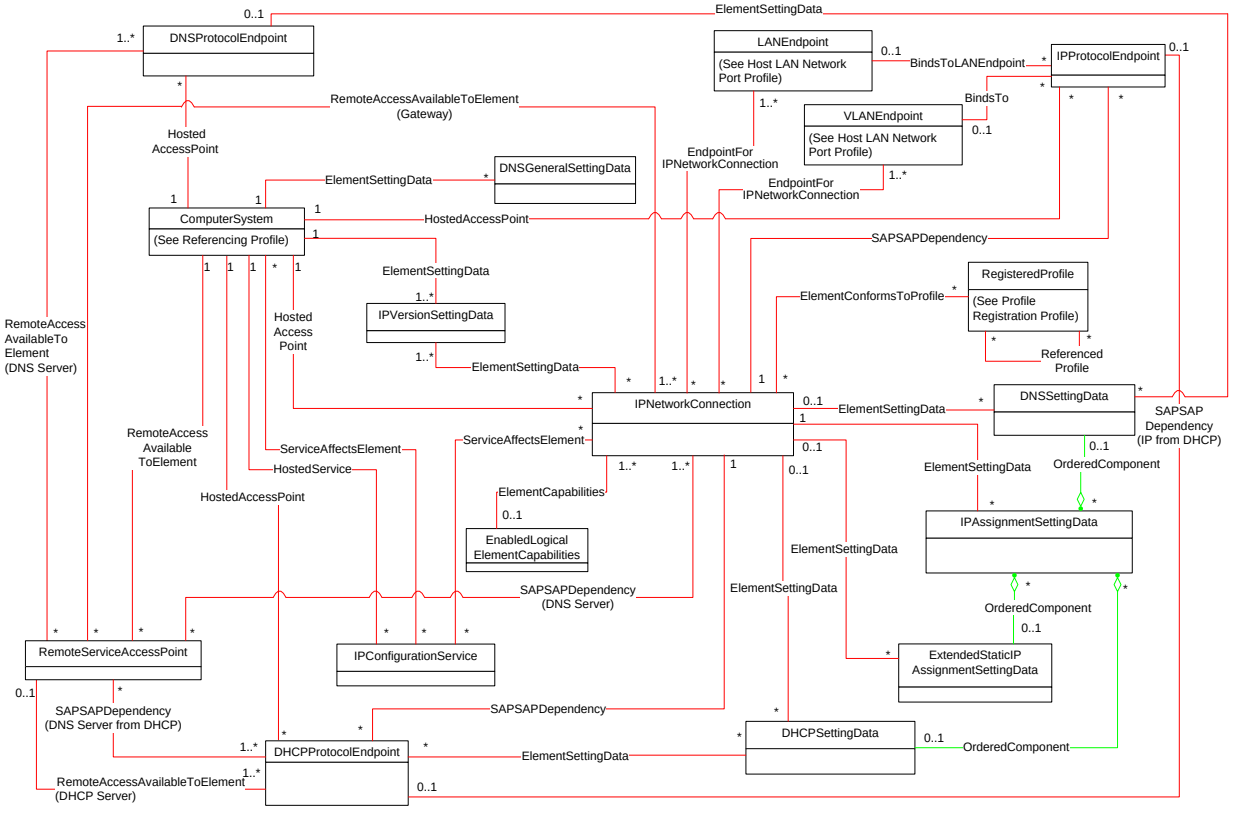


Figure 1 – IP Configuration Profile: Class diagram

Each network layer connection to an IP network is modeled by an instance of CIM_IPNetworkConnection. In general CIM_IPAssignmentSettingData and its subclasses represent the settings for a network connection. The instance of CIM_EnabledLogicalElementCapabilities is used to advertise the state management supported for the network connection.

An instance of CIM_IPVersionSettingData represents an IP version setting. The static IP settings are represented by instances of CIM_ExtendedStaticIPAssignmentSettingData. The DHCP settings are

425 represented by instances of CIM_DHCPSettingData. The stateless settings for IPv6 are represented by
426 instances of CIM_IPAssignmentSettingData. The DNS setting for the network connection is represented
427 by instances of CIM_DNSSettingData.

428 The system-wide settings for the DNS client are represented in the instance of
429 CIM_DNSGeneralSettingData, which is associated to the instance of scoping CIM_ComputerSystem,
430 through instance of CIM_ElementSettingData.

431 An instance of CIM_IPConfigurationService represents a service that provides methods for IP
432 configuration.

433 An instance of CIM_IPProtocolEndpoint represents an IP address on the system. An instance of
434 CIM_DHCPProtocolEndpoint represents the DHCP client for an IP version for a network connection. The
435 DNS client on the system is represented by an instance of CIM_DNSProtocolEndpoint.

436 Functionality provided by other systems (Gateway, DHCP server, and DNS server) is modeled from the
437 client view and is therefore represented by instances of CIM_RemoteServiceAccessPoint.

438 6.2 Concurrent settings

439 When there are multiple instances of settings that can be configured to take effect on the IP network
440 connection simultaneously, the settings are considered “concurrent” settings. A settings instance
441 associated with an IP network connection is recognized as concurrent whenever it has no configuration
442 name (ConfigurationName is null) or it has a unique ConfigurationName value among all of the
443 associated settings instances.

444 6.3 Alternate settings

445 When only one among a set of settings can be configured to take effect on the IP network connection at
446 any given point of time, they are considered as “alternate” settings. A settings instance associated with an
447 IP network connection is recognized as part of a set of alternate settings when its ConfigurationName
448 matches that of other instances with the same ConfigurationName value.

449 6.4 Accumulation of settings (cumulative configuration)

450 An instance of CIM_IPAssignmentSettingData with one or more instances of
451 CIM_IPAssignmentSettingData and its subclasses associated to it via CIM_OrderedComponent,
452 represents an accumulation of settings. This cumulative configuration is used to describe one or more
453 settings that can be applied to an IP network connection. A settings instance that represents an
454 accumulation of settings is indicated by the AddressOrigin value “11” (cumulative configuration).

455 A concurrent settings instance may represent an accumulation of settings and is referred to as a
456 “concurrent accumulation of settings”.

457 An alternate settings instance may represent an accumulation of settings and is referred to as an
458 “alternate accumulation of settings”.

459 7 Implementation

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

7.1 Representing the network connection

7.1.1 CIM_IPNetworkConnection

Zero or more instances of CIM_IPNetworkConnection shall be instantiated. The instances of the CIM_IPNetworkConnection shall be associated with instance of the scoping CIM_ComputerSystem through instance of CIM_HostedAccessPoint.

7.1.2 Managing the CIM_IPNetworkConnection state

An implementation may support management of CIM_IPNetworkConnection state. The abstract Enabled Logical Element Profile specifies requirements for supporting state management in subclasses of CIM_EnabledLogicalElement. The implementation of CIM_IPNetworkConnection shall meet the requirements of the Enabled Logical Element Profile, with CIM_IPNetworkConnection in place of CIM_EnabledLogicalElement.

7.2 Representing the IP version

7.2.1 CIM_IPVersionSettingData

At least one instance of CIM_IPVersionSettingData shall exist in the system. The instances of the CIM_IPVersionSettingData shall be associated to the scoping instance through CIM_ElementSettingData association. The instances of the CIM_IPVersionSettingData shall be associated through CIM_ElementSettingData association to the CIM_IPNetworkConnection instances on which the corresponding IP versions are supported.

7.2.1.1 CIM_IPVersionSettingData.ProtocolIFType

The ProtocolIFType shall have a value of 4096 (IPv4), if the instance represents the IPv4. The ProtocolIFType shall have a value of 4097 (IPv6), if the instance represents the IPv6.

7.3 IP setting

7.3.1 CIM_IPAssignmentSettingData requirements for accumulation of settings, stateless IP assignment settings

Zero or more instance of CIM_IPAssignmentSettingData may exist.

7.3.1.1 CIM_IPAssignmentSettingData.AddressOrigin

The value of the AddressOrigin property shall be 11 (cumulative configuration), when representing an accumulation of settings (refer to 6.4).

The value of the AddressOrigin property shall be 9 (Stateless), when representing an IPv6 stateless setting.

7.3.1.2 CIM_IPAssignmentSettingData.ProtocolIFType

If the value of AddressOrigin property is 9 (Stateless), the value of the ProtocolIFType property shall be 4097 (IPv6).

7.3.1.3 CIM_IPAssignmentSettingData.ConfigurationName

When the value of the AddressOrigin property is 11 (cumulative configuration), this property shall be implemented and shall contain non-null value.

For an instance of CIM_IPNetworkConnection, the instances of the CIM_IPAssignmentSettingData associated with the instance of CIM_IPNetworkConnection, representing the accumulation of settings that are alternate to each other shall have identical non-null value for the ConfigurationName property. For an instance of CIM_IPNetworkConnection, the instances of CIM_IPAssignmentSettingData associated with the instance of CIM_IPNetworkConnection, representing the accumulation of settings that are not alternate for each other, shall not have identical non-null value for the ConfigurationName property.

7.3.2 CIM_ExtendedStaticIPAssignmentSettingData requirements for static IP assignment settings

Zero or more instances of CIM_ExtendedStaticIPAssignmentSettingData may exist.

7.3.2.1 CIM_ExtendedStaticIPAssignmentSettingData.AddressOrigin

The value of the AddressOrigin property shall be 3 (static).

7.3.2.2 CIM_ExtendedStaticIPAssignmentSettingData.ProtocolIFType

The value of the ProtocolIFType property shall be 4096 (IPv4) or 4097 (IPv6).

7.3.2.3 CIM_ExtendedStaticIPAssignmentSettingData.IPAddresses

The value of the IPAddresses property shall be an array of 0 or more IPv4 addresses if the CIM_ExtendedStaticIPAssignmentSettingData.ProtocolIFType property has a value of 4096 (IPv4). The value of the IPAddresses property shall be an array of 0 or more IPv6 addresses if the ProtocolIFType property has a value of 4097 (IPv6).

7.3.2.4 CIM_ExtendedStaticIPAssignmentSettingData.IPv6SubnetPrefixLengths

The value of the IPv6SubnetPrefixLengths property shall be an array of 0 or more IPv6 subnet prefix lengths if the CIM_ExtendedStaticIPAssignmentSettingData.ProtocolIFType property has a value of 4097 (IPv6). Each element in this array shall have a one-to-one correspondence with the IPAddresses property.

If the value of CIM_ExtendedStaticIPAssignmentSettingData.ProtocolIFType is not 4097 (IPv6), the IPv6SubnetPrefixLengths property shall not be specified.

7.3.2.5 CIM_ExtendedStaticIPAssignmentSettingData.SubnetMasks

The value of the SubnetMasks property shall be an array of 0 or more IPv4 subnet masks if the ProtocolIFType property has a value of 4096 (IPv4). Each element in this array shall have a one-to-one correspondence with IPAddresses property.

If the value of CIM_ExtendedStaticIPAssignmentSettingData.ProtocolIFType is not 4096 (IPv4), the SubnetMasks property shall not be specified.

7.3.2.6 CIM_ExtendedStaticIPAssignmentSettingData.GatewayAddresses

The value of the GatewayAddresses property shall be an array of 0 or more IPv4 addresses representing the default gateways, if the ProtocolIFType property has a value of 4096 (IPv4). The value of the GatewayAddresses property shall be an array of 0 or more IPv6 addresses representing the default gateways if the ProtocolIFType property has a value of 4097 (IPv6).

7.3.3 CIM_DHCPSettingData requirements for dynamic IP assignment settings

Zero or more instances of CIM_DHCPSettingData may exist.

7.3.3.1 CIM_DHCPSettingData.AddressOrigin

The value of the AddressOrigin property shall be 4 (DHCP) or 7 (DHCPv6).

7.3.3.2 CIM_DHCPSettingData.ProtocolIFType

If the value of AddressOrigin property is 4 (DHCP), the value of the ProtocolIFType property shall be 4096 (IPv4). If the value of AddressOrigin property is 7 (DHCPv6), the value of the ProtocolIFType property shall be 4097 (IPv6).

7.4 Representation of current and pending settings

7.4.1 CIM_ElementSettingData

7.4.1.1 CIM_ElementSettingData.IsCurrent

For current settings (or accumulation of settings), the CIM_ElementSettingData.IsCurrent property shall have a value of 1 (Is Current). For settings (or accumulation of settings) that are not current, CIM_ElementSettingData.IsCurrent property shall have a value of 2 (Is Not Current).

7.4.1.2 CIM_ElementSettingData.IsNext

For pending settings (or accumulation of settings), the CIM_ElementSettingData.IsNext property shall be 1 (Is Next) or 3 (Is Next For Single Use). For settings (or accumulation of settings) that are not pending, CIM_ElementSettingData.IsNext property shall have a value of 2 (Is Not Next).

7.4.2 Modification of CIM_SettingData

Properties of the setting instances may be modified by modify instance operation. The modify instance operation shall fail, if changing properties of specific instance is not supported.

Modification of properties of current settings, takes effect immediately on the Managed Element. The modify instance operation shall fail, if changing of the current settings for the Managed Element is not supported.

7.5 Representation settings of a network connection

7.5.1 Concurrent settings

When concurrent settings exists, the instances of CIM_IPAssignmentSettingData and its subclasses representing concurrent settings for a network connection shall be associated via CIM_ElementSettingData to the corresponding instances of CIM_IPNetworkConnection.

7.5.2 Accumulation of settings

When accumulation of settings (refer to 6.4) exists, the instances of CIM_IPAssignmentSettingData with AddressOrigin as 11 (cumulative configuration) representing the accumulation of settings shall be associated via CIM_ElementSettingData to the corresponding instance of CIM_IPNetworkConnection.

Following requirements applies to instances of CIM_IPAssignmentSettingData with value of AddressOrigin property as 11 (cumulative configuration) having identical non-null value for ConfigurationName property (refer to 6.4 and 7.3.1.3):

- Exactly one of the above instances of CIM_IPAssignmentSettingData shall be associated to the central class instance through an instance of CIM_ElementSettingData whose IsCurrent property has the value 1 (Is Current).

- Exactly one of the above instances of CIM_IPAssignmentSettingData shall be associated to the central class instance through an instance of CIM_ElementSettingData whose IsNext property has the value 1 (Is Next).

- Exactly one of the above instances of CIM_IPAssignmentSettingData may be associated to the central class instance through an instance of CIM_ElementSettingData whose IsNext property has the value 3 (Is Next For Single Use).

- If an instance of CIM_IPAssignmentSettingData is associated with the central class instance through an instance of CIM_ElementSettingData whose IsNext property has the value 3 (Is Next For Single Use), this instance of CIM_IPAssignmentSettingData shall represent the pending configuration. If no instance of CIM_IPAssignmentSettingData is associated with the central class instance through an instance of CIM_ElementSettingData whose IsNext property has the value 3 (Is Next For Single Use), the instance of CIM_IPAssignmentSettingData that is associated with the Central Instance through an instance of CIM_ElementSettingData whose IsNext property has the value 1 (Is Next) shall represent the pending configuration.

7.5.2.1 Associating settings using CIM_OrderedComponent

The instances of the CIM_IPAssignmentSettingData and its subclasses that are part of a cumulative configuration shall be associated with one or more of the above instances of CIM_IPAssignmentSettingData via CIM_OrderedComponent.

7.5.2.1.1 CIM_OrderedComponent.GroupComponent

An instance of CIM_IPAssignmentSettingData or its subclasses, whose AddressOrigin property has the value 11 (cumulative configuration) shall be the value of the GroupComponent property of an instance of CIM_OrderedComponent.

7.5.2.1.2 CIM_OrderedComponent.PartComponent

An instance of CIM_IPAssignmentSettingData or its subclasses whose AddressOrigin property is not having the value 11 (cumulative configuration), shall be the value of the PartComponent property of an instance of CIM_OrderedComponent.

7.5.2.1.3 CIM_OrderedComponent.AssignedSequence

The relative value of the CIM_OrderedComponent.AssignedSequence property shall indicate the order in which the settings are applied to their associated CIM_IPNetworkConnection instances.

7.6 Representing the IP interface

7.6.1 CIM_IPProtocolEndpoint

Zero or more instances of CIM_IPProtocolEndpoint may exist.

The following behavior is conditional on the existence of instances of CIM_IPProtocolEndpoint. Instances of CIM_IPProtocolEndpoint may be associated with CIM_ComputerSystem via CIM_HostedAccessPoint. Instances of CIM_IPProtocolEndpoint shall be associated with CIM_IPNetworkConnection via CIM_SAPSAPDependency, where the CIM_IPProtocolEndpoint is the Dependent.

7.6.1.1 CIM_IPProtocolEndpoint.AddressOrigin

7.6.1.1.1 AddressOrigin — Static

A value of 3 (Static) shall indicate that this instance of CIM_IPProtocolEndpoint was assigned statically.

7.6.1.1.2 AddressOrigin — DHCPv4

A value of 4 (DHCP) shall indicate that this instance of CIM_IPProtocolEndpoint was obtained through an associated DHCP client. The AddressOrigin property shall have a value of 4 (DHCP) when the configuration is the result of an instance of CIM_DHCPSettingData representing the DHCP client settings for IPv4 being successfully applied.

7.6.1.1.3 AddressOrigin — DHCPv6

A value of 7 (DHCPv6) shall indicate that this instance of CIM_IPProtocolEndpoint was obtained through an associated DHCP client for IPv6. The AddressOrigin property shall have a value of 7 (DHCPv6) when the configuration is the result of an instance of CIM_DHCPSettingData representing the DHCP client settings for IPv6 being successfully applied.

7.6.1.1.4 AddressOrigin — Stateless

A value of 9 (Stateless) shall indicate that this instance of CIM_IPProtocolEndpoint was generated automatically through the router advertisement messages.

7.6.1.1.5 AddressOrigin — Link Local

A value of 10 (Link Local) shall indicate that this instance of CIM_IPProtocolEndpoint was configured with a Link Local address automatically by the local host.

7.6.1.2 CIM_IPProtocolEndpoint.ProtocolIFType

The ProtocolIFType property shall indicate the current IP address type. The value of CIM_IPProtocolEndpoint.ProtocolIFType shall be 4096 (IPv4) or 4097 (IPv6).

If the value is 4096 (IPv4), the IPv4Address and SubnetMask properties shall be implemented.

If the value is 4097 (IPv6), the IPv6Address and IPv6SubnetPrefixLength properties shall be implemented.

7.6.1.3 CIM_IPProtocolEndpoint.IPv4Address

If the value of CIM_IPProtocolEndpoint.ProtocolIFType is 4096 (IPv4), the IPv4Address property shall indicate the current IPv4 address assigned to this IP endpoint. The value of the property shall be specified in dotted decimal notation as defined in IETF RFC1208. A value of 0.0.0.0 shall indicate that a valid IP address is not assigned to this IP endpoint.

If the value of CIM_IPProtocolEndpoint.ProtocolIFType is not 4096 (IPv4), the IPv4Address property shall not be specified.

7.6.1.4 CIM_IPProtocolEndpoint.SubnetMask

If the value of CIM_IPProtocolEndpoint.ProtocolIFType is 4096 (IPv4), the SubnetMask property shall be specified by using dotted decimal notation as defined in IETF RFC1208. A value of 0.0.0.0 shall indicate that a valid subnet mask is not assigned to this IP endpoint.

If the value of CIM_IPProtocolEndpoint.ProtocolIFType is not 4096 (IPv4), the SubnetMask property shall not be specified.

7.6.1.5 CIM_IPProtocolEndpoint.IPv6Address

If the value of CIM_IPProtocolEndpoint.ProtocolIFType is 4097 (IPv6), the IPv6Address property shall indicate the current IPv6 address assigned to this IP endpoint. The value of the property shall be specified in the notation specified in IETF RFC4291, section 2.2.

If the value of CIM_IPProtocolEndpoint.ProtocolIFType is not 4097 (IPv6), the IPv6Address property shall not be specified.

7.6.1.6 CIM_IPProtocolEndpoint. IPv6SubnetPrefixLength

If the value of CIM_IPProtocolEndpoint.ProtocolIFType is 4097 (IPv6), the IPv6SubnetPrefixLength property shall indicate the prefix length used to specify the subnet.

If the value of CIM_IPProtocolEndpoint.ProtocolIFType is not 4097 (IPv6), the IPv6SubnetPrefixLength property shall not be specified.

7.7 IP configuration management

7.7.1 Configuration management is supported (optional)

When an implementation supports management of IP configuration, there shall be one or more instances of CIM_IPConfigurationService, which has methods to perform configuration management on the CIM_ComputerSystem and CIM_IPNetworkConnection. These instances shall be associated with the scoping instance through CIM_HostedService association.

If the configuration management is supported on the CIM_ComputerSystem, it shall be associated via CIM_ServiceAffectsElement to the instances of the CIM_IPConfigurationService that can configure it. The CIM_IPConfigurationService.ApplySettingToComputerSystem method shall be used to enable or disable the CIM_IPVersionSettingData on the CIM_ComputerSystem.

If the configuration management is supported on an instance of CIM_IPNetworkConnection, it shall be associated via CIM_ServiceAffectsElement to the instances of the CIM_IPConfigurationService that can configure it. The CIM_IPConfigurationService.ApplySettingToIPNetworkConnection method shall be used to enable or disable the CIM_IPVersionSettingData or CIM_IPAssignmentSettingData or its subclasses on the CIM_IPNetworkConnection.

The above methods change IsNext and/or IsCurrent property of the CIM_ElementSettingData instance associating the Managed Element with the setting. These methods are needed only when the IsCurrent or IsNext property of CIM_ElementSettingData instance needs to be modified.

7.8 DHCP client

The representation of DHCP client is optional.

7.8.1 CIM_DHCPProtocolEndpoint

Zero or more instances of CIM_DHCPProtocolEndpoint may exist. Instances of CIM_DHCPProtocolEndpoint shall be associated with CIM_IPNetworkConnection via CIM_SAPSAPDependency, where the CIM_DHCPProtocolEndpoint is the Dependent. Each instance of CIM_IPProtocolEndpoint whose IP address is assigned by DHCP may be associated with a corresponding instance of CIM_DHCPProtocolEndpoint, via CIM_SAPSAPDependency, where the CIM_IPProtocolEndpoint is the Dependent. The instances of CIM_DHCPProtocolEndpoint may be associated to CIM_ComputerSystem via CIM_HostedAccessPoint. Each CIM_DHCPProtocolEndpoint may be associated to zero or more instances of CIM_DHCPSettingData, which is a current setting (either concurrent or alternate) for the CIM_IPNetworkConnection associated to the above CIM_DHCPProtocolEndpoint via CIM_ElementSettingData association.

7.9 DNS client and configuration

The representation of DNS client and its configuration is optional.

7.9.1 CIM_DNSProtocolEndpoint

Zero or more instances of CIM_DNSProtocolEndpoint may exist. The instances of CIM_DNSProtocolEndpoint shall be associated to CIM_ComputerSystem via CIM_HostedAccessPoint.

7.9.2 CIM_DNSSettingData

Zero or more instances of CIM_DNSSettingData may exist. The instances of CIM_DNSSettingData shall be modeled either as concurrent setting or as alternate settings for CIM_IPNetworkConnection or as a setting for CIM_DNSProtocolEndpoint. The instances of CIM_DNSSettingData that are modeled as settings for CIM_IPNetworkConnection may be associated to CIM_DNSProtocolEndpoint, via CIM_ElementSettingData.

7.9.2.1 CIM_DNSSettingData.AddressOrigin

The value of the AddressOrigin property shall be 2 (Not Applicable).

7.9.2.2 CIM_DNSSettingData.ProtocolIFType

The value of the ProtocolIFType property shall be 4096 (IPv4) or 4097 (IPv6).

7.9.2.3 CIM_DNSSettingData.DNSServerAddresses

The DNSServerAddresses property indicates the DNS servers statically configured. The value of the DNSServerAddresses property shall be an array of 0 or more IPv4 addresses if the CIM_DNSSettingData.ProtocolIFType property has a value of 4096 (IPv4). The value of the DNSServerAddresses property shall be an array of 0 or more IPv6 addresses if the CIM_DNSSettingData.ProtocolIFType property has a value of 4097 (IPv6).

7.9.3 CIM_DNSGeneralSettingData

Zero or more instances of CIM_DNSGeneralSettingData may exist. Only one of them may be associated to the instance of CIM_ComputerSystem through an instance of CIM_ElementSettingData whose IsCurrent property has the value 1(Is Current). Only one of them may be associated to the instance of CIM_ComputerSystem through an instance of CIM_ElementSettingData whose IsNext property has the value 1(Is Next).

7.10 Relationship with a network interface

An IP interface is generally bound to an underlying layer 2 network interface. The underlying layer 2 network interface might participate in a LAN and be modeled using a specialization of *Host LAN Network Port Profile* (DSP1035). When the underlying network interface is modeled with instrumentation compliant with a specialization of DSP1035, following requirements applies.

The instance of CIM_IPNetworkConnection shall be associated with instances of CIM_LANEndpoint and/or with instances of CIM_VLANEndpoint via CIM_EndpointForIPNetworkConnection, where the CIM_IPNetworkConnection is the Dependent. The instances of CIM_IPProtocolEndpoint may be associated with instances of CIM_LANEndpoint via CIM_BindsToLANEndpoint, and/or with instances of CIM_VLANEndpoint via CIM_BindsTo, where CIM_IPProtocolEndpoint is the Dependent.

7.11 Remote services

7.11.1 Default gateway

A network connection can be configured with the addresses of network gateways. Modeling of default gateways is optional.

7.11.1.1 CIM_RemoteServiceAccessPoint

7.11.1.1.1 CIM_RemoteServiceAccessPoint.AccessContext

For the instances of CIM_RemoteServiceAccessPoint representing default gateways, the value for AccessContext property shall be 2 (Default Gateway).

7.11.1.1.2 CIM_RemoteServiceAccessPoint.AccessInfo

For IPv4 gateways, the value of the AccessInfo property shall be the IPv4 address of the default gateway. The value shall be specified in dotted decimal notation as defined in IETF RFC1208.

For IPv6 gateways, the value of the AccessInfo property shall be the IPv6 address of the default gateway. The value shall be specified in the IPv6 notation as defined in IETF RFC4291.

7.11.1.2 CIM_RemoteAccessAvailableToElement

If modeled, the instances of CIM_RemoteServiceAccessPoint representing default gateways for a network connection shall be associated via CIM_RemoteAccessAvailableToElement to the corresponding instance of CIM_IPNetworkConnection. The instances of CIM_RemoteServiceAccessPoint representing the gateways may be associated to Scoping instance using CIM_RemoteAccessAvailableToElement.

7.11.1.2.1 CIM_RemoteAccessAvailableToElement.Antecedent

The value of the Antecedent reference shall be the instance of CIM_RemoteServiceAccessPoint.

7.11.1.2.2 CIM_RemoteAccessAvailableToElement.Dependent

The value of the Dependent reference shall be the instance of CIM_IPNetworkConnection or CIM_System or its subclasses.

7.11.1.2.3 CIM_RemoteAccessAvailableToElement.OrderOfAccess

CIM_RemoteAccessAvailableToElement.OrderOfAccess can be used to represent the list of default gateways in priority order.

7.11.2 DHCP servers

Modeling of the DHCP servers is optional.

7.11.2.1 CIM_RemoteServiceAccessPoint

7.11.2.1.1 CIM_RemoteServiceAccessPoint.AccessContext

For the instances of CIM_RemoteServiceAccessPoint representing DHCP Servers, the value for AccessContext property shall be 6 (DHCP Server).

7.11.2.1.2 CIM_RemoteServiceAccessPoint.AccessInfo

For IPv4 DHCP Servers, the value of the AccessInfo property shall be the IPv4 address of the DHCP Server. The value shall be specified in dotted decimal notation as defined in IETF RFC1208.

For IPv6 DHCP Servers, the value of the AccessInfo property shall be the IPv6 address of the DHCP Server. The value shall be specified in the IPv6 notation as defined in IETF RFC4291.

7.11.2.2 CIM_RemoteAccessAvailableToElement

CIM_DHCPProtocolEndpoint and CIM_RemoteServiceAccessPoint representing the DHCP servers shall be associated by using CIM_RemoteAccessAvailableToElement, if both are modeled and their

corresponding instances exist. The instances of CIM_RemoteServiceAccessPoint representing the DHCP servers may be associated to Scoping instance by using CIM_RemoteAccessAvailableToElement.

7.11.2.2.1 CIM_RemoteAccessAvailableToElement.Antecedent

The value of the Antecedent reference shall be the instance of CIM_RemoteServiceAccessPoint.

7.11.2.2.2 CIM_RemoteAccessAvailableToElement.Dependent

The value of the Dependent reference shall be the instance of CIM_DHCPProtocolEndpoint or CIM_System or its subclasses.

7.11.3 DNS servers

Modeling of the DNS servers is optional.

7.11.3.1 CIM_RemoteServiceAccessPoint

7.11.3.1.1 CIM_RemoteServiceAccessPoint.AccessContext

For the instances of CIM_RemoteServiceAccessPoint representing DNS servers, the value for AccessContext property shall be 3 (DNS Server).

7.11.3.1.2 CIM_RemoteServiceAccessPoint.AccessInfo

For IPv4 DNS servers, the value of the AccessInfo property shall be the IPv4 address of the DNS server. The value shall be specified in dotted decimal notation as defined in IETF RFC1208.

For IPv6 DNS servers, the value of the AccessInfo property shall be the IPv6 address of the DNS server. The value shall be specified in the IPv6 notation as defined in IETF RFC4291.

7.11.3.2 CIM_RemoteAccessAvailableToElement

CIM_DNSProtocolEndpoint and CIM_RemoteServiceAccessPoint representing the DNS servers shall be associated by using CIM_RemoteAccessAvailableToElement, if both are modeled and their corresponding instances exist. The instances of CIM_RemoteServiceAccessPoint representing the DNS servers may be associated to Scoping instance by using CIM_RemoteAccessAvailableToElement.

7.11.3.2.1 CIM_RemoteAccessAvailableToElement.Antecedent

The value of the Antecedent reference shall be the instance of CIM_RemoteServiceAccessPoint.

7.11.3.2.2 CIM_RemoteAccessAvailableToElement.Dependent

The value of the Dependent reference shall be the instance of CIM_DNSProtocolEndpoint or CIM_System or its subclasses.

7.11.3.2.3 CIM_RemoteAccessAvailableToElement.OrderOfAccess

CIM_RemoteAccessAvailableToElement.OrderOfAccess can be used to represent the list of DNS servers in priority order.

7.11.3.3 CIM_SAPSAPDependency

The CIM_RemoteServiceAccessPoint instances representing the DNS servers may be associated via CIM_SAPSAPDependency to the corresponding instances of CIM_IPNetworkConnection representing the network connection that added the DNS server in the configuration, with CIM_IPNetworkConnection as the Antecedent and CIM_RemoteServiceAccessPoint as Dependent.

For the DNS servers added by DHCP, the CIM_RemoteServiceAccessPoint instances representing the DNS servers may be associated via CIM_SAPSAPDependency to the corresponding instances CIM_DHCPProtocolEndpoint, with CIM_DHCPProtocolEndpoint as the Antecedent and CIM_RemoteServiceAccessPoint as Dependent.

8 Methods

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

8.1 CIM_IPConfigurationService.ApplySettingToIPNetworkConnection()

The CIM_IPConfigurationService.ApplySettingToIPNetworkConnection( ) method is used to enable or disable a SettingData, as represented by an instance of CIM_IPAssignmentSettingData and/or the IPVersionSettingData represented by an instance of CIM_IPVersionSettingData, to the specified IPNetworkConnection, represented by an instance of CIM_IPNetworkConnection. Implementation of this method is optional.

Detailed requirements of the ApplySettingToIPNetworkConnection( ) method are specified in Table 2, Table 3, Table 4,and Table 5. From the optional IN parameters, SettingData and IPVersionSettingData, at least one shall be specified.

Table 2 – CIM_IPConfigurationService.ApplySettingToIPNetworkConnection( ) method: Return code values

Value	Description
0	Request was successfully executed.
1	Unsupported.
2	Failed.
4096	Input parameters have been validated and a job started to apply the setting (or accumulation of settings).

Table 3 – CIM_IPConfigurationService.ApplySettingToIPNetworkConnection( ) method: Standard messages

(return) Message ID	Message
WIPG0213	CIM instance not found
WIPG0219	CIM method not supported by CIM class implementation

Table 4 – CIM_IPConfigurationService.ApplySettingToIPNetworkConnection( ) method: Parameters

Qualifiers	Name	Type	Description/Values
IN	SettingData	CIM_IPAssignmentSettingData REF	The settings to apply
IN	IPVersionSettingData	CIM_IPVersionSettingData REF	The IPVersionSettingData to apply
IN, REQ	IPNetworkConnection	CIM_IPNetworkConnection REF	The IPNetworkConnection to which the setting will be applied

Qualifiers	Name	Type	Description/Values
IN, REQ	Mode	uint16	The mode in which the setting (or accumulation of settings) needs to be applied to the IPNetworkConnection
OUT	Job	CIM_ConcreteJob REF	Returned if job started

The CIM_IPConfigurationService.ApplySettingToIPNetworkConnection( ) method shall be implemented as follows:

- The implementation shall validate that an instance of CIM_ServiceAffectsElement references the CIM_IPConfigurationService instance and the CIM_IPNetworkConnection instance that is identified by the IPNetworkConnection parameter to the method. If the association does not exist, the return code of the method shall be 2 (Failed).
- The implementation shall validate that an instance of CIM_ElementSettingData associates the instance of CIM_IPNetworkConnection that is identified by the IPNetworkConnection parameter with the instance of CIM_IPAssignmentSettingData that is identified by the SettingData parameter and/or with the instance of CIM_IPVersionSettingData, that is identified by the IPVersionSettingData parameter. If the association does not exist, the return code of the method shall be 2 (Failed).

When the parameters have been validated and the method is applying the settings, the method shall apply the settings as specified in the Mode parameter. The state transitions specified in Table 5 – CIM_IPConfigurationService.ApplySettingToIPNetworkConnection( ) method: Mode shall complete when the return value is 0 (Completed with No Error). When the return value is 4096 (Job Started), state transitions specified in Table 5 – CIM_IPConfigurationService.ApplySettingToIPNetworkConnection( ) method: Mode shall be complete when the Job is completed successfully.

Table 5 – CIM_IPConfigurationService.ApplySettingToIPNetworkConnection( ) method: Mode

Mode	Request	End-State	Interpretation
0	Apply, if possible; mark 'Next to Apply' if not	See Modes 1 and 2	Depending on capability of CIM_IPNetworkConnection, apply settings immediately, or mark settings to be applied later
1	Apply Settings	IsCurrent==1, IsNext==1	Settings were applied by the CIM_IPNetworkConnection. Settings will be (re)applied at next state change
2	Mark Settings as Next to Apply	IsNext==1	Settings are not immediately applied but will be (re)applied at the next appropriate CIM_IPNetworkConnection state change
3	Remove these settings, if possible; or mark 'Not Next to Apply' if not	See Modes 4 and 5	Depending on capability of CIM_IPNetworkConnection, remove settings immediately, or mark settings to be removed later
4	Remove Settings	IsCurrent==2, IsNext==2	Settings are removed immediately by the CIM_IPNetworkConnection and are no longer current Settings are not (re)applied at next state change
5	Mark Settings as Not Next to Apply	IsNext==2	Current settings are unaffected. Settings are removed and not (re)applied at next state change
6	Mark Settings as Next to Apply – Single Use	IsNext==3	Settings are applied at next state change to be used once and not reapplied on future state changes

8.2 CIM_IPConfigurationService.ApplySettingToComputerSystem( )

The CIM_IPConfigurationService.ApplySettingToComputerSystem( ) method is used to enable or disable the IPVersionSettingData represented by an instance CIM_IPVersionSettingData, to the specified

Computer System, represented by an instance of CIM_ComputerSystem. Implementation of this method is optional.

Detailed requirements of the ApplySettingToComputerSystem( ) method are specified in Table 6, Table 7, Table 8, and Table 9.

Table 6 – CIM_IPConfigurationService.ApplySettingToComputerSystem( ) method: Return code values

Value	Description
0	Request was successfully executed.
1	Unsupported.
2	Failed.
4096	Input parameters have been validated and a job started to apply the setting.

Table 7– CIM_IPConfigurationService.ApplySettingToComputerSystem( ) method: Standard messages

(return) Message ID	Message
WIPG0213	CIM instance not found
WIPG0219	CIM method not supported by CIM class implementation

Table 8 – CIM_IPConfigurationService.ApplySettingToComputerSystem( ) method: Parameters

Qualifiers	Name	Type	Description/Values
IN, REQ	IPVersionSettingData	CIM_IPVersionSettingData REF	The IPVersionSettingData to apply
IN, REQ	ComputerSystem	CIM_ComputerSystem REF	The Computer System to which the setting will be applied
IN, REQ	Mode	uint16	The mode in which the setting needs to be applied to the ComputerSystem
OUT	Job	CIM_ConcreteJob REF	Returned if job started

The CIM_IPConfigurationService.ApplySettingToComputerSystem( ) method shall be implemented as follows:

- The implementation shall validate that an instance of CIM_ServiceAffectsElement references the CIM_IPConfigurationService instance and the CIM_ComputerSystem instance that is identified by the ComputerSystem parameter to the method. If the association does not exist, the return code of the method shall be 2 (Failed).
- The implementation shall validate that an instance of CIM_ElementSettingData associates the instance of CIM_ComputerSystem that is identified by the ComputerSystem parameter with the instance of CIM_IPVersionSettingData that is identified by the IPVersionSettingData parameter. If the association does not exist, the return code of the method shall be 2 (Failed).

When the parameters have been validated and the method is applying the settings, the method shall apply the settings as specified in the Mode parameter. The state transitions specified in Table 9 – CIM_IPConfigurationService.ApplySettingToComputerSystem( ) method: Mode shall be complete when the return value is 0 (Completed with No Error). When the return value is 4096 (Job Started), state

869 transitions specified in Table 9 – CIM_IPConfigurationService.ApplySettingToComputerSystem( ) method:
870 Mode shall be complete when the Job is completed successfully.

871 **Table 9 – CIM_IPConfigurationService.ApplySettingToComputerSystem( ) method: Mode**

Mode	Request	End-State	Interpretation
0	Apply, if possible; mark 'Next to Apply' if not	See Modes 1 and 2	Depending on capability of CIM_ComputerSystem, apply settings immediately, or mark settings to be applied later
1	Apply Settings	IsCurrent==1, IsNext==1	Settings were applied by the CIM_ComputerSystem. Settings will be (re)applied at next state change
2	Mark Settings as Next to Apply	IsNext==1	Settings are not immediately applied but will be (re)applied at the next appropriate CIM_ComputerSystem state change
3	Remove these settings, if possible; or mark 'Not Next to Apply' if not	See Modes 4 and 5	Depending on capability of CIM_ComputerSystem, remove settings immediately, or mark settings to be removed later
4	Remove Settings	IsCurrent==2, IsNext==2	Settings are removed immediately by the CIM_ComputerSystem and are no longer current Settings are not (re)applied at next state change
5	Mark Settings as Not Next to Apply	IsNext==2	Current settings are unaffected. Settings are removed and not (re)applied at next state change
6	Mark Settings as Next to Apply – Single Use	IsNext==3	Settings are applied at next state change to be used once and not reapplied on future state changes

872 ## 8.3 Profile conventions for operations

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

875 The default list of operations is as follows:

876 • GetInstance
877 • EnumerateInstances
878 • EnumerateInstanceNames
879 • Associators
880 • AssociatorNames
881 • References
882 • ReferenceNames

883 ## 8.4 CIM_BindsTo

884 Table 10 lists operations that either have special requirements beyond those from DSP0200 or shall not
885 be supported.

886 **Table 10 – Operations: CIM_BindsTo**

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

8.5 CIM_BindsToLANEndpoint

Table 11 lists operations that either have special requirements beyond those from DSP0200 or shall not be supported.

Table 11 – Operations: CIM_BindsToLANEndpoint

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

8.6 CIM_DHCPProtocolEndpoint

All operations in the default list in 8.3 shall be implemented as defined in DSP0200.

8.7 CIM_DHCPSettingData

Table 12 lists operations that either have special requirements beyond those from DSP0200 or shall not be supported

Table 12 – Operations: CIM_DHCPSettingData

Operation	Requirement	Messages
ModifyInstance	Optional	None

8.8 CIM_DNSGeneralSettingData

Table 13 lists operations that either have special requirements beyond those from DSP0200 or shall not be supported.

Table 13 – Operations: CIM_DNSGeneralSettingData

Operation	Requirement	Messages
ModifyInstance	Optional	None

8.9 CIM_DNSProtocolEndpoint

All operations in the default list in 8.3 shall be implemented as defined in DSP0200.

8.10 CIM_DNSSettingData

Table 14 lists operations that either have special requirements beyond those from DSP0200 or shall not be supported.

Table 14 – Operations: CIM_DNSSettingData

Operation	Requirement	Messages
ModifyInstance	Optional	None

8.11 CIM_ElementSettingData

Table 15 lists operations that either have special requirements beyond those from DSP0200 or shall not be supported.

Table 15 – Operations: CIM_ElementSettingData

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

8.12 CIM_EndpointForIPNetworkConnection

Table 16 lists operations that either have special requirements beyond those from DSP0200 or shall not be supported.

Table 16 – Operations: CIM_EndpointForIPNetworkConnection

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

8.13 CIM_ExtendedStaticIPAssignmentSettingData

Table 17 lists operations that either have special requirements beyond those from DSP0200 or shall not be supported.

Table 17 – Operations: CIM_ExtendedStaticIPAssignmentSettingData

Operation	Requirement	Messages
ModifyInstance	Optional	None

8.14 CIM_HostedAccessPoint

Table 18 lists operations that either have special requirements beyond those from DSP0200 or shall not be supported.

Table 18 – Operations: CIM_HostedAccessPoint

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

8.15 CIM_HostedService

Table 19 lists operations that either have special requirements beyond those from DSP0200 or shall not be supported.

Table 19 – Operations: CIM_HostedService

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

8.16 CIM_IPAssignmentSettingData

All operations in the default list in 8.3 shall be implemented as defined in DSP0200.

8.17 CIM_IPConfigurationService

All operations in the default list in 8.3 shall be implemented as defined in DSP0200.

8.18 CIM_IPNetworkConnection

All operations in the default list in 8.3 shall be implemented as defined in DSP0200.

8.19 CIM_IPProtocolEndpoint

All operations in the default list in 8.3 shall be implemented as defined in DSP0200.

8.20 CIM_IPVersionSettingData

All operations in the default list in 8.3 shall be implemented as defined in DSP0200.

8.21 CIM_OrderedComponent

Table 20 lists operations that either have special requirements beyond those from DSP0200 or shall not be supported.

Table 20 – Operations: CIM_OrderedComponent

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

8.22 CIM_RemoteAccessAvailableToElement

Table 21 lists operations that either have special requirements beyond those from DSP0200 or shall not be supported.

944 **Table 21 – Operations: CIM_RemoteAccessAvailableToElement**

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

945 ## 8.23 CIM_RemoteServiceAccessPoint

946 All operations in the default list in 8.3 shall be implemented as defined in DSP0200.

947 ## 8.24 CIM_SAPSAPDependency

948 Table 22 lists operations that either have special requirements beyond those from DSP0200 or shall not
949 be supported.

950 **Table 22 – Operations: CIM_SAPSAPDependency**

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

951 ## 8.25 CIM_ServiceAffectsElement

952 Table 23 lists operations that either have special requirements beyond those from DSP0200 or shall not
953 be supported.

954 **Table 23 – Operations: CIM_ServiceAffectsElement**

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

9 Use cases

This clause contains object diagrams and use cases for the *IP Configuration Profile*.

9.1 Miscellaneous object diagrams

The object diagram in Figure 2 shows one possible method for advertising profile conformance. The instances of CIM_RegisteredProfile are used to identify the version of the *IP Configuration Profile* with which an instance of CIM_IPNetworkConnection and its associated instances are conformant. An instance of CIM_RegisteredProfile exists for each profile that is instrumented in the system. One instance of CIM_RegisteredProfile identifies the DMTF *Base Server Profile,* version 1.0.0. The other instance identifies the DMTF *IP Configuration Profile,* version 1.0.0. The CIM_IPNetworkConnection instance is scoped to an instance of CIM_ComputerSystem. This instance of CIM_ComputerSystem is conformant with the DMTF *Base Server Profile,* version 1.0.0 as indicated by the CIM_ElementConformsToProfile association to the CIM_RegisteredProfile instance.

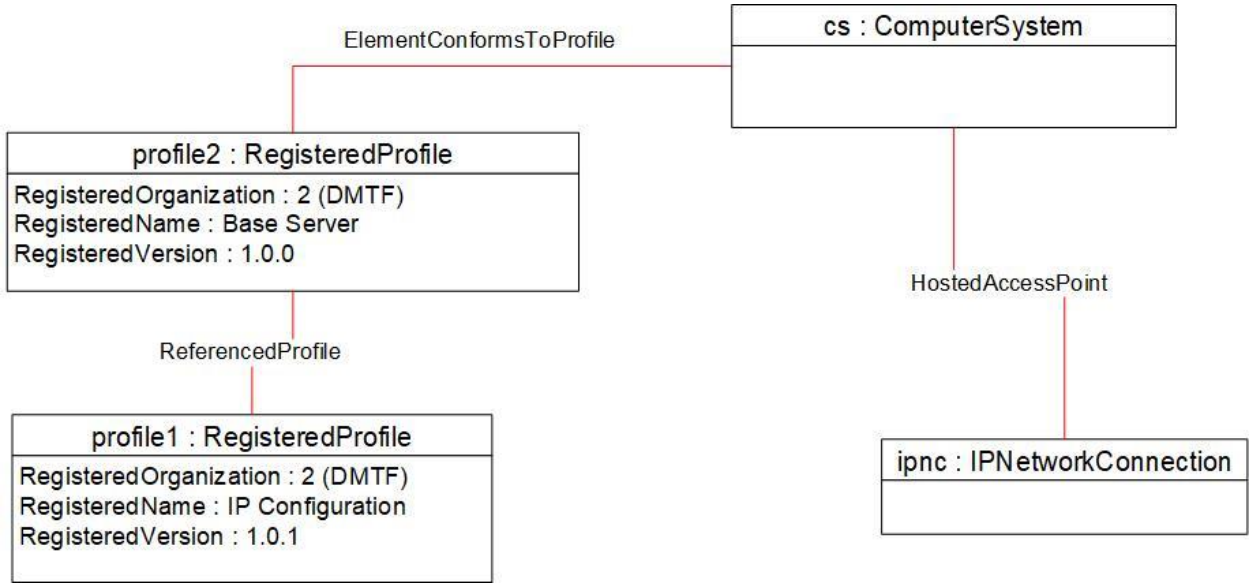


Figure 2 – Registered profile

9.2 Configuration

The object diagram shown in Figure 3 contains the basic elements used to model an IP configuration on a system, while the system is coming up and network devices are not yet detected. The system has two network cards. On this system:

- IPv4 is having alternate accumulation of settings. IPv4 settings are associated to instances of CIM_IPAssignmentSettingData representing the accumulation of settings. The instances representing alternate accumulation of settings for IPNetworkConnection-1 and IPNetworkConnection-2 contain the values “IPv4C1” and “IPv4C2” for ConfigurationName, respectively.

- IPv6 has concurrent settings. IPv6 settings are directly associated to CIM_IPNetworkConnection instance.
- IPv4 settings are considered Pending. They take effect only on the restart of the system or device.
- IPv6 settings are considered immediate. It takes effect immediately.
- IPv4 and IPv6 are currently enabled on the system. CIM_ElementSettingData associating the CIM_IPVersionSettingData for IPv4 and IPv6 with CIM_ComputerSystem has IsCurrent=1
- For IPNetworkConnection-1, IPv4 is currently disabled. IPv6 is currently enabled. This is shown by values of IsCurrent of CIM_ElementSettingData associating the CIM_IPNetworkConnection with IPVersionSettingData instances.
- For IPNetworkConnection-2, IPv4 is currently enabled. IPv6 is currently disabled. This is shown by values of IsCurrent of CIM_ElementSettingData associating the CIM_IPNetworkConnection with IPVersionSettingData instances.

To better show the objects, the diagram in Figure 4 shows the configuration for the IPNetworkConnection-1 and Figure 5 shows the configuration for IPNetworkConnection-2.

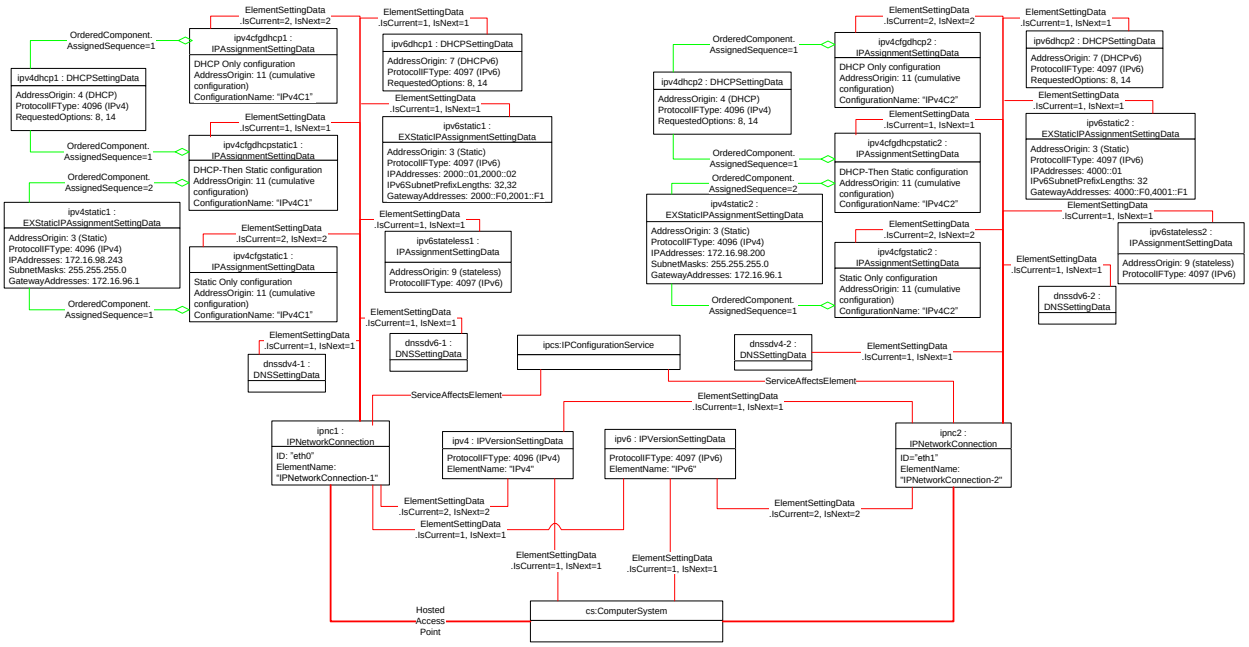
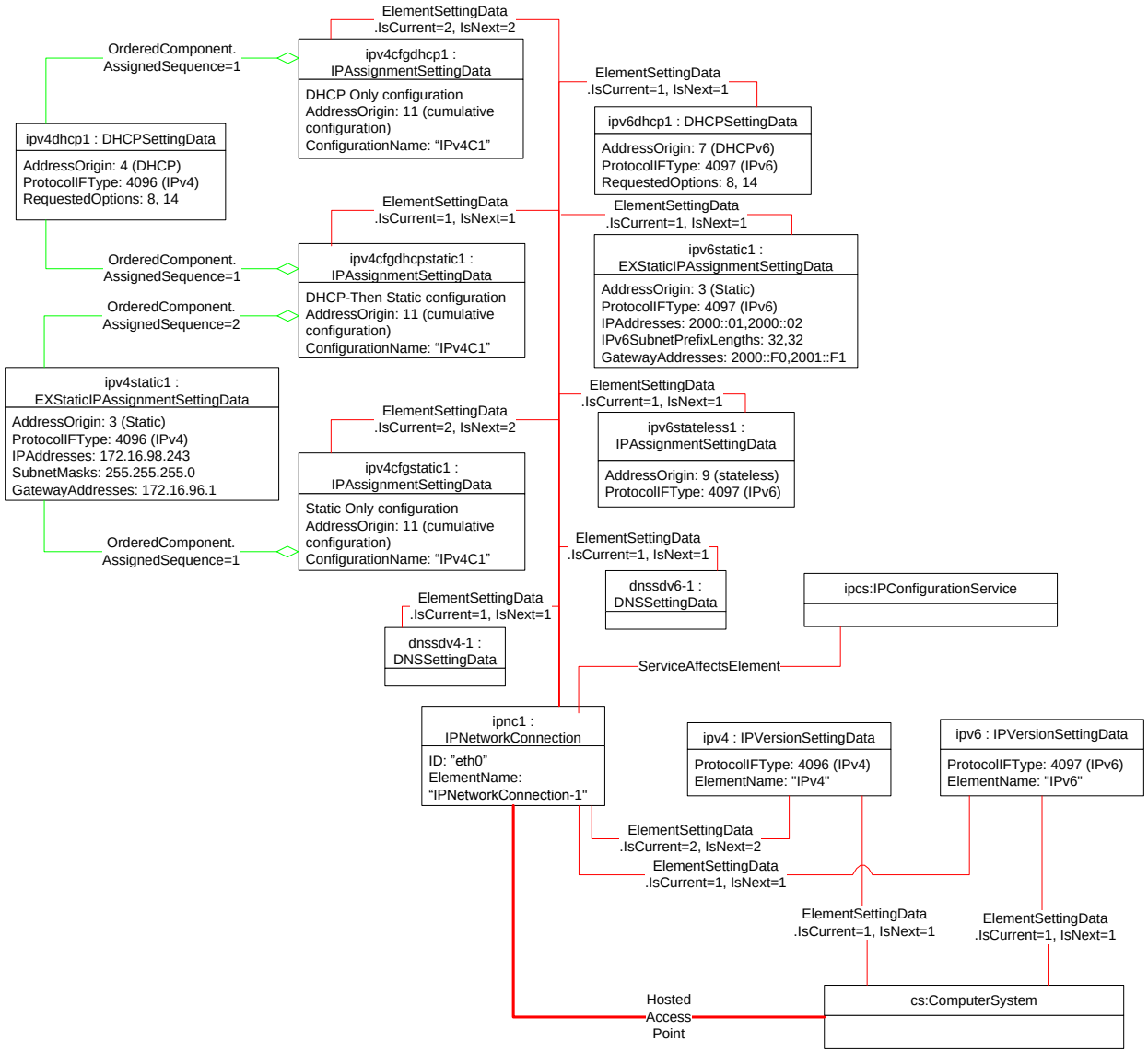


Figure 3 – Configuration

997



998

999 **Figure 4 – Configuration with IPNetworkConnection-1**

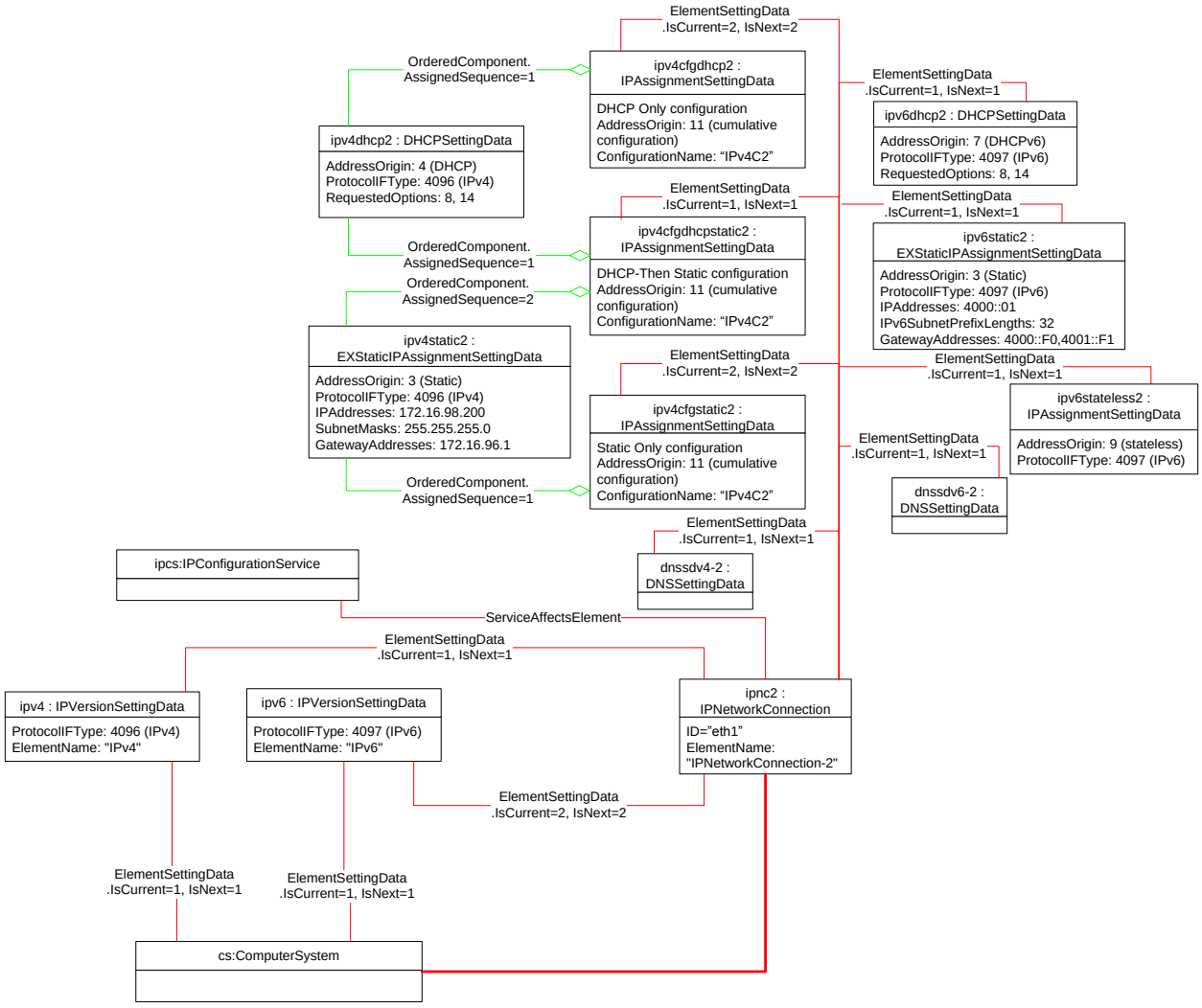


Figure 5 – Configuration with IPNetworkConnection-2

9.3 Dynamics – Booting of the system

The object diagram shown in Figure 6 is a continuation of use case in Figure 3 as the network devices were detected. This representation is optional. It shows the instances of CIM_LANEndpoint for the network devices that were detected. The CIM_LANEndpoint instances are associated to CIM_ComputerSystem via CIM_HostedAccessPoint. The CIM_LANEndpoint instances are associated to CIM_IPNetworkConnection via CIM_EndpointForIPNetworkConnection.

The following objects are not shown in Figure 6 for clarity:

- Instances of CIM_IPAssignmentSettingData for IPNetworkConnection-1 and IPNetworkConnection-2

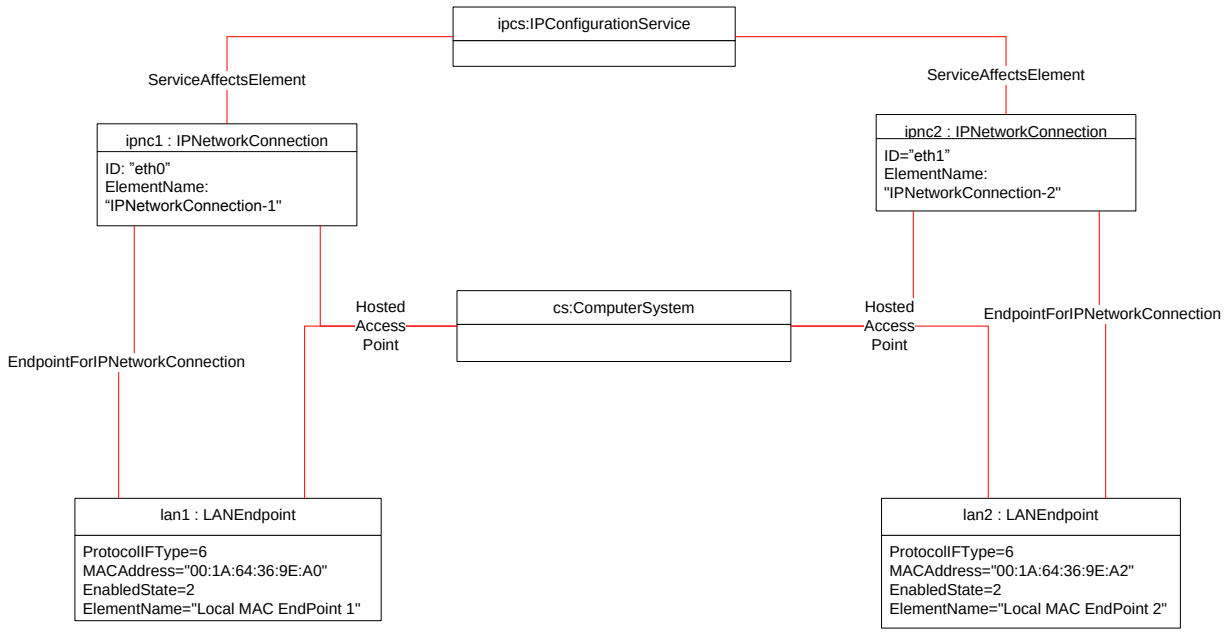


Figure 6 – Network devices detected (optional)

The object diagram shown in Figure 7 is a continuation of use case in Figure 6 as the IPv6 link local address got assigned for the IPNetworkConnection-1. It shows the instance of CIM_IPProtocolEndpoint, representing the link local address.

The following objects are not shown in Figure 7 for clarity.

- Instances of CIM_IPAssignmentSettingData for IPNetworkConnection-1
- IPNetworkConnection-2 and instances associated with it
- Instances of CIM_IPVersionSettingData
- Instance of CIM_IPConfigurationService

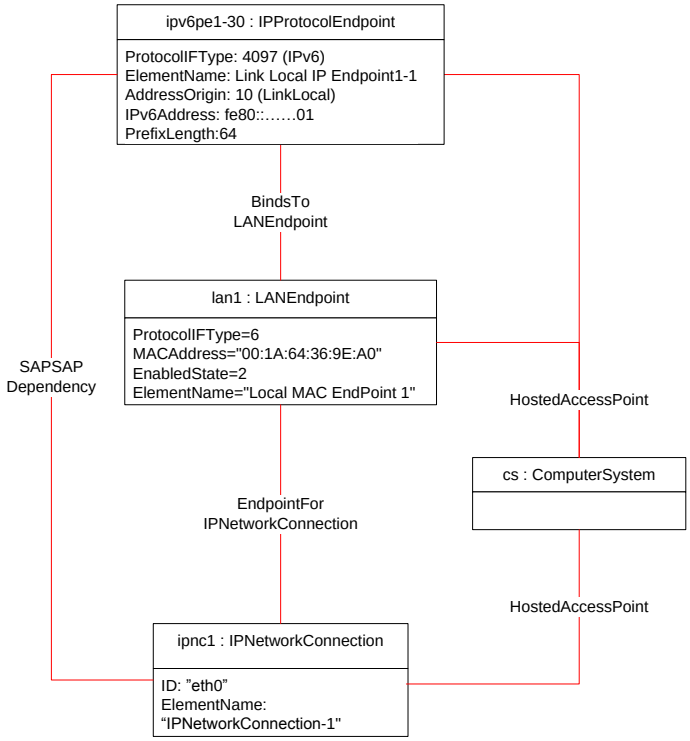


Figure 7 – IPv6 Link Local IPv6 address assigned

The object diagram in Figure 8 is a continuation of use case in Figure 7, with the following updates for IPNetworkConnection-1:

- Static IPv6 Address assigned – An instance of CIM_IPProtocolEndpoint added.
- DNS Ready – An instance of CIM_DNSProtocolEndpoint added. Instances of CIM_RemoteServiceAccessPoint added to represent the DNS Servers.
- Gateway available – Instances of CIM_RemoteServiceAccessPoint added to represent the Gateways. They are associated to CIM_IPNetworkConnection via CIM_RemoteServiceAvailableToElement.
- DHCP v6 client started – An instance of CIM_DHCPProtocolEndpoint added. This is associated to CIM_IPNetworkConnection via CIM_SAPSAPDependency and CIM_ComputerSystem via CIM_HostedAccessPoint.

The following objects are not shown in Figure 8 for clarity:

- Instances of CIM_IPAssignmentSettingData for IPNetworkConnection-1
- IPNetworkConnection-2 and instances associated with it
- Instances of CIM_IPVersionSettingData

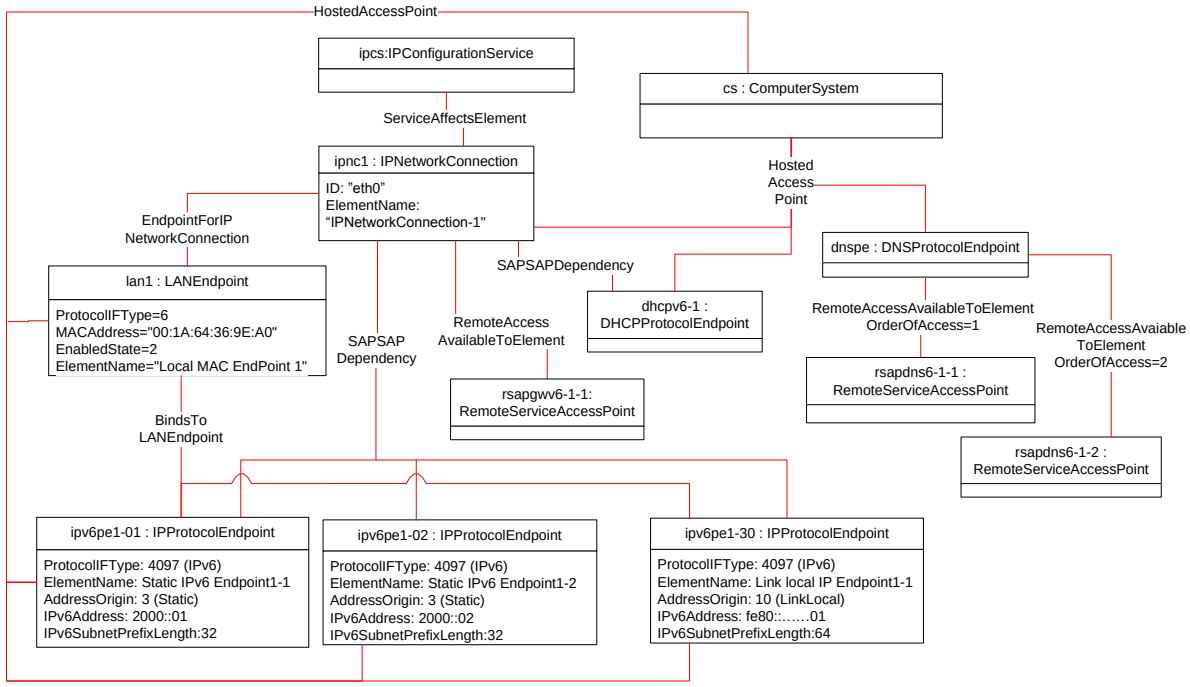


Figure 8 – Static IPv6 address assigned, DHCP clients started, DNS and Gateway available

The object diagram in Figure 9 is a continuation of use case in Figure 8. Stateless IPv6 address is assigned for the IPNetworkConnection-1, which is represented by the addition of instance of CIM_IPProtocolEndpoint. Gateway and DNS were added from Router Advertisements, which are represented by the addition of instances of CIM_RemoteServiceAccessPoint.

The following objects are not shown in Figure 9 for clarity.

- Instances of CIM_IPAssignmentSettingData for IPNetworkConnection-1.
- IPNetworkConnection-2 and instances associated with it.
- Instances of CIM_IPVersionSettingData.

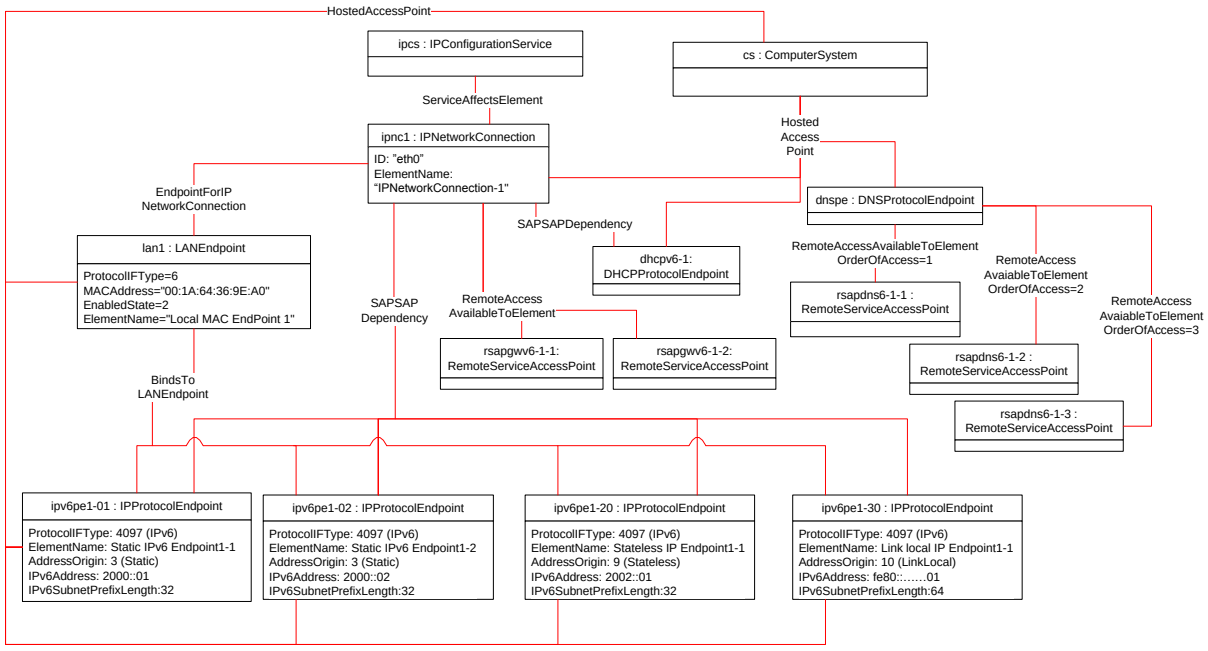


Figure 9 – Stateless IPv6 assignment for IPNetworkConnection-1

The object diagram in Figure 10 is a continuation of use case in Figure 9, with following updates for IPNetworkConnection-1.

- DHCP v6 address assigned – An instance of CIM_IPProtocolEndpoint added, associated to CIM_DHCPProtocolEndpoint, CIM_IPNetworkConnection, CIM_ComputerSystem (and optionally to CIM_LANEndpoint).
- DHCP Server - An instance of CIM_RemoteServiceAccessPoint for DHCP Server added, associated to CIM_DHCPProtocolEndpoint.
- DNS added from DHCP – Another instance of CIM_RemoteServiceAccessPoint added, associated to CIM_DNSProtocolEndpoint.
- Gateway added from DHCP - Another instance of CIM_RemoteServiceAccessPoint added, associated to CIM_IPNetworkConnection.

The following objects are not shown in Figure 10 for clarity.

- Instances of CIM_IPAssignmentSettingData for IPNetworkConnection-1.
- IPNetworkConnection-2 and instances associated with it.
- Instances of CIM_IPVersionSettingData.

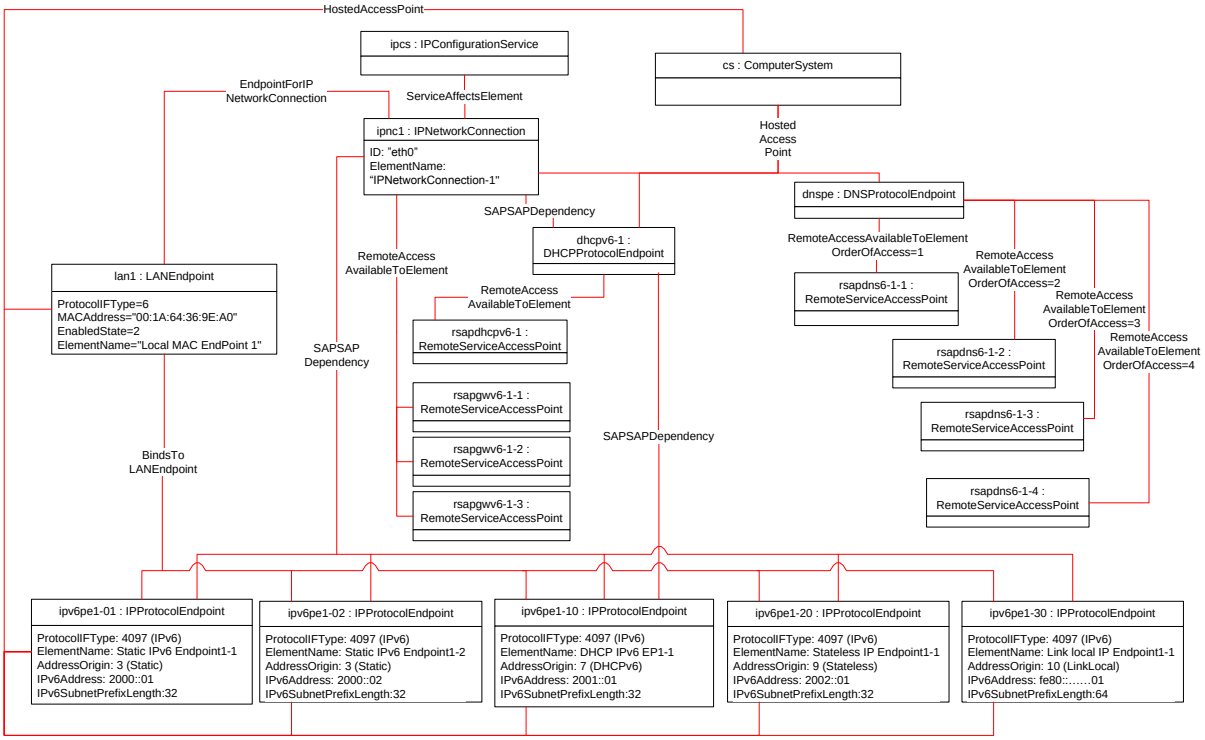


Figure 10 – DHCP v6 assignment for IPNetworkConnection-1

The object diagram in Figure 11 is a continuation of use case in Figure 10, with following updates for IPNetworkConnection-2.

- DHCP v4 address assigned – An instance of CIM_IPProtocolEndpoint added, associated to CIM_DHCPProtocolEndpoint, CIM_IPNetworkConnection, CIM_ComputerSystem (and optionally to CIM_LANEndpoint).
- DHCP Server - An instance of CIM_RemoteServiceAccessPoint for DHCP Server added, associated to CIM_DHCPProtocolEndpoint.
- DNS added from DHCP – Another instance of CIM_RemoteServiceAccessPoint added, associated to CIM_DNSProtocolEndpoint.
- Gateway added from DHCP - Another instance of CIM_RemoteServiceAccessPoint added, associated to CIM_IPNetworkConnection.

The following objects are not shown in Figure 11 for clarity.

- Instances of CIM_IPAssignmentSettingData for IPNetworkConnection-1
- Instances of CIM_IPProtocolEndpoint for IPNetworkConnection-1
- Instances of CIM_IPAssignmentSettingData for IPNetworkConnection-2.
- Instances of CIM_IPVersionSettingData.

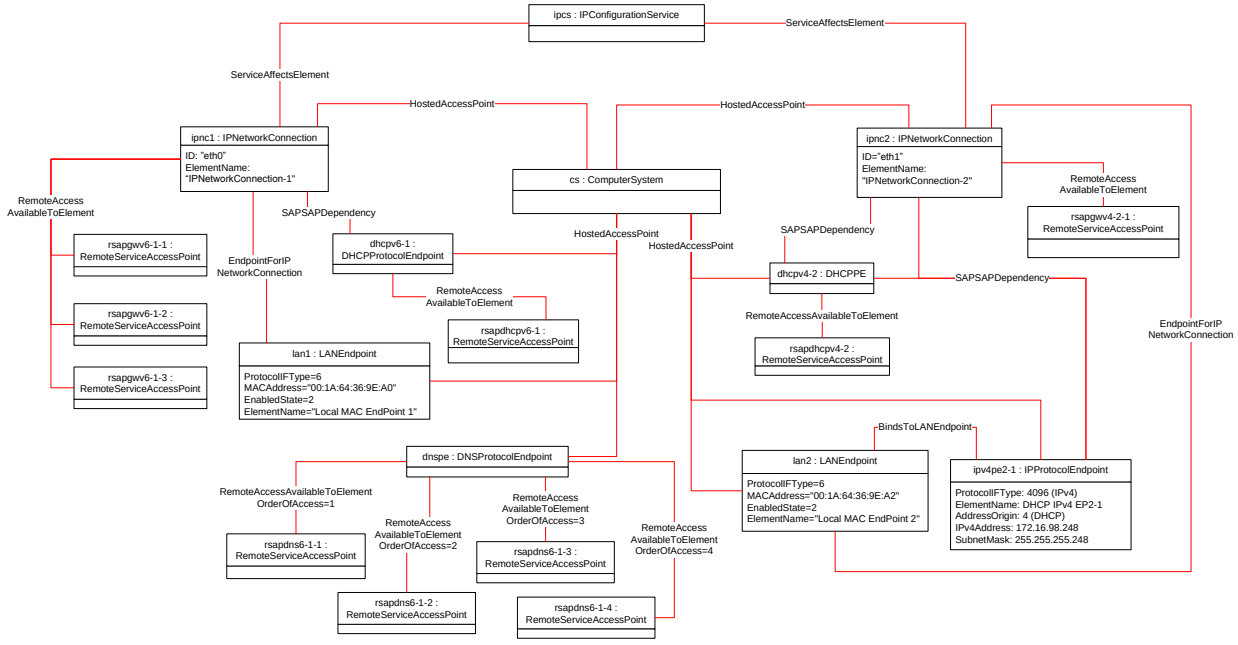


Figure 11 – DHCP v4 assignment for IPNetworkConnection-2

9.4 Dynamics – Configuration change

A client enables IPv4 on IPNetworkConnection-1 and IPv6 on IPNetworkConnection-2. This is shown in Figure 12.

The following objects are not shown in Figure 12 for clarity.

- Instances of CIM_IPAssignmentSettingData
- Instances of CIM_ProtocolEndpoint (e.g., CIM_IPProtocolEndpoint)
- Instances of CIM_RemoteServiceAccessPoint

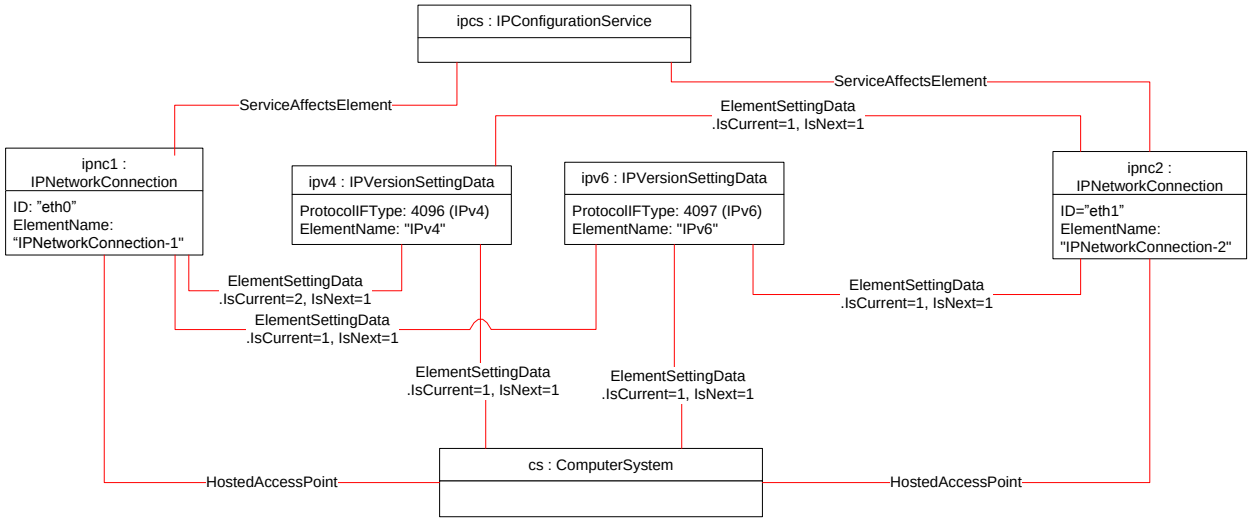


Figure 12 – Configuration change — IPv4 is enabled on IPNetworkConnection-1, IPv6 is enabled on IPNetworkConnection-2

For this system, IPv4 changes take effect only on next boot; IPv6 changes take effect immediately. Hence the IPv6 addresses, DNS, and gateways get assigned immediately on IPNetworkConnection-2. This configuration is shown in Figure 13.

The following objects are not shown in Figure 13 for clarity.

- Instance of IPNetworkConnection-1 and instances associated with it

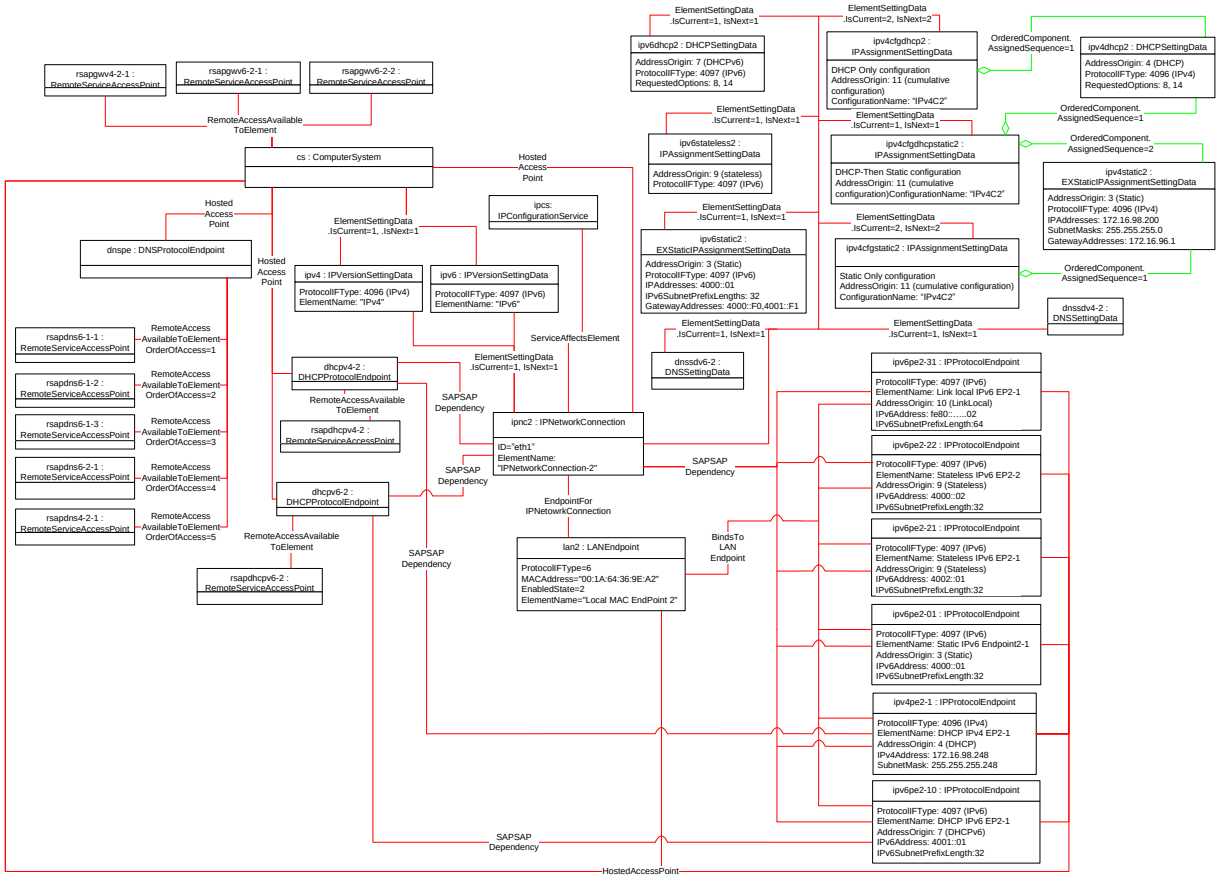


Figure 13 – Configuration change — IPv6 change is taking effect.

9.5 Determine supported settings

A client can determine which settings are supported for a given network connection as follows:

1) Find all instances of CIM_IPAssignmentSettingData and its subclasses that are associated with the CIM_IPNetworkConnection instance.

2) For each instance, query the value of the AddressOrigin property to determine the supported settings.

3) If the instance has a value 11 (cumulative configuration), it represents an accumulation of settings. Find all instances of CIM_IPAssignmentSettingData and its subclasses that are associated with this CIM_IPAssignmentSettingData instance through an instance of CIM_OrderedComponent. Query the value of the AddressOrigin property to determine the supported settings.

9.6 Determine gateway address

A client can find the default gateway in use for an IP interface as follows:

1) Find all instances of CIM_RemoteServiceAccessPoint that are associated with the CIM_IPNetworkConnection instance through an instance of CIM_RemoteAccessAvailableToElement.
2) For each instance of CIM_RemoteServiceAccessPoint, determine whether the value of the AccessContext property is "Default Gateway". If so, query the value of the AccessInfo property.

9.7 Determine method used for current IP assignment

A client can determine the method by which the IP was assigned by querying the AddressOrigin property of the CIM_IPProtocolEndpoint instance.

9.8 Determine whether DHCP then static is supported in alternate configuration

This use case is applicable only for Alternate accumulation of settings.

An implementation may support attempting to acquire its IP through a DHCP client and defaulting to static IP if the client fails to acquire IP from a DHCP server. A client can determine whether this functionality is supported as follows:

1) Find all instances of CIM_IPAssignmentSettingData with AddressOrigin 11 (cumulative configuration) that are associated with the CIM_IPNetworkConnection instance.
2) For each instance of CIM_IPAssignmentSettingData:
   a) Find the instance of CIM_DHCPSettingData that is associated through an instance of CIM_OrderedComponent.
   b) Find the instance of CIM_ExtendedStaticIPAssignmentSettingData that is associated through an instance of CIM_OrderedComponent.
   c) If the value of the AssignedSequence property of the CIM_OrderedComponent that associates the instance of CIM_DHCPSettingData with the instance of CIM_IPAssignmentSettingData is less than the value of the AssignedSequence property of an instance of CIM_OrderedComponent that associates the CIM_ExtendedStaticIPAssignmentSettingData with the instance of CIM_IPAssignmentSettingData. If so, DHCP then static is supported.

9.9 View default configuration

A client can view the default configuration for an IP network connection as follows:

1) Find all instances of CIM_ElementSettingData that associate an instance of CIM_IPAssignmentSettingData with the CIM_IPNetworkConnection instance.
2) For each instance of CIM_ElementSettingData, see if the value of the IsDefault property is 1 (Is Default).

9.10 Configure the network connection to use DHCP (Alternate accumulation of settings)

This use case applicable only for Alternate accumulation of settings.

An implementation may support attempting to acquire its IP through a DHCP client. A client can determine whether this functionality is supported and configure the interface to use it as follows:

1) Find all instances of CIM_IPAssignmentSettingData with AddressOrigin 11 (cumulative configuration) that are associated with the CIM_IPNetworkConnection instance.
2) For each instance of CIM_IPAssignmentSettingData:
   a) Find an instance of CIM_DHCPSettingData that is associated through an instance of CIM_OrderedComponent.
   b) Verify that no instances of CIM_ExtendedStaticIPAssignmentSettingData are associated with the instance of CIM_IPAssignmentSettingData.

   This instance of CIM_IPAssignmentSettingData represents a DHCP settings.
3) Find an instance of CIM_IPConfigurationService that is associated with the CIM_IPNetworkConnection instance through an instance of CIM_ServiceAffectsElement.
4) Invoke the ApplySettingToIPNetworkConnection( ) method of the CIM_IPConfigurationService instance, specifying the instances of CIM_IPNetworkConnection and CIM_IPAssignmentSettingData.

9.11 Establish a static IP for an IP network connection (Alternate accumulation of settings)

A client can manually assign an IP to an IP network connection as follows:

1) Find all instances of CIM_IPAssignmentSettingData with AddressOrigin 11 (cumulative configuration) that are associated with the CIM_IPNetworkConnection instance.
2) For each instance of CIM_IPAssignmentSettingData:
   a) Find an instance of CIM_ExtendedStaticIPAssignmentSettingData that is associated through an instance of CIM_OrderedComponent.
   b) Verify that no other instances of CIM_ExtendedStaticIPAssignmentSettingData or instances of CIM_DHCPSettingData are associated with the instance of CIM_IPAssignmentSettingData through an instance of CIM_OrderedComponent.

   This instance of CIM_IPAssignmentSettingData represents a modifiable, static configuration for the IP network connection.
3) Modify the properties of the CIM_ExtendedStaticIPAssignmentSettingData instance to contain the appropriate settings for the IP network connection.
4) Find an instance of CIM_IPConfigurationService that is associated with the CIM_IPNetworkConnection instance through an instance of CIM_ServiceAffectsElement.
5) Invoke the ApplySettingToIPNetworkConnection( ) method of the CIM_IPConfigurationService instance, specifying the instances of CIM_IPNetworkConnection and CIM_IPAssignmentSettingData.

9.12 Apply an accumulation of settings — Synchronously

Some implementations may support making an accumulation of setting, which is previously not current, as the current accumulation of settings of an IP network connection without requiring a restart of the underlying network interface. If this behavior is supported by the implementation, then given an instance of CIM_IPNetworkConnection for which the configuration should be modified and an instance of CIM_IPAssignmentSettingData that represents the new configuration, a client can:

1) Find an instance of CIM_IPConfigurationService that is associated with the CIM_IPNetworkConnection instance through an instance of CIM_ServiceAffectsElement.
2) Invoke the ApplySettingToIPNetworkConnection( ) method of the CIM_IPConfigurationService, specifying the instances of CIM_IPNetworkConnection and CIM_IPAssignmentSettingData, with the value for Mode as 1.

9.13 Apply an accumulation of settings — Upon restart

Some implementations may require that the underlying network interface be restarted in order for a new accumulation of settings that is bound to the IP network connection to take effect. The steps are same as above, with a change in value for Mode. The value for Mode shall be 2 in this case.

9.14 Apply a setting — Synchronously (concurrent settings)

Some implementations may support making a setting, which is previously not current, as the current setting of the IP network connection, without requiring a restart of the underlying network interface. If this behavior is supported by the implementation, then given an instance of CIM_IPNetworkConnection and an instance of CIM_IPAssignmentSettingData or its subclass that represents the new setting, a client can:

1) Find an instance of CIM_IPConfigurationService that is associated with the CIM_IPNetworkConnection instance through an instance of CIM_ServiceAffectsElement.
2) Invoke the ApplySettingToIPNetworkConnection( ) method of the CIM_IPConfigurationService, specifying the instances of CIM_IPNetworkConnection and CIM_IPAssignmentSettingData (or its subclass), with the value for Mode as 1.

9.15 Apply a setting — Upon restart (concurrent settings)

Some implementations may require that the underlying network interface be restarted in order for a new setting that is bound to the IP network connection to take effect. The steps are the same as above, with a change in value for Mode. The value for Mode shall be 2 in this case.

9.16 Add a static IPv4 address — Synchronously (concurrent settings)

Some implementations may support adding a static IP address without requiring a restart of the underlying network interface. If this behavior is supported by the implementation, then given an instance of CIM_IPNetworkConnection for which the static IP should be added, a client can:

1) Find the instance of CIM_ExtendedStaticIPAssignmentSettingData that represents the current static IPv4 settings for the network connection. Modifying IPAddresses and SubnetMasks properties, the new static IPv4 address can be added.
2) If there is no instance of CIM_ExtendedStaticIPAssignmentSettingData that represents the current static IPv4 settings for the network connection, identify the instance of CIM_ExtendedStaticIPAssignmentSettingData that is not current. Modify IPAddresses and SubnetMasks properties. Apply this setting as the current setting as in use case 9.14 above.

10 CIM Elements

Table 24 shows the instances of CIM Elements for this profile. Instances of the CIM Elements shall be implemented as described in Table 24. Clauses 0 (“Implementation”) and 8 (“Methods”) may impose additional requirements on these elements.

Table 24 – CIM Elements: IP configuration profile

Element Name	Requirement	Description
Classes		
CIM_BindsTo	Optional	See clauses 7.10 and 10.1
CIM_BindsToLANEndpoint	Optional	See clauses 7.10 and 10.2
CIM_DHCPProtocolEndpoint	Optional	See clauses 7.8.1 and 10.3
CIM_DHCPSettingData	Optional	See clauses 7.3.3 and 10.4

Element Name	Requirement	Description
CIM_DNSGeneralSettingData	Optional	See clauses 7.9.3 and 10.5
CIM_DNSProtocolEndpoint	Optional	See clauses 7.9.1 and 10.6
CIM_DNSSettingData	Optional	See clauses 7.9.2 and 10.7
CIM_ElementSettingData – CIM_IPAssignmentSettingData	Conditional	See clauses 7.5 and 10.8
CIM_ElementSettingData – CIM_IPAssignmentSettingData subclasses	Conditional	See clauses 7.5 and 10.9
CIM_ElementSettingData – CIM_IPVersionSettingData	Mandatory	See clauses 7.2.1, 10.10, 10.11
CIM_ElementSettingData – CIM_DNSGeneralSettingData	Conditional	See clauses 7.9.3 and 10.12
CIM_ElementSettingData – CIM_DHCPProtocolEndpoint	Optional	See clauses 7.8 and 10.13
CIM_ElementSettingData – CIM_DNSProtocolEndpoint	Optional	See clauses 7.9 and 10.14
CIM_EndpointForIPNetworkConnection	Conditional	See clauses 7.10 and 10.15
CIM_ExtendedStaticIPAssignmentSettingData	Optional	See clauses 7.3.2 and 10.16
CIM_HostedAccessPoint – CIM_IPNetworkConnection	Mandatory	See clauses 7.1.1 and 10.17
CIM_HostedAccessPoint – CIM_DNSProtocolEndpoint	Conditional	See clauses 7.9.1 and 10.18
CIM_HostedAccessPoint – CIM_IPProtocolEndpoint or CIM_DHCPProtocolEndpoint	Optional	See clauses 7.6.1, 7.8.1 and 10.19
CIM_HostedService	Conditional	See clauses 7.7 and 10.20
CIM_IPAssignmentSettingData	Optional	See clauses 7.3.1 and 10.21
CIM_IPConfigurationService	Optional	See clauses 7.7 and 10.22
CIM_IPNetworkConnection	Mandatory	See clauses 7.1 and 10.23
CIM_IPProtocolEndpoint	Optional	See clauses 7.6 and 10.24
CIM_IPVersionSettingData	Mandatory	See clauses 7.2 and 10.25
CIM_OrderedComponent	Conditional	See clauses 7.5.2.1 and 10.26
CIM_RegisteredProfile	Mandatory	See clause 10.27.
CIM_RemoteAccessAvailableToElement – Primary	Conditional	See clauses 7.11 10.28, 10.29 and 10.30
CIM_RemoteAccessAvailableToElement – Optional	Optional	See clauses 7.11 and 10.31
CIM_RemoteServiceAccessPoint	Optional	See clauses 7.11 and 10.32
CIM_SAPSAPDependency – CIM_IPNetworkConnection	Conditional	See clauses 7.6.1, 7.8.1, 10.33
CIM_SAPSAPDependency – DNS, DNS and IP from DHCP	Optional	See clauses 7.8.1, 7.11.3.3, 10.34, 10.35 and 10.36
CIM_ServiceAffectsElement	Conditional	See clauses 7.7, 10.37

Element Name	Requirement	Description
CIM_ElementConformsToProfile	Mandatory	See clauses 10.38
Indications		
None defined in this profile		

10.1 CIM_BindsTo

CIM_BindsTo relates the CIM_IPProtocolEndpoint instance with the CIM_VLANEndpoint instance on which it depends. Table 25 provides information about the properties of CIM_BindsTo.

Table 25 – Class: CIM_BindsTo

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to an instance of CIM_VLANEndpoint. Cardinality 0..1
Dependent	Mandatory	**Key:** This shall be a reference to an instance of CIM_IPProtocolEndpoint. Cardinality *

10.2 CIM_BindsToLANEndpoint

CIM_BindsToLANEndpoint relates the CIM_IPProtocolEndpoint instance with the CIM_LANEndpoint instance on which it depends. Table 26 provides information about the properties of CIM_BindsToLANEndpoint.

Table 26 – Class: CIM_BindsToLANEndpoint

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to an instance of CIM_LANEndpoint. Cardinality 0..1
Dependent	Mandatory	**Key:** This shall be a reference to an instance of CIM_IPProtocolEndpoint. Cardinality *

10.3 CIM_DHCPProtocolEndpoint

CIM_DHCPProtocolEndpoint represents the DHCP client that is associated with a network connection. Table 27 provides information about the properties of CIM_DHCPProtocolEndpoint.

Table 27 – Class: CIM_DHCPProtocolEndpoint

Elements	Requirement	Description
SystemCreationClassName	Mandatory	Key
CreationClassName	Mandatory	Key
SystemName	Mandatory	Key

Elements	Requirement	Description
Name	Mandatory	Key
ProtocolIFType	Mandatory	This property shall have a value of 4096 (IPv4) or 4097 (IPv6).

10.4 CIM_DHCPSettingData

CIM_DHCPSettingData represents the settings for the DHCP client. Table 28 provides information about the properties of CIM_DHCPSettingData.

Table 28 – Class: CIM_DHCPSettingData

Elements	Requirement	Description
InstanceID	Mandatory	Key
AddressOrigin	Mandatory	This property shall have a value of 4 (“DHCP”) or 7 (“DHCPv6”).
ElementName	Mandatory	Pattern ".*"
ProtocolIFType	Mandatory	This property shall have a value of 4096 (IPv4) or 4097 (IPv6).

10.5 CIM_DNSGeneralSettingData

CIM_DNSGeneralSettingData represents the system-wide DNS settings. Table 29 provides information about the properties of CIM_DNSGeneralSettingData.

Table 29 – Class: CIM_DNSGeneralSettingData

Elements	Requirement	Description
InstanceID	Mandatory	Key
AddressOrigin	Mandatory	Matches 2 (Not Applicable)
AppendPrimarySuffixes	Optional	None
AppendParentSuffixes	Optional	None
DNSSuffixesToAppend	Optional	None
ElementName	Mandatory	Pattern ".+"

10.6 CIM_DNSProtocolEndpoint

CIM_DNSProtocolEndpoint represents the DNS client on the system. Table 30 provides information about the properties of CIM_DNSProtocolEndpoint.

Table 30 – Class: CIM_DNSProtocolEndpoint

Elements	Requirement	Description
SystemCreationClassName	Mandatory	Key
CreationClassName	Mandatory	Key
SystemName	Mandatory	Key
Name	Mandatory	Key

Elements	Requirement	Description
ProtocolIFType	Mandatory	This property shall have a value of 1 (“Other”).
OtherTypeDescription	Mandatory	This property shall have a value of “DNS”.

10.7 CIM_DNSSettingData

CIM_DNSSettingData represents the settings for the DNS client. Table 31 provides information about the properties of CIM_DNSSettingData.

Table 31 – Class: CIM_DNSSettingData

Elements	Requirement	Description
InstanceID	Mandatory	Key
AddressOrigin	Mandatory	Matches 2 (Not Applicable).
ElementName	Mandatory	Pattern ".*"
ProtocolIFType	Mandatory	This property shall have a value of 4096 (IPv4) or 4097 (IPv6).
DNSServerAddresses	Mandatory	See clause 7.9.2.3

10.8 CIM_ElementSettingData — CIM_IPNetworkConnection and CIM_IPAssignmentSettingData

CIM_ElementSettingData associates instances of CIM_IPAssignmentSettingData with the CIM_IPNetworkConnection instance. Table 32 provides information about the properties of CIM_ElementSettingData.

Table 32 – Class: CIM_ElementSettingData — CIM_IPAssignmentSettingData

Elements	Requirement	Description
ManagedElement	Mandatory	**Key:** This shall be a reference to the Central Instance. Cardinality 1
SettingData	Mandatory	**Key:** This shall be a reference to an instance of CIM_IPAssignmentSettingData. Cardinality *
IsDefault	Mandatory	Matches 1 (Is Default) or 2 (Is Not Default)
IsCurrent	Mandatory	Matches 1 (Is Current) or 2 (Is Not Current)
IsNext	Mandatory	Matches 1 (Is Next), 2 (Is Not Next), or 3 (Is Next For Single Use)

10.9 CIM_ElementSettingData — CIM_IPNetworkConnection and CIM_IPAssignmentSettingData subclasses

CIM_ElementSettingData associates instances of subclasses of CIM_IPAssignmentSettingData with the CIM_IPNetworkConnection instance. Table 33 provides information about the properties of CIM_ElementSettingData.

Table 33 – Class: CIM_ElementSettingData — CIM_IPAssignmentSettingData subclasses

Elements	Requirement	Description
ManagedElement	Mandatory	**Key:** This shall be a reference to the Central Instance. Cardinality 0..1
SettingData	Mandatory	**Key:** This shall be a reference to an instance of subclasses of CIM_IPAssignmentSettingData. Cardinality *
IsDefault	Mandatory	Matches 1 (Is Default) or 2 (Is Not Default)
IsCurrent	Mandatory	Matches 1 (Is Current) or 2 (Is Not Current)
IsNext	Mandatory	Matches 1 (Is Next), 2 (Is Not Next), or 3 (Is Next For Single Use)

10.10 CIM_ElementSettingData — CIM_IPNetworkConnection and CIM_IPVersionSettingData

CIM_ElementSettingData associates instances of CIM_ IPVersionSettingData with the CIM_IPNetworkConnection instance. Table 34 provides information about the properties of CIM_ElementSettingData.

Table 34 – Class: CIM_ElementSettingData — CIM_IPVersionSettingData

Elements	Requirement	Description
ManagedElement	Mandatory	**Key:** This shall be a reference to the Central Instance. Cardinality *
SettingData	Mandatory	**Key:** This shall be a reference to an instance of CIM_IPVersionSettingData. Cardinality 1..*
IsDefault	Mandatory	Matches 1 (Is Default) or 2 (Is Not Default)
IsCurrent	Mandatory	Matches 1 (Is Current) or 2 (Is Not Current)
IsNext	Mandatory	Matches 1 (Is Next), 2 (Is Not Next), or 3 (Is Next For Single Use)

10.11 CIM_ElementSettingData — CIM_ComputerSystem and CIM_IPVersionSettingData

CIM_ElementSettingData associates instances of CIM_ IPVersionSettingData with the CIM_ComputerSystem instance. Table 35 provides information about the properties of CIM_ElementSettingData.

Table 35 – Class: CIM_ElementSettingData — CIM_IPVersionSettingData

Elements	Requirement	Description
ManagedElement	Mandatory	**Key:** This shall be a reference to the scoping Instance. Cardinality 1
SettingData	Mandatory	**Key:** This shall be a reference to an instance of CIM_IPVersionSettingData. Cardinality 1..*
IsDefault	Mandatory	Matches 1 (Is Default) or 2 (Is Not Default)
IsCurrent	Mandatory	Matches 1 (Is Current) or 2 (Is Not Current)
IsNext	Mandatory	Matches 1 (Is Next), 2 (Is Not Next), or 3 (Is Next For Single Use)

10.12 CIM_ElementSettingData — CIM_ComputerSystem and CIM_DNSGeneralSettingData

CIM_ElementSettingData associates instances of CIM_ DNSGeneralSettingData with the CIM_ComputerSystem instance. Table 36 provides information about the properties of CIM_ElementSettingData.

Table 36 – Class: CIM_ElementSettingData — CIM_DNSGeneralSettingData

Elements	Requirement	Description
ManagedElement	Mandatory	**Key:** This shall be a reference to the scoping Instance. Cardinality 1
SettingData	Mandatory	**Key:** This shall be a reference to an instance of CIM_DNSGeneralSettingData. Cardinality *
IsDefault	Mandatory	Matches 1 (Is Default) or 2 (Is Not Default)
IsCurrent	Mandatory	Matches 1 (Is Current) or 2 (Is Not Current)
IsNext	Mandatory	Matches 1 (Is Next), 2 (Is Not Next), or 3 (Is Next For Single Use)

10.13 CIM_ElementSettingData — CIM_DHCPProtocolEndpoint and CIM_DHCPSettingData

CIM_ElementSettingData associates instances of CIM_DHCPSettingData with the CIM_DHCPProtocolEndpoint instance. Table 37 provides information about the properties of CIM_ElementSettingData.

Table 37 – Class: CIM_ElementSettingData — CIM_DHCPProtocolEndpoint and CIM_DHCPSettingData

Elements	Requirement	Description
ManagedElement	Mandatory	**Key:** This shall be a reference to the CIM_DHCPProtocolEndpoint. Cardinality *
SettingData	Mandatory	**Key:** This shall be a reference to the instance of CIM_DHCPSettingData. Cardinality *
IsDefault	Mandatory	Matches 1 (Is Default) or 2 (Is Not Default)
IsCurrent	Mandatory	Matches 1 (Is Current) or 2 (Is Not Current)
IsNext	Mandatory	Matches 1 (Is Next), 2 (Is Not Next), or 3 (Is Next For Single Use)

10.14 CIM_ElementSettingData — CIM_DNSProtocolEndpoint and CIM_DNSSettingData

CIM_ElementSettingData associates instances of CIM_DNSSettingData with the CIM_DNSProtocolEndpoint instance. Table 38 provides information about the properties of CIM_ElementSettingData.

Table 38 – Class: CIM_ElementSettingData — CIM_DNSProtocolEndpoint and CIM_DNSSettingData

Elements	Requirement	Description
ManagedElement	Mandatory	**Key:** This shall be a reference to the CIM_DNSProtocolEndpoint. Cardinality 0..1
SettingData	Mandatory	**Key:** This shall be a reference to the instance of CIM_DNSSettingData. Cardinality *
IsDefault	Mandatory	Matches 1 (Is Default) or 2 (Is Not Default)
IsCurrent	Mandatory	Matches 1 (Is Current) or 2 (Is Not Current)
IsNext	Mandatory	Matches 1 (Is Next), 2 (Is Not Next), or 3 (Is Next For Single Use)

10.15 CIM_EndpointForIPNetworkConnection

CIM_EndpointForIPNetworkConnection associates an instance of CIM_IPNetworkConnection with the CIM_ProtocolEndpoint (e.g., CIM_LANEndpoint, CIM_VLANEndpoint) for the network connection. Table 39 provides information about the properties of CIM_EndpointForIPNetworkConnection.

Table 39 – Class: CIM_EndpointForIPNetworkConnection

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the CIM_ProtocolEndpoint (e.g., CIM_LANEndpoint, CIM_VLANEndpoint) Cardinality 1..*
Dependent	Mandatory	**Key:** This shall be a reference to an instance of CIM_IPNetworkConnection Cardinality *

10.16 CIM_ExtendedStaticIPAssignmentSettingData

CIM_ExtendedStaticIPAssignmentSettingData represents the static IP settings for an IP network connection. Table 40 provides information about the properties of CIM_ExtendedStaticIPAssignmentSettingData.

Table 40 – Class: CIM_ExtendedStaticIPAssignmentSettingData

Elements	Requirement	Description
InstanceID	Mandatory	**Key**
AddressOrigin	Mandatory	See clause 7.3.2.1
ProtocolIFType	Mandatory	See clause 7.3.2.2
ElementName	Mandatory	Pattern ".*"
IPAddresses	Mandatory	See clause 7.3.2.3
IPv6SubnetPrefixLengths	Conditional	See clause 7.3.2.4
SubnetMasks	Conditional	See clause 7.3.2.5
GatewayAddresses	Mandatory	See clause 7.3.2.6

10.17 CIM_HostedAccessPoint — CIM_IPNetworkConnection

CIM_HostedAccessPoint associates an instance of CIM_IPNetworkConnection with scoping CIM_ComputerSystem. Table 41 provides information about the properties of CIM_HostedAccessPoint.

Table 41 – Class: CIM_HostedAccessPoint — CIM_IPNetworkConnection

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the Scoping Instance. Cardinality 1
Dependent	Mandatory	**Key:** This shall be a reference to an instance of CIM_IPNetworkConnection. Cardinality *

10.18 CIM_HostedAccessPoint — CIM_DNSProtocolEndpoint

CIM_HostedAccessPoint associates an instance of CIM_DNSProtocolEndpoint with scoping CIM_ComputerSystem. Table 42 provides information about the properties of CIM_HostedAccessPoint.

Table 42 – Class: CIM_HostedAccessPoint — CIM_DNSProtocolEndpoint

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the Scoping Instance. Cardinality 1
Dependent	Mandatory	**Key:** This shall be a reference to an instance of CIM_DNSProtocolEndpoint. Cardinality *

10.19 CIM_HostedAccessPoint — CIM_IPProtocolEndpoint or CIM_DHCPProtocolEndpoint

CIM_HostedAccessPoint associates an instance of CIM_IPProtocolEndpoint or CIM_DHCPProtocolEndpoint with scoping CIM_ComputerSystem. Table 43 provides information about the properties of CIM_HostedAccessPoint.

Table 43 – Class: CIM_HostedAccessPoint — CIM_IPProtocolEndpoint or CIM_DHCPProtocolEndpoint

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the Scoping Instance. Cardinality 1
Dependent	Mandatory	**Key:** This shall be a reference to an instance of CIM_IPProtocolEndpoint or CIM_DHCPProtocolEndpoint. Cardinality *

10.20 CIM_HostedService

CIM_HostedService relates the CIM_IPConfigurationService instance to its scoping CIM_ComputerSystem instance. Table 44 provides information about the properties of CIM_HostedService.

Table 44 – Class: CIM_HostedService

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the Scoping Instance. Cardinality 1
Dependent	Mandatory	**Key:** This shall be a reference to an instance of CIM_IPConfigurationService. Cardinality *

10.21 CIM_IPAssignmentSettingData

CIM_IPAssignmentSettingData represents the settings for an IP network connection. Table 45 provides information about the properties of CIM_IPAssignmentSettingData.

Table 45 – Class: CIM_IPAssignmentSettingData

Elements	Requirement	Description
InstanceID	Mandatory	**Key**
AddressOrigin	Mandatory	See clause 7.3.1.1
ProtocolIFType	Mandatory	4096 (IPv4) or 4097 (IPv6). See clause 7.3.1.2
ElementName	Mandatory	Pattern ".*"
ConfigurationName	Optional	See clause 7.3.1.3
ChangeableType	Optional	None

10.22 CIM_IPConfigurationService

CIM_IPConfigurationService represents the ability to configure an IP interface. Table 46 provides information about the properties of CIM_IPConfigurationService.

Table 46 – Class: CIM_IPConfigurationService

Elements	Requirement	Description
SystemCreationClassName	Mandatory	**Key**
CreationClassName	Mandatory	**Key**
SystemName	Mandatory	**Key**
Name	Mandatory	**Key**
ElementName	Mandatory	Pattern ".*"
ApplySettingToIPNetworkConnection( )	Optional	See clause 8.1
ApplySettingToComputerSystem( )	Optional	See clause 8.2

10.23 CIM_IPNetworkConnection

CIM_IPNetworkConnection represents an IP network connection in system.

Table 47 provides information about the properties of CIM_IPNetworkConnection.

Table 47 – Class: CIM_IPNetworkConnection

Elements	Requirement	Description
SystemCreationClassName	Mandatory	**Key**
CreationClassName	Mandatory	**Key**
SystemName	Mandatory	**Key**
Name	Mandatory	**Key**
ID	Mandatory	Pattern ".*"

10.24 CIM_IPProtocolEndpoint

CIM_IPProtocolEndpoint represents an IP interface that is associated with an Ethernet interface. Table 48 provides information about the properties of CIM_IPProtocolEndpoint.

Table 48 – Class: CIM_IPProtocolEndpoint

Elements	Requirement	Description
SystemCreationClassName	Mandatory	**Key**
CreationClassName	Mandatory	**Key**
SystemName	Mandatory	**Key**
Name	Mandatory	**Key**
NameFormat	Mandatory	Pattern ".*"
ProtocolIFType	Mandatory	See 7.6.1.2.
ElementName	Mandatory	Pattern ".*"
IPv4Address	Conditional	See clause 7.6.1.3
SubnetMask	Conditional	See clauses 7.6.1.2 and 7.6.1.4.
AddressOrigin	Mandatory	See clause 7.6.1.1.
IPv6Address	Conditional	See clauses 7.6.1.2 and 7.6.1.5.
IPv6SubnetPrefixLength	Conditional	See clause 7.6.1.6

10.25 CIM_IPVersionSettingData

CIM_IPVersionSettingData represents an IP version. Table 49 provides information about the properties of CIM_IPVersionSettingData.

Table 49 – Class: CIM_IPVersionSettingData

Elements	Requirement	Description
InstanceID	Mandatory	**Key**
ProtocolIFType	Mandatory	See clause 7.2

10.26 CIM_OrderedComponent

CIM_OrderedComponent associates an instance of CIM_IPAssignmentSettingData that compose a configuration with instances that are part of the configuration. Table 50 provides information about the properties of CIM_OrderedComponent.

Table 50 – Class: CIM_OrderedComponent

Elements	Requirement	Description
GroupComponent	Mandatory	**Key:** See clause 7.5.2.1.1 Cardinality *
PartComponent	Mandatory	**Key:** See clause 7.5.2.1.2 Cardinality 1..*
AssignedSequence	Mandatory	See clause 7.5.2.1.3

10.27 CIM_RegisteredProfile

CIM_RegisteredProfile identifies the *IP Configuration Profile* in order for a client to determine whether an instance of CIM_IPProtocolEndpoint is conformant with this profile. The CIM_RegisteredProfile class is defined by the *Profile Registration Profile* (DSP1033). With the exception of the mandatory values specified for the properties in Table 51, the behavior of the CIM_RegisteredProfile instance is in accordance with DSP1033.

Table 51 – Class: CIM_RegisteredProfile

Elements	Requirement	Description
RegisteredName	Mandatory	This property shall have a value of "IP Configuration".
RegisteredVersion	Mandatory	This property shall have a value of "1.0.1".
RegisteredOrganization	Mandatory	This property shall have a value of 2(DMTF).

10.28 CIM_RemoteAccessAvailableToElement — Gateway

CIM_RemoteAccessAvailableToElement associates the CIM_IPNetworkConnection instance with the CIM_RemoteServiceAccessPoint instance that represents the network gateway. Table 52 provides information about the properties of CIM_RemoteAccessAvailableToElement.

Table 52 – Class: CIM_RemoteAccessAvailableToElement — Gateway

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the CIM_RemoteServiceAccessPoint Cardinality *
Dependent	Mandatory	**Key:** This shall be a reference to the CIM_IPNetworkConnection Cardinality 1..*
OrderOfAccess	Mandatory	See clause 7.11.1.2.3

10.29 CIM_RemoteAccessAvailableToElement — DHCP server

CIM_RemoteAccessAvailableToElement associates the CIM_DHCPProtocolEndpoint instance with the CIM_RemoteServiceAccessPoint instance that represents the DHCP Server. Table 53 provides information about the properties of CIM_RemoteAccessAvailableToElement.

Table 53 – Class: CIM_RemoteAccessAvailableToElement — DHCP server

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the CIM_RemoteServiceAccessPoint Cardinality 0..1
Dependent	Mandatory	**Key:** This shall be a reference to the CIM_DHCPProtocolEndpoint Cardinality 1..*

10.30 CIM_RemoteAccessAvailableToElement — DNS server

DNS Server - CIM_RemoteAccessAvailableToElement associates the CIM_DNSProtocolEndpoint instance with the CIM_RemoteServiceAccessPoint instance that represents the DNS Server. Table 54 provides information about the properties of CIM_RemoteAccessAvailableToElement.

Table 54 – Class: CIM_RemoteAccessAvailableToElement — DNS Server

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the CIM_RemoteServiceAccessPoint Cardinality *
Dependent	Mandatory	**Key:** This shall be a reference to the CIM_DNSProtocolEndpoint Cardinality 1..*
OrderOfAccess	Mandatory	See clause 7.11.3.2.3

10.31 CIM_RemoteAccessAvailableToElement — System ServiceAccessPoints

CIM_RemoteAccessAvailableToElement associates the CIM_ComputerSystem instance with the CIM_RemoteServiceAccessPoint instance that represents the Gateway, DHCP server and DNS servers. Table 55 provides information about the properties of CIM_RemoteAccessAvailableToElement.

Table 55 – Class: CIM_RemoteAccessAvailableToElement — System ServiceAccessPoints

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the CIM_RemoteServiceAccessPoint Cardinality *
Dependent	Mandatory	**Key:** This shall be a reference to the scoping instance Cardinality 1
OrderOfAccess	Mandatory	See clause 7.11.1.2.3 and 7.11.3.2.3

10.32 CIM_RemoteServiceAccessPoint

CIM_RemoteServiceAccessPoint represents the managed system’s view of the default gateway, DHCP Server or DNS Server. Table 56 provides information about the properties of CIM_RemoteServiceAccessPoint.

Table 56 – Class: CIM_RemoteServiceAccessPoint

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

Elements	Requirement	Description
AccessContext	Mandatory	See clause 7.11.1.1.1, 7.11.2.1.1 and 7.11.3.1.1
AccessInfo	Mandatory	See clause 7.11.1.1.2, 7.11.2.1.2 and 7.11.3.1.2
InfoFormat	Mandatory	3 (IPv4 Address) or 4 (IPv6 Address)
ElementName	Mandatory	Pattern ".*"

10.33 CIM_SAPSAPDependency — CIM_IPNetworkConnection

CIM_SAPSAPDependency associates the CIM_IPProtocolEndpoint or CIM_DHCPProtocolEndpoint with the CIM_IPNetworkConnection.

Table 57 provides information about the properties of CIM_SAPSAPDependency.

Table 57 – Class: CIM_SAPSAPDependency — CIM_IPNetworkConnection and CIM_IPProtocolEndpoint or CIM_DHCPProtocolEndpoint

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the central instance. Cardinality 1
Dependent	Mandatory	**Key:** This shall be a reference to the CIM_IPProtocolEndpoint or CIM_DHCPProtocolEndpoint Cardinality *

10.34 CIM_SAPSAPDependency — DNS server

DNS Server - CIM_SAPSAPDependency associates the CIM_IPNetworkConnection instance with the CIM_RemoteServiceAccessPoint instance that represents the DNS server. Table 58 provides information about the properties of CIM_SAPSAPDependency.

Table 58 – Class: CIM_SAPSAPDependency — DNS server

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the CIM_IPNetworkConnection Cardinality 1..*
Dependent	Mandatory	**Key:** This shall be a reference to the CIM_RemoteServiceAccessPoint Cardinality *

10.35 CIM_SAPSAPDependency — DNS server from DHCP

DNS Server from DHCP - CIM_SAPSAPDependency associates the CIM_DHCPProtocolEndpoint instance with the CIM_RemoteServiceAccessPoint instance that represents the DNS server obtained from DHCP.

Table 59 provides information about the properties of CIM_SAPSAPDependency.

Table 59 – Class: CIM_SAPSAPDependency — CIM_DHCPProtocolEndpoint and CIM_RemoteServiceAccessPoint

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the CIM_DHCPProtocolEndpoint. Cardinality 1..*
Dependent	Mandatory	**Key:** This shall be a reference to the CIM_RemoteServiceAccessPoint Cardinality *

10.36 CIM_SAPSAPDependency — IP from DHCP

CIM_SAPSAPDependency associates the CIM_IPProtocolEndpoint representing the IP obtained from the DHCP client with the corresponding CIM_DHCPProtocolEndpoint.

Table 60 provides information about the properties of CIM_SAPSAPDependency.

Table 60 – Class: CIM_SAPSAPDependency — CIM_DHCProtocolEndpoint and CIM_IPProtocolEndpoint

Elements	Requirement	Description
Antecedent	Mandatory	**Key:** This shall be a reference to the CIM_DHCPProtocolEndpoint instance. Cardinality 0..1
Dependent	Mandatory	**Key:** This shall be a reference to the CIM_IPProtocolEndpoint Cardinality 0..1

10.37 CIM_ServiceAffectsElement

CIM_ServiceAffectsElement associates an instance of CIM_IPConfigurationService with an instance of CIM_IPNetworkConnection or CIM_ComputerSystem that the service is able to configure. Table 61 provides information about the properties of CIM_ServiceAffectsElement.

Table 61 – Class: CIM_ServiceAffectsElement

Elements	Requirement	Description
AffectingElement	Mandatory	**Key:** This shall be a reference to the instance of CIM_IPConfigurationService. Cardinality *

Elements	Requirement	Description
AffectedElement	Mandatory	**Key:** This shall be a reference to a CIM_IPNetworkConnection or CIM_ComputerSystem. Cardinality *
ElementEffects	Mandatory	Matches 5 (Manages)

10.38 CIM_ElementConformsToProfile

CIM_ElementConformsToProfile associates an instance of CIM_IPNetworkConnection with its corresponding CIM_RegisteredProfile that represents the version of profile implemented. Table 62 provides information about the properties of CIM_ElementConformsToProfile.

Table 62 – Class: CIM_ElementConformsToProfile

Elements	Requirement	Description
ManagedElement	Mandatory	**Key:** This shall be a reference to the instance of CIM_IPNetworkConnection. Cardinality *
ConformantStandard	Mandatory	**Key:** This shall be a reference to a CIM_RegisteredProfile. Cardinality *

ANNEX A
(informative)

Change log

Version	Date	Description
1.0.0	2013-01-07	DMTF Standard Release
1.0.1	2019-03-14	This errata addresses these issues: • Updated RegisteredVersion to reflect errata version number in clause 10.27, and • Updated RegisteredOrganization description to reflect correct value of 2 for “DMTF” in clause 10.27 and figure in clause 9.1.

Bibliography

DMTF DSP1036, *IP Interface Profile 1.0*,
http://www.dmtf.org/standards/published_documents/DSP1036_1.0.pdf

DMTF DSP1037, *DHCP Client Profile 1.0,*
http://www.dmtf.org/standards/published_documents/DSP1037_1.0.pdf

DMTF DSP1038, *DNS Client Profile 1.0*,
http://www.dmtf.org/standards/published_documents/DSP1038_1.0.pdf