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DNS Client Profile

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Foreword

The *DNS Client Profile* (DSP1038) was prepared by the Server Management Working Group of the DMTF.

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

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 a DNS client 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.

DNS Client Profile

1 Scope

The *DNS Client Profile* extends the management capability of referencing profiles by adding the capability to represent the DNS client configuration of a computer system and its IP interfaces.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

2.1 Approved References

DMTF DSP0200, *CIM Operations over HTTP 1.2.0*

DMTF DSP0004, *CIM Infrastructure Specification 2.3.0*

DMTF DSP1037, *DHCP Client Profile*

DMTF DSP1036, *IP Interface Profile*

DMTF DSP1000, *Management Profile Specification Template*

DMTF DSP1001, *Management Profile Specification Usage Guide*

DMTF DSP1033, *Profile Registration Profile*

IETF RFC 1208, *A Glossary of Networking Terms*, March 1991

IETF RFC 1034, *Domain Names – Concept and Facilities*, November 1987

IETF RFC 952, *DOD Internet Host Table Specification*, October 1985

IETF RFC 1035, *Domain Names – Implementation and Specification*, November 1987

IETF RFC 2136, *Dynamic Updates in the Domain Name System*, April 1997

2.2 Other References

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

Unified Modeling Language (UML) from the Open Management Group (OMG), http://www.uml.org

3 Terms and Definitions

For the purposes of this document, the terms and definitions in DSP1033, DSP1036, and DSP1001 and the following apply.

3.1
can
used for statements of possibility and capability, whether material, physical, or causal

3.2
cannot
used for statements of possibility and capability, whether material, physical, or causal

3.3
conditional
indicates requirements to be followed strictly to conform to the document when the specified conditions are met

3.4
mandatory
indicates requirements to be followed strictly to conform to the document and from which no deviation is permitted

3.5
may
indicates a course of action permissible within the limits of the document

3.6
need not
indicates a course of action permissible within the limits of the document

3.7
optional
indicates a course of action permissible within the limits of the document

3.8
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

3.9
shall
indicates requirements to be followed strictly to conform to the document and from which no deviation is permitted

3.10
shall not
indicates requirements to be followed strictly to conform to the document and from which no deviation is permitted

3.11
should
indicates that among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required

3.12
should not
indicates that a certain possibility or course of action is deprecated but not prohibited

3.13
unspecified
indicates that this profile does not define any constraints for the referenced CIM element or operation

4 Symbols and Abbreviated Terms

Experimental Maturity Level

Some of the content considered for inclusion in *DNS Client Profile* has yet to receive sufficient review to satisfy the adoption requirements set forth by the Technical Committee within the DMTF. This content is presented here as an aid to implementers who are interested in likely future developments within this specification. The content marked experimental may change as implementation experience is gained. There is a high likelihood that it will be included in an upcoming revision of the specification. Until that time, it is purely informational, and is clearly marked within the text.
A sample of the typographical convention for experimental content is included here:

EXPERIMENTAL

Experimental content appears here

EXPERIMENTAL

The following abbreviations are used in this document.

4.1
DNS
Domain Name System

4.2
DHCP
Dynamic Host Configuration Protocol

4.3
IP
Internet Protocol

5 Synopsis

Profile Name: *DNS Client*

Version: 1.0.0

Organization: DMTF

CIM Schema Version: 2.19

Central Class: CIM_DNSProtocolEndpoint

Scoping Class: CIM_ComputerSystem

The *DNS Client Profile* extends the management capability of referencing profiles by adding the capability to represent a DNS client in a managed system. This profile includes a specification of the DNS client, its configuration, its associated capabilities, and the profile registration information for this profile.

The Central Instance of the *DNS Client Profile* shall be an instance of CIM_DNSProtocolEndpoint. The Scoping Instance shall be the instance of CIM_ComputerSystem with which the Central Instance is associated through an instance of CIM_HostedAccessPoint.

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

241 **Table 1 – Referenced Profiles**

Profile Name	Organization	Version	Relationship	Behavior
Profile Registration	DMTF	1.0.0	Mandatory	None
IP Interface	DMTF	1.0.0	Mandatory	None
DHCP Client	DMTF	1.0.0	Optional	None

242 6 Description

243 The *DNS Client Profile* describes a DNS client in a managed system. The DNS client is represented by
244 an instance of CIM_DNSProtocolEndpoint. The DNS client has a relationship with exactly one IP
245 interface. This relationship is indicated through an instance of the CIM_SAPSAPDependency association.
246 Configuration information for each interface is modeled in the CIM_DNSProtocolEndpoint instance as well
247 as in the CIM_DNSSettingData instance.

248 The system-wide DNS configuration is modeled in the CIM_DNSGeneralSettingData instance. In a
249 system with multiple IP interfaces, only a single CIM_DNSGeneralSettingData instance contains the
250 active system-wide settings, while an instance of CIM_DNSSettingData exists for each interface.

251 The DNS servers that the DNS client has been configured to use are modeled using an instance of
252 CIM_RemoteServiceAccessPoint. The actual DNS servers are not modeled in this profile.

253 Figure 1 represents the class schema for the *DNS Client Profile*. For simplicity, the prefix CIM_ has been
254 removed from the names of the classes.

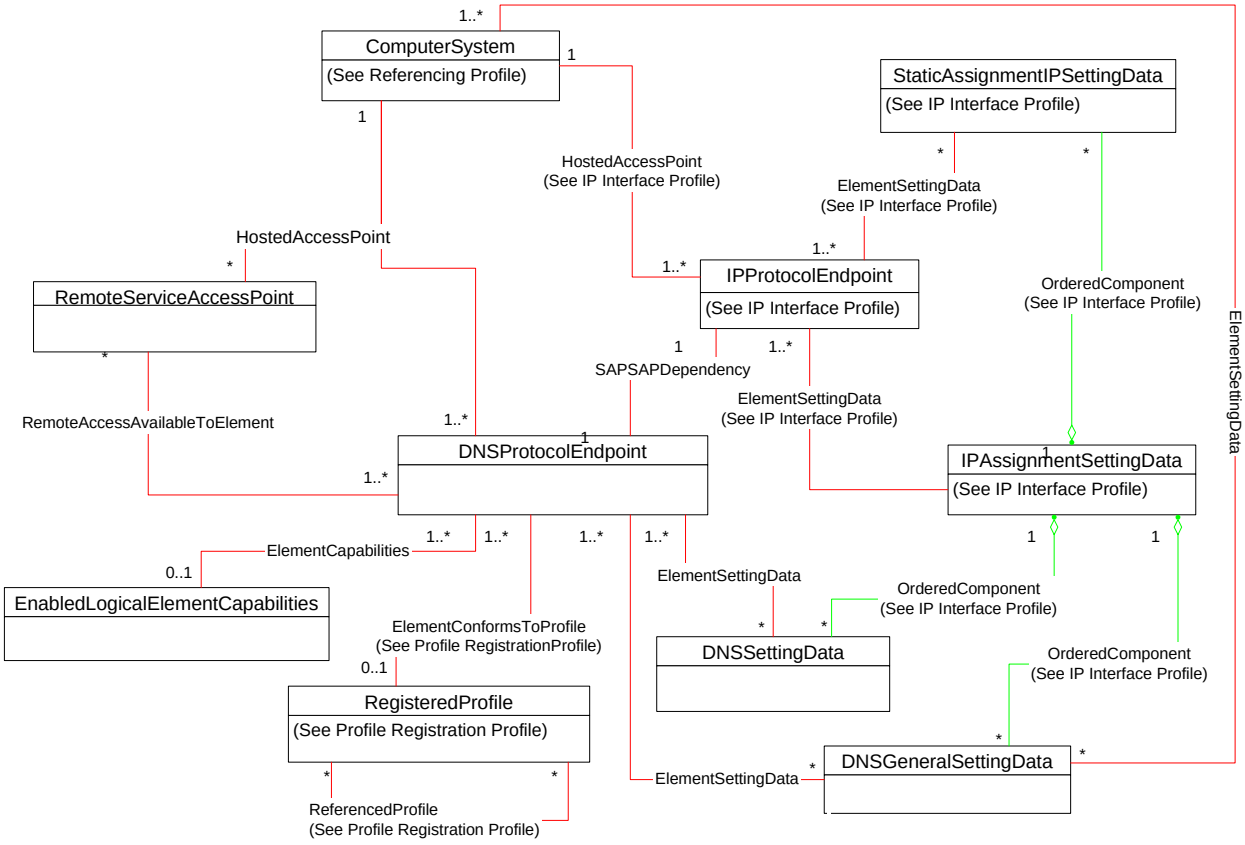

Figure 1 – DNS Client Profile: Class Diagram

7 Implementation

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

7.1 DNS Client Representation

The DNS client shall be modeled using an instance of CIM_DNSProtocolEndpoint. The CIM_DNSProtocolEndpoint shall be associated with exactly one instance of CIM_IPProtocolEndpoint through an instance of the CIM_SAPSAPDependency association.

The current configuration of the DNS client is modeled using properties of the CIM_DNSProtocolEndpoint instance. One or more alternate configurations for the client may be instrumented. Requirements when modeling one or more alternate configurations are described in section 7.4.

7.1.1 CIM_DNSProtocolEndpoint.DNSSuffixesToAppend

The value of the CIM_DNSProtocolEndpoint.DNSSuffixesToAppend property shall be zero or more strings, where each string identifies a DNS suffix to append when resolving a host name, and each string is formatted according to the preferred name syntax specified in IETF RFC 1035.

7.1.2 CIM_DNSProtocolEndpoint.DHCPOptionsToUse

The CIM_DNSProtocolEndpoint.DHCPOptionsToUse property shall identify the DHCP options whose values will be used when values are retrieved by the DHCP client for the associated IP interface. When this property is not implemented, the use of DHCP assigned values is not supported by the DNS client. When this property is implemented and no values are specified, the DNS client is not using any DHCP assigned values for its configuration.

7.1.3 DNS Client State Management Is Supported—Conditional

Support for managing the state of the DNS client is optional behavior. This section describes the CIM elements and behaviors that shall be implemented when this behavior is supported.

7.1.3.1 CIM_EnabledLogicalElementCapabilities

When state management is supported, exactly one instance of CIM_EnabledLogicalElementCapabilities shall be associated with the CIM_DNSProtocolEndpoint instance through an instance of CIM_ElementCapabilities.

7.1.3.1.1 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported

The RequestedStatesSupported property may contain zero or more of the following values: 2 (Enabled), 3 (Disabled), or 11 (Reset).

7.1.3.2 CIM_DNSProtocolEndpoint.RequestedState

When the CIM_DNSProtocolEndpoint.RequestStateChange( ) method is successfully invoked, the value of the RequestedState property shall be the value of the RequestedState parameter. If the method is not successfully invoked, the value of the RequestedState property is indeterminate.

The CIM_DNSProtocolEndpoint.RequestedState property shall have one of the values specified in the CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property or a value of 5 (No Change).

7.1.3.3 CIM_DNSProtocolEndpoint.EnabledState

When the RequestedState parameter has a value of 2 (Enabled) or 3 (Disabled) and the CIM_DNSProtocolEndpoint.RequestStateChange( ) method completes successfully, the value of the EnabledState property shall equal the value of the CIM_DNSProtocolEndpoint.RequestedState property.

If the method does not complete successfully, the value of the EnabledState property is indeterminate.

The EnabledState property shall have the value 2 (Enabled), 3 (Disabled), or 5 (Not Applicable).

7.1.4 DNS Client State Management Is Not Supported

This section describes the CIM elements and behaviors that shall be implemented when management of the DNS client state is not supported.

7.1.4.1 CIM_EnabledLogicalElementCapabilities

When state management is not supported, exactly one instance of CIM_EnabledLogicalElementCapabilities may be associated with the CIM_DNSProtocolEndpoint instance through an instance of CIM_ElementCapabilities.

7.1.4.1.1 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported

The CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property shall not contain any values.

7.1.4.2 CIM_DNSProtocolEndpoint.RequestedState

The RequestedState property shall have the value 12 (Not Applicable).

7.1.4.3 CIM_DNSProtocolEndpoint.EnabledState

The EnabledState property shall have one of the following values: 2 (Enabled), 3 (Disabled), 5 (Not Applicable), or 6 (Enabled but Offline).

7.1.5 Modifying ElementName Is Supported—Conditional

The CIM_DNSProtocolEndpoint.ElementName property may support being modified by the ModifyInstance operation; see section 8.4.2. This behavior is conditional. This section describes the CIM elements and behavior requirements when an implementation supports client modification of the CIM_DNSProtocolEndpoint.ElementName property.

7.1.5.1 CIM_EnabledLogicalElementCapabilities

An instance of CIM_EnabledLogicalElementCapabilities shall be associated with the CIM_DNSProtocolEndpoint instance through an instance of CIM_ElementCapabilities.

7.1.5.1.1 CIM_EnabledLogicalElementCapabilities.ElementNameEditSupported

The ElementNameEditSupported property shall have a value of TRUE.

7.1.5.1.2 CIM_EnabledLogicalElementCapabilities.MaxElementNameLen

The MaxElementNameLen property shall be implemented.

7.1.6 Modifying ElementName Is Not Supported

This section describes the CIM elements and behaviors that shall be implemented when the CIM_DNSProtocolEndpoint.ElementName does not support being modified by the ModifyInstance operation.

7.1.6.1 CIM_EnabledLogicalElementCapabilities

An instance of CIM_EnabledLogicalElementCapabilities may be associated with the CIM_DNSProtocolEndpoint instance through an instance of CIM_ElementCapabilities.

7.1.6.1.1 CIM_EnabledLogicalElementCapabilities.ElementNameEditSupported

The ElementNameEditSupported property shall have a value of FALSE.

7.1.6.1.2 CIM_EnabledLogicalElementCapabilities.MaxElementNameLen

The MaxElementNameLen property may be implemented. The MaxElementNameLen property is irrelevant in this context.

7.2 DNS Server Representation

A DNS client may be configured with the addresses of zero or more DNS servers to use for the resolution of names. An instance of CIM_RemoteServiceAccessPoint shall exist for each DNS server that the DNS client is configured to use.

7.2.1 CIM_RemoteServiceAccessPoint.AccessInfo

The value of the AccessInfo property of each instance of CIM_RemoteServiceAccessPoint shall be the IP address of the DHCP server. If the value of CIM_RemoteServiceAccessPoint.InfoFormat is 3 (IPv4 Address), then the value of the property shall be expressed in dotted decimal notation as defined in IETF RFC 1208.

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If the value of CIM_RemoteServiceAccessPoint.InfoFormat is 4 (IPv6 Address), then the value of the property shall be expressed in the notation as defined in IETF RFC 4291, section 2.2.

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7.2.2 CIM_RemoteServiceAccessPoint.InfoFormat

The value of the InfoFormat property shall be a value of 3 (IPv4 Address)

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or a value of 4 (IPv6 Address).

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7.3 DNS Client-Server Relationship

A DNS client may be configured with the addresses of multiple DNS servers. The DNS servers are specified as an ordered set. The ordering corresponds to the order in which the DNS client will access each DNS server in an attempt to resolve a name.

For each instance of CIM_RemoteServiceAccessPoint, an instance of CIM_RemoteAccessAvailableToElement shall associate the CIM_RemoteServiceAccessPoint to the CIM_DNSProtocolEndpoint that represents the DNS client. The existence of an instance of CIM_RemoteAccessAvailableToElement is conditional on the existence of an instance of CIM_RemoteServiceAccessPoint.

7.3.1 CIM_RemoteAccessAvailableToElement.OrderOfAccess

For a given instance of CIM_DNSProtocolEndpoint, a finite set of instances of CIM_RemoteAccessAvailableToElement will exist such that the Dependent reference of the instance is the CIM_DNSProtocolEndpoint instance and the Antecedent reference is an instance of CIM_RemoteServiceAccessPoint where the AccessContext property has a value of 3.

For this set of instances, the values of the OrderOfAccess property of each instance shall form a positive, monotonically increasing sequence starting with a value of 1. The relative order of the value of the OrderOfAccess properties shall correspond to the relative order in which the DNS client will communicate with the represented DNS servers when performing name resolution.

7.4 Alternate Configuration Management (Optional)

Alternate configurations for an IP interface are described in the *IP Interface Profile*. An implementation may support the management of an alternate DNS client configuration as part of the IP interface alternate configurations. This behavior is optional. When management of alternate DNS configurations is supported, the optional complete configuration behavior is mandatory.

When alternate configuration management of the DNS client is not supported, the current configuration of the DNS client shall not be affected when an alternate configuration for an IP interface is applied to the associated IP interface.

Some aspects of the configuration are specific to a particular IP interface. These aspects are modeled using CIM_DNSSettingData. Other aspects of the complete configuration are applicable system wide. These aspects are modeled using CIM_DNSGeneralSettingData. When alternate configuration management of the DNS client is supported, the current configuration of the DNS client shall not be affected when an alternate configuration for an IP interface is applied to the associated IP interface where no instance of CIM_DNSSettingData or CIM_DNSGeneralSettingData is associated with the CIM_IPAssignmentSettingData instance.

The following subclauses specify the requirements when this optional behavior is implemented.

7.4.1 CIM_DNSSettingData.DNSServerAddresses

The DNSServerAddresses property of the CIM_DNSSettingData instance indicates the DNS servers that will be used. Each valid value of the DNSServerAddresses property shall be expressed in dotted decimal notation as defined in IETF RFC 1208. Values shall occupy consecutive array positions beginning at index 0 (zero). The property shall contain zero or more values.

7.4.2 CIM_DNSSettingData.DHCPOptionsToUse

The CIM_DNSSettingData.DHCPOptionsToUse property shall identify the DHCP options whose values will be used when values are retrieved by the DHCP client for the associated IP interface. When this property is not implemented or is an empty array, no DHCP options will be used by the DNS client.

7.4.3 CIM_DNSGeneralSettingData Property Requirements

When CIM_DNSGeneralSettingData is instrumented, at least one of the following properties shall be implemented:

- AppendPrimarySuffixes
- AppendParentSuffixes
- DNSSuffixesToAppend

7.4.4 CIM_DNSGeneralSettingData.DNSSuffixesToAppend

The value of the DNSSuffixesToAppend property of the CIM_DNSGeneralSettingData class shall be zero or more strings, where each string identifies a DNS suffix to append when resolving a host name, and each string is formatted according to the preferred name syntax specified in IETF RFC 1035.

7.4.5 Alternate Interface-Specific Configuration

At least one instance of CIM_DNSSettingData shall be associated with at least one instance of CIM_IPAssignmentSettingData through an instance of CIM_OrderedComponent.

7.4.6 Alternate System-Wide Configuration

At least one instance of CIM_DNSGeneralSettingData shall be associated with at least one instance of CIM_IPAssignmentSettingData through an instance of CIM_OrderedComponent.

7.4.7 Applying an Alternate Configuration

Whenever an alternate configuration is applied to an IP interface, the DNS client configuration may change. The alternate configuration may implicitly result in a change in the DNS client configuration when the alternate configuration uses DHCP to request a partial DNS configuration and the DNS client is configured to use values returned by DHCP. The alternate configuration may explicitly result in a change in the DNS client configuration when an instance of CIM_DNSSettingData or CIM_DNSGeneralSettingData is associated with the CIM_IPAssignmentSettingData instance.

8 Methods

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

8.1 CIM_DNSProtocolEndpoint.RequestStateChange( )

Invocation of the RequestStateChange( ) method changes the element's state to the value specified in the RequestedState parameter. The 2 (Enabled) and 3 (Disabled) values of the RequestedState parameter shall correspond to enabling or disabling the network interface represented by the CIM_DNSProtocolEndpoint instance. A value of 11 (Reset) for the RequestedState parameter shall be equivalent to disabling and then enabling the network interface represented by the instance of CIM_DNSProtocolEndpoint.

Detailed requirements for the RequestStateChange( ) method are specified in Table 2 and Table 3.

No standard messages are defined.

Invoking the RequestStateChange method multiple times could result in earlier requests being overwritten or lost.

Table 2 – CIM_DNSProtocolEndpoint.RequestStateChange( ) Method: Return Code Values

Value	Description
0	Request was successfully executed.
1	Method unsupported
2	Error occurred
0x1000	Job started: REF returned to started CIM_ConcreteJob

441 **Table 3 – CIM_DNSProtocolEndpoint.RequestStateChange( ) Method: Parameters**

Qualifiers	Name	Type	Description/Values
IN, REQ	RequestedState	uint16	Valid state values : 2 (Enabled) 3 (Disabled) 11 (Reset)
OUT	Job	CIM_ConcreteJob REF	Returned if job started
IN, REQ	TimeoutPeriod	datetime	Client specified maximum amount of time the transition to a new state is supposed to take: 0 or NULL – No time requirements <interval> – Maximum time allowed

442 #### 8.1.1.1 CIM_DNSProtocolEndpoint.RequestStateChange( ) Conditional Support

443 When an instance of CIM_EnabledLogicalElementCapabilities is associated with the
444 CIM_DNSProtocolEndpoint instance and the
445 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property contains at least one
446 value, the CIM_DNSProtocolEndpoint.RequestStateChange( ) method shall be implemented and
447 supported. The CIM_DNSProtocolEndpoint.RequestStateChange( ) method shall not return a value of 1
448 (Not Supported).

449 ## 8.2 Profile Conventions for Operations

450 Support for operations for each profile class (including associations) is specified in the following
451 subclauses. Each subclause includes either the statement “All operations in the default list in section 8.2
452 are supported as described by DSP0200 version 1.2” or a table listing all the operations that are not
453 supported by this profile or where the profile requires behavior other than that described by DSP0200
454 version 1.2.

455 The default list of operations is as follows:

456 • GetInstance
457 • Associators
458 • AssociatorNames
459 • References
460 • ReferenceNames
461 • EnumerateInstances
462 • EnumerateInstanceNames

463 A compliant implementation shall support all the operations in the default list for each class, unless the
464 “Requirement” column states something other than *Mandatory*.

8.3 CIM_DNSGeneralSettingData

Table 4 lists operations that either have special requirements beyond those from DSP0200 version 1.2 or shall not be supported.

Table 4 – Operations: CIM_DNSGeneralSettingData

Operation	Requirement	Messages
ModifyInstance	Optional	None

8.4 CIM_DNSProtocolEndpoint

Table 5 lists operations that either have special requirements beyond those from DSP0200 version 1.2 or shall not be supported.

Table 5 – Operations: CIM_DNSProtocolEndpoint

Operation	Requirement	Messages
ModifyInstance	Optional. See section 8.4.2.	None

8.4.1 CIM_DNSProtocolEndpoint – ModifyInstance Operation

This section details the specific requirements for the ModifyInstance operation applied to an instance of CIM_DNSProtocolEndpoint. The ModifyInstance operation shall not modify any properties other than the ElementName property. The ElementName property may be modified; requirements for modifying the ElementName property are specified in section 8.4.2.

8.4.2 CIM_DNSProtocolEndpoint.ElementName Property

When an instance of CIM_EnabledLogicalElementCapabilities is associated with the CIM_DNSProtocolEndpoint instance and the CIM_EnabledLogicalElementCapabilities.ElementNameEditSupported property has a value of TRUE, the implementation shall allow the ModifyInstance operation to change the value of the ElementName property of the CIM_DNSProtocolEndpoint instance. The ModifyInstance operation shall enforce the length restriction specified in the MaxElementNameLen property of the CIM_EnabledLogicalElementCapabilities instance.

When no instance of CIM_EnabledLogicalElementCapabilities is associated with the CIM_DNSProtocolEndpoint instance, or the ElementNameEditSupported property of the CIM_EnabledLogicalElementCapabilities has a value of FALSE, the implementation shall not allow the ModifyInstance operation to change the value of the ElementName property of the CIM_DNSProtocolEndpoint instance.

8.5 CIM_DNSSettingData

Table 6 lists operations that either have special requirements beyond those from DSP0200 version 1.2 or shall not be supported.

Table 6 – Operations: CIM_DNSSettingData

Operation	Requirement	Messages
ModifyInstance	Optional	None

8.6 CIM_ElementCapabilities

Table 7 lists operations that either have special requirements beyond those from DSP0200 version 1.2 or shall not be supported.

Table 7 – Operations: CIM_ElementCapabilities

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

8.7 CIM_ElementSettingData

Table 8 lists operations that either have special requirements beyond those from DSP0200 version 1.2 or shall not be supported.

Table 8 – Operations: CIM_ElementSettingData

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

8.8 CIM_EnabledLogicalElementCapabilities

All operations in the default list in section 8.2 are supported as described by DSP0200 version 1.2.

8.9 CIM_SAPSAPDependency

Table 9 lists operations that either have special requirements beyond those from DSP0200 version 1.2 or shall not be supported.

Table 9 – Operations: CIM_SAPSAPDependency

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

8.10 CIM_HostedAccessPoint

Table 10 lists operations that either have special requirements beyond those from DSP0200 version 1.2 or shall not be supported.

Table 10 – Operations: CIM_HostedAccessPoint

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

8.11 CIM_RemoteServiceAccessPoint

All operations in the default list in section 8.2 are supported as described by DSP0200 version 1.2.

8.12 CIM_RemoteAccessAvailableToElement

Table 11 lists operations that either have special requirements beyond those from DSP0200 version 1.2 or shall not be supported.

Table 11 – Operations: CIM_RemoteAccessAvailableToElement

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

9 Use Cases

This section contains object diagrams and use cases for the *DNS Client Profile*.

9.1 Object Diagrams

The object diagram in Figure 2 shows how instances of CIM_RegisteredProfile are used to identify the version of the *DNS Client Profile* with which an instance of CIM_DNSProtocolEndpoint and its associated instances are conformant. An instance of CIM_RegisteredProfile exists for each profile instrumented in the system.

- profile2 identifies the DMTF *Base System Profile* version 1.0.0.
- profile3 identifies the DMTF *IP Interface Profile* version 1.0.0.
- profile1 identifies the DMTF *DNS Client Profile* version 1.0.0.

The CIM_DNSProtocolEndpoint instance is associated with profile1, indicating that the instance of CIM_DNSProtocolEndpoint is conformant with the DMTF *DNS Client Profile* version 1.0.0. The instance of CIM_ComputerSystem is conformant with the DMTF *Base System Profile* version 1.0.0, as indicated by the CIM_ElementConformsToProfile association to profile2. Likewise, the CIM_IPProtocolEndpoint instance is conformant with the DMTF *IP Interface Profile* version 1.0.0, as indicated by the association to profile3.

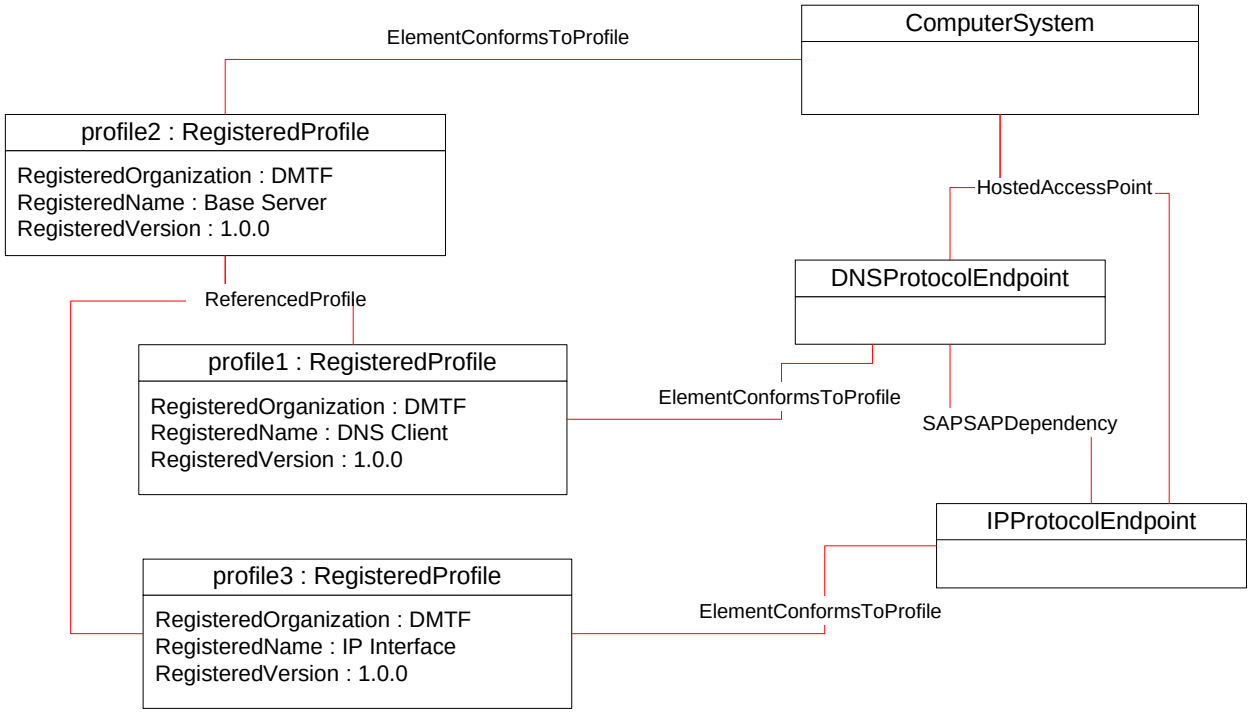

Figure 2 – Registered Profile

Figure 3 is an object diagram for an IP interface with DNS client support. Management of the DNS client is limited to indicating the host name bound to the IP interface. The DNS client for the IP interface is represented by the instance of CIM_DNSProtocolEndpoint. In this implementation, the current host name being used can be queried and the DNS client can be enabled and disabled.

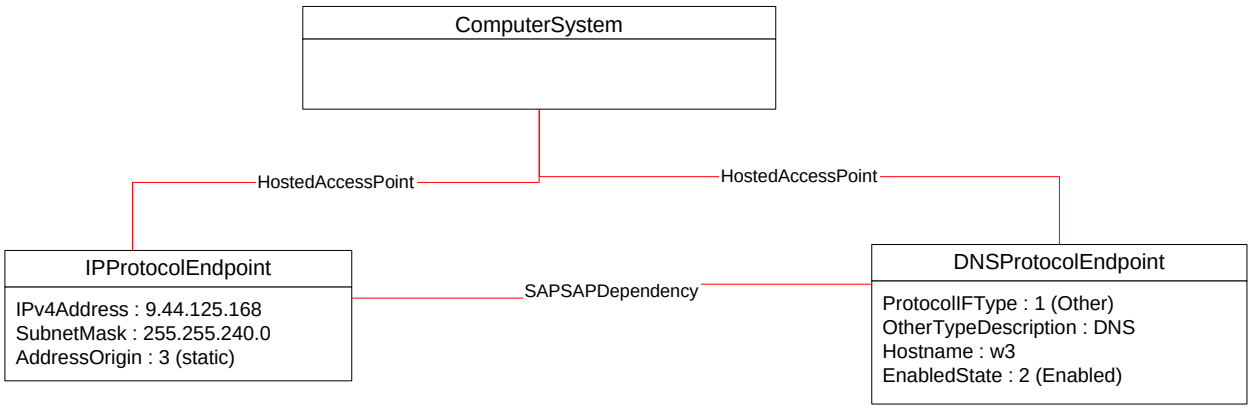

Figure 3 – Host Name Only

Figure 4 is an object diagram for an IP interface that has DNS client support. This implementation provides a complete model of the DNS client configuration. Each instance of CIM_RemoteServiceAccessPoint represents a DNS server that the client has been configured to use. The CIM_DNSProtocolEndpoint instance contains the entire configuration of the DNS client.

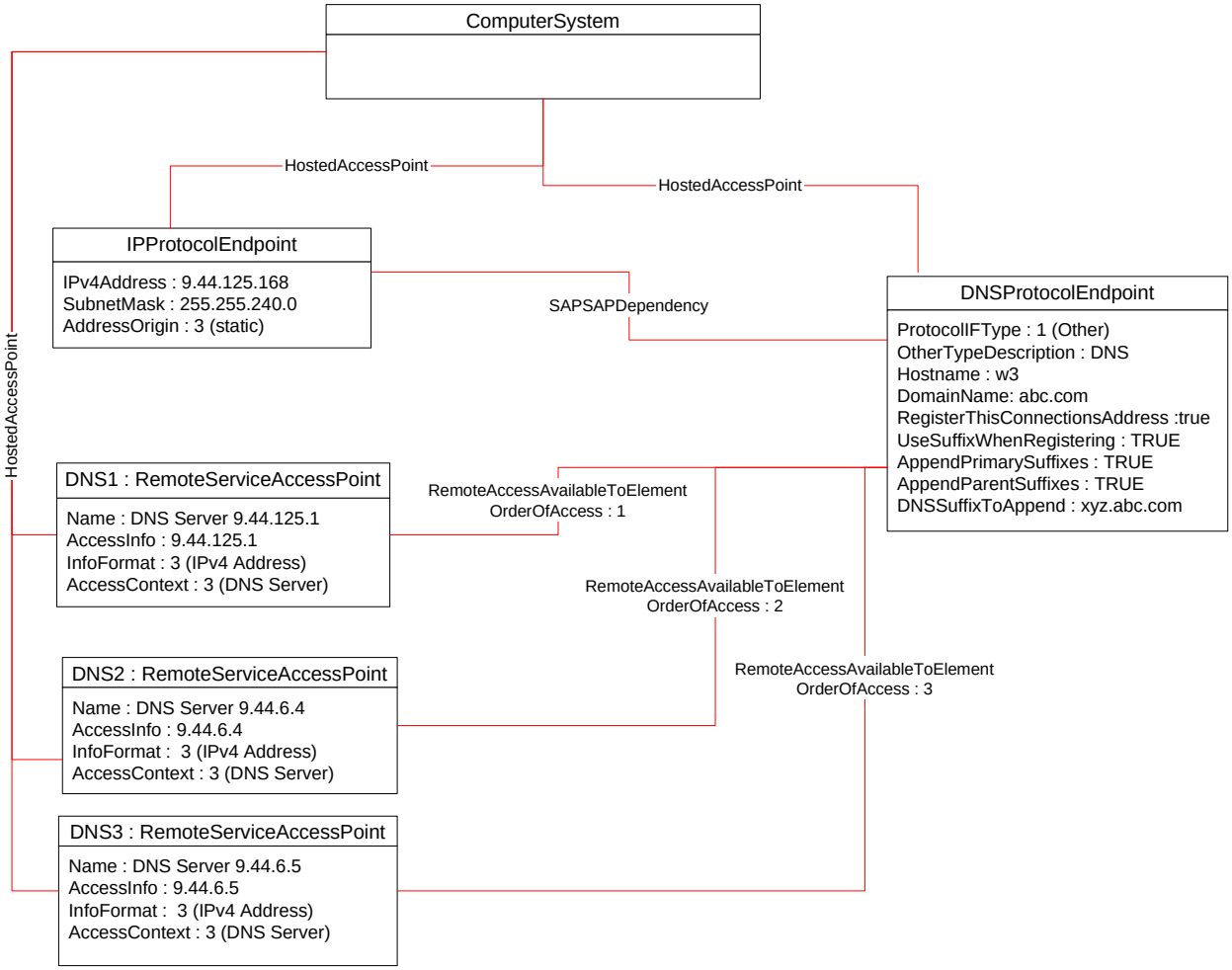

Figure 4 – DNS Configuration

The object diagram in Figure 5 is for an implementation in which the optional behavior of managing alternate configurations is supported. This diagram illustrates a more complete implementation than Figure 4. The current configuration of the DNS client is reflected by the properties of the CIM_DNSProtocolEndpoint instance.

dns2 and dnsgen2 contain the alternate configuration for the DNS client that will be used if the instance of CIM_IPAssignmentSettingData that represents an alternate configuration that could be applied to the IP interface is applied to the IP interface.

Note that to reduce clutter, the CIM_HostedAccessPoint associations are not shown. Neither are the CIM_IPConfigurationService instance and its related associations.

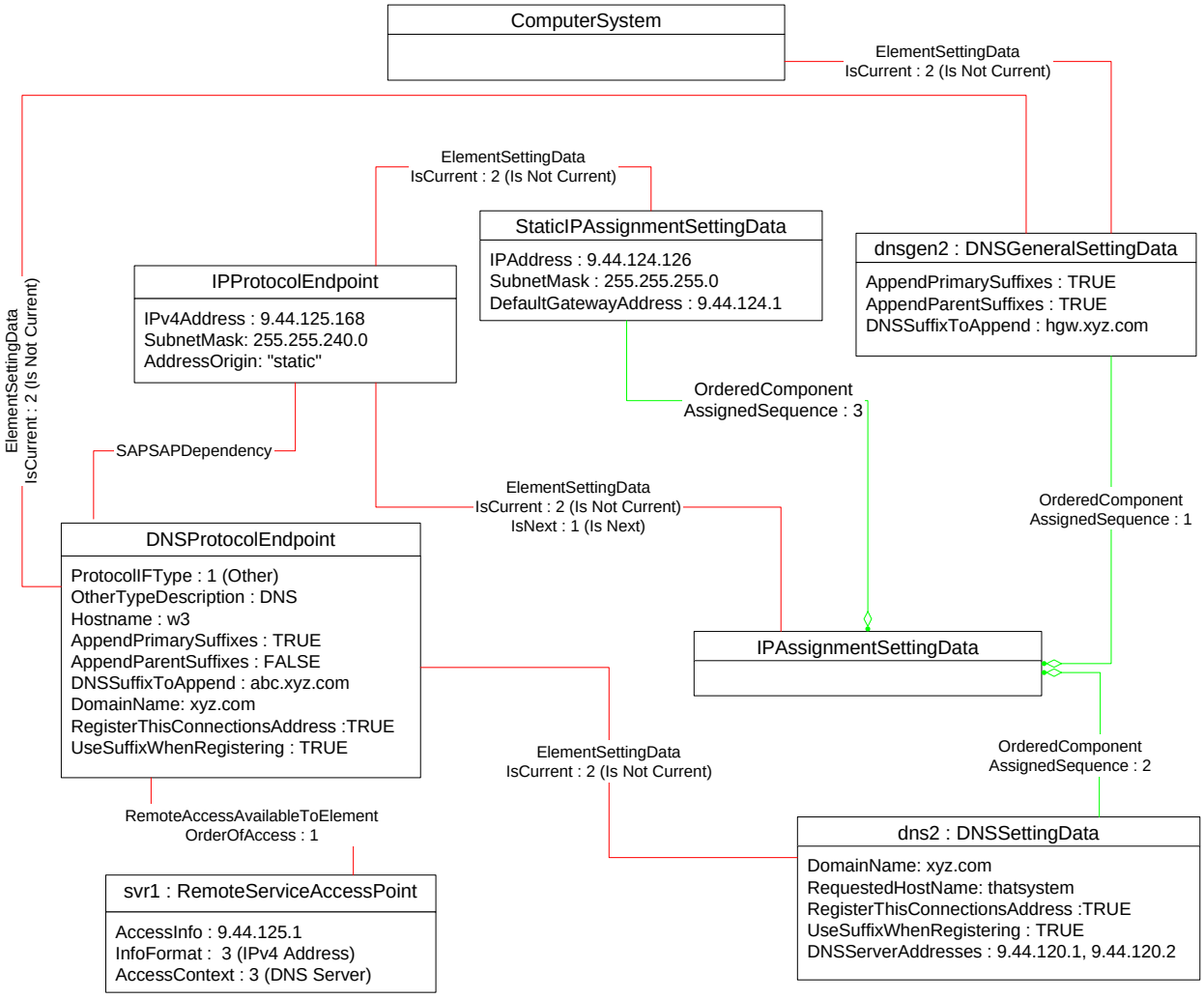

Figure 5 – DNS Configuration with Alternate Configuration

The object diagram in Figure 6 is for the same implementation as that of Figure 5 after the alternate configuration has been applied. The property values of the CIM_DNSProtocolEndpoint instance have been updated to reflect the settings applied when the alternate configuration was applied. The IsCurrent property of the instances of CIM_ElementSettingData that associate dns2 and dnsgen2 with the CIM_DNSProtocolEndpoint instance have the value 1 (Is Current), which indicates that these settings were the last applied.

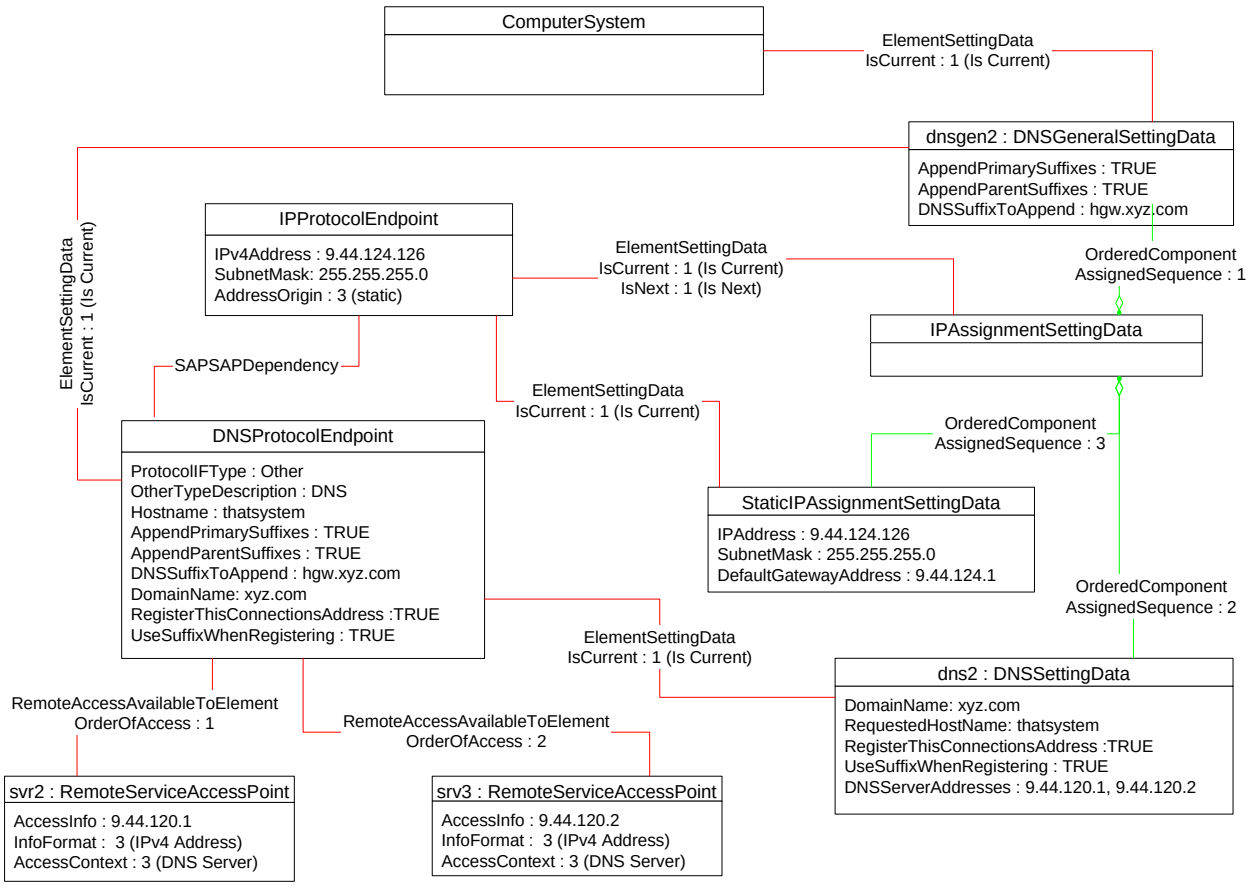

Figure 6 – Alternate Configuration Applied

9.2 Determine the Current DNS Configuration

A client can determine the current DNS client configuration for an IP interface represented by an instance of CIM_IPProtocolEndpoint as follows:

1) Starting at the instance of CIM_IPProtocolEndpoint, use the CIM_SAPSAPDependency association to find the associated instance of CIM_DNSProtocolEndpoint.

2) The host name associated with the IP endpoint is the value of the Hostname property of the CIM_DNSProtocolEndpoint instance.

3) Find each instance of CIM_RemoteServiceAccessPoint that is associated through an instance of CIM_RemoteAccessAvailableToElement with the CIM_DNSProtocolEndpoint instance where the value of the AccessContext property of the CIM_RemoteServiceAccessPoint instance is 3 (DNS Server).

4) Query the value of the OrderOfAccess property of each instance of CIM_RemoteAccessAvailableToElement to determine the relative order of access of the DNS client to each of the DNS servers represented by the CIM_RemoteServiceAccessPoint instances. The AccessInfo property of each instance of CIM_RemoteServiceAccessPoint identifies a DNS server.

5) Query the remaining properties of the CIM_DNSProtocolEndpoint instance to determine the complete DNS client configuration.

9.3 Determine Support for an Alternate DNS Configuration

A client can determine whether the implementation supports an alternate DNS configuration as follows:

1) Find the instance of CIM_IPProtocolEndpoint that is associated with the CIM_DNSProtocolEndpoint instance through an instance of CIM_SAPSAPDependency.
2) Find the instances of CIM_IPAssignmentSettingData that are associated with the CIM_IPProtocolEndpoint instance through an instance of CIM_ElementSettingData.
3) For each instance of CIM_IPAssignmentSettingData, determine if an instance of CIM_DNSSettingData or CIM_DNSGeneralSettingData is associated with the instance through an instance of CIM_OrderedComponent.

If an instance of CIM_DNSSettingData or CIM_DNSGeneralSettingData is found, the management of an alternate DNS configuration is supported. The instance of CIM_IPAssignmentSettingData represents an alternate IP configuration with DNS support.

9.4 Modify the DNS Configuration

A client can modify the DNS configuration as follows:

1) Determine if management of an alternate DNS configuration is supported as specified in section 9.3.
2) Modify the properties of the CIM_DNSGeneralSettingData and CIM_DNSSettingData instances to have the desired configuration.
3) Apply the alternate configuration to the IP interface using one of the methods described in the *IP Interface Profile*.

9.5 Determine Whether ElementName Can Be Modified

A client can determine whether it can modify the ElementName of an instance of CIM_DNSProtocolEndpoint as follows:

1) Find the CIM_EnabledLogicalElementCapabilities instance that is associated with the CIM_DNSProtocolEndpoint instance.
2) Query the value of the ElementNameEditSupported property of the CIM_EnabledLogicalElementCapabilities instance. If the value is TRUE, the client can modify the ElementName property of the target instance.

9.6 Determine Whether State Management Is Supported

A client can determine whether state management is supported for an instance of CIM_DNSProtocolEndpoint as follows:

1) Find the CIM_EnabledLogicalElementCapabilities instance that is associated with the CIM_DNSProtocolEndpoint instance.
2) Query the value of the RequestedStatesSupported property. If at least one value is specified, state management is supported.

10 CIM Elements

Table 12 shows the instances of CIM Elements for this profile. Instances of the CIM Elements shall be implemented as described in Table 12. Sections 7 ("Implementation") and 8 ("Methods") may impose additional requirements on these elements.

Table 12 – CIM Elements: DNS Client Profile

Element Name	Requirement	Description
Classes		
CIM_DNSGeneralSettingData	Optional	See section 10.1.
CIM_DNSProtocolEndpoint	Mandatory	See section 10.2.
CIM_DNSSettingData	Optional	See section 10.3.
CIM_ElementCapabilities	Conditional	See section 10.4.
CIM_ElementSettingData	Optional	See sections 10.5 and 10.6.
CIM_EnabledLogicalElementCapabilities	Optional	See section 10.7.
CIM_SAPSAPDependency	Mandatory	See section 10.8.
CIM_HostedAccessPoint	Mandatory	See sections 10.9 and 10.10.
CIM_RemoteAccessAvailableToElement	Conditional	See sections 7.3 and 10.11.
CIM_RemoteServiceAccessPoint	Optional	See sections 7.2 and 10.12.
CIM_RegisteredProfile	Mandatory	See section 10.13.
Indications		
None defined in this profile		

10.1 CIM_DNSGeneralSettingData

CIM_DNSGeneralSettingData contains the DNS settings that are applicable system wide. Table 13 contains the requirements for elements of this class.

Table 13 – Class: CIM_DNSGeneralSettingData

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
AddressOrigin	Mandatory	Matches 2 (Not Applicable)
AppendPrimarySuffixes	Optional	None
AppendParentSuffixes	Optional	None
DNSSuffixesToAppend	Optional	See section 7.1.1.
ElementName	Mandatory	Pattern ".+"

10.2 CIM_DNSProtocolEndpoint

CIM_DNSProtocolEndpoint represents a DNS client associated with an IP interface. Table 14 contains the requirements for elements of this class.

Table 14 – Class: CIM_DNSProtocolEndpoint

Elements	Requirement	Notes
SystemCreationClassName	Mandatory	**Key**
CreationClassName	Mandatory	**Key**
SystemName	Mandatory	**Key**
Name	Mandatory	**Key**
NameFormat	Mandatory	Pattern ".+"
Hostname	Mandatory	This property shall conform to the NAME restriction identified in *DOD Internet Host Table Specification*.
ProtocolIFType	Mandatory	This property shall have a value of 1 (Other).
OtherTypeDescription	Mandatory	This property shall have a value of "DNS".
RequestedState	Mandatory	See sections 7.1.3.2 and 7.1.4.2.
EnabledState	Mandatory	See sections 7.1.3.3 and 7.1.4.3.
ElementName	Mandatory	Pattern ".+"
AppendPrimarySuffixes	Optional	None
AppendParentSuffixes	Optional	None
DNSSuffixesToAppend	Optional	See section 7.1.1.
DomainName	Optional	This property shall be formatted according to the preferred name syntax specified in *Domain Names – Implementation and Specification*.
UseSuffixWhenRegistering	Optional	None
RegisterThisConnectionsAddress	Optional	None
DHCPOptionsToUse	Optional	See section 7.1.2.

10.3 CIM_DNSSettingData

CIM_DNSSettingData represents the DNS client configuration that is specific to a particular IP interface. Table 15 contains the requirements for elements of this class.

Table 15 – Class: CIM_DNSSettingData

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
AddressOrigin	Mandatory	Matches 2 (Not Applicable)
ElementName	Mandatory	Pattern ".+"
RequestedHostname	Mandatory	This property shall conform to the NAME restriction identified in *DOD Internet Host Table Specification*.
DNSServerAddresses	Mandatory	See section 7.4.1.
DomainName	Optional	This property shall be formatted according to the preferred name syntax specified in *Domain Names – Implementation and Specification*.
UseSuffixWhenRegistering	Optional	None
RegisterThisConnectionsAddress	Optional	None

10.4 CIM_ElementCapabilities

CIM_ElementCapabilities associates an instance of CIM_EnabledLogicalElementCapabilities with an instance of CIM_DNSProtocolEndpoint. CIM_ElementCapabilities is only supported if CIM_EnableLogicalElementCapabilities is supported. Table 16 contains the requirements for elements of this class.

Table 16 – Class: CIM_ElementCapabilities

Elements	Requirement	Notes
ManagedElement	Mandatory	**Key** This property shall be a reference to an instance of CIM_DNSProtocolEndpoint. Cardinality 1..*
Capabilities	Mandatory	**Key** This property shall be a reference to the instance of CIM_EnabledLogicalElementCapabilities. Cardinality 0..1

10.5 CIM_ElementSettingData—DNSGeneralSettingData

CIM_ElementSettingData associates instances of CIM_DNSGeneralSettingData with the CIM_ComputerSystem instance for which they provide configuration. CIM_ElementSettingData in this case is only supported if CIM_DNSGeneralSettingData is supported. Table 17 contains the requirements for elements of this class.

Table 17 – Class: CIM_ElementSettingData—DNSGeneralSettingData

Elements	Requirement	Notes
Antecedent	Mandatory	This property shall be a reference to the Scoping Instance or the Central Instance. Cardinality 1..*
Dependent	Mandatory	This property shall be a reference to an instance of CIM_DNSGeneralSettingData. Cardinality *
IsCurrent	Mandatory	Matches 1 (Is Current) or 2 (Is Not Current)

10.6 CIM_ElementSettingData—DNSSettingData

CIM_ElementSettingData associates instances of CIM_DNSSettingData with the CIM_DNSProtocolEndpoint for which they provide configuration. CIM_ElementSettingData in this case is only supported if CIM_DNSSettingData is supported. Table 18 contains the requirements for elements of this class.

Table 18 – Class: CIM_ElementSettingData—DNSSettingData

Elements	Requirement	Notes
Antecedent	Mandatory	This property shall be a reference to the Central Instance. Cardinality 1..*
Dependent	Mandatory	This property shall be a reference to an instance of CIM_DNSSettingData. Cardinality *
IsCurrent	Mandatory	Matches 1 (Is Current) or 2 (Is Not Current)

10.7 CIM_EnabledLogicalElementCapabilities

CIM_EnabledLogicalElementCapabilities indicates support for managing the state of the network port. Table 19 contains the requirements for elements of this class.

Table 19 – Class: CIM_EnabledLogicalElementCapabilities

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
RequestedStatesSupported	Mandatory	See sections 7.1.3.1.1 and 7.1.4.1.1.
ElementNameEditSupported	Mandatory	See sections 7.1.5.1.1 and 7.1.6.1.1.
MaxElementNameLen	Conditional	See sections 7.1.5.1.2 and 7.1.6.1.2.

10.8 CIM_SAPSAPDependency

CIM_SAPSAPDependency relates the CIM_IPProtocolEndpoint instance to the CIM_DNSProtocolEndpoint instance that provides functionality related to it. Table 20 contains the requirements for elements of this class.

Table 20 – Class: CIM_SAPSAPDependency

Elements	Requirement	Notes
Antecedent	Mandatory	This property shall be a reference to an instance of CIM_IPProtocolEndpoint. Cardinality 1
Dependent	Mandatory	This property shall be a reference to the Central Instance. Cardinality 1

10.9 CIM_HostedAccessPoint—DNSProtocolEndpoint

CIM_HostedAccessPoint relates the CIM_DNSProtocolEndpoint instances to their scoping CIM_ComputerSystem instance. Table 21 contains the requirements for elements of this class.

Table 21 – Class: CIM_HostedAccessPoint—DNSProtocolEndpoint

Elements	Requirement	Notes
Antecedent	Mandatory	This property shall be a reference to the Scoping Instance. Cardinality 1
Dependent	Mandatory	This property shall be a reference to the Central Instance. Cardinality 1..*

10.10 CIM_HostedAccessPoint—RemoteServiceAccessPoint

CIM_HostedAccessPoint relates the CIM_RemoteServiceAccessPoint instances to their scoping CIM_ComputerSystem instance. Table 22 contains the requirements for elements of this class.

Table 22 – Class: CIM_HostedAccessPoint—RemoteServiceAccessPoint

Elements	Requirement	Notes
Antecedent	Mandatory	This property shall be a reference to the Scoping Instance. Cardinality 1
Dependent	Mandatory	This property shall be a reference to an instance of CIM_RemoteServiceAccessPoint. Cardinality *

10.11 CIM_RemoteAccessAvailableToElement

CIM_RemoteAccessAvailableToElement associates CIM_ManagedElement instances scoped to the managed system with instances of CIM_RemoteServiceAccessPoint that provide function to them. Table 23 contains the requirements for elements of this class.

Table 23 – Class: CIM_RemoteAccessAvailableToElement

Elements	Requirement	Notes
Antecedent	Mandatory	This property shall be a reference to an instance of CIM_RemoteServiceAccessPoint. Cardinality *
Dependent	Mandatory	This property shall be a reference to the Central Instance. Cardinality 1..*
OrderOfAccess	Mandatory	See section 7.3.1.

10.12 CIM_RemoteServiceAccessPoint

CIM_RemoteServiceAccessPoint represents the managed system's view of the DNS servers. Table 24 contains the requirements for elements of this class.

Table 24 – Class: CIM_RemoteServiceAccessPoint

Elements	Requirement	Notes
SystemCreationClassName	Mandatory	**Key**
CreationClassName	Mandatory	**Key**
SystemName	Mandatory	**Key**
Name	Mandatory	**Key**
NameFormat	Mandatory	Pattern (".+")
AccessContext	Mandatory	Matches 3 (DNS Server)
AccessInfo	Mandatory	See section 7.2.1.
InfoFormat	Mandatory	See section 7.2.2.
ElementName	Mandatory	Pattern ".+"

10.13 CIM_RegisteredProfile

CIM_RegisteredProfile identifies the *DNS Client Profile* in order for a client to determine whether an instance of CIM_DNSProtocolEndpoint is conformant with this profile. The CIM_RegisteredProfile class is defined by the *Profile Registration Profile*. With the exception of the mandatory values specified for the properties in Table 25, the behavior of the CIM_RegisteredProfile instance is in accordance with the *Profile Registration Profile*.

Table 25 – Class: CIM_RegisteredProfile

Elements	Requirement	Notes
RegisteredName	Mandatory	This property shall have a value of "DNS Client".
RegisteredVersion	Mandatory	This property shall have a value of "1.0.0".
RegisteredOrganization	Mandatory	This property shall have a value of 2 ("DMTF").

NOTE: Previous versions of this document included the suffix “Profile” for the RegisteredName value. If implementations querying for the RegisteredName value find the suffix “Profile”, they should ignore the suffix, with any surrounding white spaces, before any comparison is done with the value as specified in this document.

693 # ANNEX A
694 # (Informative)
695
696 # Change Log

Version	Date	Description
1.0.0a	2006/07/10	Preliminary Standard
1.0.0	2008/08/10	Final Standard

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ANNEX B
(informative)

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