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117

118

Foreword

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

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122 management and interoperability.

123

Introduction

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

129

DNS Client Profile

130 1 Scope

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

133 2 Normative References

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

137 2.1 Approved References

138 DMTF [DSP0200](#), *CIM Operations over HTTP 1.2.0*

139 DMTF [DSP0004](#), *CIM Infrastructure Specification 2.3.0*

140 DMTF [DSP1037](#), *DHCP Client Profile*

141 DMTF [DSP1036](#), *IP Interface Profile*

142 DMTF [DSP1000](#), *Management Profile Specification Template*

143 DMTF [DSP1001](#), *Management Profile Specification Usage Guide*

144 DMTF [DSP1033](#), *Profile Registration Profile*

145 IETF [RFC 1208](#), *A Glossary of Networking Terms*, March 1991

146 IETF [RFC 1034](#), *Domain Names – Concept and Facilities*, November 1987

147 IETF [RFC 952](#), *DOD Internet Host Table Specification*, October 1985

148 IETF [RFC 1035](#), *Domain Names – Implementation and Specification*, November 1987

149 IETF [RFC 2136](#), *Dynamic Updates in the Domain Name System*, April 1997

150 2.2 Other References

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

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

154 3 Terms and Definitions

155 For the purposes of this document, the terms and definitions in [DSP1033](#), [DSP1036](#), and [DSP1001](#) and
156 the following apply.

157 3.1

158 can

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

- 160 **3.2**
161 **cannot**
162 used for statements of possibility and capability, whether material, physical, or causal
- 163 **3.3**
164 **conditional**
165 indicates requirements to be followed strictly to conform to the document when the specified conditions
166 are met
- 167 **3.4**
168 **mandatory**
169 indicates requirements to be followed strictly to conform to the document and from which no deviation is
170 permitted
- 171 **3.5**
172 **may**
173 indicates a course of action permissible within the limits of the document
- 174 **3.6**
175 **need not**
176 indicates a course of action permissible within the limits of the document
- 177 **3.7**
178 **optional**
179 indicates a course of action permissible within the limits of the document
- 180 **3.8**
181 **referencing profile**
182 indicates a profile that owns the definition of this class and can include a reference to this profile in its
183 "Referenced Profiles" table
- 184 **3.9**
185 **shall**
186 indicates requirements to be followed strictly to conform to the document and from which no deviation is
187 permitted
- 188 **3.10**
189 **shall not**
190 indicates requirements to be followed strictly to conform to the document and from which no deviation is
191 permitted
- 192 **3.11**
193 **should**
194 indicates that among several possibilities, one is recommended as particularly suitable, without
195 mentioning or excluding others, or that a certain course of action is preferred but not necessarily required
- 196 **3.12**
197 **should not**
198 indicates that a certain possibility or course of action is deprecated but not prohibited
- 199 **3.13**
200 **unspecified**
201 indicates that this profile does not define any constraints for the referenced CIM element or operation
202

203 4 Symbols and Abbreviated Terms

204 Experimental Maturity Level

205

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

212 A sample of the typographical convention for experimental content is included here:

213

214 **EXPERIMENTAL**

215 Experimental content appears here

216 **EXPERIMENTAL**

217 The following abbreviations are used in this document.

218 4.1

219 **DNS**

220 Domain Name System

221 4.2

222 **DHCP**

223 Dynamic Host Configuration Protocol

224 4.3

225 **IP**

226 Internet Protocol

227 5 Synopsis

228 **Profile Name:** *DNS Client*

229 **Version:** 1.0.0

230 **Organization:** DMTF

231 **CIM Schema Version:** 2.19

232 **Central Class:** CIM_DNSProtocolEndpoint

233 **Scoping Class:** CIM_ComputerSystem

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

237 The Central Instance of the *DNS Client Profile* shall be an instance of CIM_DNSProtocolEndpoint. The
 238 Scoping Instance shall be the instance of CIM_ComputerSystem with which the Central Instance is
 239 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
<i>Profile Registration</i>	DMTF	1.0.0	Mandatory	None
<i>IP Interface</i>	DMTF	1.0.0	Mandatory	None
<i>DHCP Client</i>	DMTF	1.0.0	Optional	None

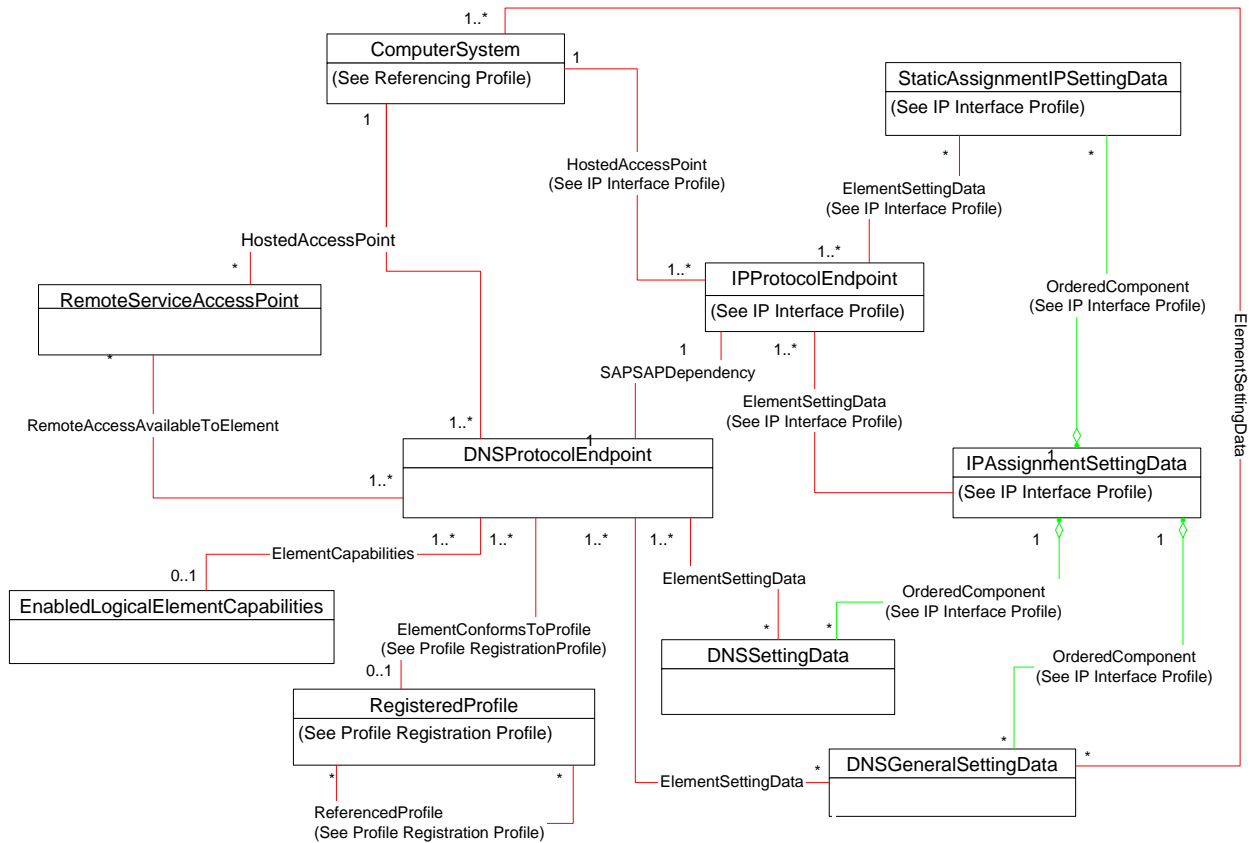
242 6 Description

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.



255

256

Figure 1 – DNS Client Profile: Class Diagram

257 7 Implementation

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

260 7.1 DNS Client Representation

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

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

267 7.1.1 CIM_DNSProtocolEndpoint.DNSSuffixesToAppend

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

271 **7.1.2 CIM_DNSProtocolEndpoint.DHCPOptionsToUse**

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

277 **7.1.3 DNS Client State Management Is Supported—Conditional**

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

280 **7.1.3.1 CIM_EnabledLogicalElementCapabilities**

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

284 **7.1.3.1.1 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported**

285 The RequestedStatesSupported property may contain zero or more of the following values: 2 (Enabled),
286 3 (Disabled), or 11 (Reset).

287 **7.1.3.2 CIM_DNSProtocolEndpoint.RequestedState**

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

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

294 **7.1.3.3 CIM_DNSProtocolEndpoint.EnabledState**

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

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

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

300 **7.1.4 DNS Client State Management Is Not Supported**

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

303 **7.1.4.1 CIM_EnabledLogicalElementCapabilities**

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

307 **7.1.4.1.1 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported**

308 The CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property shall not contain any
309 values.

310 7.1.4.2 CIM_DNSProtocolEndpoint.RequestedState

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

312 7.1.4.3 CIM_DNSProtocolEndpoint.EnabledState

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

315 7.1.5 Modifying ElementName Is Supported—Conditional

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

320 7.1.5.1 CIM_EnabledLogicalElementCapabilities

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

323 7.1.5.1.1 CIM_EnabledLogicalElementCapabilities.ElementNameEditSupported

324 The ElementNameEditSupported property shall have a value of TRUE.

325 7.1.5.1.2 CIM_EnabledLogicalElementCapabilities.MaxElementNameLen

326 The MaxElementNameLen property shall be implemented.

327 7.1.6 Modifying ElementName Is Not Supported

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

331 7.1.6.1 CIM_EnabledLogicalElementCapabilities

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

334 7.1.6.1.1 CIM_EnabledLogicalElementCapabilities.ElementNameEditSupported

335 The ElementNameEditSupported property shall have a value of FALSE.

336 7.1.6.1.2 CIM_EnabledLogicalElementCapabilities.MaxElementNameLen

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

339 7.2 DNS Server Representation

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

343 7.2.1 CIM_RemoteServiceAccessPoint.AccessInfo

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

348

349 EXPERIMENTAL

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

352 EXPERIMENTAL

353 7.2.2 CIM_RemoteServiceAccessPoint.InfoFormat

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

355

356 EXPERIMENTAL

357 or a value of 4 (IPv6 Address).

358 EXPERIMENTAL

359

360 7.3 DNS Client-Server Relationship

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

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

369 7.3.1 CIM_RemoteAccessAvailableToElement.OrderOfAccess

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

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

378 7.4 Alternate Configuration Management (Optional)

379 Alternate configurations for an IP interface are described in the [IP Interface Profile](#). An implementation
380 may support the management of an alternate DNS client configuration as part of the IP interface alternate
381 configurations. This behavior is optional. When management of alternate DNS configurations is
382 supported, the optional complete configuration behavior is mandatory.

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

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

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

394 7.4.1 CIM_DNSSettingData.DNSServerAddresses

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

399 7.4.2 CIM_DNSSettingData.DHCPOptionsToUse

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

403 7.4.3 CIM_DNSGeneralSettingData Property Requirements

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

- 406 • AppendPrimarySuffixes
- 407 • AppendParentSuffixes
- 408 • DNSSuffixesToAppend

409 7.4.4 CIM_DNSGeneralSettingData.DNSSuffixesToAppend

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

413 7.4.5 Alternate Interface-Specific Configuration

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

416 7.4.6 Alternate System-Wide Configuration

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

419 7.4.7 Applying an Alternate Configuration

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

426 8 Methods

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

429 8.1 CIM_DNSProtocolEndpoint.RequestStateChange()

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

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

437 No standard messages are defined.

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

440 **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*.

465 8.3 CIM_DNSGeneralSettingData

466 Table 4 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
467 shall not be supported.

468 **Table 4 – Operations: CIM_DNSGeneralSettingData**

Operation	Requirement	Messages
ModifyInstance	Optional	None

469 8.4 CIM_DNSProtocolEndpoint

470 Table 5 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
471 shall not be supported.

472 **Table 5 – Operations: CIM_DNSProtocolEndpoint**

Operation	Requirement	Messages
ModifyInstance	Optional. See section 8.4.2.	None

473 8.4.1 CIM_DNSProtocolEndpoint – ModifyInstance Operation

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

478 8.4.2 CIM_DNSProtocolEndpoint.ElementName Property

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

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

491 8.5 CIM_DNSSettingData

492 Table 6 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
493 shall not be supported.

494 **Table 6 – Operations: CIM_DNSSettingData**

Operation	Requirement	Messages
ModifyInstance	Optional	None

495 **8.6 CIM_ElementCapabilities**

496 Table 7 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
 497 shall not be supported.

498 **Table 7 – Operations: CIM_ElementCapabilities**

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

499 **8.7 CIM_ElementSettingData**

500 Table 8 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
 501 shall not be supported.

502 **Table 8 – Operations: CIM_ElementSettingData**

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

503 **8.8 CIM_EnabledLogicalElementCapabilities**

504 All operations in the default list in section 8.2 are supported as described by [DSP0200 version 1.2](#).

505 **8.9 CIM_SAPSAPDependency**

506 Table 9 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
 507 shall not be supported.

508 **Table 9 – Operations: CIM_SAPSAPDependency**

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

509 8.10 CIM_HostedAccessPoint

510 Table 10 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#)
511 or shall not be supported.

512 **Table 10 – Operations: CIM_HostedAccessPoint**

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

513 8.11 CIM_RemoteServiceAccessPoint

514 All operations in the default list in section 8.2 are supported as described by [DSP0200 version 1.2](#).

515 8.12 CIM_RemoteAccessAvailableToElement

516 Table 11 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#)
517 or shall not be supported.

518 **Table 11 – Operations: CIM_RemoteAccessAvailableToElement**

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

519 9 Use Cases

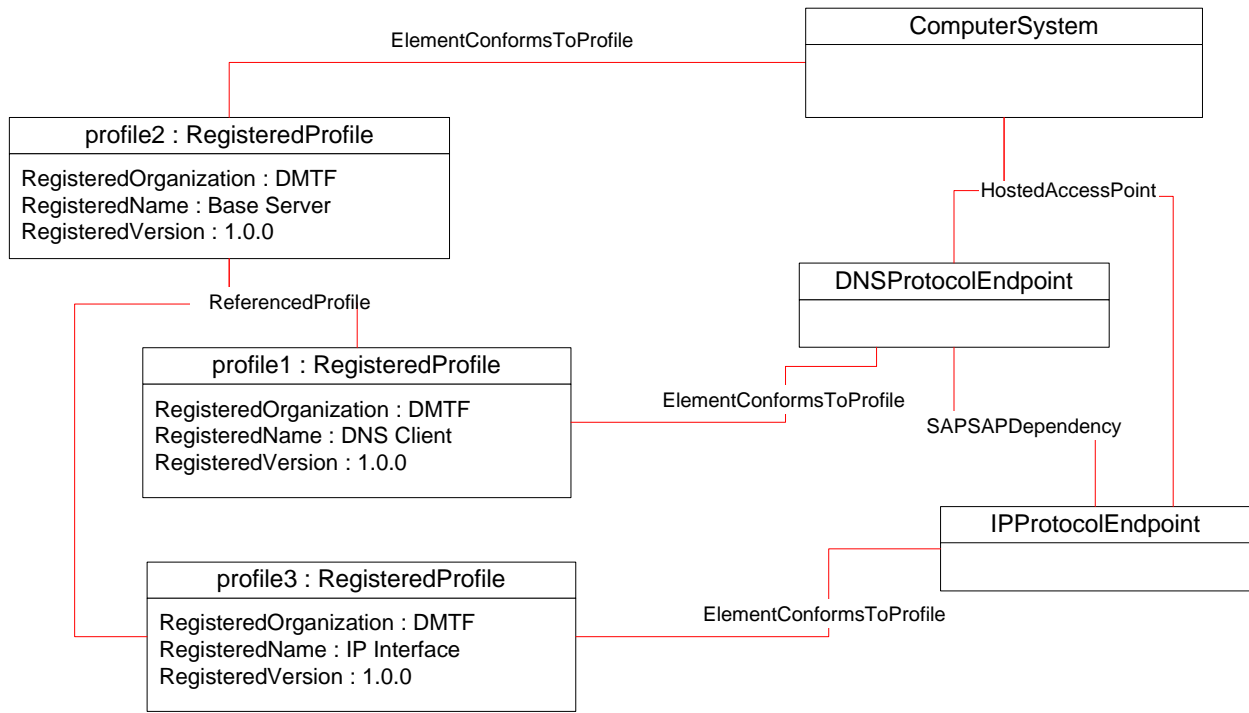
520 This section contains object diagrams and use cases for the *DNS Client Profile*.

521 9.1 Object Diagrams

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

- 526 • profile2 identifies the DMTF *Base System Profile* version 1.0.0.
- 527 • profile3 identifies the DMTF [IP Interface Profile](#) version 1.0.0.
- 528 • profile1 identifies the DMTF *DNS Client Profile* version 1.0.0.

529 The CIM_DNSProtocolEndpoint instance is associated with profile1, indicating that the instance of
530 CIM_DNSProtocolEndpoint is conformant with the DMTF *DNS Client Profile* version 1.0.0. The instance
531 of CIM_ComputerSystem is conformant with the DMTF *Base System Profile* version 1.0.0, as indicated by
532 the CIM_ElementConformsToProfile association to profile2. Likewise, the CIM_IPProtocolEndpoint
533 instance is conformant with the DMTF [IP Interface Profile](#) version 1.0.0, as indicated by the association to
534 profile3.

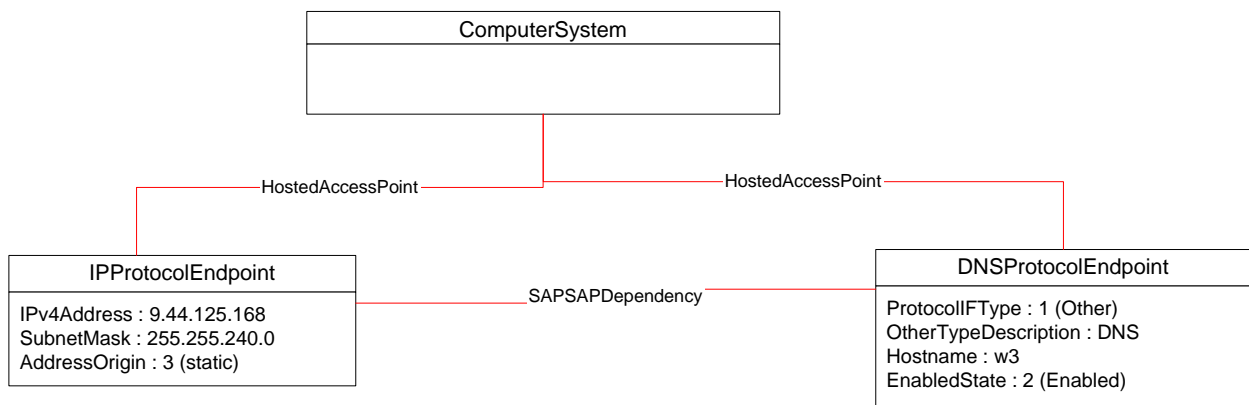


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536

Figure 2 – Registered Profile

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

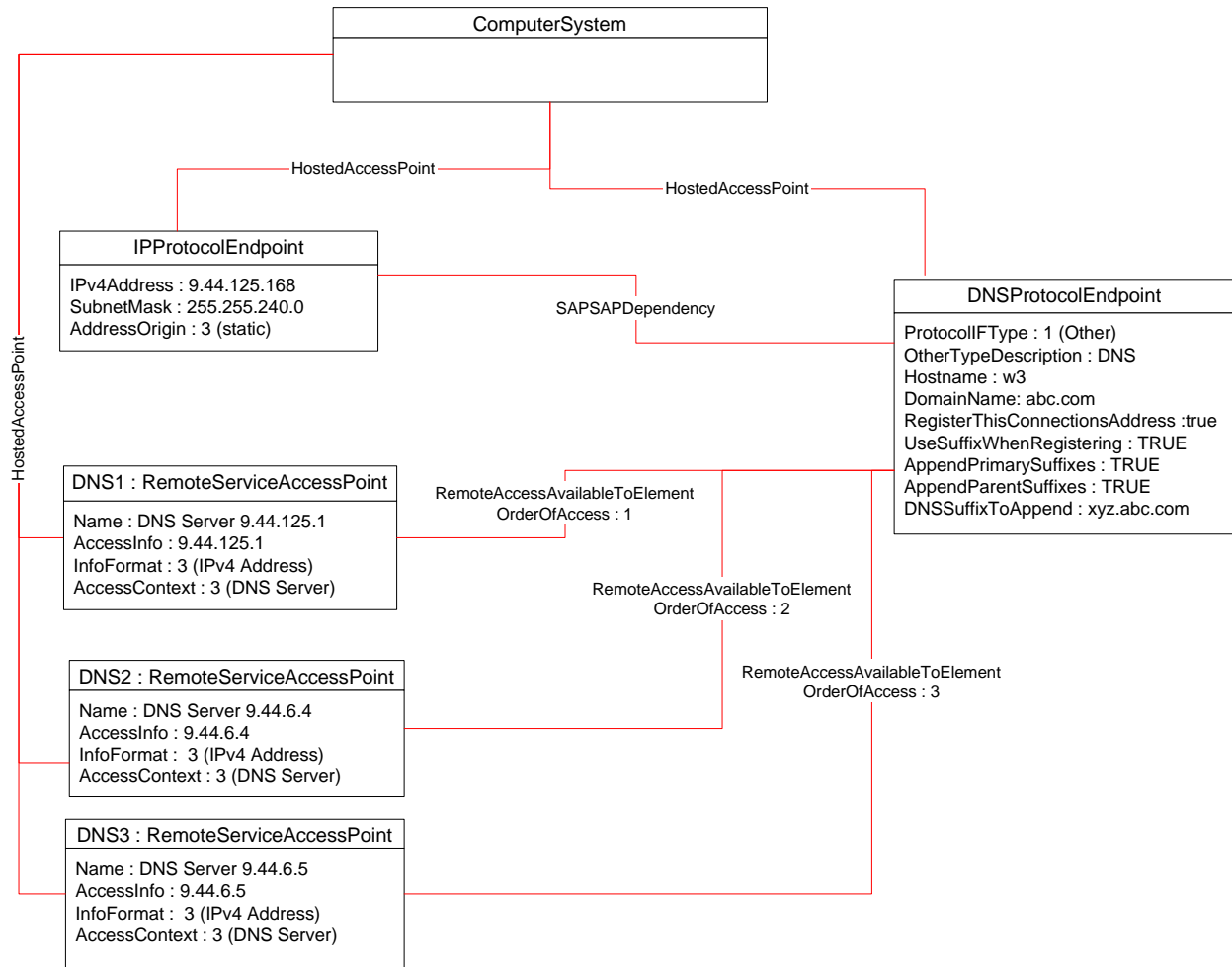


541

542

Figure 3 – Host Name Only

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



547

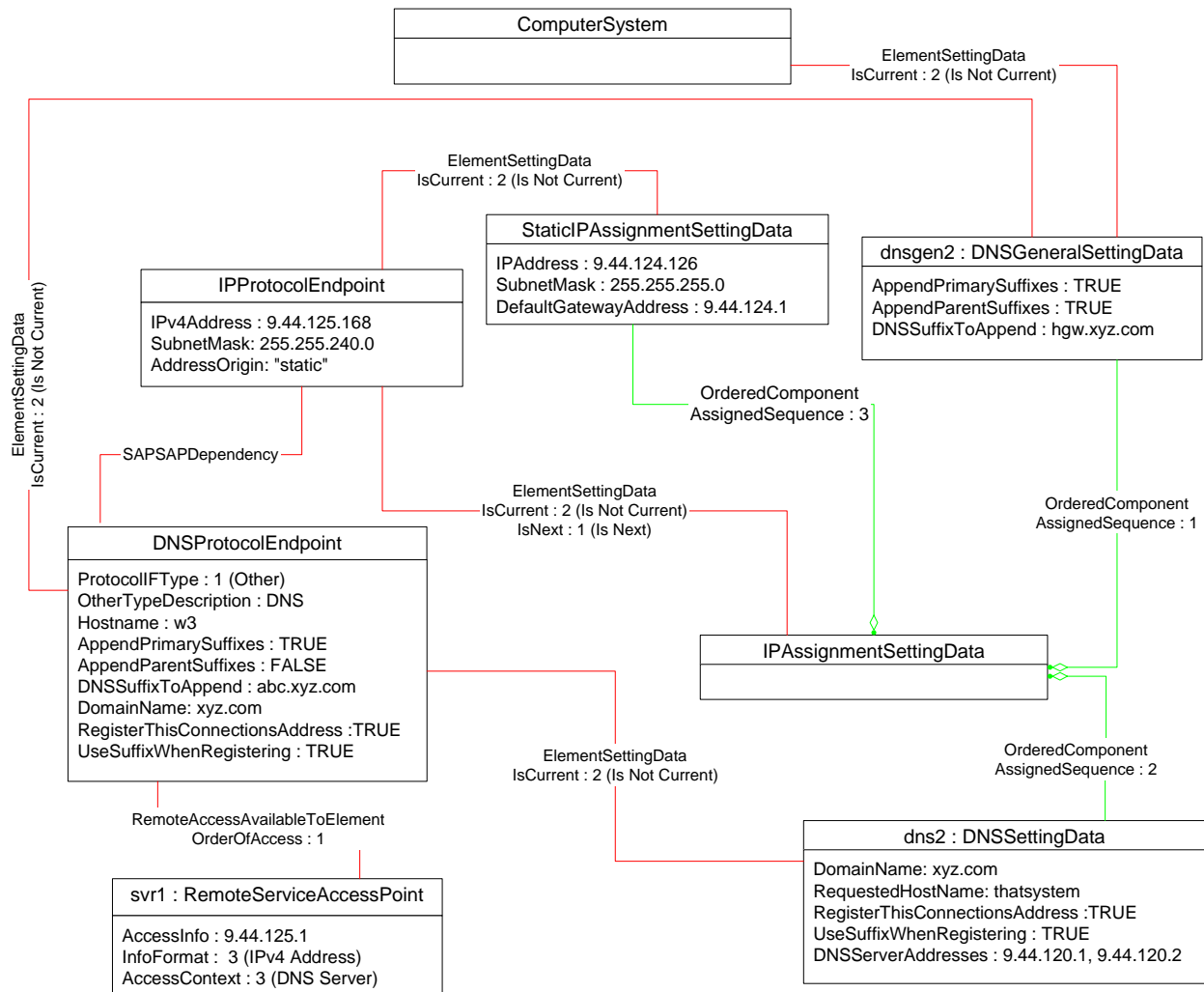
548

Figure 4 – DNS Configuration

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

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

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

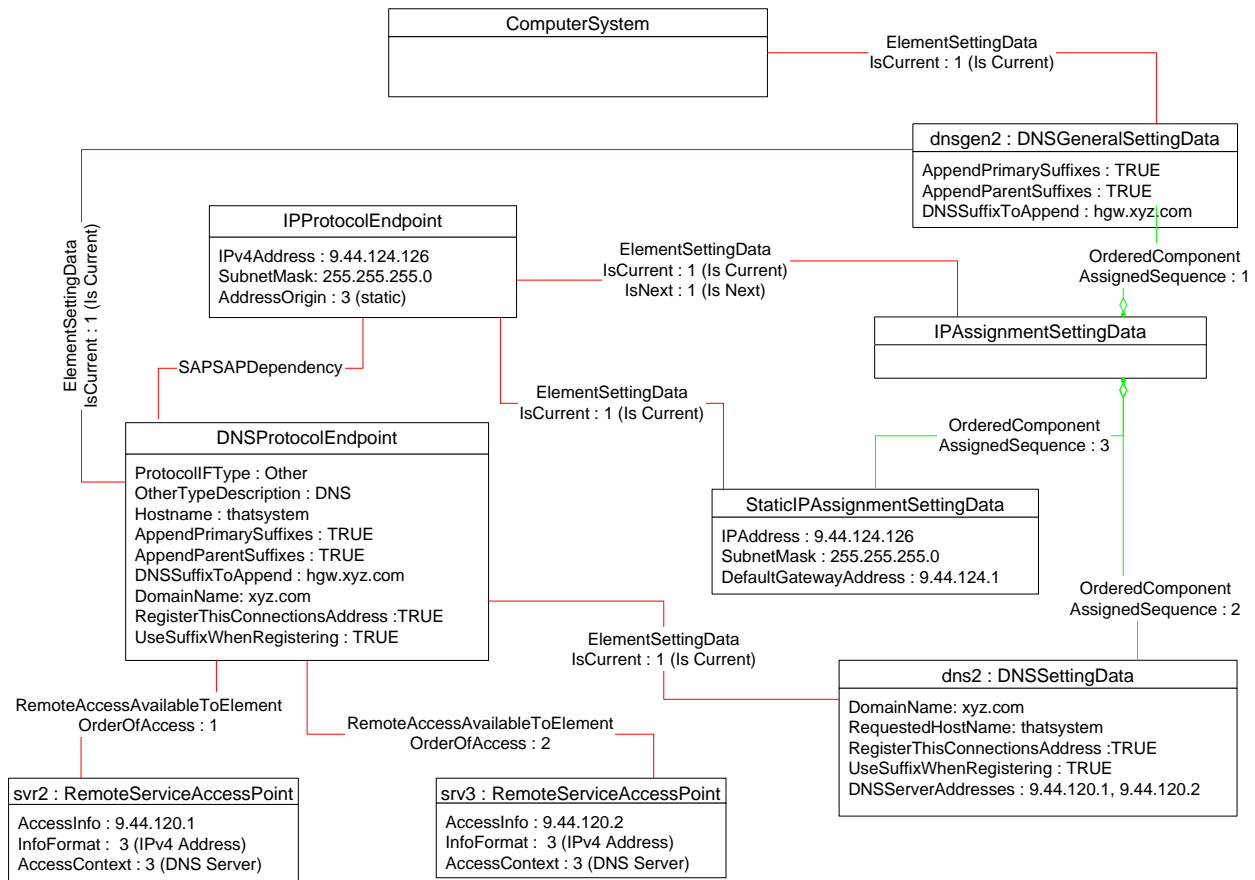


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559

Figure 5 – DNS Configuration with Alternate Configuration

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



566

567

Figure 6 – Alternate Configuration Applied

568 **9.2 Determine the Current DNS Configuration**

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

- 571 1) Starting at the instance of CIM_IPProtocolEndpoint, use the CIM_SAPSAPDependency
572 association to find the associated instance of CIM_DNSProtocolEndpoint.
- 573 2) The host name associated with the IP endpoint is the value of the Hostname property of the
574 CIM_DNSProtocolEndpoint instance.
- 575 3) Find each instance of CIM_RemoteServiceAccessPoint that is associated through an instance
576 of CIM_RemoteAccessAvailableToElement with the CIM_DNSProtocolEndpoint instance where
577 the value of the AccessContext property of the CIM_RemoteServiceAccessPoint instance is 3
578 (DNS Server).
- 579 4) Query the value of the OrderOfAccess property of each instance of
580 CIM_RemoteAccessAvailableToElement to determine the relative order of access of the DNS
581 client to each of the DNS servers represented by the CIM_RemoteServiceAccessPoint
582 instances. The AccessInfo property of each instance of CIM_RemoteServiceAccessPoint
583 identifies a DNS server.
- 584 5) Query the remaining properties of the CIM_DNSProtocolEndpoint instance to determine the
585 complete DNS client configuration.

586 9.3 Determine Support for an Alternate DNS Configuration

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

- 588 1) Find the instance of CIM_IPProtocolEndpoint that is associated with the
589 CIM_DNSProtocolEndpoint instance through an instance of CIM_SAPSAPDependency.
- 590 2) Find the instances of CIM_IPAssignmentSettingData that are associated with the
591 CIM_IPProtocolEndpoint instance through an instance of CIM_ElementSettingData.
- 592 3) For each instance of CIM_IPAssignmentSettingData, determine if an instance of
593 CIM_DNSSettingData or CIM_DNSGeneralSettingData is associated with the instance through
594 an instance of CIM_OrderedComponent.

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

598 9.4 Modify the DNS Configuration

599 A client can modify the DNS configuration as follows:

- 600 1) Determine if management of an alternate DNS configuration is supported as specified in
601 section 9.3.
- 602 2) Modify the properties of the CIM_DNSGeneralSettingData and CIM_DNSSettingData instances
603 to have the desired configuration.
- 604 3) Apply the alternate configuration to the IP interface using one of the methods described in the [IP](#)
605 [Interface Profile](#).

606 9.5 Determine Whether ElementName Can Be Modified

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

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

614 9.6 Determine Whether State Management Is Supported

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

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

621 **10 CIM Elements**

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

625 **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_SAPDependency	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		

626 **10.1 CIM_DNSGeneralSettingData**

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

629 **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 “.+”

630 **10.2 CIM_DNSProtocolEndpoint**

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

633 **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.

634 **10.3 CIM_DNSSettingData**

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

637 **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

638 **10.4 CIM_ElementCapabilities**

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

643 **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

644 **10.5 CIM_ElementSettingData—DNSGeneralSettingData**

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

649 **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)

650 **10.6 CIM_ElementSettingData—DNSSettingData**

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

655 **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)

656 **10.7 CIM_EnabledLogicalElementCapabilities**

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

659 **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.

660 **10.8 CIM_SAPSAPDependency**

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

664 **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

665 **10.9 CIM_HostedAccessPoint—DNSProtocolEndpoint**

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

668 **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..*

669 **10.10 CIM_HostedAccessPoint—RemoteServiceAccessPoint**

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

672 **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 *

673 **10.11 CIM_RemoteAccessAvailableToElement**

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

677 **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.

678 **10.12 CIM_RemoteServiceAccessPoint**

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

681 **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 ".+"

682 **10.13 CIM_RegisteredProfile**

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

688 **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").

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

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ANNEX A (Informative)

Change Log

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

697

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700
701

ANNEX B (informative)

Acknowledgments

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