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5 **DNS Client Profile**

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116

117

Foreword

118 The *DNS Client Profile* (DSP1038) was prepared by the Server Management Working Group, the
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121 DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems
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140

Introduction

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

146 **Document conventions**

147 **Typographical conventions**

148 The following typographical conventions are used in this document:

- 149 • Document titles are marked in *italics*.

150

151

DNS Client Profile

152 1 Scope

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

155 2 Normative references

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

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

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

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

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

168 DMTF DSP1004, *Base Server Profile 1.0*,
169 http://www.dmtf.org/standards/published_documents/DSP1004_1.0.pdf

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

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

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

176 IETF RFC 952, *DOD Internet Host Table Specification*, October 1985,
177 <http://tools.ietf.org/html/rfc952>

178 IETF RFC 1034, *Domain Names – Concept and Facilities*, November 1987,
179 <http://tools.ietf.org/html/rfc1034>

180 IETF RFC 1035, *Domain Names – Implementation and Specification*, November 1987,
181 <http://tools.ietf.org/html/rfc1035>

182 IETF RFC 1208, *A Glossary of Networking Terms*, March 1991,
183 <http://tools.ietf.org/html/rfc1208>

184 IETF RFC 2136, *Dynamic Updates in the Domain Name System*, April 1997,
185 <http://tools.ietf.org/html/rfc2136>

186 IETF RFC 4291, *IP Version 6 Addressing Architecture*, February 2006,
187 <http://www.ietf.org/rfc/rfc4291.txt>

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

190 3 Terms and definitions

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

193 The terms "shall" ("required"), "shall not," "should" ("recommended"), "should not" ("not recommended"),
194 "may," "need not" ("not required"), "can" and "cannot" in this document are to be interpreted as described
195 in [ISO/IEC Directives, Part 2](#), Annex H. The terms in parenthesis are alternatives for the preceding term,
196 for use in exceptional cases when the preceding term cannot be used for linguistic reasons. Note that
197 [ISO/IEC Directives, Part 2](#), Annex H specifies additional alternatives. Occurrences of such additional
198 alternatives shall be interpreted in their normal English meaning.

199 The terms "clause," "subclause," "paragraph," and "annex" in this document are to be interpreted as
200 described in [ISO/IEC Directives, Part 2](#), Clause 5.

201 The terms "normative" and "informative" in this document are to be interpreted as described in [ISO/IEC](#)
202 [Directives, Part 2](#), Clause 3. In this document, clauses, subclauses, or annexes labeled "(informative)" do
203 not contain normative content. Notes and examples are always informative elements.

204 The terms defined in [DSP0004](#), [DSP0223](#), and [DSP1001](#) apply to this document. The following additional
205 terms are used in this document.

206 3.1

207 **can**

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

209 3.2

210 **cannot**

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

212 3.3

213 **conditional**

214 indicates requirements to be followed strictly to conform to the document when the specified conditions
215 are met

216 3.4

217 **mandatory**

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

220 3.5

221 **may**

222 indicates a course of action permissible within the limits of the document

223 3.6

224 **need not**

225 indicates a course of action permissible within the limits of the document

226 3.7

227 **optional**

228 indicates a course of action permissible within the limits of the document

229 3.8

230 **referencing profile**

231 indicates a profile that owns the definition of this class and can include a reference to this profile in its
232 "Referenced Profiles" table

- 233 **3.9**
234 **shall**
235 indicates requirements to be followed strictly to conform to the document and from which no deviation is
236 permitted
- 237 **3.10**
238 **shall not**
239 indicates requirements to be followed strictly to conform to the document and from which no deviation is
240 permitted
- 241 **3.11**
242 **should**
243 indicates that among several possibilities, one is recommended as particularly suitable, without
244 mentioning or excluding others, or that a certain course of action is preferred but not necessarily required
- 245 **3.12**
246 **should not**
247 indicates that a certain possibility or course of action is deprecated but not prohibited
- 248 **3.13**
249 **unspecified**
250 indicates that this profile does not define any constraints for the referenced CIM element or operation

251 **4 Symbols and abbreviated terms**

252 The following abbreviations are used in this document.

- 253 **4.1**
254 **DHCP**
255 Dynamic Host Configuration Protocol
- 256 **4.2**
257 **DNS**
258 Domain Name System
- 259 **4.3**
260 **IP**
261 Internet Protocol

262 **5 Synopsis**

- 263 **Profile name:** DNS Client
264 **Version:** 1.0.3
265 **Organization:** DMTF
266 **CIM Schema version:** 2.27
267 **Central class:** CIM_DNSProtocolEndpoint
268 **Scoping class:** CIM_ComputerSystem

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

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

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

276

Table 1 – Referenced profiles

Profile Name	Organization	Version	Requirement	Description
Profile Registration	DMTF	1.0	Mandatory	None
IP Interface	DMTF	1.0	Mandatory	None
DHCP Client	DMTF	1.0	Optional	None

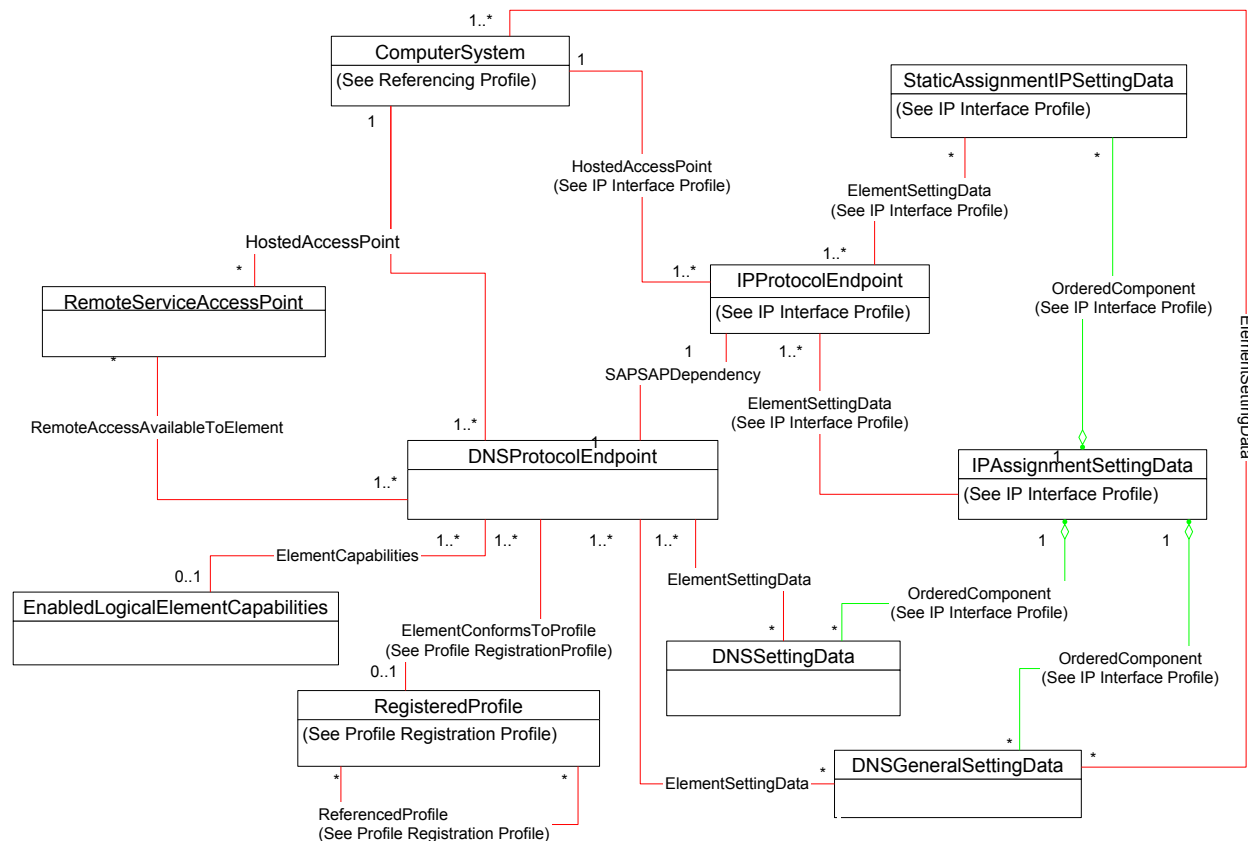
277 6 Description

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

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

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

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



290

291

Figure 1 – DNS Client Profile: Class diagram

292 7 Implementation

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

295 7.1 DNS client representation

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

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

302 7.1.1 CIM_DNSProtocolEndpoint.DNSSuffixesToAppend

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

306 **7.1.2 CIM_DNSProtocolEndpoint.DHCPOptionsToUse**

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

312 **7.1.3 DNS client state management is supported — conditional**

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

315 **7.1.3.1 CIM_EnabledLogicalElementCapabilities**

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

319 **7.1.3.1.1 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported**

320 The RequestedStatesSupported property may contain zero or more of the following values: 2 (Enabled),
321 3 (Disabled), or 11 (Reset).

322 **7.1.3.2 CIM_DNSProtocolEndpoint.RequestedState**

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

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

329 **7.1.3.3 CIM_DNSProtocolEndpoint.EnabledState**

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

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

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

335 **7.1.4 DNS client state management is not supported**

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

338 **7.1.4.1 CIM_EnabledLogicalElementCapabilities**

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

342 **7.1.4.1.1 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported**

343 The CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property shall not contain any
344 values.

345 7.1.4.2 CIM_DNSProtocolEndpoint.RequestedState

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

347 7.1.4.3 CIM_DNSProtocolEndpoint.EnabledState

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

350 7.1.5 Modifying ElementName is supported — conditional

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

355 7.1.5.1 CIM_EnabledLogicalElementCapabilities

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

358 7.1.5.1.1 CIM_EnabledLogicalElementCapabilities.ElementNameEditSupported

359 The ElementNameEditSupported property shall have a value of TRUE.

360 7.1.5.1.2 CIM_EnabledLogicalElementCapabilities.MaxElementNameLen

361 The MaxElementNameLen property shall be implemented.

362 7.1.6 Modifying ElementName is not supported

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

366 7.1.6.1 CIM_EnabledLogicalElementCapabilities

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

369 7.1.6.1.1 CIM_EnabledLogicalElementCapabilities.ElementNameEditSupported

370 The ElementNameEditSupported property shall have a value of FALSE.

371 7.1.6.1.2 CIM_EnabledLogicalElementCapabilities.MaxElementNameLen

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

374 7.2 DNS server representation

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

378 **7.2.1 CIM_RemoteServiceAccessPoint.AccessInfo**

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

383 If the value of CIM_RemoteServiceAccessPoint.InfoFormat is 4 (IPv6 Address), then the value of the
384 property shall be expressed in the notation as defined in IETF [RFC 4291](#), clause 2.2.

385 **7.2.2 CIM_RemoteServiceAccessPoint.InfoFormat**

386 The value of the InfoFormat property shall be a value of 3 (IPv4 Address) or a value of 4 (IPv6 Address).

387 **7.3 DNS client-server relationship**

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

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

396 **7.3.1 CIM_RemoteAccessAvailableToElement.OrderOfAccess**

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

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

405 **7.4 Alternate configuration management (optional)**

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

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

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

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

421 **7.4.1 CIM_DNSSettingData.DNSServerAddresses**

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

426 **7.4.2 CIM_DNSSettingData.DHCPOptionsToUse**

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

430 **7.4.3 CIM_DNSGeneralSettingData property requirements**

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

- 433 • AppendPrimarySuffixes
- 434 • AppendParentSuffixes
- 435 • DNSSuffixesToAppend

436 **7.4.4 CIM_DNSGeneralSettingData.DNSSuffixesToAppend**

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

440 **7.4.5 Alternate interface-specific configuration**

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

443 **7.4.6 Alternate system-wide configuration**

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

446 **7.4.7 Applying an alternate configuration**

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

453 **8 Methods**

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

456 8.1 CIM_DNSProtocolEndpoint.RequestStateChange()

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

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

464 No standard messages are defined.

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

467 **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.

468 **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

469 8.1.1.1 CIM_DNSProtocolEndpoint.RequestStateChange() conditional support

470 When an instance of CIM_EnabledLogicalElementCapabilities is associated with the
 471 CIM_DNSProtocolEndpoint instance and the
 472 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property contains at least one
 473 value, the CIM_DNSProtocolEndpoint.RequestStateChange() method shall be implemented and
 474 supported. The CIM_DNSProtocolEndpoint.RequestStateChange() method shall not return a value of 1
 475 (Not Supported).

476 8.2 Profile conventions for operations

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

479 The default list of operations is as follows:

- 480 • GetInstance
- 481 • EnumerateInstances
- 482 • EnumerateInstanceNames
- 483 • Associators
- 484 • AssociatorNames
- 485 • References
- 486 • ReferenceNames

487 **8.3 CIM_DNSGeneralSettingData**

488 Table 4 lists implementation requirements for operations. If implemented, these operations shall be
 489 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 4, all operations in
 490 the default list in 8.2 shall be implemented as defined in [DSP0200](#).

491 NOTE Related profiles may define additional requirements on operations for the profile class.

492 **Table 4 – Operations: CIM_DNSGeneralSettingData**

Operation	Requirement	Messages
ModifyInstance	Optional	None

493 **8.4 CIM_DNSProtocolEndpoint**

494 Table 5 lists implementation requirements for operations. If implemented, these operations shall be
 495 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 5, all operations in
 496 the default list in 8.2 shall be implemented as defined in [DSP0200](#).

497 NOTE Related profiles may define additional requirements on operations for the profile class.

498 **Table 5 – Operations: CIM_DNSProtocolEndpoint**

Operation	Requirement	Messages
ModifyInstance	Optional. See 8.4.2.	None

499 **8.4.1 CIM_DNSProtocolEndpoint — ModifyInstance operation**

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

504 **8.4.2 CIM_DNSProtocolEndpoint.ElementName property**

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

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

517 8.5 CIM_DNSSettingData

518 Table 6 lists implementation requirements for operations. If implemented, these operations shall be
 519 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 6, all operations in
 520 the default list in 8.2 shall be implemented as defined in [DSP0200](#).

521 NOTE Related profiles may define additional requirements on operations for the profile class.

522 **Table 6 – Operations: CIM_DNSSettingData**

Operation	Requirement	Messages
ModifyInstance	Optional	None

523 8.6 CIM_ElementCapabilities

524 Table 7 lists implementation requirements for operations. If implemented, these operations shall be
 525 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 7, all operations in
 526 the default list in 8.2 shall be implemented as defined in [DSP0200](#).

527 NOTE Related profiles may define additional requirements on operations for the profile class.

528 **Table 7 – Operations: CIM_ElementCapabilities**

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

529 8.7 CIM_ElementSettingData

530 Table 8 lists implementation requirements for operations. If implemented, these operations shall be
 531 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 8, all operations in
 532 the default list in 8.2 shall be implemented as defined in [DSP0200](#).

533 NOTE Related profiles may define additional requirements on operations for the profile class.

534 **Table 8 – Operations: CIM_ElementSettingData**

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

535 8.8 CIM_EnabledLogicalElementCapabilities

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

537 NOTE Related profiles may define additional requirements on operations for the profile class.

538 **8.9 CIM_SAPSAPDependency**

539 Table 9 lists implementation requirements for operations. If implemented, these operations shall be
 540 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 9, all operations in
 541 the default list in 8.2 shall be implemented as defined in [DSP0200](#).

542 NOTE Related profiles may define additional requirements on operations for the profile class.

543 **Table 9 – Operations: CIM_SAPSAPDependency**

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

544 **8.10 CIM_HostedAccessPoint**

545 Table 10 lists implementation requirements for operations. If implemented, these operations shall be
 546 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 10, all operations
 547 in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

548 NOTE Related profiles may define additional requirements on operations for the profile class.

549 **Table 10 – Operations: CIM_HostedAccessPoint**

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

550 **8.11 CIM_RemoteServiceAccessPoint**

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

552 NOTE Related profiles may define additional requirements on operations for the profile class.

553 **8.12 CIM_RemoteAccessAvailableToElement**

554 Table 11 lists implementation requirements for operations. If implemented, these operations shall be
 555 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 11, all operations
 556 in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

557 NOTE Related profiles may define additional requirements on operations for the profile class.

558

Table 11 – Operations: CIM_RemoteAccessAvailableToElement

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

559 9 Use cases

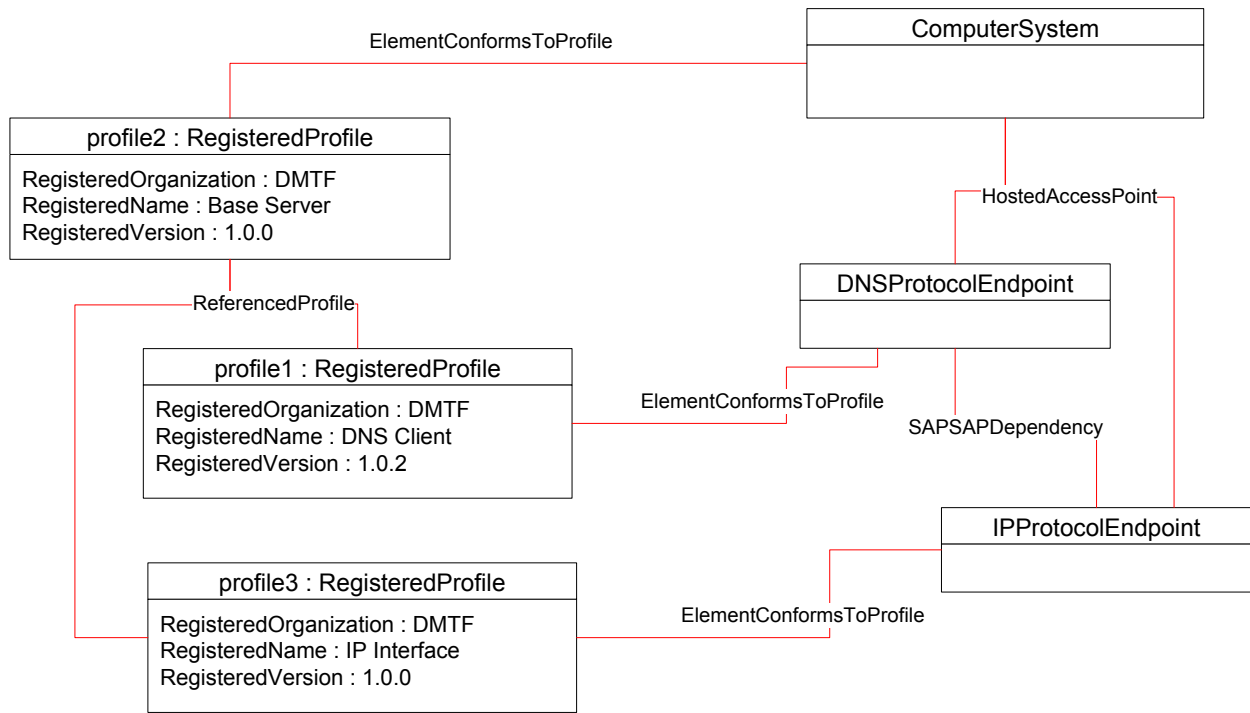
560 This clause contains object diagrams and use cases for the *DNS Client Profile*.

561 9.1 Object diagrams

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

- 566 • profile2 identifies the DMTF [Base System Profile](#) version 1.0.0.
- 567 • profile3 identifies the DMTF [IP Interface Profile](#) version 1.0.0.
- 568 • profile1 identifies the DMTF *DNS Client Profile* version 1.0.2.

569 The CIM_DNSProtocolEndpoint instance is associated with profile1, indicating that the instance of
 570 CIM_DNSProtocolEndpoint is conformant with the DMTF *DNS Client Profile* version 1.0.2. The instance
 571 of CIM_ComputerSystem is conformant with the DMTF [Base System Profile](#) version 1.0.0, as indicated by
 572 the CIM_ElementConformsToProfile association to profile2. Likewise, the CIM_IPProtocolEndpoint
 573 instance is conformant with the DMTF [IP Interface Profile](#) version 1.0.0, as indicated by the association to
 574 profile3.

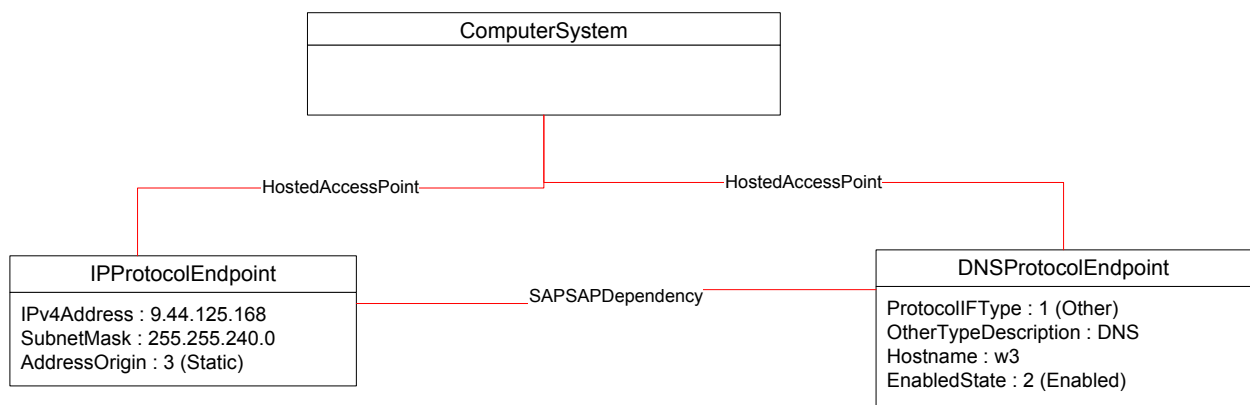


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Figure 2 – Registered profile

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

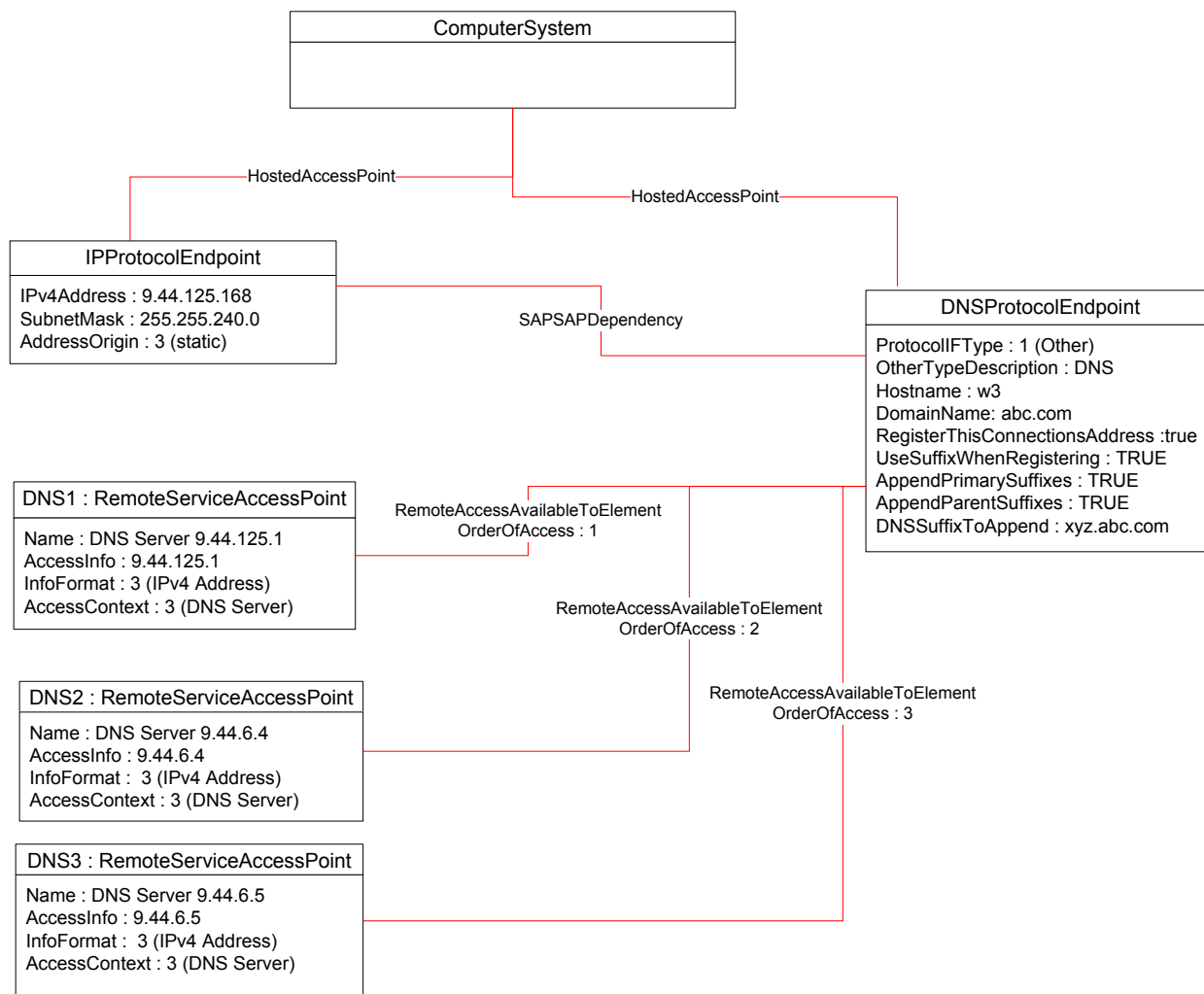


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Figure 3 – Host name only

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



588

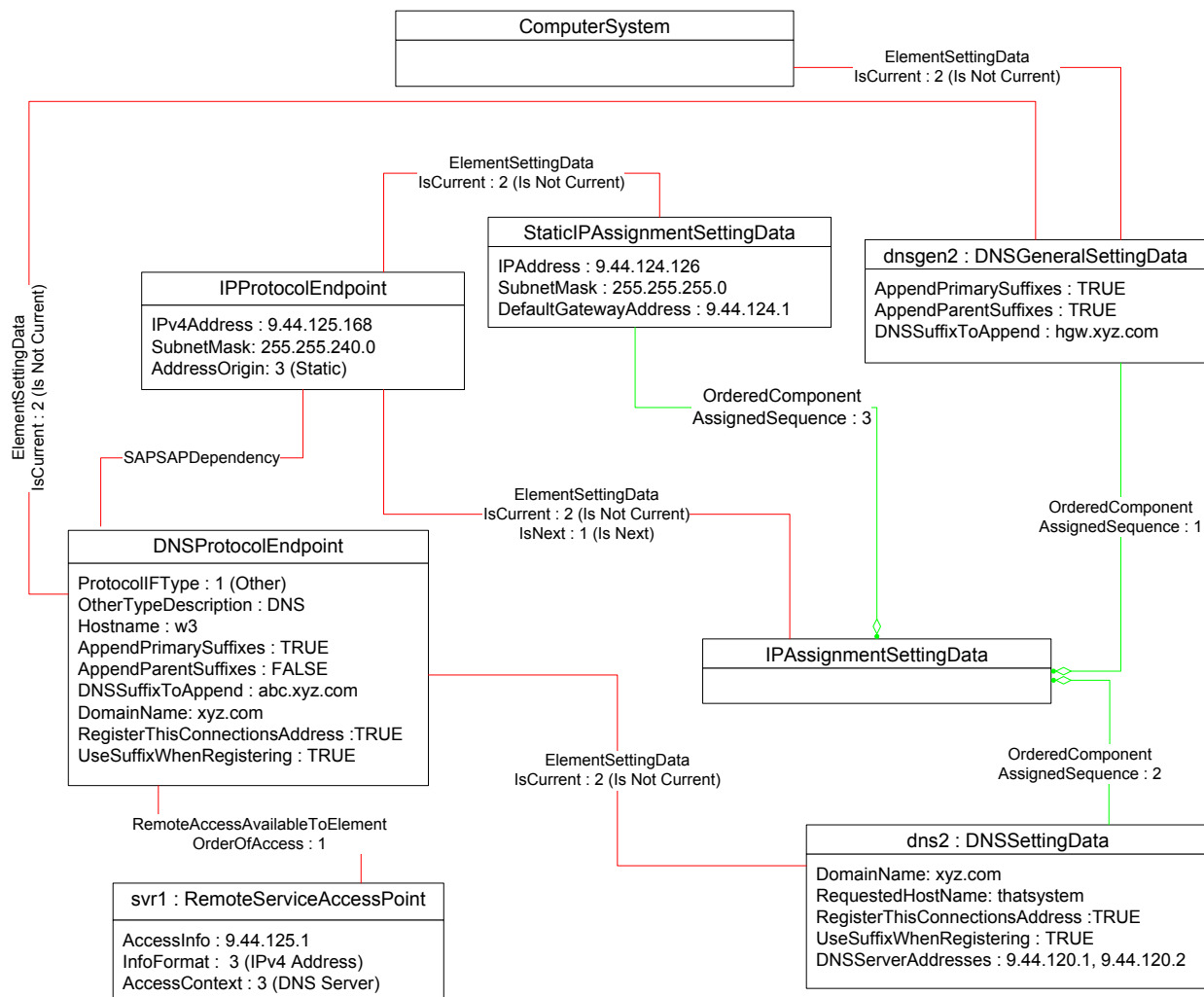
589

Figure 4 – DNS configuration

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

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

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

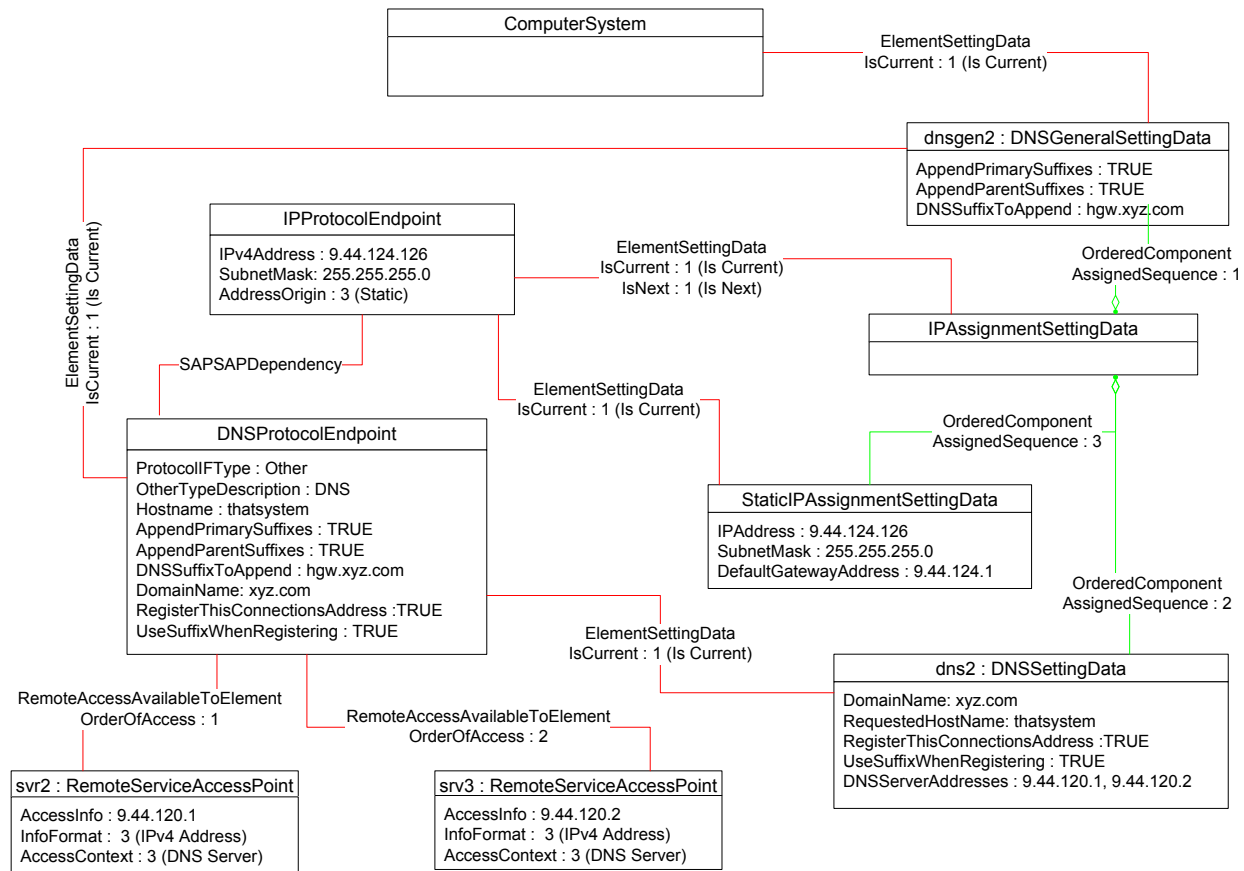


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Figure 5 – DNS configuration with alternate configuration

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



607

608

Figure 6 – Alternate configuration applied

609 9.2 Determine the current DNS configuration

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

- 612 1) Starting at the instance of CIM_IPProtocolEndpoint, use the CIM_SAPSAPDependency
613 association to find the associated instance of CIM_DNSProtocolEndpoint.
- 614 2) The host name associated with the IP endpoint is the value of the Hostname property of the
615 CIM_DNSProtocolEndpoint instance.
- 616 3) Find each instance of CIM_RemoteServiceAccessPoint that is associated through an instance
617 of CIM_RemoteAccessAvailableToElement with the CIM_DNSProtocolEndpoint instance where
618 the value of the AccessContext property of the CIM_RemoteServiceAccessPoint instance is 3
619 (DNS Server).
- 620 4) Query the value of the OrderOfAccess property of each instance of
621 CIM_RemoteAccessAvailableToElement to determine the relative order of access of the DNS
622 client to each of the DNS servers represented by the CIM_RemoteServiceAccessPoint
623 instances. The AccessInfo property of each instance of CIM_RemoteServiceAccessPoint
624 identifies a DNS server.
- 625 5) Query the remaining properties of the CIM_DNSProtocolEndpoint instance to determine the
626 complete DNS client configuration.

627 **9.3 Determine support for an alternate DNS configuration**

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

- 629 1) Find the instance of CIM_IPProtocolEndpoint that is associated with the
630 CIM_DNSProtocolEndpoint instance through an instance of CIM_SAPSAPDependency.
- 631 2) Find the instances of CIM_IPAssignmentSettingData that are associated with the
632 CIM_IPProtocolEndpoint instance through an instance of CIM_ElementSettingData.
- 633 3) For each instance of CIM_IPAssignmentSettingData, determine if an instance of
634 CIM_DNSSettingData or CIM_DNSGeneralSettingData is associated with the instance through
635 an instance of CIM_OrderedComponent.

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

639 **9.4 Modify the DNS configuration**

640 A client can modify the DNS configuration as follows:

- 641 1) Determine if management of an alternate DNS configuration is supported as specified in 9.3.
- 642 2) Modify the properties of the CIM_DNSGeneralSettingData and CIM_DNSSettingData instances
643 to have the desired configuration.
- 644 3) Apply the alternate configuration to the IP interface using one of the methods described in the [IP](#)
645 [Interface Profile](#).

646 **9.5 Determine whether ElementName can be modified**

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

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

654 **9.6 Determine whether state management is supported**

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

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

661 **10 CIM Elements**

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

665 **Table 12 – CIM Elements: DNS Client Profile**

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

666 **10.1 CIM_DNSGeneralSettingData**

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

669 **Table 13 – Class: CIM_DNSGeneralSettingData**

Elements	Requirement	Description
InstanceID	Mandatory	Key
AddressOrigin	Mandatory	Matches 2 (Not Applicable)
AppendPrimarySuffixes	Optional	None
AppendParentSuffixes	Optional	None
DNSSuffixesToAppend	Optional	See 7.1.1.
ElementName	Mandatory	Pattern “.+”

670 **10.2 CIM_DNSProtocolEndpoint**

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

673 **Table 14 – Class: CIM_DNSProtocolEndpoint**

Elements	Requirement	Description
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 RFC 952 .
ProtocolIFType	Mandatory	This property shall have a value of 1 (Other).
OtherTypeDescription	Mandatory	This property shall have a value of “DNS”.
RequestedState	Mandatory	See 7.1.3.2 and 7.1.4.2.
EnabledState	Mandatory	See 7.1.3.3 and 7.1.4.3.
ElementName	Mandatory	Pattern “.+”
AppendPrimarySuffixes	Optional	None
AppendParentSuffixes	Optional	None
DNSSuffixesToAppend	Optional	See 7.1.1.
DomainName	Optional	This property shall be formatted according to the preferred name syntax specified in RFC 1035 .
UseSuffixWhenRegistering	Optional	None
RegisterThisConnectionsAddress	Optional	None
DHCPOptionsToUse	Optional	See 7.1.2.

674 **10.3 CIM_DNSSettingData**

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

677 **Table 15 – Class: CIM_DNSSettingData**

Elements	Requirement	Description
InstanceID	Mandatory	Key
AddressOrigin	Mandatory	Matches 2 (Not Applicable)
ElementName	Mandatory	Pattern “.+”
RequestedHostname	Mandatory	This property shall conform to the NAME restriction identified in RFC 952 .
DNSServerAddresses	Mandatory	See 7.4.1.
DomainName	Optional	This property shall be formatted according to the preferred name syntax specified in RFC 1035 .
UseSuffixWhenRegistering	Optional	None
RegisterThisConnectionsAddress	Optional	None

678 **10.4 CIM_ElementCapabilities**

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

683 **Table 16 – Class: CIM_ElementCapabilities**

Elements	Requirement	Description
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

684 **10.5 CIM_ElementSettingData — DNSGeneralSettingData**

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

689 **Table 17 – Class: CIM_ElementSettingData — DNSGeneralSettingData**

Elements	Requirement	Description
ManagedElement	Mandatory	This property shall be a reference to the Scoping Instance or the Central Instance. Cardinality 1..*
SettingData	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)

690 **10.6 CIM_ElementSettingData — DNSSettingData**

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

695 **Table 18 – Class: CIM_ElementSettingData — DNSSettingData**

Elements	Requirement	Description
ManagedElement	Mandatory	This property shall be a reference to the Central Instance. Cardinality 1..*
SettingData	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)

696 **10.7 CIM_EnabledLogicalElementCapabilities**

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

699 **Table 19 – Class: CIM_EnabledLogicalElementCapabilities**

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

700 **10.8 CIM_SAPSAPDependency**

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

704 **Table 20 – Class: CIM_SAPSAPDependency**

Elements	Requirement	Description
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

705 **10.9 CIM_HostedAccessPoint — DNSProtocolEndpoint**

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

708 **Table 21 – Class: CIM_HostedAccessPoint — DNSProtocolEndpoint**

Elements	Requirement	Description
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..*

709 **10.10 CIM_HostedAccessPoint — RemoteServiceAccessPoint**

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

712 **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 *

713 **10.11 CIM_RemoteAccessAvailableToElement**

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

717 **Table 23 – Class: CIM_RemoteAccessAvailableToElement**

Elements	Requirement	Description
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 7.3.1.

718 **10.12 CIM_RemoteServiceAccessPoint**

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

721 **Table 24 – Class: CIM_RemoteServiceAccessPoint**

Elements	Requirement	Description
SystemCreationClassName	Mandatory	Key
CreationClassName	Mandatory	Key
SystemName	Mandatory	Key
Name	Mandatory	Key
InfoFormat	Mandatory	Pattern ("."+")
AccessContext	Mandatory	Matches 3 (DNS Server)
AccessInfo	Mandatory	See 7.2.1.
InfoFormat	Mandatory	See 7.2.2.
ElementName	Mandatory	Pattern “.+”

722 **10.13 CIM_RegisteredProfile**

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

728 **Table 25 – Class: CIM_RegisteredProfile**

Elements	Requirement	Description
RegisteredName	Mandatory	This property shall have a value of "DNS Client".
RegisteredVersion	Mandatory	This property shall have a value of "1.0.3".
RegisteredOrganization	Mandatory	This property shall have a value of 2 ("DMTF").

729 NOTE Previous versions of this document included the suffix "Profile" for the RegisteredName value. If
 730 implementations querying for the RegisteredName value find the suffix "Profile", they should ignore the suffix, with
 731 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
1.0.1	2008-09-26	Errata 1.0.1
1.0.2	2010-09-15	Version 1.0.1 of the Final Standard formatted for DMTF Standard release
1.0.3	2012-02-23	Errata 1.0.3 Section 9 - Correction in association for CIM_RemoteServiceAccessPoint.

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