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5 **DHCP Client Profile**

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113

Foreword

114 The *DHCP Client Profile* (DSP1037) was prepared by the Server Management Working Group and the
115 Physical Platform Profiles Working Group of the DMTF.

116 DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems
117 management and interoperability. For information about the DMTF, see <http://www.dmtf.org>.

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135

136

Introduction

137 The information in this specification should be sufficient for a provider or consumer of this data to identify
138 unambiguously the classes, properties, methods, and values that shall be instantiated and manipulated to
139 represent and manage a DHCP client.

140 The target audience for this specification is implementers who are writing CIM-based providers or
141 consumers of management interfaces that represent the component described in this document.

142

143

DHCP Client Profile

144 1 Scope

145 The *DHCP Client Profile* extends the management capability of referencing profiles by adding the
146 capability to represent a DHCP client that is associated with an IP interface.

147 2 Normative References

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

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

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

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

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

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

161 IETF RFC 1208, *A Glossary of Networking Terms*, March 1991, <http://www.ietf.org/rfc/rfc1208.txt>

162 IETF RFC 2131, *Dynamic Host Configuration Protocol*, March 1997, <http://www.ietf.org/rfc/rfc2131.txt>

163 IETF RFC 3315, *Dynamic Host Configuration Protocol for IPv6 (DHCPv6)*, July 2003,
164 <http://www.ietf.org/rfc/rfc3315.txt>

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

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

168 3 Terms and Definitions

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

171 3.1

172 **can**

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

174 3.2

175 **cannot**

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

- 177 **3.3**
178 **conditional**
179 indicates requirements to be followed strictly to conform to the document when the specified conditions
180 are met
- 181 **3.4**
182 **mandatory**
183 indicates requirements to be followed strictly to conform to the document and from which no deviation is
184 permitted
- 185 **3.5**
186 **may**
187 indicates a course of action permissible within the limits of the document
- 188 **3.6**
189 **need not**
190 indicates a course of action permissible within the limits of the document
- 191 **3.7**
192 **optional**
193 indicates a course of action permissible within the limits of the document
- 194 **3.8**
195 **referencing profile**
196 indicates a profile that owns the definition of this class and can include a reference to this profile in its
197 "Referenced Profiles" table
- 198 **3.9**
199 **shall**
200 indicates requirements to be followed strictly to conform to the document and from which no deviation is
201 permitted
- 202 **3.10**
203 **shall not**
204 indicates requirements to be followed strictly to conform to the document and from which no deviation is
205 permitted
- 206 **3.11**
207 **should**
208 indicates that among several possibilities, one is recommended as particularly suitable, without
209 mentioning or excluding others, or that a certain course of action is preferred but not necessarily required
- 210 **3.12**
211 **should not**
212 indicates that a certain possibility or course of action is deprecated but not prohibited
- 213 **3.13**
214 **unspecified**
215 indicates that this profile does not define any constraints for the referenced CIM element or operation

216 **4 Symbols and Abbreviated Terms**

217 The following abbreviations are used in this document.

218 **4.1**
 219 **DHCP**
 220 Dynamic Host Configuration Protocol

221 **4.2**
 222 **IP**
 223 Internet Protocol

224 **5 Synopsis**

225 **Profile Name:** DHCP Client

226 **Version:** 1.0.2

227 **Organization:** DMTF

228 **CIM Schema Version:** 2.27

229 **Central Class:** CIM_DHCPProtocolEndpoint

230 **Scoping Class:** CIM_ComputerSystem

231 The *DHCP Client Profile* extends the capability of referencing profiles by adding the capability to manage
 232 a DHCP client and its associated capabilities and configuration. Table 1 identifies profiles on which this
 233 profile has a dependency.

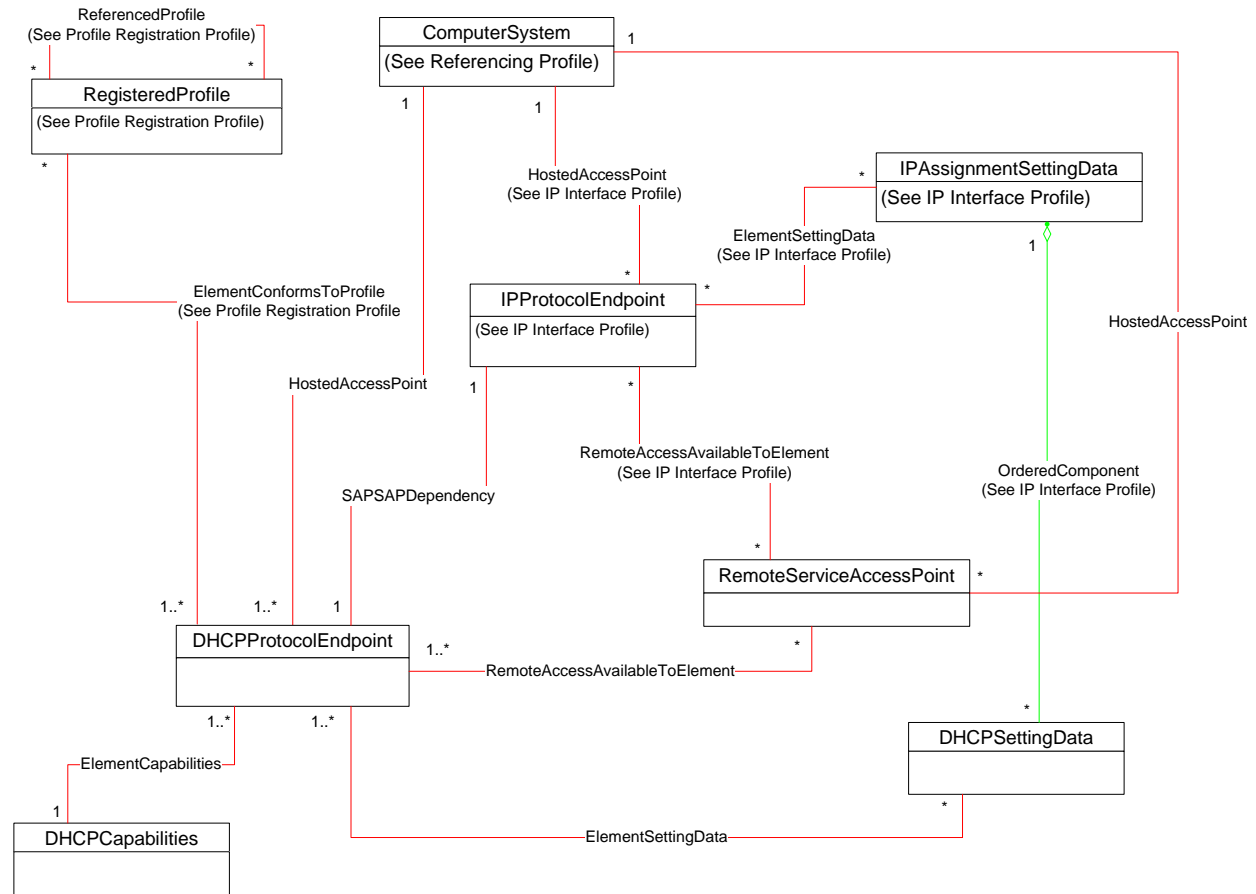
234 **Table 1 – Referenced Profiles**

Profile Name	Organization	Version	Requirement	Description
Profile Registration	DMTF	1.0	Mandatory	None
IP Interface	DMTF	1.0	Mandatory	See 7.2.1.

235 **6 Description**

236 The *DHCP Client Profile* extends the management capability of referencing profiles by adding the
 237 capability to represent a DHCP client and its associated capabilities and configuration. The DHCP client
 238 is modeled with an instance of CIM_DHCPProtocolEndpoint. The DHCP client's capabilities are modeled
 239 with an instance of CIM_DHCPCapabilities. Aspects of the DHCP client's configuration are modeled with
 240 properties of DHCPProtocolEndpoint as well as with CIM_DHCPSettingData.

241 Figure 1 represents the class schema for the *DHCP Client Profile*. For simplicity, the prefix CIM_ has
 242 been removed from the names of the classes.



243

244

Figure 1 – DHCP Client Profile: Class Diagram

245 7 Implementation

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

248 7.1 DHCP Server Representation

249 When the DHCP client successfully acquires a configuration from a DHCP server, an instance of
 250 CIM_RemoteServiceAccessPoint shall represent the DHCP server from which the DHCP client received
 251 its configuration.

252 7.1.1 CIM_RemoteServiceAccessPoint.AccessInfo

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

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

259 7.1.2 CIM_RemoteServiceAccessPoint.InfoFormat

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

261 7.1.3 Representing Multiple DHCP Servers

262 An instance of CIM_RemoteServiceAccessPoint may represent each DHCP server that responded to the
263 client's DHCPDISCOVER message.

264 7.2 DHCP Client Representation

265 The DHCP client shall be modeled using an instance of CIM_DHCPProtocolEndpoint.

266 7.2.1 Relationship with CIM_IPProtocolEndpoint

267 The DHCP client is associated with a single IP interface, which is instrumented according to the [IP](#)
268 [Interface Profile](#). A single instance of CIM_SAPSAPDependency shall associate the Central Instance with
269 the CIM_IPProtocolEndpoint defined in the [IP Interface Profile](#).

270 7.2.1.1 CIM_SAPSAPDependency.Dependent

271 A reference to the CIM_DHCPProtocolEndpoint instance shall be the value of the Dependent property of
272 the CIM_SAPSAPDependency instance.

273 7.2.1.2 CIM_SAPSAPDependency.Antecedent

274 A reference to the CIM_IPProtocolEndpoint instance shall be the value of the Antecedent property of the
275 CIM_SAPSAPDependency instance.

276 7.3 Managing the DHCP Client's State

277 This clause describes the use of the EnabledState property to represent the state of an instance of
278 CIM_DHCPProtocolEndpoint.

279 7.3.1 CIM_DHCPProtocolEndpoint.RequestedState

280 When the last configuration process of the associated IP interface includes the use of the DHCP client to
281 acquire all or part of the configuration, the value of the RequestedState property of the
282 CIM_DHCPProtocolEndpoint instance shall be 2 (Enabled), regardless of whether the configuration was
283 successfully obtained. This value indicates that the configuration process included an attempt to use
284 DHCP.

285 When the last configuration process of the associated IP interface does not include an attempt to use the
286 DHCP client, the value of the RequestedState property of the CIM_DHCPProtocolEndpoint instance shall
287 be 3 (Disabled). This value indicates that the configuration process did not include an attempt to use
288 DHCP.

289 Before a configuration is applied to the associated IP interface, the value of the
290 CIM_DHCPProtocolEndpoint.RequestedState property shall be 5 (No Change).

291 7.3.2 CIM_DHCPProtocolEndpoint.EnabledState

292 Valid values for the CIM_DHCPProtocolEndpoint.EnabledState property shall be 2 (Enabled), 3
293 (Disabled), or 6 (Enabled but Offline).

294 7.3.2.1 Enabled

295 The EnabledState property shall have a value of 2 (Enabled) when the
296 CIM_DHCPProtocolEndpoint.ClientState property has a value of 8 (Bound).

297 7.3.2.2 Enabled but Offline

298 The EnabledState property shall have a value of 6 (Enabled but Offline) when the
299 CIM_DHCPProtocolEndpoint.ClientState property has a value other than 8 (Bound) or 0 (Unknown). This
300 value shall indicate that the DHCP client is actively attempting to acquire a configuration for the
301 associated IP interface.

302 7.3.2.3 Disabled

303 The EnabledState property shall have a value of 3 (Disabled) when the DHCP client is disabled for the
304 associated IP interface. This value is appropriate when the DHCP client is not actively attempting to
305 acquire a configuration either because the last configuration applied to the associated IP interface did not
306 use DHCP or because the DHCP client failed to acquire a configuration and was disabled.

307 7.3.3 CIM_DHCPProtocolEndpoint.ClientState

308 When the CIM_DHCPProtocolEndpoint.EnabledState property has a value other than 3 (Disabled), the
309 CIM_DHCPProtocolEndpoint.ClientState property shall identify the current status of the DHCP client
310 following the state diagram illustrated in Figure 5 of IETF [RFC 2131](#).

311 When the CIM_DHCPProtocolEndpoint.EnabledState property has a value of 3 (Disabled), the
312 CIM_DHCPProtocolEndpoint.ClientState property shall have the value 0 (Unknown).

313 7.3.4 Modifying ElementName Is Supported

314 This clause describes the CIM elements and behaviors that shall be implemented when the
315 CIM_DHCPProtocolEndpoint.ElementName property supports being modified by the ModifyInstance
316 operation.

317 7.3.4.1 CIM_DHPCCapabilities

318 For the instance of CIM_DHPCCapabilities that is associated with the Central Instance through an
319 instance of CIM_ElementCapabilities, the CIM_DHPCCapabilities.ElementNameEditSupported property
320 shall have a value of TRUE when the implementation supports client modification of the
321 CIM_DHCPProtocolEndpoint.ElementName property. The CIM_DHPCCapabilities.MaxElementNameLen
322 property shall be implemented.

323 7.3.5 Modifying ElementName Is Not Supported

324 This clause describes the CIM elements and behaviors that shall be implemented when the
325 CIM_DHCPProtocolEndpoint.ElementName property does not support being modified by the
326 ModifyInstance operation.

327 7.3.5.1 CIM_DHPCCapabilities

328 For the instance of CIM_DHPCCapabilities that is associated with the Central Instance through an
329 instance of CIM_ElementCapabilities, the CIM_DHPCCapabilities.ElementNameEditSupported property
330 shall have a value of FALSE when the implementation does not support client modification of the
331 CIM_DHCPProtocolEndpoint.ElementName property. The CIM_DHPCCapabilities.MaxElementNameLen
332 property may be implemented. The MaxElementNameLen property is irrelevant in this context.

333 7.4 DHCP Client Capabilities

334 Exactly one instance of CIM_DHCPCapabilities shall be associated with the Central Instance through an
335 instance of CIM_ElementCapabilities.

336 7.5 DHCP Client-Server Relationship

337 A DHCP client will receive its configuration from exactly one DHCP server. An instance of
338 CIM_RemoteAccessAvailableToElement shall associate each CIM_RemoteServiceAccessPoint instance
339 that represents a DHCP server to the CIM_DHCPProtocolEndpoint instance that represents the DHCP
340 client. Instrumentation of CIM_RemoteAccessAvailableToElement is conditional upon instrumentation of
341 CIM_RemoteServiceAccessPoint.

342 7.5.1 Identifying the DHCP Server That Provides Configuration

343 When more than one instance of CIM_RemoteServiceAccessPoint is associated with the
344 CIM_DHCPProtocolEndpoint instance through an instance of CIM_RemoteAccessAvailableToElement,
345 the CIM_RemoteAccessAvailableToElement.OrderOfAccess property shall be implemented. For each
346 instance of CIM_RemoteAccessAvailableToElement that associates the CIM_DHCPProtocolEndpoint
347 instance with an instance of CIM_RemoteServiceAccessPoint that represents a DHCP server from which
348 the DHCP client did not receive the IP configuration, the OrderOfAccess property shall have the value 0
349 (zero). For the instance of CIM_RemoteAccessAvailableToElement that associates the
350 CIM_DHCPProtocolEndpoint instance with the instance of CIM_RemoteServiceAccessPoint that
351 represents the DHCP server from which the DHCP client received the IP configuration, the
352 OrderOfAccess property shall have the value 1.

353 When exactly one instance of CIM_RemoteServiceAccessPoint is associated with the instance of
354 CIM_DHCPProtocolEndpoint through an instance of CIM_RemoteAccessAvailableToElement, the
355 CIM_RemoteAccessAvailableToElement.OrderOfAccess property may be implemented. If the
356 CIM_RemoteAccessAvailableToElement.OrderOfAccess property is implemented, the property shall have
357 the value 1.

358 7.6 Alternate DHCP Configuration

359 An implementation may support the management of alternate configurations for the associated IP
360 interface that uses DHCP. The representation of alternate configurations is described in general in the [IP](#)
361 [Interface Profile](#). The configuration of the DHCP client as part of an alternate configuration for the
362 associated IP interface is optional behavior that is defined in this clause.

363 When an alternate configuration for the associated IP interface includes the configuration of the DHCP
364 client, at least one instance of CIM_DHCPSettingData shall be associated with the
365 CIM_DHCPProtocolEndpoint instance through an instance of CIM_ElementSettingData. The
366 CIM_ElementSettingData instance is conditional on the existence of an instance of
367 CIM_DHCPSettingData.

368 7.6.1 Applying an Alternate Configuration

369 When an instance of CIM_DHCPSettingData is applied to the CIM_DHCPProtocolEndpoint instance, the
370 DHCP client shall transition to the INIT state and the value of the ClientState property of the
371 CIM_DHCPProtocolEndpoint instance shall be 2 (Init). The values specified in applicable properties of the
372 CIM_DHCPSettingData shall be used by the DHCP client during the binding acquisition process.

373 7.6.1.1 Successful Application of Settings

374 DHCP settings shall be considered to be successfully applied if the DHCP client transitions to a client
375 state of Bound and the ClientState property of the CIM_DHCPProtocolEndpoint has the value 8 (Bound).

376 8 Methods

377 This clause details the requirements for supporting intrinsic operations for the CIM elements defined by
378 this profile. No extrinsic methods are specified by this profile.

379 8.1 Profile Conventions for Operations

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

382 The default list of operations is as follows:

- 383 • GetInstance
- 384 • EnumerateInstances
- 385 • EnumerateInstanceNames
- 386 • Associators
- 387 • AssociatorNames
- 388 • References
- 389 • ReferenceNames

390 8.2 CIM_DHCPCapabilities

391 All operations in the default list in 8.1 shall be implemented as defined in [DSP0200](#).

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

393 8.3 CIM_DHCPProtocolEndpoint

394 Table 2 lists implementation requirements for operations. If implemented, these operations shall be
395 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 2, all operations in
396 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

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

398 **Table 2 – Operations: CIM_DHCPProtocolEndpoint**

Operation	Requirement	Messages
ModifyInstance	Optional. See 8.3.1.	None

399 8.3.1 CIM_DHCPProtocolEndpoint — ModifyInstance Operation

400 This clause details the specific requirements for the ModifyInstance operation applied to an instance of
401 CIM_DHCPProtocolEndpoint.

402 8.3.1.1 CIM_DHCPProtocolEndpoint.ElementName Property

403 When an instance of CIM_DHCPCapabilities is associated with the CIM_DHCPProtocolEndpoint instance
404 and the CIM_DHCPCapabilities.ElementNameEditSupported property has a value of TRUE, the
405 implementation shall allow the ModifyInstance operation to change the value of the ElementName
406 property of the CIM_DHCPProtocolEndpoint instance. The ModifyInstance operation shall enforce the
407 length restriction specified in the MaxElementNameLen property of the CIM_DHCPCapabilities instance.

408 When no instance of CIM_DHCPCapabilities is associated with the CIM_DHCPProtocolEndpoint
409 instance, or the ElementNameEditSupported property of the CIM_DHCPCapabilities has a value of

410 FALSE, the implementation shall not allow the ModifyInstance operation to change the value of the
 411 ElementName property of the CIM_DHCPProtocolEndpoint instance.

412 **8.4 CIM_DHCPSettingData**

413 All operations in the default list in 8.1 shall be implemented as defined in [DSP0200](#).

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

415 **8.5 CIM_ElementCapabilities**

416 Table 3 lists implementation requirements for operations. If implemented, these operations shall be
 417 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 3, all operations in
 418 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

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

420 **Table 3 – Operations: CIM_ElementCapabilities**

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

421 **8.6 CIM_ElementSettingData**

422 Table 4 lists implementation requirements for operations. If implemented, these operations shall be
 423 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 4, all operations in
 424 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

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

426 **Table 4 – Operations: CIM_ElementSettingData**

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

427 **8.7 CIM_SAPSAPDependency**

428 Table 5 lists implementation requirements for operations. If implemented, these operations shall be
 429 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 5, all operations in
 430 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

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

432

Table 5 – Operations: CIM_SAPSAPDependency

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

433 8.8 CIM_HostedAccessPoint

434 Table 6 lists implementation requirements for operations. If implemented, these operations shall be
 435 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 6, all operations in
 436 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

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

438

Table 6 – Operations: CIM_HostedAccessPoint

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

439 8.9 CIM_RemoteAccessAvailableToElement

440 Table 7 lists implementation requirements for operations. If implemented, these operations shall be
 441 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 7, all operations in
 442 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

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

444

Table 7 – Operations: CIM_RemoteAccessAvailableToElement

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

445 8.10 CIM_RemoteServiceAccessPoint

446 All operations in the default list in 8.1 shall be implemented as defined in [DSP0200](#).

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

448 9 Use Cases

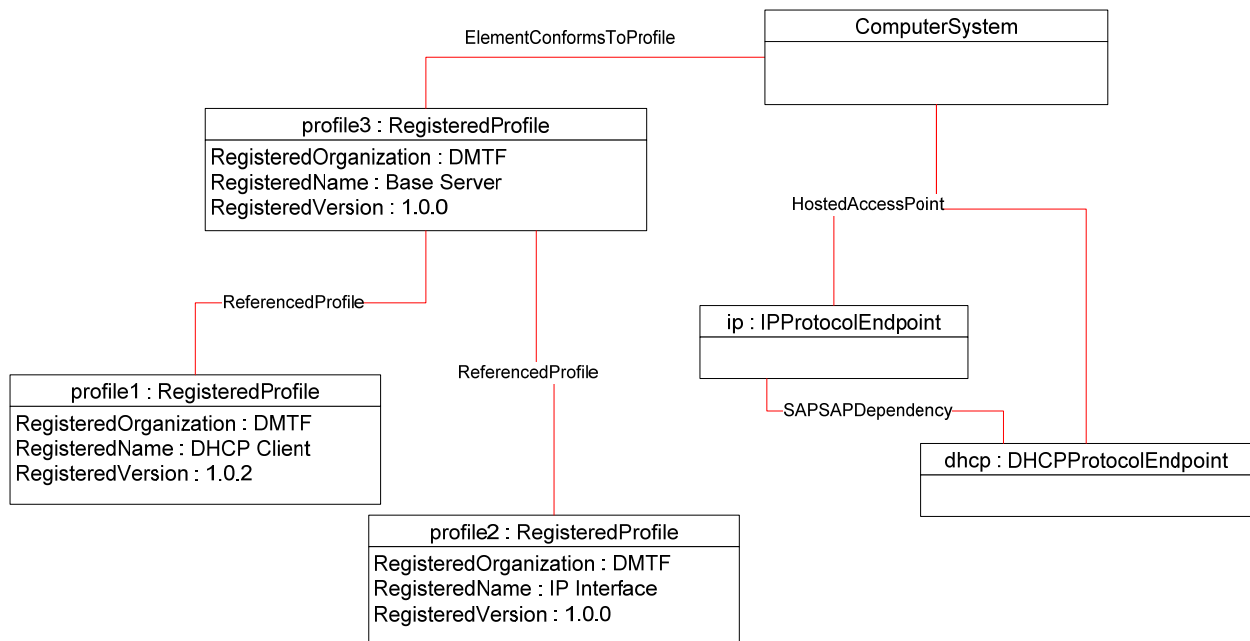
449 This clause contains object diagrams and use cases for the *DHCP Client Profile*.

450 **9.1 Object Diagrams**

451 The object diagram in Figure 2 shows one method for advertising conformance with the *DHCP Client Profile*.
 452 The instance of CIM_RegisteredProfile is used to identify the version of the *DHCP Client Profile*
 453 with which an instance of CIM_DHCPProtocolEndpoint and its associated instances are conformant. An
 454 instance of CIM_RegisteredProfile exists for each profile instrumented in the system.

- 455 • profile3 identifies the DMTF *Base Server Profile* version 1.0.0.
- 456 • profile1 identifies the DMTF *DHCP Client Profile* version 1.0.2.
- 457 • profile2 identifies the DMTF *IP Interface Profile* version 1.0.0.

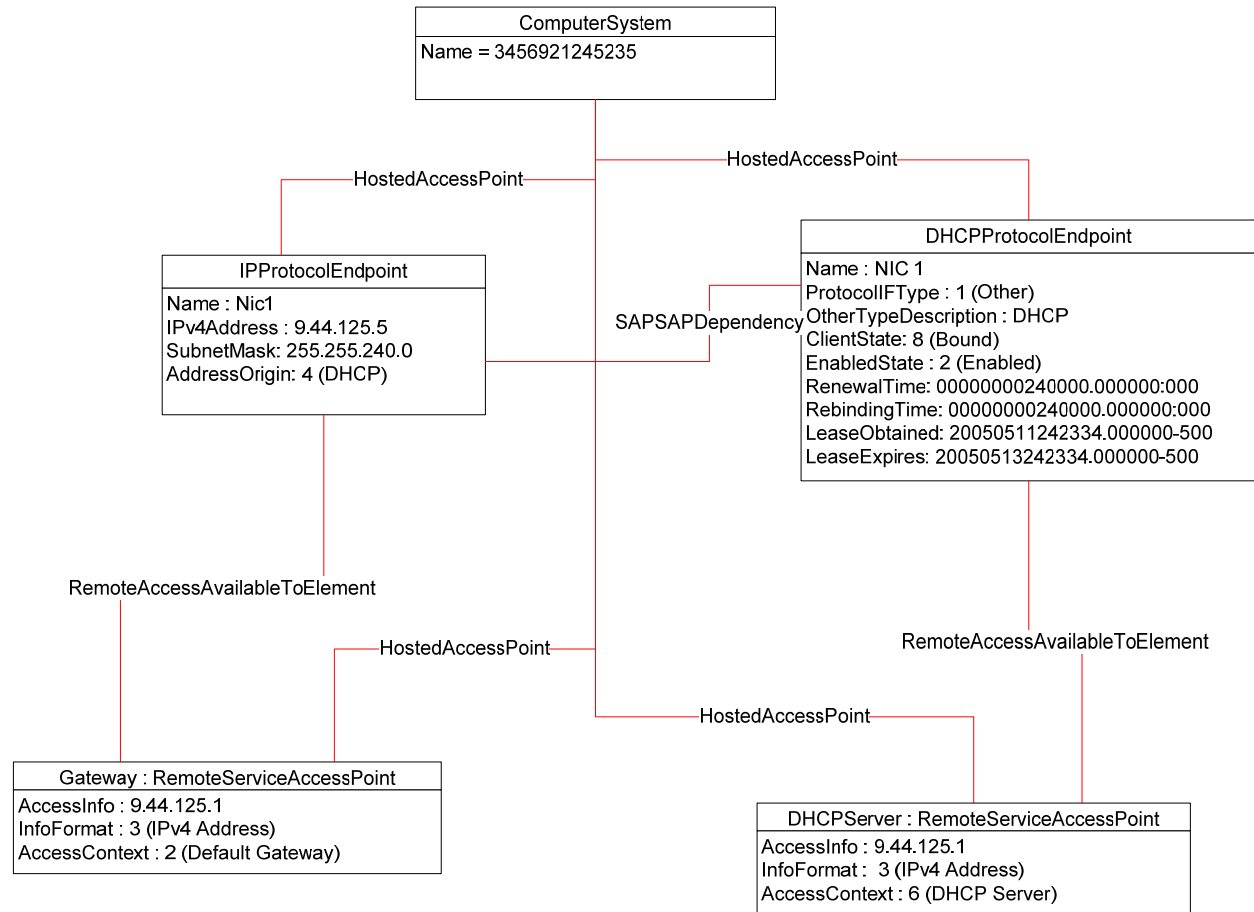
458 The *IP Interface Profile* is specified as mandatory to be implemented when this profile is implemented.
 459 The CIM_DHCPProtocolEndpoint instance is scoped to an instance of CIM_ComputerSystem. This
 460 instance of CIM_ComputerSystem is conformant with the DMTF *Base Server Profile* version 1.0.0 as
 461 indicated by the CIM_ElementConformsToProfile association with the CIM_RegisteredProfile instance.
 462 The CIM_ComputerSystem instance is the Scoping Instance for the CIM_DHCPProtocolEndpoint. By
 463 following the CIM_ReferencedProfile association, a client can determine that the
 464 CIM_DHCPProtocolEndpoint instance is conformant with the version of the *DHCP Client Profile* identified
 465 by profile1.



466

467 **Figure 2 – Registered Profile**

468 The object diagram in Figure 3 illustrates an implementation in which an IP interface was successfully
 469 configured through DHCP. The CIM_DHCPProtocolInstance.ClientState property has a value of "Bound"
 470 indicating that a configuration was successfully obtained. DHCPServer is the instance of
 471 CIM_RemoteServiceAccessPoint that represents the DHCP server contacted by the DHCP client. The
 472 value of the CIM_IPProtocolEndpoint.AddressOrigin property is "DHCP" indicating that the IP
 473 configuration was obtained through DHCP.

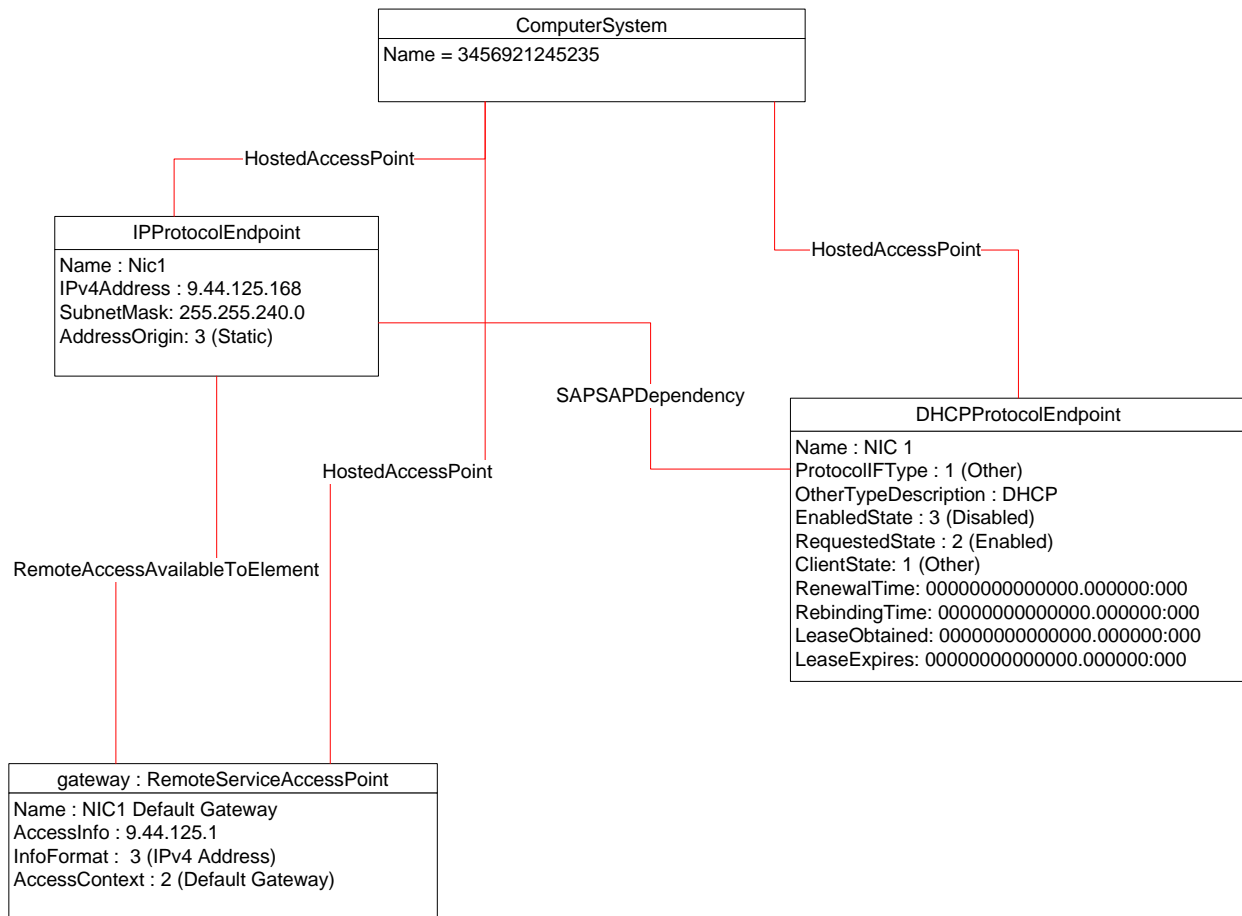


474

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Figure 3 – DHCP Assigned IP Configuration

476 The object diagram in Figure 4 illustrates an implementation similar to that of Figure 3, with the addition of
 477 the optional configuration management functionality of the [IP Interface Profile](#). The
 478 CIM_DHCPProtocolEndpoint.ClientState property has a value of "Bound", indicating that a configuration
 479 was successfully obtained. DHCP Server is the instance of CIM_RemoteServiceAccessPoint that
 480 represents the DHCP server contacted by the DHCP client. The value of the
 481 CIM_IPProtocolEndpoint.AddressOrigin property is "DHCP", indicating that the IP configuration was
 482 obtained through DHCP. The IsCurrent property of the CIM_ElementSettingData instance that associates
 483 the CIM_StaticIPAssignmentSettingData instance with the CIM_IPProtocolEndpoint instance has a value
 484 of 2 (Is Not Current). This value indicates that the static configuration was not applied for the IP interface.
 485 The IsCurrent property of the instance of CIM_ElementSettingData that associates the
 486 CIM_DHCPSettingData instance with the CIM_DHCPProtocolEndpoint instance has a value of 1 (Is
 487 Current), indicating that the CIM_DHCPSettingData was applied.



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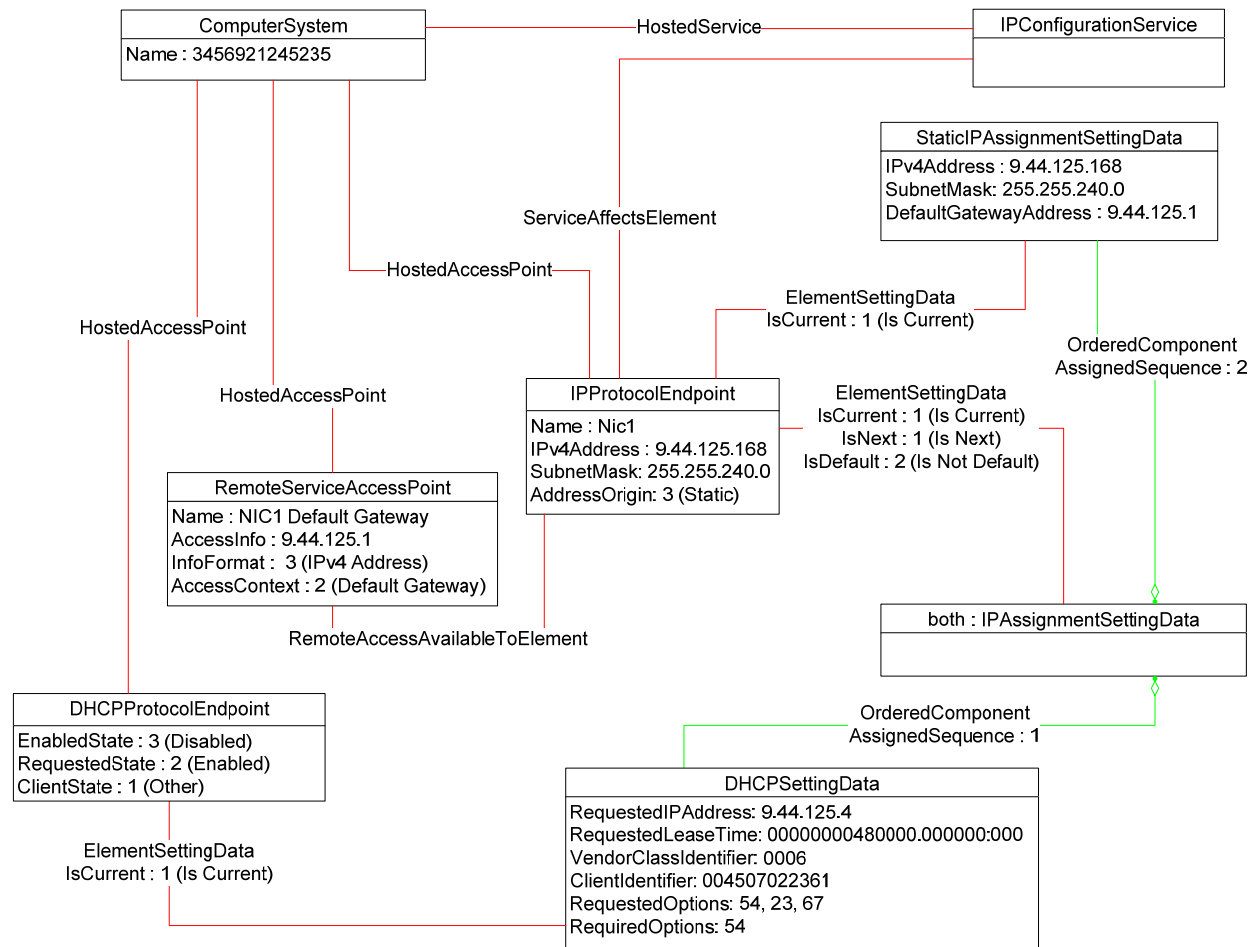
Figure 5 – DHCP Timeout to Static

504 The object diagram in Figure 6 provides an example of an IP interface that was configured to default to a
 505 statically assigned IP configuration if the DHCP client failed to obtain a configuration from a DHCP server.
 506 The instance of CIM_IPAssignmentSettingData associated with the CIM_IPProtocolEndpoint instance is
 507 for a configuration in which the CIM_DHCPSettingData is applied first, resulting in the DHCP client being
 508 enabled.

509 The DHCP client failed to acquire a configuration from the DHCP server. The EnabledState and
 510 ClientState properties of the CIM_DHCPProtocolEndpoint instance indicate that the DHCP client is now
 511 disabled. No instance of CIM_RemoteServiceAccessPoint is associated with the
 512 CIM_DHCPProtocolEndpoint because the DHCP client failed to communicate with a DHCP server.

513 The CIM_StaticIPAssignmentSettingData was then used to configure the IP interface, which is indicated
 514 by the IsCurrent property of the referencing instance of CIM_ElementSettingData having a value of 1 (Is
 515 Current).

516 The AddressOrigin property of the CIM_IPProtocolEndpoint instance reflects that the address was
 517 assigned statically.

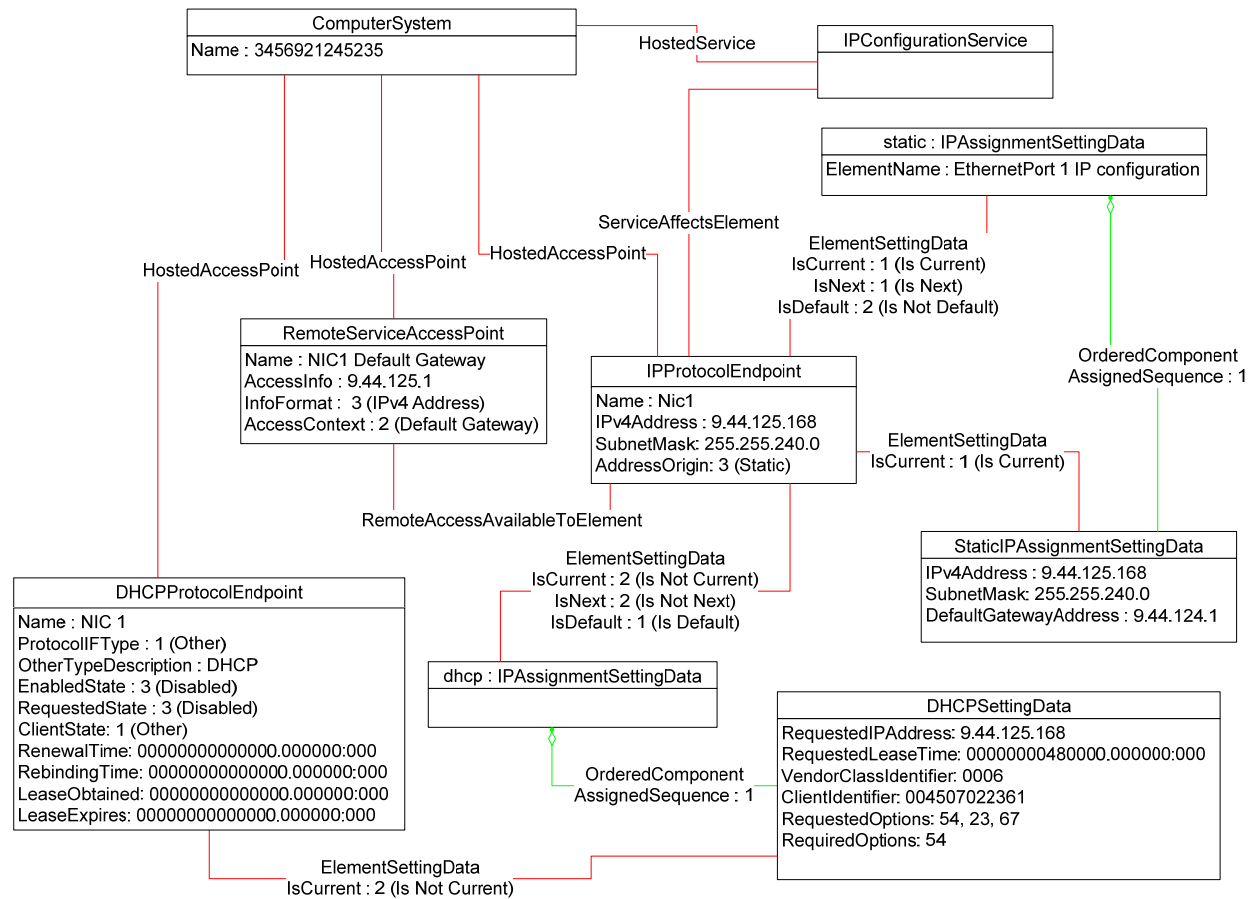


518

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Figure 6 – DHCP Timeout to Static with Configuration Management

520 The object diagram in Figure 7 illustrates an IP interface with two supported alternate configurations. Two
 521 discrete IP configuration options are available for the IP interface. Each option is represented by an
 522 instance of CIM_IPAssignmentSettingData. One configuration option represents the ability to statically
 523 assign the IP configuration. This option is indicated by the instance of CIM_OrderedComponent that
 524 associates the CIM_IPAssignmentSettingData instance with an instance of
 525 CIM_StaticIPAssignmentSettingData. The other configuration option represents the ability to obtain the
 526 configuration through a DHCP client. This option is indicated by the instance of CIM_OrderedComponent
 527 that associates the CIM_IPAssignmentSettingData instance with an instance of CIM_DHCPSettingData.



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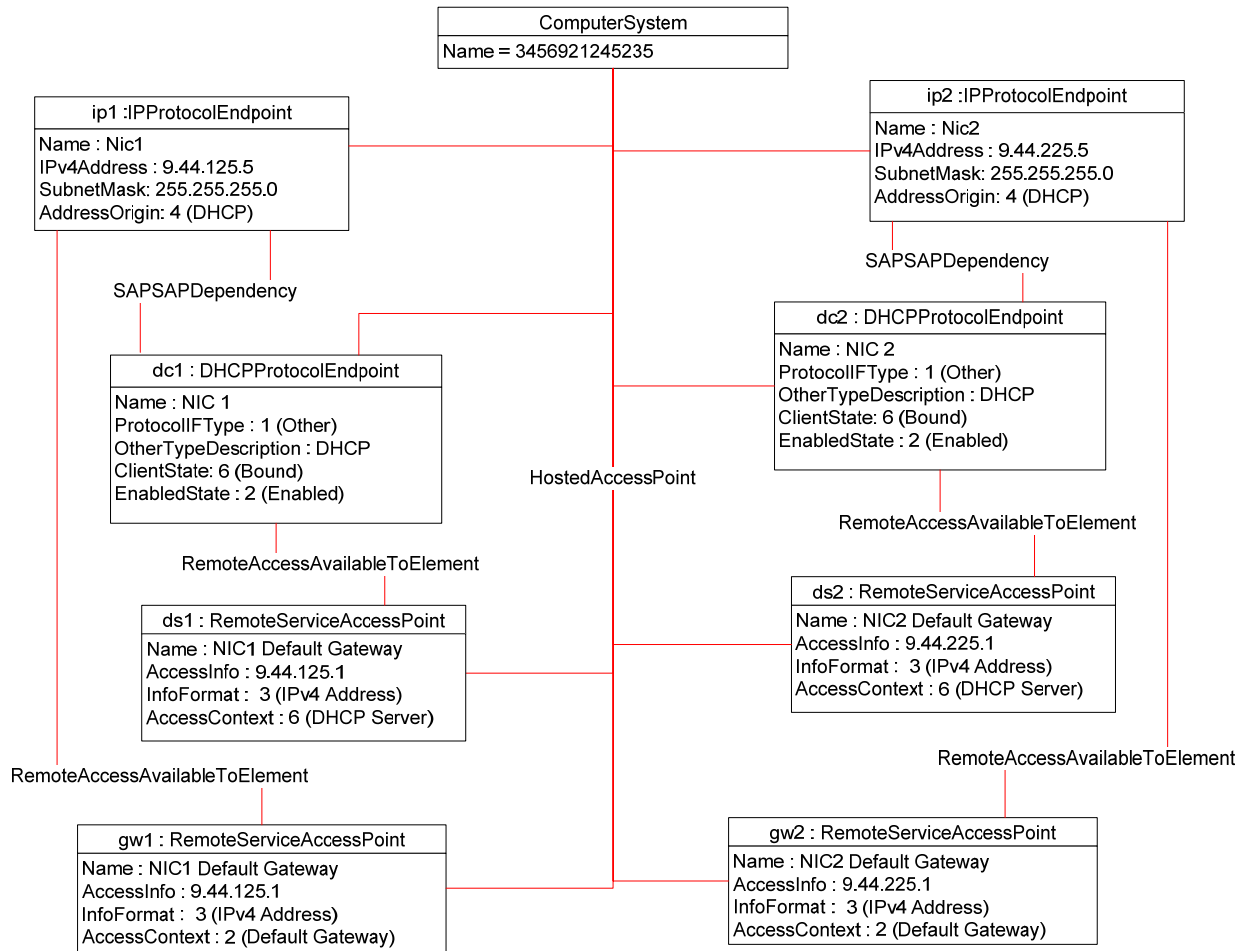
Figure 7 – Static or DHCP Pending Configurations

530 Each configuration option consists of a single instance of a subclass of CIM_IPAssignmentSettingData.
 531 Therefore, the value of the AssignedSequence property of the CIM_OrderedComponent instances is
 532 irrelevant.

533 The default configuration is to attempt to obtain a configuration through DHCP. This default is indicated
 534 by the IsDefault property having a value of 1 (Is Default) on the CIM_ElementSettingData instance that
 535 associates the CIM_IPAssignmentSettingData instance with the CIM_IPProtocolEndpoint instance.

536 However, the current configuration of the IP interface was statically assigned using the configuration
 537 identified by the CIM_IPAssignmentSettingData instance *static*. This configuration is indicated by the
 538 value of the CIM_ElementSettingData.IsCurrent property on the instance of CIM_ElementSettingData that
 539 associates the CIM_IPAssignmentSettingData instance *static* to the CIM_IPProtocolEndpoint instance
 540 and is also indicated by the value of the AddressOrigin property on the CIM_IPProtocolEndpoint instance.
 541 Note that configuration through DHCP was not used or even attempted; thus the
 542 CIM_DHCPProtocolEndpoint.RequestedState property has a value of 3 (Disabled).

543 Upon the next restart of the interface, the static configuration will be used again for the IP interface. This
 544 is indicated by the value of the CIM_ElementSettingData.IsNext property on the instance of
 545 CIM_ElementSettingData that associates the CIM_IPAssignmentSettingData instance *static* to the
 546 CIM_IPProtocolEndpoint instance. The object diagram in Figure 8 is for a dual NIC system in which the
 547 associated IP interfaces for both NICs have been configured through DHCP.

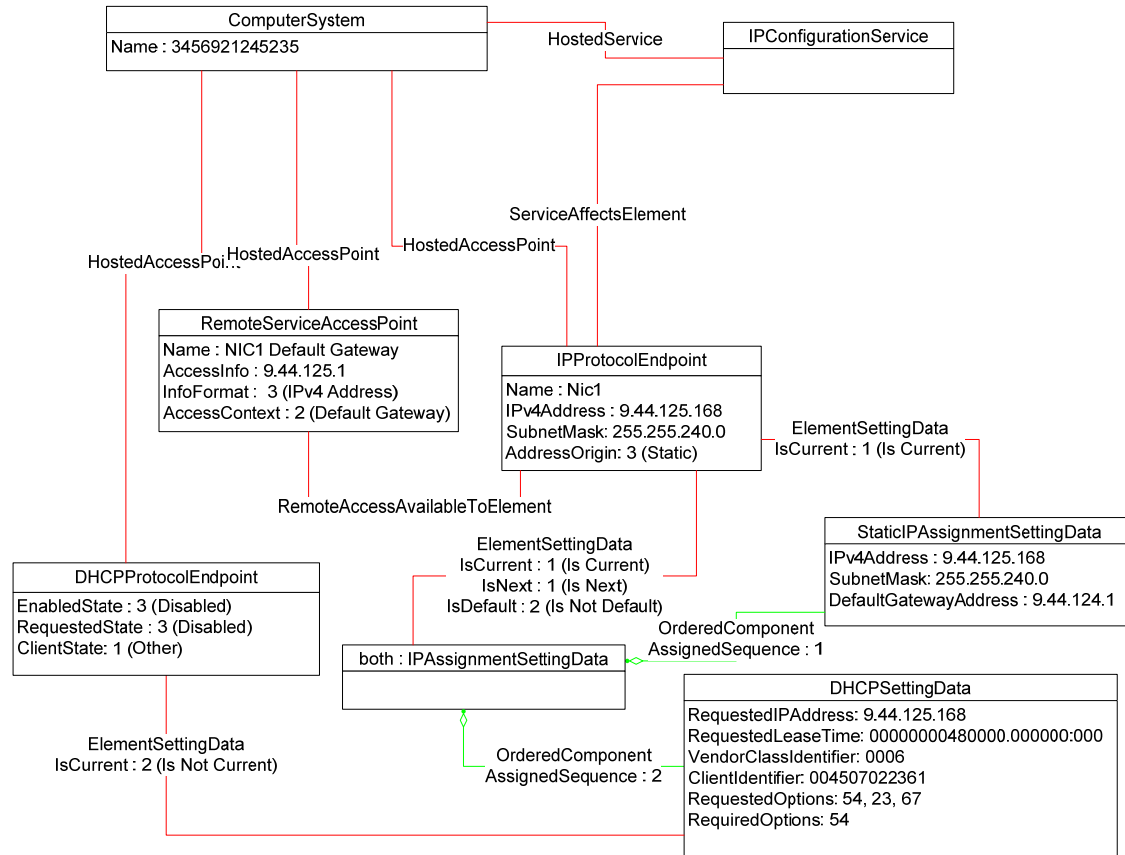


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Figure 8 – DHCP Supported on Dual NIC System

550 The object diagram in Figure 9 illustrates an IP interface that supports an alternate configuration in which
 551 a static configuration will first be applied, and if the implementation determines it to be invalid, DHCP will
 552 be used. This configuration is indicated by the relative values of the AssignedSequence property on the
 553 instances of CIM_OrderedComponent that associate the CIM_DHCPSettingData and
 554 CIM_StaticIPAssignmentSettingData instances with the CIM_IPAssignmentSettingData instance.



555

556

Figure 9 – Static Then DHCP

557 9.2 Determine Which DHCP Options Are Supported

558 A client can determine the DHCP options that are supported by a DHCP client as follows:

- 559 1) Find the instance of CIM_DHCPCapabilities that is associated with the Central Instance.
- 560 2) Query the OptionsSupported property.

561 9.3 Determine If IP Configuration Originated through DHCP

562 A client can determine if the configuration for an IP interface was assigned through DHCP as follows:

- 563 1) Find the instance of CIM_IPProtocolEndpoint that is associated with the
 564 CIM_DHCPProtocolEndpoint instance through an instance of CIM_SAPSAPDependency.
- 565 2) Query the CIM_IPProtocolEndpoint.AddressOrigin property. If the value is 4 (DHCP), the
 566 configuration was assigned through DHCP.

567 9.4 View the DHCP Server IP Address

568 A client can view information about the DHCP server that granted the lease to the DHCP client as follows:

- 569 1) Find all instances of CIM_RemoteAccessAvailableToElement that associate an instance of
570 CIM_RemoteServiceAccessPoint with the CIM_DHCPProtocolEndpoint instance.
 - 571 • If more than one instance exists, find the instance of
572 CIM_RemoteAccessAvailableToElement in which the OrderOfAccess property has the
573 value 1. Find the referenced CIM_RemoteServiceAccessPoint instance.
 - 574 • If exactly one instance exists, find the referenced CIM_RemoteServiceAccessPoint
575 instance.
 - 576 • If no instances exist, no DHCP server is currently modeled for the DHCP client.
- 577 2) View the AccessInfo property of the CIM_RemoteServiceAccessPoint instance.

578 9.5 Determine Whether Alternate DHCP Configuration Is Supported

579 A client can determine whether an implementation supports an alternate configuration that uses DHCP to
580 acquire its configuration as follows:

- 581 1) Find the CIM_IPProtocolEndpoint instance with which the CIM_DHCPProtocolEndpoint
582 instance is associated through an instance of CIM_SAPSAPDependency.
- 583 2) Find all instances of CIM_IPAssignmentSettingData (the parent class and not subclasses) that
584 are associated with the CIM_IPProtocolEndpoint instance.
- 585 3) For each instance of CIM_IPAssignmentSettingData, look for at least one instance of
586 CIM_DHCPSettingData that is associated through an instance of CIM_OrderedComponent.
- 587 4) If at least one instance of CIM_IPAssignmentSettingData is found that satisfies the preceding
588 constraints, the implementation supports a configuration that uses DHCP to acquire a
589 configuration.

590 9.6 Determine Whether DHCP Then Static Is Supported

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

- 594 1) Find the CIM_IPProtocolEndpoint instance with which the CIM_DHCPProtocolEndpoint
595 instance is associated through an instance of CIM_SAPSAPDependency.
- 596 2) Find all instances of CIM_IPAssignmentSettingData (the parent class and not subclasses) that
597 are associated with the CIM_IPProtocolEndpoint instance.
- 598 3) For each instance of CIM_IPAssignmentSettingData:
 - 599 a) Find all instances of CIM_DHCPSettingData that are associated through an instance of
600 CIM_OrderedComponent.
 - 601 b) Find all instances of CIM_StaticIPAssignmentSettingData that are associated through an
602 instance of CIM_OrderedComponent.
 - 603 c) Determine if an instance of CIM_DHCPSettingData exists such that the value of the
604 AssignedSequence property of the CIM_OrderedComponent instance that associates the
605 instance of CIM_DHCPSettingData with the instance of CIM_IPAssignmentSettingData is
606 less than the value of the AssignedSequence property of an instance of
607 CIM_OrderedComponent that associates the CIM_StaticIPAssignmentSettingData
608 instance with the instance of CIM_IPAssignmentSettingData.
- 609 4) If such an instance of CIM_DHCPSettingData is found, DHCP then Static is supported.

610 9.7 Select DHCP Options for DHCP Pending Configuration

611 When the implementation supports pending configuration management, a client can configure the DHCP
612 options that will be used by the DHCP client when the pending configuration is applied as follows:

- 613 1) Determine the supported DHCP options as specified in 9.2.
- 614 2) Find the instance of CIM_DHCPSettingData that is associated with the
615 CIM_DHCPProtocolEndpoint instance through an instance of CIM_ElementSettingData.
- 616 3) If an option is required, assign the value to the RequiredOptions property.
- 617 4) If an option is desired but not required, assign the value to the RequestedOptions property.

618 9.8 Determine Whether ElementName Can Be Modified

619 A client can determine whether it can modify the ElementName property of an instance of
620 CIM_DHCPProtocolEndpoint as follows:

- 621 1) Find the CIM_DHPCCapabilities instance that is associated with the
622 CIM_DHCPProtocolEndpoint instance.
- 623 2) Query the value of the ElementNameEditSupported property of the CIM_DHPCCapabilities
624 instance. If the value is TRUE, the client can modify the ElementName property of the target
625 instance.

626 10 CIM Elements

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

630 **Table 8 – CIM Elements: DHCP Client Profile**

Element Name	Requirement	Description
Classes		
CIM_DHPCCapabilities	Mandatory	See 7.4 and 10.1.
CIM_DHCPProtocolEndpoint	Mandatory	See 7.2, 7.3, and 10.2.
CIM_DHCPSettingData	Optional	See 7.6 and 10.3.
CIM_ElementCapabilities	Mandatory	See 10.4.
CIM_ElementSettingData	Conditional	See 7.6 and 10.5.
CIM_SAPSAPDependency	Mandatory	See 7.2 and 10.6.
CIM_HostedAccessPoint	Mandatory	See 10.7.
CIM_RemoteAccessAvailableToElement	Conditional	See 7.5 and 10.8.
CIM_RemoteServiceAccessPoint	Optional	See 7.1 and 10.9.
CIM_RegisteredProfile	Optional	See 10.10.
Indications		
None defined in this profile		

631 **10.1 CIM_DHCPCapabilities**

632 CIM_DHCPCapabilities represents the capabilities of a DHCP client. Table 9 contains the requirements
 633 for elements of this class.

634 **Table 9 – Class: CIM_DHCPCapabilities**

Elements	Requirement	Description
InstanceID	Mandatory	Key
ElementName	Mandatory	Pattern ".*"
ElementNameEditSupported	Mandatory	See 7.3.4.1 and 7.3.5.1.
MaxElementNameLen	Conditional	See 7.3.4.1 and 7.3.5.1.
OptionsSupported	Mandatory	None
IPv6OptionsSupported	Optional	None

635 **10.2 CIM_DHCPProtocolEndpoint**

636 CIM_DHCPProtocolEndpoint represents the DHCP client that is associated with an IP interface. Table 10
 637 contains the requirements for elements of this class.

638 **Table 10 – Class: CIM_DHCPProtocolEndpoint**

Elements	Requirement	Description
SystemCreationClassName	Mandatory	Key
CreationClassName	Mandatory	Key
SystemName	Mandatory	Key
Name	Mandatory	Key
NameFormat	Mandatory	Pattern ".*"
ProtocolIFType	Mandatory	This property shall have a value of 1 (Other).
OtherTypeDescription	Mandatory	This property shall have a value of "DHCP".
RequestedState	Mandatory	See 7.3.1.
EnabledState	Mandatory	See 7.3.2.
ClientState	Mandatory	See 7.2.
ElementName	Mandatory	Pattern ".*"

639 **10.3 CIM_DHCPSettingData**

640 CIM_DHCPSettingData indicates that the IP configuration should be obtained through the DHCP client if
 641 possible. Table 11 contains the requirements for elements of this class.

642 **Table 11 – Class: CIM_DHCPSettingData**

Elements	Requirement	Description
InstanceID	Mandatory	Key
AddressOrigin	Mandatory	Matches 4 ("DHCP")
ElementName	Mandatory	Pattern ".*"

643 **10.4 CIM_ElementCapabilities**

644 CIM_ElementCapabilities associates an instance of CIM_DHPCCapabilities with the
 645 CIM_DHCPProtocolEndpoint instance. Table 12 contains the requirements for elements of this class.

646 **Table 12 – Class: CIM_ElementCapabilities**

Elements	Requirement	Description
ManagedElement	Mandatory	This property shall be a reference to the Central Instance. Cardinality 1..*
Capabilities	Mandatory	This property shall be a reference to an instance of CIM_DHPCCapabilities. Cardinality 1

647 **10.5 CIM_ElementSettingData**

648 CIM_ElementSettingData associates instances of CIM_DHCPSettingData with the
 649 CIM_DHCPProtocolEndpoint instance for which they provide configuration. Table 13 contains the
 650 requirements for elements of this class.

651 **Table 13 – Class: CIM_ElementSettingData**

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_DHCPSettingData. Cardinality *
IsCurrent	Mandatory	Matches 1 (Is Current) or 2 (Is Not Current)

652 **10.6 CIM_SAPSAPDependency**

653 CIM_SAPSAPDependency relates the CIM_DHCPProtocolEndpoint instance with the
 654 CIM_IPProtocolEndpoint instance. Table 14 contains the requirements for elements of this class.

655 **Table 14 – Class: CIM_SAPSAPDependency**

Elements	Requirement	Description
Antecedent	Mandatory	See 7.2.1.2. Cardinality 1
Dependent	Mandatory	See 7.2.1.1. Cardinality 1

656 **10.7 CIM_HostedAccessPoint**

657 CIM_HostedAccessPoint relates the CIM_DHCPProtocolEndpoint instance to the scoping
 658 CIM_ComputerSystem instance. Table 15 contains the requirements for elements of this class.

659 **Table 15 – Class: CIM_HostedAccessPoint**

Elements	Requirement	Description
Antecedent	Mandatory	The value shall be a reference to the Scoping Instance. Cardinality 1
Dependent	Mandatory	The value shall be a reference to the Central Instance. Cardinality 1..*

660 **10.8 CIM_RemoteAccessAvailableToElement**

661 CIM_RemoteAccessAvailableToElement represents the relationship between a DHCP client and a DHCP
 662 server. This class associates an instance of CIM_DHCPProtocolEndpoint with an instance of
 663 CIM_RemoteServiceAccessPoint. Table 16 contains the requirements for elements of this class.

664 **Table 16 – 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	Optional	See 7.5.1.

665 **10.9 CIM_RemoteServiceAccessPoint**

666 CIM_RemoteServiceAccessPoint represents the managed system's view of the DHCP server. Table 17
 667 contains the requirements for elements of this class.

668 **Table 17 – Class: CIM_RemoteServiceAccessPoint**

Elements	Requirement	Description
SystemCreationClassName	Mandatory	Key
CreationClassName	Mandatory	Key
SystemName	Mandatory	Key
Name	Mandatory	Key
InfoFormat	Mandatory	Pattern ".*"
AccessContext	Mandatory	Matches 7 (DHCP Server)
AccessInfo	Mandatory	See 7.1.1.
InfoFormat	Mandatory	See 7.1.2.
ElementName	Mandatory	Pattern ".*"

669 **10.10 CIM_RegisteredProfile**

670 CIM_RegisteredProfile identifies the *DHCP Client Profile* in order for a client to determine whether an
 671 instance of CIM_IPProtocolEndpoint is conformant with this profile. The CIM_RegisteredProfile class is
 672 defined by the [Profile Registration Profile](#). With the exception of the mandatory values specified for the
 673 properties in Table 18, the behavior of the CIM_RegisteredProfile instance is in accordance with the
 674 [Profile Registration Profile](#).

675 **Table 18 – Class: CIM_RegisteredProfile**

Elements	Requirement	Description
RegisteredName	Mandatory	This property shall have a value of "DHCP Client".
RegisteredVersion	Mandatory	This property shall have a value of "1.0.2".
RegisteredOrganization	Mandatory	This property shall have a value of "DMTF".

676 NOTE: Previous versions of this document included the suffix "Profile" for the RegisteredName value. If
 677 implementations querying for the RegisteredName value find the suffix "Profile", they should ignore the suffix, with
 678 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	2006-06-12	Preliminary Release
1.0.0	2008-08-10	Final Release
1.0.1	2009-09-26	Errata Release
1.0.2	2010-09-15	Version 1.0.1 of the Final Standard formatted for DMTF Standard release

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