



1

2

3

4

Document Number: DSP1074

Date: 2013-03-28

Version: 1.0.1

5 **Indicator LED Profile**

6 **Document Type: Specification**

7 **Document Status: DMTF Standard**

8 **Document Language: en-US**

9 Copyright Notice

10 Copyright © 2007, 2013 Distributed Management Task Force, Inc. (DMTF). All rights reserved.

11 DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems
12 management and interoperability. Members and non-members may reproduce DMTF specifications and
13 documents, provided that correct attribution is given. As DMTF specifications may be revised from time to
14 time, the particular version and release date should always be noted.

15 Implementation of certain elements of this standard or proposed standard may be subject to third party
16 patent rights, including provisional patent rights (herein "patent rights"). DMTF makes no representations
17 to users of the standard as to the existence of such rights, and is not responsible to recognize, disclose,
18 or identify any or all such third party patent right, owners or claimants, nor for any incomplete or
19 inaccurate identification or disclosure of such rights, owners or claimants. DMTF shall have no liability to
20 any party, in any manner or circumstance, under any legal theory whatsoever, for failure to recognize,
21 disclose, or identify any such third party patent rights, or for such party's reliance on the standard or
22 incorporation thereof in its product, protocols or testing procedures. DMTF shall have no liability to any
23 party implementing such standard, whether such implementation is foreseeable or not, nor to any patent
24 owner or claimant, and shall have no liability or responsibility for costs or losses incurred if a standard is
25 withdrawn or modified after publication, and shall be indemnified and held harmless by any party
26 implementing the standard from any and all claims of infringement by a patent owner for such
27 implementations.

28 For information about patents held by third-parties which have notified the DMTF that, in their opinion,
29 such patent may relate to or impact implementations of DMTF standards, visit
30 <http://www.dmtf.org/about/policies/disclosures.php>.

31

CONTENTS

33 Foreword 5

34 Introduction..... 6

35 1 Scope 7

36 2 Normative References..... 7

37 2.1 Approved References 7

38 2.2 Other References..... 7

39 3 Terms and Definitions 7

40 4 Symbols and Abbreviated Terms 9

41 5 Synopsis 9

42 6 Description (Informative) 9

43 7 Implementation..... 10

44 7.1 Representing an Indicator LED..... 10

45 7.2 Representing Capabilities of an Indicator LED (Optional) 11

46 7.3 Relating an Indicator LED to a Managed System Element 11

47 7.4 Representing the Physical Packaging (Optional) 11

48 7.5 DMTF Grammar for Control Pattern 11

49 8 Methods..... 13

50 8.1 Profile Conventions for Operations..... 13

51 8.2 CIM_AssociatedIndicatorLED 13

52 8.3 CIM_ElementCapabilities 13

53 8.4 CIM_IndicatorLEDCapabilities 14

54 8.5 CIM_IndicatorLED..... 14

55 8.6 CIM_SystemDevice 14

56 9 Use Cases (Informative)..... 15

57 9.1 Object Diagrams 15

58 9.2 Determine Whether the LED May Be Manually Controlled, Is Automatically Controlled, or
59 Can Be Put into Test..... 15

60 9.3 Configure an LED for Manual Control..... 16

61 9.4 Find All Indicator LEDs Associated with a Managed System Element..... 16

62 9.5 Determine Managed System Elements for Which the LED Indicates a Condition 16

63 9.6 Determine the Conditions Indicated by the LED 16

64 9.7 Determine the Current Status of the LED 16

65 9.8 Determine the Supported Colors of the LED 17

66 9.9 Determine Supported Activation States for an LED 17

67 9.10 Turn on an LED..... 17

68 9.11 Configure a Control Pattern for an LED..... 17

69 10 CIM Elements 18

70 10.1 CIM_AssociatedIndicatorLED 18

71 10.2 CIM_ElementCapabilities 19

72 10.3 CIM_IndicatorLEDCapabilities 19

73 10.4 CIM_IndicatorLED..... 19

74 10.5 CIM_RegisteredProfile..... 20

75 10.6 CIM_SystemDevice 20

76 ANNEX A (informative) Change Log..... 21

78 **Figures**

79	Figure 1 – Indicator LED Profile: Class Diagram	10
80	Figure 2 – Object Diagram	15

81

82

83 **Tables**

84	Table 1 – Referenced Profiles	9
85	Table 2 – Operations: CIM_AssociatedIndicatorLED	13
86	Table 3 – Operations: CIM_ElementCapabilities	13
87	Table 4 – Operations: CIM_IndicatorLED	14
88	Table 5 – Operations: CIM_SystemDevice	14
89	Table 6 – CIM Elements: Indicator LED Profile	18
90	Table 7 – Class: CIM_AssociatedIndicatorLED	18
91	Table 8 – Class: CIM_ElementCapabilities	19
92	Table 9 – Class: CIM_IndicatorLEDCapabilities	19
93	Table 10 – Class: CIM_IndicatorLED	19
94	Table 11 – Class: CIM_RegisteredProfile	20
95	Table 12 – Class: CIM_SystemDevice	20

96

97

Foreword

98 The *Indicator LED Profile* (DSP1074) was prepared by the Server Management Working Group and the
99 Physical Platform Profiles Working Group of the DMTF.

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

102 Acknowledgments

103 The authors wish to acknowledge the following people.

104 Editor:

- 105 • Aaron Merkin – IBM

106 Contributors:

- 107 • Jon Hass – Dell
- 108 • Khachatur Papanyan – Dell
- 109 • Jeff Hilland – HP
- 110 • Christina Shaw – HP
- 111 • Aaron Merkin – IBM
- 112 • John Leung – Intel
- 113 • Satheesh Thomas - AMI

114

115

Introduction

116 The information in this specification should be sufficient for a provider or consumer of this data to identify
117 unambiguously the classes, properties, methods, and values that shall be instantiated and manipulated to
118 represent and manage indicator LEDs of managed system elements. The target audience for this
119 specification is implementers who are writing Common Information Model (CIM) based providers or
120 consumers of management interfaces that represent the component described in this document.

121

Indicator LED Profile

122 1 Scope

123 The *Indicator LED Profile* extends the management capability of referencing profiles by adding the
124 capability to represent indicator LEDs of managed systems. Associations with the LED's physical aspects
125 and profile-implementation information are modeled in this profile.

126 2 Normative References

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

130 2.1 Approved References

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

133 DMTF DSP0004, *CIM Infrastructure Specification 2.5*,
134 http://www.dmtf.org/standards/published_documents/DSP0004_2.5.pdf

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

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

139 DMTF DSP1011, *Physical Asset Profile 1.0*,
140 http://www.dmtf.org/standards/published_documents/DSP1011_1.0.pdf

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

143 IETF RFC 5234, *Augmented BNF for Syntax Specifications: ABNF*, January 2008,
144 <http://www.ietf.org/rfc/rfc5234.txt>

145 2.2 Other References

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

148 3 Terms and Definitions

149 For the purposes of this document, the following terms and definitions apply. For the purposes of this
150 document, the terms and definitions given in [DSP1033](#) and [DSP1001](#) also apply.

151 3.1

152 can

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

- 154 **3.2**
155 **cannot**
156 used for statements of possibility and capability, whether material, physical, or causal
- 157 **3.3**
158 **conditional**
159 indicates requirements to be followed strictly to conform to the document if the specified conditions are
160 met
- 161 **3.4**
162 **mandatory**
163 indicates requirements to be followed strictly to conform to the document and from which no deviation is
164 permitted
- 165 **3.5**
166 **may**
167 indicates a course of action permissible within the limits of the document
- 168 **3.6**
169 **need not**
170 indicates a course of action permissible within the limits of the document
- 171 **3.7**
172 **optional**
173 indicates a course of action permissible within the limits of the document
- 174 **3.8**
175 **referencing profile**
176 indicates a profile that owns the definition of this class and can include a reference to this profile in its
177 "Referenced Profiles" table
- 178 **3.9**
179 **shall**
180 indicates requirements to be followed strictly to conform to the document and from which no deviation is
181 permitted
- 182 **3.10**
183 **shall not**
184 indicates requirements to be followed strictly to conform to the document and from which no deviation is
185 permitted
- 186 **3.11**
187 **should**
188 indicates that among several possibilities, one is recommended as particularly suitable, without
189 mentioning or excluding others, or that a certain course of action is preferred but not necessarily required
- 190 **3.12**
191 **should not**
192 indicates that a certain possibility or course of action is deprecated but not prohibited
- 193 **3.13**
194 **unspecified**
195 indicates that this profile does not define any constraints for the referenced CIM element
196

197 4 Symbols and Abbreviated Terms

198 The following symbols and abbreviations are used in this document.

199 4.1

200 LED

201 Light Emitting Diode

202 5 Synopsis

203 **Profile Name:** Indicator LED

204 **Version:** 1.0.1

205 **Organization:** DMTF

206 **CIM Schema version:** 2.35

207 **Central Class:** CIM_IndicatorLED

208 **Scoping Class:** CIM_ComputerSystem

209 The *Indicator LED Profile* extends the management capability of referencing profiles by adding the
210 capability to represent indicator LEDs of managed elements. This profile includes a specification of
211 indicator LEDs and a grammar for describing LED behavior. Also specified are associations with physical
212 information and advertisement of profile version information.

213 CIM_IndicatorLED shall be the Central Class of this profile. The instance of CIM_IndicatorLED shall be
214 the Central Instance of this profile. CIM_ComputerSystem shall be the Scoping Class of this profile. The
215 instance of CIM_ComputerSystem with which the Central Instance is associated through an instance of
216 CIM_SystemDevice shall be the Scoping Instance of this profile.

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

218

Table 1 – Referenced Profiles

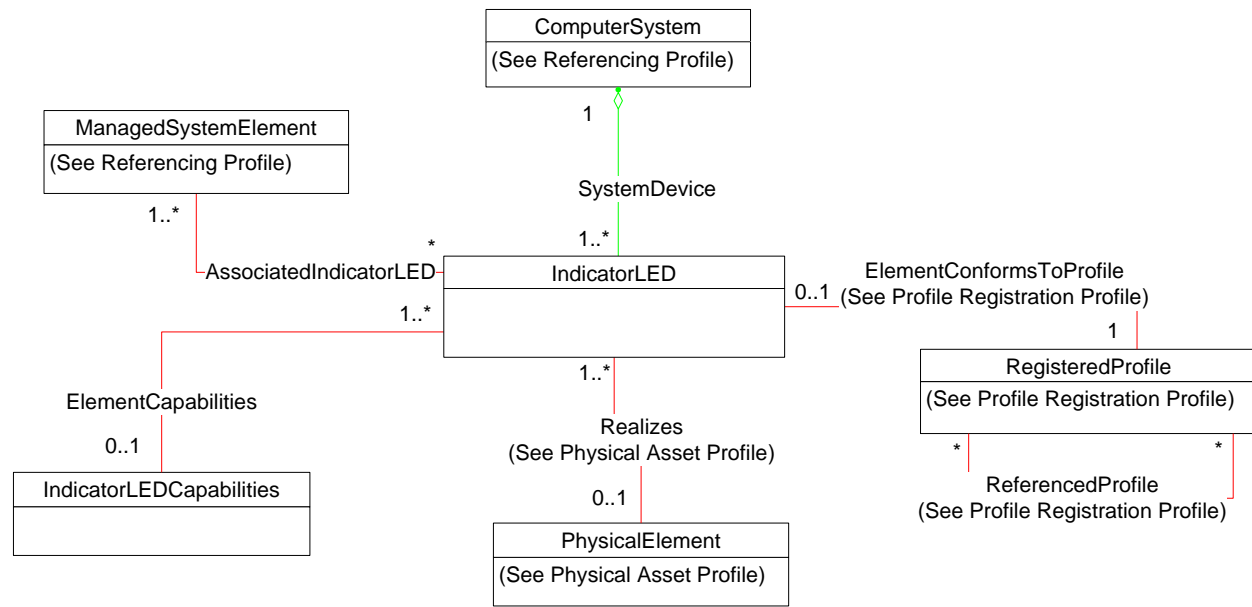
Profile Name	Organization	Version	Description
Profile Registration	DMTF	1.0	Mandatory
Physical Asset	DMTF	1.0	Optional. See section 7.4.

219 6 Description (Informative)

220 The *Indicator LED Profile* describes indicator LEDs and a grammar for describing LED behavior. Also
221 specified are associations with physical information and advertisement of profile version information.

222 Figure 1 represents the class schema for the *Indicator LED Profile*. The CIM_IndicatorLED class
223 represents an indicator LED of the system. The CIM_IndicatorLEDCapabilities class describes the
224 capabilities of the LED.

225 For simplicity, the prefix *CIM_* has been removed from the names of the classes.



226

227

Figure 1 – Indicator LED Profile: Class Diagram

228 7 Implementation

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

231 7.1 Representing an Indicator LED

232 This clause defines requirements for representing an indicator LED.

233 7.1.1 General Requirements

234 An instance of CIM_IndicatorLED shall represent each modeled indicator LED.

235 7.1.2 Controlling LED Behavior

236 This clause describes the properties that control indicator LED behavior.

237 7.1.2.1 CIM_IndicatorLED.ActivationState

238 The ActivationState property shall have one of the values listed in the SupportedActivationStates property
239 of the associated instance of CIM_IndicatorLEDCapabilities, the value 0 (Unknown), or the value 1
240 (Other).

241 7.1.2.2 CIM_IndicatorLED.IndicatedConditions

242 The IndicatedConditions property shall have one or more of the values listed in the
243 SupportedIndicatedConditions property of the associated instance of CIM_IndicatorLEDCapabilities, the
244 value 0 (Unknown), the value 1 (Other), or the value 2 (Not Applicable).

245 7.1.2.3 CIM_IndicatorLED.ControlMode

246 The ControlMode property shall have one of the values listed in the SupportedControlModes property of
247 the associated instance of CIM_IndicatorLEDCapabilities, the value 0 (Unknown), or the value 1 (Other).

248 7.1.2.4 CIM_IndicatorLED.Color

249 The Color property shall have one of the values listed in the SupportedColors property of the associated
250 instance of CIM_IndicatorLEDCapabilities, the value 0 (Unknown), the value 1 (Other), or the value 2 (Not
251 Applicable).

252 7.1.3 Control Pattern (Conditional)

253 Complex or detailed behavior for an indicator LED may be modeled using the
254 CIM_IndicatorLED.ControlPattern property. This behavior is conditional. If the
255 CIM_IndicatorLEDCapabilities.SupportedControlPattern property contains at least one value for the
256 instance of CIM_IndicatorLEDCapabilities that is associated with the instance of CIM_IndicatorLED, the
257 CIM_IndicatorLED.ControlPattern property shall be implemented. If the CIM_IndicatorLED.ActivationState
258 property does not have the value 5 (Control Pattern), the ControlPattern property may be NULL. If the
259 CIM_IndicatorLED.ActivationState property has the value 5 (Control Pattern), the ControlPattern property
260 shall not be NULL.

261 7.2 Representing Capabilities of an Indicator LED (Optional)

262 The capabilities of an indicator LED may be modeled. This behavior is optional.

263 If the instance of CIM_IndicatorLED supports more than one value for the Color property, the instance of
264 CIM_IndicatorLED shall be associated with exactly one instance of CIM_IndicatorLEDCapabilities through
265 the CIM_ElementCapabilities association.

266 If the instance of CIM_IndicatorLED supports more than one value for the ActivationState property, the
267 instance of CIM_IndicatorLED shall be associated with exactly one instance of
268 CIM_IndicatorLEDCapabilities through the CIM_ElementCapabilities association.

269 If the instance of CIM_IndicatorLED supports more than one value for the IndicatedConditions property,
270 the instance of CIM_IndicatorLED shall be associated with exactly one instance of
271 CIM_IndicatorLEDCapabilities through the CIM_ElementCapabilities association.

272 If the instance of CIM_IndicatorLED supports more than one value for the ControlPattern property, the
273 instance of CIM_IndicatorLED shall be associated with exactly one instance of
274 CIM_IndicatorLEDCapabilities through the CIM_ElementCapabilities association.

275 If the instance of CIM_IndicatorLED supports more than one value for the ControlMode property, the
276 instance of CIM_IndicatorLED shall be associated with exactly one instance of
277 CIM_IndicatorLEDCapabilities through the CIM_ElementCapabilities association.

278 7.3 Relating an Indicator LED to a Managed System Element

279 Each instance of CIM_IndicatorLED shall be associated with at least one instance of
280 CIM_ManagedSystemElement through the CIM_AssociatedIndicatorLED association.

281 7.4 Representing the Physical Packaging (Optional)

282 Support for representing the physical packaging of the indicator LED is optional. If the physical packaging
283 of the indicator LED is modeled, it shall be modeled using the [Physical Asset Profile](#).

284 7.5 DMTF Grammar for Control Pattern

285 This clause describes the constraints for expressing a control pattern using the default grammar specified
286 by this profile.

287 **7.5.1 General Requirements**

288 If a control pattern is expressed using the grammar defined by this profile, the control pattern shall comply
289 with the DMTFControlPattern production in 7.5.2.

290 If the grammar for expressing control patterns described by this profile is supported, the
291 CIM_IndicatorLEDCapabilities.SupportedControlPatterns property shall contain the value
292 "DMTF:DSP1074:ControlPattern1.0.0" for the instance of CIM_IndicatorLEDCapabilities that is
293 associated with the instance of CIM_IndicatorLED.

294 The legal value substitutions for ColorValue shall be "off" or the corresponding value of the Values
295 qualifier for a value contained in the CIM_IndicatorLEDCapabilities.SupportedColors property for the
296 instance of CIM_IndicatorLEDCapabilities that is associated with the instance of CIM_IndicatorLED.

297 If the color keyword is followed by the string "off", the LED shall not be lit. If the color keyword is followed
298 by a supported color for the LED, the LED shall be lit in that color.

299 The value of the Duration production shall be interpreted as a duration expressed in milliseconds for the
300 LED to be lit or unlit.

301 The value of the RepeatOccurrences property shall be interpreted as the number of times to repeat the
302 pattern enclosed within the repeat/endrepeat pair, where a value of "infinite" indicates that the pattern
303 shall be repeated indefinitely.

304 A control pattern shall be executed exactly once. To achieve recurring behavior, it is necessary to specify
305 the desired behavior by using the repeat production.

306 EXAMPLE: DMTF:DSP1074:ControlPattern1.0.0 repeat infinite color blue 5 color off 5 color blue 10 color off 5
307 endrepeat.

308 This will cause the LED to alternate long and short blinks in a blue color indefinitely.

309 EXAMPLE: DMTF:DSP1074:ControlPattern1.0.0 repeat 15 color blue 10 color off 5 color red 10 color off 5
310 endrepeat.

311 This will cause the LED to alternate blinking blue and red 15 times.

312 **7.5.2 Grammar**

313 This clause details the grammar for values of ControlPattern if formatted using the conventions defined by
314 this profile. The rules for production and notation are those defined in [RFC 5234](#).

315 DMTFControlPattern = "DMTF:DSP1074:ControlPattern1.0.0" Sequence

316 Sequence = 1*(" Repeat / Multistate)

317 Repeat = "repeat" " " RepeatOccurrences " " Multistate " " "endrepeat"

318 RepeatOccurrences = "infinite" / 1*DIGIT

319 Multistate = Singlestate *(" " Singlestate)

320 Singlestate = "color" " " ColorValue " " Duration

321 ColorValue = 1*ALPHA / "off"

322 Duration = 1*DIGIT

323 8 Methods

324 This section details the requirements for supporting intrinsic operations for the CIM elements defined by
 325 this profile. No extrinsic methods are defined by this profile.

326 8.1 Profile Conventions for Operations

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

329 The default list of operations is as follows:

- 330 • GetInstance
- 331 • Associators
- 332 • AssociatorNames
- 333 • References
- 334 • ReferenceNames
- 335 • EnumerateInstances
- 336 • EnumerateInstanceNames

337 8.2 CIM_AssociatedIndicatorLED

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

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

342 **Table 2 – Operations: CIM_AssociatedIndicatorLED**

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

343 8.3 CIM_ElementCapabilities

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

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

348 **Table 3 – Operations: CIM_ElementCapabilities**

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

349 8.4 CIM_IndicatorLEDCapabilities

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

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

352 8.5 CIM_IndicatorLED

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

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

357 **Table 4 – Operations: CIM_IndicatorLED**

Operation	Requirement	Messages
ModifyInstance	Optional. See 8.5.1.	None

358 8.5.1 CIM_IndicatorLED—ModifyInstance Operation

359 This clause details the specific requirements for the ModifyInstance operation that is applied to an
 360 instance of CIM_IndicatorLED.

361 If the CIM_IndicatorLED.ControlMode property has the value 2 (Automatic), the ModifyInstance operation
 362 shall not modify the following properties:

- 363 • IndicatedConditions
- 364 • Color
- 365 • ActivationState
- 366 • ControlPattern

367 If the CIM_IndicatorLED.ControlMode property has the value 3 (Manual), the ModifyInstance operation
 368 may modify the preceding properties.

369 8.6 CIM_SystemDevice

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

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

374 **Table 5 – Operations: CIM_SystemDevice**

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

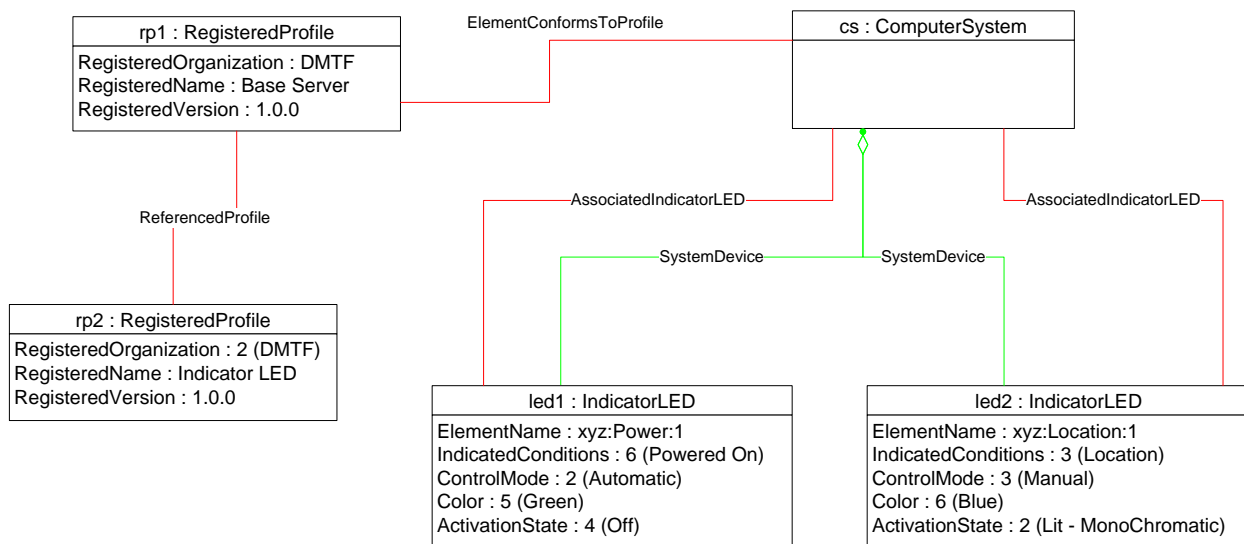
375 **9 Use Cases (Informative)**

376 This section contains object diagrams and use cases for the *Indicator LED Profile*.

377 **9.1 Object Diagrams**

378 The object diagram in Figure 2 shows an implementation of the *Indicator LED Profile*. The
 379 CIM_RegisteredProfile class is used to identify the version of the *Indicator LED Profile* with which the
 380 instances of CIM_IndicatorLED are conformant. An instance of CIM_RegisteredProfile exists for each
 381 profile that is instrumented in the system. One instance of CIM_RegisteredProfile identifies the DMTF
 382 [Base Server Profile](#), version 1.0.0. The other instance identifies the DMTF *Indicator LED Profile*, version
 383 1.0.0.

384 Two instances of CIM_IndicatorLED are implemented, representing two LEDs in the system. led1 is used
 385 to indicate whether the system is currently powered on. It is controlled by the management subsystem of
 386 the system. The LED is currently not lit; therefore, a client could infer that the system is not powered on.
 387 led2 is a location LED used to identify the system and differentiate it from nearby systems. This LED is
 388 controlled by a management client. It is currently lit.



389

390 **Figure 2 – Object Diagram**

391 **9.2 Determine Whether the LED May Be Manually Controlled, Is Automatically**
 392 **Controlled, or Can Be Put into Test**

393 A client may determine the type of control supported by an instance of CIM_IndicatorLED as follows:

- 394 1) Starting with the instance of CIM_IndicatorLED, query for an instance of
 395 CIM_IndicatorLEDCapabilities that is associated through an instance of
 396 CIM_ElementCapabilities.
- 397 2) If an instance of CIM_IndicatorLEDCapabilities is associated, query the
 398 CIM_IndicatorLEDCapabilities.SupportedControlModes property for the set of control modes
 399 supported.

- 400 3) If an instance of CIM_IndicatorLEDCapabilities is not associated, query the
401 CIM_IndicatorLED.ControlMode property. This property indicates the single control mode
402 supported by the indicator LED.

403 **9.3 Configure an LED for Manual Control**

404 A client may configure an LED for manual control as follows:

- 405 1) Use the steps in 9.2 to determine if the manual control mode is supported.
406 2) If the manual control mode is supported and the CIM_IndicatorLED.ControlMode property does
407 not have the value 3 (Manual), modify the control mode property to have the value 3 (Manual).

408 **9.4 Find All Indicator LEDs Associated with a Managed System Element**

409 A client may find the LEDs that indicate one or more conditions for a managed system element as
410 follows:

- 411 1) Starting with the instance of CIM_ManagedSystemElement, query for instances of
412 CIM_IndicatorLED that are associated through an instance of CIM_AssociatedIndicatorLED.

413 **9.5 Determine Managed System Elements for Which the LED Indicates a 414 Condition**

415 A client may determine the managed system elements for which the LED indicates a condition as follows:

- 416 1) Starting with the instance of CIM_IndicatorLED, query for instances of
417 CIM_ManagedSystemElement that are associated through an instance of
418 CIM_AssociatedIndicatorLED.

419 **9.6 Determine the Conditions Indicated by the LED**

420 A client may determine the conditions indicated by an instance of CIM_IndicatorLED as follows:

- 421 1) Starting with the instance of CIM_IndicatorLED, query for an instance of
422 CIM_IndicatorLEDCapabilities that is associated through an instance of
423 CIM_ElementCapabilities.
424 2) If an instance of CIM_IndicatorLEDCapabilities is associated, query the
425 CIM_IndicatorLEDCapabilities.SupportedIndicatedConditions property for the set of indicated
426 conditions.
427 a) If the property contains the value 1 (Other), query the corresponding array position of the
428 CIM_IndicatorLEDCapabilities.OtherSupportedIndicatedConditionDescriptions property.
429 3) If an instance of CIM_IndicatorLEDCapabilities is not associated, query the
430 CIM_IndicatorLED.IndicatedConditions property. This property provides the single condition
431 indicated by the indicator LED.
432 a) If the CIM_IndicatorLED.IndicatedConditions property contains the value 1 (Other), query
433 the CIM_IndicatorLED.OtherIndicatedConditionDescription property.

434 **9.7 Determine the Current Status of the LED**

435 A client may determine the current status of an indicator LED as follows:

- 436 1) Starting with the instance of CIM_IndicatorLED, query the ActivationState property.
437 2) If the value of the ActivationState property is 5 (ControlPattern), query the ControlPattern
438 property. Otherwise, the ActivationState property indicates the current state of the indicator
439 LED.

440 **9.8 Determine the Supported Colors of the LED**

441 A client may determine the colors supported by an instance of CIM_IndicatorLED as follows:

- 442 1) Starting with the instance of CIM_IndicatorLED, query for an instance of
443 CIM_IndicatorLEDCapabilities that is associated through an instance of
444 CIM_ElementCapabilities.
- 445 2) If an instance of CIM_IndicatorLEDCapabilities is associated, query the
446 CIM_IndicatorLEDCapabilities.SupportedColors property for the set of colors supported.
 - 447 a) If the property contains the value 1 (Other), query the corresponding array position of the
448 CIM_IndicatorLEDCapabilities.OtherSupportedColorDescriptions property.
- 449 3) If an instance of CIM_IndicatorLEDCapabilities is not associated, query the
450 CIM_IndicatorLED.Color property. This property indicates the single color supported by the
451 indicator LED.
 - 452 a) If the CIM_IndicatorLED.Color property contains the value 1 (Other), query the
453 CIM_IndicatorLED.OtherColorDescription property.

454 **9.9 Determine Supported Activation States for an LED**

455 A client may determine the activation states supported by an instance of CIM_IndicatorLED as follows:

- 456 1) Starting with the instance of CIM_IndicatorLED, query for an instance of
457 CIM_IndicatorLEDCapabilities that is associated through an instance of
458 CIM_ElementCapabilities.
- 459 2) If an instance of CIM_IndicatorLEDCapabilities is associated, query the
460 CIM_IndicatorLEDCapabilities.SupportedActivationStates property for the set of activation
461 states supported.
- 462 3) If an instance of CIM_IndicatorLEDCapabilities is not associated, query the
463 CIM_IndicatorLED.ActivationState property. This property indicates the single activation state
464 supported by the indicator LED.

465 **9.10 Turn on an LED**

466 A client may turn on an LED as follows:

- 467 1) Starting with the instance of CIM_IndicatorLED, place the indicator LED into manual control
468 mode using the steps in 9.3.
- 469 2) Use the steps in 9.9 to determine if 2 (Lit – Monochromatic) is a supported activation state.
- 470 3) If 2 (Lit – Monochromatic) is a supported activation state, modify the
471 CIM_IndicatorLED.ActivationState property to have the value 2 (Lit – Monochromatic).
- 472 4) If 2 (Lit – Monochromatic) is not a supported activation state, the LED does not support being
473 turned on directly. This behavior may be supported through a control pattern supported by the
474 indicator LED.

475 **9.11 Configure a Control Pattern for an LED**

476 Given an instance of CIM_IndicatorLED, a client can configure a control pattern for an LED as follows:

- 477 1) Query for an associated instance of CIM_IndicatorLEDCapabilities.
478 If an instance is not found, the only supported control pattern (if any) is the current value of the
479 CIM_IndicatorLED.ControlPattern property.

- 480 2) Query the CIM_IndicatorLEDCapabilities.SupportedControlPatterns property. If the property
 481 contains values that identify grammars or behaviors of which the client has a priori knowledge,
 482 the client is able to configure the control pattern.
- 483 3) If the desired control pattern is a named behavior supported by the LED, the client may use the
 484 ModifyInstance operation to modify the CIM_IndicatorLED.ControlPattern property to have the
 485 value that identifies the named behavior.
- 486 4) If the desired control pattern is not a named behavior but can be expressed by the client using a
 487 grammar supported by the indicator LED, the client can construct a string value expressing the
 488 desired behavior and use the ModifyInstance operation to modify the
 489 CIM_IndicatorLED.ControlPattern property to have the value that describes the behavior.

490 10 CIM Elements

491 Table 6 shows the instances of CIM Elements for this profile. Instances of the CIM Elements shall be
 492 implemented as described in Table 6. Sections 7 (“Implementation”) and 8 (“Methods”) may impose
 493 additional requirements on these elements.

494 **Table 6 – CIM Elements: Indicator LED Profile**

Element Name	Requirement	Description
Classes		
CIM_AssociatedIndicatorLED	Mandatory	See 10.1.
CIM_ElementCapabilities	Mandatory	See 10.2.
CIM_IndicatorLEDCapabilities	Mandatory	See 10.3.
CIM_IndicatorLED	Mandatory	See 10.4.
CIM_RegisteredProfile	Mandatory	See 10.5.
CIM_SystemDevice	Mandatory	See 10.6.
Indications		
None defined in this profile		

495 10.1 CIM_AssociatedIndicatorLED

496 CIM_AssociatedIndicatorLED is used to associate one or more instances of
 497 CIM_ManagedSystemElement with an instance of CIM_IndicatorLED. Table 7 contains the requirements
 498 for elements of this class.

499 **Table 7 – Class: CIM_AssociatedIndicatorLED**

Elements	Requirement	Notes
Antecedent	Mandatory	This property shall be an instance of CIM_ManagedSystemElement. Cardinality 1..*
Dependent	Mandatory	This property shall be an instance of CIM_IndicatorLED. Cardinality *

500 **10.2 CIM_ElementCapabilities**

501 CIM_ElementCapabilities is used to associate an instance of CIM_IndicatorLEDCapabilities with an
 502 instance of CIM_IndicatorLED. Table 8 contains the requirements for elements of this class.

503 **Table 8 – Class: CIM_ElementCapabilities**

Elements	Requirement	Notes
ManagedElement	Mandatory	This property shall be a reference to an instance of CIM_IndicatorLED. Cardinality 1..*
Capabilities	Mandatory	This property shall be a reference to the instance of CIM_IndicatorLEDCapabilities. Cardinality 1

504 **10.3 CIM_IndicatorLEDCapabilities**

505 CIM_IndicatorLEDCapabilities is used to indicate support for managing the state of the indicator LED.
 506 Table 9 contains the requirements for elements of this class.

507 **Table 9 – Class: CIM_IndicatorLEDCapabilities**

Elements	Requirement	Notes
InstanceID	Mandatory	None
SupportedIndicatedConditions	Mandatory	None
OtherSupportedIndicatedCondition Descriptions	Conditional	This property shall be non-NULL if SupportedIndicatedConditions has the value 1 (Other) in any array position.
SupportedColors	Mandatory	None
OtherSupportedColorDescriptions	Conditional	This property shall be non-NULL if SupportedColors has the value 1 (Other) in any array position.
SupportedControlModes	Mandatory	None
SupportedActivationStates	Mandatory	None
SupportedControlPatterns	Conditional	None

508 **10.4 CIM_IndicatorLED**

509 CIM_IndicatorLED represents the logical aspects of an indicator LED. Table 10 contains the requirements
 510 for elements of this class.

511 **Table 10 – Class: CIM_IndicatorLED**

Elements	Requirement	Notes
SystemCreationClassName	Mandatory	None
CreationClassName	Mandatory	None
SystemName	Mandatory	None
DeviceId	Mandatory	None
ElementName	Mandatory	pattern ("+.")
IndicatedConditions	Mandatory	None

Elements	Requirement	Notes
OtherIndicatedConditionDescription	Conditional	This property shall have pattern (“+.”) if IndicatedConditions has the value 1 (Other).
Color	Mandatory	See 7.1.2.4.
OtherColorDescription	Conditional	This property shall have pattern (“+.”) if Color has the value 1 (Other).
ControlMode	Mandatory	See 7.1.2.3.
DefaultActivationState	Mandatory	None
ActivationState	Mandatory	See 7.1.2.1.
ControlPattern	Conditional	See 7.1.3.

512 10.5 CIM_RegisteredProfile

513 CIM_RegisteredProfile identifies the *Indicator LED Profile* in order for a client to determine whether an
 514 instance of CIM_IndicatorLED is conformant with this profile. The CIM_RegisteredProfile class is defined
 515 by the [Profile Registration Profile](#). With the exception of the mandatory values specified for the elements
 516 in Table 11, the behavior of the CIM_RegisteredProfile instance is in accordance with the constraints
 517 specified in the [Profile Registration Profile](#).

518 **Table 11 – Class: CIM_RegisteredProfile**

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

519 10.6 CIM_SystemDevice

520 CIM_SystemDevice is used to associate an instance of CIM_IndicatorLED with the instance of
 521 CIM_ComputerSystem to which the CIM_IndicatorLED instance is scoped.

522 **Table 12 – Class: CIM_SystemDevice**

Elements	Requirement	Notes
GroupComponent	Mandatory	This property shall be a reference to an instance of CIM_ComputerSystem. Cardinality 1
PartComponent	Mandatory	This property shall be a reference to CIM_IndicatorLED. Cardinality 1..*

523
524
525
526

ANNEX A (informative)

Change Log

Version	Date	Description
1.0.0	2009-06-17	
1.0.1	2013-03-28	Errata

527