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6 **Sensors Profile**

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120

121

Foreword

122 The Sensors Profile (DSP1009) was prepared by the Server Management Working Group of the DMTF

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124 management and interoperability.

125

Introduction

126 This document defines the classes used to describe the sensors in a managed system. The document
127 also defines association classes that describe the relationship of the sensors with the monitored devices
128 and with DMTF profile version information. The information in this specification is intended to be sufficient
129 for a provider or consumer of this data to identify unambiguously the classes, properties, methods, and
130 values that are mandatory to be instantiated and manipulated to represent and manage sensors of
131 managed systems and subsystems that are modeled using the DMTF CIM core and extended model
132 definitions.

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

135

Sensors Profile

136 1 Scope

137 The Sensors Profile extends the management capabilities of referencing profiles by adding the capability
138 to represent sensors. The sensor's relationship with devices and the profile's registration for the schema
139 implementation version information are also described.

140 2 Normative References

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

144 2.1 Approved References

145 DMTF DSP0200, *CIM Operations over HTTP 1.2.0*

146 DMTF DSP0004, *CIM Infrastructure Specification 2.3.0*

147 DMTF DSP1000, *Management Profile Specification Template*

148 DMTF DSP1001, *Management Profile Specification Usage Guide*

149 2.2 References under Development

150 DMTF DSP1033, *Profile Registration Profile*

151 2.3 Other References

152 ISO/IEC Directives, Part 2, *Rules for the structure and drafting of International Standards*,
153 <http://isotc.iso.org>

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

155 3 Terms and Definitions

156 For the purposes of this document, the following terms and definitions apply.

157 3.1

158 **can**

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

160 3.2

161 **cannot**

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

163 3.3

164 **conditional**

165 indicates requirements to be followed strictly to conform to the document when the specified conditions
166 are met

167 **3.4**
168 **mandatory**
169 indicates requirements to be followed strictly to conform to the document and from which no deviation is
170 permitted

171 **3.5**
172 **may**
173 indicates a course of action permissible within the limits of the document

174 **3.6**
175 **need not**
176 indicates a course of action permissible within the limits of the document

177 **3.7**
178 **optional**
179 indicates a course of action permissible within the limits of the document

180 **3.8**
181 **referencing profile**
182 indicates a profile that owns the definition of this class and can include a reference to this profile in its
183 "Related Profiles" table

184 **3.9**
185 **shall**
186 indicates requirements to be followed strictly to conform to the document and from which no deviation is
187 permitted

188 **3.10**
189 **shall not**
190 indicates requirements to be followed strictly to conform to the document and from which no deviation is
191 permitted

192 **3.11**
193 **should**
194 indicates that among several possibilities, one is recommended as particularly suitable, without
195 mentioning or excluding others, or that a certain course of action is preferred but not necessarily required

196 **3.12**
197 **should not**
198 indicates that a certain possibility or course of action is deprecated but not prohibited

199 **4 Symbols and Abbreviated Terms**

200 none

201 **5 Synopsis**

202 **Profile Name:** Sensors Profile

203 **Version:** 1.0.0c

204 **Organization:** DMTF

205 **CIM Schema Version:** 2.12

206 **Central Class:** CIM_Sensor and CIM_NumericSensor

207 **Scoping Class:** CIM_ComputerSystem

208 The Sensors Profile extends the management capability of the referencing profiles by adding the
209 capability to represent sensors in a managed system.

210 Table 1 identifies profiles related to this profile.

211

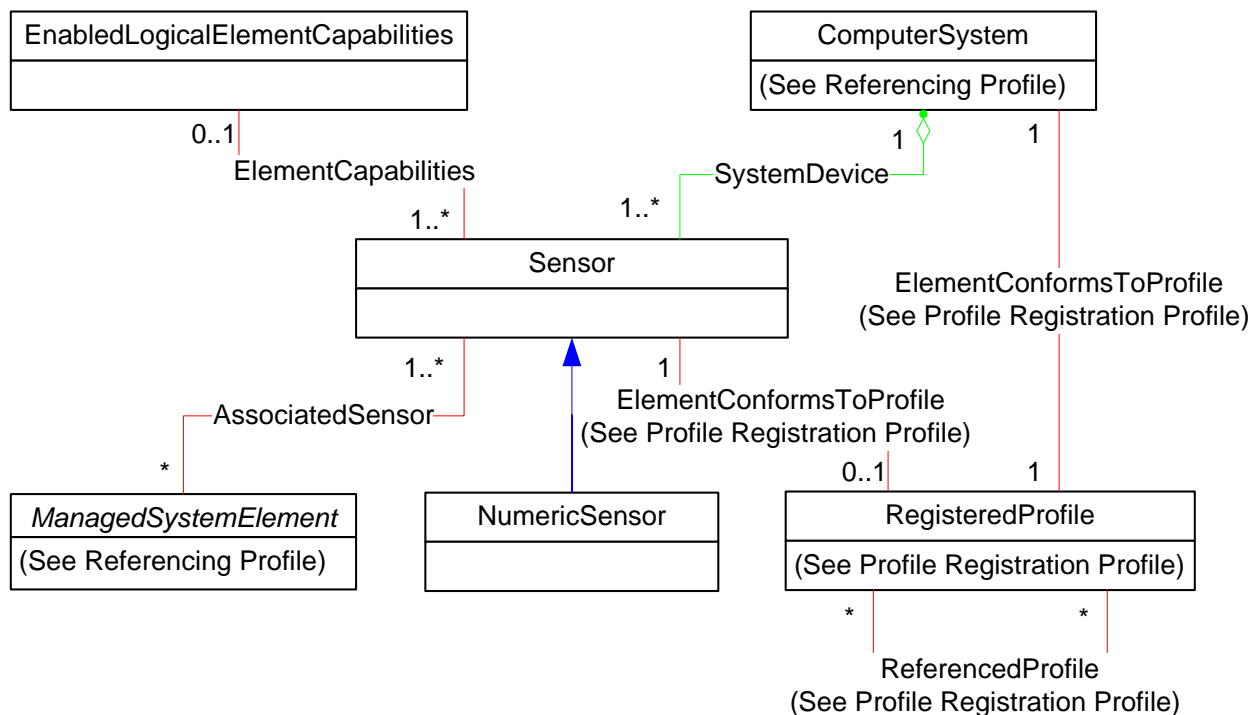
Table 1 – Related Profiles

Profile Name	Organization	Version	Relationship	Behavior
Profile Registration Profile	DMTF	1.0	Mandatory	None

212 6 Description

213 The Sensors Profile describes the properties and methods of sensors in a managed system.

214 Figure 1 represents the class schema for the Sensors Profile. For simplicity, the prefix CIM_ has been
215 removed from the names of the classes.



216

217

Figure 1 – Sensors Profile: Class Diagram

218 7 Implementation Requirements

219 This section details the requirements related to the instantiation of instances and their properties for
 220 implementations of this profile. The requirements for the implementation of the methods are listed in
 221 section 8.

222 7.1 CIM_Sensor and CIM_NumericSensor

223 The implementation shall instantiate an instance of CIM_Sensor or CIM_NumericSensor.

224 7.2 CIM_Sensor.PossibleStates

225 The CIM_Sensor.PossibleStates property shall represent an array of the possible string outputs of the
 226 sensor provided as a value of the CIM_Sensor.CurrentState property. The CIM_Sensor.SensorType
 227 property shall determine which CIM_Sensor.PossibleStates enumeration set to use.

228 The mappings between the CIM_Sensor.SensorType property values and the
 229 CIM_Sensor.PossibleStates property values are shown in Table 2. When the value of the
 230 CIM_Sensor.SensorType property matches a value in the “CIM_Sensor.SensorType” column of Table 2,
 231 the CIM_Sensor.PossibleStates property shall contain an array of values or an array of the subset of
 232 values specified in the corresponding “CIM_Sensor.PossibleStates” column. If the value of the
 233 CIM_Sensor.SensorType property is not listed in Table 2, the CIM_Sensor.PossibleStates property shall
 234 be defined by the implementation. The mapping between the values of CIM_Sensor.PossibleStates in
 235 Table 2 and the actual condition of the monitored device is implementation specific.

236 **Table 2 – CIM_Sensor.PossibleStates Values for Discrete Sensors**

CIM_Sensor.SensorType	CIM_Sensor.PossibleStates
2 (Temperature)	“Bad”, “Good”, “Unknown”
3 (Voltage)	“Bad”, “Good”, “Unknown”
4 (Current)	“Bad”, “Good”, “Unknown”
5 (Tachometer)	“Bad”, “Good”, “Unknown”
7 (Switch)	“Closed”, “Open”, “Unknown”
8 (Lock)	“Locked”, “Unlocked”, “Unknown”
9 (Humidity)	“Humid”, “Normal”, “Unknown”
10 (Smoke Detection)	“Smoky”, “Normal”, “Unknown”
11 (Presence)	“Not Present”, “Present”, “Unknown”
12 (Air Flow)	“Bad”, “Good”, “Unknown”

237 7.3 CIM_NumericSensor.PossibleStates

238 The CIM_NumericSensor.PossibleStates property shall represent an array of the possible string outputs
 239 of the sensor provided as a value of the CIM_NumericSensor.CurrentState property. The
 240 CIM_NumericSensor.SensorType property shall determine which CIM_NumericSensor.PossibleStates
 241 enumeration set to use.

242 The mappings between the CIM_NumericSensor.SensorType property values and the
 243 CIM_NumericSensor.PossibleStates property values are shown in Table 3. When the value of the
 244 CIM_NumericSensor.SensorType property matches a value in the “CIM_NumericSensor.SensorType”
 245 column of Table 3, the CIM_NumericSensor.PossibleStates property shall contain an array of values or
 246 an array of the subset of the values specified in the corresponding “CIM_NumericSensor.PossibleStates”
 247 column. If the value of the CIM_NumericSensor.SensorType property is not listed in Table 3, the
 248 CIM_NumericSensor.PossibleStates property shall be defined by the implementation. The mapping

249 between the values of CIM_NumericSensor.PossibleStates in Table 3 and the actual condition of the
250 monitored device is implementation specific.

251 **Table 3 – CIM_NumericSensor.PossibleStates Values for Numeric Sensors**

CIM_NumericSensor.SensorType	CIM_NumericSensor.PossibleStates
2 (Temperature) 3 (Voltage) 4 (Current) 5 (Tachometer) 9 (Humidity) 10 (Smoke Detection) 12 (Air Flow)	"Non-Critical", "Lower Non-Critical", "Upper Non-Critical", "Critical", "Lower Critical", "Upper Critical", "Fatal", "Lower Fatal", "Upper Fatal", "Normal", "Unknown"

252 **7.4 CIM_Sensor.CurrentState and CIM_NumericSensor.CurrentState**

253 The CIM_Sensor.CurrentState property shall have a value of one of the elements in the
254 CIM_Sensor.PossibleStates array.

255 The CIM_NumericSensor.CurrentState property shall have a value of one of the elements in the
256 CIM_NumericSensor.PossibleStates array.

257 **7.5 CIM_NumericSensor.LowerThresholdNonCritical**

258 The CIM_NumericSensor.LowerThresholdNonCritical property shall be mandatory when the
259 CIM_NumericSensor.SupportedThresholds array contains a value of 0 (LowerThresholdNonCritical).

260 The CIM_NumericSensor.LowerThresholdNonCritical property shall be settable only if the
261 CIM_NumericSensor.SettableThresholds array contains a value of 0 (LowerThresholdNonCritical).

262 **7.6 CIM_NumericSensor.UpperThresholdNonCritical**

263 The CIM_NumericSensor.UpperThresholdNonCritical property shall be mandatory when the
264 CIM_NumericSensor.SupportedThresholds array contains a value of 1 (UpperThresholdNonCritical).

265 The CIM_NumericSensor.UpperThresholdNonCritical property shall be settable only if the
266 CIM_NumericSensor.SettableThresholds array contains a value of 1 (UpperThresholdNonCritical).

267 **7.7 CIM_NumericSensor.LowerThresholdCritical**

268 The CIM_NumericSensor.LowerThresholdCritical property shall be mandatory when the
269 CIM_NumericSensor.SupportedThresholds array contains a value of 2 (LowerThresholdCritical).

270 The CIM_NumericSensor.LowerThresholdCritical property shall be settable only if the
271 CIM_NumericSensor.SettableThresholds array contains a value of 2 (LowerThresholdCritical).

272 **7.8 CIM_NumericSensor.UpperThresholdCritical**

273 The CIM_NumericSensor.UpperThresholdCritical property shall be mandatory when the
274 CIM_NumericSensor.SupportedThresholds array contains a value of 3 (UpperThresholdCritical).

275 The CIM_NumericSensor.UpperThresholdCritical property shall be settable only if the
276 CIM_NumericSensor.SettableThresholds array contains a value of 3 (UpperThresholdCritical).

277 **7.9 CIM_NumericSensor.LowerThresholdFatal**

278 The CIM_NumericSensor.LowerThresholdFatal property shall be mandatory when the
279 CIM_NumericSensor.SupportedThresholds array contains a value of 4 (LowerThresholdFatal).

280 The CIM_NumericSensor.LowerThresholdFatal property shall be settable only if the
281 CIM_NumericSensor.SettableThresholds array contains a value of 4 (LowerThresholdFatal).

282 **7.10 CIM_NumericSensor.UpperThresholdFatal**

283 The CIM_NumericSensor.UpperThresholdFatal property shall be mandatory when the
284 CIM_NumericSensor.SupportedThresholds array contains a value of 5 (UpperThresholdFatal).

285 The CIM_NumericSensor.UpperThresholdFatal property shall be settable only if the
286 CIM_NumericSensor.SettableThresholds array contains a value of 5 (UpperThresholdFatal).

287 **7.11 CIM_NumericSensor.SupportedThresholds**

288 The CIM_NumericSensor.SupportedThresholds property is an array that contains the list of the
289 implemented thresholds: LowerThresholdNonCritical, UpperThresholdNonCritical,
290 LowerThresholdCritical, UpperThresholdCritical, LowerThresholdFatal, and UpperThresholdFatal. When
291 the implementation does not support any of these threshold properties, the
292 CIM_NumericSensor.SupportedThresholds property shall be an empty array.

293 **7.12 CIM_NumericSensor.SettableThresholds**

294 The CIM_NumericSensor.SettableThresholds property is an array that contains the list of the settable
295 implemented thresholds: LowerThresholdNonCritical, UpperThresholdNonCritical,
296 LowerThresholdCritical, UpperThresholdCritical, LowerThresholdFatal, and UpperThresholdFatal. The
297 CIM_NumericSensor.SettableThresholds array shall contain the subset of values in the
298 CIM_NumericSensor.SupportedThresholds array (see section 7.11). When the implementation does not
299 support any of the settable threshold properties, the CIM_NumericSensor.SettableThresholds property
300 shall be an empty array.

301 **7.13 CIM_EnabledLogicalElementCapabilities**

302 When the CIM_EnabledLogicalElementCapabilities class is instantiated, the instance of
303 CIM_EnabledLogicalElementCapabilities shall be associated with the Central Instance through the
304 CIM_ElementCapabilities association and used for advertising the capabilities of the Central Instance.

305 At most only one instance of CIM_EnabledLogicalElementCapabilities shall be associated with a given
306 instance of CIM_Sensor or CIM_NumericSensor.

307 **7.13.1 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported**

308 The CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property is an array that
309 contains the supported requested states for the instance of CIM_Sensor or CIM_NumericSensor. This
310 property shall be the super set of the values to be used as the RequestedState parameter in the
311 RequestStateChange() method.

312 The value of the CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property shall be
313 an empty array or contain any combination of the following values: 2 (Enabled), 3(Disabled), or
314 11(Reset).

315 7.13.2 CIM_EnabledLogicalElementCapabilities.ElementNameEditSupported

316 The CIM_EnabledLogicalElementCapabilities.ElementNameEditSupported property shall have a value of
317 TRUE when the implementation supports client modification of the ElementName property of the
318 associated CIM_Sensor or CIM_NumericSensor instance.

319 7.13.3 CIM_EnabledLogicalElement.MaxElementNameLen

320 The CIM_EnabledLogicalElement.MaxElementNameLen property shall be implemented when the
321 CIM_EnabledLogicalElementCapabilities.ElementNameEditSupported property has a value of TRUE.

322 7.14 Sensor State Management (Optional)

323 Sensor state management consists of the RequestStateChange() method of the Central Instance being
324 supported (see section 8.1) and the RequestedState property of the Central Instance having a value other
325 than 12 (Not Applicable).

326 7.14.1 Sensor State Management Support

327 When no CIM_EnabledLogicalElementCapabilities instance is associated with the Central Instance,
328 sensor state management shall not be supported.

329 When a CIM_EnabledLogicalElementCapabilities instance is associated with the Central Instance but the
330 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property is an empty array, sensor
331 state management shall not be supported.

332 When a CIM_EnabledLogicalElementCapabilities instance is associated with the Central Instance and the
333 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property is a non-empty array,
334 sensor state management shall be supported.

335 7.15 CIM_Sensor.RequestedState and CIM_NumericSensor.RequestedState

336 The RequestedState property shall have a value of 12 (Not Applicable), a value of 5 (No Change), or a
337 value that is contained in the CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported
338 property array of the associated CIM_EnabledLogicalElementCapabilities instance (see section 7.13.1).

339 When sensor state management is supported and the RequestStateChange() method is successfully
340 executed, the RequestedState property shall be set to the value of the RequestedState parameter of the
341 RequestStateChange() method. After the RequestStateChange() method completes successfully, the
342 RequestedState and EnabledState properties shall have equal values with the exception of the
343 transitional requested state 11 (Reset). The value of the RequestedState property may also change as a
344 result of the request for a change to the sensor's enabled state by a non-CIM implementation.

345 7.15.1 RequestedState – 12 (Not Applicable)

346 When sensor state management is not supported, the value of the RequestedState property of the
347 Central Instance shall be 12 (Not Applicable).

348 7.15.2 RequestedState – 5 (No Change)

349 When sensor state management is supported, the initial value of the RequestedState property of the
350 Central Instance shall be 5 (No Change).

351 7.16 CIM_Sensor.EnabledState and CIM_NumericSensor.EnabledState

352 Table 4 describes the mapping between the EnabledState property values and the corresponding
 353 description of the state of the sensor. The EnabledState property shall match the values that are specified
 354 in Table 4. The value of the EnabledState property may change as a result of a client execution of the
 355 RequestStateChange() method or a change to the sensor's enabled state by a non-CIM implementation.

356 **Table 4 – EnabledState Value Description**

Value	Description	Extended Description
1	Enabled	Sensor shall be operational.
2	Disabled	Sensor shall be disabled.
5	Not Applicable	Sensor state is indeterminate, or sensor state management is not supported.

357 7.17 CIM_Sensor.OtherSensorTypeDescription and 358 CIM_NumericSensor.OtherSensorTypeDescription

359 The OtherSensorTypeDescription property shall be mandatory when the SensorType property is set to a
 360 value of 1 (Other).

361 The OtherSensorTypeDescription property shall be formatted as a free-formed string of variable length
 362 (pattern ".*").

363 7.18 CIM_SystemDevice and CIM_AssociatedSensor

364 When the Central Instance represents a sensor for the entire managed system, the instance of
 365 CIM_ComputerSystem that is referenced by CIM_SystemDevice shall identify the managed system and
 366 no instances of CIM_AssociatedSensor shall reference the Central Instance.

367 When the Central Instance represents a sensor for one or more discrete components and not for the
 368 entire system, for each component an instance of CIM_AssociatedSensor shall reference the Central
 369 Instance and the CIM_ManagedElement that identifies the component.

370 7.19 CIM_Sensor.ElementName and CIM_NumericSensor.ElementName

371 The ElementName property shall be formatted as a free-formed string of variable length (pattern ".*").

372 7.19.1 ElementName Is Modifiable

373 Implementations may allow the ElementName property to be modifiable by a client. This behavior is
 374 conditional. This section describes the CIM elements and behavior requirements when an implementation
 375 supports client modification of the ElementName property.

376 8 Methods

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

379 8.1 CIM_Sensor.RequestStateChange() and 380 CIM_NumericSensor.RequestStateChange()

381 The RequestStateChange() method shall be implemented when sensor state management is supported
 382 (see section 7.14.1).

383 Invocation of the RequestStateChange() method shall change the element's state to the value specified
384 in the RequestedState parameter.

385 RequestStateChange() return code values are specified in Table 5. RequestStateChange() parameters
386 are specified in Table 6.

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

389 No standard messages are defined for this method.

390 **Table 5 – RequestStateChange() Method: Return Code Values**

Value	Description
0	Request was successfully executed.
1	Method is not supported in the implementation.
2	Error occurred.

391 **Table 6 – RequestStateChange() Method: Parameters**

Qualifiers	Name	Type	Description/Values
IN, REQ	RequestedState	uint16	Shall have a value from the CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported array (see section 7.14)
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

392 **8.2 CIM_NumericSensor.RestoreDefaultThresholds()**

393 The CIM_NumericSensor.RestoreDefaultThresholds() method shall be implemented and shall not return
394 a value of 1 (Unsupported) when the CIM_NumericSensor.SettableThresholds property is a non-empty
395 array (see section 7.12).

396 Invocation of the CIM_NumericSensor.RestoreDefaultThresholds() method shall reset the values of the
397 thresholds of the sensor represented by the instance of CIM_NumericSensor to the hardware defaults.

398 Detailed requirements of the CIM_NumericSensor.RestoreDefaultThresholds() method are specified in
399 Table 7.

400 No method parameters are defined for this method.

401 No standard messages are defined for this method.

402 **Table 7 – CIM_NumericSensor.RestoreDefaultThresholds() Method: Return Code Values**

Value	Description
0	Request was successfully executed.
1	Method is not supported in the implementation.
2	Error occurred.

403 8.3 Profile Conventions for Operations

404 Support for operations for each profile class (including associations) is specified in the following
 405 subclauses. Each subclause includes either the statement “All operations in the default list in section 8.3
 406 are supported as described by DSP0200 version 1.2” or a table listing all of the operations that are not
 407 supported by this profile or where the profile requires behavior other than that described by DSP0200.

408 The default list of operations is as follows:

- 409 • GetInstance
- 410 • EnumerateInstances
- 411 • EnumerateInstanceNames
- 412 • Associators
- 413 • AssociatorNames
- 414 • References
- 415 • ReferenceNames

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

418 8.4 CIM_Sensor

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

421 **Table 8 – Operations: CIM_Sensor**

Operation	Requirement	Messages
ModifyInstance	Optional. See section 8.4.1.	None

422 8.4.1 CIM_Sensor—ModifyInstance

423 This section details the requirements for the ModifyInstance operation applied to an instance of
 424 CIM_Sensor. The ModifyInstance operation may be supported.

425 The ModifyInstance operation shall be supported when the ElementNameEditSupported property of the
 426 CIM_EnabledLogicalElementCapabilities instance that is associated with the CIM_Sensor instance has a
 427 value of TRUE.

428 8.4.1.1 CIM_Sensor.ElementName

429 When the ElementNameEditSupported property of the CIM_EnabledLogicalElementCapabilities instance
 430 that is associated with the CIM_Sensor instance has a value of TRUE, the implementation shall allow the
 431 ModifyInstance operation to change the value of the ElementName property of the CIM_Sensor instance.
 432 The ModifyInstance operation shall enforce the length restriction specified in the MaxElementNameLen
 433 property of the CIM_EnabledLogicalElementCapabilities instance.

434 When the ElementNameEditSupported property of the CIM_EnabledLogicalElementCapabilities instance
 435 has a value of FALSE, the implementation shall not allow the ModifyInstance operation to change the
 436 value of the ElementName property of the CIM_Sensor instance.

437 8.5 CIM_NumericSensor

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

440 **Table 9 – Operations: CIM_NumericSensor**

Operation	Requirement	Messages
ModifyInstance	Optional. See section 8.5.1.	None

441 8.5.1 CIM_NumericSensor—ModifyInstance

442 This section details the requirements for the ModifyInstance operation applied to an instance of
443 CIM_NumericSensor. The ModifyInstance operation may be supported.

444 The ModifyInstance operation shall be supported when the ElementNameEditSupported property of the
445 CIM_EnabledLogicalElementCapabilities instance that is associated with the CIM_NumericSensor
446 instance has a value of TRUE.

447 The ModifyInstance operation shall be supported when CIM_NumericSensor.SettableThresholds property
448 is a non-empty array. The ModifyInstance operation shall modify the following properties:

- 449 • LowerThresholdNonCritical when CIM_NumericSensor.SettableThresholds contains a value of 0
450 (LowerThresholdNonCritical)
- 451 • UpperThresholdNonCritical when CIM_NumericSensor.SettableThresholds contains a value of 1
452 (UpperThresholdNonCritical)
- 453 • LowerThresholdCritical when CIM_NumericSensor.SettableThresholds contains a value of 2
454 (LowerThresholdCritical)
- 455 • UpperThresholdCritical when CIM_NumericSensor.SettableThresholds contains a value of 3
456 (UpperThresholdCritical)
- 457 • LowerThresholdFatal when CIM_NumericSensor.SettableThresholds contains a value of 4
458 (LowerThresholdFatal)
- 459 • UpperThresholdFatal when CIM_NumericSensor.SettableThresholds contains a value of 5
460 (UpperThresholdFatal)

461 8.5.1.1 CIM_NumericSensor.ElementName

462 When the ElementNameEditSupported property of the CIM_EnabledLogicalElementCapabilities instance
463 that is associated with the CIM_NumericSensor instance has a value of TRUE, the implementation shall
464 allow the ModifyInstance operation to change the value of the ElementName property of the
465 CIM_NumericSensor instance. The ModifyInstance operation shall enforce the length restriction specified
466 in the MaxElementNameLen property of the CIM_EnabledLogicalElementCapabilities instance.

467 When the ElementNameEditSupported property of the CIM_EnabledLogicalElementCapabilities instance
468 has a value of FALSE, the implementation shall not allow the ModifyInstance operation to change the
469 value of the ElementName property of the CIM_NumericSensor instance.

470 **8.6 CIM_EnabledLogicalElementCapabilities**

471 All operations in the default list in section 8.3 are supported as described by DSP0200 version 1.2.

472 **8.7 CIM_ElementCapabilities**473 Table 10 lists operations that either have special requirements beyond those from DSP0200 or shall not
474 be supported.475 **Table 10 – Operations: CIM_ElementCapabilities**

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

476 **8.8 CIM_SystemDevice**477 Table 11 lists operations that either have special requirements beyond those from DSP0200 or shall not
478 be supported.479 **Table 11 – Operations: CIM_SystemDevice**

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

480 **8.9 CIM_AssociatedSensor**481 Table 12 lists operations that either have special requirements beyond those from DSP0200 or shall not
482 be supported.483 **Table 12 – Operations: CIM_AssociatedSensor**

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

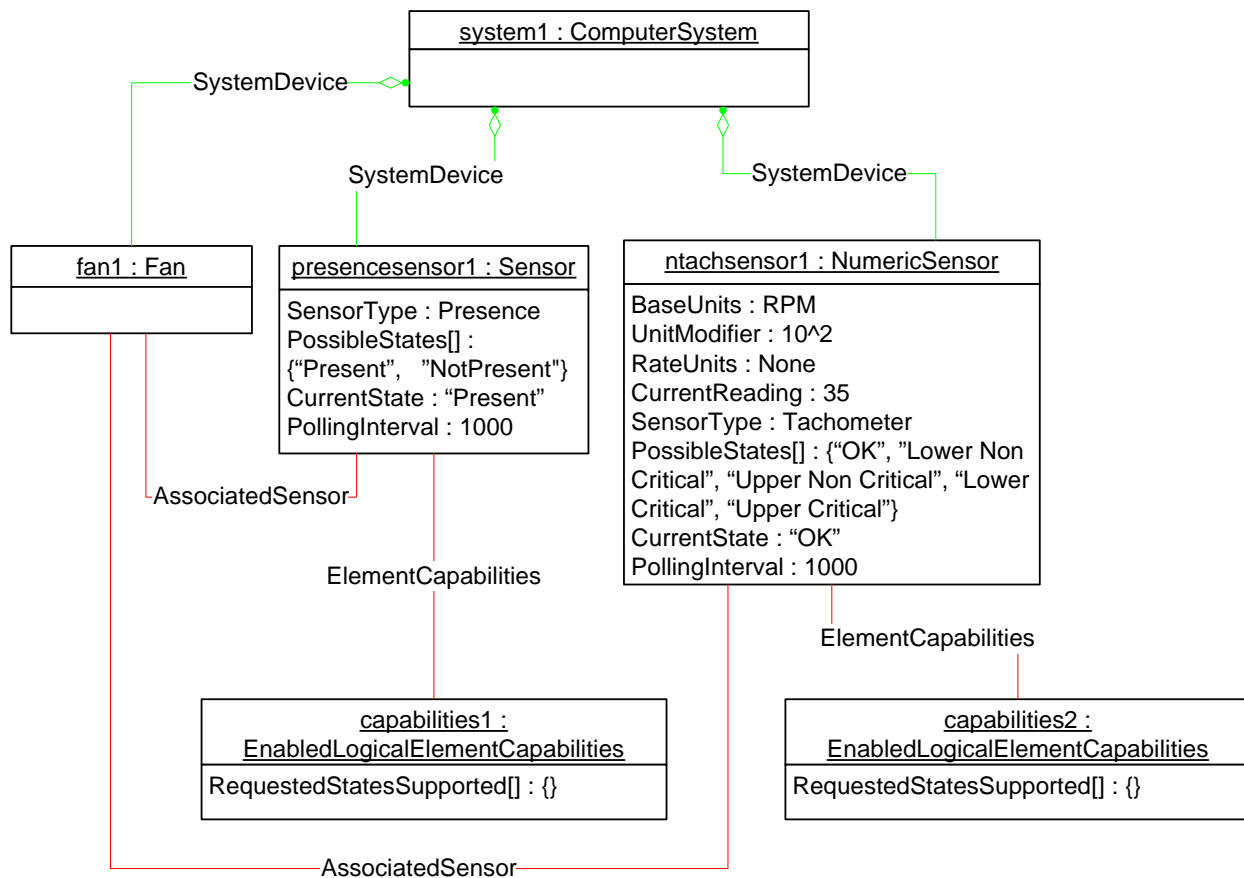
484 9 Use Cases

485 All use cases are based on the implementation conformance to the DMTF Sensors Profile.

486 9.1 Object Diagrams

487 Figure 2 represents a possible instantiation of the Sensors Profile classes. In the diagram, the instances
 488 of CIM_Sensor and CIM_NumericSensor are associated with an instance of CIM_Fan through instances
 489 of CIM_AssociatedSensor. In other cases, different instances of concrete classes derived from
 490 CIM_ManagedElement can be associated through CIM_AssociatedSensor with an instance of
 491 CIM_Sensor or CIM_NumericSensor.

492 Based on the SensorType property of the CIM_Sensor instance, presencesensor1 is a Presence sensor.
 493 presencesensor1 is a discrete sensor and provides the value "Present" or "Not Present" based on the
 494 PossibleStates property. Based on the SensorType property, ntachsensor1 is a Tachometer sensor,
 495 which is an analog sensor, and provides numeric reading of the fan1 speed. Based on the BaseUnits
 496 property, the reading is in RPM units, and the RateUnit property shows no additional units. The
 497 CurrentReading property in this object diagram has a value of 35, which is multiplied by the value of the
 498 UnitModifier property (in this case 10^2), and therefore has a value of 3500 RPM.



499

500

Figure 2 – Sensors Profile: Object Diagram

501 9.2 Show All Current States of the Monitored Devices in the Computer System

502 Starting from the CIM_ComputerSystem instance that represents the computer system, select all of the
 503 CIM_Sensor and CIM_NumericSensor instances that are associated through instances of
 504 CIM_SystemDevice, which represent the sensors of the computer system. Iterate through the instances
 505 and get the CIM_Sensor.CurrentState and CIM_NumericSensor.CurrentState property value, which will
 506 represent the states of the monitored devices.

507 9.3 Find Sensors Associated with a Specific Component

508 Select all of the CIM_Sensor and CIM_NumericSensor instances that are associated with the instance of
 509 a subclass of CIM_ManagedElement through an instance of CIM_AssociatedSensor.

510 9.4 Change Upper Non-Critical Threshold of Numeric Sensor

511 Select the instance of CIM_NumericSensor. Determine whether the SettableThresholds property contains
 512 a value of 1 (UpperThresholdNonCritical). If so, set the value of the UpperThresholdNonCritical property;
 513 otherwise, return an appropriate error.

514 9.5 Reset Sensor to Threshold Defaults

515 Select the instance of CIM_NumericSensor. Execute the method RestoreDefaultThresholds().

516 9.6 Determining if ElementName can be Modified

517 For a given instance of CIM_Sensor or CIM_NumericSensor, a client can determine whether it can modify
 518 the ElementName as follows:

- 519 1) Find the CIM_EnabledLogicalElementCapabilities instance that is associated with the target
 520 instance.
- 521 2) Query the value of the ElementNameEditSupported property of the
 522 CIM_EnabledLogicalElementCapabilities instance. If the value is TRUE, the client can modify
 523 the ElementName property of the target instance.

524 9.7 Determining if State Management is Supported

- 525 1) For a given instance of CIM_Sensor or CIM_NumericSensor, a client can determine whether
 526 state management is supported as follows:
- 527 2) Find the CIM_EnabledLogicalElementCapabilities instance that is associated with the instance.
- 528 3) Query the value of the RequestedStatesSupported property. If at least one value is specified,
 529 state management is supported.

530

531 10 CIM Elements

532 Table 13 shows the list of CIM Elements for this profile and details their requirements. The
 533 implementation requirements for the classes and properties described in this section are defined in
 534 section 7 ("Implementation Requirements").

535 **Table 13 – CIM Elements: Sensors Profile**

Element Name	Requirement	Description
Classes		
CIM_Sensor	Conditional	See sections 7.1 and 10.1.

Element Name	Requirement	Description
CIM_NumericSensor	Conditional	See sections 7.1 and 10.2.
CIM_EnabledLogicalElementCapabilities	Optional	See sections 7.13 and 10.3.
CIM_ElementCapabilities	Conditional	See section 10.4.
CIM_SystemDevice	Mandatory	See sections 7.18 and 10.5.
CIM_AssociatedSensor	Conditional	See sections 7.18 and 10.6.
CIM_RegisteredProfile	Mandatory	See section 10.7.
Indications		
None defined in this profile		

536 **10.1 CIM_Sensor**

537 CIM_Sensor is used to represent a discrete sensor. The CIM_Sensor class is mandatory if the
538 CIM_NumericSensor class is not implemented. Table 14 provides information about the properties of
539 CIM_Sensor.

540

Table 14 – Class: CIM_Sensor

Properties and Methods	Requirement	Notes
SystemCreationClassName	Mandatory	Key
SystemName	Mandatory	Key
CreationClassName	Mandatory	Key
DeviceID	Mandatory	Key
SensorType	Mandatory	None
PossibleStates	Mandatory	See section 7.2.
CurrentState	Mandatory	See section 7.4.
ElementName	Mandatory	See section Error! Reference source not found..
OtherSensorTypeDescription	Conditional	See section 7.17.
EnabledState	Mandatory	See section 7.16.
RequestedState	Mandatory	See section 7.14.
OperationalStatus	Mandatory	None
HealthState	Mandatory	None
RequestStateChange()	Conditional	See section 8.1.

541 **10.2 CIM_NumericSensor**

542 CIM_NumericSensor is used to represent an analog sensor. The CIM_NumericSensor class is mandatory
 543 when the CIM_Sensor class is not implemented. Table 15 provides information about the properties of
 544 CIM_NumericSensor.

545 **Table 15 – Class: CIM_NumericSensor**

Properties and Methods	Requirement	Notes
SystemCreationClassName	Mandatory	Key
SystemName	Mandatory	Key
CreationClassName	Mandatory	Key
DeviceID	Mandatory	Key
BaseUnits	Mandatory	None
UnitModifier	Mandatory	None
RateUnits	Mandatory	None
CurrentReading	Mandatory	None
LowerThresholdNonCritical	Conditional	See section 7.5.
UpperThresholdNonCritical	Conditional	See section 7.6.
LowerThresholdCritical	Conditional	See section 7.7.
UpperThresholdCritical	Conditional	See section 7.8.
LowerThresholdFatal	Conditional	See section 7.9.
UpperThresholdFatal	Conditional	See section 7.10.
SupportedThresholds	Mandatory	See section 7.11.
SettableThresholds	Mandatory	See section 7.12.
SensorType	Mandatory	None
PossibleStates	Mandatory	See section 7.3.
CurrentState	Mandatory	See section 7.4.
ElementName	Mandatory	See section Error! Reference source not found..
OtherSensorTypeDescription	Conditional	See section 7.17.
EnabledState	Mandatory	See section 7.16.
RequestedState	Mandatory	See section 7.14.
OperationalStatus	Mandatory	None
HealthState	Mandatory	None
RequestStateChange()	Conditional	See section 8.1.
RestoreDefaultThresholds()	Conditional	See section 8.2.

546 10.3 CIM_EnabledLogicalElementCapabilities

547 CIM_EnabledLogicalElementCapabilities is used to represent the capabilities of the sensor as it applies to
 548 the properties of CIM_Sensor or CIM_NumericSensor that are derived from CIM_EnabledLogicalElement,
 549 such as RequestedEnabledState. For implementation details, see section 7.13.

550 Table 16 provides information about the properties of CIM_EnabledLogicalElementCapabilities.

551 **Table 16 – Class: CIM_EnabledLogicalElementCapabilities**

Properties	Requirement	Notes
InstanceID	Mandatory	Key
RequestedStatesSupported	Mandatory	See section 7.13.1.
ElementNameEditSupported	Mandatory	See section 7.13.2.
MaxElementNameLen	Conditional	See section 7.13.3.

552 10.4 CIM_ElementCapabilities

553 CIM_ElementCapabilities is used to associate CIM_Sensor or CIM_NumericSensor with an instance of
 554 CIM_EnabledLogicalElementCapabilities that describes the capabilities of CIM_Sensor or
 555 CIM_NumericSensor. CIM_ElementCapabilities shall be mandatory when an instance of
 556 CIM_EnabledLogicalElementCapabilities is associated to the Central Instance..

557 Table 17 provides information about the properties of CIM_ElementCapabilities.

558 **Table 17 – Class: CIM_ElementCapabilities**

Properties	Requirement	Notes
ManagedElement	Mandatory	Key
Capabilities	Mandatory	Key. See section Error! Reference source not found..

559 10.5 CIM_SystemDevice

560 CIM_SystemDevice is used to associate the instance of CIM_Sensor or CIM_NumericSensor with the
 561 instance of CIM_ComputerSystem of which the CIM_Sensor instance is a member. Table 18 provides
 562 information about the properties of CIM_SystemDevice.

563 **Table 18 – Class: CIM_SystemDevice**

Properties	Requirement	Notes
GroupComponent	Mandatory	Key: shall be a reference to the CIM_ComputerSystem instance of which the current CIM_Sensor or CIM_NumericSensor instance is a member.
PartComponent	Mandatory	Key: shall be a reference to the current CIM_Sensor or CIM_NumericSensor instance.

564 **10.6 CIM_AssociatedSensor**

565 CIM_AssociatedSensor is used to associate the instance of CIM_Sensor or CIM_NumericSensor with the
 566 instance of a subclass of CIM_ManagedElement. Table 19 provides information about the properties of
 567 CIM_AssociatedSensor.

568 **Table 19 – Class: CIM_AssociatedSensor**

Properties	Requirement	Notes
Antecedent	Mandatory	shall be a reference to a specific instance of CIM_Sensor or CIM_NumericSensor.
Dependent	Mandatory	shall be a reference to the instance of a subclass of CIM_ManagedElement that the sensor is monitoring.

569 **10.7 CIM_RegisteredProfile**

570 CIM_RegisteredProfile is defined by the Profile Registration Profile. The requirements denoted in Table
 571 20 are in addition to those mandated by the Profile Registration Profile.

572 **Table 20 – Class: CIM_RegisteredProfile**

Properties	Requirement	Description
RegisteredName	Mandatory	This property shall have a value of "Sensors Profile".
RegisteredVersion	Mandatory	This property shall have a value of "1.0.0".
RegisteredOrganization	Mandatory	This property shall have a value of 2 (DMTF).

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ANNEX A
(informative)

Change Log

Version	Date	Description
1.0.0b	05/12/2006	Incorporated Company Review editorial changes from cPubs.

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ANNEX B (informative)

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