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5 # Power State Management Profile

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9

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99 # Foreword

100 The *Power State Management Profile* (DSP1027) was prepared by the Server Management Working
101 Group of the DMTF.

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

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123 # Introduction

124 The information in this specification should be sufficient for a provider or consumer of this data to identify
125 unambiguously the classes, properties, methods, and values that must be instantiated and manipulated to
126 describe and control the power state and hardware management for a computer system using the DMTF
127 Common Information Model (CIM) core and extended model definitions.

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

130 # Power State Management Profile

131 ## 1   Scope

132 The *Power State Management Profile* describes the classes, associations, properties, and methods used
133 to manage the power of a computer system.

134 ## 2   Normative references

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

139 DMTF DSP0004, *CIM Infrastructure Specification 2.3*
140 http://www.dmtf.org/sites/default/files/standards/documents/DSP0004V2.3_final.pdf

141 DMTF DSP0200*, CIM Operations over HTTP 1.2*
142 http://dmtf.org/sites/default/files/standards/documents/DSP200.html

143 DMTF DSP0215, *Server Management Managed Element Addressing Specification (SM ME Addressing)*
144 *1.0*
145 http://dmtf.org/sites/default/files/standards/documents/DSP0215_1.0.pdf

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

148 DMTF DSP1000, *Management Profile Specification Template*
149 http://www.dmtf.org/sites/default/files/standards/documents/DSP1000.pdf

150 DMTF DSP1001, *Management Profile Specification Usage Guide, 1.1*
151 http://dmtf.org/sites/default/files/standards/documents/DSP1001_1.1.pdf

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

154 *Advanced Configuration and Power Interface Specification, 3.0*, September 2, 2004
155 http://www.acpi.info/DOWNLOADS/ACPIspec30.pdf

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

158 OMG, Unified Modeling Language (UML) from the Open Management Group (OMG)

159 ## 3   Terms and definitions

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

162 The terms "shall" ("required"), "shall not", "should" ("recommended"), "should not" ("not recommended"),
163 "may," "need not" ("not required"), "can" and "cannot" in this document are to be interpreted as described
164 in ISO/IEC Directives, Part 2, Annex H. The terms in parenthesis are alternatives for the preceding term,

165 for use in exceptional cases when the preceding term cannot be used for linguistic reasons. Note that
166 ISO/IEC Directives, Part 2, Annex H specifies additional alternatives. Occurrences of such additional
167 alternatives shall be interpreted in their normal English meaning.

168 The terms "clause", "subclause", "paragraph", and "annex" in this document are to be interpreted as
169 described in ISO/IEC Directives, Part 2, Clause 5.

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

173 The terms defined in DSP0004, DSP0223, and DSP1001 apply to this document. The following additional
174 terms are used in this document.

175 **3.1**
176 **conditional**
177 indicates requirements to be followed strictly in order to conform to the document when the specified
178 conditions are met

179 **3.2**
180 **Immediate Power State Change**
181 indicates the power state transition that will be initiated immediately

182 **3.3**
183 **mandatory**
184 indicates requirements to be followed strictly in order to conform to the document and from which no
185 deviation is permitted

186 **3.4**
187 **optional**
188 indicates a course of action permissible within the limits of the document

189 **3.5**
190 **Pending Power State Change**
191 indicates the power state transition that will be initiated sometime in the future

192 **3.6**
193 **referencing profile**
194 indicates a profile that owns the definition of this class and can include a reference to this profile in its
195 "Referenced profiles" table

196 **3.7**
197 **unspecified**
198 indicates that this profile does not define any constraints for the referenced CIM element or operation

199 # 4   Symbols and abbreviated terms

200 The following abbreviations defined in DSP0004, DSP0223, and DSP1001 apply to this document. The
201 following additional abbreviations are used in this document.

202 **4.1**
203 **ACPI**
204 Advanced Configuration and Power Interface

205	**4.2**
206	**CIM**
207	Common Information Model

208   5   Synopsis

209   5.1   Profile attributes

210   **Profile name:** Power State Management

211   **Version:** 1.0.2

212   **Organization:** DMTF

213   **CIM Schema version:** 2.19.1

214   **Central class:** CIM_PowerManagementService

215   **Scoping class:** CIM_ComputerSystem

216   5.2   Summary

217   The *Power State Management Profile* extends the management capability of the referencing profiles by
218   adding the capability to describe and manage the power state of computer systems.

219   CIM_PowerManagementService shall be the central class of this profile. The instance of
220   CIM_PowerManagementService shall be the central instance of this profile. CIM_ComputerSystem shall
221   be the scoping class of this profile. The instance of CIM_ComputerSystem with which the central instance
222   is associated through an instance of CIM_HostedService shall be the scoping instance of this profile.

223   5.3   Related profiles

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

225   **Table 1 – Related profiles**

Profile Name	Organization	Version	Requirement	Description
Profile Registration	DMTF	1.0	Mandatory	

226   6   Description

227   The *Power State Management Profile* defines the behavior of the power management service and related
228   classes used to describe and control power state and hardware reset management for a computer
229   system. The profile describes the classes, property values, and methods that constitute a Pending Power
230   State Change and an Immediate Power State Change.

231   The CIM_ComputerSystem class is not part of this profile, but is shown for clarification in all the class and
232   instance diagrams.

233 Figure 1 represents the class schema of the *Power State Management Profile* and shows the elements of
234 the *Power State Management Profile*, as well as the dependent relationships between the elements of
235 *Power State Management Profile* and the referencing profiles. For simplicity, the prefix CIM_ has been
236 removed from the names of the classes.
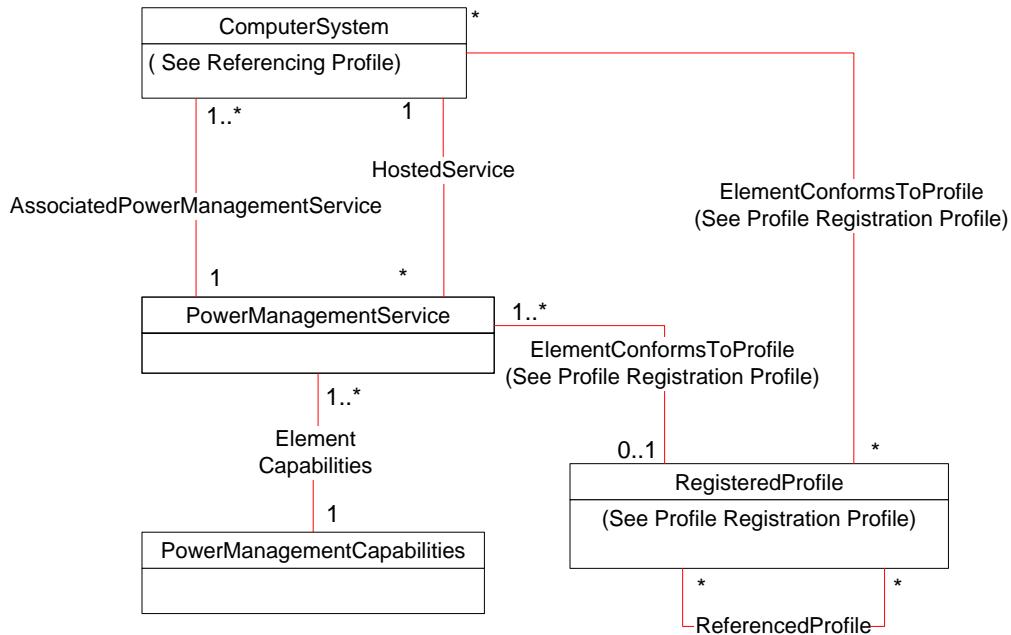
237

238 **Figure 1 – Power State Management Profile: Class diagram**

239 **7 Implementation**

240 This section details the requirements related to the arrangement of instances and their properties for
241 implementations of this profile. Methods are listed in clause 8 ("Methods"), and properties are listed in
242 clause 10 ("CIM Elements").

243 **7.1 CIM_PowerManagementService**

244 At least one instance of CIM_PowerManagementService shall be associated with one or more instances
245 of CIM_ComputerSystem through an instance of CIM_AssociatedPowerManagementService. The
246 managed system that is hosting the power management service, represented by an instance of
247 CIM_ComputerSystem, shall be associated with CIM_PowerManagementService through the
248 CIM_HostedService association.

249 **7.1.1 CIM_PowerManagementService.ElementName**

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

251 **7.2 CIM_PowerManagementCapabilities**

252 One CIM_PowerManagementCapabilities instance shall be associated with one or more instances of
253 CIM_PowerManagementService through the CIM_ElementCapabilities association.

254 **7.2.1   CIM_PowerManagementCapabilities.PowerChangeCapabilities**

255 The PowerChangeCapabilities property array is used to represent the power state related capabilities of
256 the instances of CIM_ComputerSystem associated with the CIM_PowerManagementService instances
257 with which the CIM_PowerManagementCapabilities instance is associated. This property is also used to
258 indicate support for client management of the power state through the
259 CIM_PowerManagementService.RequestPowerStateChange( ) method. When the
260 RequestPowerStateChange( ) method is supported, the PowerChangeCapabilities property array shall
261 contain the value 3 (Power State Settable).

262 When the PowerStatesSupported property contains the value in the "PowerStatesSupported Value"
263 column, the PowerChangeCapabilities property shall contain the value or values specified in the
264 "PowerChangeCapabilities Value" column.

265 Note that the PowerChangeCapabilities values in Table 2 cannot be used independently to determine the
266 behavior of the CIM_PowerManagementService.RequestPowerStateChange() method. For example, if
267 an implementation reports PowerChangeCapabilities values 4 (Power Cycling Supported) and 8 (Graceful
268 Shutdown Supported), the client cannot assume that the implementation supports the
269 PowerStatesSupported value 15 (Power Cycle Off Soft Graceful) unless the value 15 appears in the
270 PowerStatesSupported array property. Please see clause 8.1.3 for additional requirements for the
271 PowerStatesSupported array property.

272   **Table 2 – PowerStatesSupported and PowerChangeCapabilities values**

PowerStatesSupported Value	PowerChangeCapabilities Value
5 (Power Cycle (Off–Soft))	4 (Power Cycling Supported)
9 (Power Cycle (Off–Hard))	6 (Off Hard Power Cycling Supported)
10 (Master Bus Reset)	7 (HW Reset Supported)
11 (Diagnostic Interrupt (NMI))	7 (HW Reset Supported)
12 (Off-Soft Graceful)	8 (Graceful Shutdown Supported)
13 (Off-Hard Graceful)	8 (Graceful Shutdown Supported)
14 (Master Bus Reset Graceful)	7 (HW Reset Supported) and 8 (Graceful Shutdown Supported)
15 (Power Cycle Off-Soft Graceful)	4 (Power Cycling Supported) and 8 (Graceful Shutdown Supported)
16 (Power Cycle Off Hard Graceful)	6 (Off Hard Power Cycling Supported) and 8 (Graceful Shutdown Supported)

273 **7.2.2   CIM_PowerManagementCapabilities.ElementName**

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

275 **7.2.3   CIM_PowerManagementCapabilities.PowerStatesSupported**

276 The PowerStatesSupported property array is used to represent the power states that are supported by
277 the associated computer system as an observable power state (clause 7.3
278 CIM_AssociatedPowerManagementService.PowerState), as a power state transition (PowerState
279 parameter of the CIM_PowerManagementService.RequestPowerStateChange( ) method, clause 8.1), or
280 as both. Note that the computer system may not support use of all PowerStatesSupported values as the
281 PowerState parameter of the RequestPowerStateChange( ) method.

282 **7.3 CIM_AssociatedPowerManagementService.PowerState**

283 The PowerState property indicates the current power state of the associated computer system
284 represented by an instance of CIM_ComputerSystem. The PowerState property shall have one of the
285 values specified in the PowerStatesSupported property of the instance of
286 CIM_PowerManagementCapabilities that is associated with the instance of
287 CIM_PowerManagmentService that is referenced by the CIM_AssociatedPowerManagementService
288 association.

289 The RequestPowerStateChange( ) method of the CIM_PowerManagementService shall be used to
290 change the value of the PowerState property.

291 **7.3.1 Power states values**

292 The correspondence between the CIM_AssociatedPowerManagementService.PowerState property,
293 CIM_PowerManagementService.RequestPowerStateChange( ) method PowerState parameter values,
294 and standard ACPI power state descriptions are specified in Table 3. The value of the PowerState
295 property shall have the meaning specified in Table 3. Note that it is not necessary for the managed
296 system to actually support the ACPI specification.

297 **Table 3 – PowerState values and ACPI states**

PowerState Value	Corresponding ACPI State	Description (When PowerState value is used as a verb in the method RequestPowerStateChange( ))	Resulting ACPI State
2 (On)	G0 or S0 Working	Bring system to full on from any state (Sleep, Hibernate, Off)	G0 or S0 Working
3 (Sleep–Light)	S1 or S2	Standby	S1 or S2
4 (Sleep–Deep)	S3	Suspend	S3
5 (Power Cycle (Off–Soft))	N/A	Reset system without removing power	S0 with context fully lost: - Requires master bus reset of entire system - Requires full boot from POST and BIOS
6 (Off–Hard)	G3	Power off performed through mechanical means like unplugging power cable or UPS On	G3
7 (Hibernate (Off–Soft))	S4	System context and OS image written to non-volatile storage; system and devices powered off	S4
8 (Off–Soft)	G2 or S5	System power off but auxiliary or flea power may be available	G2 or S5
9 (Power Cycle (Off–Hard))	N/A	Equivalent to Off–Hard followed by On	G0 to G3, then return to S0
10 (Master Bus Reset)	N/A	Hardware reset	S5
11 (Diagnostic Interrupt (NMI))	N/A	Hardware reset	S5
12 (Off-Soft Graceful)	N/A	System power off but auxiliary or flea power may be available but preceded by a request to the managed element to perform an orderly shutdown	G2 or S5

PowerState Value	Corresponding ACPI State	Description (When PowerState value is used as a verb in the method RequestPowerStateChange( ))	Resulting ACPI State
13 (Off-Hard Graceful)	N/A	Power off performed through mechanical means like unplugging power cable or UPS On but preceded by a request to the managed element to perform an orderly shutdown	G3
14 (Master Bus Reset Graceful)	N/A	Hardware reset but preceded by a request to the managed element to perform an orderly shutdown	S5
15 (Power Cycle Off-Soft Graceful)	N/A	Reset system without removing power but preceded by a request to the managed element to perform an orderly shutdown	S0 with context fully lost: • Requires master bus reset of entire system • Requires full boot from POST and BIOS
16 (Power Cycle Off Hard Graceful	N/A	Equivalent to Off–Hard followed by On but preceded by a request to the managed element to perform an orderly shutdown	G3

298   7.4   Representing power state changes

299   The CIM_AssociatedPowerManagementService.RequestedPowerState property indicates the requested
300   power state of the associated computer system.

301   The CIM_AssociatedPowerManagementService.PowerOnTime property indicates the date-time that the
302   power state change that is indicated by the RequestedPowerState property was or will be initiated. When
303   the PowerOnTime property is non-Null, the value shall be a date-time and shall not specify a time interval.
304   A value of Null for the PowerOnTime property shall indicate that the last power state change was initiated
305   immediately or shall indicate that the last requested time to initiate the power state change is unknown.

306   When the Pending Power State Change exists for the instance of CIM_ComputerSystem that is
307   referenced by the CIM_AssociatedPowerManagementService association, the RequestedPowerState
308   property shall have the value of 2 (On), 5 (Power Cycle (Off–Soft)), 6 (Power Cycle (Off–Hard)), 15
309   (Power Cycle (Off-Soft Graceful)), or 16 (Power Cycle (Off-Hard Graceful)) and the value of the
310   PowerOnTime property shall identify a date-time in the future.

311   The RequestedPowerState and PowerOnTime properties are affected by the invocation of the
312   CIM_PowerManagementService.RequestPowerStateChange( ) method; see clause 8.1.

313   8   Methods

314   This clause details the requirements for supporting intrinsic operations and extrinsic methods for the CIM
315   Elements defined by this profile.

316   8.1   CIM_PowerManagementService.RequestPowerStateChange( )

317   The RequestPowerStateChange( ) method is used to set the power state that the user wants for the
318   target computer system and to set when that system should be put into the new state. The
319   PowerChangeCapabilities property array of the associated instance of

320 CIM_PowerManagementCapabilities is used to represent the capabilities of the
321 RequestPowerStateChange( ) method. When this method is supported, the PowerChangeCapabilities
322 property shall contain the value 3 (Power State Settable).

323 RequestPowerStateChange( ) method return code values shall be as specified in Table 4.
324 RequestPowerStateChange( ) method parameters are specified in Table 5.

325 Invoking the RequestPowerStateChange( ) method multiple times could result in earlier requests being
326 overwritten or lost.

327 No standard messages are defined for this method.

328 **Table 4 – CIM_PowerManagementService.RequestPowerStateChange( ) method: Return code**
329 **values**

Value	Description
0	The initiation of Pending/Immediate Power State Change was successful.
	Sample uses:
	• The system has immediately transitioned to the requested state.
	• The system transition to the requested state has started, but may not be immediate. Subsequent queries of CIM_PowerManagementService.PowerState may report the original state, an intermediate state, or the requested state.
	• The system transition has started, but may eventually fail due to external factors (power source, human intervention at the managed system, etc.).
1	Method is not supported in the implementation.
2	Error occurred.
	Sample uses:
	• A PowerState parameter value was used that is supported as a transition operation by the managed system, but the system cannot start the transition.
	• A PowerState parameter value was used that is not specified in PowerStatesSupported.
	• An observable system power state included in PowerStatesSupported was used as the value of the PowerState parameter, but is not supported as a transition operation by the managed system.
4096	Job started: REF returned to started CIM_ConcreteJob.

330 **Table 5 – CIM_PowerManagementService.RequestPowerStateChange( ) method: Parameters**

Qualifiers	Name	Type	Description/Values
IN	PowerState	uint16	See clause 8.1.3.
IN	ManagedElement	CIM_ComputerSystem REF	See clause 8.1.4.
IN	Time	Datetime	See clause 8.1.5.
OUT	Job	CIM_ConcreteJob REF	See clause 8.1.6.
IN	TimeoutPeriod	Datetime	See clause 8.1.7.

8.1.1   Establishing a Pending Power State Change

331

332   The RequestPowerStateChange( ) method can be invoked with the Time parameter specified, which will
333   result in establishing the Pending Power State Change. The Pending Power State Change will be
334   reflected in the PowerOnTime and RequestedPowerState properties of the instance of
335   CIM_AssociatedPowerManagementService that references the CIM_PowerManagementService and the
336   instance of CIM_ComputerSystem that is represented by the ManagedElement parameter.

337   The TimeoutPeriod and Time parameters shall not be supported for the same invocation of the
338   RequestPowerStateChange( ) method. When the TimeoutPeriod and Time parameters are specified for
339   the same method invocation, the method shall return a value of 2.

340   When the method invocation is to establish the Pending Power State Change, the method may return the
341   Job output parameter and return a value of 4096. When the method invocation returns the Job output
342   parameter, the status of the referenced CIM_Job instance shall reflect the status of the attempt to
343   establish the Pending Power State Change. When the method invocation does not return the Job output
344   parameter, the method completion shall be synchronous with the establishment of the Pending Power
345   State Change.

8.1.2   Initiating an Immediate Power State Change

346

347   The RequestPowerStateChange( ) method may be invoked without the Time parameter, which will result
348   in the immediate initiation of a power state change. This clause describes requirements for when the
349   Time parameter is not specified.

350   When the method invocation is to initiate the Immediate Power State Change, the method may return the
351   Job output parameter and a return code value of 4096. When the method invocation returns the Job
352   output parameter, the status of the referenced CIM_Job instance shall reflect the status of the initiated
353   power state change request. When the method invocation does not return the Job output parameter, the
354   method completion shall be synchronous with the initiation of the Immediate Power State Change.

8.1.3   PowerState

355

356   The PowerState parameter indicates the desired power state of the computer system.

357   When the value used for the PowerState parameter is not equal to one of the values in the
358   PowerStatesSupported property array of the associated instance of CIM_PowerManagementCapabilities,
359   the method shall return 2. Note that the implementation may return 2 for other conditions, as noted in
360   Table 4. For example, a PowerStatesSupported value may represent an observable power state of the
361   system, but not be supported as a power transition. When the PowerState parameter contains such a
362   value, the implementation may return 2.

363   When the value 5 (Power Cycle (Off–Soft)) or the value 15 (Power Cycle (Off-Soft Graceful)) is supported
364   for the PowerState parameter, the PowerChangeCapabilities property array of the associated instance of
365   CIM_PowerManagementCapabilities shall contain the value 4 (Power Cycling Supported).

366   When the value 6 (Power Cycle (Off–Hard)) or the value 16 (Power Cycle (Off-Hard Graceful)) is
367   supported for the PowerState parameter, the PowerChangeCapabilities property array of the associated
368   instance of CIM_PowerManagementCapabilities shall contain the value 6 (Off Hard Power Cycling
369   Supported).

370   When the values 10 (Master Bus Reset) and 11 (Diagnostic Interrupt) are supported for the PowerState
371   parameter, the PowerChangeCapabilities property array of the associated instance of
372   CIM_PowerManagementCapabilities shall contain the value 7 (HW Reset Supported).

373   When the value is 12 (Off-Soft Graceful), 13 (Off-Hard Graceful), 14 (Master Bus Reset Graceful), 15
374   (PowerCycle (Off-Soft Graceful), or 16 (Power Cycle (Off-Hard Graceful)), is supported for the

375 PowerState parameter, the PowerManagementCapabilities property array of the associated instance of
376 CIM_PowerManagementCapabilities shall contain value 8 (Graceful Shutdown supported).

377 When the CIM_PowerManagementService.RequestPowerStateChange( ) method returns a value of 0 or
378 4096, the RequestedPowerState property of the instance of CIM_AssociatedPowerManagementService
379 that references the CIM_PowerManagementService instance and the CIM_ComputerSystem instance
380 indicated by the ManagedElement parameter shall be set to the value of the PowerState parameter of the
381 method.

382 8.1.4 ManagedElement

383 The ManagedElement parameter indicates the reference to the instance of CIM_ComputerSystem that
384 represents the target computer system whose power state is to be set.

385 If the instance of CIM_ComputerSystem is not associated with the instance of
386 CIM_PowerManagementService through the CIM_AssociatedPowerManagementService association, the
387 RequestPowerStateChange( ) method shall return 2 (Error Occurred).

388 8.1.5 Time

389 The Time parameter is used to set the power state of the managed system at a certain time and can be
390 used only to set the power state to On or Power Cycle. The Time parameter shall be supported when the
391 PowerChangeCapabilities property array of the associated instance of
392 CIM_PowerManagementCapabilities contains the value 5 (Timed Power On Supported). The Time
393 parameter shall not be supported when the PowerState parameter has any value other than 2 (On), 5
394 (Power Cycle (Off–Soft)) 6 (Power Cycle (Off–Hard)), 15 (Power Cycle Off-Soft Graceful), or 16 (Power
395 Cycle Off-Hard Graceful). When the Time parameter is specified and is not supported, the method shall
396 return a value of 2.

397 When the Time parameter is specified and the method returns a value of 0, the PowerOnTime property of
398 the CIM_AssociatedPowerManagementService association that references the CIM_ComputerSystem
399 instance identified by the ManagedElement parameter and references the
400 CIM_PowerManagementService instance shall have the date-time value that indicates when the
401 computer system will undergo the power state change indicated by the PowerState parameter. When the
402 Time parameter complies with the interval format of the Datetime data type, the interval value indicated
403 by the Time parameter shall be interpreted relative to the current date-time and the calculated absolute
404 date-time shall be the value of the PowerOnTime property. When the Time parameter complies with the
405 timestamp format of the Datetime data type, the PowerOnTime property shall have the value of the Time
406 parameter.

407 When the Time parameter is either Null or 0, an immediate initiation of the power state change shall
408 occur.

409 8.1.6 Job

410 The Job is an OUT parameter. It is a reference to the instance of CIM_Job that represents the job or task
411 that may be started by the invocation of the RequestPowerStateChange( ) method.

412 The method may return the Job output parameter and a return code value of 4096 when the parameters
413 for the method have been validated, regardless of whether the method will create a Pending Power State
414 Change or an Immediate Power State Change.

415 8.1.7 TimeoutPeriod

416 The TimeoutPeriod parameter specifies the maximum amount of time that the client allows the
417 RequestPowerStateChange( ) method to complete execution.

418 If the TimeoutPeriod parameter is specified and the value is not in the interval format of the Datetime data
419 type, the method shall return a value of 2. If the TimeoutPeriod parameter is specified and the
420 implementation is able to determine if the power state change will take more time than the TimeoutPeriod
421 parameter, the method shall return a value of 2. A value of 0 or Null for the TimeoutPeriod shall indicate
422 that no timeout requirements exist.

8.2 Profile conventions for operations

424 Support for operations for each profile class (including associations) is specified in the following
425 subclauses. Each of these subclauses includes either the statement "All operations in the default list in
426 clause 8.2 are supported as described by DSP0200 or a table listing all the operations that are not
427 supported by this profile or where the profile requires behavior other than that described by DSP0200.

428 The default list of operations is as follows:

429 • GetInstance

430 • EnumerateInstances

431 • EnumerateInstanceNames

432 • Associators

433 • AssociatorNames

434 • References

435 • ReferenceNames

436 A compliant implementation shall support all the operations in the default list for each class, unless the
437 "Requirement" column states something other than *Mandatory*.

8.3 CIM_PowerManagementService

439 All operations in the default list in clause 8.2 are supported as described by DSP0200.

8.4 CIM_PowerManagementCapabilities

441 All operations in the default list in clause 8.2 are supported as described by DSP0200.

8.5 CIM_AssociatedPowerManagementService

443 Table 6 lists operations that either have special requirements beyond those from DSP0200 or shall not be
444 supported.

445 **Table 6 – Operations: CIM_AssociatedPowerManagementService**

Operation	Requirement	Messages
ModifyInstance	Optional See clause 8.5.1.	None
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

446 8.5.1 CIM_AssociatedPowerManagementService—ModifyInstance

447 When the ModifyInstance operation is supported for an instance of
448 CIM_AssociatedPowerManagementService, the ModifyInstance operation shall not modify the following
449 properties:

450 • PowerState

451 • OtherPowerState

452 • PowerOnTime

453 • RequestedPowerState

454 These properties can be affected by the invocation of the RequestPowerStateChange( ) method; see
455 clause 8.1.

456 8.6 CIM_ElementCapabilities

457 Table 7 lists operations that either have special requirements beyond those from DSP0200 or shall not be
458 supported.

459 **Table 7 – Operations: CIM_ElementCapabilities**

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

460 8.7 CIM_HostedService

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

463 **Table 8 – Operations: CIM_HostedService**

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

464 9 Use cases

465 This clause contains object diagrams and use cases for the *Power State Management Profile.*

466 9.1 Object diagrams

467 This section contains object diagrams for the *Power State Management Profile.* For simplicity, the prefix
468 CIM_ has been removed from the names of the classes in the diagrams.

469   **9.1.1   Advertising the profile conformance**

470   Figure 2 represents a possible instantiation of the *Power State Management Profile*. In this instantiation,
471   the managed system, system1, hosts a power management service, pwrmgtsvc1. system1 is also the
472   scoping instance for pwrmgtsvc1. Thus, following the CIM_ElementConformsToProfile association to
473   profile1 and then the referenced CIM_ReferencedProfile association to profile2, the client can retrieve
474   profile2. profile2 will show the version of the current *Power State Management Profile* implementation.
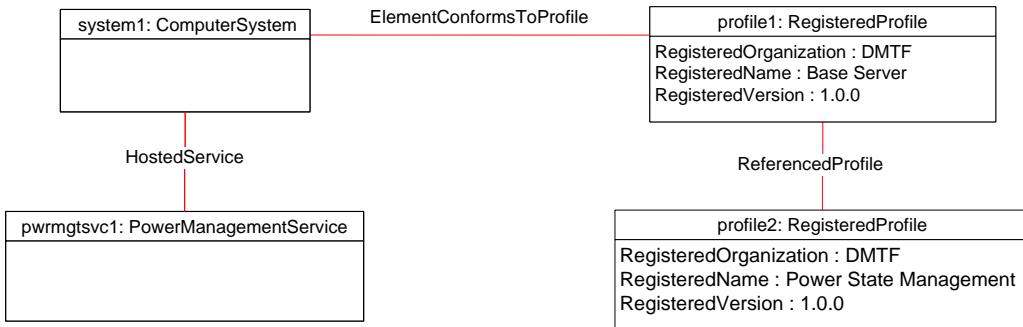
475

476   **Figure 2 – Registered profile**

477   **9.1.2   Monolithic system**

478   Figure 3 shows the CIM instances that are required to control power for a single, monolithic system:
479   system1. system1 hosts the power management service, pwrmgtsvc1, which manages the power for
480   system1.
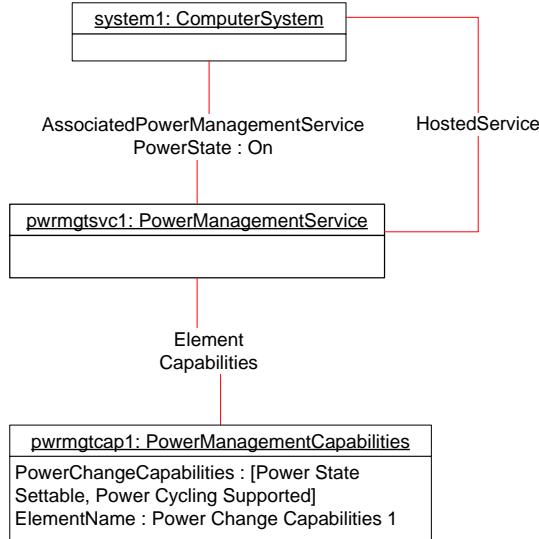
481

482   **Figure 3 – Power control instance diagram: Monolithic system**

483 **9.1.3 Monolithic system with service processor**

484 Figure 4 shows the CIM instances required to control power for a monolithic system with an attached
485 service processor. The power management service, pwrmgtsvc1, hosted by the service processor, sp1, is
486 responsible for managing the power of the system, system1. Optionally, the service processor may host
487 another power management service, pwrmgtsvc2, to control its own power.

488 A service processor in this sense may be an add-in remote management component or an integrated
489 baseboard management controller.
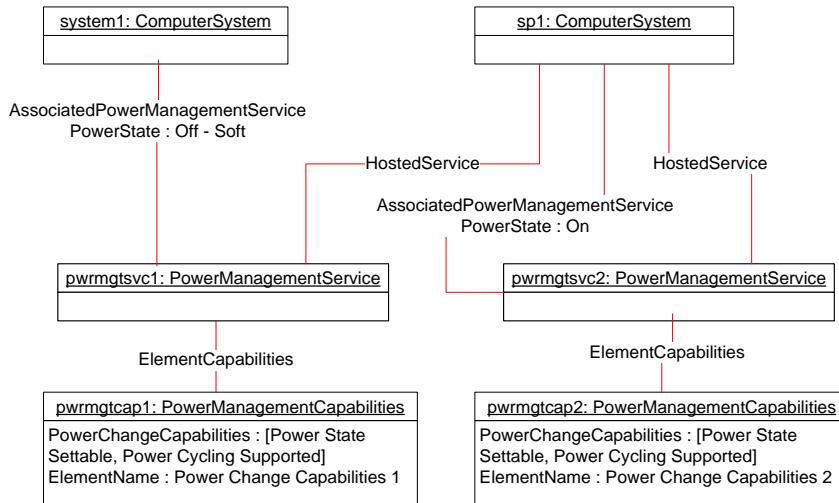
490

491 **Figure 4 – Power control instance diagram: Monolithic system with service processor**

492 **9.1.4 Modular system with chassis service processor**

493 Figure 5 shows the CIM instances required to represent a modular computer system. The chassis
494 manager, chassismgr1, hosts one or more power management services (pwrmgtsvc2) to control the
495 power of all the blade systems. Optionally, the chassis manager may host another power management
496 service (pwrmgtsvc1) to control its own power.
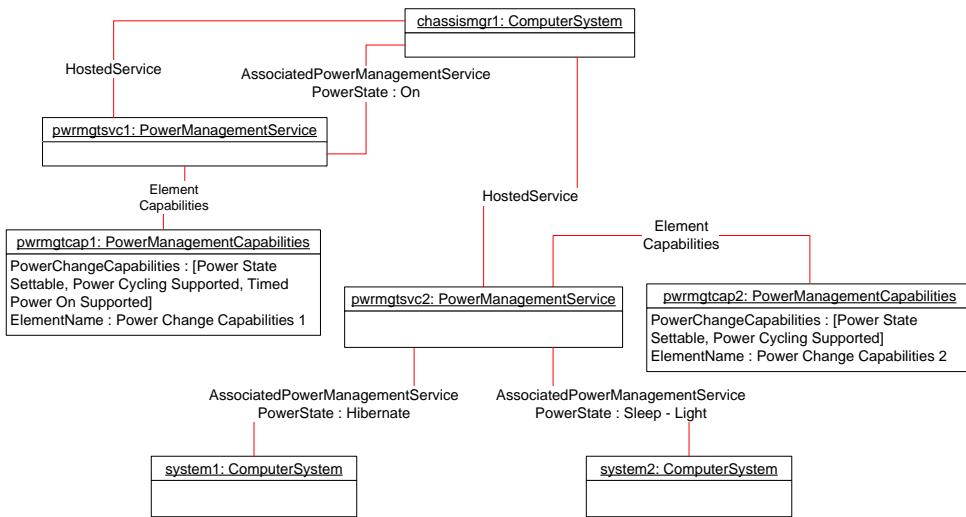
497

498 **Figure 5 – Power control instance diagram: Modular system with chassis service processor**

499 **9.2   Determine the power state of the computer system**

500 A client can determine the power state of the computer system as follows:

501 For the instance of CIM_ComputerSystem that represents the given computer system, select the
502 referencing instance of CIM_AssociatedPowerManagementService.

503 The PowerState property of the referencing instance of CIM_AssociatedPowerManagementService
504 represents the power state of the computer system.

505 **9.3   Find the power management service for a computer system**

506 A client can find the power management service for a computer system as follows:

507 For the instance of CIM_ComputerSystem that represents the given computer system, select the instance
508 of CIM_PowerManagementService that represents the power management service for the computer
509 system through the CIM_AssociatedPowerManagementService association.

510 **9.4   Find all the computer systems for a power management service**

511 A client can find all the computer systems for a power management service as follows:

512 For the instance of CIM_PowerManagementService that represents the given power management
513 service, select all of the instances of CIM_ComputerSystem that are associated with it through the
514 CIM_AssociatedPowerManagementService association.

515 **9.5   Change the power state of the computer system**

516 A client can change the power state of the computer system as follows:

517   1)   Navigate from the target instance of CIM_ComputerSystem to the instance of
518   CIM_PowerManagementService that represents the service that manages that system by using
519   the CIM_AssociatedPowerManagementService association.

520   2)   Invoke the RequestPowerStateChange( ) method of the instance of
521   CIM_PowerManagementService with an argument that contains the PowerState action
522   appropriate to the operation.

523 **9.6   Determine whether the power state transition is supported for a computer**
524 **   system**

525 A client can determine whether a type of Power State Transition is supported for a computer system as
526 follows:

527   1)   Navigate from the target instance of CIM_ComputerSystem to the instance of
528   CIM_PowerManagementService by using the CIM_AssociatedPowerManagementService
529   association.

530   2)   Using the instance of CIM_PowerManagementService, navigate to the instance of
531   CIM_PowerManagementCapabilities through the CIM_ElementCapabilities association.

532   If the PowerChangeCapabilities property array contains the value 4 (Power Cycling Supported),
533   the computer system supports one or more of the following power cycles: 5 (Power Cycle (Off–
534   Soft)), 15 (Power Cycle Off-Soft Graceful).

535   If the PowerChangeCapabilities property array contains the value 6 (Off Hard Power Cycling
536   Supported), the computer system supports one or more of the following power cycles: 9 (Power
537   Cycle (Off–Hard)), 16 (Power Cycle Off Hard Graceful).

538   If the PowerChangeCapabilities property array contains the value 7 (HW Reset Supported), the
539   computer system supports one or more of the following power state transitions: 10 (Master Bus
540   Reset), 11 (Diagnostic Interrupt (NMI)), 14 (Master Bus Reset Graceful).

541   If the PowerChangeCapabilities property array contains the value 8 (Graceful Shutdown
542   Supported), the computer system supports one or more of the following power state transitions:
543   12 (Off-Soft Graceful), 13 (Off-Hard Graceful), 14 (Master Bus Reset Graceful), 15 (Power
544   Cycle Off-Soft Graceful), 16 (Power Cycle Off Hard Graceful).

545   Note that the values or combination of values of the PowerChangeCapabilities array property cannot be
546   used independently to determine the values of the PowerStatesSupported array property. For example,
547   the PowerChangeCapabilities property array may contain the values 4 and 8; however, the computer
548   system may only support PowerStateSupported values 5 (Power Cycle (Off-Soft)) and 12 (Off-Soft
549   Graceful) and not support 15 (Power Cycle Off-Soft Graceful). For the PowerState parameter of the
550   RequestPowerStateChange( ) method, a client should use only those values provided in the
551   PowerStatesSupported array property and check the method return code to ensure that the transition was
552   started successfully.

553   9.7   Execute Power Cycle (Off–Soft) within a given time

554   A client can execute Power Cycle (Off–Soft) within a given time as follows:

555   1)   Navigate from the target instance of CIM_ComputerSystem to the instance of
556   CIM_PowerManagementService by using the CIM_AssociatedPowerManagementService
557   association.

558   2)   Invoke the RequestPowerStateChange( ) method of the instance of
559   CIM_PowerManagementService with the Power State argument set to 5 (Power Cycle (Off–
560   Soft)) and the TimeoutPeriod argument set to "t".

561   9.8   Execute Power Cycle (Off–Soft Graceful)

562   1)   Navigate from the target instance of CIM_ComputerSystem to the instance of
563   CIM_PowerManagementService by using the CIM_AssociatedPowerManagementService
564   association.

565   2)   Invoke the RequestPowerStateChange( ) method of the instance of
566   CIM_PowerManagementService with the Power State argument set to 15 (Power Cycle (Off–
567   Soft Graceful)).

568   If the return code of the method is the value 0, the computer system has successfully started
569   the power cycle.

570   If the return code of the method is the value 2, the computer system cannot execute the Power
571   Cycle (Off-Soft Graceful) transition.

572   10   CIM Elements

573   Table 9 shows the instances of CIM Elements for this profile. Instances of the CIM Elements shall be
574   implemented as described in Table 9. Clauses 7 ("Implementation") and 8 ("Methods") may impose
575   additional requirements on these elements.

576   **Table 9 – CIM Elements: Power State Management Profile**

Element Name	Requirement	Description
Classes		
PowerManagementCapabilities	Mandatory	See clauses 7.2 and 10.1.
PowerManagementService	Mandatory	See clauses 7.1 and 10.2.
AssociatedPowerManagementService	Mandatory	See clause 10.3.
ElementCapabilities	Mandatory	See clause 10.4.
HostedService	Mandatory	See clause 10.5.
RegisteredProfile	Mandatory	See clause 10.6.
Indications		
None defined in this profile		

577   10.1   CIM_PowerManagementCapabilities

578   CIM_PowerManagementCapabilities represents the power management capabilities of a computer
579   system. Table 10 contains the requirements for elements of this class.

580   **Table 10 – Class: CIM_PowerManagementCapabilities**

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
PowerChangeCapabilities	Mandatory	See clause 7.2.1.
ElementName	Mandatory	See clause 7.2.2.
PowerStatesSupported	Mandatory	See clause 7.2.3.

581   10.2   CIM_PowerManagementService

582   CIM_PowerManagementService represents the power management service responsible for controlling
583   the power of a computer system. Table 11 contains the requirements for elements of this class.

584   **Table 11 – Class: CIM_PowerManagementService**

Elements	Requirement	Notes
CreationClassName	Mandatory	**Key**
Name	Mandatory	**Key**
ElementName	Mandatory	See clause 7.1.1.
RequestPowerStateChange( )	Conditional	See clause 8.1.

585 **10.3 CIM_AssociatedPowerManagementService**

586 CIM_AssociatedPowerManagementService associates the CIM_ComputerSystem instance that
587 represents the target computer system with the CIM_PowerManagementService instance that represents
588 the service responsible for controlling the power of a computer system. Table 12 contains the
589 requirements for elements of this class.

590 **Table 12 – Class: CIM_AssociatedPowerManagementService**

Elements	Requirement	Notes
ServiceProvided	Mandatory	**Key** Cardinality 1
UserOfService	Mandatory	**Key** Cardinality *
PowerState	Mandatory	See clause 7.3.
RequestedPowerState	Conditional	See clause 7.4.
PowerOnTime	Conditional	See clause 7.4.

591 **10.4 CIM_ElementCapabilities**

592 CIM_ElementCapabilities associates the CIM_PowerManagementService instance that represents the
593 service responsible for controlling the power of a computer system with the
594 CIM_PowerManagementCapabilities instance that represents the power management capabilities of a
595 computer system. Table 13 contains the requirements for elements of this class.

596 **Table 13 – Class: CIM_ElementCapabilities**

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

597 **10.5 CIM_HostedService**

598 CIM_HostedService associates the CIM_ComputerSystem instance with the
599 CIM_PowerManagementService instance that it hosts. Table 14 contains the requirements for elements
600 of this class.

601 **Table 14 – Class: CIM_HostedService**

Elements	Requirement	Notes
Antecedent	Mandatory	This property shall be a reference to the instance of CIM_ComputerSystem. Cardinality 1..*
Dependent	Mandatory	This property shall be a reference to the instance of CIM_PowerManagementService. Cardinality *

10.6 CIM_RegisteredProfile

CIM_RegisteredProfile is defined by the *Profile Registration Profile (DSP1033)*. The requirements
denoted in Table 15 are in addition to those mandated by the DSP1033.

Table 15 – Class: CIM_RegisteredProfile

Elements	Requirement	Notes
RegisteredName	Mandatory	This property shall have a value of "Power State Management".
RegisteredVersion	Mandatory	This property shall have a value of "1.0.1".
RegisteredOrganization	Mandatory	This property shall have a value of 2 (DMTF).

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

609 **ANNEX A**
610 **(informative)**
611
612 **Change log**

Version	Date	Description
1.0.0b	2006/07/11	Preliminary Standard version.
1.0.0c	2007/01/30	Preliminary Standard refresh. Updated CIM schema version from 2.11 to 2.15 to reflect the correct schema that contains all the properties that the profile references.
1.0.0	2008/04/11	Final Standard version.
1.0.1	2008/09/25	Errata 1.0.1 version
1.0.2	2012/08/03	Errata 1.0.2 version - Clarified use of PowerStatesSupported and PowerChangeCapabilities. - Clarified return code usages for RequestPowerStateChange. - Removed normative language from Clause 9 (Use Cases) and clarified use of PowerChangeCapabilities.

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