



1
2
3
4

Document Number: DSP1027

Date: 2008-05-23

Version: 1.0.0

5 **Power State Management Profile**

6 **Document Type: Specification**
7 **Document Status: Final Standard**
8 **Document Language: E**
9

10 Copyright notice

11 Copyright © 2008 Distributed Management Task Force, Inc. (DMTF). All rights reserved.

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

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27 withdrawn or modified after publication, and shall be indemnified and held harmless by any party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

CONTENTS

31	Foreword	5
32	Introduction	6
33	1 Scope	7
34	2 Normative References.....	7
35	2.1 Approved References	7
36	2.2 Other References.....	7
37	3 Terms and Definitions	7
38	4 Symbols and Abbreviated Terms.....	9
39	5 Synopsis.....	9
40	6 Description	9
41	7 Implementation.....	10
42	7.1 CIM_PowerManagementService	10
43	7.2 CIM_PowerManagementCapabilities	10
44	7.3 CIM_AssociatedPowerManagementService.....	11
45	7.4 Representing Power State Changes	13
46	8 Methods.....	13
47	8.1 CIM_PowerManagementService.RequestPowerStateChange().....	13
48	8.2 Profile Conventions for Operations.....	16
49	8.3 CIM_PowerManagementService	16
50	8.4 CIM_PowerManagementCapabilities	16
51	8.5 CIM_AssociatedPowerManagementService	16
52	8.6 CIM_ElementCapabilities	17
53	8.7 CIM_HostedService	17
54	9 Use Cases.....	18
55	9.1 Object Diagrams	18
56	9.2 Determine the Power State of the Computer System.....	20
57	9.3 Find the Power Management Service for a Computer System	20
58	9.4 Find All the Computer Systems for a Power Management Service	20
59	9.5 Change the Power State of the Computer System.....	20
60	9.6 Determine Whether the Power Cycle Is Supported for a Computer System.....	20
61	9.7 Execute Power Cycle (Off–Soft) within a Given Time	20
62	9.8 Execute Power Cycle (Off–Soft Graceful)	21
63	10 CIM Elements.....	21
64	10.1 CIM_PowerManagementCapabilities	22
65	10.2 CIM_PowerManagementService	22
66	10.3 CIM_AssociatedPowerManagementService	22
67	10.4 CIM_ElementCapabilities	22
68	10.5 CIM_HostedService.....	23
69	10.6 CIM_RegisteredProfile.....	23
70	ANNEX A (informative) Change Log.....	24
71	ANNEX B (informative) Acknowledgments.....	25
72		

73 **Tables**

74	Table 1 – Referenced Profiles	9
75	Table 2 – PowerStatesSupported and PowerChangeCapabilities Values	11
76	Table 3 – PowerState Values and ACPI States.....	12
77	Table 4 – CIM_PowerManagementService.RequestPowerStateChange() Method: Return Code	
78	Values	13
79	Table 5 – CIM_PowerManagementService.RequestPowerStateChange() Method: Parameters	14
80	Table 6 – Operations: CIM_AssociatedPowerManagementService.....	17
81	Table 7 – Operations: CIM_ElementCapabilities	17
82	Table 8 – Operations: CIM_HostedService	17
83	Table 9 – CIM Elements: Power State Management Profile	21
84	Table 10 – Class: CIM_PowerManagementCapabilities	22
85	Table 11 – Class: CIM_PowerManagementService	22
86	Table 12 – Class: CIM_AssociatedPowerManagementService	22
87	Table 13 – Class: CIM_ElementCapabilities.....	23
88	Table 14 – Class: CIM_HostedService	23
89	Table 15 – Class: CIM_RegisteredProfile.....	23
90		

91

Foreword

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

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

96

97

Introduction

98 The information in this specification should be sufficient for a provider or consumer of this data to identify
99 unambiguously the classes, properties, methods, and values that must be instantiated and manipulated to
100 describe and control the power state and hardware management for a computer system using the DMTF
101 Common Information Model (CIM) core and extended model definitions. The target audience for this
102 specification is implementers who are writing CIM-based providers or consumers of management
103 interfaces that represent the component described in this document.

104

Power State Management Profile

105 1 Scope

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

108 2 Normative References

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

112 2.1 Approved References

113 [Advanced Configuration and Power Interface Specification](#), 3.0, September 2, 2004

114 DMTF [DSP0200](#), *CIM Operations over HTTP 1.2.0*

115 DMTF [DSP0004](#), *CIM Infrastructure Specification 2.3.0*

116 DMTF [DSP1000](#), *Management Profile Specification Template*

117 DMTF [DSP1001](#), *Management Profile Specification Usage Guide*

118 DMTF [DSP1033](#), *Profile Registration Profile*

119 2.2 Other References

120 [ISO/IEC Directives, Part 2](#), *Rules for the structure and drafting of International Standard*

121 OMG, [Unified Modeling Language \(UML\) from the Open Management Group \(OMG\)](#)

122 DMTF [DSP0215](#), *Server Management Managed Element Addressing Specification (SM ME Addressing)*

123 3 Terms and Definitions

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

126 3.1

127 can

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

129 3.2

130 cannot

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

- 132 **3.3**
133 **conditional**
134 indicates requirements to be followed strictly in order to conform to the document when the specified
135 conditions are met
- 136 **3.4**
137 **mandatory**
138 indicates requirements to be followed strictly in order to conform to the document and from which no
139 deviation is permitted
- 140 **3.5**
141 **may**
142 indicates a course of action permissible within the limits of the document
- 143 **3.6**
144 **need not**
145 indicates a course of action permissible within the limits of the document
- 146 **3.7**
147 **optional**
148 indicates a course of action permissible within the limits of the document
- 149 **3.8**
150 **referencing profile**
151 indicates a profile that owns the definition of this class and can include a reference to this profile in its
152 "Referenced Profiles" table
- 153 **3.9**
154 **shall**
155 indicates requirements to be followed strictly in order to conform to the document and from which no
156 deviation is permitted
- 157 **3.10**
158 **shall not**
159 indicates requirements to be followed strictly in order to conform to the document and from which no
160 deviation is permitted
- 161 **3.11**
162 **should**
163 indicates that among several possibilities, one is recommended as particularly suitable, without
164 mentioning or excluding others, or that a certain course of action is preferred but not necessarily required
- 165 **3.12**
166 **should not**
167 indicates that a certain possibility or course of action is deprecated but not prohibited
- 168 **3.13**
169 **unspecified**
170 indicates that this profile does not define any constraints for the referenced CIM element or operation
- 171 **3.14**
172 **Immediate Power State Change**
173 indicates the power state transition that will be initiated immediately

174 **3.15**
 175 **Pending Power State Change**
 176 indicates the power state transition that will be initiated sometime in the future

177 **4 Symbols and Abbreviated Terms**

178 The following abbreviations are used in this document.

179 **4.1**
 180 **ACPI**
 181 Advanced Configuration and Power Interface

182 **4.2**
 183 **CIM**
 184 Common Information Model

185 **5 Synopsis**

186 **Profile Name:** Power State Management
 187 **Version:** 1.0.0
 188 **Organization:** DMTF
 189 **CIM Schema Version:** 2.18
 190 **Central Class:** CIM_PowerManagementService
 191 **Scoping Class:** CIM_ComputerSystem

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

195 CIM_PowerManagementService shall be the Central Class of this profile. The instance of
 196 CIM_PowerManagementService shall be the Central Instance of this profile. CIM_ComputerSystem shall
 197 be the Scoping Class of this profile. The instance of CIM_ComputerSystem with which the Central
 198 Instance is associated through an instance of CIM_HostedService shall be the Scoping Instance of this
 199 profile.

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

201 **Table 1 – Referenced Profiles**

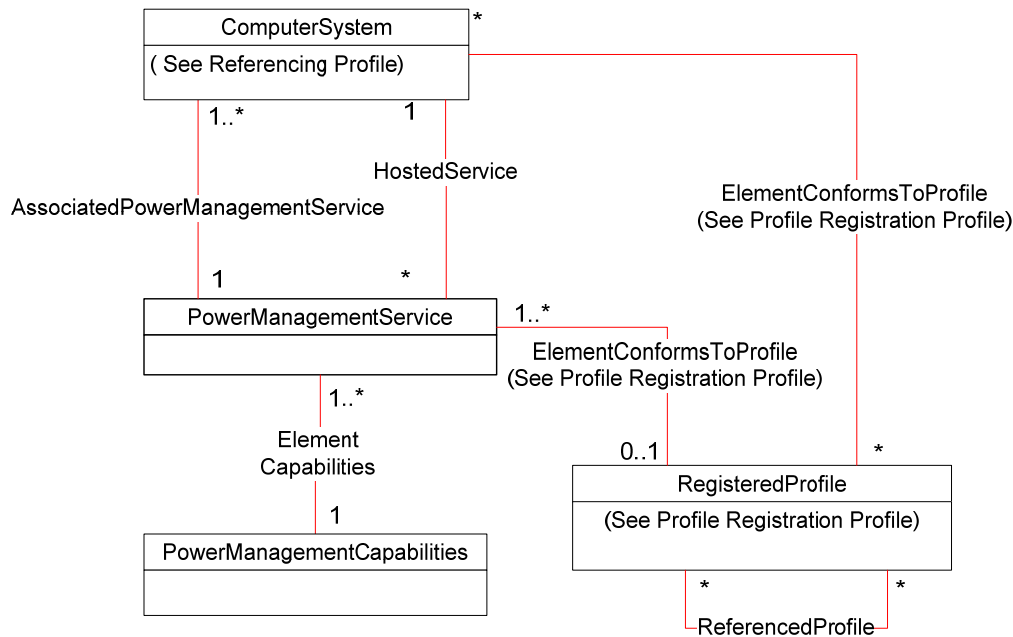
Profile Name	Organization	Version	Description
<i>Profile Registration</i>	DMTF	1.0.0	Mandatory

202 **6 Description**

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

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

209 Figure 1 represents the class schema of the *Power State Management Profile* and shows the elements of
 210 the *Power State Management Profile*, as well as the dependent relationships between the elements of
 211 *Power State Management Profile* and the referencing profiles. For simplicity, the prefix CIM_ has been
 212 removed from the names of the classes.



213

214 **Figure 1 – Power State Management Profile: Class Diagram**

215 7 Implementation

216 This section details the requirements related to the arrangement of instances and their properties for
 217 implementations of this profile. Methods are listed in section 8 (“Methods”), and properties are listed in
 218 section 10 (“CIM Elements”).

219 7.1 CIM_PowerManagementService

220 At least one instance of CIM_PowerManagementService shall be associated with one or more instances
 221 of CIM_ComputerSystem through an instance of CIM_AssociatedPowerManagementService. The
 222 managed system that is hosting the power management service, represented by an instance of
 223 CIM_ComputerSystem, shall be associated with CIM_PowerManagementService through the
 224 CIM_HostedService association.

225 7.1.1 CIM_PowerManagementService.ElementName

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

227 7.2 CIM_PowerManagementCapabilities

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

230 **7.2.1 CIM_PowerManagementCapabilities.PowerChangeCapabilities**

231 The PowerChangeCapabilities property array is used to represent the power state related capabilities of
 232 the instances of CIM_ComputerSystem associated with the CIM_PowerManagementService instances
 233 with which the CIM_PowerManagementCapabilities instance is associated. This property is also used to
 234 indicate support for client management of the power state through the
 235 CIM_PowerManagementService.RequestPowerStateChange() method. When the
 236 RequestPowerStateChange() method is supported, the PowerChangeCapabilities property array shall
 237 contain the value 3 (Power State Settable).

238 When the PowerStatesSupported property contains the value in the "PowerStatesSupported Value"
 239 column, the PowerChangeCapabilities property shall contain the value specified in the
 240 "PowerChangeCapabilities Value" column.

241 **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)

242 **7.2.2 CIM_PowerManagementCapabilities.ElementName**

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

244 **7.2.3 CIM_PowerManagementCapabilities.PowerStatesSupported**

245 The PowerStatesSupported property array is used to represent the power states that are supported by
 246 the associated computer system.

247 **7.3 CIM_AssociatedPowerManagementService.PowerState**

248 The PowerState property indicates the current power state of the associated computer system
 249 represented by an instance of CIM_ComputerSystem. The PowerState property shall have one of the
 250 values specified in the PowerStatesSupported property of the instance of
 251 CIM_PowerManagementCapabilities that is associated with the instance of
 252 CIM_PowerManagementService that is referenced by the CIM_AssociatedPowerManagementService
 253 association.

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

256 **7.3.1 Power States Values**

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

262 **Table 3 – PowerState Values and ACPI States**

PowerState enum Value (interpreted as a verb in the RequestPowerStateChange() method)	Description	Corresponding ACPI State
2 (On)	Bring system to full On from any state (Sleep, Hibernate, Off)	G0 or S0 Working
3 (Sleep–Light)	Standby	S1 or S2
4 (Sleep–Deep)	Suspend	S3
5 (Power Cycle (Off–Soft))	Reset system without removing power	S0 with context fully lost: <ul style="list-style-type: none"> • Requires master bus reset of entire system • Requires full boot from POST and BIOS
6 (Off–Hard)	Power Off performed through mechanical means like unplugging power cable or UPS On	G3
7 (Hibernate (Off–Soft))	System context and OS image written to non-volatile storage; system and devices powered off	S4
8 (Off–Soft)	System power off but auxiliary or flea power may be available	G2 or S5
9 (Power Cycle (Off–Hard))	Equivalent to Off–Hard followed by On	G0 to G3, then return to S0
10 (Master Bus Reset)	Hardware reset	S5
11 (Diagnostic Interrupt (NMI))	Hardware reset	S5
12 (Off–Soft Graceful)	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
13 (Off–Hard Graceful)	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)	Hardware reset but preceded by a request to the managed element to perform an orderly shutdown.	S5
15 (Power Cycle Off-Soft Graceful)	Reset system without removing power but preceded by a request to the managed element to perform an orderly shutdown.	S0 with context fully lost: <ul style="list-style-type: none"> • Requires master bus reset of entire system • Requires full boot from POST and BIOS
16 (Power Cycle Off Hard Graceful)	Equivalent to Off–Hard followed by On but preceded by a request to the managed element to perform an orderly shutdown.	G3

263 **7.4 Representing Power State Changes**

264 The CIM_AssociatedPowerManagementService.RequestedPowerState property indicates the requested
265 power state of the associated computer system.

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

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

276 The RequestedPowerState and PowerOnTime properties are affected by the invocation of the
277 CIM_PowerManagementService.RequestPowerStateChange() method; see section 8.1.

278 **8 Methods**

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

281 **8.1 CIM_PowerManagementService.RequestPowerStateChange()**

282 The RequestPowerStateChange() method is used to set the power state that the user wants for the
283 target computer system and when that system should be put into the new state. The
284 PowerChangeCapabilities property array of the associated instance of
285 CIM_PowerManagementCapabilities is used to represent the capabilities of the
286 RequestPowerStateChange() method. When this method is supported, the PowerChangeCapabilities
287 property shall contain the value 3 (Power State Settable).

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

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

292 No standard messages are defined for this method.

293 **Table 4 – CIM_PowerManagementService.RequestPowerStateChange() Method: Return Code**
294 **Values**

Value	Description
0	The initiation of Pending/Immediate Power State Change was successful.
1	Method is not supported in the implementation.
2	Error occurred
4096	Job started: REF returned to started CIM_ConcreteJob

295 **Table 5 – CIM_PowerManagementService.RequestPowerStateChange() Method: Parameters**

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

296 **8.1.1 Establishing a Pending Power State Change**

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

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

305 When the method invocation is to establish the Pending Power State Change, the method may return the
 306 Job output parameter and return a value of 4096. When the method invocation returns the Job output
 307 parameter, the status of the referenced CIM_Job instance shall reflect the status of the attempt to
 308 establish the Pending Power State Change. When the method invocation does not return the Job output
 309 parameter, the method completion shall be synchronous with the establishment of the Pending Power
 310 State Change.

311 **8.1.2 Initiating an Immediate Power State Change**

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

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

320 **8.1.3 PowerState**

321 The PowerState parameter indicates the desired power state of the computer system. When the value
 322 used for the PowerState parameter is not equal to one of the values in the PowerStatesSupported
 323 property array of the associated instance of CIM_PowerManagementCapabilities, the method shall return
 324 2.

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

328 When the value 6 (Power Cycle (Off–Hard)) or the value 16 (Power Cycle (Off-Hard Graceful)) is
 329 supported for the PowerState parameter, the PowerChangeCapabilities property array of the associated

330 instance of CIM_PowerManagementCapabilities shall contain the value 6 (Off Hard Power Cycling
331 Supported).

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

335 When the value is 12 (Off-Soft Graceful), 13 (Off-Hard Graceful), 14 (Master Bus Reset Graceful), 15
336 (PowerCycle (Off-Soft Graceful), or 16 (Power Cycle (Off-Hard Graceful)), is supported for the
337 PowerState parameter, the PowerManagementCapabilities property array of the associated instance of
338 CIM_PowerManagementCapabilities shall contain value 8 (Graceful Shutdown supported).

339 When the CIM_PowerManagementService.RequestPowerStateChange() method returns a value of 0 or
340 4096, the RequestedPowerState property of the instance of CIM_AssociatedPowerManagementService
341 that references the CIM_PowerManagementService instance and the CIM_ComputerSystem instance
342 indicated by the ManagedElement parameter shall be set to the value of the PowerState parameter of the
343 method.

344 **8.1.4 ManagedElement**

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

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

350 **8.1.5 Time**

351 The Time parameter is used to set the power state of the managed system at a certain time and can be
352 used only to set the power state to On or Power Cycle. The Time parameter shall be supported when the
353 PowerChangeCapabilities property array of the associated instance of
354 CIM_PowerManagementCapabilities contains the value 5 (Timed Power On Supported). The Time
355 parameter shall not be supported when the PowerState parameter has any value other than 2 (On), 5
356 (Power Cycle (Off-Soft)) 6 (Power Cycle (Off-Hard)), 15 (Power Cycle (Off-Soft Graceful)), or 16 (Power
357 Cycle (Off-Hard Graceful)). When the Time parameter is specified and is not supported, the method shall
358 return a value of 2.

359 When the Time parameter is specified and the method returns a value of 0, the PowerOnTime property of
360 the CIM_AssociatedPowerManagementService association that references the CIM_ComputerSystem
361 instance identified by the ManagedElement parameter and references the
362 CIM_PowerManagementService instance shall have the date-time value that indicates when the
363 computer system will undergo the power state change indicated by the PowerState parameter. When the
364 Time parameter complies with the interval format of the Datetime data type, the interval value indicated
365 by the Time parameter shall be interpreted relative to the current date-time and the calculated absolute
366 date-time shall be the value of the PowerOnTime property. When the Time parameter complies with the
367 timestamp format of the Datetime data type, the PowerOnTime property shall have the value of the Time
368 parameter.

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

371 **8.1.6 Job**

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

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

377 **8.1.7 TimeoutPeriod**

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

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

385 **8.2 Profile Conventions for Operations**

386 Support for operations for each profile class (including associations) is specified in the following
387 subclauses. Each of these subclauses includes either the statement “All operations in the default list in
388 section 8.2 are supported as described by [DSP0200 v1.2](#)” or a table listing all the operations that are not
389 supported by this profile or where the profile requires behavior other than that described by
390 [DSP0200 v1.2](#).

391 The default list of operations is as follows:

- 392 • GetInstance
- 393 • EnumerateInstances
- 394 • EnumerateInstanceNames
- 395 • Associators
- 396 • AssociatorNames
- 397 • References
- 398 • ReferenceNames

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

401 **8.3 CIM_PowerManagementService**

402 All operations in the default list in section 8.2 are supported as described by [DSP0200 v1.2](#).

403 **8.4 CIM_PowerManagementCapabilities**

404 All operations in the default list in section 8.2 are supported as described by [DSP0200 v1.2](#).

405 **8.5 CIM_AssociatedPowerManagementService**

406 Table 6 lists operations that either have special requirements beyond those from [DSP0200 v1.2](#) or shall
407 not be supported.

408

Table 6 – Operations: CIM_AssociatedPowerManagementService

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

409 **8.5.1 CIM_AssociatedPowerManagementService—ModifyInstance**

410 When the ModifyInstance operation is supported for an instance of
 411 CIM_AssociatedPowerManagementService, the ModifyInstance operation shall not modify the following
 412 properties:

- 413 • PowerState
- 414 • OtherPowerState
- 415 • PowerOnTime
- 416 • RequestedPowerState

417 These properties can be affected by the invocation of the RequestPowerStateChange() method; see
 418 section 8.1.

419 **8.6 CIM_ElementCapabilities**

420 Table 7 lists operations that either have special requirements beyond those from [DSP0200 v1.2](#) or shall
 421 not be supported.

422 **Table 7 – Operations: CIM_ElementCapabilities**

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

423 **8.7 CIM_HostedService**

424 Table 8 lists operations that either have special requirements beyond those from [DSP0200 v1.2](#) or shall
 425 not be supported.

426 **Table 8 – Operations: CIM_HostedService**

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

427 **9 Use Cases**

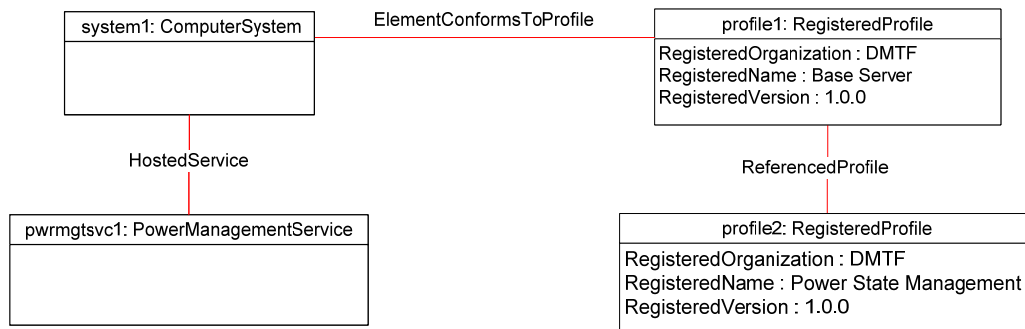
428 This section contains object diagrams and use cases for the *Power State Management Profile*.

429 **9.1 Object Diagrams**

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

432 **9.1.1 Advertising the Profile Conformance**

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

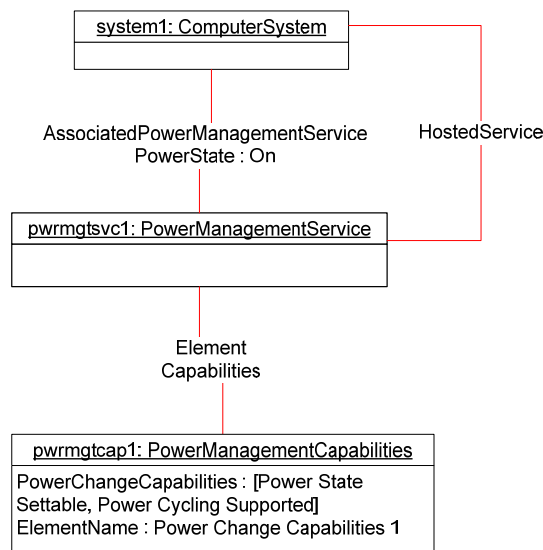


438

439 **Figure 2 – Registered Profile**

440 **9.1.2 Monolithic System**

441 Figure 3 shows the CIM instances required to control power for a single, monolithic system, system1.
442 system1 hosts the power management service, pwrmgtsvc1, which manages the power for system1.



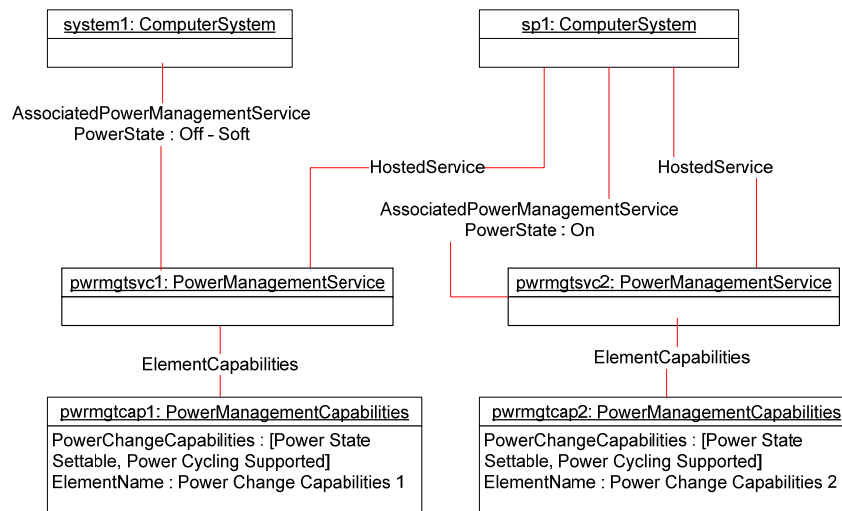
443

444 **Figure 3 – Power Control Instance Diagram: Monolithic System**

445 **9.1.3 Monolithic System with Service Processor**

446 Figure 4 shows the CIM instances required to control power for a monolithic system with an attached
 447 service processor. The power management service, pwrmtgsvc1, hosted by the service processor, sp1, is
 448 responsible for managing the power of the system, system1. Optionally, the service processor may host
 449 another power management service, pwrmtgsvc2, to control its own power.

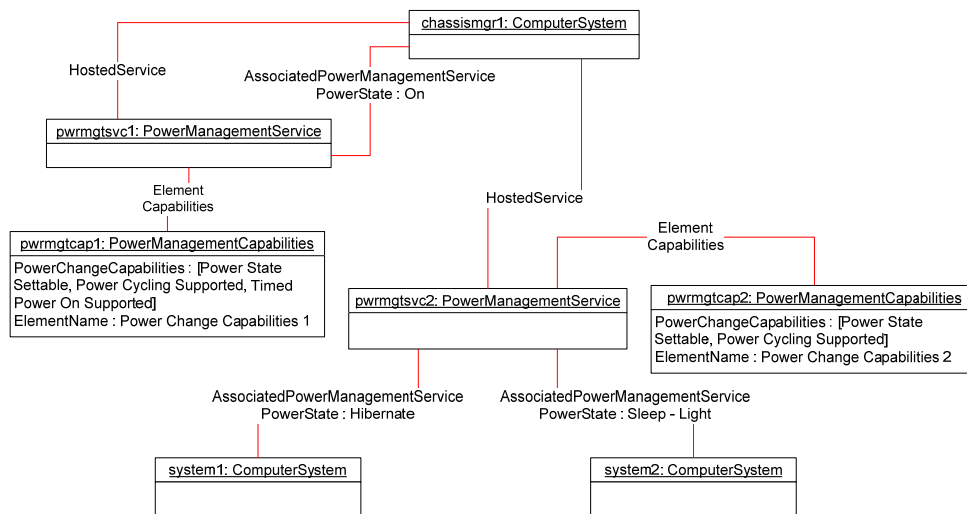
450 A service processor in this sense may be an add-in remote management component or an integrated
 451 baseboard management controller.



452
 453 **Figure 4 – Power Control Instance Diagram: Monolithic System with Service Processor**

454 **9.1.4 Modular System with Chassis Service Processor**

455 Figure 5 shows the CIM instances required to represent a modular computer system. The chassis
 456 manager, chassismgr1, hosts one or more power management services (pwrmtgsvc2) to control the
 457 power of all the blade systems. Optionally, the chassis manager may host another power management
 458 service (pwrmtgsvc1) to control its own power.



459
 460 **Figure 5 – Power Control Instance Diagram: Modular System with Chassis Service Processor**

461 **9.2 Determine the Power State of the Computer System**

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

463 For the instance of CIM_ComputerSystem that represents the given computer system, select the
464 referencing instance of CIM_AssociatedPowerManagementService.

465 The PowerState property of the referencing instance of CIM_AssociatedPowerManagementService
466 represents the power state of the computer system.

467 **9.3 Find the Power Management Service for a Computer System**

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

469 For the instance of CIM_ComputerSystem that represents the given computer system, select the instance
470 of CIM_PowerManagementService that represents the power management service for the computer
471 system through the CIM_AssociatedPowerManagementService association.

472 **9.4 Find All the Computer Systems for a Power Management Service**

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

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

477 **9.5 Change the Power State of the Computer System**

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

- 479 1) Navigate from the target instance of CIM_ComputerSystem to the instance of
480 CIM_PowerManagementService that represents the service that manages that system by using
481 the CIM_AssociatedPowerManagementService association.
- 482 2) Invoke the RequestPowerStateChange() method of the instance of
483 CIM_PowerManagementService with an argument that contains the PowerState action
484 appropriate to the operation.

485 **9.6 Determine Whether the Power Cycle Is Supported for a Computer System**

486 A client can determine whether Power Cycle is supported for a computer system as follows:

- 487 1) Navigate from the target instance of CIM_ComputerSystem to the instance of
488 CIM_PowerManagementService using the CIM_AssociatedPowerManagementService
489 association.
- 490 2) Using the instance of CIM_PowerManagementService, navigate to the instance of
491 CIM_PowerManagementCapabilities through the CIM_ElementCapabilities association.

492 If the PowerChangeCapabilities property array contains the value 4 (Power Cycling Supported), Power
493 Cycle shall be supported for the computer system.

494 **9.7 Execute Power Cycle (Off-Soft) within a Given Time**

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

- 496 1) Navigate from the target instance of CIM_ComputerSystem to the instance of
- 497 CIM_PowerManagementService using the CIM_AssociatedPowerManagementService
- 498 association.
- 499 2) Invoke the RequestPowerStateChange() method of the instance of
- 500 CIM_PowerManagementService with the Power State argument set to 5 (Power Cycle (Off-
- 501 Soft)) and the TimeoutPeriod argument set to "t".

502 **9.8 Execute Power Cycle (Off-Soft Graceful)**

503 A client can determine whether Power Cycle and Graceful Shutdown is supported for a computer system
504 as follows:

- 505 1) Navigate from the target instance of CIM_ComputerSystem to the instance of
- 506 CIM_PowerManagementService using the CIM_AssociatedPowerManagementService
- 507 association.
- 508 2) Using the instance of CIM_PowerManagementService, navigate to the instance of
- 509 CIM_PowerManagementCapabilities through the CIM_ElementCapabilities association.

510 If the PowerChangeCapabilities property array contains the value 4 (Power Cycling Supported) and 8
511 (Graceful Shutdown Supported), Power Cycle and Graceful Shutdown shall be supported for the
512 computer system.

513 If the Power Cycle and Graceful Shutdown is supported, then a client can execute Power Cycle (Off-Soft
514 Graceful) as follows:

- 515 1) Navigate from the target instance of CIM_ComputerSystem to the instance of
- 516 CIM_PowerManagementService using the CIM_AssociatedPowerManagementService
- 517 association.
- 518 2) Invoke the RequestPowerStateChange() method of the instance of
- 519 CIM_PowerManagementService with the Power State argument set to 15 (Power Cycle (Off-
- 520 Soft Graceful))

521 **10 CIM Elements**

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

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

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

526 **10.1 CIM_PowerManagementCapabilities**

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

529 **Table 10 – Class: CIM_PowerManagementCapabilities**

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

530 **10.2 CIM_PowerManagementService**

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

533 **Table 11 – Class: CIM_PowerManagementService**

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

534 **10.3 CIM_AssociatedPowerManagementService**

535 CIM_AssociatedPowerManagementService associates the CIM_ComputerSystem instance that
536 represents the target computer system with the CIM_PowerManagementService instance that represents
537 the service responsible for controlling the power of a computer system. Table 12 contains the
538 requirements for elements of this class.

539 **Table 12 – Class: CIM_AssociatedPowerManagementService**

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

540 **10.4 CIM_ElementCapabilities**

541 CIM_ElementCapabilities associates the CIM_PowerManagementService instance that represents the
542 service responsible for controlling the power of a computer system with the

543 CIM_PowerManagementCapabilities instance that represents the power management capabilities of a
 544 computer system. Table 13 contains the requirements for elements of this class.

545 **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

546 **10.5 CIM_HostedService**

547 CIM_HostedService associates the CIM_ComputerSystem instance with the
 548 CIM_PowerManagementService instance that it hosts. Table 14 contains the requirements for elements
 549 of this class.

550 **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 *

551 **10.6 CIM_RegisteredProfile**

552 CIM_RegisteredProfile is defined by the [Profile Registration Profile](#). The requirements denoted in
 553 Table 15 are in addition to those mandated by the [Profile Registration Profile](#).

554 **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 "1.0.0".
RegisteredOrganization	Mandatory	This property shall have a value of 2 (DMTF).

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

558
559
560
561

ANNEX A (informative)

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.

562
563

**ANNEX B
(informative)**

564
565
566
567

Acknowledgments

568 The authors wish to acknowledge the following people.

569 Editor:

- 570 • RadhaKrishna R. Dasari – Dell
- 571 • Jeff Hilland – HP

572 Contributors:

- 573 • Jon Hass – Dell
- 574 • Khachatur Papanyan – Dell
- 575 • Richard Landau – Dell
- 576 • RadhaKrishna R. Dasari – Dell
- 577 • Aaron Merkin – IBM
- 578 • Jeff Lynch – IBM
- 579 • Jeff Hilland – HP
- 580 • Christina Shaw – HP
- 581 • Perry Vincent – Intel
- 582 • John Leung – Intel

583 Mike Dutch – Symantec

584