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Power State Management Profile

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Tables

Foreword

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

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

Introduction

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

Power State Management Profile

1 Scope

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

2 Normative References

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

2.1 Approved References

Advanced Configuration and Power Interface Specification, 3.0, September 2, 2004

DMTF DSP0200, *CIM Operations over HTTP 1.2.0*

DMTF DSP0004, *CIM Infrastructure Specification 2.3.0*

DMTF DSP1000, *Management Profile Specification Template*

DMTF DSP1001, *Management Profile Specification Usage Guide*

DMTF DSP1033, *Profile Registration Profile*

2.2 Other References

ISO/IEC Directives, Part 2, *Rules for the structure and drafting of International Standard*

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

DMTF DSP0215, *Server Management Managed Element Addressing Specification (SM ME Addressing)*

3 Terms and Definitions

For the purposes of this document, the terms and definitions in DSP1033 and DSP1001 and the following terms and definitions apply.

3.1
can
used for statements of possibility and capability, whether material, physical, or causal

3.2
cannot
used for statements of possibility and capability, whether material, physical, or causal

3.3
conditional
indicates requirements to be followed strictly in order to conform to the document when the specified conditions are met

3.4
mandatory
indicates requirements to be followed strictly in order to conform to the document and from which no deviation is permitted

3.5
may
indicates a course of action permissible within the limits of the document

3.6
need not
indicates a course of action permissible within the limits of the document

3.7
optional
indicates a course of action permissible within the limits of the document

3.8
referencing profile
indicates a profile that owns the definition of this class and can include a reference to this profile in its "Referenced Profiles" table

3.9
shall
indicates requirements to be followed strictly in order to conform to the document and from which no deviation is permitted

3.10
shall not
indicates requirements to be followed strictly in order to conform to the document and from which no deviation is permitted

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

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

3.13
unspecified
indicates that this profile does not define any constraints for the referenced CIM element or operation

3.14
Immediate Power State Change
indicates the power state transition that will be initiated immediately

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

4 Symbols and Abbreviated Terms

The following abbreviations are used in this document.

4.1
ACPI
Advanced Configuration and Power Interface

4.2
CIM
Common Information Model

5 Synopsis

Profile Name: Power State Management

Version: 1.0.0

Organization: DMTF

CIM Schema Version: 2.18

Central Class: CIM_PowerManagementService

Scoping Class: CIM_ComputerSystem

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

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

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

Table 1 – Referenced Profiles

Profile Name	Organization	Version	Description
Profile Registration	DMTF	1.0.0	Mandatory

6 Description

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

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

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

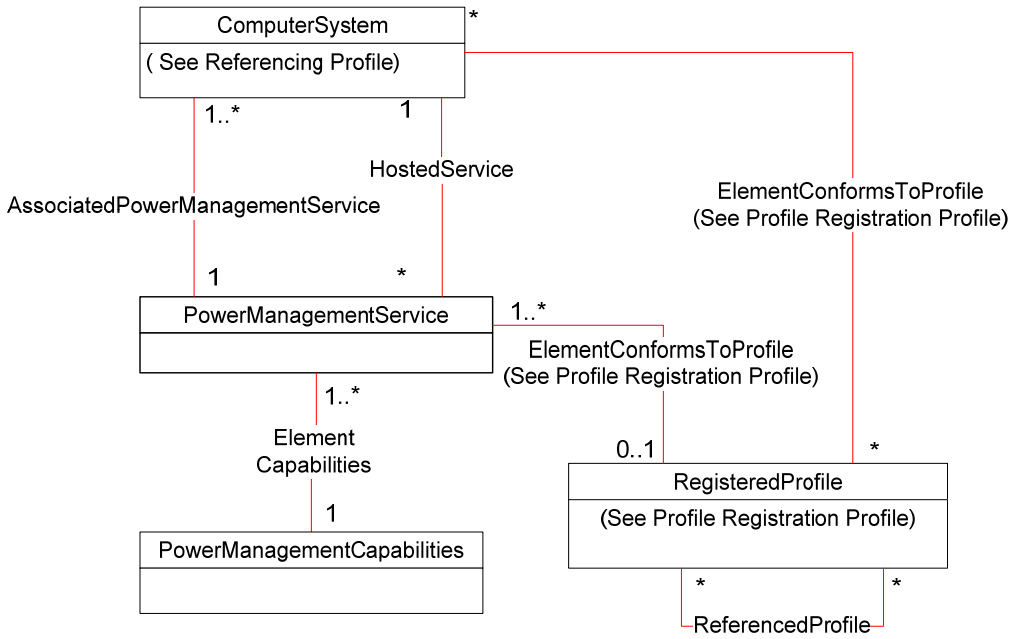

Figure 1 – Power State Management Profile: Class Diagram

7 Implementation

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

7.1 CIM_PowerManagementService

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

7.1.1 CIM_PowerManagementService.ElementName

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

7.2 CIM_PowerManagementCapabilities

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

7.2.1 CIM_PowerManagementCapabilities.PowerChangeCapabilities

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

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

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)

7.2.2 CIM_PowerManagementCapabilities.ElementName

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

7.2.3 CIM_PowerManagementCapabilities.PowerStatesSupported

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

7.3 CIM_AssociatedPowerManagementService.PowerState

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

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

7.3.1 Power States Values

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

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: • 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: • 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

7.4 Representing Power State Changes

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

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

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

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

8 Methods

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

8.1 CIM_PowerManagementService.RequestPowerStateChange( )

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

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

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

No standard messages are defined for this method.

Table 4 – CIM_PowerManagementService.RequestPowerStateChange( ) Method: Return Code 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

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

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

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

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

8.1.4 ManagedElement

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

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

8.1.5 Time

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

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

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

8.1.6 Job

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

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

8.1.7 TimeoutPeriod

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

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

8.2 Profile Conventions for Operations

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

The default list of operations is as follows:

- GetInstance
- EnumerateInstances
- EnumerateInstanceNames
- Associators
- AssociatorNames
- References
- ReferenceNames

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

8.3 CIM_PowerManagementService

All operations in the default list in section 8.2 are supported as described by DSP0200 v1.2.

8.4 CIM_PowerManagementCapabilities

All operations in the default list in section 8.2 are supported as described by DSP0200 v1.2.

8.5 CIM_AssociatedPowerManagementService

Table 6 lists operations that either have special requirements beyond those from DSP0200 v1.2 or shall 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

9 Use Cases

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

9.1 Object Diagrams

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

9.1.1 Advertising the Profile Conformance

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

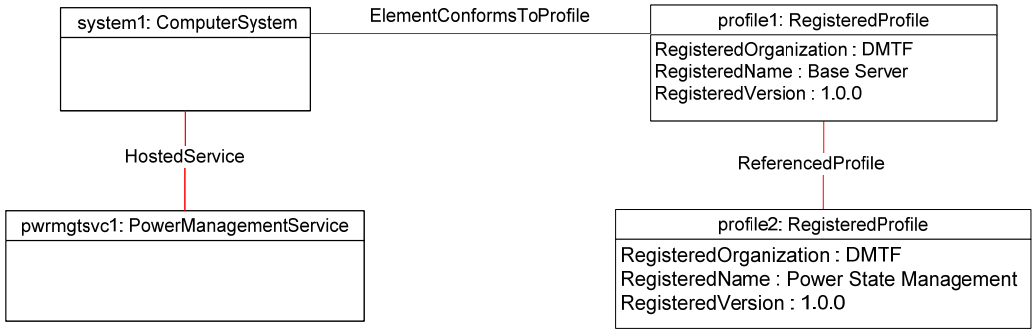

Figure 2 – Registered Profile

9.1.2 Monolithic System

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

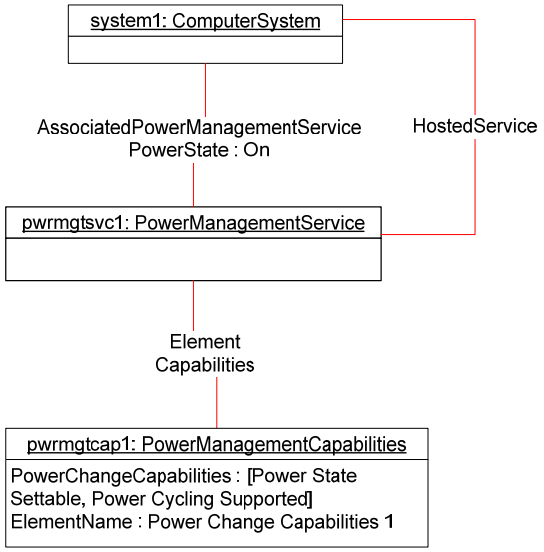

Figure 3 – Power Control Instance Diagram: Monolithic System

9.1.3 Monolithic System with Service Processor

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

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

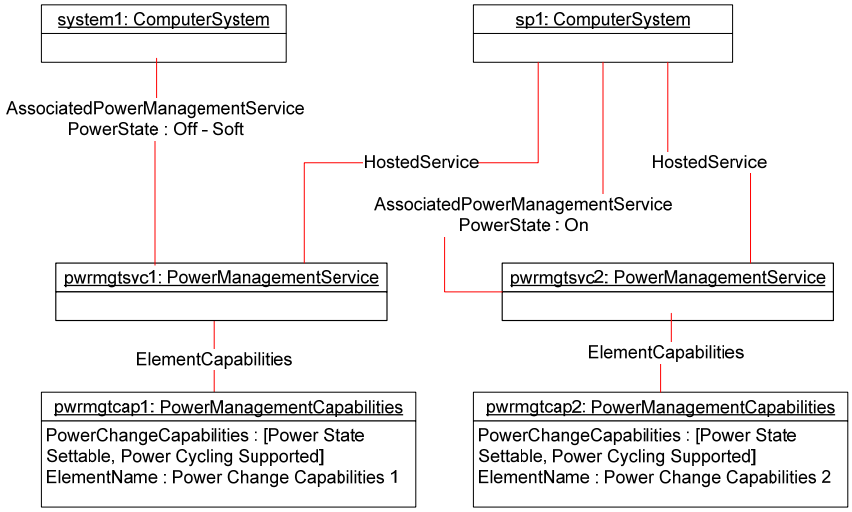

Figure 4 – Power Control Instance Diagram: Monolithic System with Service Processor

9.1.4 Modular System with Chassis Service Processor

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

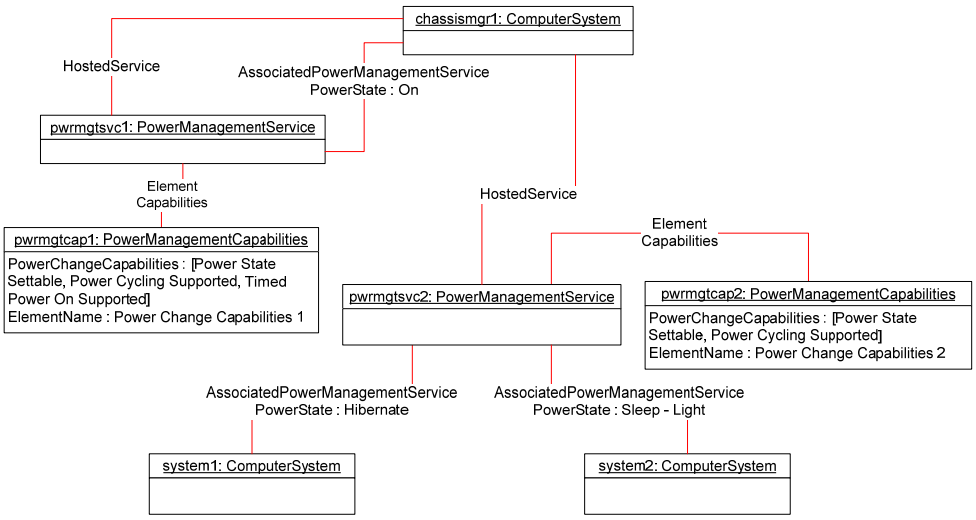

Figure 5 – Power Control Instance Diagram: Modular System with Chassis Service Processor

9.2 Determine the Power State of the Computer System

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

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

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

9.3 Find the Power Management Service for a Computer System

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

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

9.4 Find All the Computer Systems for a Power Management Service

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

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

9.5 Change the Power State of the Computer System

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

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

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

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

1) Navigate from the target instance of CIM_ComputerSystem to the instance of CIM_PowerManagementService using the CIM_AssociatedPowerManagementService association.
2) Using the instance of CIM_PowerManagementService, navigate to the instance of CIM_PowerManagementCapabilities through the CIM_ElementCapabilities association.

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

9.7 Execute Power Cycle (Off–Soft) within a Given Time

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

1) Navigate from the target instance of CIM_ComputerSystem to the instance of CIM_PowerManagementService using the CIM_AssociatedPowerManagementService association.

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

9.8 Execute Power Cycle (Off–Soft Graceful)

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

1) Navigate from the target instance of CIM_ComputerSystem to the instance of CIM_PowerManagementService using the CIM_AssociatedPowerManagementService association.

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

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

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

1) Navigate from the target instance of CIM_ComputerSystem to the instance of CIM_PowerManagementService using the CIM_AssociatedPowerManagementService association.

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

10 CIM Elements

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

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		

10.1 CIM_PowerManagementCapabilities

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

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.

10.2 CIM_PowerManagementService

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

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.

10.3 CIM_AssociatedPowerManagementService

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

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.

10.4 CIM_ElementCapabilities

CIM_ElementCapabilities associates the CIM_PowerManagementService instance that represents the 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.

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.

ANNEX B
(informative)

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