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WBEM Server Profile

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Foreword

The *WBEM Server Profile* (DSP1092) was prepared by the DMTF WBEM Infrastructure Modeling Working Group.

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Introduction

The information in this specification should be sufficient for a provider or consumer of this data to unambiguously identify the classes, properties, methods, and values that shall be instantiated to manage and monitor WBEM server and WBEM protocols using the DMTF Common Information Model (CIM) Schema.

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

Document conventions

Typographical conventions

The following typographical conventions are used in this document:

- Document titles are marked in *italics*.
- Important terms that are used for the first time are marked in *italics*.
- ABNF rules are in `monospaced font`.

ABNF usage conventions

Format definitions in this document are specified using ABNF (see RFC5234), with the following deviations:

- Literal strings are to be interpreted as case-sensitive Unicode characters, as opposed to the definition in RFC5234 that interprets literal strings as case-insensitive US-ASCII characters.

Experimental material

Experimental material has yet to receive sufficient review to satisfy the adoption requirements set forth by the DMTF. Experimental material is included in this document as an aid to implementers who are interested in likely future developments. Experimental material may change as implementation experience is gained. It is likely that experimental material will be included in an upcoming revision of the specification. Until that time, experimental material is purely informational.

The following typographical convention indicates experimental material:

EXPERIMENTAL

Experimental material appears here.

EXPERIMENTAL

In places where this typographical convention cannot be used (for example, tables or figures), the "EXPERIMENTAL" label is used alone.

WBEM Server Profile

1 Scope

The *WBEM Server Profile* defines the CIM elements that are used to report and manage information regarding the WBEM server.

2 Normative references

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

DMTF DSP0004, *CIM Infrastructure Specification 2.7,*
http://dmtf.org/standards/published_documents/DSP0004_2.7.pdf

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

DMTF DSP1052, *Computer System Profile 1.0*,
http://dmtf.org/standards/published_documents/DSP1052_1.0.pdf

DMTF DSP0207, *WBEM URI Mapping 1.0,*
http://dmtf.org/standards/published_documents/DSP0207_1.0.pdf

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

DMTF DSP1036, *IP Interface Profile 1.1*,
http://dmtf.org/standards/published_documents/DSP1036_1.1.pdf

DMTF DSP1054, *Indications Profile 1.2*,
http://dmtf.org/standards/published_documents/DSP1054_1.2.pdf

DMTF DSP1103, *Job Control Profile 1.0*,
http://dmtf.org/standards.published_documents/DSP1103_1.0.pdf

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

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

DMTF DSP1034, *Simple Identity Management Profile 1.1*,
http://dmtf.org/standards/published_documents/DSP1034_1.1.pdf

DMTF DSP1039, *Role Based Authorization Profile 1.1*,
http://dmtf.org/standards/published_documents/DSP1039_1.1.pdf

IETF RFC3986, *Uniform Resource Identifier (URI): Generic Syntax, Jan. 2005*,
http://www.ietf.org/rfc/rfc3986.txt

IETF RFC5234, *Augmented BNF for Syntax Specifications: ABNF, Jan. 2008*,
http://www.ietf.org/rfc/rfc5234.txt

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

3 Terms and definitions

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

The terms "shall" ("required"), "shall not", "should" ("recommended"), "should not" ("not recommended"), "may", "need not" ("not required"), "can" and "cannot" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Annex H. The terms in parenthesis are alternatives for the preceding term, for use in exceptional cases when the preceding term cannot be used for linguistic reasons. Note that ISO/IEC Directives, Part 2, Annex H specifies additional alternatives. Occurrences of such additional alternatives shall be interpreted in their normal English meaning.

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

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

The terms defined in DSP0004, DSP0200, and DSP1001 apply to this document. The following additional terms are used in this document.

3.1

WBEM server

a CIM server (see DSP0004) that supports at least one WBEM protocol.

3.2

WBEM protocol

A communications protocol that defines WBEM Operations (see DSP0223)

4 Symbols and abbreviated terms

The abbreviations defined in DSP0004, DSP0200, and DSP1001 apply to this document. The following additional abbreviations are used in this document.

4.1

CQL

CIM Query Language

4.2

FQL

Filter Query Language

4.3

URI

Uniform Resource Identifier

4.4

WBEM

Web Based Enterprise Management

5 Synopsis

Profile name: WBEM Server

Version: 1.0.0

Organization: DMTF

CIM schema version: 2.38

Central Class: CIM_ComputerSystem

Scoping Class: CIM_ComputerSystem

The *WBEM Server Profile* is an autonomous profile that specializes the *Computer System Profile* (DSP1052) to provide the capability to discover, monitor and manage the WBEM server infrastructure.

The central instance of this profile shall be an instance of CIM_ComputerSystem. The scoping instance shall be the instance of CIM_ComputerSystem.

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

Table 1 – Referenced profiles

Profile Name	Organization	Version	Relationship	Behavior
Computer System (DSP1052)	DMTF	1.0	Specializes	
Indications Profile (DSP1054)	DMTF	1.2	Optional	
IP Interface Profile (DSP1036)	DMTF	1.1	Conditional	Mandatory when WBEM protocol management is supported.
Job Control Profile (DSP1103)	DMTF	1.0	Optional	
Profile Registration Profile (DSP1033)	DMTF	1.0	Mandatory	
Role Based Authorization (DSP1039)	DMTF	1.0	Mandatory	
Simple Identity Management (DSP1034)	DMTF	1.1	Mandatory	

6 Description (Informative)

The *WBEM Server Profile* describes the WBEM server and WBEM protocol management.

Figure 1 represents the UML class diagram for the *WBEM Server Profile*. For simplicity, the *CIM_* prefix has been removed from the names of the classes in Figure 1.

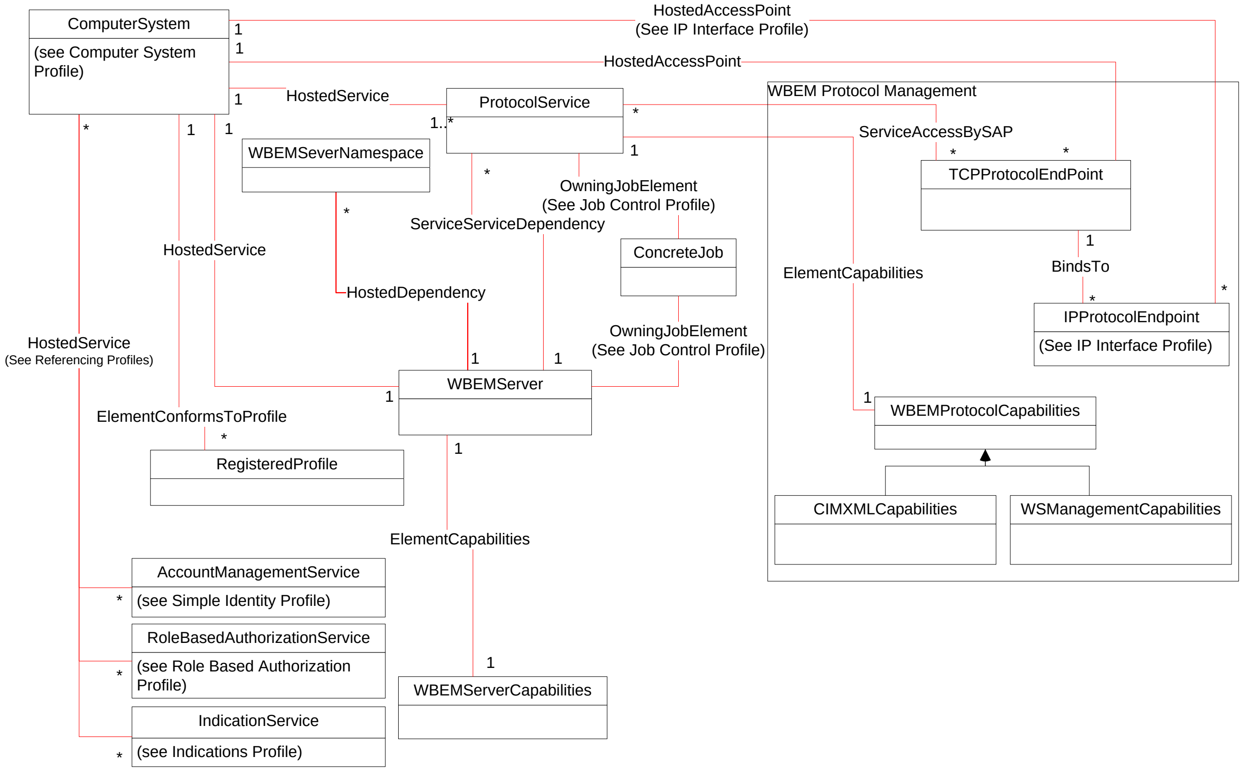

Figure 1 – WBEM Server Profile: Class diagram

The *WBEM Server Profile* represents the capabilities of the WBEM server and supported WBEM protocols. Functionality within the scope of this profile includes: namespace discovery, WBEM server settings and WBEM protocol discovery and management.

The WBEM Server profile mandates the support of the Simple Identity Profile and Role Based Authorization profiles to provide an interoperable means for authentication and authorization.

The WBEM server is modeled as an instance of CIM_WBEMServer, a subclass of CIM_Service. Aspects of the WBEM server's configuration are modeled through the capabilities and settings associated to the instance of CIM_WBEMServer.

Namespaces are modeled using the class CIM_WBEMServerNamespace. Namespace instances include the information regarding the schemas contained in the namespace.

A WBEM protocol is modeled using a single instance of CIM_ProtocolService. A WBEM server may have support for one or more WBEM protocols.

A WBEM server may support the managing of WBEM protocols. If supported, the administrator can enable, disable or reset a protocol, determine the capabilities supported, change the port(s) the protocol is listening on and bind the protocol to a specific IP Address.

WBEM protocol session management is outside the scope of this profile.

7 Implementation

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

The WBEM Server profile shall be implemented in the interop namespace.

7.1 WBEM server

Exactly one instance of this class shall exist that represents the WBEM server.

7.1.1 WBEM server capabilities

The WBEM server capabilities are represented through an instance of CIM_WBEMServerCapabilities, Exactly one instance of this class shall exist and be associated to the CIM_WBEMServer instance through an instance of CIM_WBEMServerCapabilities.OperationsSupported

7.1.1.1 CIM_WBEMServerCapabilities.OperationsSupported

Support for methods for CIM_WBEMServer is optional. For each method supported, the OperationsSupported property shall contain the value representing the method.

7.1.1.2 CIM_WBEMServerCapabilities.RequestedStatesSupported

If the CIM_WBEMServerCapabilities.OperationsSupported property value includes 2 (RequestStateChange) this property value shall include at least one of the following values: 4 (Shut Down), 9 (Reboot) or 10 (Reset).

If the CIM_WBEMServerCapabilities.OperationsSupported property does not contain the value 2 (RequestedStateChange), then the RequestedStatesSupported property shall be Null.

7.1.2 CIM_WBEMServer.RequestedState

When the CIM_WBEMServer.RequestStateChange( ) method is successfully invoked, the value of the RequestedState property shall be the value of the RequestedState parameter.

The CIM_WBEMServer.RequestedState property shall have one of the values specified in the CIM_WBEMServerCapabilities.RequestedStatesSupported property or a value of 5 (No Change).

7.1.3 CIM_WBEMServer.EnabledState

The EnabledState property shall have the value 2 (Enabled) or 4 (Shutting Down).

When the RequestedState parameter has a value of 4 (Shut Down) and the CIM_WBEMServer.RequestStateChange() method completes successfully, the EnabledState property shall change to 4 (Shutting Down) until the WBEM server is no longer available.

If the method does not complete successfully, the value of the EnabledState shall be 2 (Enabled) and the WBEM server shall not try to shut down.

7.2 WBEM server namespaces

A WBEM server namespace is modeled using the class CIM_WBEMServerNamespace. A WBEM server may contain one or more namespaces. The following clauses describe implementation requirements for CIM_WBEMServerNamespace.

7.2.1 CIM_WBEMServerNamespace.Name

The Name property is the actual name of the namespace. The namespace name shall be unique, in other words you shall not have two namespace with the same name in a WBEM server.

7.3 WBEM protocols

A WBEM protocol is modeled using the CIM_ProtocolService class. For each WBEM protocol supported an instance of CIM_ProtocolService shall exist. At least one instance of CIM_ProtocolService shall exist.

The following subclauses describe implementation requirements for CIM_ProtocolService.

7.3.1 CIM_ProtocolService.RequestedStateChange

When the CIM_ProtocolService.RequestStateChange( ) method is successfully invoked, the value of the RequestedState property shall be the value of the RequestedState parameter.

The CIM_ProtocolService.RequestedState property shall have one of the values specified in the CIM_WBEMProtocolServiceCapabilities.RequestedStatesSupported property or a value of 5 (No Change).

7.3.2 CIM_ProtocolService.EnabledState

When the RequestedState parameter has a value of 2 (Enabled) or 3 (Disabled) and the CIM_ProtocolService.RequestStateChange( ) method completes successfully, the value of the EnabledState property shall equal the value of the CIM_ProtocolService.RequestedState property.

The EnabledState property shall have the value 2 (Enabled), 3 (Disabled), or 6 (Enabled but Offline).

7.4 WBEM protocol management

WBEM protocol management for a WBEM protocol is conditional. A WBEM server may support one or more WBEM protocols. If WBEM protocol management is supported for a specified protocol, an instance of CIM_WBEMProtocolServiceCapabilities shall be associated to the instance of CIM_ProtocolService via CIM_ElementCapabilities and the CIM_WBEMProtocolServiceCapabilities.ListeningPortManagementSupported value shall be True.

7.4.1 WBEM protocol capabilities

WBEM protocol capabilities are modeled using CIM_WBEMProtocolServiceCapabilities. The support for the CIM_WBEMProtocolServiceCapabilities is optional.

7.4.1.1 CIM_WBEMProtocolServiceCapabilities.ListeningPortManagementSupported

If the CIM_WBEMProtocolServiceCapabilities is implemented, then the ListeningPortManagementSupported property shall be supported. When the ListeningPortManagementSupported property has a value of True, the instance(s) of CIM_ProtocolService associated via CIM_ElementCapabilities shall support the ListenOnPortIF() method. When the ListeningPortManagementSupported property has a value of False, the ListenOnPortIF() method shall not be supported.

7.4.1.2 CIM_WBEMProtocolServiceCapabilities.RequestedStatesSupported

If WBEM protocol management is supported (See 7.4) then the RequestedStatesSupported property value shall contain the following values: 2 (Enabled), 3 (Disabled), or 11 (Reset). If WBEM protocol management (See 7.4) is not supported, then the RequestedStatesSupported property shall be Null.

7.4.1.3 CIM_WBEMProtocolServiceCapabilities.GenericOperationsSupported

The GenericOperationsSupported property is mandatory for all protocols. The property value is an array of CIM_GenericOperationCapabilitiesStructure. The following subclauses describe implementation requirements for CIM_GenericOperationCapabilitiesStructure.

7.4.1.3.1 CIM_GenericOperationCapabilitiesStructure.ContinueOnErrorSupported

The CIM_GenericOperationCapabilitiesStructure.ContinueOnErrorSupported property is mandatory when the CIM_GenericOperationCapabilitiesStructure.OperationsSupported property includes any of the following values 12(OpenClassInstancesWithPath), 13(OpenClassInstancePaths), 14(OpenAssociatedInstancesWithPath), 15(OpenAssociatedInstancePaths), 16(OpenReferencingInstancesWithPath), 17(OpenReferencingInstancePaths), 18(OpenQueryInstances), 19(PullInstancesWithPath), 20 (PullInstancePaths), 21 (PullInstances).

7.4.1.3.2 CIM_GenericOperationCapabilitiesStructure.MinimumOperationTimeout

The CIM_GenericOperationCapabilitiesStructure.MinimumOperationTimeout property is mandatory when the CIM_GenericOperationCapabilitiesStructure.OperationsSupported property includes any of the following values 12(OpenClassInstancesWithPath), 13(OpenClassInstancePaths), 14(OpenAssociatedInstancesWithPath), 15(OpenAssociatedInstancePaths), 16(OpenReferencingInstancesWithPath), 17(OpenReferencingInstancePaths), 18(OpenQueryInstances), 19(PullInstancesWithPath), 20 (PullInstancePaths), 21 (PullInstances).

7.4.1.3.3 CIM_GenericOperationCapabilitiesStructure.MaximumOperationTimeout

The CIM_GenericOperationCapabilitiesStructure.MaximumOperationTimeout property is mandatory when the CIM_GenericOperationCapabilitiesStructure.OperationsSupported property includes any of the following values 12(OpenClassInstancesWithPath), 13(OpenClassInstancePaths), 14(OpenAssociatedInstancesWithPath), 15(OpenAssociatedInstancePaths), 16(OpenReferencingInstancesWithPath), 17(OpenReferencingInstancePaths), 18(OpenQueryInstances), 19(PullInstancesWithPath), 20 (PullInstancePaths), 21 (PullInstances).

7.4.1.4 Protocol-specific capabilities

A WBEM protocol may have a subclass of CIM_WBEMProtocolServiceCapabilities to define protocol specific capabilities. The following clauses describe when a subclass may be required instead.

7.4.1.4.1 CIM-XML capabilities

If the CIM_WBEMProtocolServiceCapabilities is implemented and the associated CIM_ProtocolService.Protocol has the value 5 (CIM-XML), CIM_CIMXMLCapabilities (subclass of CIM_WBEMProtocolServiceCapabilities) shall be supported and associated via CIM_ElementCapbilities.

7.4.1.4.2 WS-Management capabilities

If the CIM_WBEMProtocolServiceCapabilities is implemented and the associated CIM_ProtocolService.Protocol has the value 6 (WS-Management), CIM_WSManagementCapabilities (subclass of CIM_WBEMProtocolServiceCapabilities) shall be supported and associated via CIM_ElementCapbilities.

7.4.2 CIM_TCPProtocolEndpoint

Support for CIM_TCPProtocolEndpoint is conditional. If WBEM protocol management is supported (see 7.4), then CIM_TCPProtocolEndpoint and its two associations CIM_HostedAccessPoint and CIM_ServiceAccessBySAP are Mandatory. If WBEM protocol management is not supported (see 7.4), support for CIM_TCPProtocolEndpoint, CIM_HostedAccessPoint and CIM_ServiceAccessBySAP is optional.

7.5 Indications Profile

Indications Profile (DSP1054) support is optional. If the Indications Profile is implemented, the CIM_HostedService association shall be implemented with the Antecedent property referencing the central instance of this profile and the Dependent referencing the central instance of the Indications Profile.

The WBEM server related requirements defined in the *Indications Profile* (DSP1054) shall be implemented.

8 Methods

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

8.1 Profile conventions for operations

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

The default list of operations is as follows:

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

8.2 CIM_ComputerSystem

All operations in the default list in 8.1 shall be implemented as defined in DSP0200.

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

8.3 CIM_WBEMServer

All operations in the default list in 8.1 shall be implemented as defined in DSP0200.

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

The following additional methods shall be implemented.

8.3.1 RequestStateChange( )

A WBEM server may be requested to reboot, reset or shut down. A WBEM server reboot will shut down and re-enable the WBEM server. Resetting a WBEM server means that the WBEM server goes into the disabled state and then back to enabled state. Shutdown means that the WBEM server stops executing, usually meaning that any cleanup needed is completed as part of the shutdown process. The WBEM server shall respond to the method (for example, if shut down is requested, the server will respond to the method prior to shutting down, this will require the WBEM server to ensure that is can shut down before it responds).

A WBEM server shall not return 4096 (i.e. shall not utilize jobs, See Table 2) when shut down is requested. A WBEM server may utilize a job for reset or reboot. If the method utilizes a job, it shall support the *Job Control Profile* (DSP1103).

A WBEM server shall be unavailable after a shutdown (until started again). A WBEM server may be unavailable during a reboot or reset. The amount of time the WBEM server is unavailable is up to the implementation.

Support for the RequestStateChange( ) method is conditional; if the CIM_WBEMServerCapabilities.OperationsSupported property value includes the value 2 (RequestStateChange) then the RequestStateChange( ) method shall be supported. The RequestStateChange( ) method may support the RequestedState parameter with a value of 4 (Shut Down), 9 (Reboot) or 10 (Reset). The method shall support the values in CIM_WBEMServerCapabilities.RequestedStatesSupported property value for the RequestedState parameter.

The permissible return code values and parameters for the RequestStateChange( ) method are specified in Table 2 and Table 3, respectively.

Table 2 – RequestStateChange( ) method: Return code values

Value	Description
0 (Completed with No Error)	The method executed successfully.
3 (Cannot complete within Timeout Period)	The requested amount of time is less than the time the requested state transition takes.
4 (Failed)	The method failed.
5 (Invalid Parameters)	One or more parameters are invalid.
6 (In Use)	Another client has requested a state change that has not completed.
4096 (Method Parameters Checked – Job Started)	The method parameters were validated and a job has been started.
4097 (Invalid State Transition)	The state change requested is invalid for the current state.
4098 (Use of Timeout Parameter Not Supported)	This implementation does not support the TimeoutPeriod parameter. A client may pass Null for the TimeoutPeriod and try again.
4099 (Busy)	A state change is underway in the job; as such, the state cannot be changed. An implementation may use this return code to indicate the job cannot be suspended, killed, or terminated at all or in the current phase of execution.

Table 3 – RequestStateChange( ) method: Parameters

Qualifiers	Name	Type	Description
IN	RequestedState	uint16	For the purposes of this profile, the valid states that can be requested are 9 (Reboot), 10 (Reset), and 4 (Shut Down). Each value is optional to be supported.

Qualifiers	Name	Type	Description
IN	TimeoutPeriod	datetime	A timeout period that specifies the maximum amount of time that the client expects the transition to the new state to take. The interval format must be used to specify the TimeoutPeriod. A value of 0 or a Null parameter indicates that the client has no time requirements for the transition. If this property does not contain 0 or Null and the implementation does not support this parameter, a return code of 4098 (Use of Timeout Parameter Not Supported) shall be returned.

8.3.2 CreateWBEMServerNamespace( )

Support for CreateWBEMServerNamespace( ) is conditional, if the CIM_WBEMServerCapabilities .OperationsSupported property value includes the value 3 (CreateNamespace) then this method shall be supported.

CreateWBEMServerNamespace( ) creates a namespace. Upon successful completion of the method (return value 0 (Completed with No Error)), there shall be a newly created instance of CIM_WBEMServerNamespace associated through the CIM_HostedDependency association with this instance of CIM_WBEMServer and a new namespace shall be created. The method shall return 2 (Failed) if a known error occurred (e.g. namespace already exists).

Table 4 – CreateWBEMServerNamespace( ) method: Return code values

Value	Description
0 (Completed with No Error)	The method executed successfully.
1 (Failed)	The method failed.

Table 5 – CreateWBEMServerNamespace( ) method: Parameters

Qualifiers	Name	Type	Description
IN	NamespaceTemplate	String	NamespaceTemplate is an instance of CIM_WBEMServerNamespace with the desired property values for the namespace to be created.
OUT	Namespace	REF	Reference to the instance of CIM_WBEMServerNamespace created when the method returns a value of 0.
OUT	Errors[]	String	An array of CIM_Error instances. If the error fails, at least one CIM_Error instance shall exist

8.4 CIM_WBEMServerNamespace

Table 6 lists implementation requirements for operations. If implemented, these operations shall be implemented as defined in DSP0200. In addition, and unless otherwise stated in Table 6, all operations in the default list in 8.1 shall be implemented as defined in DSP0200.

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

Table 6 – Operations: CIM_HostedDependency

Operation	Requirement	Messages
ModifyInstance	Conditional	None

Operation	Requirement	Messages
DeleteInstance	Conditional	None

8.4.1 ModifyInstance

Support for the ModifyInstance operation is conditional, if the CIM_WBEMServerCapabilities.OperationsSupported property value includes the value 5 (ModifyNamespace) then the ModifyInstance operation shall be supported.

The Name and InstanceID properties shall not be modified, only the SchemaInformation property value shall support modification.

8.4.2 DeleteInstance

Support for the DeleteInstance operation is conditional, if the CIM_WBEMServerCapabilities.OperationsSupported property value includes the value 4 (DeleteNamespace) then the DeleteInstance operation shall be supported.

The namespace being deleted may include qualifier types, classes and instances. All of the information shall be deleted when this operation is executed. The managed environment that is represented in the namespace shall not be affected.

8.5 CIM_ProtocolService

All operations in the default list in 8.1 shall be implemented as defined in DSP0200.

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

The following additional methods shall be implemented.

8.5.1 RequestStateChange()

A WBEM protocol may be “enabled”, “disabled” or “reset”.

The RequestStateChange( ) method is conditional. If WBEMServerCapabilities.OperationsSupported has a value of 2 (RequestStateChange), then the RequestStateChange( ) method is mandatory. The RequestStateChange( ) method shall support the RequestedState parameter with a value of 2 (Enabled), 3 (Disabled) or 11 (Reset). 4 (Shut Down) and 10 (Reboot) are optional.

The permissible return code values and parameters for the RequestStateChange( ) method are specified in Table 7 and Table 8, respectively.

Table 7 – RequestStateChange( ) method: Return code values

Value	Description
0 (Completed with No Error)	The method executed successfully.
3 (Cannot complete within Timeout Period)	The requested amount of time is less than the time the requested state transition takes.
4 (Failed)	The method failed.
5 (Invalid Parameters)	One or more parameters are invalid.
6 (In Use)	Another client has requested a state change that has not completed.

Value	Description
4096 (Method Parameters Checked – Job Started)	The method parameters were validated and a job has been started.
4097 (Invalid State Transition)	The state change requested is invalid for the current state.
4098 (Use of Timeout Parameter Not Supported)	This implementation does not support the TimeoutPeriod parameter. A client may pass Null for the TimeoutPeriod and try again. There is no mechanism to determine what state changes are supported by a particular implementation
4099 (Busy)	A state change is underway in the job; as such, the state cannot be changed. An implementation may use this return code to indicate the job cannot be suspended, killed, or terminated at all or in the current phase of execution.

Table 8 – RequestStateChange( ) method: Parameters

Qualifiers	Name	Type	Description
IN	RequestedState	uint16	For the purposes of this profile, the valid states can be requested as defined in this subclause.
IN	TimeoutPeriod	datetime	A timeout period that specifies the maximum amount of time that the client expects the transition to the new state to take. The interval format must be used to specify the TimeoutPeriod. A value of 0 or a Null parameter indicates that the client has no time requirements for the transition. If this property does not contain 0 or Null and the implementation does not support this parameter, a return code of 4098 (Use of Timeout Parameter Not Supported) shall be returned.

8.5.2 ListenOnPortIF()

The ListenOnPortIF( ) method shall be supported when the CIM_WBEMProtocolServiceCapabilities.ListeningPortManagementSupported property has a value of True.

The ListenOnPortIF( ) method is used to configure ports on which the protocol represented by the CIM_ProtocolService instance will listen. Detailed requirements of the ListenOnPortIF( ) method are specified in Table 9 and Table 10.

Table 9 – ListenOnPortIF() method: Return code values

Return Code Values	Description
0	Request was successfully executed.
1	Method is unsupported in the implementation.
2	Error occurred
0x1000	Job started: REF returned to started CIM_ConcreteJob

Table 10 – ListenOnPortIF() method: Parameters

Qualifiers	Name	Type	Description/Values
IN	IPEndpoint	CIM_IPProtocolEndpoint REF	Optional reference to the specific CIM_IPProtocolEndpoint instance to which the created CIM_TCPProtocolEndpoint instance will be bound
OUT	TCPEndpoint	CIM_TCPProtocolEndpoint REF	CIM_TCPProtocolEndpoint instance that is created if the method is successful
IN, REQ	PortNumber	uint16	Desired port number for the service to listen on
IN, REQ	ProtocolIFTyp e	uint32	Desired IF Type(e.g. HTTPS, HTTP …) to listen for

8.6 CIM_HostedDependency

Table 11 lists implementation requirements for operations. If implemented, these operations shall be implemented as defined in DSP0200. In addition, and unless otherwise stated in Table 11, all operations in the default list in 8.1 shall be implemented as defined in DSP0200.

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

Table 11 – Operations: CIM_HostedDependency

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

8.7 CIM_ServiceServiceDependency

Table 12 lists implementation requirements for operations. If implemented, these operations shall be implemented as defined in DSP0200. In addition, and unless otherwise stated in Table 12, all operations in the default list in 8.1 shall be implemented as defined in DSP0200.

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

Table 12 – Operations: CIM_ServiceServiceDependency

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

8.8 CIM_HostedService (WBEMServer)

Table 13 lists implementation requirements for operations. If implemented, these operations shall be implemented as defined in DSP0200. In addition, and unless otherwise stated in Table 13, all operations in the default list in 8.1 shall be implemented as defined in DSP0200

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

Table 13 – Operations: CIM_HostedService (WBEMServer)

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

8.9 CIM_HostedService (ProtocolService)

Table 14 lists implementation requirements for operations. If implemented, these operations shall be implemented as defined in DSP0200. In addition, and unless otherwise stated in Table 14, all operations in the default list in 8.1 shall be implemented as defined in DSP0200

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

Table 14 – Operations: CIM_HostedService (ProtocolService)

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

8.10 CIM_WBEMServerCapabilities

All operations in the default list in 8.1 shall be implemented as defined in DSP0200.

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

8.11 CIM_ElementCapabilities (WBEMServerCapabilities)

Table 16 lists implementation requirements for operations. If implemented, these operations shall be implemented as defined in DSP0200. In addition, and unless otherwise stated in Table 15, all operations in the default list in 8.1 shall be implemented as defined in DSP0200

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

Table 15 – Operations: CIM_ElementCapabilities (WBEMServerCapabilities)

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None

Operation	Requirement	Messages
References	Unspecified	None
ReferenceNames	Unspecified	None

8.12 CIM_WBEMProtocolServiceCapabilities

All operations in the default list in 8.1 shall be implemented as defined in DSP0200.

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

8.13 CIM_ElementCapabilities (WBEMProtocolServiceCapabilities)

Table 16 lists implementation requirements for operations. If implemented, these operations shall be implemented as defined in DSP0200. In addition, and unless otherwise stated in Table 16, all operations in the default list in 8.1 shall be implemented as defined in DSP0200

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

Table 16 – Operations: CIM_ElementCapabilities (WBEMProtocolServiceCapabilities)

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

8.14 CIM_TCPProtocolEndpoint

All operations in the default list in 8.1 shall be implemented as defined in DSP0200.

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

8.15 CIM_ServiceAccessBySAP

Table 17 lists implementation requirements for operations. If implemented, these operations shall be implemented as defined in DSP0200. In addition, and unless otherwise stated in Table 17, all operations in the default list in 8.1 shall be implemented as defined in DSP0200

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

Table 17 – Operations: CIM_ServiceAccessBySAP

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

8.16 CIM_HostedAccessPoint (TCPProtocolEndpoint)

Table 18 lists implementation requirements for operations. If implemented, these operations shall be implemented as defined in DSP0200. In addition, and unless otherwise stated in Table 18, all operations in the default list in 8.1 shall be implemented as defined in DSP0200

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

Table 18 – Operations: CIM_HostedAccessPoint (TCPProtocolEndpoint)

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

8.17 CIM_BindsTo

Table 19 lists implementation requirements for operations. If implemented, these operations shall be implemented as defined in DSP0200. In addition, and unless otherwise stated in Table 19, all operations in the default list in 8.1 shall be implemented as defined in DSP0200

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

Table 19 – Operations: CIM_BindsTo

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

8.18 CIM_CIMXMLCapabilities

All operations in the default list in 8.1 shall be implemented as defined in DSP0200.

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

8.19 CIM_WSManagementCapabilities

All operations in the default list in 8.1 shall be implemented as defined in DSP0200.

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

9 Use cases (Informative)

This clause provides informative use cases and object diagrams.

The following diagrams will be used to illustrate some of the use cases.

Figure 2 represents a WBEM server that supports a single namespace (interop) and a single WBEM protocol (CIM-XML). Only the relevant instances for the use case are shown, many of the mandatory instances are not in the diagram for readability.

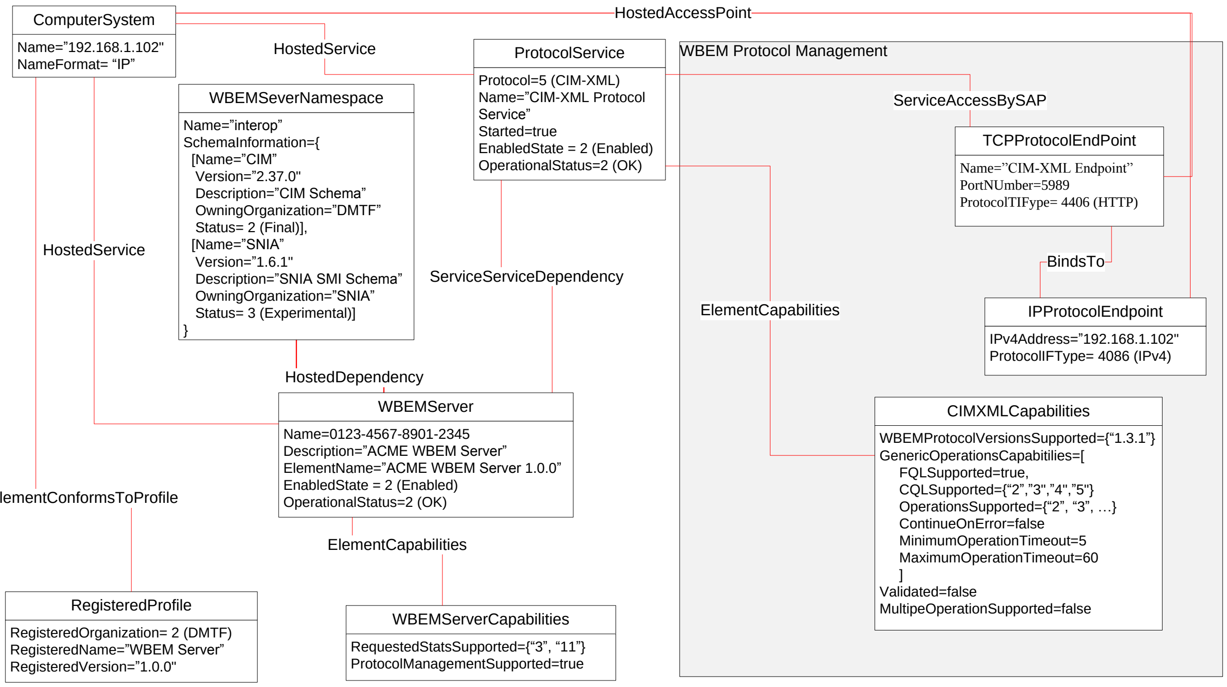

Figure 2 – WBEM Server Profile: Instance diagram

Figure 3 represents an instance diagram of a WBEM server that supports two WBEM protocols (CIM-XML and WS-Management), each listening on two ports; one for HTTP and one for HTTPS. All the protocols are bound to the same IP Address. Only the relevant instances for the use case are shown, many of the mandatory instances are not in the diagram for readability.

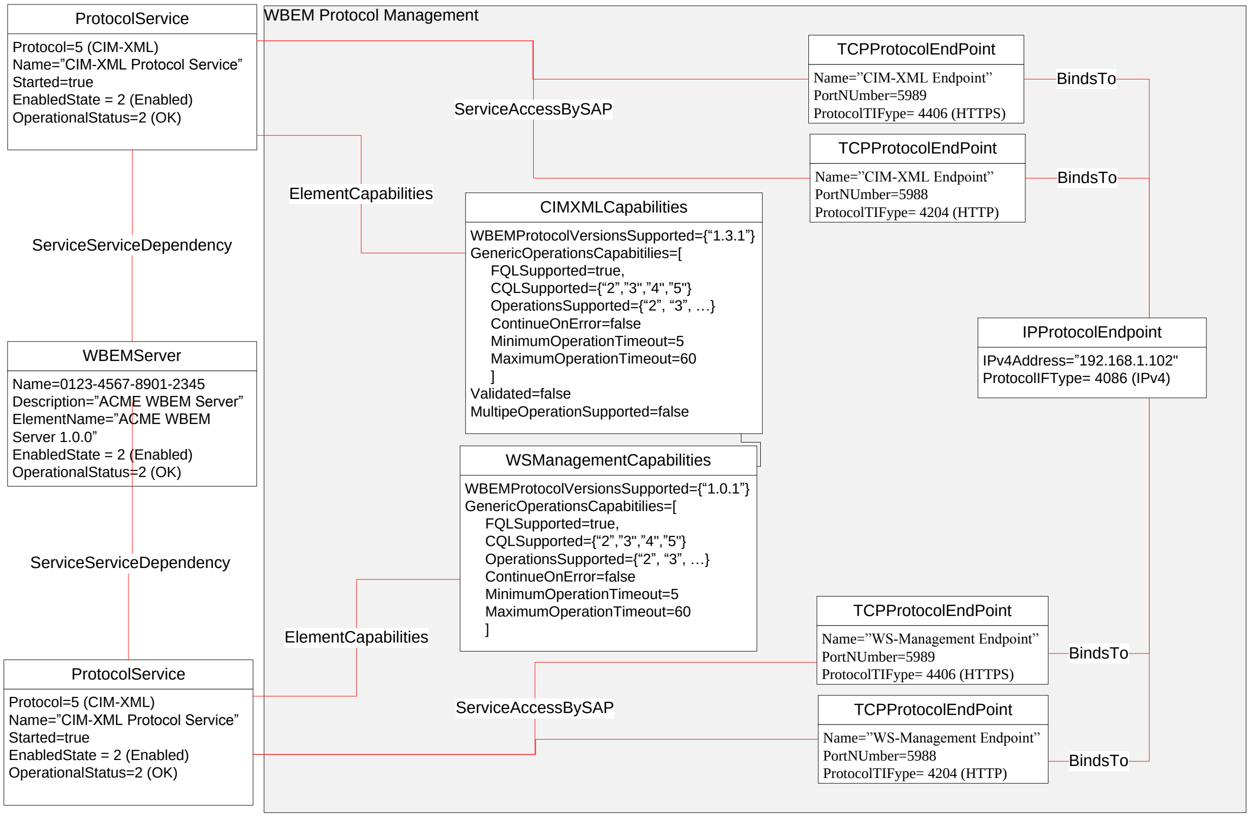
ProtocolService
Protocol=5 (CIM-XML)
Name="CIM-XML Protocol Service"
Started=true
EnabledState = 2 (Enabled)
OperationalStatus=2 (OK)
WBEM Protocol Management
ServiceAccessBySAP
TCPProtocolEndPoint
Name="CIM-XML Endpoint"
PortNUmber=5989
ProtocolTIFype= 4406 (HTTPS)
BindsTo
TCPProtocolEndPoint
Name="CIM-XML Endpoint"
PortNUmber=5988
ProtocolTIFype= 4204 (HTTP)
BindsTo
ElementCapabilities
CIMXMLCapabilities
WBEMProtocolVersionsSupported={"1.3.1"}
GenericOperationsCapabitilies=[
FQLSupported=true,
CQLSupported={"2","3","4","5"}
OperationsSupported={"2", "3", …}
ContinueOnError=false
MinimumOperationTimeout=5
MaximumOperationTimeout=60
]
Validated=false
MultipeOperationSupported=false
ServiceServiceDependency
IPProtocolEndpoint
IPv4Address="192.168.1.102"
ProtocolIFType= 4086 (IPv4)
WBEMServer
Name=0123-4567-8901-2345
Description="ACME WBEM Server"
ElementName="ACME WBEM Server 1.0.0"
EnabledState = 2 (Enabled)
OperationalStatus=2 (OK)
WSManagementCapabilities
WBEMProtocolVersionsSupported={"1.0.1"}
GenericOperationsCapabitilies=[
FQLSupported=true,
CQLSupported={"2","3","4","5"}
OperationsSupported={"2", "3", …}
ContinueOnError=false
MinimumOperationTimeout=5
MaximumOperationTimeout=60
]
ServiceServiceDependency
ElementCapabilities
TCPProtocolEndPoint
Name="WS-Management Endpoint"
PortNUmber=5989
ProtocolTIFype= 4406 (HTTPS)
BindsTo
ProtocolService
Protocol=5 (CIM-XML)
Name="CIM-XML Protocol Service"
Started=true
EnabledState = 2 (Enabled)
OperationalStatus=2 (OK)
ServiceAccessBySAP
TCPProtocolEndPoint
Name="WS-Management Endpoint"
PortNUmber=5988
ProtocolTIFype= 4204 (HTTP)
BindsTo

Figure 3 – WBEM Server Profile: Instance diagram with multiple WBEM protocols

9.1 Determine the namespaces of a WBEM server

A WBEM server may contain one or more namespaces. The interop namespace is mandatory. A client may retrieve all namespaces supported and optionally information about each namespace.

1) Starting from the central instance of the profile, traverse the HostedService association (with a result class of CIM_WBEMServer) to get the instance that represents the WBEM server
2) From the CIM_WBEMServer instance, traverse the HostedDependency association to get the instance(s) of CIM_WBEMServerNamespace. Each instance represents a namespace that exists. The value of the name property is the name of the namespace.

9.2 Determine the contents of a namespace

A namespace may contain multiple schemas. The following steps will describe how a client determines the contents of a namespace.

1) Use 9.1 to retrieve the namespace instance(s)
2) The CIM_WBEMServerNamespace.SchemaInformation property contains an array of structures that represent the information in the namespace. A namespace may contain multiple schemas (e.g. CIM, SNIA, ACME). An example of what an entry may look like for the DMTF CIM Schema 2.37.0 is below.

Property Name	Value

Property Name	Value
Name	CIM
Version	2.37.0
Description	CIM 2.37.0 Schema
URI	http://schemas.dmtf.org/wbem/cim-schemas
OwningOrganization	DMTF
Status	2 (Final)

9.3 Modify WBEMServerNamespace to update what is represented

The schema contained in a namespace may change over time. For example, the schema may be upgraded to a newer version or a new extension schema is added. An installation program that installs new extension schema in a namespace should update the WBEMServerNamespace instance that represents the namespace to include the information for this new extension schema. The following steps describe one way to accomplish this task.

1) Use 9.1 to retrieve the namespace instance(s)
2) Find the instance that has the Name property value that matches the namespace
3) Using the instance from step 2, and a CIM_SchemaInformationStructure structure instance that represents the information for the extension schema added and use the ModifyInstance operation to apply the changes.

9.4 Determine the WBEM protocols supported and state

1) Starting from the central instance of the profile, traverse the CIM_HostedService association, with a result class of CIM_WBEMServer, to retrieve the instance that represents the WBEM server
2) Traverse the CIM_ServiceServiceDependency association starting from the CIM_WBEMServer instance with a result class of CIM_ProtocolService.
   a. For each instance returned, view the Protocol property value for the id that represents the name of the protocol supported.
   b. To determine the state of the protocol, view the EnabledState property value. For example, if the value is 2 (Enabled), the protocol is available to accept requests and issue responses.

9.5 Determine the port used for a WBEM protocol

Support for WBEM protocol management is optional.

1) Starting from the central instance of the profile, traverse the CIM_HostedService association (with a result class of CIM_WBEMServer) to retrieve the instance that represents the WBEM server
2) Traverse the CIM_ServiceServiceDependency association starting from the CIM_WBEMServer instance with a result class of CIM_ProtocolService to retrieve the instance(s) that represent the WBEM protocol(s) supported.
3) Traverse the CIM_ServiceAccessBySAP association with a result class of CIM_TCPProtocolEndpoint to retrieve the instance(s) that represent the endpoint and port.

9.6 Determine the IP address for a WBEM protocol

Support for WBEM protocol management is optional.

1) Starting from the central instance of the profile, traverse the CIM_HostedService association (with a result class of CIM_WBEMServer) to retrieve the instance that represents the WBEM server
2) Traverse the CIM_ServiceServiceDependency association starting from the CIM_WBEMServer instance with a result class of CIM_ProtocolService to retrieve the instance(s) that represent the WBEM protocol(s) supported.
3) Traverse the CIM_ServiceAccessBySAP association with a result class of CIM_TCPProtocolEndpoint to retrieve the instance(s) that represent the endpoint and port. View the CIM_TCPProtocolEndpoint.PortNumber property to see the port that this endpoint is listening on.
4) Traverse the CIM_BindTo association with a result class of CIM_IPProtocolEndpoint. The instance(s) of CIM_IPProtocolEndpoint returned will have a value for either the IPv4Address and/or IPv6Address properties.

9.7 Determine the capabilities of a WBEM protocol

1) Starting from the central instance of the profile, traverse the CIM_HostedService association (with a result class of CIM_WBEMServer) to retrieve the instance that represents the WBEM server
2) Traverse the CIM_ServiceServiceDependency association starting from the CIM_WBEMServer instance with a result class of CIM_ProtocolService to retrieve the instance(s) that represent the WBEM protocol(s) supported. If a specific protocol is desired, filter on the CIM_ProtocolService.Protocol property value.
3) Using the instance(s) from the previous step, traverse the CIM_ElementCapabilities association with a result class of CIM_WBEMProtocolServiceCapabilities. The capabilities include the version(s) of the protocol supported as well as the list of operations supported. Some protocols may have subclasses of CIM_WBEMProtocolServiceCapabilities to provide profile specific capabilities, for example CIM_CIMXMLCapapbilities and CIM_WSManagementCapabilities.

9.8 Modify the port for a WBEM protocol

1) Starting from the central instance of the profile, traverse the CIM_HostedService association (with a result class of CIM_WBEMServer) to retrieve the instance that represents the WBEM server
2) Traverse the CIM_ServiceServiceDependency association starting from the CIM_WBEMServer instance with a result class of CIM_ProtocolService to retrieve the instance(s) that represent the WBEM protocol(s) supported. . If a specific protocol is desired, filter on the CIM_ProtocolService.Protocol property value.
3) Using the instance(s) from the previous step, traverse the CIM_ElementCapabilities association with a result class of CIM_WBEMProtocolServiceCapabilities. Support for WBEM protocol management is optional. If the value of the CIM_WBEMProtocolServiceCapabilities.ListeningPortManagementSupported is True, port modification is supported.
4) Using the CIM_ProtocolService instance(s) from step 2, invoke the ListenOnPortIF() method with the desired port. An implementation may allow listening on multiple ports or only a single port per protocol interface (e.g. HTTP, HTTPS, …). In other words, if you invoke this method, it may remove the old port and replace it with the new port or may add the new port as an additional port. To determine this, a client can follow the steps in 9.5.

9.9 Disable/Enable a WBEM protocol

A WBEM server may support one or more protocols. An administrator may enable or disable a WBEM protocol. The following describe the steps to enable a WBEM protocol. To disable a protocol, follow the same steps changing the RequestedState parameter to 3 (Disable).

1) Starting from the central instance of the profile, traverse the CIM_HostedService association (with a result class of CIM_WBEMServer) to retrieve the instance that represents the WBEM server

2) Traverse the CIM_ServiceServiceDependency association starting from the CIM_WBEMServer instance with a result class of CIM_ProtocolService to retrieve the instance(s) that represent the WBEM protocol(s) supported. . If a specific protocol is desired, filter on the CIM_ProtocolService.Protocol property value.
3) Support for the RequestStateChange() method is conditional. A client can determine if the RequestStateChange() method is supported by using the instance(s) from the previous step, traverse the CIM_ElementCapabilities association with a result class of CIM_WBEMProtocolServiceCapabilities and determine if the value of the CIM_WBEMProtocolServiceCapabilities.RequestedStatesSupported property has the value of the desired RequestedState.
4) Using the instance(s) from Step 2, invoke the CIM_ProtocolService.RequestStateChange() method with the RequestedState parameter value set to 2 (Enable).
5) If the return value of the method is 0 (Completed with No Error), then the protocol was enabled. If the return value of the method is 4096, a job was started – see the *Job Control Profile* (DSP1103) for information on jobs.

9.10 Reset the WBEM server

The WBEM server may be reset using the following steps.

1) Starting from the central instance of the profile, traverse the CIM_HostedService association (with a result class of CIM_WBEMServer) to get the instance that represents the WBEM server
2) Using the instance of CIM_WBEMServer traverse the CIM_ElementCapabilities association with a result class of CIM_WBEMServerCapabilities
3) This behavior is optional. If the CIM_WBEMServerCapabilities.RequestedStatesSupported includes the value 11 (Reset), the server supports being reset.
4) Invoke the CIM_WBEMServer.RequestStateChange() method with the RequestedState parameter value set to 11 (Reset).
5) If the return value of the method is 0 (Completed with No Error), then the WBEM server will shut down (it may take some amount of time for the WBEM server to shut down all services) and restart. If the return value of the method is 4096, a job was started – see the *Job Control Profile* (DSP1103) for information on jobs.

9.11 Shut down the WBEM server

The WBEM server may be shut down using the following steps.

1) Starting from the central instance of the profile, traverse the CIM_HostedService association (with a result class of CIM_WBEMServer) to get the instance that represents the WBEM server
2) Using the instance of CIM_WBEMServer traverse the CIM_ElementCapabilities association with a result class of CIM_WBEMServerCapabilities
3) This behavior is optional. If the CIM_WBEMServerCapabilities.RequestedStatesSupported includes the value 4 (Shut Down), the server supports being shut down.
4) Invoke the RequestStateChange() method with the RequestedState parameter value set to 4 (Shut Down).
5) If the return value of the method is 0 (Completed with No Error), then the WBEM server will shut down (it may take some amount of time for the WBEM server to shut down all services). If the return value of the method is 4096, a job was started – see the *Job Control Profile* (DSP1103) for information on jobs.

10 CIM elements

Table 20 shows the instances of CIM elements for this profile. Instances of the CIM elements shall be implemented as described in Table 20. Clauses 7 (“Implementation”) and 8 (“Methods”) may impose additional requirements on these elements.

Table 20 – CIM Elements: WBEM Server Profile

Element name	Requirement	Description
Classes		
CIM_BindsTo	Optional	See 10.1.
CIM_CIMXMLCapabilities	Conditional	See 10.2 and 7.4.1.4.1.
CIM_ComputerSystem	Mandatory	See 10.3.
CIM_ConcreteJob	Optional	See 10.4.
CIM_ElementCapabilities (WBEMServerCapabilities)	Mandatory	See 10.5.
CIM_ElementCapabilities (WBEMProtocolServiceCapabilities)	Conditional	See 10.6 and 7.4.1.
CIM_ElementConformsToProfile	Mandatory	See 10.7.
CIM_GenericOperationCapabilitiesStructure	See embedding element.	See 10.8.
CIM_HostedAccessPoint	Conditional	See 10.9 and 7.4.2.
CIM_HostedAccessPoint (TCPProtocolEndpoint)	Conditional	See 10.10.
CIM_HostedDependency	Mandatory	See 10.11.
CIM_HostedService (WBEMServer)	Mandatory	See 10.12.
CIM_HostedService (ProtocolService)	Mandatory	See 10.13.
CIM_IPProtocolEndPoint	Optional	See 10.14.
CIM_ProtocolService	Mandatory	See 10.15.
CIM_RegisteredProfile	Mandatory	See 10.16.
CIM_SchemaInformationStructure	See embedding element.	See 10.17.
CIM_ServiceAccessBySAP	Conditional	See 10.18 and 7.4.2.
CIM_ServiceServiceDependency	Mandatory	See 10.19.
CIM_TCPProtocolEndpoint	Conditional	See 10.20 and 7.4.2.
CIM_WBEMProtocolServiceCapabilities	Conditional	See 10.21 and 7.4.1.
CIM_WBEMServer	Mandatory	See 10.22.
CIM_WBEMServerCapabilities	Mandatory	See 10.23.
CIM_WBEMServerNamespace	Mandatory	See 10.24.
CIM_WSManagementCapabilities	Conditional	See 10.25 and 7.4.1.4.2.
Indications		
None		

10.1 CIM_BindsTo

CIM_BindsTo represents an association between a ProtocolEndPoint and a ServiceAccessPoint. Table 21 contains the requirements for elements of this class.

Table 21 – Class: CIM_BindsTo

Elements	Requirement	Notes
Antecedent	Mandatory	Key: Shall reference the instance of CIM_ProtocolEndpoint.
Dependent	Mandatory	Key: Shall reference the instance of CIM_ServiceAccessPoint.

10.2 CIM_CIMXMLCapabilities

CIM_BindsTo represents an association between a ProtocolEndPoint and a ServiceAccessPoint. Table 21 contains the requirements for elements of this class.

Table 22 – Class: CIM_CIMXMLCapabilities

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ElementName	Mandatory	None
RequestedStatesSupported	Mandatory	See 7.4.1.2
MaxConnections	Mandatory	A value of 0 (zero) shall indicate unknown
ProtocolVersionSupported	Mandatory	None
GenericOperationCapabilities	Mandatory	See 10.8
AuthenticationMechansimsSupported	Mandatory	None
MultipleOperationsSupported	Mandatory	None
Validated	Mandatory	None

10.3 CIM_ComputerSystem

The requirements denoted in Table 23 are in addition to those mandated by the *Computer System Profile* (DSP1052).

Table 23 – Class: CIM_ComputerSystem

Elements	Requirement	Notes
CreationClassName	Mandatory	**Key**
Name	Mandatory	**Key**
NameFormat	Mandatory	None

10.4 CIM_ConcreteJob

There are no additional requirements than to those mandated by the *Job Control Profile* (DSP1103).

10.5 CIM_ElementCapabilities (WBEMServerCapabilities)

CIM_ElementCapabilities represents an association between a CIM_WBEMServer and its capabilities. Table 25 Table 24 contains the requirements for elements of this class.

Table 24 – Class: CIM_ElementCapabilities (WBEMServerCapabilities)

Elements	Requirement	Notes
ManagedElement	Mandatory	**Key:** Shall reference the instance of CIM_WBEMServer.
Capabilities	Mandatory	**Key:** Shall reference the instance of CIM_WBEMServerCapabilities.
Characteristics	Mandatory	Matches 3

10.6 CIM_ElementCapabilities (WBEMProtocolServiceCapabilities)

CIM_ElementCapabilities represents an association between a CIM_ProtocolService and its capabilities. Table 25 contains the requirements for elements of this class.

Table 25 – Class: CIM_ElementCapabilities (WBEMProtocolServiceCapabilities)

Elements	Requirement	Notes
ManagedElement	Mandatory	**Key:** Shall reference the instance of CIM_ProtocolService.
Capabilities	Mandatory	**Key:** Shall reference the instance of CIM_WBEMProtocolServiceCapabilities.
Characteristics	Mandatory	Matches 3

10.7 CIM_ElementConformsToProfile

The requirements denoted in Table 26 are in addition to those mandated by the *Profile Registration Profile* (DSP1033).

Table 26 – Class: CIM_ElementConformsToProfile

Elements	Requirement	Notes
ManagedElement	Mandatory	**Key:** Shall reference the instance of CIM_ComputerSystem.
ConformantStandard	Mandatory	**Key:** Shall reference the instance of CIM_RegisteredProfile.

10.8 CIM_GenericOperationCapabilitiesStructure

The CIM_GenericOperationCapabilitiesStructure is a structure that describes the capabilities for Generic Operations based on the *Generic Operations* (DSP0223) specification.

Table 27 – Class: CIM_GenericOperationCapabilitiesStructure

Elements	Requirement	Notes
FQLSupported	Mandatory	None
CQLSupport	Mandatory	None
OperationsSupported	Mandatory	None
OperationsSupportedDescriptions	Conditional	Mandatory when OperationsSupported has 1 (Other)
ContinueOnErrorSupported	Conditional	See 7.4.1.3.1
MinimumOperationTimeout	Conditional	See 7.4.1.3.2
MaximumOperationTimeeout	Conditional	See 7.4.1.3.3

10.9 CIM_HostedAccessPoint

There are no additional requirements than to those mandated by the *IP Interface Profile* (DSP1036).

10.10 CIM_HostedAccessPoint (TCPProtocolEndpoint)

CIM_HostedAccessPoint represents an association between the computer system and the TP protocol endpoints. Table 28 contains the requirements for elements of this class.

Table 28 – Class: CIM_HostedAccessPoint (TCPProtocolEndpoint)

Elements	Requirement	Notes
Antecedent	Mandatory	**Key:** Shall reference the instance of CIM_ComputerSystem (the central instance of this profile).
Dependent	Mandatory	**Key:** Shall reference the instance of CIM_TCPProtocolEndpoint.

10.11 CIM_HostedDependency

CIM_HostedDependency associates the CIM_WBEMServerNamespace instances with the CIM_WBEMServer. Table 29 contains the requirements for elements of this class.

Table 29 – Class: CIM_HostedDependency

Elements	Requirement	Notes
Antecedent	Mandatory	**Key:** Shall reference the instance of CIM_WBEMServer
Dependent	Mandatory	**Key:** Shall reference the instance of CIM_WBEMServerNamespace.

10.12 CIM_HostedService (WBEMServer)

CIM_HostedService (WBEMServer) associates the CIM_ComputerSystem and CIM_WBEMServer. Table 30 contains the requirements for elements of this class.

Table 30 – Class: CIM_HostedService (WBEMServer)

Elements	Requirement	Notes
Antecedent	Mandatory	**Key:** Shall reference the instance of CIM_ComputerSystem (the central instance of this profile).
Dependent	Mandatory	**Key:** Shall reference the instance of CIM_WBEMServer.

10.13 CIM_HostedService (ProtocolService)

CIM_HostedService (ProtocolService) associates the CIM_ComputerSystem and CIM_ProtocolService. Table 31 contains the requirements for elements of this class.

Table 31 – Class: CIM_HostedService (ProtocolService)

Elements	Requirement	Notes
Antecedent	Mandatory	**Key:** Shall reference the instance of CIM_ComputerSystem (the central instance of this profile).
Dependent	Mandatory	**Key:** Shall reference the instance of CIM_ProtocolService.

10.14 CIM_IPProtocolEndpoint

There are no additional requirements than to those mandated by the *IP Interface Profile* (DSP1036).

10.15 CIM_ProtocolService

CIM_ProtocolService represents a WBEM protocol. Table 32 contains the requirements for elements of this class.

Table 32 – Class: CIM_ProtocolService

Elements	Requirement	Notes
SystemCreationClassName	Mandatory	**Key**
SystemName	Mandatory	**Key**
CreationClassName	Mandatory	**Key**
Name	Mandatory	**Key**
Protocol	Mandatory	None
MaxConnections	Mandatory	A value of 0 (zero) shall indicate unknown
RequestedState	Mandatory	See 7.3.1
EnabledState	Mandatory	See 7.3.2

Elements	Requirement	Notes
HealthState	Mandatory	None
OperationalStatus	Mandatory	None
ElementName	Mandatory	None
RequestStateChange()	Conditional	See 8.5.1
ListenOnPortIF()	Conditional	See 8.5.2

10.16 CIM_RegisteredProfile

The requirements denoted in Table 33 are in addition to those mandated by the *Profile Registration Profile* (DSP1033).

Table 33 – Class: CIM_RegisteredProfile

Properties	Requirement	Notes
RegisteredName	Mandatory	This property shall have a value of "WBEM Server".
RegisteredVersion	Mandatory	This property shall have a value of "1.0.0h".
RegisteredOrganization	Mandatory	This property shall have a value of 2 (DMTF).

10.17 CIM_SchemaInformationStructure

The CIM_SchemaInformationStructure is a structure that describes the schema information that may be contained in a namespace.

Table 34 – Class: CIM_SchemaInformationStructure

Elements	Requirement	Notes
Name	Mandatory	None
Version	Mandatory	None
Description	Optional	None
URI	Optional	None
OwningOrganization	Mandatory	None
Status	Optional	None

10.18 CIM_ServiceAccessBySAP

CIM_ServiceAccessBySAP represents an association between a CIM_ProtocolService and the CIM_ServiceAccessPoint(s). Table 35 contains the requirements for elements of this class.

Table 35 – Class: CIM_ServiceAccessBySAP

Elements	Requirement	Notes
Antecedent	Mandatory	**Key:** Shall reference the instance of CIM_ProtocolService that has this CIM_ServiceAccessPoint.

Elements	Requirement	Notes
Dependent	Mandatory	**Key:** Shall reference the instance of CIM_ServiceAccessPoint.

10.19 CIM_ServiceServiceDependency

CIM_ServiceServiceDependency associates the CIM_WBEMServer instance with the CIM_ProtocolService instances. Table 36 contains the requirements for the elements of this class.

Table 36 – Class: CIM_ServiceServiceDependency

Elements	Requirement	Notes
Antecedent	Mandatory	**Key:** Shall reference the instance of CIM_WBEMServer.
Dependent	Mandatory	**Key:** Shall reference an instance of CIM_ProtocolService.
TypeOfDependency	Mandatory	Value shall be 3
RestartService	Mandatory	Value shall be False

10.20 CIM_TCPProtocolEndpoint

CIM_TCPProtocolEndpoint represents a protocol endpoint used for communications. Table 37 contains the requirements for elements of this class.

Table 37 – Class: CIM_TCPProtocolEndpoint

Elements	Requirement	Notes
Name	Mandatory	**Key**
CreationClassName	Mandatory	**Key**
SystemName	Mandatory	**Key**
SystemCreationClassName	Mandatory	**Key**
PortNumber	Mandatory	None
ProtocolIFType	Mandatory	None
NameFormat	Mandatory	Pattern “.*”
ElementName	Mandatory	Pattern “.*”

10.21 CIM_WBEMProtocolServiceCapabilities

CIM_WBEMProtocolServiceCapabilities represents the capabilities for a CIM_ProtocolService. Table 38 contains the requirements for elements of this class.

Table 38 – Class: CIM_WBEMProtocolServiceCapabilities

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ElementName	Mandatory	None

Elements	Requirement	Notes
ListeningPortManagementSupported	Mandatory	See 7.4.1.1
RequestedStatesSupported	Mandatory	See 7.4.1.2
MaxConnections	Mandatory	A value of 0 (zero) shall indicate unknown
ProtocolVersionSupported	Mandatory	None
GenericOperationCapabilities	Mandatory	See 10.7
AuthenticationMechanismsSupported	Mandatory	None
AuthenticationMechanismsDescriptions	Conditional	Mandatory when AuthenticationMechanismsSupports has the value 1

10.22 CIM_WBEMServer

CIM_WBEMServer represents the WBEM server as a service running on a system. Table 39 contains the requirements for elements of this class.

Table 39 – Class: CIM_WBEMServer

Elements	Requirement	Notes
SystemCreationClassName	Mandatory	**Key**
SystemName	Mandatory	**Key**
CreationClassName	Mandatory	**Key**
Name	Mandatory	**Key**
RequestedState	Mandatory	See 7.1.2
EnabledState	Mandatory	See 7.1.3
HealthState	Mandatory	None
OperationalStatus	Mandatory	None
ElementName	Mandatory	None
RequestStateChange()	Conditional	See 8.3.1
CreateWBEMServerNameSpace()	Conditional	See 8.3.2

10.23 CIM_WBEMServerCapabilities

CIM_WBEMServerCapabilities represents the capabilities for a WBEM server. Table 40 contains the requirements for elements of this class.

Table 40 – Class: CIM_WBEMServerCapabilities

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
OperationsSupported	Optional	See 7.1.1.1
RequestedStatesSupported	Optional	See 7.1.1.2

10.24 CIM_WBEMServerNamespace

CIM_WBEMServerNamespace represents the namespaces of the WBEM server. Table 41 contains the requirements for elements of this class.

Table 41 – Class: CIM_WBEMServerNamespace

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
Name	Mandatory	See 7.2.1
SchemaInformation	Mandatory	See 10.17
ElementName	Mandatory	None

10.25 CIM_WSManagementCapabilities

CIM_BindsTo represents an association between a ProtocolEndPoint and a ServiceAccessPoint. Table 21 contains the requirements for elements of this class.

Table 42 – Class: CIM_WSManagementCapabilities

Elements	Requirement	Notes
InstanceID	Mandatory	**Key**
ElementName	Mandatory	None
RequestedStatesSupported	Mandatory	See 7.4.1.2
MaxConnections	Mandatory	A value of 0 (zero) shall indicate unknown
ProtocolVersionSupported	Mandatory	None
GenericOperationCapabilities	Mandatory	See 10.7
AuthenticationMechansimsSupported	Mandatory	None
XPathFeatures	Mandatory	None

ANNEX A
(informative)

Change log

Version	Date	Author	Description
1.0.0a	2013-01-29	Jim Davis	Released as Work in Progress
1.0.0g	2013-08-22	Jim Davis	Released as Work in Progress, with the following changes: • Update SchemaInformationStructure table per WG discussion.