

[MS-WSMV]: Web Services Management Protocol Extensions for Windows Vista

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Revision Summary

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1 Introduction

This document describes Windows Vista extensions to the WS-Management Protocol, as specified in [\[DMTF-DSP0226\]](#), the WS-Management Common Information Model (CIM) Binding Specification, as specified in [\[DMTF-DSP0227\]](#), and the WS-CIM Mapping Specification, as specified in [\[DMTF-DSP0230\]](#), for accessing **CIM objects** as a Web **service**.

1.1 Glossary

The following terms are defined in [\[MS-GLOS\]](#):

Server
Universally Unique Identifier (UUID)

The following terms are specific to this document:

Action URI: Identifies which operation needs to be carried out against a **resource**.

Client: The **client** application using the WS-Management Protocol to access the management **service**, on the local computer or a remote computer.

CIM Class: A **CIM object** that represents a **CIM class** definition as a **CIM object**. It is the template representing a **manageable entity** with a set of **properties** and methods.

CIM Instance: An instantiation of a **CIM class** representing a **manageable entity**.

CIM Method: An operation describing the behavior of a **CIM class** or a **CIM instance**. It is generally an action that can be performed against the **manageable entity** made up of a **CIM class**.

CIM Namespace: A logical grouping of a set of **CIM classes** designed for the same purpose or sharing a common management objective within the database used to store all **CIM class** definitions.

CIM Object: Refers to a **CIM class** or a **CIM instance**.

CIM Path: In the context of this document, a string expression locating a class or an instance of class in the operating system. The **CIM path** includes the computer name, the namespace, the **CIM class** name, and the unique identifier locating the **CIM class** or **CIM instance**.

CIM Relative Path: A string expression where the computer and/or the namespace of the **CIM class** and/or **CIM instance** elements are not used.

Collector: In the context of events, the consumer of the event.

Common Information Model (CIM): The **DMTF** model that describes how to represent real-world computer and network objects. **CIM** uses an object-oriented paradigm, where managed objects are modeled using the concepts of classes and instances. For more information, see [\[DMTF-DSP004\]](#).

Custom-Remote Shell: Refers to any shell besides the default Windows Command Shell configured, manipulated, and invoked by the client.

Distributed Management Task Force (DMTF): The industry organization developing management standards and integration technology for Enterprise and Internet environments.

Endpoint: A **resource** that can be addressed by an **endpoint reference**.

Endpoint Reference (EPR): A combination of [\[WSAddressing\]](#) and WS-Management addressing elements that together describe an address for a **resource** in the message **SOAP** header.

Manageable Entity: A **CIM instance** representing a manageable component of an operating system.

Managed Object Format (MOF): A language-based on Interface Definition Language (IDL) that describes management information. The **MOF** syntax is a method for describing object definitions in textual form. The **MOF** compiler processes a **MOF** file and adds the required object definitions to the **CIM** repository.

Property: A name/value pair that describes a unit of data for a class. **Property** values must have a valid **Managed Object Format (MOF)** data type.

Publisher: In the context of events, the source of event generation.

Publisher-Initiated Event Subscriptions: Publisher-initiated event subscription is an alternative approach to collector-initiated subscription, where the publisher initiates the subscription process, instead of the collector.

Qualifier: A metadata item, as specified in [\[DMTF-DSP004\]](#) section 4.5.4, consisting of a simple name, a type, a value, and a "flavor" (that is, a propagation rule for the **qualifier**).

Resource: An **endpoint** that represents a distinct type of management operation or value. A **service** exposes one or more **resources**, and some **resources** can have more than one instance. For example, the Win32_LogicalDisk class represents a **resource**; Win32_LogicalDisk="C:\" is a specific instance of that **resource**.

Resource URI: The **Uniform Resource Identifier (URI)** used to identify a specific type of **resource**, such as disks or processes, on a system.

Selector: A name/value pair that represents a particular instance of a **resource**; essentially a filter or "key" that identifies the desired instance of the **resource**.

Service: An application that provides management **services** to **clients** through the WS-Management Protocol and other Web **services**.

SOAP: Simple Object Access Protocol. An XML-based protocol used by Web **services**. For more information, see [\[SOAP1.2/1\]](#).

Uniform Resource Identifier (URI): A string that identifies a **resource**. The **URI** is the Web **service** addressing mechanism defined in Internet Engineering Task Force (IETF) **Uniform Resource Identifier (URI): Generic Syntax** [\[RFC3986\]](#).

Windows Management Instrumentation (WMI): The Microsoft implementation of the Web-Based Enterprise Management (WBEM) standard published by **Distributed Management Task Force (DMTF)**. **WMI** allows an administrator to manage local and remote computers and models computer and network objects by using an extension of the **Common Information Model (CIM)** standard.

WMI Provider: An add-on to WMI that maps topic-specific information into the CIM for uniform representation in WMI.

MAY, SHOULD, MUST, SHOULD NOT, MUST NOT: These terms (in all caps) are used as described in [\[RFC2119\]](#). All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

1.2 References

1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information. Please check the archive site, <http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624>, as an additional source.

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1.3 Protocol Overview (Synopsis)

Web Services Management Protocol Extensions for Windows Vista are a set of additions and modifications to the [Web Services for Management \(WS-Management\)](#) protocol (as specified in [\[DMTF-DSP0226\]](#)), the WS-Management CIM Binding specification (as specified in [\[DMTF-DSP0227\]](#)), and the WS-CIM Mapping specification (as specified in [\[DMTF-DSP0230\]](#)) for compatibility with Windows Vista and Windows Server 2008.

WS-Management is a remote management protocol that can be used for managing software and hardware components and is specified in [\[DMTF-DSP0226\]](#).

The WS-Management protocol can provide remote access to **Common Information Model (CIM)** objects, as specified in [\[DMTF-DSP004\]](#). The Web Services Management Protocol Extensions for Windows Vista service exposes a set of entities that can be managed as objects with attributes and methods. Web Services Management Protocol Extensions for Windows Vista **clients** perform management tasks by issuing object operations against objects exposed by the Web Services Management Protocol Extensions for Windows Vista service.

The CIM management schema provides a standard framework and set of base classes that describe a managed environment. Each type of managed entity is described by a **CIM Class**, and individual entities are managed through instances of the appropriate CIM Class. For example, a logical disk drive may be managed through an instance of the CIM_DiskDrive class. This class contains various member **properties** such as Name, DeviceID, and Status. For a system with multiple storage devices, the CIM_DiskDrive class will contain one instance for each storage device on the system. The CIM_DiskDrive class may also be sub-classed to add platform-specific properties such as the drive letter used on the Windows platform. CIM Class definitions are similar to class definitions in other object-oriented database systems and object-oriented programming languages.

CIM-based management in a Web services environment requires that the CIM schema (classes, properties, and methods) be rendered in both XML schema and the [Web Services Description Language \(WSDL\)](#). To achieve this, the CIM must be mapped to [WSDL](#) and XML Schema via a translation or mapping algorithm. The WS-CIM Mapping Specification, as specified in [\[DMTF-DSP0230\]](#), defines the normative rules and recommendations that describe the structure of the XML Schema, [WSDL](#) fragments, and metadata fragments corresponding to the elements of CIM models. The WS-CIM Mapping Specification also defines the representation of **CIM Instances** as XML instance documents.

The WS-Management CIM Binding specification (as specified in [\[DMTF-DSP0227\]](#)) describes how to name and access CIM entities by using the WS-Management protocol. To query the status of managed entities, the WS-Management protocol is used to retrieve their CIM Instances by using operations such as Get and Enumerate. Updates to managed entities are sent by using the WS-Management Put operation. To invoke a **CIM Method**, a WS-Management protocol custom method is used.

Web Services Management Protocol Extensions for Windows Vista include the following sets of changes to the WS-Management protocol, the WS-Management CIM Binding specification, and the WS-CIM Mapping specification:

- New element tags for vendor-extensible tags.
- Unsupported Actions and Actions with only limited support.
- New data types for configuration of Web Services Management Protocol Extensions for Windows Vista service and clients. [<1><2><3>](#)
- Custom Remote Shell.
- Publisher-Initiated Event Subscription.
- Event Security.

1.4 Relationship to Other Protocols

WS-Management Protocol MUST use **SOAP** (as specified in [\[SOAP1.2/1\]](#)) over HTTP or HTTPS for communication. [WS-Management](#) MUST be used as the transport to provide access to CIM data by

using binding techniques, as specified in [\[DMTF-DSP0227\]](#), and mapping techniques, as specified in [\[DMTF-DSP0230\]](#).

The [Windows Management Instrumentation Remote Protocol](#) is an alternative network protocol for accessing CIM data on servers.

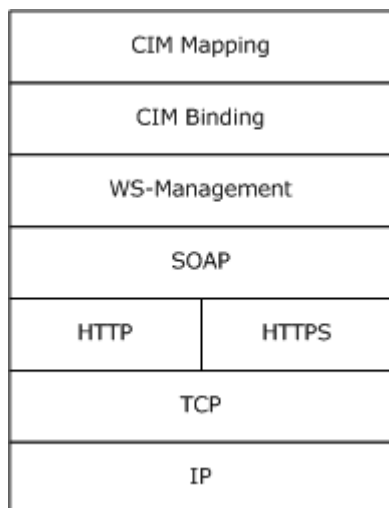


Figure 1: The Windows Management Instrumentation Remote Protocol network protocol stack

The [WS-Management](#) protocol layer defines management abstraction by using Web Services/SOAP technology. The CIM Binding layer defines the protocol binding to the [SOAP](#) layer, and the CIM Mapping layer defines XML schema for CIM classes, WSDL, and Metadata fragments.

1.5 Prerequisites/Preconditions

For a client that uses the [WS-Management](#) protocol, as specified in [\[DMTF-DSP0226\]](#), to communicate with a server, the server MUST have an operational SOAP1.2/HTTP1.1/TCP/IP stack. [WS-Management](#) operates on the assumption that the system already has an IP address and is therefore able to communicate on the network. It also assumes that the client has already obtained the IP address and HTTP port of the server, for example, through manual configuration.

1.6 Applicability Statement

Web Services Management Protocol Extensions for Windows Vista is a protocol for accessing CIM objects to remotely administer software and hardware configuration.

1.7 Versioning and Capability Negotiation

The WS-Management Protocol defines a simple request called Identity to facilitate the process of finding the protocol version or versions supported by the service. [<4>](#)

1.8 Vendor-Extensible Fields

Web Services Management Protocol Extensions for Windows Vista does not define any vendor-extensible fields.

1.9 Standards Assignments

The following table shows the standard XML namespaces used within this protocol and the alias (prefix) used in the remaining sections of this protocol specification.

Prefix	XML namespace	Specification
s	http://www.w3.org/2003/05/soap-envelope	As specified in [SOAP1.2/1]
xs	http://www.w3.org/2001/XMLSchema	As specified in [XMLSCHEMA1] and [XMLSCHEMA2]
xsi	http://www.w3.org/2001/XMLSchema-instance	As specified in [XMLSCHEMA1]
a	http://schemas.xmlsoap.org/ws/2004/08/addressing	As specified in [WSAddressing] section 1.2.
w	http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd	As specified in [DMTF-DSP0226] section 1.5.
wsmid	http://schemas.dmtf.org/wbem/wsman/identify/1/wsmanidentity.xsd	As specified in [DMTF-DSP0226] section 8.
wsmanfault	http://schemas.dmtf.org/wbem/wsman/1/wsman/fault	As specified in Fault Detail (section 2.2.1.1) .
cim	http://schemas.dmtf.org/wbem/wsman/1/base	As specified in [DMTF-DSP0230] section 5.3.

Web Services Management Protocol Extensions for Windows Vista uses the following as the XML namespaces for configuration, client authentication, certification mapping, and all other complex types of Web Services Management Protocol Extensions for Windows Vista service:

- <http://schemas.microsoft.com/wbem/wsman/1/config>
- <http://schemas.microsoft.com/wbem/wsman/1/config/client>
- <http://schemas.microsoft.com/wbem/wsman/1/config/service>
- <http://schemas.microsoft.com/wbem/wsman/1/config/service/certmapping>
- <http://schemas.microsoft.com/wbem/wsman/1/config/listener>
- <http://schemas.microsoft.com/wbem/wsman/1/subscription>
- <http://schemas.microsoft.com/wbem/wsman/1/windows/shell>
- <http://schemas.microsoft.com/wbem/wsman/1/config/winrs/customremoteshell>
- <http://schemas.microsoft.com/wbem/wsman/1/machineid>

2 Messages

The following sections specify how Web Services Management Protocol Extensions for Windows Vista are transported and common data types.

2.1 Transport

Messages MUST be transported over the Hypertext Transfer Protocol (HTTP) or Hypertext Transfer Protocol Secure (HTTPS).

2.2 Message Syntax

The syntax for the messages in the WS-Management Protocol is specified in [\[DMTF-DSP0226\]](#). Web Services Management Protocol Extensions for Windows Vista defines new data types.

2.2.1 Common Data Types

This section describes the common data types that MUST be used by the Web Services Management Protocol Extensions for Windows Vista service.

2.2.1.1 Fault Detail

A SOAP fault is used to carry error information within a SOAP message. Faults are returned when the SOAP message is successfully delivered by the transport and processed by the service, but the message cannot be processed properly.

The WS-Management Protocol defines an extensibility model that allows a service to include additional fault information in the s:Detail element. The Web Services Management Protocol Extensions for Windows Vista defines WSMANFault for reporting additional fault information. The schema for WSMANFault MUST be as follows:

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:wsmanfault="http://schemas.microsoft.com/ws/2005/06/wsmanfault"
  targetNamespace="http://schemas.microsoft.com/ws/2005/06/wsmanfault"
  elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:simpleType name="GUIDType">
    <xs:restriction base="xs:string">
      <xs:pattern value="
[0-9a-fA-F]{8}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{4}-[0-9a-fA-F]{12}"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:complexType name="WSMANFaultType">
    <xs:sequence>
      <xs:element name="Message" type="wsmanfault:MessageType"
        minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="Code" type="xs:unsignedInt" use="required"/>
    <xs:attribute name="Machine" type="xs:string" use="required"/>
    <xs:anyAttribute processContents="lax"/>
  </xs:complexType>
  <xs:element name="WSMANFault" type="wsmanfault:WSMANFaultType"/>
  <xs:complexType name="ProviderFaultType" mixed="true">
    <xs:sequence>
      <xs:any processContents="lax" minOccurs="0"
        maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="providerId" type="wsmanfault:GUIDType"/>
    <xs:anyAttribute processContents="lax"/>
  </xs:complexType>
```



```

</xs:complexType>
<xs:complexType name="MessageType" mixed="true">
  <xs:sequence>
    <xs:element name="ProviderFault"
      type="wsmanfault:ProviderFaultType"
      minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
</xs:schema>

```

Code: An integer that contains an implementation-specific error code. [<5>](#)

Machine: A string that MUST specify the machine name where this fault occurred.

Message: Message is a complex type that allows mixed content. It can contain a sequence of elements of type ProviderFault and text that contains a user-friendly description of the fault. No restrictions are placed on content or format of the descriptive text. Each ProviderFault element contains **resource**-specific fault information. ProviderFault can contain a sequence of elements of xs:any type.

The Web Services Management Protocol Extensions for Windows Vista service MUST include either a Message element of xs:string type that contains a user-friendly description of the error or a ProviderFault element that MUST contain a WSMANFault element of type WSMANFault. This WSMANFault element MUST contain a Message element that is of xs:string type that contains a user-friendly description of the error. The language of the text SHOULD correspond to the language specified in the xml:lang attribute in the Text element, as defined in [\[DMTF-DSP0226\]](#) section 11.2.

ProviderFault: Element that MUST contain specific resource provider fault information.

providerId: A GUID element that MUST contain the identifier of the resource provider that generated the fault on the Web Services Management Protocol Extensions for Windows Vista service.

2.2.2 CIM Data Types

This section describes CIM-related data types that are used by the Web Services Management Protocol Extensions for Windows Vista service.

2.2.2.1 DateTime

The CIM specification defines the DateTime type for specifying a time stamp (point in time) or an interval. If it specifies a time stamp, it allows preservation of the time zone offset. In both cases, DateTime allows specification of varying precision of the date and time information. WS-CIM mapping specification, as specified in [\[DMTF-DSP0230\]](#) section 6.1, defines cim:cimDateTime type for mapping DateTime to XML. [<6>](#)

2.2.3 Shell Complex Type

The **Shell data type** describes the body element of the wfx:Create message (for more information, see section [3.4.1.1](#)) and defines information required to properly initialize the targeted shell. This data type is used to create both Windows Command Shell and Custom Remote Shell. The element has several predefined elements and ends with an open content model, so additional resource-specific initialization can be provided by using a single XML element of arbitrary structure from another XML namespace.

The XML namespace URI that MUST be used by implementations for all Shell Data types is <http://schemas.microsoft.com/wbem/wsman/1/windows/shell>:

```
<xs:complexType name="Shell">
  <xs:sequence>
    <xs:element name="ShellId"
      type="xs:anyURI"
      minOccurs="0"
    />
    <xs:element name="Environment"
      minOccurs="0"
    >
      <xs:complexType>
        <xs:sequence
          maxOccurs="unbounded"
        >
          <xs:element name="Variable"
            type="EnvironmentVariable"
          />
        </xs:sequence>
      </xs:complexType>
    </xs:element>
    <xs:element name="WorkingDirectory"
      type="xs:string"
      nillable="false"
      minOccurs="0"
    />
    <xs:element name="Lifetime"
      type="xs:duration"
      minOccurs="0"
    />
    <xs:element name="IdleTimeout"
      type="xs:duration"
      minOccurs="0"
    />
    <xs:element name="InputStreams"
      type="StreamNameList"
      minOccurs="0"
    />
    <xs:element name="OutputStreams"
      type="StreamNameList"
      minOccurs="0"
    />
    <xs:any
      minOccurs="0"
      maxOccurs="unbounded"
      namespace="##other"
    />
  </xs:sequence>
</xs:complexType>
```

Child Elements

Element	Type	Description
ShellId	xs:anyURI	An xs:anyURI value that identifies the shell. An optional element used in the wxf:GetResponse message (for more information, see section 3.4.1.15).
Environment	N/A	
Variable	EnvironmentVariable	The starting set of environment variables that the shell will use. If omitted, the environment is indicated. Each environment variable MUST be individually defined. For more information, see section 2.2.3.1 .
WorkingDirectory	xs:string	An xs:string value that MUST contain the starting directory that the shell should use for initialization.
Lifetime	xs:duration	An optional quota setting to control the total shell lifetime. The shell MAY become invalid once this time limit is reached and no other commands may be issued.
IdleTimeout	xs:duration	An optional idle time-out for the shell. The service MUST close and terminate the shell instance if it is idle for this much time. If the shell is reused within this time limit, the countdown timer is reset once the command sequence is completed.
InputStreams	StreamNameList	A simple token list of all input streams the client will be using during execution. The only supported stream is "stdin". There is no requirement that the client make use of it. However, the client MUST NOT later attempt to send a named stream "stdin" if it is not specified in the wxf:Create message. For example, if the client knows that "stdin" will not be used during the session, the client can specify an empty rsp:InputStreams element or omit it entirely. However, if the client anticipates that the "stdin" stream may be used, it MUST include the name in the list. If it is specified, there is no requirement that the client actually use it during the session.
OutputStreams	StreamNameList	A simple token list of all output streams expected by the client. The supported streams are "stdout" and "stderr". There is no requirement that the client make all of them available output streams. For example, if the client only needs "stdout" during the session, it can list "stdout" as the sole stream of interest. If a stream is specified, there is no requirement that the client actually use it during the session.

In addition to the preceding standardized initialization parameters, the open content model for the rsp:Shell body allows individual shells to have any additional XML content required for initialization.[<7>](#)

2.2.3.1 EnvironmentVariable Complex Type

This type extends the xs:string type to describe individual environment variables that MAY be set when the new shell is initialized.

```
<xs:complexType name="EnvironmentVariable">
  <xs:simpleContent>
    <xs:extension
```

```

        base="xs:string"
      >
        <xs:attribute name="Name"
          type="xs:string"
          use="required"
        />
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>

```

Attributes

Name	Type
Name	xs:string

2.2.3.2 CommandLine Complex Type

This type describes the structure of the command line and its arguments. It is used as the body element of the Command message (for more information, see section [3.4.1.5](#)).

```

<xs:complexType name="CommandLine">
  <xs:sequence>
    <xs:element name="Command"
      type="xs:string"
    />
    <xs:element name="Arguments"
      minOccurs="0"
      maxOccurs="unbounded"
    >
      <xs:simpleType>
        <xs:restriction
          base="xs:string"
        />
      </xs:simpleType>
    </xs:element>
  </xs:sequence>
</xs:complexType>

```

Child Elements

Element	Type	Description
Command	xs:string	This is a required string that MUST contain the name of the command to be executed without any arguments. The latter are encoded separately. The syntax of the command is specific to Cmd.exe.
Arguments	N/A	If the command requires no arguments, this element may be omitted. If more than one argument is required, multiple elements are included. Each element MUST contain a string value of a single command argument. Because many command processors use characters that are XML reserved characters, it is important to observe correct XML reserved character escape sequences. This is

Element	Type	Description
		particularly important because the "<" and ">" characters (reserved in XML) are often used for I/O redirection in Cmd.exe, so these MUST be replaced with their "escaped" XML equivalents "<" or ">".

2.2.3.3 CommandStateType Complex Type

This type describes the status of the executing command (for more information, see [Receive Response \(section 3.4.1.11\)](#)).

```
<xs:complexType name="CommandStateType">
  <xs:sequence>
    <xs:element name="ExitCode"
      minOccurs="0"
      >
      <xs:simpleType>
        <xs:restriction
          base="xs:integer"
        />
      </xs:simpleType>
    </xs:element>
  </xs:sequence>
  <xs:attribute name="CommandId"
    type="xs:anyURI"
    use="required"
  />
  <xs:attribute name="State"
    type="CommandStateEnumeration"
  />
</xs:complexType>
```

Child Elements

Element	Type	Description
ExitCode	N/A	This optional element MUST contain a shell processor specific exit code. <8>

Attributes

Name	Type	Description
CommandId	xs:anyURI	Attribute indicating the identity of the command for which status is being reported.
State	CommandStateEnumeration	This required attribute MUST contain the specific state of the command for which status is being reported and MUST be one of the following values: <ul style="list-style-type: none"> http://schemas.microsoft.com/wbem/wsmman/1/windows/shell/CommandState/Done http://schemas.microsoft.com/wbem/wsmman/1/windows/shell/CommandState/Pending

Name	Type	Description
		<ul style="list-style-type: none"> http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CommandState/Running

2.2.3.4 CommandResponse Complex Type

This type defines the format the s:Body element of the server response message upon successful processing of the Command message (for more information, see [CommandResponse \(section 3.4.1.6\)](#)).

```
<xs:complexType name="CommandResponse">
  <xs:sequence>
    <xs:element name="CommandId"
      type="xs:anyURI"
    />
  </xs:sequence>
</xs:complexType>
```

Child Elements

Element	Type
CommandId	xs:anyURI

2.2.3.5 StreamType Complex Type

The **StreamType Complex Type** describes a block of base64-encoded stream data sent or received via the Remote Shell Protocol. For a command to execute, one or many of such blocks may be sent or received. Depending on the command, the shell processor may receive and/or return ANSI data, Unicode data, or encodings specific to the command being executed.

```
<xs:complexType name="StreamType">
  <xs:simpleContent>
    <xs:extension
      base="xs:base64binary"
    >
      <xs:attribute name="Name"
        type="StreamName"
        use="required"
      />
      <xs:attribute name="CommandId"
        type="xs:anyURI"
        use="optional"
      />
      <xs:attribute name="End"
        type="xs:boolean"
        use="optional"
      />
      <xs:attribute name="Unit"
        type="xs:anyURI"
        use="optional"
      />
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
```

```

    />
    <xs:attribute name="EndUnit"
      type="xs:boolean"
      use="optional"
    />
  </xs:extension>
</xs:simpleContent>
</xs:complexType>

```

Attributes

Name	Type	Description
Name	StreamName	Required attribute that MUST contain the name of the stream.
CommandId	xs:anyURI	This optional attribute indicates that the stream relates to a currently executing command and if present MUST be the one returned in the CommandResponse message. If absent, the stream relates directly to the shell processor, not to the command in progress.
End	xs:boolean	This optional attribute MUST be set to "true" to indicate that the stream is ending and that no more content will occur for this stream for the currently executing command. This MUST not be used for streams tied to the shell processor itself.
Unit	xs:anyURI	This optional attribute indicates the beginning of the logical record. This attributes may appear alone on the Stream element, or may appear in combination with encoded data. If it appears alone, it indicates that the unit of transmission identified by the URI value is about to begin. Any subsequent data within the same stream is considered to be part of the unit and the attribute need not reappear.
EndUnit	xs:boolean	This optional attribute indicates the end of above mentioned Unit attribute. It is especially useful in case of nested Unit.

2.2.3.6 Send Complex Type

This type describes the input data blocks sent to the server. It is used as the s:Body element of the Send message (for more information, see [Send](#)).

```

<xs:complexType name="Send">
  <xs:sequence>
    <xs:element name="Stream"
      type="StreamType"
      minOccurs="1"
      maxOccurs="unbounded"
    />
  </xs:sequence>
</xs:complexType>

```

Child Elements

Element	Type	Description
Stream	StreamType	MUST include at least one element of the StreamType, as specified in StreamType Complex Type .

2.2.3.7 SendResponse Complex Type

This type defines the format of the s:Body element of the server response message which is sent after successful processing of the Send message.

```
<xs:complexType name="SendResponse">
  <xs:sequence>
    <xs:element name="DesiredStream"
      type="StreamType"
      minOccurs="0"
    />
  </xs:sequence>
</xs:complexType>
```

Child Elements

Element	Type	Description
DesiredStream	StreamType	This Optional element allows the shell processor to request input from a particular stream. If this is omitted, then the shell processor will accept input from any stream.

2.2.3.8 Receive Complex Type

This type describes the output data blocks received from the server. It is used as the s:Body element of the Receive message (for more information, see [Receive](#)).

```
<xs:complexType name="Receive">
  <xs:sequence>
    <xs:element name="DesiredStreams"
      type="StreamNameList"
      minOccurs="1"
    />
  </xs:sequence>
</xs:complexType>
```

Child Elements

Element	Type	Description
DesiredStreams	StreamNameList	MUST include at least one element of the StreamType defined in StreamType Complex Type .

2.2.3.9 ReceiveResponse Complex Type

This type defines the format of the s:Body element of the server response message. The server response message is sent after successful processing of the [Receive](#) message (for more information, see [ReceiveResponse](#)).

```
<xs:complexType name="ReceiveResponse">
  <xs:sequence>
    <xs:element name="Stream"
      type="StreamType"
      minOccurs="1"
      maxOccurs="unbounded"
    />
    <xs:element name="CommandState"
      type="CommandStateType"
      minOccurs="0"
    />
  </xs:sequence>
  <xs:attribute name="SequenceID"
    type="xs:unsignedLong"
    use="optional"
  />
</xs:complexType>
```

Child Elements

Element	Type	Description
Stream	StreamType	MUST include at least one element of the StreamType, as specified in StreamType Complex Type .
CommandState	CommandStateType	Reports the status of the executing command. For more information, see section 2.2.3.3 .

Attributes

Name	Type	Description
SequenceID	xs:unsignedLong	This optional attribute is reserved for future use and SHOULD be ignored.

2.2.3.10 Signal Complex Type

This type describes the signal values that are used to control the execution of the specific commands or of the shell processor itself. It defines the format of the s:Body element of the Signal message (For more information, see [Signal](#)).

```
<xs:complexType name="Signal">
  <xs:sequence>
    <xs:element name="Code"
      type="SignalCodeEnumeration"
    />
  </xs:sequence>
```



```

<xs:attribute name="CommandId"
  type="xs:anyURI"
  use="optional"
/>
</xs:complexType>

```

Child Elements

Element	Type	Description
Code	SignalCodeEnumeration	<p>This required element MUST contain the control code being sent to the shell or to a specific command. The value MUST be one of the following URIs:</p> <ul style="list-style-type: none"> http://schemas.microsoft.com/wbem/wsmman/1/windows/shell/signal/ctrl_c <p>This value indicates the shell MUST attempt to terminate any currently running command or commands and return to an idle state and represents the behavior of Control-C.</p> <ul style="list-style-type: none"> http://schemas.microsoft.com/wbem/wsmman/1/windows/shell/signal/ctrl_break <p>This value represents the behavior Control-Break. While most of the tools do not differentiate between Control-Break and Control-C some handle them as separate and different signals. The underlying implementation should take whatever steps are necessary to ensure that the running command can process Control-Break separately from Control-C.</p> <ul style="list-style-type: none"> http://schemas.microsoft.com/wbem/wsmman/1/windows/shell/signal/Terminate <p>This control code is sent by the client to acknowledge receipt of the end of the command output from the service and to clean up any resources associated with command execution. Because the service may have to cache this information until it knows the client has received the entire stream, the client MUST send this before a new command can be executed.</p>

Attributes

Name	Type	Description
CommandId	xs:anyURI	This optional attribute directs the signal to a specific command instead of the shell. If present it MUST be the one returned in the CommandResponse message. This is used when terminating individual commands.

2.2.3.11 SignalResponse Complex Type

This type defines the format of the s:Body element of the server response message which is sent after successful processing of the Signal message.

```

<xs:complexType name="SignalResponse">
  <xs:sequence>
    <xs:any
      minOccurs="0"
      maxOccurs="unbounded"
      namespace="##other"
    />
  </xs:sequence>
</xs:complexType>

```

2.2.4 Configuration Data Types

This section defines the data types used for configuring the Web Services Management Protocol Extensions for Windows Vista service.

2.2.4.1 Common Configuration Data Types

This section defines the common data types that are used for configuring the Web Services Management Protocol Extensions for Windows Vista service running on a system that supports Web Services Management Protocol Extensions for Windows Vista.

2.2.4.1.1 ConfigType

ConfigType is the container for Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista configuration data. Note that listeners are not part of this configuration and need to be retrieved separately. The schema MUST be as shown as the following:

```

<xs:schema xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://schemas.microsoft.com/wbem/wsman/1/config"
  elementFormDefault="qualified">
  <xs:element name="Config" type="cfg:ConfigType"/>
  <xs:complexType name="ConfigType">
    <xs:sequence>
      <xs:element name="MaxEnvelopeSizekb"
        type="xs:unsignedInt" default="50"/>
      <xs:element name="MaxTimeoutms" type="xs:unsignedInt"
        default="60000"/>
      <xs:element name="MaxBatchItems" type="xs:unsignedInt"
        default="20"/>
      <xs:element name="MaxProviderRequests"
        type="xs:unsignedInt" default="25"/>
      <xs:element name="Client" type="cfg:ClientType"/>
      <xs:element name="Service" type="cfg:ServiceType"/>
      <xs:element name="Winrs" type="cfg:WinrsType"/>
    </xs:sequence>
  </xs:complexType>
</xs:schema>

```

MaxEnvelopeSizekb: Maximum SOAP data in KB. The minimum value MUST be 8. The maximum value MUST be 4294967295. This configuration setting is used when processing the wsman:MaxEnvelopeSize header, as specified in [wsman:MaxEnvelopeSize \(section 3.1.5.1.8\)](#).

MaxTimeoutms: The maximum time-out in milliseconds that MUST be used for any request except for Pull requests. The minimum value MUST be 500. The maximum value MUST be 4294967295. This configuration setting is used when processing the wsman:OperationTimeout header, as specified in [wsman:OperationTimeout \(section 3.1.5.1.7\)](#).

MaxBatchItems: The maximum number of elements that MUST be used in a Pull response. The minimum value MUST be 1. The maximum value MUST be 4294967295. This configuration setting is used when processing Pull messages, as specified in [wsen:Filter \(section 3.1.5.2.1\)](#).

MaxProviderRequests: The maximum number of concurrent requests that MUST be allowed by the Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista. The minimum value MUST be 1. The maximum value MUST be 4294967295. The limit is applied per provider. The categories include CIM and configuration. This configuration setting is used when processing messages, as specified in [Concurrent Operations \(section 3.1.5.4.1\)](#).

Client: MUST contain additional elements to configure Web Services Management Protocol Extensions for Windows Vista clients, as specified in [Client Configuration Data Types \(section 2.2.4.2\)](#).

Service: MUST contain additional elements to configure the Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista, as specified in [Server Configuration Data Types \(section 2.2.4.3\)](#).

2.2.4.2 Client Configuration Data Types

This section defines the data types used for configuring Web Services Management Protocol Extensions for Windows Vista clients.

2.2.4.2.1 ClientType Complex Type

ClientType is the overall container for the Web Services Management Protocol Extensions for Windows Vista client configuration. The schema MUST be as shown:

```
<xs:complexType name="ClientType">
  <xs:sequence>
    <xs:element name="NetworkDelaysms"
      type="xs:unsignedInt"
      default="5000"
    />
    <xs:element name="URIPrefix"
      type="xs:string"
      default="wsman"
    />
    <xs:element name="AllowUnencrypted"
      type="xs:boolean"
      default="false"
    />
    <xs:element name="Auth"
      type="cfg:ClientAuthType"
    />
    <xs:element name="DefaultPorts"
```

```

        type="cfg:ClientDefaultPortsType"
      />
    <xs:element name="TrustedHosts"
      type="xs:string"
    />
  </xs:sequence>
</xs:complexType>

```

Child Elements

Element	Type	Description
NetworkDelaysms	xs:unsignedInt	Extra time in milliseconds that the Web Services Management Protocol Extensions for Windows Vista client MUST wait to accommodate for network delay time. The minimum value MUST be 500. The maximum value MUST be 4294967295.
URIPrefix	xs:string	Default URI suffix that MUST be used by Web Services Management Protocol Extensions for Windows Vista clients when sending requests. MUST NOT be blank. MUST be a string containing only the following characters: a-zA-Z9-0_/. MUST NOT start with or end with "/".
AllowUnencrypted	xs:boolean	Contains a setting that allows the Web Services Management Protocol Extensions for Windows Vista client to send requests by using an authentication scheme and transport that does not encrypt the request and response, such as Digest over HTTP. Used when sending messages as specified in section 3.1.5.5.2 .
Auth	cfg:ClientAuthType	Contains additional elements to configure authentication schemes, as specified in ClientAuthType Complex Type .
DefaultPorts	cfg:ClientDefaultPortsType	Contains additional elements to configure the default ports used when sending request messages, as specified in ClientDefaultPortsType Complex Type .
TrustedHosts	xs:string	<p>Contains a hostnames to which the Web Services Management Protocol Extensions for Windows Vista clients are allowed to send requests by using an authentication scheme and transport that does not allow the client to authenticate the service, such as Basic over HTTP. The specified hostnames may be either DNS names or IP addresses. TrustedHosts MUST be one of three possible values:</p> <ul style="list-style-type: none"> Blank: No hosts are trusted. The asterisk "*" character: All hosts are trusted. A list of host name patterns separated by the comma "," character, in which each host name

Element	Type	Description
		<p>can be one of four possible values:</p> <ul style="list-style-type: none"> String starting with the asterisk "*" character and containing at least two characters: All hosts that share the suffix are trusted. String ending with the asterisk "*" character and containing at least two characters: All hosts that share the prefix are trusted. The exact string "<local>": All NetBIOS names are trusted (for example, strings that do not contain the period "." character). A string without the asterisk "*" character: The host named by the string is trusted. <p>Used when sending messages as specified in section 3.1.5.5.2.</p>

2.2.4.2.2 ClientAuthType Complex Type

ClientAuthType MUST be used to configure the authentication mechanisms that are enabled or disabled on the Web Services Management Protocol Extensions for Windows Vista client.

These configuration settings are used when sending messages as specified in section [3.1.5.5.2](#).

```

<xs:complexType name="ClientAuthType">
  <xs:sequence>
    <xs:element name="Basic"
      type="xs:boolean"
      default="false"
    />
    <xs:element name="Digest"
      type="xs:boolean"
      default="false"
    />
    <xs:element name="Kerberos"
      type="xs:boolean"
      default="false"
    />
    <xs:element name="Negotiate"
      type="xs:boolean"
      default="false"
    />
    <xs:element name="Certificate"
      type="xs:boolean"
      default="false"
    />
  </xs:sequence>
</xs:complexType>

```

Child Elements

Element	Type	Description
Basic	xs:boolean	Enables or disables Basic Authentication (as specified in RFC2617 section 2).
Digest	xs:boolean	Enables or disables Digest Authentication (as specified in RFC2617 section 3).
Kerberos	xs:boolean	Enables or disables Kerberos Authentication (as specified in RFC4559 section 4).
Negotiate	xs:boolean	Enables or disables Negotiate Authentication (as specified in RFC4559 section 4).
Certificate	xs:boolean	Enable or disable Certificate Authentication (as specified in RFC2246 section 7.4.4).

2.2.4.2.3 ClientDefaultPortsType Complex Type

ClientDefaultPortsType MUST be used to configure the default ports used by the Web Services Management Protocol Extensions for Windows Vista client with each network transport.

```
<xs:complexType name="ClientDefaultPortsType">
  <xs:sequence>
    <xs:element name="HTTP"
      type="xs:unsignedInt"
      default="80"
    />
    <xs:element name="HTTPS"
      type="xs:unsignedInt"
      default="443"
    />
  </xs:sequence>
</xs:complexType>
```

Child Elements

Element	Type	Description
HTTP	xs:unsignedInt	Port used by the client when using the HTTP protocol. Minimum value: 1. Maximum value: 65535.
HTTPS	xs:unsignedInt	Port used by the client when using the HTTP protocol. Minimum value: 1. Maximum value: 65535.

2.2.4.3 Server Configuration Data Types

This section defines the data types that are used for configuring the Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista.

2.2.4.3.1 ServiceType

ServiceType is the overall container for the Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista configuration. Note that listeners are not part of this container and need to be retrieved separately.

```
<xs:schema xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://schemas.microsoft.com/wbem/wsman/1/config"
  elementFormDefault="qualified">
  <xs:element name="Service" type="cfg:ServiceType"/>
  <xs:complexType name="ServiceType">
    <xs:sequence>
      <xs:element name="RootSDDL" type="xs:string"
        default="O:NSG:BAD:P(A;;GA;;;BA)S:P(AU;FA;GA;;;WD)
(AU;SA;GWGX;;;WD)"/>
      <xs:element name="MaxConcurrentOperations"
        type="xs:unsignedInt"
        default="100"/>
      <xs:element name="EnumerationTimeoutms" type="xs:unsignedInt"
        default="60000"/>
      <xs:element name="MaxConnections" type="xs:unsignedInt"
        default="5"/>
      <xs:element name="AllowUnencrypted" type="xs:boolean"
        default="false"/>
      <xs:element name="Auth" type="cfg:ServiceAuthType"/>
      <xs:element name="DefaultPorts"
        type="cfg:ServiceDefaultPortsType"/>
      <xs:element name="IPv4Filter" type="xs:string"/>
      <xs:element name="IPv6Filter" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
</xs:schema>
```

RootSDDL: The security descriptor controls remote access to the listener. The string format of RootSDDL uses the syntax defined by the Security Descriptor Definition Language (as specified in [\[MS-DTYP\]](#) section 2.2.6). This configuration setting is used when processing messages, as specified in [Security Considerations for Implementers \(section 5.1\)](#).

MaxConcurrentOperations: The maximum number of concurrent Enumeration operations allowed. Minimum value: 1. Maximum value: 4294967295. This configuration setting is used when processing messages, as specified in section [3.1.5.4.1](#).

EnumerationTimeoutms: The idle time-out in milliseconds between Pull messages. Minimum value: 500. Maximum value: 4294967295. This configuration setting is used when processing messages, as specified in section [3.1.5.5.2.2](#).

MaxConnections: Maximum number of active requests that the service can process simultaneously. Minimum value: 1. Maximum value: 50. This configuration setting is used when processing messages, as specified in Concurrent Operations (section 3.1.5.4.1).

AllowUnencrypted: Contains a setting that allows the Web Services Management Protocol Extensions for Windows Vista client to send requests by using an authentication scheme and transport that does not encrypt the request and response, such as Digest over HTTP. Used when processing messages as specified in section [3.1.5.5.3](#).

Auth: Contains additional elements to configure authentication schemes, as specified in section [2.2.4.3.2](#).

DefaultPorts: Contains additional elements to configure the default ports used when creating a listener.

IPv4Filter: The IPv4 addresses that can be used by listeners. May be one of three possible values:

- Blank: No IPv4 addresses can be used.
- The asterisk "*" character: Any IPv4 address can be used.
- A list of IP ranges in which the ranges are separated by a comma "," character and each range is a pair of IPv4 addresses in dotted-decimal format separated by a hyphen "-" character and the smaller value occurs first in the pair. Indicates that any IP address in the given ranges may be used. Ranges are inclusive.

Used when processing messages, as specified in section [3.1.5.5.3](#).

IPv6Filter: The IPv6 addresses that can be used by listeners. May be one of three possible values:

- Blank: No IPv6 addresses can be used.
- The asterisk "*" character: Any IPv6 address can be used.
- A list of IP ranges in which the ranges are separated by a comma "," character and each range is a pair of IPv6 addresses in colon-hexadecimal format separated by a hyphen "-" character and the smaller value occurs first in the pair. Indicates that any IP address in the given ranges may be used. Ranges are inclusive.

Used when processing messages, as specified in section [3.1.5.5.3](#).

2.2.4.3.2 ServiceAuthType

ServiceAuthType MUST be used to configure the authentication mechanisms that are enabled or disabled on the Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista.

```
<xs:schema xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://schemas.microsoft.com/wbem/wsman/1/config"
  elementFormDefault="qualified">
  <xs:complexType name="ServiceAuthType">
    <xs:sequence>
      <xs:element name="Basic" type="xs:boolean" default="false"/>
      <xs:element name="Kerberos" type="xs:boolean" default="true"/>
      <xs:element name="Negotiate" type="xs:boolean" default="true"/>
      <xs:element name="Certificate" type="xs:boolean" default="false"/>
    </xs:sequence>
  </xs:complexType>
</xs:schema>
```

Basic: Enables or disables Basic Authentication (as specified in [\[RFC2617\]](#) section 2).

Kerberos: Enables or disables Negotiate Authentication (as specified in [\[RFC4559\]](#) section 4).

Negotiate: Enables or disables Negotiate Authentication (as specified in [\[RFC4559\]](#) section 4).

These configuration settings are used when processing messages, as specified in section [3.1.5.5.3](#).

Certificate: Enables or disable Certificate Authentication (as specified in [\[RFC2246\]](#), section 7.4.4).

These configuration settings are used when processing messages as specified in section [3.1.5.5.3](#).

2.2.4.3.3 ServiceDefaultPortsType

ServiceDefaultPortsType MUST be used to configure the default ports that are used when constructing a listener.

```
<xs:schema xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://schemas.microsoft.com/wbem/wsman/1/config"
  elementFormDefault="qualified">
  <xs:complexType name="ServiceDefaultPortsType">
    <xs:sequence>
      <xs:element name="HTTP" type="xs:unsignedInt" default="80"/>
      <xs:element name="HTTPS" type="xs:unsignedInt" default="443"/>
    </xs:sequence>
  </xs:complexType>
</xs:schema>
```

HTTP: Port used by the service when using the HTTP protocol. Minimum value: 1. Maximum value: 65535.

HTTPS: Port used by the service when using the HTTPS protocol. Minimum value: 1. Maximum value: 65535.

These configuration settings are used when creating a listener.

2.2.4.3.4 ListenerType

ListenerType MUST be used by the Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista to listen on one or more IP addresses for WS-Management Protocol requests. ListenerType can be configured for HTTP or HTTPS on a specific IP or on an IP associated with a MAC address.

```
<xs:schema xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://schemas.microsoft.com/wbem/wsman/1/config"
  elementFormDefault="qualified">
  <xs:element name="Listener" type="cfg:ListenerType"/>
  <xs:complexType name="ListenerType">
    <xs:sequence>
      <xs:element name="Address" type="xs:string"/>
      <xs:element name="Transport" type="xs:string"/>
      <xs:element name="Port" type="xs:unsignedInt"/>
      <xs:element name="Hostname" type="xs:string"/>
      <xs:element name="Enabled" type="xs:boolean" default="true"
        minOccurs="0"/>
      <xs:element name="URIPrefix" type="xs:string" default="wsman"
        minOccurs="0"/>
      <xs:element name="CertificateThumbprint" type="xs:string"
        minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>
</xs:schema>
```

```

        <xs:element name="ListeningOn" type="xs:string" minOccurs="0"
                    maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
</xs:schema>

```

Address: The address for which this listener is created. The value can be one of the following:

- The literal string "*".
- The literal string "IP:" followed by a static IP address in either IPV4 dotted-decimal format or in IPV6 colon-delimited hexadecimal format.
- The literal string "MAC:" followed by a MAC address of a Network Interface Card (NIC). The MAC address MUST be a sequence of six or eight pairs of case-insensitive hexadecimal digits separated by "-" (for example, 32-a3-58-90-be-cc).

Transport: The transport used to send and receive WS-Management protocol requests and responses. Allowed values are HTTP and HTTPS.

Port: The TCP port for which this listener is created. Minimum value: 1. Maximum value: 65535.

Hostname: Host name of the computer where the WS-Management service is running.

Enabled: Indicates if the listener is enabled or disabled.

URIPrefix: URI prefix on which to accept HTTP or HTTPS requests. MUST NOT be blank. MUST be a string containing only the following characters a-zA-Z9-0_/_ and MUST NOT start with or end with '/'. For example, if the computer name is SampleMachine, the WS-Management client would specify http://SampleMachine/<URIPrefix> in the destination address.

CertificateThumbprint: Contains the thumbprint of the certificate as a 40-digit hexadecimal number. This is required if Transport is HTTPS.

ListeningOn: Contains the IP address for all IP addresses on which the service is actually listening. This is derived from the Address element based upon the actual IPs associated with the listener. The value of the IP address MUST be in either IPV4 dotted-decimal notation or in IPV6 colon-delimited hexadecimal notation.

These configuration settings are used when processing messages as specified in section [3.1.5.5.5](#).

These configuration settings are used when processing messages as specified in section [3.1.5.5.5](#).

2.2.4.3.5 CertMappingType

Client Certificates are used by Web Services Management Protocol Extensions for Windows Vista servers as an alternative authentication mechanism to Kerberos in non-domain scenarios. [<9>](#)

```

<xs:schema
  xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config/service/certmapping"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://schemas.microsoft.com/wbem/wsman/1/config/service/certmapping"
  elementFormDefault="qualified">

```

```

<xs:element name="CertMapping" type="cfg:CertMappingType"/>
<xs:complexType name="CertMappingType">
  <xs:sequence>
    <xs:element name="Issuer" type="xs:string"/>
    <xs:element name="Subject" type="xs:string" />
    <xs:element name="URI" type="xs:string" />
    <xs:element name="UserName" type="xs:string" minOccurs="0" />
    <xs:element name="Password" type="xs:string" minOccurs="0"/>
    <xs:element name="Enabled" type="xs:boolean" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
</xs:schema>

```

Issuer: This is a thumbprint (40 digit Hex string) for the issuer of the client certificate. For example, in a certificate chain (client cert, issuer, intermediate CA1, . . . root CA), this thumbprint MUST always identify the certificate used to sign the client certificate (issuer).

Subject: This is a string to pattern match against the subject in the certificate. It MUST contain at least one character, and it Must contain at most one "*" character that is the first character (this may be the only character in which case it matches all subjects).

URI: The URI or URI prefix for which this mapping applies. It MUST contain at least one character, it MUST contain at most one "*" character that is the last character (this may be the only character in which case it matches all URIs), and it MUST not contain any internal whitespace and "?" character.

UserName: User account in the server used to impersonate for the operation if using this certmapping configuration. Domain credentials are not allowed.

Password: Password for the user account in the server used to impersonate for the operation if using this certmapping configuration. If present, this cannot be empty.

Enabled: Boolean to decide if the server should use this certmapping configuration for subsequent operations.

2.2.4.3.6 WinrsType

WinrsType is the overall container for the remote shell server configuration. It uses the following schema:

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns="http://schemas.microsoft.com/wbem/wsman/1/config/winrs"
  targetNamespace="http://schemas.microsoft.com/wbem/wsman/1/config/winrs"
  attributeFormDefault="unqualified">
  <xs:complexType name="WinrsType">
    <xs:annotation>
      <xs:documentation>This schema defines winrs configuration
        settings </xs:documentation>
    </xs:annotation>
    <xs:sequence>
      <xs:element name="AllowRemoteShellAccess" type="xs:boolean"
        default="True"/>
      <xs:element name="IdleTimeout" type="xs:unsignedLong"
        default="900000"/>
      <xs:element name="MaxConcurrentUsers" type="xs:unsignedShort"
        default="5"/>
      <xs:element name="ShellTimeOut" type="xs:unsignedLong"

```

```

        default="2880000"/>
<xs:element name="MaxProcessesPerShell" type="xs:unsignedShort"
  default="5"/>
<xs:element name="MaxMemoryPerShellMB" type="xs:unsignedLong"
  default="0"/>
<xs:element name="MaxShellsPerUser" type="xs:unsignedShort"
  default="2"/>
</xs:sequence>
</xs:complexType>
</xs:schema>

```

AllowRemoteShellAccess: Configures access to remote shells. If set to False, new remote shell connections MUST be rejected by the server. The default value is True.

MaxCuncurrentUsersp: Configures maximum number of users concurrently performing remote operations on the same system by using remote CMD shell. The value can be any number from 1 to 100. The new shell connections MUST be rejected if they exceed the specified limit. The default number is five connections per user.

IdleTimeout: Configures maximum time in milliseconds remote shell will stay open without any user activity until it is automatically deleted. Any value from 0 to 0x7FFFFFFF can be set, where 0 indicates infinite time-out. The server MUST wait for the specified amount of time since the last received message from the client before terminating the open shell. The default value is 900000, which corresponds to 15 minutes.

ShellTimeOut: Configures maximum time in milliseconds for the remote command or script will be allowed to execute. Any value from 0 to 0x7FFFFFFF can be set, where 0 indicates infinite time-out. The server MUST terminate the command in progress if it takes longer than the specified amount of time. The default value is 2880000, which corresponds to eight hours.

MaxProcessesPerLShell: Configures maximum number of processes any shell operations is allowed to launch. Any number from 0 to 0x7FFFFFFF can be set, where 0 means unlimited number of processes. The remote operation MUST be terminated when it attempts to launch a new process and the process count exceeds the specified limit. By default, the limit is five processes per shell.

MaxMemoryPerShellMB: Configures maximum total amount of memory that can be allocated by any active remote shell and all its child processes. Any value from 0 to 0x7FFFFFFF can be set, where 0 means unlimited memory; that is, the ability of the remote operations to allocate memory is only limited by the available virtual memory. The remote operation MUST be terminated when a new allocation exceeds the specified quota. The default value is 0.

MaxShellsPerUser: Configures maximum number of concurrent shells any user can remotely open on the same system. Any number from 0 to 0x7FFFFFFF can be set, where 0 means unlimited number of shells. If this policy setting is enabled, the user will not be able to open new remote shells if the count exceeds the specified limit. If this policy setting is disabled or is not configured, by default the limit will be set to two remote shells per user.

2.2.4.3.7 CustomRemoteShell Complex Type

CustomRemoteShellType contains configuration data that's used to create a custom shell. Web Services Management Protocol Extensions for Windows Vista clients MAY use this configuration to create a custom shell instead of cmd.exe. Web Services Management Protocol Extensions for Windows Vista service MUST use this configuration to create a custom shell when it receives a Create request (as defined in section [3.4.1.1](#)) and the request contains a Resource URI which is specified in the CustomRemoteShell configuration.

Following is the schema for **Custom Remote Shell** configuration table: [<10>](#)

```
<xs:complexType name="CustomRemoteShell">
  <xs:sequence>
    <xs:element name="URI"
      type="xs:anyURI"
      minOccurs="0"
      maxOccurs="1"
    />
    <xs:element name="Shell"
      type="xs:string"
      minOccurs="1"
      maxOccurs="1"
    />
    <xs:element name="Arguments"
      type="xs:string"
      minOccurs="0"
      maxOccurs="1"
    />
  </xs:sequence>
</xs:complexType>
```

Child Elements

Element	Type	Description
URI	xs:anyURI	This optional attribute refers to the Resource URI for the custom shell.
Shell	xs:string	This attribute contains the process string for the custom shell. It can contain environment variables.
Arguments	xs:string	This optional attribute contains the argument string and it specifies the command line arguments to be passed to the custom shell. The Arguments field is treated as an opaque value, it is up to the Shell itself to interpret these arguments.

2.2.5 Encrypted Message Types

This section describes data types that are used by the Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista, when encrypting messages for confidentiality and integrity protection by using HTTP as the transport. Web Services Management Protocol Extensions for Windows Vista clients **MUST** use this message when sending a request and the Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista **MUST** use this message when responding to a request if integrity protection and encryption is required.

2.2.5.1 NegotiateEncryptedMessage

This message is used when SPNEGO, as specified in [\[RFC4559\]](#) section 6, is used for setting up a security context between the client and server. The client and servers can encrypt the message by using the negotiated session key, as specified in [\[RFC4121\]](#).

2.2.5.1.1 HTTP Headers

The request includes a number of fields in the HTTP message headers. The fields MUST follow the rules as specified in [\[RFC2616\]](#) section 4.2.

Tokens

Content-Length: Contains the size in bytes of the message body. MUST be present.

Authorization: Contains the credentials as defined according to the framework as specified in [\[RFC2616\]](#), section 14.8.

```
Authorization = "Authorization" ":" credentials
credentials   = "Negotiate" auth-data2
auth-data2    = 1#( gssapi-data )
```

gssapi-data is the base64 encoding of the InitializeContextToken, as specified in [\[RFC4559\]](#) section 4.2. The client MUST include the Authorization field in the request until the Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista responds with a "200 OK" response, indicating that the security context is complete.

Content-Type: Contains the media type, as specified in [\[RFC2616\]](#) section 14.17.

```
Content-Type = "Content-Type" ":"
  1#(contenttype;"protocol"=" protocolvalue";
  ""boundary"="boundaryvalue)
```

contenttype: Contains the message content type. MUST be set to "multipart/encrypted".

protocolvalue: Contains the authentication mechanism used to establish the security token and it MUST be set to "application/HTTP-SPNEGO-session-encrypted", which indicates security context obtained from authentication by using SPNEGO over HTTP, as specified in [\[RFC4559\]](#) section 6, is used to encrypt the message.

boundaryvalue: Contains the boundary used as the delimiter line for the multipart media content. MUST be set to "Encrypted Boundary".

2.2.5.1.2 Message Payload

The message payload MUST contain two multipart media type body parts that are delineated by using the boundary string specified in the boundary parameter within the Content-Type header.

2.2.5.1.2.1 Metadata Fields

The first part contains metadata about the encrypted message and MUST contain the following headers:

Tokens

Content-Type: Contains the media type of the encrypted message.

```
Content-Type = HT"Content-Type":"" 1#(contenttype)
```

HT is a horizontal tab character. MUST precede the literal "Content-Type".

contenttype contains the encrypted message content type and it MUST be set to:

```
application/HTTP-SPNEGO-session-encrypted
```

OriginalContent: Contains information about the original message before encryption:

```
OriginalContent=HT"OriginalContent":  
    "1#(contenttype";"charset"="charsetvalue";  
    "Length"="lengthvalue)
```

HT: The horizontal tab character. MUST precede the literal "OriginalContent".

contenttype: Contains the message content type of the original message and MUST be set to application/soap+xml.

charsetvalue: Contains the UTF format and MUST be set to one of UTF-8 or UTF-16.

length: Contains the length of the original message.

2.2.5.1.2.2 Encrypted Data

The second part of the message payload contains the encrypted message. This is an octet stream of the encrypted SOAP message, which is encrypted and integrity-protected by using the framework as specified in [\[RFC4121\]](#).

2.2.5.2 KerberosEncryptedMessage

This message is used when Kerberos (as specified in [\[RFC4559\]](#) section 4) is used for setting up a security context between the client and server. The client and servers can encrypt the message by using the negotiated session key, as specified in [\[RFC4121\]](#).

2.2.5.2.1 HTTP Headers

The request includes a number of fields in the HTTP Message Headers. The fields MUST follow the rules as specified in [\[RFC2616\]](#) section 4.2.

Tokens

Content-Length: Contains the size in bytes of the message body. MUST be present.

Authorization: Contains the credentials as defined according to the framework as specified in [\[RFC2616\]](#) section 14.8.

```
Authorization = "Authorization" ":" credentials  
credentials = "Kerberos" auth-data2  
auth-data2 = 1#( gssapi-data )
```

where gssapi-data is the base64 encoding of the InitializeContextToken, as specified in [\[RFC4559\]](#) section 4.2. The client MUST include the Authorization field in the request until the Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista responds with a 200 OK response indicating that the security context is complete.

Content-Type: Contains the media type, as specified in [\[RFC2616\]](#) section 14.17.

```
Content-Type = "Content-Type": "  
  1#(contenttype"; "protocol"=" protocolvalue";  
  "boundary"="boundaryvalue)
```

contenttype: Contains the message content type and it MUST be set to "multipart/encrypted".

protocolvalue: Contains the authentication mechanism used to establish the security token and it MUST be set to "application/HTTP-Kerberos-session-encrypted", which indicates security context obtained from authentication by using SPNEGO over HTTP, as specified in [\[RFC4559\]](#), is used to encrypt the message.

boundaryvalue: Contains the boundary used as the delimiter line for the multipart media content. MUST be set to "Encrypted Boundary".

2.2.5.2.2 Message Payload

The message payload MUST contain two multipart media type body parts that are delineated by using the boundary string specified in the boundary parameter within the Content-Type header.

2.2.5.2.2.1 Metadata Fields

The first part of the message payload contains metadata about the encrypted message and MUST contain the following headers:

Tokens

Content-Type: Contains the media type of the encrypted message.

```
Content-Type = HT"Content-Type": " 1#(contenttype)
```

HT: The horizontal tab character. MUST precede the literal "Content-Type".

contenttype: Contains the encrypted message content type and it MUST be set to:

```
application/HTTP-SPNEGO-session-encrypted
```

OriginalContent: Contains information about the original message before encryption.

```
OriginalContent=HT"OriginalContent":  
  "1#(contenttype"; "charset"="charsetvalue";  
  "Length"="lengthvalue)
```


HT: The horizontal tab character. MUST precede the literal "OriginalContent".

contentType: Contains the message content type of the original message and it MUST be set to application/soap+xml.

charsetvalue: Contains the UTF format and MUST be set to one of UTF-8 or UTF-16.

length: Contains the length of the original message.

2.2.5.2.2.2 Encrypted Data

The second part of the message payload contains the encrypted message. This is an octet stream of the encrypted SOAP message, which is encrypted and integrity-protected by using the framework, as specified in [\[RFC4121\]](#).

2.2.6 Compressed Message Types

This section describes data types used by the Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista when compressing messages for reduced network traffic. Web Services Management Protocol Extensions for Windows Vista clients MUST use this message when sending a request, and the Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST use this message when responding to a request for it to work properly.

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista supports Streaming Lossless Data Compression Algorithm (SLDC) to compress the data and appends four bytes containing the length of the uncompressed data BLOB in little-endian format.

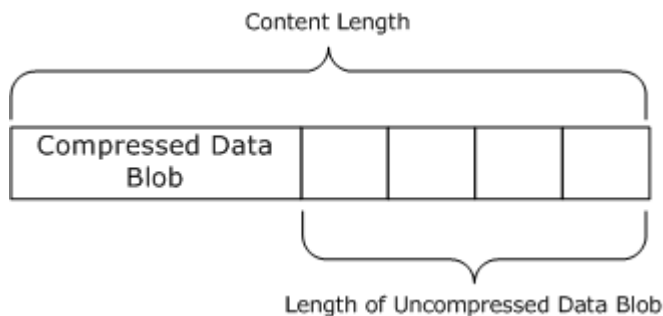


Figure 2: Compressed message layout showing compressed data BLOB and uncompressed length

2.2.7 SubscriptionType Complex Type

As an alternative to the Subscribe request, publisher-initiated subscriptions use the following message as an enumeration result. Web Services Management Protocol Extensions for Windows Vista servers and clients MUST support this message in order to use the publisher-initiated subscription. [<11>](#)

The type is used under the following namespace:
<http://schemas.microsoft.com/wbem/wsman/1/subscription>

```
<xs:complexType name="SubscriptionType">
  <xs:sequence>
```

```

    <xs:element name="Version"
      type="xs:string"
    />
    <xs:element name="Envelope"
      type="s:Envelope"
    />
  </xs:sequence>
</xs:complexType>

```

Child Elements

Element	Type	Description
Version	xs:string	Version is a globally unique identifier assigned to the current version of the subscription referred to in the Envelope. If the client receives a result with the same Version on subsequent enumerations, it means the same subscription is present and has not changed. Whenever parameters for the subscription change, subsequent enumeration results containing that subscription MUST use a new Version identifier.
Envelope	s:Envelope	This is the standard SOAP Envelope.

2.2.8 MachineIDType Complex Type

This type is used to uniquely identify a particular machine, so that requests issued from the same machine can be correlated. The **MachineID** type is used under the namespace <http://schemas.microsoft.com/wbem/wsman/1/machineid>.

```

<xs:complexType name="MachineIDType">
  <xs:sequence>
    <xs:element name="MachineID"
      type="xs:string"
    />
  </xs:sequence>
  <xs:anyAttribute
    processContents="lax"
    namespace="##any"
  />
</xs:complexType>

```

Child Elements

Element	Type	Description
MachineID	xs:string	SOAP header containing a globally unique string that uniquely identifies the machine sending the request. This allows the receiver of the request to correlate requests from the same machine, even if different requests use different credentials or DNS names. It is required for publisher-initiated subscription message.

2.2.9 Authentication Type

This type is used to indicate the credentials that should be used by the Event Source when delivering events.

```
<wsman:Authentication
Profile="http://schemas.dmtf.org/wbem/wsman/1/wsman/secprofile/http/
spnego-kerberos"/>

<wsman:Authentication Profile=
"http://schemas.dmtf.org/wbem/wsman/1/wsman/secprofile/https/
spnego-kerberos"/>
<wsman:Authentication Profile=
"http://schemas.dmtf.org/wbem/wsman/1/wsman/secprofile/https/
mutual">
<wsman:ClientCertificate>
  <wsman:Thumbprint Role="issuer">
    A 40 digit Hex number
  </wsman:Thumbprint >
</wsman:ClientCertificate>

</wsman:Authentication>
```

Authentication: A set of instructions for a specific security profile.

ClientCertificate: A set of constraints on the client certificate. The policy assertion may have multiple ClientCertificate elements, in which case the server may chose a certificate that matches any set of constraints.

Thumbprint: Identifies the issuer certificate by its thumbprint. [<12>](#12)

Profile: A URI that identifies which security profile to use when making the connection to deliver events.

Role: Identifies whether the thumbprint is directly to the client certificate (value of certificate) or to the issuer of the certificate (value of issuer). If not present, the default value is certificate.

3 Protocol Details

3.1 WS-Management Details

The WS-Management protocol specification, as specified in [\[DMTF-DSP0226\]](#), describes a general SOAP –based protocol for managing systems such as computers, servers, devices, Web services and other applications, and other manageable entities.

This section describes changes to the Web Services Management Protocol Extensions for Windows Vista service.

3.1.1 Abstract Data Model

Web Services Management Protocol Extensions for Windows Vista includes no changes to the abstract data model of the WS-Management Protocol, as specified in [\[DMTF-DSP0226\]](#).

3.1.2 Timers

Web Services Management Protocol Extensions for Windows Vista defines one timer in addition to the timers of the WS-Management Protocol, as specified in [\[DMTF-DSP0226\]](#).

The Enumeration Garbage Collection timer MUST trigger cleanup of the state associated with an enumeration if a client has not used it recently.

3.1.3 Initialization

Web Services Management Protocol Extensions for Windows Vista includes no changes to the initialization of the WS-Management Protocol, as specified in [\[DMTF-DSP0226\]](#).

3.1.4 Higher-Layer Triggered Events

Web Services Management Protocol Extensions for Windows Vista includes no changes to the higher-layer events of the WS-Management Protocol, as specified in [\[DMTF-DSP0226\]](#).

3.1.5 Message Processing

This section describes changes made by Web Services Management Protocol Extensions for Windows Vista to the message processing of the WS-Management Protocol, as specified in [\[DMTF-DSP0226\]](#).

3.1.5.1 Common Headers

3.1.5.1.1 wsman:ResourceURI

Web Services Management Protocol Extensions for Windows Vista clients and servers MUST accept **Resource URIs** starting with the following prefixes:

- <http://schemas.microsoft.com/wbem/wsman/1/config>

Configuration; for more information, see [Retrieving Configuration \(section 4.2.1\)](#).

- <http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/>

Common Information Model (CIM); for more information, see [ResourceURI for Common Information Model \(CIM\) classes \(section 3.3.5.1\)](#).

- <http://schemas.microsoft.com/wbem/wsman/1/wmi/root/>
Windows Management Instrumentation (WMI); for more information, see ResourceURI for CIM classes (section 3.3.5.1).
- <http://schemas.microsoft.com/wbem/wsman/1/windows/EventLog>
Windows Event Log; as specified in [\[MS-EVEN6\]](#).
- <http://schemas.microsoft.com/wbem/wsman/1/windows/shell>
Windows Command Shell and Custom Remote Shell; for more information, see [WS-Management - Remote Shell Access Details \(section 3.4\)](#)
- <http://schemas.microsoft.com/wbem/wsman/1/SubscriptionManager/Subscription>
Publisher-Initiated Subscriptions; for more information, see section [3.1.8.1.3](#).

3.1.5.1.2 wsman:SelectorSet

The WS-Management specification defines **selector** as a resource-relative name and value pair that acts as an instance-level discriminant. The selector set MUST be a set of these selectors, as specified in [\[DMTF-DSP0226\]](#) section 2.1.2. Rule R2.1.2-1 specifies that the selector names and values MAY be treated as case-insensitive or case-sensitive.

Web Services Management Protocol Extensions for Windows Vista clients and servers MUST treat all selector names and values as case-insensitive.

3.1.5.1.3 wsa:ReplyTo

The WS-Management specification allows the ReplyTo Header value to be either a valid address for a new connection by using any transport supported by the service, or the URI <http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous>, as specified in [\[DMTF-DSP0226\]](#) section 2.5.

Web Services Management Protocol Extensions for Windows Vista clients MUST set the ReplyTo Header value to <http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous>.

Web Services Management Protocol Extensions for Windows Vista servers MUST return a wsman:UnsupportedFeature fault with a detail code of wsman:faultDetail/AddressingMode if they receive a value other than <http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous> in the ReplyTo header.

3.1.5.1.4 wsa:FaultTo

The WS-Management specification allows a conformant service to require that all faults be delivered to the client over the same transport or connection on which the request arrives. In this case, the URI MUST be <http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous/>, as specified in [\[DMTF-DSP0226\]](#) section 2.6.

Web Services Management Protocol Extensions for Windows Vista clients MUST set the wsa:Address element within the wsa:FaultTo to <http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous/>.

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST return the wsman:UnsupportedFeature fault with a detail

code of wsman:faultDetail/AddressingMode if the wsa:Address element within the wsa:FaultTo is not set to <http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous/>.

3.1.5.1.5 wsa:MessageID

The WS-Management specification endorses two different MessageID URI formats, as specified in [\[DMTF-DSP0226\]](#) section 2.7.

Web Services Management Protocol Extensions for Windows Vista clients and servers MUST use only the **uuid**:xxxxxxxx-xxxx--xxxx--xxxx--xxxxxxxxxxxxx MessageID format.

3.1.5.1.6 wsa:Action

The WS-Management specification defines all the **Action URIs** that indicate the method being invoked against the resource, as specified in [\[DMTF-DSP0226\]](#) section 2.8.

The Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST support the following Action URIs for operations related to CIM data:

- <http://schemas.xmlsoap.org/ws/2004/09/transfer/Get>
- <http://schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse>
- <http://schemas.xmlsoap.org/ws/2004/09/transfer/Put>
- <http://schemas.xmlsoap.org/ws/2004/09/transfer/PutResponse>
- <http://schemas.xmlsoap.org/ws/2004/09/enumeration/Enumerate>
- <http://schemas.xmlsoap.org/ws/2004/09/enumeration/EnumerateResponse>
- <http://schemas.xmlsoap.org/ws/2004/09/enumeration/Pull>
- <http://schemas.xmlsoap.org/ws/2004/09/enumeration/PullResponse>
- <http://schemas.xmlsoap.org/ws/2004/09/enumeration/Release>
- <http://schemas.xmlsoap.org/ws/2004/09/enumeration/ReleaseResponse>

The Web Services Management Protocol Extensions for Windows Vista clients and servers MUST support the following additional Action URIs for operations related to Web Services Management Protocol Extensions for Windows Vista configuration data:

- <http://schemas.xmlsoap.org/ws/2004/09/transfer/Create>
- <http://schemas.xmlsoap.org/ws/2004/09/transfer/CreateResponse>
- <http://schemas.xmlsoap.org/ws/2004/09/transfer/Delete>
- <http://schemas.xmlsoap.org/ws/2004/09/transfer/DeleteResponse>

The Web Services Management Protocol Extensions for Windows Vista clients and servers MUST support the following additional Action URIs for operations related to subscriptions to Windows Event Log:

- <http://schemas.xmlsoap.org/ws/2004/08/eventing/Subscribe>

- <http://schemas.xmlsoap.org/ws/2004/08/eventing/SubscribeResponse>
- <http://schemas.xmlsoap.org/ws/2004/08/eventing/Unsubscribe>
- <http://schemas.xmlsoap.org/ws/2004/08/eventing/UnsubscribeResponse>

Web Services Management Protocol Extensions for Windows Vista clients and servers MUST support the following additional Action URIs for operations related to Remote Shell:

- <http://schemas.xmlsoap.org/ws/2004/09/transfer/Create>
- <http://schemas.xmlsoap.org/ws/2004/09/transfer/CreateResponse>
- <http://schemas.xmlsoap.org/ws/2004/09/transfer/Delete>
- <http://schemas.xmlsoap.org/ws/2004/09/transfer/DeleteResponse>
- <http://schemas.xmlsoap.org/ws/2004/09/transfer/Get>
- <http://schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse>
- <http://schemas.xmlsoap.org/ws/2004/09/enumeration/Enumerate>
- <http://schemas.xmlsoap.org/ws/2004/09/enumeration/EnumerateResponse>
- <http://schemas.xmlsoap.org/ws/2004/09/enumeration/Pull>
- <http://schemas.xmlsoap.org/ws/2004/09/enumeration/PullResponse>
- <http://schemas.microsoft.com/wbem/wsman/1/windows/shell/Command>
- <http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CommandResponse>
- <http://schemas.microsoft.com/wbem/wsman/1/windows/shell/Send>
- <http://schemas.microsoft.com/wbem/wsman/1/windows/shell/SendResponse>
- <http://schemas.microsoft.com/wbem/wsman/1/windows/shell/Signal>
- <http://schemas.microsoft.com/wbem/wsman/1/windows/shell/SignalResponse>

3.1.5.1.7 wsman:OperationTimeout

The WS-Management specification defines the OperationTimeout value to indicate that the clients expect a response or a fault within the specified time, as specified in [\[DMTF-DSP0226\]](#) section 3.1.

Web Services Management Protocol Extensions for Windows Vista clients MUST set an OperationTimeout value with the value of the MaxTimeoutms configuration setting as specified in [Common Configuration Data Types \(section 2.2.4.1\)](#).

The Web Services Management Protocol Extensions for Windows Vista servers MUST default the time-out value to the value of the MaxTimeoutms configuration setting, as specified in Common Configuration Data Types (section 2.2.4.1), if no OperationTimeout value is specified by the client, or if the OperationTimeout value is more than this setting. [<13>](#)

3.1.5.1.8 wsman:MaxEnvelopeSize

The WS-Management specification defines the MaxEnvelopeSize value to indicate that the clients expect a response to be no larger than the given number of octets, as specified in [\[DMTF-DSP0226\]](#) section 3.2.

Web Services Management Protocol Extensions for Windows Vista clients MUST set a MaxEnvelopeSize value with the value of the MaxEnvelopeSizekb configuration setting (as specified in [Common Configuration Data Types \(section 2.2.4.1\)](#)) multiplied by 1024.

Web Services Management Protocol Extensions for Windows Vista servers MUST default the MaxEnvelopeSize value to the value of the MaxEnvelopeSizekb configuration setting (as specified in [Common Configuration Data Types \(section 2.2.4.1\)](#)) multiplied by 1,024 if no MaxEnvelopeSize value is specified by the client, or if the MaxEnvelopeSize value is more than this setting.

WS-Management, as specified in [\[DMTF-DSP0226\]](#) section 3.2, indicates that servers SHOULD return a wsman:EncodingLimit fault if the value of wsman:MaxEnvelopeSize is less than 8192 octets. Web Services Management Protocol Extensions for Windows Vista servers MUST return the indicated fault in this situation. [<14>](#)

3.1.5.1.9 wsman:Locale

The WS-Management specification defines the Locale element, which specifies the language in which the client wants response text to be translated, as specified in [\[DMTF-DSP0226\]](#) section 3.3.

Web Services Management Protocol Extensions for Windows Vista clients SHOULD NOT set the mustUnderstand attribute of this element to "true".

Web Services Management Protocol Extensions for Windows Vista servers MUST return a fault of wsman:UnsupportedFeature with a detail code of wsman:faultDetail/Locale, if the mustUnderstand attribute of this element is "true".

3.1.5.1.10 wsman:OptionSet

The WS-Management specification defines the OptionSet element as a set of switches to the service to modify or refine the nature of the request, as specified in [\[DMTF-DSP0226\]](#) section 3.4.

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST process the OptionSet element. The options supported vary by ResourceURI and operation. For specific options, see the following table.

ResourceURI	Prefix	Section
http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/	Yes	wsman:OptionSet (section 3.3.5.5)
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/	Yes	wsman:OptionSet (section 3.3.5.5)
http://schemas.microsoft.com/wbem/wsman/1/windows/EventLog	No	wsman:ResourceURI (section 3.1.5.1.1)
http://schemas.microsoft.com/wbem/wsman/1/windows/shell	Yes	Message Processing (section 3.4.1)

Web Services Management Protocol Extensions for Windows Vista [<15>](#)[<16>](#)

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST process the OptionSet block for the supported URI regardless of the value of the SOAP mustUnderstand header.

Web Services Management Protocol Extensions for Windows Vista clients SHOULD use the OptionSet element with one of the supported option values.

3.1.5.1.11 wsman:RequestEPR

The WS-Management specification defines the RequestEPR SOAP header, which can be used by clients that need to get the **Endpoint Reference (EPR)** in the response. This information is as specified in [\[DMTF-DSP0226\]](#) section 3.5.

Web Services Management Protocol Extensions for Windows Vista clients SHOULD NOT use the RequestEPR header.

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista SHOULD ignore the RequestEPR header.[<17>](#)

3.1.5.2 Enumeration

3.1.5.2.1 wsen:Filter

The WS-Management specification defines the Filter element, which is used to retrieve a subset of the result set, as specified in [\[DMTF-DSP0226\]](#) section 5.2.1.

The **Windows Management Instrumentation (WMI)** specification defines the WQL query language, as specified in [\[MS-WMI\]](#) section 2.2.1.1.

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST process the request if it is targeted to a ResourceURI for a CIM or WMI resource and contains the Filter element with a Dialect identifying WQL: <http://schemas.microsoft.com/wbem/wsman/1/WQL>. The results of the WQL query MUST be rendered as described in the WS-Management CIM Binding specification for CQL, as specified in [\[DMTF-DSP0227\]](#) section 7.1.[<18><19>](#)

The WS-Management CIM Binding specification (as specified in [\[DMTF-DSP0227\]](#)) defines the wsmb:Expression element to correlate response elements with portions of the select-clause.[<20>](#)

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST fault if the enumerate request contains the Filter element for any ResourceURI.

3.1.5.2.2 wsen:Pull/wsen:MaxElements

The WS-Management specification defines the MaxElements element, which is used to limit how many items are retrieved in a single message, as specified in [\[DMTF-DSP0226\]](#) section 5.4.

Web Services Management Protocol Extensions for Windows Vista clients MUST use the value of MaxBatchItems configuration setting (as specified in [Common Configuration Data Types \(section 2.2.4.1\)](#)) as the value of MaxElements when sending Pull requests.

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST use the smaller of the value of MaxBatchItems configuration setting (as specified in Common Configuration Data Types (section 2.2.4.1)) and the value of wsen:MaxElements as the effective value of wsen:MaxElements.

3.1.5.2.3 wsman:RequestTotalItemsCountEstimate

The WS-Management specification defines the RequestTotalItemsCountEstimate SOAP header to allow a client to request an estimate for the number of items being returned in the result set. More information is as specified in [\[DMTF-DSP0226\]](#) section 5.2.2.

Web Services Management Protocol Extensions for Windows Vista clients SHOULD NOT use the Request-Total-Items-Count-Estimate header.

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista SHOULD ignore the Request-Total-Items-Count-Estimate header. [<21>](#)

3.1.5.2.4 wsman:OptimizeEnumeration

The WS-Management specification defines the optional element OptimizeEnumeration to allow a client to request that initial results be returned in the enumeration response, as specified in [\[DMTF-DSP0226\]](#) section 5.2.3. [<22>](#) [<23>](#)

Web Services Management Protocol Extensions for Windows Vista clients SHOULD use the OptimizeEnumeration element.

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST process the request containing OptimizeEnumeration request as specified in [\[DMTF-DSP0226\]](#) section 5.2.3.

3.1.5.2.5 wsman:EnumerationMode

The WS-Management specification defines the optional EnumerationMode element to allow a client to specify whether the actual objects, the Endpoint Reference (EPR) of the object, or both the EPR and the object should be returned. For more information, see [\[DMTF-DSP0226\]](#) section 5.7.

Web Services Management Protocol Extensions for Windows Vista clients MAY use the EnumerationMode element.

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST process the EnumerationMode element and respond according to the client request if the ResourceURI supports the indicated mode. The Resource URIs that support EnumerationMode are shown in the following table.

ResourceURI	Mode s	Prefi x	Section
http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/	All 3	Yes	wsman:EnumerationM ode
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/	All 3	Yes	wsman:EnumerationM ode
http://schemas.microsoft.com/wbem/wsman/1/config/listener	All 3	No	Enumeration of Listeners
For Windows Command Shell: http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cm d An example of Custom Remote Shell:	All 3	No	wsen:Enumerate

ResourceURI	Mode s	Prefi x	Section
http://schemas.microsoft.com/wbem/wsman/1/windows/shell/Cu stomShell			

3.1.5.2.6 wsman:Filter

The WS-Management specification defines wsman:Filter as an alternative mechanism to specify filters that are different from that of the wsen:Filter, as specified in [\[DMTF-DSP0226\]](#) section 5.3.

Web Services Management Protocol Extensions for Windows Vista clients SHOULD use the wsman:Filter element.

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST use the wsman:Filter element and process it exactly the same as if the wsen:Filter element were present.[<24>](#)

3.1.5.2.6.1 wsman:Selector Filter Dialect

The Selector filter dialect is a simple filtering dialect that allows a filtered enumeration with no representation change. Selectors are part of the default addressing model as specified in [\[DMTF-DSP0226\]](#) section 2.1.[<25>](#)

Run-Time Rules

- Selector filter dialect can only be used for class-specific resource URIs, as specified in [\[DMTF-DSP0227\]](#) section 5.1.
- The filter expression will be rejected in the following cases:
 - The selector set contains duplicate selector names.
 - The selector names a property of one of the following types:
 - Array
 - Datetime
 - Reference or object
 - The value contains either the double quote (") character or the single quote (') character.

3.1.5.2.7 Windows Command Shell Enumeration

For information on enumeration of Windows Command Shell, see section [3.4.1.16](#) (wsen:Enumerate).

3.1.5.2.8 Custom Remote Shell Enumeration

For information on enumeration of Custom Remote Shell, see section [3.4.1.16](#) (wsen:Enumerate).

3.1.5.3 Transfer Get and Put

3.1.5.3.1 wsman:FragmentTransfer

The WS-Management specification defines the FragmentTransfer SOAP header, which is used to retrieve and update fragments or individual elements of the resource. See specification [\[DMTF-DSP0226\]](#) section 4.8.

Web Services Management Protocol Extensions for Windows Vista clients SHOULD use the FragmentTransfer header when working with CIM/WMI objects.

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST process the wsman:FragmentTransfer header regardless of the value of the SOAP mustUnderstand attribute.

The dialects supported vary by Resource URI and operation. For specific dialects, see the following table.

Resource URI	Prefix	Section
http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/	Yes	Fragment Transfer
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/	Yes	Fragment Transfer

If the Resource URI does not support the FragmentTransfer header but does support the WS-Transfer operation, Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST return a fault.[<26>](#)

3.1.5.4 Miscellaneous

3.1.5.4.1 Concurrent Operations

A Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST reject additional requests if it is already processing a number of concurrent requests equal to the MaxConnections configuration setting as specified in [Server Configuration Data Types \(section 2.2.4.3\)](#).

A Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST reject additional Enumerate requests if it has a number of outstanding enumerations equal to the MaxConcurrentOperations configuration setting as specified in [Server Configuration Data Types \(section 2.2.4.3\)](#).

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST reject additional requests to a specific provider if the provider is already processing a number of concurrent requests equal to the MaxProviderRequests configuration setting as specified in [Common Configuration Data Types \(section 2.2.4.1\)](#).

3.1.5.4.2 Inbound Message Size

The Web Services Management Protocol Extensions for Windows Vista clients MUST return an HTTP status of 413 (Request Entity Too Large) without processing the SOAP message if the request packet from the client is larger than the MaxEnvelopeSizeKb configuration setting, as specified in [Common Configuration Data Types \(section 2.2.4.1\)](#).

3.1.5.4.3 Fault Detail

The WS-Management specification allows servers to specify additional fault details as part of SOAP fault it generates, as specified in [\[DMTF-DSP0226\]](#) section 11. The URI prefix for fault detail is <http://schemas.dmtf.org/wbem/wsman/1/wsman/faultDetail>.

Web Services Management Protocol Extensions for Windows Vista clients and servers MUST use the wsman:faultDetail prefix instead of the <http://schemas.dmtf.org/wbem/wsman/1/wsman/faultDetail> prefix.

3.1.5.4.4 Metadata and Discovery

The WS-Management specification defines a mechanism to determine the existence of a WS-Management service on a server. More information is as specified in [\[DMTF-DSP0226\]](#) section 8.

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST support the WS-Management discovery mechanism as specified in [\[DMTF-DSP0226\]](#) section 8, when the request is authenticated. [<27><28>](#)

Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista MUST support the WS-Management discovery mechanism as specified in [\[DMTF-DSP0226\]](#) section 8, when the request is unauthenticated and the following HTTP header is present: [<29>](#)

WSMANIDENTIFY: unauthenticated

3.1.5.4.5 Binary Attachments

The WS-Management Protocol defines a mechanism to send binary attachments, as specified in [\[DMTF-DSP0226\]](#) section 10.6.

Web Services Management Protocol Extensions for Windows Vista service and clients MUST NOT send binary attachments.

3.1.5.5 Configuration

The remote configuration of the Web Services Management Protocol Extensions for Windows Vista service and clients can be performed through a series of get, put, create, delete, and enumeration operations addressed to a set of resource URIs defined in this section. In this section, wherever client and server are mentioned, the reference is to Web Services Management Protocol Extensions for Windows Vista service and clients.

3.1.5.5.1 <http://schemas.microsoft.com/wbem/wsman/1/config>

The <http://schemas.microsoft.com/wbem/wsman/1/config> Resource URI MUST be used to retrieve the complete configuration of Web Services Management Protocol Extensions for Windows Vista client and servers. The configuration is grouped under separate XML elements; further URIs are exposed to allow easier and finer-grained levels of retrieval and updates.

This URI refers to a single instance of data, and therefore, no additional selectors are needed to address this resource.

The set of operations that the Web Services Management Protocol Extensions for Windows Vista service MUST support on this URI are defined in the following table, and where relevant, the XSD type for the data that MUST be passed as part of the request or response is referenced.

Operation	Input data type	Output data type
Get	None	cfg:ConfigType
Put	cfg:ConfigType	cfg:ConfigType

3.1.5.5.2 <http://schemas.microsoft.com/wbem/wsman/1/config/client>

The <http://schemas.microsoft.com/wbem/wsman/1/config/client> Resource URI MUST be used to configure the client.

This URI refers to a single instance of data, and therefore, no additional selectors are needed to address this resource.

The set of operations that the Web Services Management Protocol Extensions for Windows Vista service MUST support on this URI are defined in the following table, and where relevant, the XSD type for the data that MUST be passed as part of the request or response is referenced.

Operation	Request data type	Response data type
Get	None	cfg:ClientType
Put	cfg:ClientType	cfg:ClientType

Web Services Management Protocol Extensions for Windows Vista clients MUST NOT send the request if the selected protocol would result in sending the SOAP message unencrypted if the AllowUnencrypted property of the cfg:ClientType is false. SOAP messages can be encrypted over HTTP when using Kerberos or Negotiate; for more information, see [Encryption \(section 3.1.6\)](#).

Web Services Management Protocol Extensions for Windows Vista clients MUST NOT send the request if the selected protocol cannot authenticate the server and the server name is not allowed by the TrustedHosts property of the cfg:ClientType.

3.1.5.5.2.1 <http://schemas.microsoft.com/wbem/wsman/1/config/client/auth>

The <http://schemas.microsoft.com/wbem/wsman/1/config/client/auth> Resource URI MUST be used to configure the authentication schemes specified in [ClientAuthType \(section 2.2.4.2.2\)](#). If a client application tries to use an authentication scheme that is not enabled, the request MUST fail with an error.

This URI refers to a single instance of data, and therefore, no additional selectors are needed to address this resource.

The set of operations that the Web Services Management Protocol Extensions for Windows Vista service MUST support on this URI are defined in the following table, and where relevant, the XSD type for the data that MUST be passed as part of the request or response is referenced.

Operation	Request data type	Response data type
Get	None	cfg:ClientAuthType
Put	cfg:ClientAuthType	cfg:ClientAuthType

- Web Services Management Protocol Extensions for Windows Vista clients MUST use wsman:secprofile/http/basic as an authentication scheme if and only if the Basic property in the cfg:ClientAuthType is true.
- Web Services Management Protocol Extensions for Windows Vista clients MUST use wsman:secprofile/http/digest as an authentication scheme if and only if the Digest property in the cfg:ClientAuthType is true.
- Web Services Management Protocol Extensions for Windows Vista clients MUST use wsman:secprofile/http/spnego-kerberos as an authentication scheme if and only if the Negotiate property in the cfg:ClientAuthType is true.
- Web Services Management Protocol Extensions for Windows Vista clients MUST use wsman:secprofile/http/spnego-kerberos as an authentication scheme if and only if the Kerberos property in the cfg:ClientAuthType is true.

3.1.5.5.2.2

http://schemas.microsoft.com/wbem/wsman/1/config/client/defaultports

The http://schemas.microsoft.com/wbem/wsman/1/config/client/defaultports Resource URI MUST be used to configure the default ports used when initiating transport connection.

This URI refers to a singleton instance of data, and therefore, no additional selectors are needed to address this resource.

The set of operations that the Web Services Management Protocol Extensions for Windows Vista service MUST support on this URI are defined in the following table, and where relevant, the XSD type for the data that MUST be passed as part of the request or response is referenced.

Operation	Request data type	Response data type
Get	None	cfg:ClientDefaultPortsType
Put	cfg:ClientDefaultPortsType	cfg:ClientDefaultPortsType

3.1.5.5.3 http://schemas.microsoft.com/wbem/wsman/1/config/service

The http://schemas.microsoft.com/wbem/wsman/1/config/service Resource URI MUST be used to configure the server.

This URI refers to a single instance of data, and therefore, no additional selectors are needed to address this resource.

The set of operations that Web Services Management Protocol Extensions for Windows Vista servers MUST support on this URI are defined in the following table, and where relevant, the XSD type for the data that MUST be passed as part of the request or response is referenced.

Operation	Request data type	Response data type
Get	None	cfg:ServiceType
Put	cfg:ServiceType	cfg:ServiceType

Web Services Management Protocol Extensions for Windows Vista service MUST NOT accept requests if the desired protocol implies either the SOAP request or response would be unencrypted if

the AllowUnencrypted property of the cfg:ServiceType is false. SOAP messages can be encrypted over HTTP when using Kerberos or Negotiate; for more information, see [Encryption \(section 3.1.6\)](#).

3.1.5.5.3.1 <http://schemas.microsoft.com/wbem/wsman/1/config/service/auth>

The <http://schemas.microsoft.com/wbem/wsman/1/config/service/auth> resource URI MUST be used to configure the authentication mechanisms supported by a server. If a client application tries to use an authentication scheme that is not enabled on the server, the request will fail with an error.

This URI refers to a single instance of data, and therefore, no additional selectors are needed to address this resource.

The set of operations that Web Services Management Protocol Extensions for Windows Vista servers MUST support on this URI are defined in the following table, and where relevant, the XSD type for the data that MUST be passed as part of the request or response is referenced.

Operation	Request data type	Response data type
Get	None	cfg:ServiceAuthType
Put	cfg:ServiceAuthType	cfg:ServiceAuthType

Web Services Management Protocol Extensions for Windows Vista service MUST use [wsman:secprofile/http/basic](#) as an authentication scheme if and only if the Basic property in the cfg:ServiceAuthType is true. [<30>](#)

Web Services Management Protocol Extensions for Windows Vista service MUST use [wsman:secprofile/http/spnego-kerberos](#) as an authentication scheme if and only if the Negotiate property in the cfg:ServiceAuthType is true.

Web Services Management Protocol Extensions for Windows Vista service MUST use [wsman:secprofile/http/spnego-kerberos](#) as an authentication scheme if and only if the Kerberos property in the cfg:ServiceAuthType is true.

3.1.5.5.3.2

<http://schemas.microsoft.com/wbem/wsman/1/config/service/defaultports>

The <http://schemas.microsoft.com/wbem/wsman/1/config/service/defaultports> Resource URI MUST be used to indicate the default ports used when creating a Listener.

This URI refers to a single instance of data, and therefore, no additional selectors are needed to address this resource.

The set of operations that Web Services Management Protocol Extensions for Windows Vista servers MUST support on this URI are defined in the following table, and where relevant, the XSD type for the data that MUST be passed as part of the request or response is referenced.

Operation	Request data type	Response data type
Get	None	cfg:ServiceDefaultPortsType
Put	cfg:ServiceDefaultPortsType	cfg:ServiceDefaultPortsType

3.1.5.5.3

<http://schemas.microsoft.com/wbem/wsman/1/config/service/certmapping>

The <http://schemas.microsoft.com/wbem/wsman/1/config/service/certmapping> Resource URI MUST be used to map a client certificate to a particular user account. The following properties, which are part of `cfg:CertMappingType`, are the selectors.

Selector name	Descriptor
Issuer	This is a thumbprint (40 digit Hex string) for the issuer of the client certificate. For example, in a certificate chain (client cert, issuer, intermediate CA1, . . . root CA), this thumbprint MUST always identify the certificate used to sign the client certificate (issuer).
Subject	This is a string to pattern match against the subject in the certificate. It MUST contain at least one character, and it MAY contain at most one "*" character that is the first character (this may be the only character in which case it matches all subjects).
URI	The URI or URI prefix for which this mapping applies. It MUST contain at least one character, it MAY contain at most one "*" character that is the last character (this may be the only character in which case it matches all URIs), and it MUST not contain any internal whitespace and "?" character.

The set of operations that Web Services Management Protocol Extensions for Windows Vista servers MUST support on this URI are defined in the following table, and where relevant, the XSD type for the data that MUST be passed as part of the request or response is referenced.

Operation	Input data type	Output data type
Create	<code>cfg: CertMappingType</code>	None
Get	None	<code>cfg: CertMappingType</code>
Put	<code>cfg: CertMappingType</code>	<code>cfg: CertMappingType</code>
Delete	None	None
Enumerate	None	None
Pull	None	<code>cfg: CertMappingType</code>

3.1.5.5.4 <http://schemas.microsoft.com/wbem/wsman/1/config/winrs>

The <http://schemas.microsoft.com/wbem/wsman/1/config/winrs> Resource URI MUST be used to set and retrieve the remote shell server configuration.

This URI refers to a single instance of data, and therefore, no additional selectors are needed to address this resource.

The set of operations that Web Services Management Protocol Extensions for Windows Vista servers MUST support on this URI are defined in the following table, and where relevant, the XSD type for the data that MUST be passed as part of the request or response is referenced.

Operation	Request data type	Response data type
Get	None	<code>cfg:WinrsType</code>

Operation	Request data type	Response data type
Put	cfg:WinrsType	cfg:WinrsType

3.1.5.5.5 http://schemas.microsoft.com/wbem/wsman/1/config/listener

The http://schemas.microsoft.com/wbem/wsman/1/config/listener Resource URI MUST be used for configuring the server to listen on the network for WS-Management requests. By default, the server is configured with no listeners resulting in no remote configuration of the machine by using WS-Management. This means that no remote configuration can be done initially until some form of configuration is performed locally.

3.1.5.5.5.1 Enumeration of Listeners

Enumeration can be used to retrieve all listeners configured on the server. The IP and Port properties that are returned with each of the objects can be used as a selector to address the specific configuration item for updates.

This URI refers to all instances of the listeners, and so no additional selectors are needed to address this resource.

The set of operations that Web Services Management Protocol Extensions for Windows Vista servers and clients MUST support on this URI are defined in the following table, and where relevant, the XSD type for the data that MUST be passed as part of the request or response is referenced.

Operation	Request data type	Response data type
Enumerate	None	None
Pull	None	cfg:ListenerType

Web Services Management Protocol Extensions for Windows Vista service MUST support wsman:EnumerationMode for this Resource URI and respond with the listener or EPR or both as requested by the client.

3.1.5.5.5.2 Retrieval and Modification of Individual Listeners

To retrieve and configure an individual listener, the listener needs to be referred by a selector. The following properties, which are part of cfg:ListenerType, are the selectors.

Selector name	Description
Address	The address on which the server is configured to listen.
Transport	Transport on which to listen; must be either HTTP or HTTPS.

The set of operations that Web Services Management Protocol Extensions for Windows Vista servers and clients MUST support on this URI are defined in the following table, and where relevant, the XSD type for the data that MUST be passed as part of the request or response is referenced.

Operation	Request data type	Response data type
Get	None	cfg:ListenerType

Operation	Request data type	Response data type
Put	cfg:ListenerType	cfg:ListenerType
Delete	None	None
Create	cfg:ListenerType	None

When doing a Create, some properties in cfg:ListenerType are mandatory whereas others are optional, as shown in following table.

Property	Mandatory	Default value
Address	Yes	None, must be specified as selector.
Transport	Yes	None, must be specified as selector.
Port	No	Defaults based upon the values of cfg:ServiceDefaultPortsType.
Hostname	No	None if HTTP. Defaults to machine name if HTTPS.
Enabled	No	True.
URIPrefix	No	wsman.
CertificateThumbprint	No	None, if HTTP. Defaults to a certificate whose CN matches the Hostname property. If no such certificate can be found, the create MUST fail.
ListeningOn	No	None; this value is computed from other properties and cannot be directly set.

If and only if the Enabled property is true, the Web Services Management Protocol Extensions for Windows Vista service MUST listen on the network on the port given by the Port property and only process requests sent to a configured destination IP address and addressed to the path given by the URIPrefix property.

When considering destination IP addresses, the Web Services Management Protocol Extensions for Windows Vista service MUST listen to address(es) specified by the Address property of the listener unless those addresses are excluded by the IPv4Filter or IPv6Filter properties of the service configuration. The Address property indicates a specific IP addresses (if the Address property is a valid IP address), on all IP address associated with a specific MAC address (if the Address property is a valid MAC address), or all IP addresses on the server (if the Address property is "*").

The Web Services Management Protocol Extensions for Windows Vista service MUST return a SOAP fault in response to a Create or Put request if the Transport property is HTTPS and the certificate identified by the CertificateThumbprint property does not exist or the Common Name in the certificate does not match the Hostname property.

3.1.5.5.6

<http://schemas.microsoft.com/wbem/wsman/1/config/winrs/customremoteshell>

The Resource URI <http://schemas.microsoft.com/wbem/wsman/1/config/winrs/customremoteshell> MUST be used to manipulate the Custom Remote Shell URI configuration table. By default, this table

does not exist on the server, and the admin MUST set this table up for the user to execute custom remote shell.

3.1.5.5.6.1 Enumeration of Custom Remote Shell URI Configuration Table

Enumeration can be used to retrieve all entries in the Custom Remote Shell URI configuration table on the server.

Operation	Request data type	Response data type
Enumater	None	None (see Note)
Pull	None	cfg:CustomRemoteShell

Note In the case of Optimized Enumeration, the service implementing the optimized enumeration will respond with the additional content in an Enumerate Response message, as specified in [\[DMTF-DSP0226\]](#) section 5.2.3

3.1.5.5.6.2 Manipulation Custom Remote Shell URI Configuration Table

The following actions are supported to manipulate the Custom Remote Shell URI Configuration Table. Delete, Get, and Put need selectors to identify the specific entity in the URI Configuration Table.

Operation	Request data type	Response data type
Create	cfg:CustomRemoteShell	None
Delete	None	None
Get	None	cfg:CustomRemoteShell
Put	cfg:CustomRemoteShell	cfg:CustomRemoteShell

3.1.6 Encryption

Encryption is used by Web Services Management Protocol Extensions for Windows Vista service and clients when encrypting messages for confidentiality and integrity protection when using HTTP as the transport. Web Services Management Protocol Extensions for Windows Vista service clients MUST use this message when sending a request and Web Services Management Protocol Extensions for Windows Vista service MUST use this message when responding to a request if integrity protection and encryption is required.

When using Encryption, there are two options available.

Option	Description
Negotiate Encrypted Message	SPNEGO (as specified in [RFC4559] section 4.1) is used for setting up a security context between the client and server, and message encryption is done by using the negotiated session key, as specified in [RFC4121] .
Kerberos Encrypted Message	Kerberos (as specified in [RFC4559] section 4) is used for setting up a security context between the client and server, and message encryption is done by using the negotiated session key, as specified in [RFC4121] .

When using Negotiate Encrypted Message, the Authorization HTTP header contains credentials defined according to the framework as specified in [\[RFC2616\]](#) section 4.2. The Content-Type header must be set to multipart/encrypted, protocolvalue header must be set to application/HTTP-SPNEGO-session-encrypted, and boundaryvalue header must be set to Encrypted Boundary.

The message payload MUST contain two multipart media type body parts that are delineated by using the boundary string specified in the boundary parameter within the Content-Type header. The first part contains the metadata and the second part contains the Encrypted Data.

When using Kerberos Encrypted Message, the Authorization HTTP header contains credentials defined according to the framework as specified in [\[RFC2616\]](#) section 14.8. The Content-Type header must be set to multipart/encrypted, protocolvalue header must be set to application/HTTP-Kerberos-session-encrypted, and boundaryvalue header must be set to Encrypted Boundary.

The message payload MUST contain two multipart media type body parts that are delineated by using the boundary string specified in the boundary parameter within the Content-Type header. The first part contains the metadata and the second part contains the Encrypted Data.

3.1.7 Compression

When delivering events, as specified in [\[DMTF-DSP0226\]](#) section 7.2, the Web Services Management Protocol Extensions for Windows Vista service may use compression. The Web Services Management Protocol Extensions for Windows Vista service supports the Streaming Lossless Data Compression (SLDC) algorithm for compressing/uncompressing data.

When using compression, the Web Services Management Protocol Extensions for Windows Vista service uses compression before it encrypts the data, so the Web Services Management Protocol Extensions for Windows Vista service clients will have to decode in the reverse order, that is, first decrypt then uncompress.

The compression payload consists of the compressed data BLOB, followed by four additional bytes containing the length of the uncompressed data BLOB in little-endian format.

3.1.8 Event

See the Windows behavior tag. [<31>](#)

3.1.8.1 Event Subscription

Web Services Management Protocol Extensions for Windows Vista supports two event subscription types. [<32>](#)

1. Collector Initiated Event subscription
2. Publisher Initiated Event Subscription

Information on Collector Initiated event subscriptions is as specified in [\[DMTF-DSP0226\]](#) section 7.2. Publisher Initiated event subscription is addressed later in this document, specified in section [3.1.8.1.3](#).

3.1.8.1.1 Action URI

The Web Services Management Protocol Extensions for Windows Vista service and clients MUST support the following additional Action URIs for operations related to subscriptions to Windows Event Log:

- <http://schemas.xmlsoap.org/ws/2004/08/eventing/Subscribe>
- <http://schemas.xmlsoap.org/ws/2004/08/eventing/SubscribeResponse>
- <http://schemas.xmlsoap.org/ws/2004/08/eventing/Unsubscribe>
- <http://schemas.xmlsoap.org/ws/2004/08/eventing/UnsubscribeResponse>

3.1.8.1.2 wsman:OptionSet

3.1.8.1.2.1 Options

The following options are available for OptionSet block for subscription.

Option	Description
Compression	This option determines the compression algorithm used. Web Services Management Protocol Extensions for Windows Vista supports the SLDC (Streaming Lossless Data Compression) algorithm, so the only valid value of 'SLDC' is allowed. The HTTP packet containing compressed data MUST have the Content-Encoding set to SLDC. It is an ECMA standard (ECMA-321), as specified in [ECMA-321] .
CDATA	This option determines if the data (event xml) should be parsed or passed unprocessed. It has the xsi:nil attribute associated with it, whose value if set to true, indicates that the data should not be processed by the Web Services Management Protocol Extensions for Windows Vista service. In that case, the data is considered a BLOB and passed as-is to the event subscriber for interpretation.
ContentFormat	This option determines how the event data will be received by the event subscriber. If the value of this option is "RenderedText", both the event data and rendering information are passed, whereas event data is contained within the element <EventData> and rendering info is contained with the element <RenderingInfo>, so that the event can be displayed by the event subscriber according to a predefined format. The default value for this option is "Raw", which mean only event data will be passed without any rendering information.
IgnoreChannelError	This option determines if various filtering options resulting in errors in different channels should result in termination of the processing. It has the xsi:nil attribute associated with it, whose value is set to "true", meaning the filtering errors in different channels MUST be ignored by the subscription service and processing should continue.
ReadExistingEvents	This option has the same effect as the predefined, reserved bookmark http://schemas.dmtf.org/wbem/wsman/1/wsman/bookmark/earliest , as specified in [DMTF-DSP0226] section 7.2.6 (Bookmarks). If a subscription is received with this option set to 'true', the event source should replay all possible events that match the filter and any events that subsequently occur for that event source. <33><34>

3.1.8.1.3 Publisher-Initiated Subscriptions

Publisher-Initiated Subscriptions are an alternative approach to Collector-Initiated Subscriptions. For Collector-Initiated Subscription, see [\[DMTF-DSP0226\]](#) section 7.2. Publisher-Initiated Subscription is useful when security constrains do not allow open ports in firewalls, and when the event publishers are not known, such as on a quarantine network.

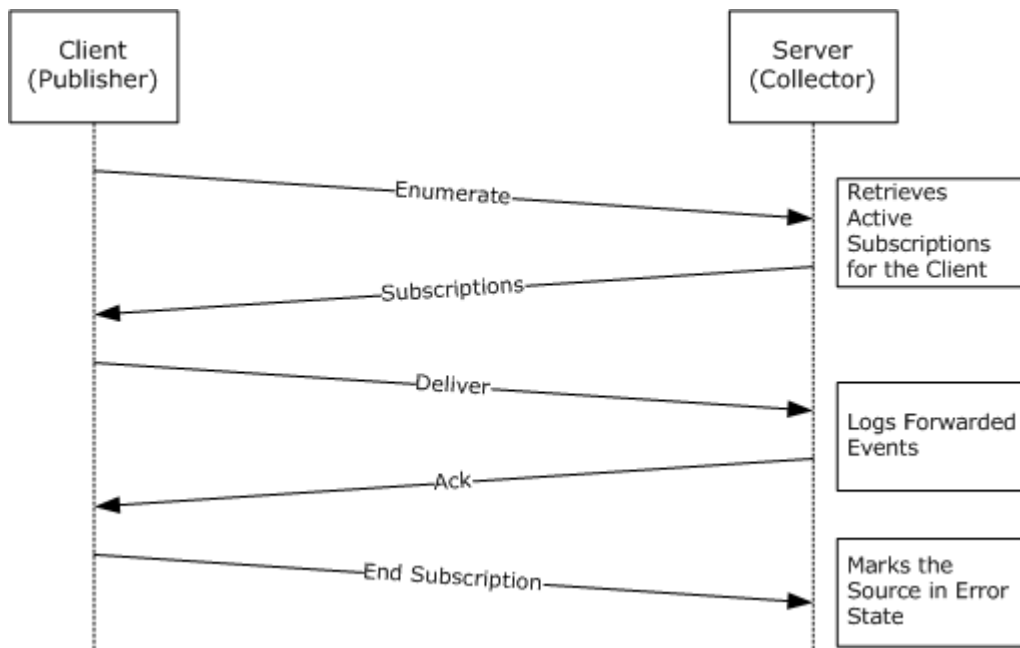


Figure 3: Publisher-Initiated Subscriptions

3.1.8.1.3.1 Action URI

In this case, the publisher of the event sends an enumerate request to the collector.

Web Services Management Protocol Extensions for Windows Vista uses the following action uri for enumeration request:

<http://schemas.xmlsoap.org/ws/2004/09/enumeration/Enumerate>

3.1.8.1.3.2 Resource URI

The enumeration request MUST use the following Resource URI:

<http://schemas.microsoft.com/wbem/wsman/1/SubscriptionManager/Subscription>

The collector retrieves all active subscriptions for the publisher and sends the list of Subscribe requests, as specified in [\[DMTF-DSP0226\]](#) section 7.2, in an Enumerate Response message back to the publisher. The publisher can then deliver the events.

3.1.8.1.3.3 wsman:OptionSet

For information on the options available, see section [3.1.8.1.2](#).

3.1.9 Event Delivery

3.1.9.1 Action URI

The Web Services Management Protocol Extensions for Windows Vista service uses the following Action URI, as specified in [\[DMTF-DSP0226\]](#) section 7.2.8:

<http://schemas.dmtf.org/wbem/wsman/1/wsman/Event>.

This URI may be required in cases where event types are inferred in real-time from other sources and not published as Web service events, and therefore, do not have a designated Action URI. The URI should be as specific as possible in most cases so that it can act as a reliable dispatching point.

3.1.9.2 wsman:OptionSet

3.1.9.2.1 Options

The following options are available for OptionSet block for subscription.

Option	Description
Compression	This option determines the compression algorithm used. Web Services Management Protocol Extensions for Windows Vista supports the Streaming Lossless Data Compression (SLDC) algorithm. It is an ECMA standard (ECMA-321), as specified in [ECMA-321] .
CDATA	This option determines if the data SHOULD be parsed or passed unprocessed. If this option is set to true, it indicates that the data SHOULD NOT be processed by the Web Services Management Protocol Extensions for Windows Vista service. In that case, the data is considered a BLOB and passed as-is to the subscription service for interpretation.
ContentFormat	This option determines how the data will be displayed by the subscription service. If the value of this option is "RenderedText", the data SHOULD be displayed by the subscription service according to a predefined format.
IgnoreChannelError	This option determines if various filtering options resulting in errors in different channels SHOULD result in termination of the processing. If the value of this option is "true", the filtering errors in different channels SHOULD be ignored by the subscription service and processing SHOULD continue.

3.1.9.3 Event Security

In general, management operations and responses should be protected against attacks such as snooping, interception, replay, and modification during transmission. Generally, authenticating the user who has sent a request is also necessary so that access control rules can be applied to determine whether to process a request.

When specifying the wse:NotifyTo address in subscriptions, the implementation SHOULD identify the event source, and which authentication model to use when delivering the event.

If the authentication model is not identified, the event source can try to infer from the wsa:Address what needs to be done. However, if the event source can support multiple modes and has a certificate or password store, it may not know which authentication model to choose or which credentials to use without being told in the subscription.

Information describing the allowed security profiles and potentially acceptable credentials are communicated by using that as specified in [\[WS-Policy\]](#) in the wse:NotifyTo address:

```
<s:Body>
  <wse:Subscribe>
    <wse:Delivery>
      <wse:NotifyTo>
        <wsa:Address> ... </wsa:Address>
        <wsa:ReferenceParameters>... </wsa:ReferenceParameters>
      </wse:NotifyTo>
    </wse:Delivery>
  </wse:Subscribe>
</s:Body>
```



```

        <wsp:Policy> ... </wsp:Policy> *
    </wse:NotifyTo>
</wse:Delivery>
</wse:Subscribe>
</s:Body>

```

In general, as specified in [\[WS-Policy\]](#), there are a variety of representations and nesting of policies. To ensure a baseline for interoperation, minimum implementation levels are suggested.

The following minimal policy expressions MUST be used:

```

<wsp:Policy>
  <wsp:ExactlyOne>
    <wsp:all>
      ... assertions ...
    </wsp:all>
  </wsp:ExactlyOne>
</wsp:Policy>

```

Where each assertion is a set of instructions for a specific security profile. Each assertion is an Authentication element. Web Services Management Protocol Extensions for Windows Vista supports the three assertions in [Authentication Types \(section 2.2.9\)](#):

- Authentication
- Role
- Thumbprint

3.1.9.3.1 Rules for Use

A Web Services Management Protocol Extensions for Windows Vista MAY accept WS-Policy expressions consisting of a sequence of policy assertions but need not accept nested policy assertions; it MAY reject WS-Policy expressions in which a single wsp:All element contains more than one wsman:Authentication assertion; and it MUST reject requests in which the NotifyTo EPR contains more than one wsp:Policy block with wsman:Authentication assertions.

If a service cannot comply with all wsp:Policy elements in the wse:NotifyTo EPR, it MUST return a fault.

A service MUST return a wsman:EventDeliverToUnusable fault with a detail of <http://schemas.dmtf.org/wbem/wsman/1/wsman/faultDetail/CannotComplyWithPolicy>, if one of the wsp:Policy elements contains a requirement that the event source cannot fulfill when delivering events. This includes unknown elements or attributes in the open content sections of known elements.

A service MUST return a wsman:EventDeliverToUnusable fault with a detail of <http://schemas.dmtf.org/wbem/wsman/1/wsman/faultDetail/PolicyTooComplex>, if one of the wsp:Policy elements contains a policy expression that exceeds its ability to evaluate.

3.1.10 Timer Events

Web Services Management Protocol Extensions for Windows Vista defines one timer, the [Enumeration Garbage Collection Timer \(section 3.1.10.1\)](#), in addition to the events of the WS-Management Protocol timer, as specified in [\[DMTF-DSP0226\]](#).

3.1.10.1 Enumeration Garbage Collection Timer

The Enumeration Garbage Collection timer MUST be started by the Web Services Management Protocol Extensions for Windows Vista service when it sends an EnumerationResponse or a PullResponse message. There MUST be a unique timer for each enumeration. Upon receipt of a Pull or Release request, the Enumeration Garbage Collection timer for that enumeration MUST be canceled.

The Enumeration Garbage Collection timer MUST expire after the number of milliseconds given by the EnumerationTimeoutms configuration setting as specified in [Server Configuration Data Types \(section 2.2.4.3\)](#). Upon expiration of this timer, the Web Services Management Protocol Extensions for Windows Vista service MUST return a wsen:InvalidEnumerationContext fault in response to a Pull or Release request that contains the enumeration context value of the last PullResponse message or the EnumerateResponse if no PullResponse messages were sent.

3.1.11 Other Local Events

Web Services Management Protocol Extensions for Windows Vista includes no changes to the other local events of the WS-Management Protocol, as specified in [\[DMTF-DSP0226\]](#).

3.2 WS-CIM Mapping Details

The WS-CIM Mapping Specification, as specified in [\[DMTF-DSP0230\]](#), defines a normative description of a protocol-independent mapping of CIM models to XML Schema, WSDL fragments, and metadata fragments.

This section describes changes to the WS-CIM Mapping Specification for Web Services Management Protocol Extensions for Windows Vista service and clients.

3.2.1 Abstract Data Model

Web Services Management Protocol Extensions for Windows Vista includes no changes to the abstract data model of the WS-CIM Mapping Specification, as specified in [\[DMTF-DSP0230\]](#).

3.2.2 Timers

Web Services Management Protocol Extensions for Windows Vista includes no changes to the timers of the WS-CIM Mapping Specification, as specified in [\[DMTF-DSP0230\]](#).

3.2.3 Initialization

Web Services Management Protocol Extensions for Windows Vista includes no changes to the initialization of the WS-CIM Mapping Specification, as specified in [\[DMTF-DSP0230\]](#).

3.2.4 Higher-Layer Triggered Events

Web Services Management Protocol Extensions for Windows Vista includes no changes to the higher-layer triggered events of the WS-CIM Mapping Specification, as specified in [\[DMTF-DSP0230\]](#).

3.2.5 Message Processing

This section describes changes made by Web Services Management Protocol Extensions for Windows Vista to the message processing of the WS-CIM Mapping Specification, as specified in [\[DMTF-DSP0230\]](#).

3.2.5.1 Arrays

The WS-CIM Mapping Specification defines specific rules for mapping CIM properties that are arrays. Additional information is as specified in [\[DMTF-DSP0230\]](#) section 7.2.2.

Web Services Management Protocol Extensions for Windows Vista service and clients MUST NOT send null array elements. Web Services Management Protocol Extensions for Windows Vista service and clients MUST indicate null arrays by including the element once with the xsi:nil attribute set to "true".

3.2.6 Timer Events

Web Services Management Protocol Extensions for Windows Vista includes no changes to the timer events of the WS-CIM Mapping Specification, as specified in [\[DMTF-DSP0230\]](#).

3.2.7 Other Local Events

Web Services Management Protocol Extensions for Windows Vista includes no changes to the other local events of the WS-CIM Mapping Specification, as specified in [\[DMTF-DSP0230\]](#).

3.3 WS-Management - CIM Binding Details

The WS-Management Common Information Model (CIM) Binding Specification (as specified in [\[DMTF-DSP0227\]](#)) describes how transformed CIM resources, as specified by the WS-CIM specification, are bound to WS-Management operations and WSDL definitions.

This section describes changes to the WS-Management-CIM Binding Specification for Web Services Management Protocol Extensions for Windows Vista service and clients.

3.3.1 Abstract Data Model

Web Services Management Protocol Extensions for Windows Vista includes no changes to the abstract data model of the WS-Management Common Information Model (CIM) Binding Specification, as specified in [\[DMTF-DSP0227\]](#).

3.3.2 Timers

Web Services Management Protocol Extensions for Windows Vista includes no changes to the timers of the WS-Management Common Information Model (CIM) Binding Specification, as specified in [\[DMTF-DSP0227\]](#).

3.3.3 Initialization

Web Services Management Protocol Extensions for Windows Vista includes no changes to the initialization of the WS-Management Common Information Model (CIM) Binding Specification, as specified in [\[DMTF-DSP0227\]](#).

3.3.4 Higher-Layer Triggered Events

Web Services Management Protocol Extensions for Windows Vista includes no changes to the higher-layer triggered events of WS-Management Common Information Model (CIM) Binding Specification, as specified in [\[DMTF-DSP0227\]](#).

3.3.5 Message Processing

This section describes changes made by Web Services Management Protocol Extensions for Windows Vista to the message processing of the WS-Management CIM Binding Specification, as specified in [\[DMTF-DSP0227\]](#).

3.3.5.1 ResourceURI for CIM classes

The CIM binding for WS-Management defines ResourceURIs to be used in referencing the CIM Objects. More information is as specified in [\[DMTF-DSP0227\]](#) section 5.1.

Web Services Management Protocol Extensions for Windows Vista service and clients MUST use the `http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/` namespace prefix followed by the class name when accessing **DMTF** classes. The classes in WMI are considered DMTF classes if they have a Version **qualifier** with major number equal to 2.

As specified in [\[DMTF-DSP0227\]](#) section 5.3, the "`__cimnamespace`" selector specifies the CIM namespace that the request is associated with.

Web Services Management Protocol Extensions for Windows Vista service and clients MAY use the "`__cimnamespace`" selector.

Web Services Management Protocol Extensions for Windows Vista service MUST use `root\hardware` as the default if the "`__cimnamespace`" selector is not specified in the request.

3.3.5.2 ResourceURI for WMI classes

Web Services Management Protocol Extensions for Windows Vista service and clients MUST use the following format when accessing any WMI class:

```
<prefix> <cim namespace> "/" <class name>
```

Where `<prefix>` is `http://schemas.microsoft.com/wbem/wsman/1/wmi/` and `<cim namespace>` is the CIM namespace in which `"\"` has been converted to `"/`.

As specified in [\[DMTF-DSP0227\]](#) section 5.3, the "`__cimnamespace`" selector specifies the **CIM Namespace** that the request associated with Web Services Management Protocol Extensions for Windows Vista service and clients MUST NOT use the "`__cimnamespace`" selector when using a WMI ResourceURI.

3.3.5.3 Transfer

The CIM binding for WS-Management defines which operations can be used on which ResourceURIs when referencing CIM Objects. More information is as specified in [\[DMTF-DSP0227\]](#) section 6.

Web Services Management Protocol Extensions for Windows Vista service MUST support WS-Transfer Get when the class name in the ResourceURI and the selectors identify an instance of that class.

Web Services Management Protocol Extensions for Windows Vista service MUST support WS-Transfer Get when the class name A in the ResourceURI and the selectors identify an instance of class B such that class B is a subclass of class A. Both classes have the same key properties.

Web Services Management Protocol Extensions for Windows Vista service MUST support WS-Transfer Put when the class name in the ResourceURI and the selectors identify an instance of that class.

3.3.5.4 Fragment Transfer

Web Services Management Protocol Extensions for Windows Vista clients MAY use the wsman:FragmentTransfer header to access sub-pieces of a CIM/WMI object with the WS-Transfer Get and WS-Transfer Put operations.

Web Services Management Protocol Extensions for Windows Vista service MUST accept a wsman:FragmentTransfer header containing a fragment expression in the XPath Level 1 dialect as specified in [\[DMTF-DSP0226\]](#) section 13.1 for WS-Transfer Get and WS-Transfer Put operations when the Resource URI and selectors identify an instance of a CIM/WMI class.

WS-Management indicates that a wsman:CannotProcessFilter SHOULD be returned when the fragment expression exceeds the subset supported by the service. More information is as specified in [\[DMTF-DSP0226\]](#) section 4.8. [<35><36><37>](#)

3.3.5.5 wsman:OptionSet

The options supported by a CIM/WMI ResourceURI vary based upon the WMI provider that has implemented the class. These are communicated to the WMI provider by using a "WMI context" object. The WsMan OptionSet can be used to construct a "WMI context" but the specific names for options are beyond this specification.

Web Services Management Protocol Extensions for Windows Vista service MUST process any Option element that starts with "wmi:" by removing the "wmi:" prefix and adding the resulting name to the WMI content with the value of the Option element.

Web Services Management Protocol Extensions for Windows Vista service MUST process any Option element that starts with "wmiarray:" by removing the "wmiarray:" prefix and grouping all values with the same name into an array before adding to the WMI context. The order of the values in the array MUST match the order in which the Option element occurred in the OptionSet element.

Web Services Management Protocol Extensions for Windows Vista service MUST return a wsman:InvalidOptions fault for CIM/WMI ResourceURIs if the wsman:OptionSet element contains a wsman:Option element with mustComply="true" regardless of the name of the option.

3.3.5.6 wsman:EnumerationMode

Web Services Management Protocol Extensions for Windows Vista service MUST support wsman:EnumerationMode for CIM/WMI resources and respond with the instance or EPR or both, as requested by the client.

3.3.5.7 wsmb:PolymorphismMode

A common way to extend CIM classes is to define derivatives of the CIM Class. When a client requests objects of the type for CIM_Process, it is possible to return instances that are actually of a derived type such as Vendor_Process. The WS-Management CIM Binding Specification defines details for handling polymorphism in the resultSet, as specified in [\[DMTF-DSP0227\]](#) section 8.1.

Web Services Management Protocol Extensions for Windows Vista clients SHOULD NOT send the PolymorphismMode element.

Web Services Management Protocol Extensions for Windows Vista service MUST ignore the PolymorphismMode element.

Web Services Management Protocol Extensions for Windows Vista service MUST return instances of both base and derived classes by effectively casting derived objects to the base class. Each returned instance MUST contain only the properties of the base class and omits the properties from the derived classes.

3.3.6 Timer Events

Web Services Management Protocol Extensions for Windows Vista includes no changes to the timer events of WS-Management CIM Binding Specification, as specified in [\[DMTF-DSP0227\]](#).

3.3.7 Other Local Events

Web Services Management Protocol Extensions for Windows Vista includes no changes to the other local events of WS-Management CIM Binding Specification, as specified in [\[DMTF-DSP0227\]](#).

3.4 WS-Management - Remote Shell Access Details

This section describes remote shell operations supported by Web Services Management Protocol Extensions for Windows Vista clients and **servers**.

3.4.1 Message Processing

This section describes the message processing rules for the remote shell operations part of Web Services Management Protocol Extensions for Windows Vista.

There are two usage scenarios for Remote Shell:

1. Windows Command Shell Scenario
2. Custom Remote Shell Scenario

Windows Command Shell: The scenario mimics the pattern of operations of a user with the Windows cmd.exe interactive command shell: opening the shell, running a command in the form of simple text-based command-line, possibly feeding input streams, examining the output streams, running new commands, and finally closing the shell. This scenario is limited to Windows Command Shell only.

Custom Remote Shell: Unlike Windows Command Shell scenario, the Custom Remote Shell scenario allows the user to execute any shell remotely. However, before the user tries to execute the custom shell remotely, the admin has to set up the configuration table at the server to map a specific custom shell to corresponding resource URIs. For information on the Custom Remote Shell URI configuration table setup, see section [3.1.5.5.6](#). The user then provides a resource URI that is mapped to a custom shell and the server executes the shell remotely on behalf of the user. In case of Custom Remote Shell, the 'Command' request and response are not sent explicitly, as is the case with Windows Command Shell. Rather, in this scenario, the 'Command', its arguments, and any associated data is sent as a blob in 'Send' request. This blob is shell-specific and is transparent to the protocol. In case of Custom Remote Shell, the 'Send' is targeted at the shell itself, which decodes the blob.

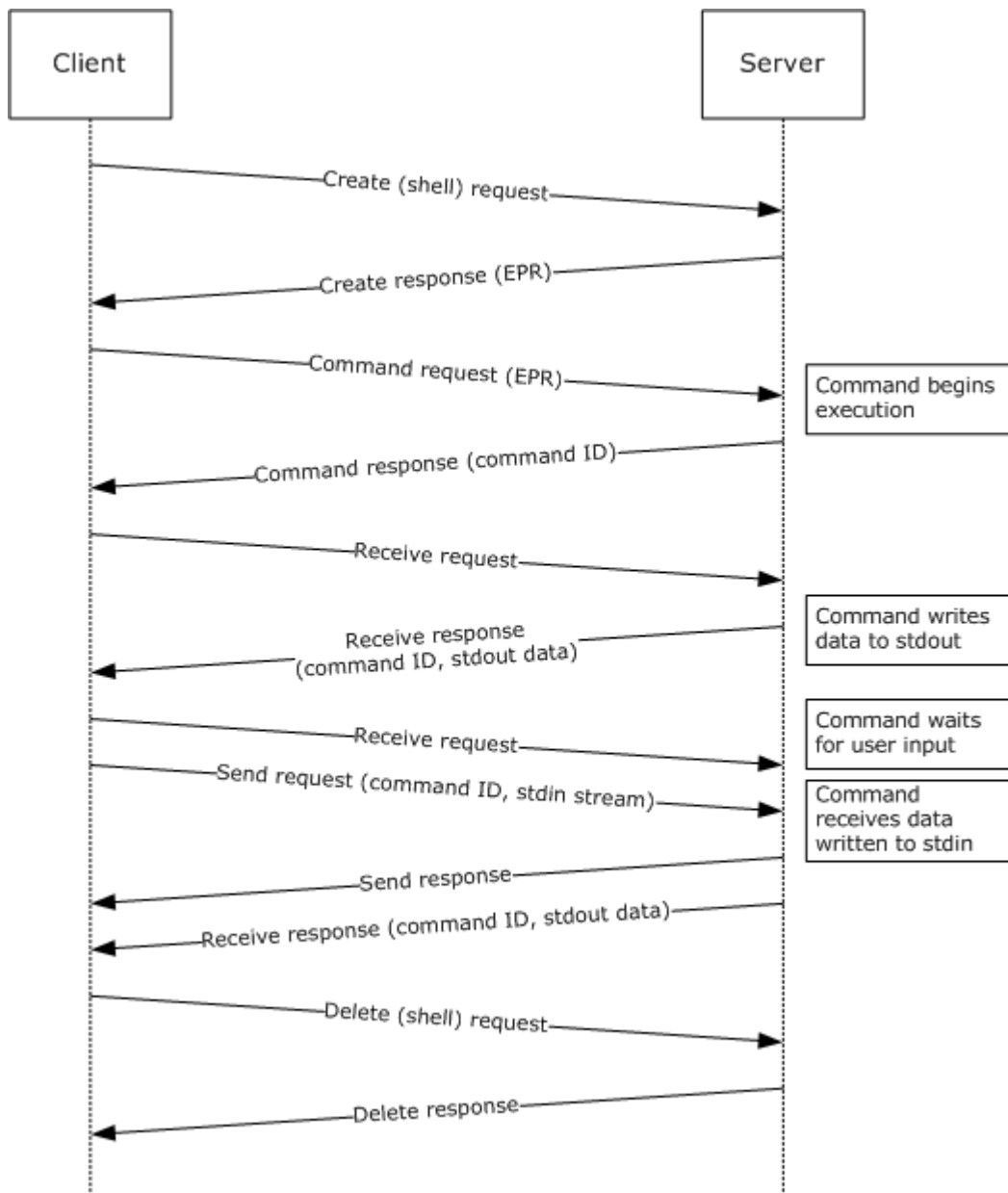


Figure 4: Web Services Management Protocol Extensions for Windows Vista remote shell message processing sequence

3.4.1.1 wxf:Create

To open a new shell, a WS-Transfer Create message MUST be sent by using the model and restrictions established by what is specified in [\[DMTF-DSP0226\]](#). The wsman:ResourceURI element of the EPR contains the URI of a resource, which can create new instances of the specific type of shell referenced by the URI. To connect to the Windows cmd.exe shell on the remote system, the URI element MUST have the value `http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd`. In essence, this EPR (with its

wsman:ResourceURI) is a "factory" for instances of the shell. The s:Body of the message contains the startup parameters defined by the Shell data type, as specified in section [2.2.3](#). This is illustrated below:

```
<s:Envelope ...>
  <s:Header ...>
    <wsa:Action>
      http://schemas.xmlsoap.org/ws/2004/09/transfer/Create
    </wsa:Action>
    ...other WS-Addressing & WS-Management headers...
    <wsman:ResourceURI>
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
    </wsman:ResourceURI>
    <w:OptionSet xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
      <w:Option Name="xs:string"/>...value...</w:Option>+
    </w:OptionSet>
  </s:Header>
  <s:Body ...>
    <rsp:Shell>
      ...Value defined by the Shell data type...
    </rsp:Shell>
  </s:Body>
</s:Envelope>
```

The value of Resource URI will be different for Windows Command Shell and Custom Remote Shell.

In case of Windows Command Shell, the value of Resource URI is as follows:
http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd

An example of Resource URI for Custom Remote Shell scenario, is as follows:
http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CustomShell

3.4.1.1.1 wsman:OptionSet

The following named options MAY be used when creating the remote shell.

Option	Description
WINRS_NOPROFILE	If set to TRUE, this option specifies that the user profile does not exist on the remote system and that the default profile SHOULD be used. By default, the value is TRUE.
WINRS_CODEPAGE	The value of the options specifies the client's console output code page. The value is returned by GetConsoleOutputCP API; on the server side, this value is set as input and output code page to display the number of the active character set (code page) or to change the active character set.

3.4.1.1.2 wsman:Locale

While it is as specified in [\[DMTF-DSP0226\]](#) to allow the wsman:Locale message to appear on any message, in general it only makes sense to establish the wsman:Locale when the shell is created by using wxf:Create. The Web Services Management Protocol Extensions for Windows Vista service MUST return a wsa:InvalidMessageInformationHeader fault if a different locale is sent with any message other than wsf:Create.

3.4.1.2 wxf:ResourceCreated

Upon successful processing of an [wxf:Create](#) message, the Web Services Management Protocol Extensions for Windows Vista service **MUST** create a shell instance and return a reference to it as a `wsa:EndpointReference`, as specified in [\[WSAddressing\]](#) and [\[DMTF-DSP0226\]](#). This is illustrated as follows:

```
<s:Envelope ...>
  <s:Header ...>
    <wsa:Action>
      http://schemas.xmlsoap.org/ws/2004/09/transfer/CreateResponse
    </wsa:Action>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body>
    <wxf:ResourceCreated>
      <wsa:Address>
        Transport level
        address of shell processor
      </wsa:Address>
      <wsa:ReferenceParameters>
        <wsman:ResourceURI>
          http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
        </wsman:ResourceURI>
        <wsman:SelectorSet>
          <wsman:Selector Name="ShellID">
            ...shell GUID...
          </wsman:Selector>
        </wsman:SelectorSet>
      </wsa:ReferenceParameters>
    </wxf:ResourceCreated>
  </s:Body>
</s:Envelope>
```

The `wsa:EndpointReference` encapsulated within the `wxf:ResourceCreated` contains a reference to the newly created shell instance. This address is used in all subsequent messages to the shell instance, that is, `wxf>Delete`, `Command`, `Signal`, `Send`, and `Receive`.

The following describes the additional normative constraints on the shell EPR:

ReferenceParametersp: This required element identifies the created shell instance.

ResourceURI: The value of Resource URI will be different for Windows Command Shell and Custom Remote Shell.

- In case of Windows Command Shell, the value of Resource URI is as follows: `http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd`
- An example of Resource URI for Custom Remote Shell scenario is as follows: `http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CustomShell`

SelectorSet: This value of the Name attribute of Selector element **MUST** contain the GUID identifying the new shell.

The client must extract this new EPR and use it in all subsequent messages, as it refers to the shell instance that was just created.

3.4.1.3 wxf:Delete

To close an active shell, a wxf:Delete message MAY be sent by using the wsa:EndpointReference returned in the [wxf:ResourceCreated](#) when the shell was first created.

This message MAY be sent asynchronously to any outstanding messages in progress to the specified shell, allowing the shell to be forcibly closed. Any commands in progress SHOULD be immediately terminated and all resources for the shell SHOULD be freed. The final results of any operations in progress are undefined and similar to forcibly terminating a shell processor in any other context outside SOAP.

The Delete message is of the form as specified in [\[DMTF-DSP0226\]](#), as illustrated below:

```
<s:Envelope ...>
  <s:Header ...>
    <wsa:Action>
      http://schemas.xmlsoap.org/ws/2004/09/transfer/Delete
    </wsa:Action>
    <wsa:To> Network address URL </wsa:To>
    <wsman:ResourceURI>
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
    </wsman:ResourceURI>
    <wsman:SelectorSet>
      <wsman:Selector Name="ShellID">
        ...shell GUID...
      </wsman:Selector>
    </wsman:SelectorSet>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body />
</s:Envelope>
```

The value of Resource URI will be different for Windows Command Shell and Custom Remote Shell.

In case of Windows Command Shell, the value of Resource URI is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd>

An example of Resource URI for Custom Remote Shell scenario is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CustomShell>

3.4.1.4 wxf:DeleteResponse

Upon successful processing of a [wxf:Delete](#) request message, a processor is expected to return a wxf:DeleteResponse message, which MUST adhere to the form as specified in [\[DMTF-DSP0226\]](#).

This specification places no additional restrictions or requirements on the response.

3.4.1.5 Command (for Windows Command Shell Scenario Only)

This is applicable for Windows Command Shell scenario only. Custom Shell scenario uses Send to execute the command as specified in section [3.4.1.8](#). To execute a command within a shell, the Command message is sent to the EPR of an existing shell instance. This EPR was obtained from a [wxf:ResourceCreated](#) message during shell instance creation.

The Command message MUST be of the following form:

```

<s:Envelope ...>
  <s:Header ...>
    <wsman:ResourceURI>
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
    </wsman:ResourceURI>
    <wsman:SelectorSet>
      <wsman:Selector Name="ShellID">
        ...shell GUID...
      </wsman:Selector>
    </wsman:SelectorSet>
    <w:OptionSet xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
      <w:Option Name="xs:string"/>...value...</w:Option>+
    </w:OptionSet>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body ...>
    <rsp:CommandLine ...>
      ...Value defined by the CommandLine data type...
    </rsp:CommandLine>
  </s:Body>
</s:Envelope>

```

3.4.1.5.1 wsman:OptionSet

The following named options MAY be used with the Command message.

Option	Description
WINRS_CONSOLEMODE_STDIN	The client-side mode for standard input is CONSOLE if TRUE and PIPE if FALSE. This does not have an impact on the wire protocol. This option name MUST be used by the client of the Windows command shell when starting the execution of a command using rsp:Command request to indicate that the client side of the standard input is Console; the default implies Pipe.
WINRS_SKIP_CMD_SHELL	If set to TRUE, this option requests that the server runs the command without using cmd.exe; if set to FALSE, the server is requested to use cmd.exe. By default the value is FALSE. This does not have any impact on the wire protocol.

3.4.1.5.2 Rules for Use

Web Services Management Protocol Extensions for Windows Vista only supports one outstanding command per instance of the shell processor. To achieve concurrent commands, more than one instance of the shell must be created.

An attempt to execute a new command while the data stream of a previously executed command is still active MUST result in a wsman:Concurrency fault.

3.4.1.6 CommandResponse (for Windows Command Shell Scenario Only)

This is applicable for Windows Command Shell scenario only. Upon successful processing of a Command request message, a shell processor MUST return a CommandResponse message, which MUST adhere to the following form:

```

<s:Envelope ...>
  <s:Header ...>
    <wsman:ResourceURI>
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
    </wsman:ResourceURI>
    <wsman:SelectorSet>
      <wsman:Selector Name="ShellID">
        ...shell GUID...
      </wsman:Selector>
    </wsman:SelectorSet>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body ...>
    <rsp:CommandResponse ...>
      ...Value defined by the CommandResponse data type...(section 2.2.3.4)
    </rsp:CommandResponse>
  </s:Body>
</s:Envelope>

```

3.4.1.7 I/O streams

The Web Services Management Protocol Extensions for Windows Vista client in the Windows Command Shell scenario interacts with the remote command, and in Custom Remote Shell, the scenario interacts with the shell by sending and receiving I/O streams. This section discusses how the I/O streams are encoded within Send and Receive messages.

The Web Services Management Protocol Extensions for Windows Vista supports one input stream (stdin) and two output streams (stdout and stderr). The name attribute of the `rsp:Stream` element SHOULD be one of these values. The `s:Body` element may contain more than one stream data block. Each MUST be encoded by using base64binary:

```

<s:Body>
  ...
  <rsp:Stream Name="stdout" CommandId="xs:anyURI">
    ...encoded data...
  </rsp:Stream>
  <rsp:Stream Name="stderr" CommandId="xs:anyURI">
    ...encoded data...
  </rsp:Stream>
</s:Body>

```

In the Windows Command Shell scenario, if the stream is tied to a particular command, it MUST be indicated by an optional attribute `CommandId`. The value of `CommandId` MUST be the value contained in the `CommandResponse` message. For example:

```

<rsp:Stream
  Name="stdout"
  CommandId="77df7bb6-b5a0-4777-abd9-9823c0774074">
  c3RpbmdlaXNoZWQsIG5vdCBvbmx5IGJ5IGhpc=
</rsp:Stream>

```

The `CommandId` attribute MUST be omitted if the stream is bound to the shell processor and contains shell output messages such as prompts, error messages, etc. or input messages such as prompt responses. The shell bound input streams SHOULD NOT be used to activate or execute a command. For example, the client should not send a stream to the shell that contains "cd" as data

to get the "cd" command executed. Instead, the client SHOULD send the Command message where `rsp:CommandLine` will contain the "cd" command line. In the Custom Shell scenario, the input stream is bound to the shell only and can contain the command, its arguments, and input data for the command, as encoded data from stream element. The shell bound input streams is used to activate or execute commands. For example the client can send a stream to the shell that contains "cd" as data to get the "cd" command executed. Also the `CommandId` attribute of each Stream element MUST be omitted for CustomShell.

3.4.1.8 Send

In Windows Command Shell scenario, the Send message is used to pipe input to a running command and in Custom Remote Shell scenario, the Send message is used to pipe input to the shell processor. The message MUST be of the same general format, with the value of Resource URI the only difference between the two scenarios. Also the `CommandId` attribute of each Stream element MUST be used for Windows Command Shell and MUST be omitted for CustomShell. The message for Windows Command Shell is shown below:

```
<s:Envelope ...>
  <s:Header ...>
    <wsman:ResourceURI>
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
    </wsman:ResourceURI>
    <wsman:SelectorSet>
      <wsman:Selector Name="ShellID">
        ...shell GUID...
      </wsman:Selector>
    </wsman:SelectorSet>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body ...>
    <rsp:Send ...>
      ...Value defined by the Send data type...
    </rsp:Send>
  </s:Body>
</s:Envelope>
```

The value of Resource URI will be different for Windows Command Shell and Custom Remote Shell.

In case of Windows Command Shell, the value of Resource URI is as follows:
`http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd`

An example of Resource URI for Custom Remote Shell scenario is as follows:
`http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CustomShell`

3.4.1.8.1 Rules for Use

1. Only one [Send](#) request can be outstanding per instance of the shell. Only when a `rsp:SendResponse` is received may another `rsp:Send` occur. However, a `rsp:Send` may occur asynchronously to any `rsp:Receive` request.
2. In case of Windows Command Shell scenario, if the input is being sent to a specific command and the command completes or fails without consuming all the input, that additional unconsumed input is discarded and ignored.

3. Sending empty stream content ("dummy" messages) is permitted. This may be required to prevent deadlock or livelock in certain commands with heavy input and output interaction. CommandId is mandatory (as specified in [\[RFC2119\]](#)) for Windows Command Shell scenario and MUST be omitted for Custom Remote Shell scenario.

3.4.1.9 SendResponse

Upon successful processing of a [Send](#) request message, a processor MUST return a SendResponse response message, which MUST adhere to the same general form in both scenarios, with the only difference being the value of the Resource URI. Custom Shell scenario uses SendResponse to get status information. SendResponse reflects the status of writing the blob of data (commands+args+data) to stdin; the status of executing the commands, if any, is not reflected in the SendResponse message, but later in the ReceiveResponse message (stdout/stderr); this is transparent to the Remote Shell protocol and up to the shell.

Following is the response message:

```
<s:Envelope ...>
  <s:Header ...>
    <wsman:ResourceURI>
      Resource URI
    </wsman:ResourceURI>
    <wsman:SelectorSet>
      <wsman:Selector Name="ShellID">
        ...shell GUID...
      </wsman:Selector>
    </wsman:SelectorSet>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body ...>
    <rsp:SendResponse ...>
      ...Value defined by the SendResponse data type...
    </rsp:SendResponse>
  </s:Body>
</s:Envelope>
```

The value of Resource URI will be different for Windows Command Shell and Custom Remote Shell.

In case of Windows Command Shell, the value of Resource URI is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd>

An example of Resource URI for Custom Remote Shell scenario is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CustomShell>

The attribute CommandId MUST only be used in Windows Command Shell scenario, and MUST NOT be used in Custom Remote Shell scenario.

3.4.1.10 Receive

In the Windows Command Shell scenario, the Receive message is used to collect output from a running command, whereas in the Custom Remote Shell scenario, it is used to collect output from the shell itself. Also note that in case of the Windows Command Shell scenario, a final Signal message MUST also be issued for the command after all the stream data has been received; it is not sufficient to simply use Receive to receive all the data. The Receive message MUST adhere to the

following general form, with the only difference being the value of the Resource URI between the two scenarios. Following is the Receive message format:

```
<s:Envelope ...>
  <s:Header ...>
    <wsman:ResourceURI>
      Resource URI
    </wsman:ResourceURI>
    <wsman:SelectorSet>
      <wsman:Selector Name="ShellID">
        ...shell GUID...
      </wsman:Selector>
    </wsman:SelectorSet>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body ...>
    <rsp:Receive ...>
      ...Value defined by the Receive data type...
    </rsp:Receive>
  </s:Body>
</s:Envelope>
```

The value of Resource URI will be different for Windows Command Shell and Custom Remote Shell.

In case of Windows Command Shell, the value of Resource URI is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd>

An example of Resource URI for Custom Remote Shell scenario is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CustomShell>

Note The value defined by the [ReceiveResponse](#) data type is as specified in section [2.2.3.8](#).

3.4.1.10.1 wsman:OptionSet

The following named option MAY be used during receive operation of the remote shell:
WSMAN_CMDSHELL_OPTION_KEEPALIVE.

WSMAN_CMDSHELL_OPTION_KEEPALIVE enables the polling mechanism, which is used in conjunction with SequenceId. The client places a zero value on the initial message and increases this by 1 with each subsequent rsp:Receive message until the operation completes.

The rsp:ReceiveResponse will echo this value. If the client needs to retry an rsp:Receive operation because of a fault, it should reuse the SequenceId in order to ensure that the service provides continuity in the stream data.

The client should only increase this value once an rsp:ReceiveResponse has been received with a copy of the value which was sent.

3.4.1.11 ReceiveResponse

Upon successful processing of a [Receive](#) request message, the shell processor MUST return a ReceiveResponse message, which MUST adhere to the following general form, with the only difference being the value of the Resource URI between the two scenarios. The following is the ReceiveResponse message format.

```

<s:Envelope ...>
  <s:Header ...>
    <wsman:ResourceURI>
      Resource URI
    </wsman:ResourceURI>
    <wsman:SelectorSet>
      <wsman:Selector Name="ShellID">
        ...shell GUID...
      </wsman:Selector>
    </wsman:SelectorSet>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body ...>
    <rsp:ReceiveResponse ...>
      ...Value defined by the ReceiveResponse data type...
    </rsp:ReceiveResponse>
  </s:Body>
</s:Envelope>

```

The value of Resource URI will be different for Windows Command Shell and Custom Remote Shell.

In case of Windows Command Shell, the value of Resource URI is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd>

An example of Resource URI for Custom Remote Shell scenario is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CustomShell>

Note The value defined by the ReceiveResponse data type is as specified in section [2.2.3.9](#).

3.4.1.11.1 Rules for Use

1. When the shell was opened with [wxf:Create](#), the client and service established a contractual obligation regarding the output streams that would be in use. The client **MUST** be prepared to accept output from any of these streams. If additional output streams are available and were not part of the initial wxf:Create handshake, the server-side processor **MUST** omit these streams in the response.
2. The Receive message **MAY** execute concurrently or asynchronously with Send messages, but only one Receive **MAY** be outstanding at any given time.
3. A client **SHOULD** immediately issue a Receive message when a command is launched, whether or not it will be sending input using Send messages. To prevent deadlock, livelock, or time-out situations, the server **MAY** return Receive messages with empty string content, but typically it will delay responding until output is available, providing that wsman:OperationTimeout rules are not violated. The client **SHOULD** continue to issue Receive messages as soon as the previous ReceiveResponse has been received.
4. At least one Receive **MUST** be issued to get a final ReceiveResponse, which indicates that a command has terminated.

In case of Windows Command Shell scenario, the server **MAY** reject processing new Command requests until it has successfully returned a ReceiveResponse with a CommandState element, indicating that the command has terminated or succeeded.

When the client receives the final output from a command, it **MUST** subsequently send a Signal with a code of <http://schemas.microsoft.com/wbem/wsman/1/windows/shell/signal/Terminate> to

signal to the command processor that it MAY discard all final state information for the most recently executed command.

The reason for this final step is that the server will cache the final ReceiveResponse content to allow for intermittent connections. The server cannot be certain that the client has received the final command status. Only by acknowledging this with a subsequent Signal can the server safely release the final command status information.

5. In case of Windows Command Shell scenario, while some individual streams MAY optionally end by using the `rsp:Stream/@End` attribute, the completion of a command and consequently its entire output is distinct and signaled using the `rsp:CommandState` element with the `<State>` element having the value `rsp:CommandState/Done`.

The server MAY notify that a command is blocked while waiting for input stream content by returning `rsp:CommandState` element with the `<Status>` element set to `rsp:CommandState/Pending`. The command state and its output is sent back to the client in the Custom Remote Shell scenario as part of a blob of data transparent to the Remote Shell protocol.

3.4.1.12 Signal

The Signal operation is used to control the shell processor. It can be sent either asynchronously or synchronously. In case of Windows Command Shell scenario, a signal may be sent to a specific command, or in the case of a Custom Remote Shell scenario, to the shell itself. The Signal request message MUST be of the general form, with the only difference being the value of the Resource URI between the two scenarios. The following is the Signal message format.

```
<s:Envelope ...>
  <s:Header ...>
    <wsman:ResourceURI>
      Resource URI
    </wsman:ResourceURI>
    <wsman:SelectorSet>
      <wsman:Selector Name="ShellID">
        ...shell GUID...
      </wsman:Selector>
    </wsman:SelectorSet>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body ...>
    <rsp:Signal ...>
      ...Value defined by the Signal data type...
    </rsp:Signal>
  </s:Body>
</s:Envelope>
```

The value of Resource URI will be different for Windows Command Shell and Custom Remote Shell.

In case of Windows Command Shell, the value of Resource URI is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd>

An example of Resource URI for Custom Remote Shell scenario is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CustomShell>

Also, the `CommandId` attribute is only used in Windows Command Shell scenario, and is not applicable in Custom Remote Shell scenario.

Note The value defined by the Signal data type is as specified in section [2.2.3.10](#).

3.4.1.13 SignalResponse

Upon successful processing of a [Signal](#) request message, a processor is expected to return a SignalResponse response message. The Signal response message MUST be of the following general form, with the only difference being the value of the Resource URI between Windows Command Shell and Custom Remote Shell scenarios. Following is the SignalResponse message format:

```
<s:Envelope ...>
  <s:Header ...>
    <wsman:ResourceURI>
      Resource URI
    </wsman:ResourceURI>
    <wsman:SelectorSet>
      <wsman:Selector Name="ShellID">
        ...shell GUID...
      </wsman:Selector>
    </wsman:SelectorSet>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body ...>
    <rsp:SignalResponse ...>
      ...Value defined by the SignalResponse data type...
    </rsp:SignalResponse>
  </s:Body>
</s:Envelope>
```

The value of Resource URI will be different for Windows Command Shell and Custom Remote Shell.

In case of Windows Command Shell, the value of Resource URI is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd>.

An example of Resource URI for Custom Remote Shell scenario is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CustomShell>.

3.4.1.14 wxf:Get

To read the startup parameters of an active shell, a wxf:Get message MAY be sent by using the wsa:EndpointReference returned in the wxf:ResourceCreated, when the shell was first created.

This message MAY be sent asynchronously to any outstanding messages in progress to the specified shell. The Get message is of the form as specified in [\[DMTF-DSP0226\]](#), with the only difference being the value of the Resource URI between the two scenarios. Following is the Get message format:

```
<s:Envelope ...>
  <s:Header ...>
    <wsa:Action>
      http://schemas.xmlsoap.org/ws/2004/09/transfer/Get
    </wsa:Action>
    <wsa:To> Network address URL </wsa:To>
    <wsman:ResourceURI>
      Resource URI
    </wsman:ResourceURI>
```

```

<wsman:SelectorSet>
  <wsman:Selector Name="ShellID">
    ...shell GUID...
  </wsman:Selector>
</wsman:SelectorSet>
...other WS-Addressing & WS-Management headers...
</s:Header>
<s:Body />
</s:Envelope>

```

The value of Resource URI will be different for Windows Command Shell and Custom Remote Shell.

In case of Windows Command Shell, the value of Resource URI is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd>

An example of Resource URI for Custom Remote Shell scenario is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CustomShell>

3.4.1.14.1 wsman:FragmentTransfer

The WS-Management specification defines the FragmentTransfer SOAP header, which is used to retrieve and update fragments or individual elements of a CIM Object. More details are as specified in [\[DMTF-DSP0226\]](#) section 4.8.

Web Services Management Protocol Extensions for Windows Vista does not support that header for shell operations and the clients SHOULD NOT use it.

3.4.1.15 wxf:GetResponse

On successful processing of a [wxf:Get](#) request message, a processor MUST return a wxf:GetResponse message in the form, as specified in [\[DMTF-DSP0226\]](#), with the only difference that in case of Custom Remote Shell scenario, CommandLine element is absent. The GetResponse message format is as follows:

```

<s:Envelope ...>
  <s:Header ...>
    <wsa:Action>
      http://schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse
    </wsa:Action>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body>
    <rsp:Shell ...>
      <rsp:ShellId>
        ...Shell GUID...
      </rsp:ShellId>
      <rsp:Lifetime>
        ... valueof the Lifetime
      </rsp:Lifetime>
      <rsp:InputStreams>
        ...list of input streams...
      </rsp:InputStreams>
      <rsp:OutputStreams>
        ...list of output streams...
      </rsp:OutputStreams>
    </rsp:Shell>
  </s:Body>
</s:Envelope>

```

```

        <rsp:CommandLine>
            <rsp:Command>...command line text...</rsp:Command>
        </rsp:CommandLine>
    </rsp:Shell>
</s:Body>
</s:Envelope>

```

Note The optional <ShellId> element of the [Shell data type](#) (see section 2.2.3) MUST be present in the GetResponse message.

Note CommandLine attribute MUST only be used in Windows Command Shell scenario, and MUST NOT be used in case of Custom Remote Shell scenario.

3.4.1.16 wsen:Enumerate

To initiate enumeration of the active shell instances, a wsen:Enumerate message MAY be sent.

This message MAY be sent asynchronously to any outstanding messages in progress to any of the active shells. The Enumerate message is of the form as specified in [\[DMTF-DSP0226\]](#), with the only difference being the value of the Resource URI between the two scenarios. Following is the Enumerate message format:

```

<s:Envelope ...>
  <s:Header ...>
    <wsa:Action>
      http://schemas.xmlsoap.org/ws/2004/09/enumeration/Enumerate
    </wsa:Action>
    <wsa:To> Network address URL </wsa:To>
    <wsman:ResourceURI>
      Resource URI
    </wsman:ResourceURI>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body>
    <n:Enumerate/>
  </s:Body>
</s:Envelope>

```

The value of Resource URI will be different for Windows Command Shell and Custom Remote Shell.

In case of Windows Command Shell, the value of Resource URI is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd>

An example of Resource URI for Custom Remote Shell scenario is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CustomShell>

3.4.1.16.1 wsman:Filter

The WS-Management specification defines wsman:Filter as an alternative mechanism to specify filters that are different from that of the wsen:Filter. More details are as specified in [\[DMTF-DSP0226\]](#) section 5.3.

Web Services Management Protocol Extensions for Windows Vista clients SHOULD not use the wsman:Filter element when processing the requests against ResourceURI:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd>

Web Services Management Protocol Extensions for Windows Vista servers MUST fault if the wsman:Filter element is used against ResourceURI:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd>

3.4.1.16.2 Other wsen:Enumerate options

The other wsen:Enumerate options are applied as specified in section [3.4.1.16](#).

3.4.1.17 wsen:Pull

A processor MAY send a wsen:Pull message in the form as specified in [\[DMTF-DSP0226\]](#). Following is the Pull message format:

```
<s:Envelope ...>
  <s:Header>
    <a:To> Network address URL </a:To>
    <w:ResourceURI>
      Resource URI
    </w:ResourceURI>
    <a:Action>
      http://schemas.xmlsoap.org/ws/2004/09/enumeration/Pull
    </a:Action>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body>
    <n:Pull>
      <n:EnumerationContext>
        ...enumeration context GUID ...
      </n:EnumerationContext>
      <n:MaxElements>
        ...number of elements in the batch ...
      </n:MaxElements>
    </n:Pull>
  </s:Body>
</s:Envelope>
```

The value of Resource URI will be different for Windows Command Shell and Custom Remote Shell.

In case of Windows Command Shell, the value of Resource URI is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd>

An example of Resource URI for Custom Remote Shell scenario is as follows:
<http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CustomShell>

Note MaxElements is an optional element.

3.4.1.18 wsen:PullResponse

A processor MUST return a wsen:PullResponse message in the form as specified in [\[DMTF-DSP0226\]](#). Following is the PullResponse message format for Windows Command Shell scenario:

```

<s:Envelope ... >
  <s:Header>
    <a:Action ... >
      http://schemas.xmlsoap.org/ws/2004/09/enumeration/PullResponse
    </a:Action>
    ...other WS-Addressing & WS-Management headers...
  </s:Header>
  <s:Body>
    <n:PullResponse>
      <n:Items>
        <rsp:Shell>
          <rsp:ShellId>
            ...shell GUID ...
          </rsp:ShellId>
          <rsp:Lifetime>
            ... valueof the Lifetime
          </rsp:Lifetime>
          <rsp:InputStreams>
            ...list of input streams...
          </rsp:InputStreams>
          <rsp:OutputStreams>
            ...list of output streams...
          </rsp:OutputStreams>
          <rsp:CommandLine>
            <rsp:Command>...command line text...</rsp:Command>
          </rsp:CommandLine>
        </rsp:Shell>
        ... other shell instances ...
      </n:Items>
      <n:EndOfSequence/>
    </n:PullResponse>
  </s:Body>
</s:Envelope>

```

Note The EndOfSequence element MUST be included by the server if there are no additional active shell instances to pull.

3.4.1.19 Faults

The remote shell extensions do not introduce additional faults. This section describes how it uses the faults as specified in [\[DMTF-DSP0226\]](#).

3.4.1.19.1 wsman:SchemaValidationError

This fault is returned for any operation when the xml is invalid. It includes the following detail f:Message:

"The Windows Remote Shell cannot process the request. The SOAP packet contains an element *invalid_xml_element* that is invalid. Retry the request with the correct XML element".

Note *invalid_xml_element* is replaced with the actual XML element.

3.4.1.19.2 wsman:QuotaLimit

This fault is returned by the [wxf:Create](#) operation when a quota limit is exceeded.

If the winr/config/winrs/MaxShellsPerUser (default 2) value is violated the detail f:Message will contain:

"The Windows Remote Shell cannot process the request. The server is already executing the maximum number of concurrent shells a user can remotely open on the same system. Retry later."

If the winr/config/winrs/ MaxConcurrentUsers (default 5) value is violated, the detail f:Message will appear:

"The Windows Remote Shell cannot process the request. The server exceeded the maximum number of users concurrently performing remote operations on the same system. Retry later."

Note Violations of other winrs quota limits currently will not result in faults.

4 Protocol Examples

The following sections describe several operations as used in common scenarios to illustrate the function of the Web Services Management Protocol Extensions for Windows Vista.

4.1 CIM Examples

This section illustrates protocol examples related to the CIM.

4.1.1 Retrieving a CIM Instance

This section illustrates an example of a simple CIM Class being accessed via the WS-Management Protocol.

MOF) representation of the class is as specified in [\[DMTF-DSP004\]](#):

```
[abstract]
class Base
{
    [key] sint32 id;
};
class MyClass : Base
{
    string Data1;
};
instance of MyClass
{
    id = 1;
    Data1 = "Hello World";
};
```

This is a simple CIM Class hierarchy of two classes, a base CIM Class and a derived CIM Class called MyClass. These classes are defined in the CIM Namespace called root\mycimnamespace.

To access an instance of this class by using a Get operation, the request is as follows:

```
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://server:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/transfer/Get
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
51200
    </w:MaxEnvelopeSize>
  </s:Header>
  <s:Body>
  </s:Body>
</s:Envelope>
```



```

    <a:MessageID>
      uuid:5E6FD101-710A-4EEA-A50D-70C0BF863AA3
    </a:MessageID>
    <w:SelectorSet>
      <w:Selector Name="id">1</w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body/>
</s:Envelope>

```

Get Response:

```

<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse
    </a:Action>
    <a:MessageID s:mustUnderstand="true">
      uuid:2DAB718A-0103-4E0A-AB17-06C8A5530D2B
    </a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo s:mustUnderstand="true">
      uuid:5E6FD101-710A-4EEA-A50D-70C0BF863AA3
    </a:RelatesTo>
  </s:Header>
  <s:Body>
    <p:myclass
      xmlns:p="http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass"
    >
      <p>Data1>Hello World</p>Data1>
      <p:id>1</p:id>
      <cim:Location
        xmlns:cim="http://schemas.dmtf.org/wbem/wscim/1/common"
        xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
        xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
          <a:Address>
            http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
          </a:Address>
          <a:ReferenceParameters>
            <w:ResourceURI>
              http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass
            </w:ResourceURI>
            <w:SelectorSet>
              <w:Selector Name="id">1</w:Selector>
            </w:SelectorSet>
          </a:ReferenceParameters>
        </cim:Location>
      </p:myclass>
    </s:Body>
  </s:Envelope>

```

4.1.2 Enumeration of Instances

If there are multiple instances of a class, enumeration can be used to retrieve all the instances of the CIM Class. The example from [Retrieving a CIM Instance \(section 4.1.1\)](#) can be extended to add another instance.

```
[abstract]
class Base
{
    [key]uint32 id;
};

class MyClass : Base
{
    string Data1;
};

instance of MyClass
{
    id = 1;
    Data1 = "Hello World";
};

instance of MyClass
{
    id = 2;
    Data1 = "Hello Again";
};
```

Enumeration involves multiple requests and response exchanges, as shown in the following figure:

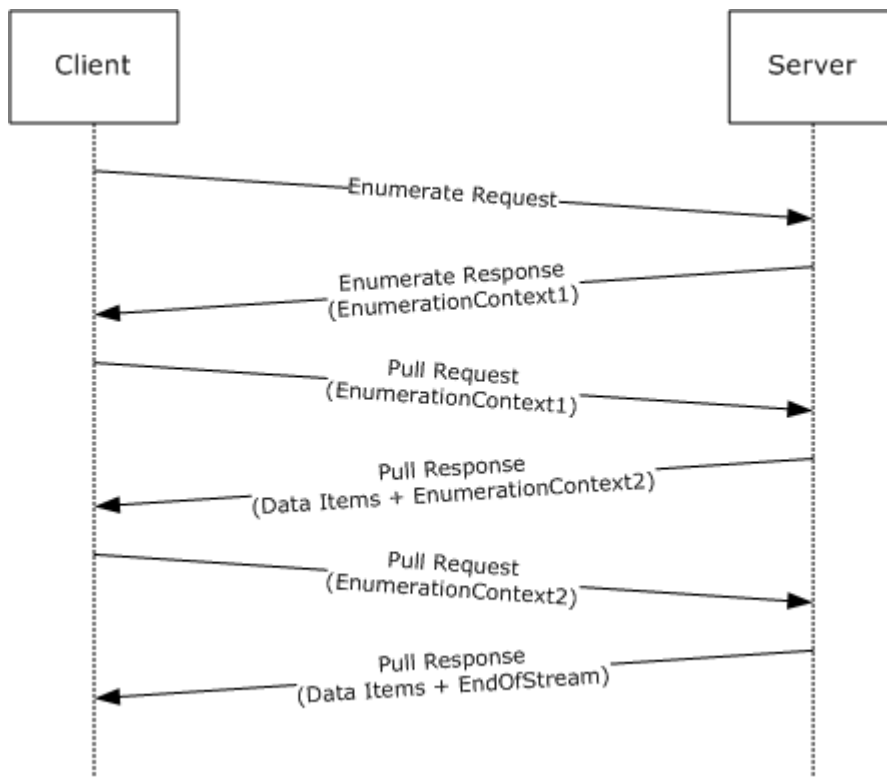


Figure 5: CIM class instances enumeration request-response sequence

1. The Web Services Management Protocol Extensions for Windows Vista client sends an Enumerate request with the Resource URI of the CIM Class.
2. The Web Services Management Protocol Extensions for Windows Vista service responds with an Enumerate response that contains an Enumeration Context.
3. The client sends a Pull request and includes the Enumeration Context returned in the Enumerate Response.
4. The service responds with one or more instances of the CIM Class along with a new Enumeration Context. The number of instances is determined by maxElements specified in the Pull request.
5. The client sends a Pull request and includes the Enumeration Context received in the previous Pull response.
6. The service responds with one or more instances of the CIM Class along with a new Enumeration Context.
7. This sequence is repeated until the service sends an EndofSequence, which indicates there are no more instances.
8. The client can send a Release request at any time during the enumeration to stop the exchange.

4.1.2.1 Enumerate Request

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"

```

```

xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://server:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/enumeration/Enumerate
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
      51200
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:C61CA1DC-51C0-4353-AE46-3E42ED0DA794
    </a:MessageID>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <n:Enumerate/>
  </s:Body>
</s:Envelope>

```

4.1.2.2 Enumerate Response

```

<s:Envelope
  xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/enumeration/EnumerateResponse
    </a:Action>
    <a:MessageID s:mustUnderstand="true">
      uuid:95783CED-6AC4-471B-B773-1CC892FC674B
    </a:MessageID>
    <a:To>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo s:mustUnderstand="true">
      uuid:C61CA1DC-51C0-4353-AE46-3E42ED0DA794
    </a:RelatesTo>
  </s:Header>
  <s:Body>
    <n:EnumerateResponse>
      <n:EnumerationContext>
        uuid:22EB9809-5543-4020-A75C-FD95FF06217B
      </n:EnumerationContext>
    </n:EnumerateResponse>
  </s:Body>
</s:Envelope>

```

```

    </s:Body>
</s:Envelope>

```

4.1.2.3 First Pull Request

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://server:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/enumeration/Pull
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
      51200
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:54E3FD6C-A83E-454C-A2F6-0BDABF5F14D7
    </a:MessageID>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <n:Pull>
      <n:EnumerationContext
xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
      >
        uuid:22EB9809-5543-4020-A75C-FD95FF06217B
      </n:EnumerationContext>
      <n:MaxElements>1</n:MaxElements>
    </n:Pull>
  </s:Body>
</s:Envelope>

```

4.1.2.4 First Pull Response

```

<s:Envelope
  xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/09/enumeration/PullResponse
    </a:Action>
    <a:MessageID s:mustUnderstand="true">

```

```

        uuid:21E59CC8-6D5E-4072-BCA2-7C0DC2BC2504
      </a:MessageID>
      <a:To>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:To>
      <a:RelatesTo s:mustUnderstand="true">
        uuid:54E3FD6C-A83E-454C-A2F6-0BDABF5F14D7
      </a:RelatesTo>
    </s:Header>
    <s:Body>
      <n:PullResponse>
        <n:EnumerationContext>
          uuid:2504CA0D-94B9-4F91-B2F7-9F4CD9A2A96C
        </n:EnumerationContext>
        <n:Items>
          <p:myclass
xmlns:p="http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass"
          >
            <p:Data1>Test Message</p:Data1>
            <p:id>1</p:id>
            <cim:Location
xmlns:cim="http://schemas.dmtf.org/wbem/wscim/1/common"
xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
              <a:Address>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
              </a:Address>
              <a:ReferenceParameters>
                <w:ResourceURI>
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass
                </w:ResourceURI>
                <w:SelectorSet>
                  <w:Selector Name="id">1</w:Selector>
                </w:SelectorSet>
              </a:ReferenceParameters>
            </cim:Location>
          </p:myclass>
        </n:Items>
      </n:PullResponse>
    </s:Body>
  </s:Envelope>

```

4.1.2.5 Second Pull Request

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://server:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">

```

```

http://schemas.xmlsoap.org/ws/2004/09/enumeration/Pull
  </a:Action>
  <w:MaxEnvelopeSize s:mustUnderstand="true">
    51200
  </w:MaxEnvelopeSize>
  <a:MessageID>
    uuid:2C2D261E-D2C3-4A5D-80DE-BB1A48E90BD2
  </a:MessageID>
  <w:OperationTimeout>PT60.000S</w:OperationTimeout>
</s:Header>
<s:Body>
  <n:Pull>
    <n:EnumerationContext
xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
    >
      uuid:2504CA0D-94B9-4F91-B2F7-9F4CD9A2A96C
    </n:EnumerationContext>
    <n:MaxElements>1</n:MaxElements>
  </n:Pull>
</s:Body>
</s:Envelope>

```

4.1.2.6 Second Pull Response with EndOfSequence

```

<s:Envelope
  xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/enumeration/PullResponse
    </a:Action>
    <a:MessageID s:mustUnderstand="true">
      uuid:8820F22A-DB9C-448F-9297-C84519E93753
    </a:MessageID>
    <a:To>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo s:mustUnderstand="true">
      uuid:2C2D261E-D2C3-4A5D-80DE-BB1A48E90BD2
    </a:RelatesTo>
  </s:Header>
  <s:Body>
    <n:PullResponse>
      <n:Items>
        <p:myclass
xmlns:p="http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass"
        >
          <p:Data1>"Hello again"</p:Data1>
          <p:id>2</p:id>
          <cim:Location
xmlns:cim="http://schemas.dmtf.org/wbem/wscim/1/common"
xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
            <a:Address>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
            </a:Address>
            <a:ReferenceParameters>
              <w:ResourceURI>

```

```

http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass
    </w:ResourceURI>
    <w:SelectorSet>
        <w:Selector Name="id">2</w:Selector>
    </w:SelectorSet>
    </a:ReferenceParameters>
    </cim:Location>
    </p:myclass>
</n:Items>
<n:EndOfSequence/>
</n:PullResponse>
</s:Body>
</s:Envelope>

```

4.1.3 Modifying an Instance

To modify an instance, a Put request is used. Using the example from [Retrieving a CIM Instance \(section 4.1.1\)](#), the following exchange shows the Data1 property being modified from "Hello World" to "Test String" in an instance of MyClass.

Put Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://server:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/transfer/Put
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
      51200
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:D1408048-E0F6-4C6D-8B8A-515B9F7B641C
    </a:MessageID>
    <w:SelectorSet>
      <w:Selector Name="id">1</w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <p:myclass
      xmlns:p="http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass"
    >
      <p>Data1>Test Message</p>Data1>
      <p:id>1</p:id>
      <cim:Location
        xmlns:cim="http://schemas.dmtf.org/wbem/wscim/1/common"
        xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
        xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
          <a:Address>

```



```

http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
  </a:Address>
  <a:ReferenceParameters>
    <w:ResourceURI>
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass
    </w:ResourceURI>
    <w:SelectorSet>
      <w:Selector Name="id">1</w:Selector>
    </w:SelectorSet>
  </a:ReferenceParameters>
  </cim:Location>
</p:myclass>
</s:Body>
</s:Envelope>

```

Put Response:

```

<s:Envelope
  xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/transfer/PutResponse
    </a:Action>
    <a:MessageID s:mustUnderstand="true">
uuid:92E94D15-B9D2-4DFB-AACF-9952F19B4AFB
    </a:MessageID>
    <a:To>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo s:mustUnderstand="true">
      uuid:D1408048-E0F6-4C6D-8B8A-515B9F7B641C
    </a:RelatesTo>
  </s:Header>
  <s:Body>
    <p:myclass
  xmlns:p="http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass"
    >
      <p:Data1>Test Message</p:Data1>
      <p:id>1</p:id>
      <cim:Location
  xmlns:cim="http://schemas.dmtf.org/wbem/wscim/1/common"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
        <a:Address>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
        </a:Address>
        <a:ReferenceParameters>
          <w:ResourceURI>
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/mynamespace/myclass
          </w:ResourceURI>
          <w:SelectorSet>
            <w:Selector Name="id">1</w:Selector>
          </w:SelectorSet>
        </a:ReferenceParameters>
        </cim:Location>
      </p:myclass>
    </s:Body>
  </s:Envelope>

```

4.1.4 Invoking a Method

The WS-Management Protocol can be used to invoke a method on a CIM Class or instance. Win32_Process is a CIM Class derived from CIM_Process, which has a method called Create that is used to create a process.

Invoke Method Request:

```
<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://server:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/Win32_Process
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/Win32_Process/Create
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
51200
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:9A989269-283B-4624-BAC5-BC291F72E854
    </a:MessageID>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <p:Create INPUT
  xmlns:p="http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cim/Win32_Process"
    >
      <p:CommandLine>notepad.exe</p:CommandLine>
      <p:CurrentDirectory>C:\</p:CurrentDirectory>
    </p:Create_INPUT>
  </s:Body>
</s:Envelope>
```

Invoke Method Response:

```
<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/Win32_Process/CreateResponse
    </a:Action>
    <a:MessageID s:mustUnderstand="true">
      uuid:F0228E67-F37B-4BE3-BAA2-3BB58AA6F911
    </a:MessageID>
    <a:To>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo s:mustUnderstand="true">
      uuid:9A989269-283B-4624-BAC5-BC291F72E854
    </a:RelatesTo>
  </s:Header>
  <s:Body>
  </s:Body>
</s:Envelope>
```

```

    </s:Header>
    <s:Body>
      <p:Create_OUTPUT
xmlns:p="http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/Win32_Process"
      >
        <p:ProcessId>4000</p:ProcessId>
        <p:ReturnValue>0</p:ReturnValue>
      </p:Create_OUTPUT>
    </s:Body>
  </s:Envelope>

```

4.2 Configuration Examples

This section illustrates protocol examples related to configuration of a Web Services Management Protocol Extensions for Windows Vista service.

4.2.1 Retrieving Configuration

This section illustrates an example of the entire configuration of Web Services Management Protocol Extensions for Windows Vista accessed by using Get.

Get Request:

```

<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://localhost:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/config
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/transfer/Get
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
      51200
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:613DCD71-95AF-4ED5-86E2-1D6AB44ECE66
    </a:MessageID>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body/>
</s:Envelope>

```

Get Response:

```

<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"

```

```

        xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/
addressing"
        xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/
wsman.xsd">
    <s:Header>
        <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse
        </a:Action>
        <a:MessageID s:mustUnderstand="true">
            uuid:26ED5937-8016-41D5-9157-C9AD5B1D3C37
        </a:MessageID>
        <a:To>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
        </a:To>
        <a:RelatesTo s:mustUnderstand="true">
            uuid:613DCD71-95AF-4ED5-86E2-1D6AB44ECE66
        </a:RelatesTo>
    </s:Header>
    <s:Body>
        <cfg:Config xmlns:cfg="http://schemas.microsoft.com/wbem/
wsman/1/config">
            <cfg:MaxEnvelopeSizekb>50</cfg:MaxEnvelopeSizekb>
            <cfg:MaxTimeoutms>60000</cfg:MaxTimeoutms>
            <cfg:MaxBatchItems>20</cfg:MaxBatchItems>
            <cfg:MaxProviderRequests>25</cfg:MaxProviderRequests>
            <cfg:Client>
                <cfg:NetworkDelays>5000</cfg:NetworkDelays>
                <cfg:URLPrefix>wsman</cfg:URLPrefix>
                <cfg:AllowUnencrypted>>false</cfg:AllowUnencrypted>
                <cfg:Auth>
                    <cfg:Basic>>false</cfg:Basic>
                    <cfg:Digest>true</cfg:Digest>
                    <cfg:Kerberos>true</cfg:Kerberos>
                    <cfg:Negotiate>true</cfg:Negotiate>
                    <cfg:Certificate>true</cfg:Certificate>
                </cfg:Auth>
                <cfg:DefaultPorts>
                    <cfg:HTTP>80</cfg:HTTP>
                    <cfg:HTTPS>443</cfg:HTTPS>
                </cfg:DefaultPorts>
                <cfg:TrustedHosts></cfg:TrustedHosts>
            </cfg:Client>
            <cfg:Service>
                <cfg:RootSDDL>
O:NSG:BAD:P(A;;GA;;;BA)(A;;GR;;;ER)S:P(AU;FA;GA;;;WD)(AU;S A;
GWGX;;;WD)
                </cfg:RootSDDL>
                <cfg:MaxConcurrentOperations>
                    100
                </cfg:MaxConcurrentOperations>
                <cfg:EnumerationTimeoutms>
                    60000
                </cfg:EnumerationTimeoutms>
                <cfg:MaxConnections>5</cfg:MaxConnections>
                <cfg:AllowUnencrypted>>false</cfg:AllowUnencrypted>
                <cfg:Auth>
                    <cfg:Basic>>false</cfg:Basic>
                    <cfg:Kerberos>true</cfg:Kerberos>

```

```

    <cfg:Negotiate>true</cfg:Negotiate>
  </cfg:Auth>
  <cfg:DefaultPorts>
    <cfg:HTTP>80</cfg:HTTP>
    <cfg:HTTPS>443</cfg:HTTPS>
  </cfg:DefaultPorts>
  <cfg:IPv4Filter>*</cfg:IPv4Filter>
  <cfg:IPv6Filter>*</cfg:IPv6Filter>
  </cfg:Service>
  <cfg:Winrs>
    <cfg:AllowRemoteShellAccess>true</cfg:AllowRemoteShellAccess>
    <cfg:IdleTimeout>900000</cfg:IdleTimeout>
    <cfg:MaxConcurrentUsers>5</cfg:MaxConcurrentUsers>
    <cfg:MaxShellRunTime>2880000</cfg:MaxShellRunTime>
    <cfg:MaxProcessesPerShell>5</cfg:MaxProcessesPerShell>
    <cfg:MaxMemoryPerShellMB>80</cfg:MaxMemoryPerShellMB>
    <cfg:MaxShellsPerUser>2</cfg:MaxShellsPerUser>
  </cfg:Winrs>
</cfg:Config>
</s:Body>
</s:Envelope>

```

4.2.2 Modifying Configuration

To modify configuration, a Put request is used. In this example, `cfg:MaxBatchItems` is changed from 20 to 10.

Put Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://localhost:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/config
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/transfer/Put
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
51200
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:47F4F498-0050-4DCF-BCA1-5611732CF7DE
    </a:MessageID>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <cfg:Config
      xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config">
      <cfg:MaxEnvelopeSizekb>50</cfg:MaxEnvelopeSizekb>
      <cfg:MaxTimeoutms>60000</cfg:MaxTimeoutms>
      <cfg:MaxBatchItems>10</cfg:MaxBatchItems>
    </cfg:Config>
  </s:Body>
</s:Envelope>

```

```

<cfg:MaxProviderRequests>25</cfg:MaxProviderRequests>
<cfg:Client>
  <cfg:NetworkDelays>5000</cfg:NetworkDelays>
  <cfg:URLPrefix>wsman</cfg:URLPrefix>
  <cfg:AllowUnencrypted>false</cfg:AllowUnencrypted>
  <cfg:Auth>
    <cfg:Basic>false</cfg:Basic>
    <cfg:Digest>true</cfg:Digest>
    <cfg:Kerberos>true</cfg:Kerberos>
    <cfg:Negotiate>true</cfg:Negotiate>
  </cfg:Auth>
  <cfg:DefaultPorts>
    <cfg:HTTP>80</cfg:HTTP>
    <cfg:HTTPS>443</cfg:HTTPS>
  </cfg:DefaultPorts>
  <cfg:TrustedHosts>
    </cfg:TrustedHosts>
  </cfg:Client>
</cfg:Service>
O:NSG:BAD:P(A;;GA;;;BA)(A;;GR;;;ER)S:P(AU;FA;GA;;;WD)(AU;S A;GWGX;;;WD)
  <cfg:RootSDDL>
    </cfg:RootSDDL>
  <cfg:MaxConcurrentOperations>
    100
  </cfg:MaxConcurrentOperations>
  <cfg:EnumerationTimeoutms>
    60000
  </cfg:EnumerationTimeoutms>
  <cfg:AllowUnencrypted>false</cfg:AllowUnencrypted>
  <cfg:Auth>
    <cfg:Basic>false</cfg:Basic>
    <cfg:Kerberos>true</cfg:Kerberos>
    <cfg:Negotiate>true</cfg:Negotiate>
  </cfg:Auth>
  <cfg:DefaultPorts>
    <cfg:HTTP>80</cfg:HTTP>
    <cfg:HTTPS>443</cfg:HTTPS>
  </cfg:DefaultPorts>
  <cfg:IPv4Filter>*</cfg:IPv4Filter>
  <cfg:IPv6Filter>*</cfg:IPv6Filter>
</cfg:Service>
<cfg:Winrs>
  <cfg:AllowRemoteShellAccess>
    true
  </cfg:AllowRemoteShellAccess>
  <cfg:IdleTimeout>900000</cfg:IdleTimeout>
  <cfg:MaxConcurrentUsers>5</cfg:MaxConcurrentUsers>
  <cfg:MaxShellRunTime>28800000</cfg:MaxShellRunTime>
  <cfg:MaxProcessesPerShell>5</cfg:MaxProcessesPerShell>
  <cfg:MaxMemoryPerShellMB>80</cfg:MaxMemoryPerShellMB>
  <cfg:MaxShellsPerUser>2</cfg:MaxShellsPerUser>
</cfg:Winrs>
</cfg:Config>
</s:Body>
</s:Envelope>

```

Put Response:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">

```

```

<s:Header>
  <a:To>http://localhost:80/wsman</a:To>
  <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/config
  </w:ResourceURI>
  <a:ReplyTo>
    <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:Address>
  </a:ReplyTo>
  <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/transfer/Put
  </a:Action>
  <w:MaxEnvelopeSize s:mustUnderstand="true">
51200
  </w:MaxEnvelopeSize>
  <a:MessageID>
    uuid:47F4F498-0050-4DCF-BCA1-5611732CF7DE
  </a:MessageID>
  <w:OperationTimeout>PT60.000S</w:OperationTimeout>
</s:Header>
<s:Body>
  <cfg:Config
    xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config">
    <cfg:MaxEnvelopeSizekb>50</cfg:MaxEnvelopeSizekb>
    <cfg:MaxTimeoutms>60000</cfg:MaxTimeoutms>
    <cfg:MaxBatchItems>10</cfg:MaxBatchItems>
    <cfg:MaxProviderRequests>25</cfg:MaxProviderRequests>
    <cfg:Client>
      <cfg:NetworkDelays>5000</cfg:NetworkDelays>
      <cfg:URLPrefix>wsman</cfg:URLPrefix>
      <cfg:AllowUnencrypted>false</cfg:AllowUnencrypted>
      <cfg:Auth>
        <cfg:Basic>false</cfg:Basic>
        <cfg:Digest>true</cfg:Digest>
        <cfg:Kerberos>true</cfg:Kerberos>
        <cfg:Negotiate>true</cfg:Negotiate>
      </cfg:Auth>
      <cfg:DefaultPorts>
        <cfg:HTTP>80</cfg:HTTP>
        <cfg:HTTPS>443</cfg:HTTPS>
      </cfg:DefaultPorts>
      <cfg:TrustedHosts>
      </cfg:TrustedHosts>
    </cfg:Client>
    <cfg:Service>
      <cfg:RootSDDL>
O:NSG:BAD:P(A;;GA;;;BA)(A;;GR;;;ER)S:P(AU;FA;GA;;;WD)(AU;S A;GWGX;;;WD)
      </cfg:RootSDDL>
      <cfg:MaxConcurrentOperations>
100
      </cfg:MaxConcurrentOperations>
      <cfg:EnumerationTimeoutms>
60000
      </cfg:EnumerationTimeoutms>
      <cfg:AllowUnencrypted>false</cfg:AllowUnencrypted>
      <cfg:Auth>
        <cfg:Basic>false</cfg:Basic>
        <cfg:Kerberos>true</cfg:Kerberos>
        <cfg:Negotiate>true</cfg:Negotiate>
      </cfg:Auth>
      <cfg:DefaultPorts>
        <cfg:HTTP>80</cfg:HTTP>
        <cfg:HTTPS>443</cfg:HTTPS>
      </cfg:DefaultPorts>
    </cfg:Service>
  </cfg:Config>

```

```

        <cfg:IPv4Filter>*</cfg:IPv4Filter>
        <cfg:IPv6Filter>*</cfg:IPv6Filter>
    </cfg:Service>
    <cfg:Winrs>
        <cfg:AllowRemoteShellAccess>
            true
        </cfg:AllowRemoteShellAccess>
        <cfg:IdleTimeout>900000</cfg:IdleTimeout>
        <cfg:MaxConcurrentUsers>5</cfg:MaxConcurrentUsers>
        <cfg:MaxShellRunTime>28800000</cfg:MaxShellRunTime>
        <cfg:MaxProcessesPerShell>5</cfg:MaxProcessesPerShell>
        <cfg:MaxMemoryPerShellMB>80</cfg:MaxMemoryPerShellMB>
        <cfg:MaxShellsPerUser>2</cfg:MaxShellsPerUser>
    </cfg:Winrs>
</cfg:Config>
</s:Body>
</s:Envelope>

```

4.2.3 Client Certificate Mapping Configuration

Create Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://localhost:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/config/service/certmapping
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/
anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/transfer/Create
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
153600
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:05FC732F-9D6A-4A92-875C-171A2A71B938
    </a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:SelectorSet>
      <w:Selector Name="Issuer">
5600a015ca5e8a26f638b74e819ae92096da5c8c
      </w:Selector>
      <w:Selector Name="Subject">*@mig.net</w:Selector>
      <w:Selector Name="URI">*</w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>

```



```

        <p:certmapping
xmlns:p="http://schemas.microsoft.com/wbem/wsman/1/config/service/
certmapping.xsd">
        <p:UserName>certAdminAccount</p:UserName>
        <p:password>Bull_dog1</p:password>
        <p:Enabled>true</p:Enabled>
    </p:certmapping>
</s:Body>
</s:Envelope>

```

Create Response:

```

<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
http://schemas.xmlsoap.org/ws/2004/09/transfer/CreateResponse
    </a:Action>
    <a:MessageID>
      uuid:DDB06DC3-D3FB-480F-A1EA-275100D688C3
    </a:MessageID>
    <a:To>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>
      uuid:05FC732F-9D6A-4A92-875C-171A2A71B938
    </a:RelatesTo>
  </s:Header>
  <s:Body>
    <wxf:ResourceCreated
      xmlns:wxf="http://schemas.xmlsoap.org/ws/2004/09/transfer"
      xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
      xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
      <a:Address>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
      <a:ReferenceParameters>
        <w:ResourceURI>
http://schemas.microsoft.com/wbem/wsman/1/config/service/certmapping
        </w:ResourceURI>
        <w:SelectorSet>
          <w:Selector Name="URI">*</w:Selector>
          <w:Selector Name="Subject">*@mig.net</w:Selector>
          <w:Selector Name="Issuer">
            5600a015ca5e8a26f638b74e819ae92096da5c8c
          </w:Selector>
        </w:SelectorSet>
      </a:ReferenceParameters>
    </wxf:ResourceCreated>
  </s:Body>
</s:Envelope>

```

Put Request:

```
<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://localhost:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/config/service/certmapping
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/transfer/Put
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
      153600
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:898949E0-D492-4E01-8D5D-B3982FF1C722
    </a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:SelectorSet>
      <w:Selector Name="Issuer">
        1212131238d84023982e381f2
      </w:Selector>
      <w:Selector Name="Subject">*.sampl.com</w:Selector>
      <w:Selector Name="URI">
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/*
      </w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <cfg:CertMapping
  xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config/service/
  certmapping"
  xml:lang="en-US">
      <cfg:URI>
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/*
      </cfg:URI>
      <cfg:Subject>*.sampl.com</cfg:Subject>
      <cfg:Issuer>1212131238d84023982e381f2</cfg:Issuer>
      <cfg:UserName>certadminACCOUNT</cfg:UserName>
      <cfg:Enabled>>false</cfg:Enabled>
      <cfg:PassCertToPlugin>>false</cfg:PassCertToPlugin>
      <cfg:Password />
    </cfg:CertMapping>
  </s:Body>
</s:Envelope>
```

Put Response:

```

<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
      http://schemas.xmlsoap.org/ws/2004/09/transfer/
PutResponse
    </a:Action>
    <a:MessageID>
      uuid:28491235-98D4-43EE-95E9-5ED3D7D0A1B8
    </a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/
anonymous
    </a:To>
    <a:RelatesTo>
      uuid:898949E0-D492-4E01-8D5D-B3982FF1C722
    </a:RelatesTo>
  </s:Header>
  <s:Body>
    <cfg:CertMapping
xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config/service/
certmapping"
    >
      <cfg:URI>
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/*
      </cfg:URI>
      <cfg:Subject>*.sampl.com</cfg:Subject>
      <cfg:Issuer>1212131238d84023982e381f2</cfg:Issuer>
      <cfg:UserName>certadminACCOUNT</cfg:UserName>
      <cfg:Enabled>>false</cfg:Enabled>
      <cfg:PassCertToPlugin>>false</cfg:PassCertToPlugin>
      <cfg:Password />
    </cfg:CertMapping>
  </s:Body>
</s:Envelope>

```

Get Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://localhost:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/config/service/certmapping
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
  </s:Header>
  <s:Body>
    <w:Response>
      <w:Status>200
      <w:ResponseData>
        <cfg:CertMapping
xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config/service/
certmapping"
        >
          <cfg:URI>
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/*
          </cfg:URI>
          <cfg:Subject>*.sampl.com</cfg:Subject>
          <cfg:Issuer>1212131238d84023982e381f2</cfg:Issuer>
          <cfg:UserName>certadminACCOUNT</cfg:UserName>
          <cfg:Enabled>>false</cfg:Enabled>
          <cfg:PassCertToPlugin>>false</cfg:PassCertToPlugin>
          <cfg:Password />
        </cfg:CertMapping>
      </w:ResponseData>
    </w:Response>
  </s:Body>
</s:Envelope>

```

```

    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/transfer/Get
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
      153600
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:006AAD01-1C1D-4316-A837-C5A0753AEE5B
    </a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:SelectorSet>
      <w:Selector Name="Issuer">
        1212131238d84023982e381f2
      </w:Selector>
      <w:Selector Name="Subject">*.sampl.com</w:Selector>
      <w:Selector Name="URI">
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/*
      </w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body />
</s:Envelope>

```

Get Response:

```

<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
http://schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse
    </a:Action>
    <a:MessageID>
      uuid:4137066B-FEA6-43A4-9DE4-65C3BE07C4EA
    </a:MessageID>
    <a:To>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>
      uuid:006AAD01-1C1D-4316-A837-C5A0753AEE5B
    </a:RelatesTo>
  </s:Header>
  <s:Body>
    <cfg:CertMapping
xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config/service/
certmapping"
    >
      <cfg:URI>
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/*
      </cfg:URI>
      <cfg:Subject>*.sampl.com</cfg:Subject>
      <cfg:Issuer>1212131238d84023982e381f2</cfg:Issuer>
      <cfg:UserName>certadminACCOUNT</cfg:UserName>
    </s:Body>
  </s:Envelope>

```

```

        <cfg:Enabled>true</cfg:Enabled>
        <cfg:PassCertToPlugin>false</cfg:PassCertToPlugin>
        <cfg:Password />
    </cfg:CertMapping>
</s:Body>
</s:Envelope>

```

Delete Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://localhost:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/config/service/certmapping
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/transfer/Delete
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
153600
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:D0EF8968-9372-494C-8FF6-7F7DB4A07CC5
    </a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:SelectorSet>
      <w:Selector Name="Issuer">
1212131238d84023982e381f2
      </w:Selector>
      <w:Selector Name="Subject">*.sampl.com</w:Selector>
      <w:Selector Name="URI">
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/*
      </w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body />
</s:Envelope>

```

Delete Response:

```

<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">

```

```

    <s:Header>
      <a:Action>
http://schemas.xmlsoap.org/ws/2004/09/transfer/DeleteResponse
      </a:Action>
      <a:MessageID>
        uuid:F8D8373A-6C15-4297-8352-42695644158B
      </a:MessageID>
      <a:To>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:To>
      <a:RelatesTo>
        uuid:D0EF8968-9372-494C-8FF6-7F7DB4A07CC5
      </a:RelatesTo>
    </s:Header>
    <s:Body />
  </s:Envelope>

```

Enumerate Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://localhost:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/config/service/certmapping
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/09/enumeration/Enumerate
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
      153600
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:E5405DE2-BBC0-43DF-8C32-7B70A6038704
    </a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <n:Enumerate>
      <w:OptimizeEnumeration />
      <w:MaxElements>20</w:MaxElements>
    </n:Enumerate>
  </s:Body>
</s:Envelope>

```

Enumerate Response:

```
<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
      http://schemas.xmlsoap.org/ws/2004/09/enumeration/EnumerateResponse
    </a:Action>
    <a:MessageID>
      uuid:92A89B30-F342-483E-99EC-E4B72D56C78F
    </a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>
      uuid:E5405DE2-BBC0-43DF-8C32-7B70A6038704
    </a:RelatesTo>
  </s:Header>
  <s:Body>
    <n:EnumerateResponse>
      <n:EnumerationContext />
      <w:Items>
        <cfg:CertMapping
          xmlns:cfg="http://schemas.microsoft.com/wbem/wsman/1/config/service/
          certmapping"
            >
              <cfg:URI>
                http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/*
              </cfg:URI>
              <cfg:Subject>*.sampl.com</cfg:Subject>
              <cfg:Issuer>1212131238d84023982e381f2<
/            </cfg:Issuer>
              <cfg:UserName>certadminACCOUNT</cfg:UserName>
              <cfg:Enabled>true</cfg:Enabled>
              <cfg:PassCertToPlugin>>false</cfg:PassCertTo
Plugin>
              <cfg:Password />
            </cfg:CertMapping>
          </w:Items>
          <w:EndOfSequence />
        </n:EnumerateResponse>
      </s:Body>
    </s:Envelope>
```

4.3 Events

The following figure illustrates the sequence of requests, responses, and deliveries when subscribing to an event.

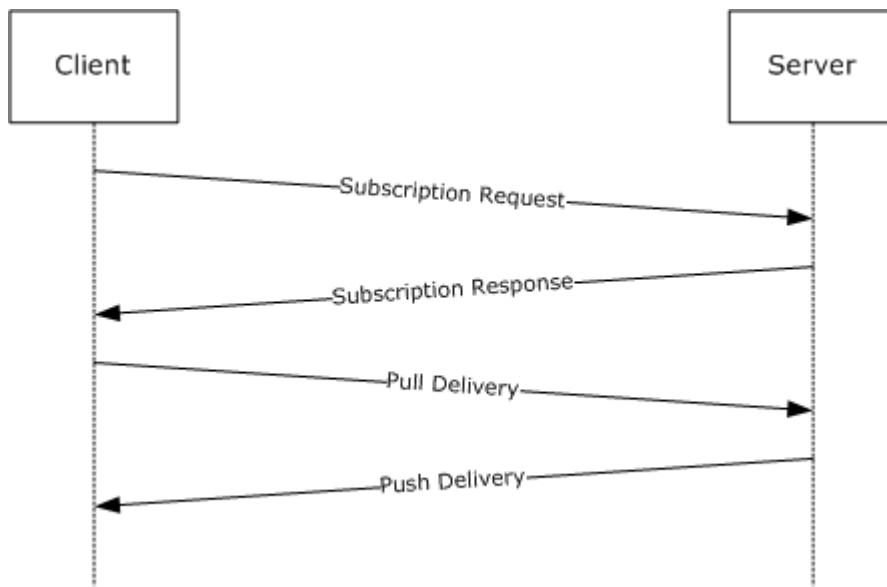


Figure 6: Event subscription example message exchange sequence

4.4 Event Subscription Example

This section provides an example of a subscription message.

```

<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:e="http://schemas.xmlsoap.org/ws/2004/08/eventing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://RAVIBPERF59D.MIG.NET:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/windows/EventLog
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/
          ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/08/eventing/Subscribe
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
      153600
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:5E7FE85C-6A5B-4033-A94D-B892A7C528EB
    </a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:OptionSet
      xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
      <w:Option Name="Compression">SLDC</w:Option>
      <w:Option Name="CDATA" xsi:nil="true"/>
    </w:OptionSet>
  </s:Header>
  <s:Body>
    <e:Subscribe/>
  </s:Body>
</s:Envelope>
  
```



```

    <w:Option Name="ContentFormat">RenderedText</w:Option>
    <w:Option Name="IgnoreChannelError" xsi:nil="true"/>
  </w:OptionSet>
</s:Header>
<s:Body>
  <e:Subscribe="">
    <e:EndTo>
      <a:Address>
        HTTP://RAVIBPERF90D.MIG.NET:80/wsman/
        subscriptions/07C41EF8-1EE6-4519-86C5-47A78FB16DEC
      </a:Address>
      <a:ReferenceProperties>
        <e:Identifier>
          430055A3-8146-49AA-A5C1-D87DC542AB0C
        </e:Identifier>
      </a:ReferenceProperties>
    </e:EndTo>
    <e:Delivery="">
      Mode="http://schemas.dmtf.org/wbem/wsman/1/wsman/Events">
      <w:Heartbeats>PT3600.000S</w:Heartbeats>
      <e:NotifyTo>
        <a:Address>
          HTTP://RAVIBPERF90D.MIG.NET:80/wsman/
          subscriptions/07C4 1EF8-1EE6-4519-86C5-47A78FB16DEC
        </a:Address>
        <a:ReferenceProperties>
          <e:Identifier="">
            430055A3-8146-49AA-A5C1-D87DC542AB0C
          </e:Identifier>
        </a:ReferenceProperties>
      </e:NotifyTo>
      <w:MaxElements>20</w:MaxElements>
      <w:MaxTime>PT30.000S</w:MaxTime>
      <w:MaxEnvelopeSize Policy="Notify">
        153600
      </w:MaxEnvelopeSize>
      <w:Locale xml:lang="en-US"/>
      <w:ContentEncoding="">
        UTF-8
      </w:ContentEncoding>
    </e:Delivery>
    <e:Expires>PT3960732748.184S</e:Expires>
    <w:Filter>
      <QueryList>
        <Query Id="0">
          <Select Path="Application">*</Select>
        </Query>
      </QueryList>
    </w:Filter>]
    <w:SendBookmarks/>
  </e:Subscribe>
</s:Body>
</s:Envelope>

```

4.5 Compression Example

Request:

```
POST /wsman/subscriptions/724030E6-ACF0-46BE-A76D-0800A457D6A2 HTTP/1.1
Authorization: Negotiate TlRMTVNTUAABAAAAt7II4gMAAwAzAAACwALACgAAAAFASg
KAAAADlBBVUXBTEwtWFAxTULH
Content-Encoding: SLDC
Content-Type: application/soap+xml;charset=UTF-16
User-Agent: Microsoft WinRM Client
Host: paulall-xpl.MIG.NET
Content-Length: 0
Connection: Keep-Alive
```

Response:

```
HTTP/1.1 401
WWW-Authenticate: Negotiate TlRMTVNTUAAACAAAABgAGADgAAAA1wonib/VRvQnylk
QAeAsAAAAAAHYAdgA+AAAABQEoCgAAAA9NAEkARwACAAYATQBJAEcAAQAWAFAAQQBVAEwA
QQBMAEwALQBYAFAAMQAEAA4ATQBJAEcALgBOAEUAVAADACYAcABhAHUAbABhAGwAbAAAtAH
gAcAAxAc4ATQBJAEcALgBOAEUAVAAFAA4ATQBJAEcALgBOAEUAVAAAAAA
Server: Microsoft-HTTPAPI/1.0
Date: Thu, 11 Jan 2007 02:35:24 GMT
Content-Length: 0
```

4.6 Encryption Example

Request:

```
POST /wsman/subscriptions/724030E6-ACF0-46BE-A76D-0800A457D6A2 HTTP/1.1
Authorization: Negotiate TlRMTVNTUADAAAAAAAAAAEgAAAAAAAAASAAAAAAAAABIA
AAAAAAAAAegAAAAAAAAASAAAAAAAAABIAAAANcKI4gUBKAoAAAAAP
Content-Encoding: SLDC
User-Agent: Microsoft WinRM Client
Content-Type: multipart/encrypted;
protocol="application/HTTP-SPNEGO-session-encrypted";boundary="Encrypted Boundary"
Host: paulall-xpl.MIG.NET
Content-Length: 964
Connection: Keep-Alive
-- Encrypted Boundary
Content-Type: application/HTTP-SPNEGO-session-encrypted
OriginalContent: type=application/soap+xml;charset=UTF-16;Length=705
-- Encrypted Boundary
Content-Type: application/octet-stream
.....g.....q!..f...y.$o.\.wF'.0..1....N..|.
.pQo:[..f[.X".Q...W$.lYw\B.7-.D...U6..b..?.....f..0%u...4X...sX.
We. S....#...e.w?.1...&M4....A....~.....J...HY.&]p.e.
..O...+...m.....8..1.f.5a..G....e>.....N.Q,...P.....(.....R.
...G<.&X.p.7.].....Ri ) ".....}..
.g.....x.....A.....X.....r.....0.....bV=he*..AK?.N$u..O&K...|N...
.B...-F.Q]ch.Ha..9n.0S...0.hn.O...F^.:$x...!Z.`.l...1.K.~.....gf...A%
.....g.75..U.....c*jja;9Z.J....q....'9...8/.1.u&.....kq.`8..)1cc.
;'& ....o044....%..#.....G[...].V....NK...w.JeY..O.....U-.9.\<r^*=M.
k..".b9...I..%...+Q.%....,1.. -.U.'.....hd.Z.....&o....\ :
@...Bf.P..B.DL..s..+...JO.AjO..&..az..Q.j.4....n..c:....M..x.a.m....
.....A.3(-- Encrypted Boundary
```

Response:

```
HTTP/1.1 200
```

```

Content-Type: multipart/encrypted;protocol="application/HTTP-SPNEGO-session-encrypted";boundary="Encrypted Boundary"
Server: Microsoft-HTTPAPI/1.0
Date: Thu, 11 Jan 2007 02:35:24 GMT
Content-Length: 1504
-- Encrypted Boundary
Content-Type: application/HTTP-SPNEGO-session-encrypted
OriginalContent: type=application/soap+xml;charset=UTF-16;Length=1244
-- Encrypted Boundary
Content-Type: application/octet-stream
.....b.^p.....S.%Y#.....{#x.u....q.]..uD.....U[^M..RS22=....!'M.
+.....#..U..F!=.....l.C.n....q.8hB.%.?|...X..F..1..w..^...a..[0A....
T...R...J.4A...@.%.>..r..>-fu.\.=...../.....w...$......qA.....k.
..d.wKU..j....<.q...j.I.5.tA....`..t....~X.5lq.....c..}{(.I..~...f.8.
e..`....04.Z.....X.hG...gK.~....m.s..X%..~+.#W.}.b.c;..q...ir.ug<4
7^.T...iFD.;.m1...r|r..z..."...b....5\..B@...e8.b.!!|.....$.k.Xg.y.+u.
....'...3.-.....Lq@.}.=....iL.[2J.Z...T...^i~...o..-4fC....
9.+...A.....\....y.j.[.HZ.....a.+0.be.M.k....=xi.p}.b....d..
.Kk.;.....G....6y.....4..%.ltfC.O.d...J.gH...}....f..K.d+m.l...
...WPK..^.....2....#. [.H.....x.ON6...C..>.9.qm.K|.n.U{\.u
4..E.9...O..\_%Y.W?.j.zL.*#.'....f.<w..."..Q).e...fX..t....-....QU..<
#Mw...f..}|. @..K..9>...l..._k.\O.GQ.....G..|.y.$..d...FUT...{L.
.D.l.....4.Zk.....K...W...f(..v?...j..0..)j.R..uT.Hr...j.AN.Y...
v..._....li.....}i.^(..` )BP.e]~1.....K...}S.....y.....F
D.[/.#.?+...H...v...6....Zdl.?2.....5.b..Y..4M..G..h.B.B.p..4|^...
r..M...E.....I.(#....]..e.`.g.g]....'.....e..9.e..../...=....!a..o..
bP.....)s.K...}.!i.u..m./..a....v<D.J....'...../...=. ;..T.`G....5U..=
.....) .U.[...fk".....(E.\....J...{ }.\.4...L.....O..-- Encrypted
Boundary

```

4.7 Publisher-Initiated Subscription Examples

4.7.1 Enumerate Example

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>
      https://rmacktest0.MIG.NET:443/wsman/SubscriptionManager/WEC
    </a:To>
    <w:ResourceURI s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/SubscriptionManager/Subscription
    </w:ResourceURI>
    <m:MachineID
      xmlns:m="http://schemas.microsoft.com/wbem/wsman/1/machineid"
      s:mustUnderstand="false">
        RMACKTEST0.MIG.NET
      </m:MachineID>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">

```

```

        http://schemas.xmlsoap.org/ws/2004/09/enumeration/Enumerate
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
        153600
    </w:MaxEnvelopeSize>
    <a:MessageID>
        uuid:A90FFBE2-525B-49D2-942F-A20F95FC643B
    </a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
</s:Header>
<s:Body>
    <n:Enumerate>
        <w:OptimizeEnumeration />
        <w:MaxElements>20</w:MaxElements>
    </n:Enumerate>
</s:Body>
</s:Envelope>

```

4.7.2 Enumerate Response (Subscriptions) Example

```

<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
      http://schemas.xmlsoap.org/ws/2004/09/enumeration/EnumerateResponse
    </a:Action>
    <a:MessageID>uuid:06D6A1CD-A99D-441C-8A8C-5571844C4D09</a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>uuid:A90FFBE2-525B-49D2-942F-A20F95FC643B</a:RelatesTo>
  </s:Header>
  <s:Body>
    <n:EnumerateResponse>
      <n:EnumerationContext />
      <w:Items>
        <m:Subscription
          xmlns:m="http://schemas.microsoft.com/wbem/wsman/1/subscription">
          <m:Version>
            uuid:BB8CD0E7-46F4-40E4-B74C-A0C7B509F669
          </m:Version>
          <s:Envelope
            xmlns:s="http://www.w3.org/2003/05/soap-envelope"
            xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
            xmlns:e="http://schemas.xmlsoap.org/ws/2004/08/eventing"
            xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
            xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
            <s:Header>
              <a:To>
                http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
              </a:To>
              <w:ResourceURI s:mustUnderstand="true">
                wsman:microsoft.test/testresource/subscribe
              </w:ResourceURI>
              <a:ReplyTo>
                <a:Address s:mustUnderstand="true">
                  http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
                </a:Address>
              </a:ReplyTo>
            </s:Envelope>
          </m:Subscription>
        </w:Items>
      </n:EnumerateResponse>
    </s:Body>
  </s:Envelope>

```

```

        <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/eventing/Subscribe
        </a:Action>
        <w:MaxEnvelopeSize s:mustUnderstand="true">
153600
        </w:MaxEnvelopeSize>
        <a:MessageID>
        uuid:346A0039-0C21-465E-8ABD-CF89EE730FA7
        </a:MessageID>
        <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
        <w:OptionSet
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
        <w:Option Name="Compression">SLDC</w:Option>
        <w:Option Name="CDATA" xsi:nil="true" />
        </w:OptionSet>
    </s:Header>
    <s:Body>
        <e:Subscribe>
            <e:EndTo>
                <a:Address>
HTTPS://RMACKTEST0.MIG.NET:443/wsman/subscriptions/633E146A-17F7-46CF-A149-50B29DB90692
                </a:Address>
                <a:ReferenceProperties>
                    <e:Identifier>
BB8CD0E7-46F4-40E4-B74C-A0C7B509F669
                    </e:Identifier>
                </a:ReferenceProperties>
            </e:EndTo>
            <e:Delivery
Mode="http://schemas.dmtf.org/wbem/wsman/1/wsman/Events">
                <w:Heartbeats>PT300.000S</w:Heartbeats>
                <e:NotifyTo>
                    <a:Address>
HTTPS://RMACKTEST0.MIG.NET:443/wsman/subscriptions/633E146A-17F7-46CF-A149-50B29DB90692
                    </a:Address>
                    <a:ReferenceProperties>
                        <e:Identifier>
BB8CD0E7-46F4-40E4-B74C-A0C7B509F669
                        </e:Identifier>
                    </a:ReferenceProperties>
                <c:Policy
xmlns:c="http://schemas.xmlsoap.org/ws/2002/12/policy">
                    <c:ExactlyOne>
                        <c:All>
                            <w:Authentication
Profile="http://schemas.dmtf.org/wbem/wsman/1/wsman/secprofile/https/mutual"
                            >
                                <w:ClientCertificate>
                                    <w:Thumbprint Role="issuer">
5600a015ca5e8a26f638b74e819ae92096da5c8c
                                    </w:Thumbprint>
                                </w:ClientCertificate>
                            </w:Authentication>
                        </c:All>
                    </c:ExactlyOne>
                </c:Policy>
            </e:NotifyTo>
            <w:MaxElements>5</w:MaxElements>
            <w:MaxEnvelopeSize Policy="Notify">
153600
            </w:MaxEnvelopeSize>
            <w:Locale xml:lang="en-US" />
            <w:ContentEncoding>UTF-16</w:ContentEncoding>
        </e:Delivery>
        <w:Filter Dialect="dialect">dialect</w:Filter>
    </s:Body>
</soap:Envelope>

```

```

        </e:Subscribe>
    </s:Body>
</s:Envelope>
</m:Subscription>
</w:Items>
<w:EndOfSequence />
</n:EnumerateResponse>
</s:Body>
</s:Envelope>

```

4.7.3 Event Delivery Example

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:e="http://schemas.xmlsoap.org/ws/2004/08/eventing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>
      https://RMAKTEST0.MIG.NET:443/wsman/subscriptions/633E146A-17F7-46CF-A149-50B29DB90692
    </a:To>
    <m:MachineID
      xmlns:m="http://schemas.microsoft.com/wbem/wsman/1/machineid"
      s:mustUnderstand="false">
      RMAKTEST0.MIG.NET
    </m:MachineID>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.dmtf.org/wbem/wsman/1/wsman/Events
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
    <a:MessageID>uuid:0111C890-857C-498F-B00A-7011EBD34064</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <e:Identifier
      xmlns:e="http://schemas.xmlsoap.org/ws/2004/08/eventing">
      BB8CD0E7-46F4-40E4-B74C-A0C7B509F669
    </e:Identifier>
    <w:AckRequested />
  </s:Header>
  <s:Body>
    <w:Events>
      <w:Event Action="http://schemas.dmtf.org/wbem/wsman/1/wsman/Event">
<![CDATA[<Event
  xmlns="http://schemas.microsoft.com/win/2004/08/events/event"><System><Provider
Name="f,msndfowaierfmw3lpjou0um0923"/><EventID
Qualifiers="0">1000</EventID><Level>2</Level><Task>0</Task><Keywords>36028797018963968</K
eywords><TimeCreated SystemTime="2005-11-
08T17:58:50.000Z"/><EventRecordID>29358</EventRecordID><Channel>Application</Channel><Com
puter>1rfdsv456dfgert0782134nsf,msndfowaierfmw3lpjou0um0923</Computer><Security
UserID="S-1-5-21-197996865-488505291-1039700575-
1110"/></System><EventData><Data>82134nsf,msndfowaierfmw3lpjou0um0923</Data><Variable1>4q
dzxhoqctvyxd4h21rfdsv456dfgert0782134nsf,msndfowaierfmw3lpjou0um0923</Variable1><Variable
2>fdsv456dfgert0782134nsf,msndfowaierfmw3lpjou0um0923</Variable2><Variable3>56dfgert07821
34nsf,msndfowaierfmw3lpjou0um0923</Variable3><Variable4>gert0782134nsf,msndfowaierfmw3lpj
ou0um0923</Variable4></EventData></Event>
]]>
      </w:Event>
    </w:Events>
  </s:Body>
</s:Envelope>

```

```

    </s:Body>
</s:Envelope>

```

4.7.4 Ack Example

```

<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
http://schemas.dmtf.org/wbem/wsman/1/wsman/Ack
    </a:Action>
    <a:MessageID>
      uuid:6593DD91-ABB8-457B-AE7A-102715CAC7AC
    </a:MessageID>
    <a:To>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>
      uuid:0111C890-857C-498F-B00A-7011EBD34064
    </a:RelatesTo>
  </s:Header>
  <s:Body />
</s:Envelope>

```

4.7.5 End Subscription Example

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:e="http://schemas.xmlsoap.org/ws/2004/08/eventing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>
https://RMACKTEST0.MIG.NET:443/wsman/subscriptions/633E146A-17F7-46CF-A149-50B29DB90692\
    </a:To>
    <m:MachineID
      xmlns:m="http://schemas.microsoft.com/wbem/wsman/1/machineid"
      s:mustUnderstand="false">
      RMACKTEST0.MIG.NET
    </m:MachineID>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/eventing/SubscriptionEnd
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
      153600
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:9CCFD722-7A27-49A2-859E-9C643FAC4556
    </a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
  </s:Header>
  <s:Body />
</s:Envelope>

```

```

    <w:OperationTimeout>PT0.500S</w:OperationTimeout>
    <e:Identifier
      xmlns:e="http://schemas.xmlsoap.org/ws/2004/08/eventing">
      BB8CD0E7-46F4-40E4-B74C-A0C7B509F669
    </e:Identifier>
    <w:AckRequested />
  </s:Header>
  <s:Body>
    <e:SubscriptionEnd>
      <e:SubscriptionManager>
        <a:Address>
          https://RMACKTEST0.MIG.NET:443/wsman/subscriptions/633E146A-17F7-46CF-A149-50B29DB90692
        </a:Address>
        <a:ReferenceProperties>
          <e:Identifier>
            F04857FA-DB89-40D2-9A7F-8AF5EBBA6FA6
          </e:Identifier>
        </a:ReferenceProperties>
      </e:SubscriptionManager>
      <e>Status>
        http://schemas.xmlsoap.org/ws/2004/08/eventing/SourceShuttingDown
      </e>Status>
    </e:SubscriptionEnd>
  </s:Body>
</s:Envelope>

```

4.8 Remote Shell Examples

4.8.1 Create Shell

This section shows how to use [wxf:Create](#) message to create a new shell instance on the remote computer that does not have the client's profile. The client computer uses code page 437.

Create request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>
      http://localhost:80/wsman
    </a:To>
    <w:ResourceURI s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/09/transfer/Create
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
    <a:MessageID>uuid:AF6A2E07-BA33-496E-8AFA-E77D241A2F2F</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:OptionSet xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
      <w:Option Name="WINRS NOPROFILE">TRUE</w:Option>
      <w:Option Name="WINRS CODEPAGE">437</w:Option>
    </w:OptionSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
  </s:Body>
</s:Envelope>

```



```

    </s:Header>
    <s:Body>
      <rsp:Shell
xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
        <rsp:Environment>
          <rsp:Variable Name="test">1</rsp:Variable>
        </rsp:Environment>
        <rsp:WorkingDirectory>d:\windows</rsp:WorkingDirectory>
        <rsp:Lifetime>PT1000.000S</rsp:Lifetime>
        <rsp:InputStreams>stdin</rsp:InputStreams>
        <rsp:OutputStreams>stdout stderr</rsp:OutputStreams>
      </rsp:Shell>
    </s:Body>
  </s:Envelope>

```

Create response:

```

<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
http://schemas.xmlsoap.org/ws/2004/09/transfer/CreateResponse
    </a:Action>
    <a:MessageID>
      uuid:1BD7E077-34CD-46F9-8AC2-F7D004C3D858
    </a:MessageID><a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>uuid:A221E630-5122-491F-BA6E-D8D6F5988865</a:RelatesTo>
  </s:Header>
  <s:Body>
    <x:ResourceCreated
      xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd"
      xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
      xmlns:x="http://schemas.xmlsoap.org/ws/2004/09/transfer"
      xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
      <a:Address>
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
      <a:ReferenceParameters>
        <w:ResourceURI>
          http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
        </w:ResourceURI>
        <w:SelectorSet>
          <w:Selector Name="ShellId">
            uuid:C443F44F-28E4-486F-A5A1-12745F90CF5A
          </w:Selector>
        </w:SelectorSet>
      </a:ReferenceParameters>
    </x:ResourceCreated>
  </s:Body>
</s:Envelope>

```

4.8.2 Execute Command

This example shows how to execute the Del command to delete a file on the remote system with the confirmation prompt.

Command Request:

```
<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>
      http://localhost:80/wsman
    </a:To>
    <w:ResourceURI s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/Command
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:F8671978-E928-49DA-ADB8-5BF97EDD9535</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:SelectorSet>
      <w:Selector Name="ShellId">
        uuid:0A442A7F-4627-43AE-8751-900B509F0A1F
      </w:Selector>
    </w:SelectorSet>
    <w:OptionSet xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
      <w:Option Name="WINRS_CONSOLEMODE_STDIN">TRUE</w:Option>
      <w:Option Name="WINRS_SKIP_CMD_SHELL">FALSE</w:Option>
    </w:OptionSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <rsp:CommandLine
      xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
      <rsp:Command>del</rsp:Command>
      <rsp:Arguments>p</rsp:Arguments>
      <rsp:Arguments>
        d:\temp\out.txt
      </rsp:Arguments>
    </rsp:CommandLine>
  </s:Body>
</s:Envelope>
```

Command Response:

```
<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CommandResponse
    </a:Action>
    <a:MessageID>
      uuid:6D79AA96-4656-4BDD-9716-FB68898DA396
    </a:MessageID>
    <a:To>
```

```

http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
  </a:To>
  <a:RelatesTo>uuid:F8671978-E928-49DA-ADB8-5BF97EDD9535</a:RelatesTo>
</s:Header>
<s:Body>
  <rsp:CommandResponse
    xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
    <rsp:CommandId>77df7bb6-b5a0-4777-abd9-9823c0774074</rsp:CommandId>
  </rsp:CommandResponse>
</s:Body>
</s:Envelope>

```

4.8.3 Receive Output

This example shows how to receive the prompt via the stdout stream from the Del command in the previous example, as defined in section [4.8.2](#). It also receives error results through the stderr stream if the remote command fails.

Receive Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>
      http://localhost:80/wsman
    </a:To>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/Receive
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
      153600
    </w:MaxEnvelopeSize>
    <a:MessageID>uuid:D384DEF8-351E-41F0-B3DA-C91BE1A58A09</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:ResourceURI
      xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
    </w:ResourceURI>
    <w:SelectorSet
      xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd"
      xmlns="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
      <w:Selector Name="ShellId">
        uuid:0A442A7F-4627-43AE-8751-900B509F0A1F
      </w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <rsp:Receive
      xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
      SequenceId="0">
      <rsp:DesiredStream CommandId="77df7bb6-b5a0-4777-abd9-9823c0774074">
        stdout stderr
      </rsp:DesiredStream>
    </rsp:Receive>
  </s:Body>
</s:Envelope>

```

```

    </s:Body>
</s:Envelope>

```

Receive Response:

```

<s:Envelope
  xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
http://schemas.microsoft.com/wbem/wsman/1/windows/shell/ReceiveResponse
    </a:Action>
    <a:MessageID>
      uuid:36B5315E-6592-4512-957E-038F14C27C83</a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>uuid:D384DEF8-351E-41F0-B3DA-C91BE1A58A09</a:RelatesTo>
  </s:Header>
  <s:Body>
    <rsp:ReceiveResponse
      xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
      SequenceId="0">
      <rsp:Stream
        xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
        Name="stdout"
        CommandId="77df7bb6-b5a0-4777-abd9-9823c0774074">
          ZDpcdGVtcFxxvdXQudHh0LCBEZWxldGUgKFkvTik/IA==
        </rsp:Stream>
        <rsp:CommandState
          xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
          State="http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CommandState/Running"
          CommandId="77df7bb6-b5a0-4777-abd9-9823c0774074">
            <rsp:ExitCode>0</rsp:ExitCode>
          </rsp:CommandState>
        </rsp:ReceiveResponse>
      </s:Body>
    </s:Envelope>

```

4.8.4 Send Input

This example shows how to send the response to the prompt via the stdin stream to the Del command in the previous example, as defined in section [4.8.2](#).

Send Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>
      http://localhost:80/wsman
    </a:To>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
  </s:Header>
  <s:Body>
    <w:SendRequest
      xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd"
      </w:SendRequest>
  </s:Body>
</s:Envelope>

```

```

</a:ReplyTo>
<a:Action s:mustUnderstand="true">
  http://schemas.microsoft.com/wbem/wsman/1/windows/shell/Send
</a:Action>
<w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
<a:MessageID>uuid:F6F2CB27-2927-4750-8C9A-D1E854138F88</a:MessageID>
<w:Locale xml:lang="en-US" s:mustUnderstand="false" />
<w:ResourceURI
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
</w:ResourceURI>
<w:SelectorSet
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd"
  xmlns="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <w:Selector Name="ShellId">
    uuid:0A442A7F-4627-43AE-8751-900B509F0A1F
  </w:Selector>
</w:SelectorSet>
  <w:OperationTimeout>PT60.000S</w:OperationTimeout>
</s:Header>
<s:Body>
  <rsp:Send
    xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
    <rsp:Stream
      xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
      Name="stdin" CommandId="77df7bb6-b5a0-4777-abd9-9823c0774074">
      eQ0K
    </rsp:Stream>
    </rsp:Send>
  </s:Body>
</s:Envelope>

```

Send Response:

```

<s:Envelope
  xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/SendResponse
    </a:Action>
    <a:MessageID >uuid:40C8B4B3-C584-4FA9-9B6F-8A08BF3F350F</a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>
      uuid:F6F2CB27-2927-4750-8C9A-D1E854138F88</a:RelatesTo>
  </s:Header>
  <s:Body>
    <rsp:SendResponse
      xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
    </rsp:SendResponse>
  </s:Body>
</s:Envelope>

```

4.8.5 Terminate Operation

This example shows how to use CTRL+C to terminate the command in progress.

Signal Request:

```
<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>
      http://localhost:80/wsman
    </a:To>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/Signal
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
    <a:MessageID>uuid:23F5AAD4-9501-4070-A4F8-B216782DE466</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false"/>
    <w:ResourceURI
      xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
    </w:ResourceURI>
    <w:SelectorSet xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd"
      xmlns="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
      <w:Selector Name="ShellId">
        uuid:BEF9B5F1-BC59-46C9-A48F-BF55973B9D7B
      </w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <rsp:Signal
      xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
      CommandId="3cb05d74-af20-4ff1-b318-2c6cc0f99045">
      <rsp:Code>
        http://schemas.microsoft.com/wbem/wsman/1/windows/shell/signal/ctrl_c
      </rsp:Code>
    </rsp:Signal>
  </s:Body>
</s:Envelope>
```

Signal Response:

```
<s:Envelope
  xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/SignalResponse
    </a:Action>
    <a:MessageID>
      uuid:FE802FF2-82FD-4406-AEBF-8A9466F0DBFE
    </a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>uuid:23F5AAD4-9501-4070-A4F8-B216782DE466</a:RelatesTo>
```

```

</s:Header>
<s:Body>
  <rsp:SignalResponse
    xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
  </rsp:SignalResponse>
</s:Body>
</s:Envelope>

```

4.8.6 Enumerate Remote Shells

This examples shows how to list the open shells by using the enum:Enumerate message. Each pull request is limited to five shell instances, but because only one remote shell is active at the time of the request, only one instance is returned.

Enumerate Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://SORINOTEST05:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/09/enumeration/Enumerate
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
    <a:MessageID>uuid:08E59736-6A1B-4560-8442-64E4D7A26EB5</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <n:Enumerate>
    </n:Enumerate>
  </s:Body>
</s:Envelope>

```

Enumerate Response:

```

<s:Envelope
  xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action >
      http://schemas.xmlsoap.org/ws/2004/09/enumeration/EnumerateResponse
    </a:Action>
    <a:MessageID >
      uuid:337E353D-C3EA-4021-B4BE-6BC20AEEB490

```

```

    </a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>
      uuid:08E59736-6A1B-4560-8442-64E4D7A26EB5</a:RelatesTo>
  </s:Header>
  <s:Body>
    <n:EnumerateResponse>
      <n:EnumerationContext>
        uuid:F2EF0F83-D6E5-4F70-8E6B-D870551A5D9A
      </n:EnumerationContext>
    </n:EnumerateResponse>
  </s:Body>
</s:Envelope>

```

Pull Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://SORINOTEST05:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/09/enumeration/Pull
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:BE9EDB22-23A3-489A-B025-ED7F3461E4AB</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <n:Pull>
      <n:EnumerationContext
        xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration">
        uuid:F2EF0F83-D6E5-4F70-8E6B-D870551A5D9A
      </n:EnumerationContext>
      <n:MaxElements>5</n:MaxElements>
    </n:Pull>
  </s:Body>
</s:Envelope>

```

Pull Response:

```

<s:Envelope
  xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">

```



```

<s:Header>
  <a:Action>
    http://schemas.xmlsoap.org/ws/2004/09/enumeration/PullResponse
  </a:Action>
  <a:MessageID>
    uuid:EAB18F1F-0D6F-4176-989B-741ADD72A933
  </a:MessageID>
  <a:To>
    http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
  </a:To>
  <a:RelatesTo>uuid:BE9EDB22-23A3-489A-B025-ED7F3461E4AB</a:RelatesTo>
</s:Header>
<s:Body>
  <n:PullResponse>
    <n:Items>
      <rsp:Shell
        xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
        <rsp:ShellId>
          uuid:5B666291-0910-4E8F-B802-B697ACD7953D
        </rsp:ShellId>
        <rsp:Lifetime>PT28737.000S</rsp:Lifetime>
        <rsp:InputStreams>stdin</rsp:InputStreams>
        <rsp:OutputStreams>stdout stderr</rsp:OutputStreams>
        <rsp:CommandLine>
          <rsp:Command>pause</rsp:Command>
        </rsp:CommandLine>
        </rsp:Shell>
      </n:Items>
      <n:EndOfSequence/>
    </n:PullResponse>
  </s:Body>
</s:Envelope>

```

4.8.7 Retrieve Shell Instance

This example shows how to use [wxf:Get](#) to retrieve the instance of the active remote shell.

Get Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>
      http://SORINOTEST05:80/wsman
    </a:To>
    <w:ResourceURI s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/09/transfer/Get
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
    <a:MessageID>uuid:968C6C1D-7FBE-4E24-A160-A3F298ABE0DA</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:SelectorSet>
      <w:Selector Name="ShellId">

```

```

        uuid:5B666291-0910-4E8F-B802-B697ACD7953D
      </w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>
      PT60.000S
    </w:OperationTimeout>
  </s:Header>
  <s:Body></s:Body>
</s:Envelope>

```

Get Response:

```

<s:Envelope
  xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
      http://schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse
    </a:Action>
    <a:MessageID>uuid:57B22E63-725A-424B-99A2-3795112A8701</a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>uuid:56BF1009-CFF1-447B-98E8-F54D40388EA1</a:RelatesTo>
  </s:Header>
  <s:Body>
    <rsp:Shell
      xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
      <rsp:ShellId>
        uuid:5B666291-0910-4E8F-B802-B697ACD7953D
      </rsp:ShellId>
      <rsp:Lifetime>PT27993.000S</rsp:Lifetime>
      <rsp:InputStreams>stdin</rsp:InputStreams>
      <rsp:OutputStreams>stdout stderr</rsp:OutputStreams>
      <rsp:CommandLine>
        <rsp:Command>pause</rsp:Command>
      </rsp:CommandLine>
    </rsp:Shell>
  </s:Body>
</s:Envelope>

```

4.8.8 Delete Shell

This example shows how to delete the active shell instance by using the [wxf:Delete](#) message.

Delete Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>
      http://localhost:80/wsman
    </a:To>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
  </s:Header>
  <s:Body>
    <wxf:Delete>

```

```

    </a:Address>
  </a:ReplyTo>
  <a:Action s:mustUnderstand="true">
    http://schemas.xmlsoap.org/ws/2004/09/transfer/Delete
  </a:Action>
  <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
  <a:MessageID>uuid:B1C2D82D-A3BC-42A8-9A61-0664003AA97C</a:MessageID>
  <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
  <w:ResourceURI
    xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
    http://schemas.microsoft.com/wbem/wsman/1/windows/shell/cmd
  </w:ResourceURI>
  <w:SelectorSet xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd"
    xmlns="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
    <w:Selector Name="ShellId">
      uuid:1C5CCAB0-F418-44D8-9C43-E42AA1D5150C
    </w:Selector>
  </w:SelectorSet>
  <w:OperationTimeout>PT60.000S</w:OperationTimeout>
</s:Header>
<s:Body></s:Body>
</s:Envelope>

```

Delete Response:

```

<s:Envelope
  xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action >
      http://schemas.xmlsoap.org/ws/2004/09/transfer/DeleteResponse
    </a:Action>
    <a:MessageID >
      uuid:4295A44D-6225-4BB5-BE51-4AE24241CE23
    </a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>uuid:B1C2D82D-A3BC-42A8-9A61-0664003AA97C</a:RelatesTo>
  </s:Header>
  <s:Body></s:Body>
</s:Envelope>

```

4.9 Custom Remote Shell Examples

4.9.1 Custom Remote Shell Configuration Table Setup

Create:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://432829J04-19D:80/wsman</a:To>
    <w:ResourceURI a:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/config/winrs/customremoteshell
    </w:ResourceURI>
  </s:Header>
  <s:Body></s:Body>
</s:Envelope>

```

```

    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/09/transfer/Create
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
    <a:MessageID>uuid:516D85A5-D661-4169-861F-B165E7F00381</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:SelectorSet>
      <w:Selector Name="uri">
http://schemas.microsoft.com/wbem/wsman/1/windows/shell/test
      </w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <p:customremoteshell
xmlns:p="http://schemas.microsoft.com/wbem/wsman/1/config/winrs/customremoteshell.xsd"
    >
      <p:Shell>C:\WINDOWS\system32\Stdin2Stdout.exe</p:Shell>
      <p:Arguments>-light</p:Arguments>
    </p:customremoteshell>
  </s:Body>
</s:Envelope>

```

Create Response:

```

<s:Envelope xml:lang="en-US"
xmlns:s="http://www.w3.org/2003/05/soap-envelope"
xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
      http://schemas.xmlsoap.org/ws/2004/09/transfer/CreateResponse
    </a:Action>
    <a:MessageID>
      uuid:1C7F8309-26D8-40AC-BD7F- D2AE5DD7325C
    </a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>
      uuid:516D85A5-D661-4169-861F-B165E7F00381
    </a:RelatesTo>
  </s:Header>
  <s:Body>
    <wxf:ResourceCreated
xmlns:wxf="http://schemas.xmlsoap.org/ws/2004/09/transfer"
xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
      <a:Address>
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
      <a:ReferenceParameters>
        <w:ResourceURI>
http://schemas.microsoft.com/wbem/wsman/1/config/winrs/customremoteshell
        </w:ResourceURI>
        <w:SelectorSet>

```

```

        <w:Selector Name="uri">
http://schemas.microsoft.com/wbem/wsman/1/windows/shell/test
        </w:Selector>
    </w:SelectorSet>
    </a:ReferenceParameters>
    </wxf:ResourceCreated>
</s:Body>
</s:Envelope>

```

X

4.9.2 Custom Shell Create

Create:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://432829j04-19d.MIG.NET:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/test
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/09/transfer/Create
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
    <a:MessageID>uuid:22AFDD56-B645-4750-91ED-B909CB4CC938</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body>
    <rsp:Shell
      xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
      <rsp:Environment>
        <rsp:Variable Name="WinRSCClientGuid">
          7988584e-d748-4ba4-9cfa-7688258fc346
        </rsp:Variable>
      </rsp:Environment>
      <rsp:InputStreams>stdin</rsp:InputStreams>
      <rsp:OutputStreams>stdout stderr</rsp:OutputStreams>
    </rsp:Shell>
  </s:Body>
</s:Envelope>

```

Create Response:

```

<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>

```

```
<a:Action>
http://schemas.xmlsoap.org/ws/2004/09/transfer/CreateResponse
</a:Action>
<a:MessageID>uuid:E9A51D9D-A97F-47AC-A46D-052F8C0DEA10</a:MessageID>
<a:To>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
</a:To>
<a:RelatesTo>uuid:22AFDD56-B645-4750-91ED-B909CB4CC938</a:RelatesTo>
</s:Header>
<s:Body>
<x:ResourceCreated
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:x="http://schemas.xmlsoap.org/ws/2004/09/transfer"
  xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
    <a:Address>
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:Address>
    <a:ReferenceParameters>
      <w:ResourceURI>
http://schemas.microsoft.com/wbem/wsman/1/windows/shell/test
      </w:ResourceURI>
      <w:SelectorSet>
        <w:Selector Name="ShellId">
          uuid:4573BCA4-B667-4A84-BB06-AE5994B4395A
        </w:Selector>
      </w:SelectorSet>
    </a:ReferenceParameters>
  </x:ResourceCreated>
</s:Body>
</s:Envelope>
```

4.9.3 Custom Shell Send

Send:

```
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope" xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing" xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://432829j04-19d.MIG.NET:80/wsman</a:To>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/Send
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
    <a:MessageID>uuid:A216A4A8-BDFD-44C1-8CA5-8CD8558D09C0</a:MessageID>
    <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
    <w:ResourceURI
      xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/test
    </w:ResourceURI>
    <w:SelectorSet
      xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd"
      xmlns="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
      <w:Selector Name="ShellId">
        uuid:664AB94A-8B67-4544-8DD0-44AD39D06816
```

```

        </w:Selector>
    </w:SelectorSet>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
</s:Header>
<s:Body>
    <rsp:Send
        xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
        <rsp:Stream
            xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
            Name="stdin" End="true">
            SABlAGwAbABvACwAIAB3AG8AcgBsAGQAIQA=
        </rsp:Stream>
    </rsp:Send>
</s:Body>
</s:Envelope>

```

Send Response:

```

<s:Envelope xml:lang="en-US"
    xmlns:s="http://www.w3.org/2003/05/soap-envelope"
    xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
    xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
    <s:Header>
        <a:Action>
            http://schemas.microsoft.com/wbem/wsman/1/windows/shell/SendResponse
        </a:Action>
        <a:MessageID>uuid:0CAE63BA-655B-469E-B245-F6F248C85430</a:MessageID>
        <a:To>
            http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
        </a:To>
        <a:RelatesTo>uuid:A216A4A8-BDFD-44C1-8CA5-8CD8558D09C0</a:RelatesTo>
    </s:Header>
    <s:Body>
        <rsp:SendResponse
            xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell">
        </rsp:SendResponse>
    </s:Body>
</s:Envelope>

```

4.9.4 Custom Shell Receive

Receive:

```

<s:Envelope
    xmlns:s="http://www.w3.org/2003/05/soap-envelope"
    xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
    xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
    <s:Header>
        <a:To>http://432829j04-19d.MIG.NET:80/wsman</a:To>
        <w:ResourceURI s:mustUnderstand="true">
            http://schemas.microsoft.com/wbem/wsman/1/windows/shell/test
        </w:ResourceURI>
        <a:ReplyTo>
            <a:Address s:mustUnderstand="true">
                http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
            </a:Address>
        </a:ReplyTo>
        <a:Action s:mustUnderstand="true">
            http://schemas.microsoft.com/wbem/wsman/1/windows/shell/Receive

```

```

</a:Action>
<w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
<a:MessageID>uuid:C135739B-17C1-418B-BE0D-FD6025539695</a:MessageID>
<w:Locale xml:lang="en-US" s:mustUnderstand="false" />
<w:SelectorSet>
  <w:Selector Name="ShellId">
    uuid:4573BCA4-B667-4A84-BB06-AE5994B4395A
  </w:Selector>
</w:SelectorSet>
<w:OptionSet xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <w:Option Name="WSMAN CMDSHELL OPTION KEEPALIVE">TRUE</w:Option>
</w:OptionSet>
</s:Header>
<s:Body>
  <rsp:Receive
    xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
    SequenceId="0">
    <rsp:DesiredStream>stdout stderr</rsp:DesiredStream>
  </rsp:Receive>
</s:Body>
</s:Envelope>

```

Receive Response:

```

<s:Envelope xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action>
      http://schemas.microsoft.com/wbem/wsman/1/windows/shell/ReceiveResponse
    </a:Action>
    <a:MessageID>uuid:A4FEDB22-489D-42CD-8C1B-2110A79E47FD</a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo>uuid:C135739B-17C1-418B-BE0D-FD6025539695</a:RelatesTo>
  </s:Header>
  <s:Body>
    <rsp:ReceiveResponse
      xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
      SequenceId="0">
      <rsp:Stream
        xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
        Name="stdout">
        SA==
      </rsp:Stream>
      <rsp:CommandState
        xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
        State="http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CommandState/Pending"
      >
        <rsp:ExitCode>0</rsp:ExitCode>
      </rsp:CommandState>
      <rsp:Stream
        xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
        Name="stderr" End="true">
      </rsp:Stream>
      <rsp:Stream
        xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
        Name="stdout">
        AGUAbABsAG8ALAAgAHcAbwByAGwAZAAhAA==
      </rsp:Stream>
    </rsp:ReceiveResponse>
  </s:Body>
</s:Envelope>

```



```

        </rsp:Stream>
        <rsp:CommandState
            xmlns:rsp="http://schemas.microsoft.com/wbem/wsman/1/windows/shell"
            State="http://schemas.microsoft.com/wbem/wsman/1/windows/shell/CommandState/Done"
        >
            <rsp:ExitCode>0</rsp:ExitCode>
        </rsp:CommandState>
    </rsp:ReceiveResponse>
</s:Body>
</s:Envelope>

```

4.9.5 Custom Shell Delete

Delete:

```

<s:Envelope
    xmlns:s="http://www.w3.org/2003/05/soap-envelope"
    xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
    xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
    <s:Header>
        <a:To>http://432829j04-19d.MIG.NET:80/wsman</a:To>
        <a:ReplyTo>
            <a:Address s:mustUnderstand="true">
                http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
            </a:Address>
        </a:ReplyTo>
        <a:Action s:mustUnderstand="true">
            http://schemas.xmlsoap.org/ws/2004/09/transfer/Delete
        </a:Action>
        <w:MaxEnvelopeSize s:mustUnderstand="true">153600</w:MaxEnvelopeSize>
        <a:MessageID>uuid:801DA636-5722-4709-8C41-80CCCF24667B</a:MessageID>
        <w:Locale xml:lang="en-US" s:mustUnderstand="false" />
        <w:ResourceURI
            xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
            http://schemas.microsoft.com/wbem/wsman/1/windows/shell/test
        </w:ResourceURI>
        <w:SelectorSet
            xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd"
            xmlns="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
            <w:Selector Name="ShellId">
                uuid:3F9B9350-5F21-4C4F-A2F0-A6FD33B94D75
            </w:Selector>
        </w:SelectorSet>
        <w:OperationTimeout>PT60.000S</w:OperationTimeout>
    </s:Header>
    <s:Body>
    </s:Body>
</s:Envelope>

```

Delete Response:

```

<s:Envelope
    xml:lang="en-US"
    xmlns:s="http://www.w3.org/2003/05/soap-envelope"
    xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
    xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
    <s:Header>
        <a:Action>

```

```

    http://schemas.xmlsoap.org/ws/2004/09/transfer/DeleteResponse
  </a:Action>
  <a:MessageID>uuid:CB899D4F-0161-4FFD-B696-FB26B467AF44</a:MessageID>
  <a:To>
    http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
  </a:To>
  <a:RelatesTo>uuid:801DA636-5722-4709-8C41-80CCCF24667B</a:RelatesTo>
</s:Header>
<s:Body>
  </s:Body>
</s:Envelope>

```

4.10 Selector Filter Dialect Example

Here is the example of the message using Selector Filter Dialect.

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:n="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://myhost/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
      http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/Win32_Service
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
        http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/09/enumeration/Enumerate
    </a:Action>
    <a:MessageID>uuid:B0AA1D80-F74F-4C39-8280-66273FB14D07</a:MessageID>
  </s:Header>
  <s:Body>
    <n:Enumerate>
      <w:Filter
        Dialect="http://schemas.dmtf.org/wbem/wsman/1/wsman/SelectorFilter">
        <w:SelectorSet>
          <w:Selector Name="StartMode">Auto</w:Selector>
          <w:Selector Name="State">Stopped</w:Selector>
        </w:SelectorSet>
      </w:Filter>
    </n:Enumerate>
  </s:Body>
</s:Envelope>

```

4.11 Fault Detail

In this section, an example of fault detail is shown. A Get request with an invalid Resource URI is sent, resulting in a fault.

Get Request:

```

<s:Envelope
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"

```

```

xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:To>http://localhost:80/wsman</a:To>
    <w:ResourceURI s:mustUnderstand="true">
http://schemas.microsoft.com/wbem/wsman/1/wmi/root/cimv2/win32_nosuchclass
    </w:ResourceURI>
    <a:ReplyTo>
      <a:Address s:mustUnderstand="true">
http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
      </a:Address>
    </a:ReplyTo>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/09/transfer/Get
    </a:Action>
    <w:MaxEnvelopeSize s:mustUnderstand="true">
      51200
    </w:MaxEnvelopeSize>
    <a:MessageID>
      uuid:B2C3F241-1C90-4B91-9D66-EEA0DEB81879
    </a:MessageID>
    <w:OperationTimeout>PT60.000S</w:OperationTimeout>
  </s:Header>
  <s:Body/>
</s:Envelope>

```

Fault Response:

```

<s:Envelope
  xml:lang="en-US"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:w="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  <s:Header>
    <a:Action s:mustUnderstand="true">
      http://schemas.xmlsoap.org/ws/2004/08/addressing/fault
    </a:Action>
    <a:MessageID s:mustUnderstand="true">
      uuid:F6968902-D4EA-4B50-9F6E-DECCFBA1BDFD
    </a:MessageID>
    <a:To>
      http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
    </a:To>
    <a:RelatesTo s:mustUnderstand="true">
      uuid:B2C3F241-1C90-4B91-9D66-EEA0DEB81879
    </a:RelatesTo>
  </s:Header>
  <s:Body>
    <s:Fault>
      <s:Code>
        <s:Value>s:Sender</s:Value>
        <s:Subcode>
          <s:Value>a:DestinationUnreachable</s:Value>
        </s:Subcode>
      </s:Code>
      <s:Reason>
        <s:Text xml:lang="en-US">
          The WS-Management service cannot process the request.
          The service cannot find the resource identified by the
          resource URI and selectors.
        </s:Text>
      </s:Reason>
    </s:Fault>
  </s:Body>
</s:Envelope>

```

```

        <w:FaultDetail>
            wsman:faultDetail/ResourceNotFound
        </w:FaultDetail>
        <f:WSManFault
xmlns:f="http://schemas.microsoft.com/wbem/wsman/1/wsmanfault"
Code="32768" Machine="http://localhost:80/wsman">
            <f:Message>
                <f:ProviderFault
                    providerId="D9A2A039-A4B3-4A70-8CB9-8D7714EAD776">
                        <f:WSManFault
xmlns:f="http://schemas.microsoft.com/wbem/wsman/1/wsmanfault"
Code="32768" Machine="">
                            <f:Message>The WS-Management service cannot
                                process the request. The service cannot
                                find the resource identified by the
                                resource URI and selectors.</f:Message>
                            </f:WSManFault>
                        </f:ProviderFault>
                    </f:Message>
                </f:WSManFault>
            </s:Detail>
        </s:Fault>
    </s:Body>
</s:Envelope>

```

5 Security

The following sections specify security considerations for implementers of Web Services Management Protocol Extensions for Windows Vista.

5.1 Security Considerations for Implementers

Web Services Management Protocol Extensions for Windows Vista uses the WS-Management Security Profiles, as specified in [\[DMTF-DSP0226\]](#) section 9.

Web Services Management Protocol Extensions for Windows Vista service MUST authenticate the request by using one of the configured security profiles. See [Server Configuration Data Types \(section 2.2.4.3\)](#) and section [3.1.5.5.3](#) for more information on configured profiles.

Web Services Management Protocol Extensions for Windows Vista service MUST authorize the request by using the RootSDDL configuration setting specified in Server Configuration Data Types (section 2.2.4.3).

Web Services Management Protocol Extensions for Windows Vista clients MUST implement the following security profiles:

- wsman:secprofile/http/basic, as specified in [\[DMTF-DSP0226\]](#) section 12.5.
- wsman:secprofile/https/basic, as specified in [\[DMTF-DSP0226\]](#) section 12.7.
- wsman:secprofile/https/spnego-kerberos, as specified in [\[DMTF-DSP0226\]](#) section 12.12.
- wsman:secprofile/http/spnego-kerberos, as specified in [\[DMTF-DSP0226\]](#) section 12.14.
- wsman:secprofile/http/digest, as specified in [\[DMTF-DSP0226\]](#) section 12.6.
- wsman:secprofile/https/digest, as specified in [\[DMTF-DSP0226\]](#) section 12.8.

Web Services Management Protocol Extensions for Windows Vista service MUST implement the following security profiles:

- wsman:secprofile/http/basic specified in [\[DMTF-DSP0226\]](#) section 12.5.
- wsman:secprofile/https/basic specified in [\[DMTF-DSP0226\]](#) section 12.7.
- wsman:secprofile/https/spnego-kerberos specified in [\[DMTF-DSP0226\]](#) section 12.12.
- wsman:secprofile/http/spnego-kerberos specified in [\[DMTF-DSP0226\]](#) section 12.14. [<38><39>](#)

6 Appendix A: Windows Behavior

The information in this specification is applicable to the following versions of Windows:

- Windows Server 2003
- Windows Server 2003 R2
- Windows XP SP2
- Windows Vista
- Windows Vista SP1
- Windows Server 2008

Exceptions, if any, are noted below. Unless otherwise specified, any statement of optional behavior in this specification prescribed using the terms SHOULD or SHOULD NOT implies Windows behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that Windows does not follow the prescription.

[<1> Section 1.3:](#) Windows Vista and Windows Server 2008 support retrieval and update of existing CIM Instances but do not support creation of new CIM Instances or deletion of existing CIM Instances.

[<2> Section 1.3:](#) Windows Vista and Windows Server 2008 support the following resource providers:

- The CIM resource provider, which handles CIM related requests. The GUID of the CIM resource provider is D9A2A039-A4B3-4A70-8CB9-8D7714EAD776.
- The Configuration resource provider, which handles configuration-related requests. The GUID of the Configuration resource provider is FCBE098D-64C7-4b07-BB5B-748DBEC256A3.
- Event Forwarding resource provider
- Windows Command Shell resource provider

[<3> Section 1.3:](#) Windows Vista SP1, Windows Server 2008, Windows XP SP2, Windows Server 2003 SP1, Windows Server 2003 SP2, and Windows Server 2003 R2 support these additional features:

- Client Certification: Allows a non-domain based authentication mechanism. In this scenario, multiple client certificates can be mapped to a single account using pattern matching rules.
- Publisher-Initiated Event Subscription: Allows the publisher (source) of the event to initiate the event subscription process.
- Custom Remote Shell: Allows custom shells to be configured, manipulated and invoked, besides Windows Command Shell.
- Selector Filter Dialect: Allows the use of Selector Filter Dialect for enumeration of resources, as defined by [\[DMTF-DSP0226\]](#), Appendix C.
- Enumeration Optimization: Allows the clients to optimize the number of round trips required to enumerate the items in an enumerate request.

[<4> Section 1.7:](#) Windows Vista SP1, Windows Server 2008, Windows XP SP2, Windows Server 2003 SP1, Windows Server 2003 SP2, and Windows Server 2003 R2 support Identity requests, as specified in [\[DMTF-DSP0226\]](#) section 2.1.1.

[<5> Section 2.2.1.1:](#) Windows XP SP2, Windows Server 2003 SP1, Windows Server 2003 R2, Windows Vista SP1, and Windows Server 2008 return error codes that can be either (a) Win32 error codes whose values are taken from the Windows error number space defined in [\[MS-ERREF\]](#), or (b) application-specific error codes whose meaning must be determined from out-of-band means such as application documentation.

[<6> Section 2.2.2.1:](#) Windows Vista and Windows Server 2008, Windows Vista SP1, Windows XP SP2, Windows Server 2003 SP1, Windows Server 2003 SP2, and Windows Server 2003 R2 do not support negative time stamps, which are cim:cimDateTime values that start with a dash ('-').

[<7> Section 2.2.3:](#) Windows Vista implementation does not use this element.

[<8> Section 2.2.3.3:](#) The Windows Vista shell processor MUST use zero for no error, and a nonzero number for error conditions.

[<9> Section 2.2.4.3.5:](#) Windows Vista SP1, Windows Server 2008, Windows XP SP2, Windows Server 2003 SP1, Windows Server 2003 SP2, and Windows Server 2003 R2 support Client Certificates.

[<10> Section 2.2.4.3.7:](#) Windows Vista SP1, Windows Server 2008, Windows XP SP2, Windows Server 2003 SP1, Windows Server 2003 SP2, and Windows Server 2003 R2 support [Custom Remote Shell](#).

[<11> Section 2.2.7:](#) Windows Vista SP1, Windows Server 2008, Windows XP SP2, Windows Server 2003 SP1, Windows Server 2003 SP2, and Windows Server 2003 R2 support Publisher-Initiated Event Subscription.

[<12> Section 2.2.9:](#) Windows Vista SP1, Windows Server 2008, Windows XP SP2, Windows Server 2003 SP1, Windows Server 2003 SP2, and Windows Server 2003 R2 support only the issuer role.

[<13> Section 3.1.5.1.7:](#) Windows Server 2003 R2 do not support nonzero year and nonzero month values in the OperationTimeout field.

[<14> Section 3.1.5.1.8:](#) Windows Server 2003 R2 servers do not support nonzero year and nonzero month values in the OperationTimeout field.

[<15> Section 3.1.5.1.10:](#) The following versions of Windows SHOULD return a wsman:InvalidOptions fault if the wsman:OptionSet element contains a wsman:Option element with mustComply="true" for which the option is not supported for the ResourceURI and operation, as specified in [\[DMTF-DSP0226\]](#):

- Windows Server 2008
- Windows Vista SP1
- Windows Vista
- Windows XP SP2te
- Windows Server 2003 SP2
- Windows Server 2003 SP1

- Windows Server 2003 R2

[<16> Section 3.1.5.1.10:](#) Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista returns a wsman:InvalidOptions fault if the OptionSet contains a wsman:Option element with mustComply="true" for a ResourceURI that does not support options.

[<17> Section 3.1.5.1.11:](#) Windows Server 2003 R2 servers ignore the RequestEPR header unless mustUnderstand="true", in which case they will return a s:NotUnderstood fault as specified by [\[SOAP1.2/1\]](#).

[<18> Section 3.1.5.2.1:](#) Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista does not include the XMLNS in results when the select statement is of the form "select a, b, c from ..."

[<19> Section 3.1.5.2.1:](#) Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista returns the selected elements in alphabetical order.

[<20> Section 3.1.5.2.1:](#) Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista does not include the wsmb:Expression element in responses.

[<21> Section 3.1.5.2.3:](#) Windows Server 2003 R2 servers ignore the Request-Total-Items-Count-Estimate header.

[<22> Section 3.1.5.2.4:](#) The following versions of Windows

- Windows Server 2008
- Windows Vista SP1
- Windows Vista
- Windows XP SP2te
- Windows Server 2003 SP2
- Windows Server 2003 SP1
- Windows Server 2003 R2

support OptimizeEnumeration.

[<23> Section 3.1.5.2.4:](#) If Web Services Management Protocol Extensions for Windows Vista clients use the OptimizeEnumeration element, it will be ignored by the Web Services Management Protocol Extensions for Windows Vista. The following versions of Windows support the OptimizeEnumeration element:

- Windows Server 2008
- Windows Vista SP1
- Windows Vista
- Windows XP SP2te
- Windows Server 2003 SP2

- Windows Server 2003 SP1
- Windows Server 2003 R2

<24> [Section 3.1.5.2.6:](#) Windows Vista client sends the wsman:Filter element.

<25> [Section 3.1.5.2.6.1:](#) Windows Vista SP1, Windows Server 2008 clients, Windows XP SP2, Windows Server 2003 SP1, Windows Server 2003 SP2, and Windows Server 2003 R2 MUST support Selector Filter Dialect as specified by [\[DMTF-DSP0226\]](#) Appendix C.

<26> [Section 3.1.5.3.1:](#) Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista returns a was:ActionNotSupported fault or a wsman:FilteringNotSupported fault.

<27> [Section 3.1.5.4.4:](#) Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista uses the following string for the Vendor element: Microsoft Corporation.

<28> [Section 3.1.5.4.4:](#) Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista uses the following format for the ProductVersion element when the Identify request is authenticated (where d is a 32-bit unsigned integer. For example: OS: 5.2.3790 SP: 1.0 Stack: 1.0):

OS: d.d.d SP: d.d Stack: d.d

OS: The major and minor version numbers of the operating system.

SP: The service pack installed on the computer.

Stack: A version number that identifies which version of the WS-Management stack implementation is running.

<29> [Section 3.1.5.4.4:](#) Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista uses the following format for the ProductVersion element when the Identify request is unauthenticated and the WSMANIDENTIFY HTTP header is present:

OS: 0.0.0000 SP: 0.0 Stack: 0.0

<30> [Section 3.1.5.5.3.1:](#) Web Services Management Protocol Extensions for Windows Vista service running on Windows Server 2008 and Windows Vista only accepts user names to local accounts when using Basic or Negotiate.

<31> [Section 3.1.8:](#) Windows Vista supports the subscription and delivery of events emitted by services using WS-Eventing messaging and paradigms. WS-Management places additional restrictions and constraints on the general WS-Eventing specification, as specified in [\[DMTF-DSP0226\]](#) section 7.

<32> [Section 3.1.8.1:](#) The following table provides the summary of the event delivery mode and subscription types supported by Web Services Management Protocol Extensions for Windows Vista.

	Pull Mode	Single Push Mode	Push with Ack Mode	Batch Push Mode
Publisher Initiated	No	No	Yes	Yes
Collector Initiated	Yes	Yes	Yes	Yes

[<33> Section 3.1.8.1.2.1:](#) Windows Vista and Windows Server 2008 support ReadExisitingEvent option only, as defined above.

[<34> Section 3.1.8.1.2.1:](#) Windows Vista SP1, Windows Server 2008, Windows XP SP2, Windows Server 2003 SP1, Windows Server 2003 SP2, and Windows Server 2003 R2 support ReadExisitingEvent option as well as predefined, reserved bookmark, <http://schemas.dmtf.org/wbem/wsman/1/wsman/bookmark/earliest>, as specified in [\[DMTF-DSP0226\]](#) section 7.2.6 (Bookmarks).

[<35> Section 3.3.5.4:](#) The following versions of Windows will return a wsman:FilteringNotSupported fault if the xpath starts with a slash "/" character:

- Windows Server 2008
- Windows Vista SP1
- Windows Vista
- Windows XP SP2te
- Windows Server 2003 SP2
- Windows Server 2003 SP1
- Windows Server 2003 R2

[<36> Section 3.3.5.4:](#) The following versions of Windows will return a wsman:InternalError fault if the xpath addresses elements or attributes that are not part of the XML representation and sub-elements of endpoint references (CIM ref properties):

- Windows Server 2008
- Windows Vista SP1
- Windows Vista
- Windows XP SP2te
- Windows Server 2003 SP2
- Windows Server 2003 SP1
- Windows Server 2003 R2

[<37> Section 3.3.5.4:](#) The following versions of Windows will return the class name (for example, CIM_Sampl) rather than the class's XSD type (for example, CIM_Sampl_Type) when the xpath identifies the type attribute of an embedded object:

- Windows Server 2008
- Windows Vista SP1
- Windows Vista
- Windows XP SP2te
- Windows Server 2003 SP2
- Windows Server 2003 SP1

- Windows Server 2003 R2

[<38> Section 5.1:](#) The default security profile used by Windows Server 2003 R2 clients is wsman:secprofile/https/spnego-kerberos.

[<39> Section 5.1:](#) Windows Vista SP1, Windows Server 2008, Windows XP SP2, Windows Server 2003 SP1, Windows Server 2003 SP2, and Windows Server 2003 R2 MUST implement the following additional security profile:

- wsman:secprofile/https/mutual described in [\[DMTF-DSP0226\]](#) section 12.9

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