

The WS-Management Catalog

June 2005

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Abstract

This document describes the default metadata formats used for the WS-Management Protocol. The entire set of metadata documents available from a WS-Management service is called the "catalog".

For details on the protocol itself, see the associated **Web Services for Management (WS-Management)** specification, of **June 2005** [1], which is the normative definition and relates directly to the definitions in this specification.

This specification defines the default metadata formats for the discovery part of the protocol. Discovery in this context refers to discovering available resources at a particular network address or management node.

WS-Management supports the concept of multiple logical endpoints residing at the same network address, so a technique is required for discovering and understanding what management functionality those endpoints represent.

This list of available logical endpoints or "resources", their summary forms, compatible actions, schemas, and WSDL representations loosely constitute the **WS-Management**

WS-Management itself can be used as a starting point for organizing the management data needed by users of the protocol.

1.3 XML Namespaces

The following XML namespaces are used within this document and the WS-Management protocol itself. The choice of the namespace prefix is arbitrary and not semantically significant.

Prefixes and XML namespaces used ins specification.





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hardware.org

can coexist with older ones. The process for discovering and enumerating them remains the same, however.

2.2 Overall Structure


```
(38)
(39)     <Operation
(40)         WsdlPort="DiskOps"
(41)         WsdlRef="http://schemas.acme.com/2005/06/hardware/wsdl">
```

schema definitions. If the catalog entry supports more than one type of access, more than one Access block can be defined.

The **Compliance** section (line 18) references the version of the WS-Management protocol (or other management protocol) that the resource was designed to operate with. This may be repeated if the resource supports more than one version of the protocol.

There are one or more **Operation** elements (lines 19, 29, 39) which indicate which operations the resource is compatible with. The first two examples indicate that the resource was designed to work with wxf:Get (WS-Transfer::Get) and wsen:Enumerate

If vendors need private versioning schemes, they may use the open-content extensions provided for the Resource format, or may use the Keywords mechanism to convey versioning information.

CR 2.5.a: *Where applicable, the version information SHOULD be encoded into the ResourceURI itself.*

2.6 Notes

The Notes element (line 8) is for text-based description. This is intended for a short "help" text on the nature of the resource, and should not be used as a caption or user-friendly name.

```
(1) <Resource
(2)   xmlns="http://schemas.xmlsoap.org/ws/2005/06/wsmancat "
(3)   xmlns:xs="http://www.w3.org/2001/XMLSchema"
(4)   xml:lang="en-us">
(5)
(6)   <ResourceURI> http://schemas.acme.com/2005/06/samples/physicalDisk </ResourceURI>
(7)   <Version> 1.0 </Version>
(8)   <Notes> Describes access to a physical disk unit </Notes>
(9)   ...
```

CR 2.6.a: *The Notes element is OPTIONAL.*

CR 2.6.b: *If the **xml:lang** attribute is present (line 4), the language of Notes or other descriptive elements MUST be the specified language.*

CR 2.6.c: *If any descriptive element such as Notes is used, the **xml:lang** attribute MUST be present to identify the language in use.*

2.7 Vendor

Describes the vendor who produced the resource (line 9):

```
(1) <Resource
(2)   xmlns="http://schemas.xmlsoap.org/ws/2005/06/wsmancat "
(3)   xmlns:xs="http://www.w3.org/2001/XMLSchema"
(4)   xml:lang="en-us"      >
(5)
(6)   <ResourceURI> http://schemas.acme.com/2005/06/samples/physicalDisk </ResourceURI>
(7)   <Version> 1.0 </Version>
(8)   <Notes> Describes access to a physical disk unit </Notes>
```


The Operation element documents a valid operation supported by the current resource. This consists of the following content:

```
(1) <Access>
(2)   <Action> ... </Action>
(3)
(4)   <Operation>
(5)     <Action> wsa:Action URI for requests
(6)     <SelectorSetRef> Local ID of applicable selector set
(7)     <OptionSetRef> Local ID of available OptionSet
(8)     <SchemaRef> ...the schema QName applicable to this operation
(9)     <FilterDialect> ...for enumeration or subscription
(10)    <DeliveryMode> ...for event sources
(11)  </Operation>
(12)  ...
```

CR 2.12.a: The catalog *SHOULD* contain one or more <Operation> elements which describe what operations the Resource is compatible with.

The above example states that both Get and Put from WS-Transfer are supported, and both are required to support identical Selectors, Options, SchemaRef, and anything else defined in th

If on the othr hand Put supports different Options than Get, then a separate Operation block would have been required:

(24) . . .

If the enumeration *requires* a filter in all cases (simple enumeration is not supported, then a <FiltersRequired/> element is added:

```
(9) <Operation>
(10)     <Action>
(11)         http://schemas.xmlsoap.org/ws/2004/09/enumeration/Enumerate
(12)     </Action>
(13)     <FilterDialect>
(14)         http://www.w3.org/TR/1999/REC-xpath-19991116
(15)     </FilterDialect>
(16)     <FiltersRequired/>
(17)     ...
```

...

2.12.6 *DeliveryModes*

If the resource Action URI is <http://schemas.xmlsoap.org/ws/2004/08/eventing/Subscribe>, then the entry is an event source. In this case, one or more DeliveryMode elements must be present to indicate to the subscriber which event delivery modes are available:


```
(1)     <Operation>
(2)     <Action>
(3)         http://schemas.xmlsoap.org/ws/2004/08/eventing/Subscribe
(4)     </Action>
(5)     <FilterDialect>
(6)         http://www.w3.org/TR/1999/REC-xpath-19991116
(7)     </FilterDialect>
(8)     <DeliveryMode4/09/enumeration/Enumerate1.34 435 13.02 refBT7.98 0 0 7.98 90 313.56 Tm0 g((9))Tj/TT10
```

2.13 SelectorSet

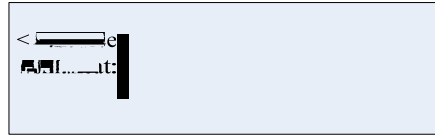
all of the specified Selector values once it has unambiguously identified an instance (short-circuiting logic is expected).

2.14 Options

In many cases, operations require additional instructions or switches which modify the behavior of an operation. It is not appropriate to include these as Selector elements. Instead, they become Option elements at the protocol level in addition to Selector elements and the ResourceURI. As with Selectors, each option that is possible must be defined by name and value.



A typical use for Options is to "include expens




```
(38)         <SchemaRef xmlns:ev="management.samples.org/2005/06/hardwareEvents"
(39)             ev:OverheatedCPUEvent
(40)         </SchemaRef>
(41) </Operation>
```

When a wse:Subscribe operation is performed, it is sent to the owning ResourceURI. If

This section describes how resource metadata is actually retrieved by client applications.

(29)

...

format, and the SelectorSet MUST refer to the resource for which the catalog entry is desired..

The resulting wxf:GetResponse contains a single catalog entry:

```
(33) <s:Envelope
(34)     xmlns:s="http://www.w3.org/2003/05/soap-envelope"

(36)     xmlns:wsman="http://schemas.xmlsoap.org/ws/2004/10/management">
(37)     <s:Header>
(38)         <wsa:To>
(39)             http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
(40)         </wsa:To>
(41)
(42)         <wsa:Action env:mustUnderstand="true">
(43)             http://schemas.xmlsoap.org/ws/2004/01/transfer/GetResponse
(44)         </wsa:Action>
(45)
(46)         <wsa:MessageID env:mustUnderstand="true">
(47)             uuid:d9726315-bc91-430b-9ed8-ce5ffb858a88
(48)         </wsa:MessageID>
(49)
(50)         <wsa:RelatesTo>
(51)             7.98 90 448.26 Tm0 g((48))Tj/TT10 17
(52)         </wsa:RelatesTo>

(54)
(55)     <s:Body>
(56)         <Resource
(57)             xmlns="http://schemas.xmlsoap.org/ws/2005/06/wsmancat"

(59)             xml:lang="en-us" >
(60)                 <ResourceURI>

(62)                 </ResourceURI>
(63)                 ...rest of catalog entry...
(64)             </Resource>

(66) </s:Envelope>
```

5.2 Subsequent Catalog Entries


```
<wsa:EndpointReference> ...SOAP address ... </wsa:EndpointReference>  
<wsa:EndpointReference> ...SOAP address ... </wsa:EndpointReference>  
<wsmanecat:URL> http address </wsmanecat:URL>  
<wsmanecat:URL>
```



```
(1) <Resource  
(2)   xmlns="http://schemas.xmlsoap.org/ws/2005/06/wsmancat "  
(3)   xmlns:xs="http://www.w3.org/2001/XMLSchema"  
(4)   lang="en-us"  
(5)   >  
(6)  
(7) </Resource>
```

It is up to the implementation to compose or retrieve catalog entries in the correct locale


```
elementFormDefault="qualified"
```

```
>
```

```
<xs:complexType name="RelationshipType">
```

```
<xs:extension base="xs:string">
```

```
<xs:attribute name="Name" type="xs:string" use="required"/>
```

```
<xs:attribute name="Type" type="xs:QName" use="optional"/>
```

```
<xs:attribute name="URI" use="optional"/>
```

90 010 7.98 90 513

```
<xs:element name="Option" type="tns:OptionType"  
  minOccurs="0" maxOccurs="unbounded"/>
```

```
minOccurs="0" minOccurs="unbounded" />
```

```
<xs:element name="Resource" type="tns:ResourceType"/>
<xs:element name="Catalog">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="Resource" type="tns:ResourceType"
        minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
</xs:schema>
```

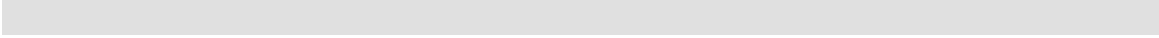
7 Appendix C : Example Catalog Entries Appa0.879o0

```
(23)         </Action>
(24)         </Operation>
```

```
(34)         <Action>
(35)             http://schemas.xmlsoap.org/ws/2004/09/enumeration/Enumerate
(36)         </Action>
(37)         <OptionSetRef Name="osl" />
(38)         <SchemaRef Location="foo"
(39)             xmlns:ac="schemas.acme.com/2005/06/hardware">

(41)         </SchemaRef>

(43)
(44)         <Operation WsdlPort="DiskOps"
(45)             WsdlRef="http://chemas.acme.com/2005/06/hardware/wsdl">
```

[WS-Transfer]

J. Alexander et al, "[Web Services Transfer \(WS-Transfer\)](#)," September 2004

[WSDL 1.1]

E. Christensen et al, "[Web Services Description Language \(WSDL\) 1.1](#)," March 2001.

[XML Schema, Part 1]

H. Thompson et al, "[XML Schema Part 1: Structures](#)," May 2001.

[XML Schema, Part 2]

P. Biron et al, "[XML Schema Part 2: Datatypes](#)," May 2001.

[RFC 2396] Uniform Resource Identifiers (URI) : Generic Syntax

<http://www.ietf.org/rfc/rfc2396.txt>

[RFC 3066] Tags for the Identification of Languages