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5 # WBEM URI Mapping Specification

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9

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56   Foreword

57   The *WBEM URI Mapping Specification* (DSP0207) was prepared by the DMTF WBEM Modeling Working
58   Group.

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

61   The Distributed Management Task Force, Inc. (DMTF), developer of CIM, is the industry organization
62   leading the development, adoption, and interoperability of management specifications and initiatives for
63   enterprise and Internet environments.

64   This specification was processed and approved by the DMTF. Approval of this specification does not
65   necessarily imply that all members voted for approval.

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67   The authors wish to acknowledge the following people.

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75   • Andreas Maier – IBM

76   Introduction

77   This specification defines the WBEM Universal Resource Identifier (URI). The WBEM URI is used in
78   WBEM protocols to identify several kinds of CIM objects.

79   A URI (as defined by the IETF in RFC 3986) is a compact string representation for a resource available
80   via the Internet. This specification defines the subset of the URI syntax that is specific to WBEM.

81   The reader is expected to have a working knowledge of URI and WBEM.

82

83

WBEM URI Mapping Specification

84 ## 1   Scope

85 This document defines the Universal Resource Identifier (URI) format for WBEM protocols. A WBEM URI
86 is a compact string of characters for identifying a CIM element. This document defines a mapping of CIM
87 naming, as defined in the CIM Infrastructure Specification (DSP0004), to the URI syntax, as defined in
88 RFC 3986.

89 The URI Generic Syntax standard and the Universal Resource Locators standards by the IETF provide a
90 framework for identifying resources.

91 ## 2   Normative References

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

95 ### 2.1   Approved References

96 DMTF DSP0004, *Common Information Model (CIM) Specification 2.5*,
97 http://www.dmtf.org/standards/published_documents/DSP0004_2.5.pdf

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

100 IETF RFC 1034, *Domain Names — Concepts and Facilities*, November 1987,
101 http://www.ietf.org/rfc/rfc1034.txt

102 IETF RFC 1123, *Requirements for Internet Hosts — Applications and Support*, October 1989,
103 http://www.ietf.org/rfc/rfc1123.txt

104 IETF RFC 2373, *IP Version 6 Addressing Architecture*, July 1998,
105 http://www.ietf.org/rfc/rfc2373.txt

106 IETF RFC 2717, *Registration Procedures for URL Scheme Names*, November 1999,
107 http://www.ietf.org/rfc/rfc2717.txt

108 IETF RFC 2718, *Guidelines for new URL Schemes*, November 1999,
109 http://www.ietf.org/rfc/rfc2718.txt

110 IETF RFC 3986, *Uniform Resource Identifiers (URI): Generic Syntax*, January 2005,
111 http://www.ietf.org/rfc/rfc3986.txt

112 IETF RFC 5234, *Augmented BNF for Syntax Specifications: ABNF*, January 2008,
113 http://www.ietf.org/rfc/rfc5234.txt

114 ### 2.2   Other References

115 ISO/IEC Directives, Part 2, *Rules for the structure and drafting of International Standards*,
116 http://isotc.iso.org/livelink/livelink.exe?func=ll&objId=4230456&objAction=browse&sort=subtype

117   3   Terms and Definitions

118   For the purposes of this document, the following terms and definitions apply.

119   **3.1**
120   **can**
121   used for statements of possibility and capability, whether material, physical, or causal

122   **3.2**
123   **cannot**
124   used for statements of possibility and capability, whether material, physical or causal

125   **3.3**
126   **conditional**
127   indicates requirements to be followed strictly in order to conform to the document when the specified
128   conditions are met

129   **3.4**
130   **mandatory**
131   indicates requirements to be followed strictly in order to conform to the document and from which no
132   deviation is permitted

133   **3.5**
134   **may**
135   indicates a course of action permissible within the limits of the document

136   **3.6**
137   **need not**
138   indicates a course of action permissible within the limits of the document

139   **3.7**
140   **optional**
141   indicates a course of action permissible within the limits of the document

142   **3.8**
143   **shall**
144   indicates requirements to be followed strictly in order to conform to the document and from which no
145   deviation is permitted

146   **3.9**
147   **shall not**
148   indicates requirements to be followed strictly in order to conform to the document and from which no
149   deviation is permitted

150   **3.10**
151   **should**
152   indicates that among several possibilities, one is recommended as particularly suitable, without
153   mentioning or excluding others, or that a certain course of action is preferred but not necessarily required

154   **3.11**
155   **should not**
156   indicates that a certain possibility or course of action is deprecated but not prohibited

157 **4   Symbols and Abbreviated Terms**

158   The following symbols and abbreviations are used in this document.

159   **4.1**
160   **ABNF**
161   Augmented Backus-Naur Form

162   **4.2**
163   **BNF**
164   Backus-Naur Form

165   **4.3**
166   **CIM**
167   Common Information Model

168   **4.4**
169   **URI**
170   Universal Resource Identifier

171   **4.5**
172   **WBEM**
173   Web-Based Enterprise Management

174   **5   WBEM URI**

175   **5.1   General**

176   This section specifies the WBEM URI.

177   The WBEM URI can be used to reference the following kinds of CIM objects:

178   • CIM namespaces

179   • CIM classes

180   • CIM instances

181   • CIM qualifier types

182   The following two formats of the WBEM URI are defined:

183   • Untyped WBEM URI is a format compatible with the CIM Object Name format defined by
184   DSP0004.

185   • Typed WBEM URI is a format that includes the data type of the key properties, as well as the
186   kind of CIM object referenced.

187   The Untyped WBEM URI is included to support legacy use of the ObjectName syntax defined in the
188   DMTF DSP0004. For some applications, the Untyped WBEM URI encoding lacks sufficient type
189   information to allow the URI to be processed unambiguously. For this reason, use of the Typed WBEM
190   URI is preferred over the Untyped WBEM URI.

191   The WBEM URI consists of the components defined in the following subclauses. Specifications that use
192   the WBEM URI shall define the components that are required in their usage of the WBEM URI. The
193   components should be referenced using the BNF production name defined in this document.

194   Figure 1 illustrates the Mapping of the CIM Object Name to the IETF URI.
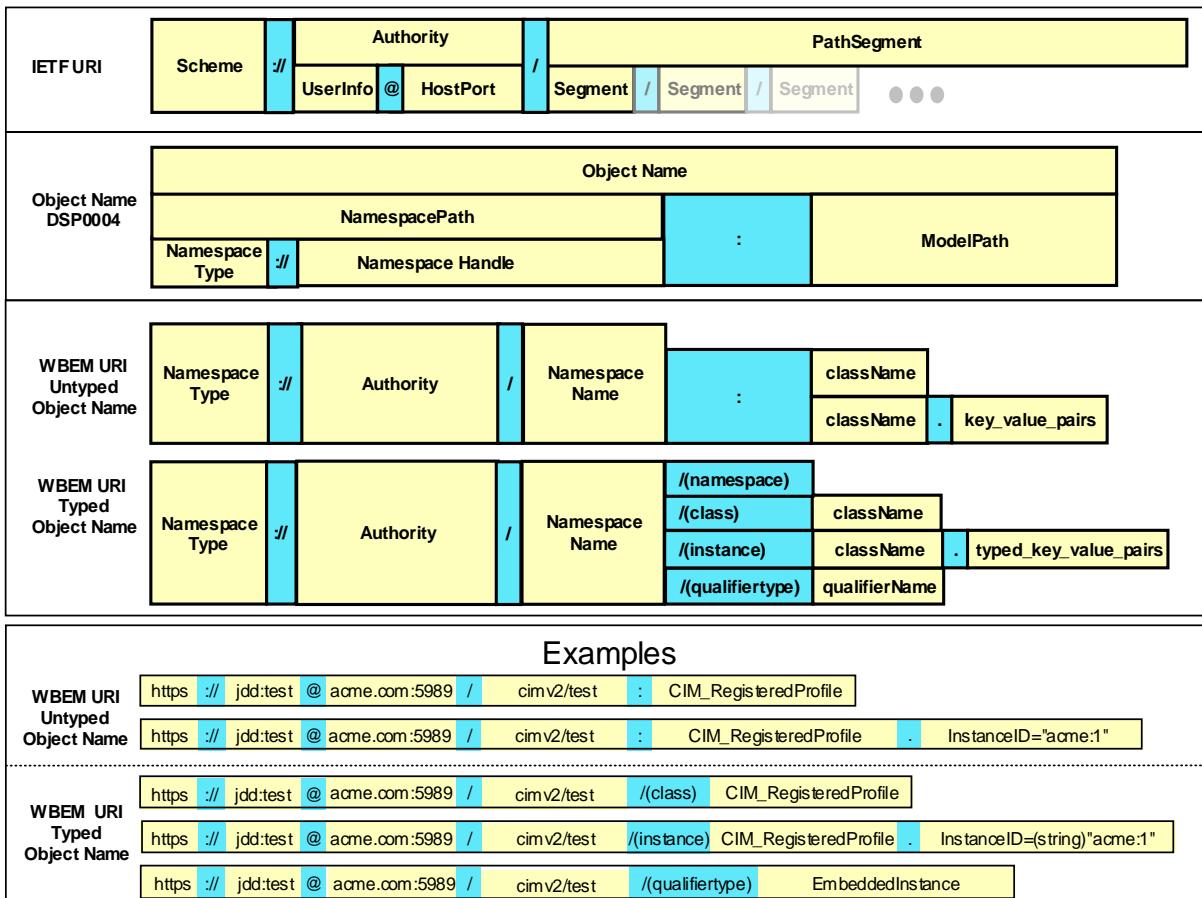
Figure 1 – WBEM URI as a Mapping of CIM Object Name to IETF URI

5.2   Namespace Type or Scheme

The Namespace Type is defined as <scheme> in section 3.1 of RFC 3986.

Each WBEM protocol specification shall define the namespace types it supports.

WBEM defined namespace types shall be in the form of <protocol>.wbem or <protocol>.wbems where protocol is the name of the WBEM protocol. The <protocol>.wbems shall be used for the secure version of the WBEM protocol. For example, for CIM-XML the protocol would be cimxml.wbem and cimxml.wbems, respectively. A WBEM protocol may also support additional namespace types. For example, the namespace types "http" and/or "https" would also be valid namespace types for the CIM-XML protocol.

5.3   Authority

Refer to section 3.2 of RFC 3986 for the definition of the authority.

5.4   Namespace Name

The <namespace> may contain the "/" character but shall not begin or end with a "/".

210   5.5   Model Path Encoding

211   Two model path encodings are defined in this specification:

212   • untyped_modelpath

213   • typed_modelpath

214   If the reference is to a CIM Namespace, the model path encoding shall not be present.

215   If the reference is to a CIM Class, the model path encoding shall only include the className.

216   If the reference is to an instance, the model path encoding shall include both the className and a
217   key_value_pair or a typed_key_value_pair for all key properties of the instance.

218   If the reference is to a Qualifier Type, the model path shall only include the qualifierName.

219   Examples of Untyped Key value pairs:

220   • stringProperty ="This is a string value with a double quote \" included in the string."

221   • char16Property='a'

222   • char16Property='\x32'

223   • booleanProperty=TRUE

224   • integerProperty=1000

225   • integerProperty=100101B

226   • datetimeProperty="19980525133015.000000-300"

227   • datetimeProperty="00000001132312.000000:000"

228   • CIM_IndicationSubscription.Filter="CIM_IndicationFilter.SystemCreationClassName=\"CIM_Co
229   mputerSystem\",SystemName=\"server001.acme.com\",CreationClassName=\"CIM_IndicationH
230   andlerCIMXML\",Name=\"Filter01\"",Handler="CIM_IndicationHandlerCIMXML.SystemCreation
231   ClassName=\"CIM_ComputerSystem\",SystemName=\"server001.acme.com\",CreationClassNa
232   me=\"CIM_IndicationHandlerCIMXML\",Name=\"Handler01\""

233   • ACME_DoubleQuoteExample.Antecedent="ACME_AntecedentClass.Name =\"Before double
234   quote \\\" after double quote\"",ACME_DependentClass.Name=\"Before backslash \\\\ after
235   backslash\""

236   Examples of Typed Key value pairs:

237   • stringProperty = (string)"This is a string value with a double quote \" included in the string."

238   • char16Property=(char16)'a'

239   • char16Property=(char16)'\x32'

240   • booleanProperty=(boolean)TRUE

241   • integerProperty=(sint32)1000

242   • integerProperty=(uint32)100101B

243   • integerProperty=(sint64)-12310

244   • datetimeProperty=(datetime)"19980525133015.000000-300"

245   • datetimeProperty=(datetime)"00000001132312.000000:000"

246   • CIM_IndicationSubscription.Filter=(reference)"CIM_IndicationFilter.SystemCreationClassName
247   =(string)\"CIM_ComputerSystem\",SystemName=(string)\"server001.acme.com\",CreationClass
248   Name=(string)\"CIM_IndicationHandlerCIMXML\",Name=(string)\"Filter01\"",Handler=(reference
249   )"CIM_IndicationHandlerCIMXML.SystemCreationClassName=(string)\"CIM_ComputerSystem\"
250   ,SystemName=(string)\"server001.acme.com\",CreationClassName=(string)\"CIM_IndicationHa
251   ndlerCIMXML\",Name=(string)\"Handler01\""

252   • ACME_DoubleQuoteExample.Antecedent=(reference)"ACME_AntecedentClass.Name
253   =(string)\"Before double quote \\\" after double
254   quote\"",ACME_DependentClass.Name=(string)\"Before backslash \\\\ after backslash\""

255   5.6 Collected BNF for WBEM URI

256   The DMTF WBEM URI BNF is a conformant subset of the BNF defined in RFC 3986. To minimize the
257   impact of future changes, implementations should be designed to reject, as invalid or unsupported,
258   WBEM URIs that do not conform to an approved version of the DMTF WBEM URI BNF.

259   This BNF conforms to ABNF as specified by RFC 5234.

260   The defining specification shall define the allowable character encodings (for example, UTF-8 or UCS-2)
261   for a WBEM URI.

```
262   WBEM-URI              = WBEM-URI-TypedPath /
263                            WBEM-URI-UntypedPath
264
265   WBEM-URI-TypedPath    = WBEM-URI-TypedNamespacePath /
266                            WBEM-URI-TypedClassPath /
267                            WBEM-URI-TypedInstancePath /
268                            WBEM-URI-TypedQualifierTypePath
269
270   WBEM-URI-UntypedPath  = WBEM-URI-UntypedNamespacePath /
271                            WBEM-URI-UntypedClassPath /
272                            WBEM-URI-UntypedInstancePath
273
274   // Note: The production rules for className and qualifierName are
275   // defined in Appendix A (MOF Syntax Grammar Description) of DMTF
276   // DSP0004, CIM Infrastructure Specification.
277
278   WBEM-URI-TypedNamespacePath     = namespacePath "/(namespace)"
279   WBEM-URI-TypedClassPath         = namespacePath "/(class)" className
280   WBEM-URI-TypedInstancePath      = namespacePath "/(instance)"
281                                       className "." typed_key_value_pairs
282   WBEM-URI-TypedQualifierTypePath = namespacePath "/(qualifiertype)"
283                                       qualifierName
284
285   WBEM-URI-UntypedNamespacePath   = namespacePath
286   WBEM-URI-UntypedClassPath       = namespacePath ":" className
287   WBEM-URI-UntypedInstancePath    = namespacePath ":"
288                                       className "." key_value_pairs
289
290   namespacePath        = [namespaceType ":"] namespaceHandle
291   namespaceType        = ("http" ["s"]) / ("cimxml.wbem" ["s"])
```

```
292
293    // Note: The production rules for authority are defined in IETF
294    // RFC 3986 (Uniform Resource Identifiers (URI): Generic Syntax).

295    namespaceHandle        = ["//" authority] "/" [namespaceName]
296
297    // Note: IDENTIFIER is an identifier for CIM naming as defined in Appendix F
298    // (Unicode Usage) of DMTF DSP0004, CIM Infrastructure Specification.

299    namespaceName          = IDENTIFIER *("/"IDENTIFIER)
300
301    // Note: The production rules for stringValue, charValue, booleanValue,
302    // integerValue, and realValue are defined in Appendix A (MOF Syntax
303    // Grammar Description) of DMTF DSP0004, CIM Infrastructure Specification.
304    // The production datetimeValue is a datetime value as defined in
305    // Section 2.2.1 (Datetime Type) of DMTF DSP0004, CIM Infrastructure
306    // Specification.
307
308    // Untyped key value pairs

309    key_value_pairs        = key_value_pair *("," key_value_pair)
310    key_value_pair         = key_name "=" key_value
311    key_value              = stringValue / charValue / booleanValue /
312                             integerValue / realValue /
313                             "\"" datetimeValue "\"" /
314                             "\"" referenceValue "\""
315
316    // Typed key value pairs

317    typed_key_value_pairs = typed_key_value_pair *("," typed_key_value_pair)
318    typed_key_value_pair  = key_name "=" typed_key_value
319    typed_key_value        = typed_string_value / typed_char_value /
320                             typed_integer_value / typed_boolean_value /
321                             typed_datetime_value / typed_real_value /
322                             typed_reference_value
323    typed_string_value     = "(string)" stringValue
324    typed_char_value       = "(char16)" charValue
325    typed_boolean_value    = "(boolean)" booleanValue
326    typed_integer_value    = ("(uint8)" / "(sint8)" /"(uint16)"/ "(sint16)"/
327                             "(uint32)" / "(sint32)" / "(uint64)" /
328                             "(sint64)") integerValue
329    typed_real_value       = ("(real32)" / "(real64)") realValue
330    typed_datetime_value  = "(datetime)" "\"" datetimeValue "\""
331
332    // Note: A typed-reference-value shall consist of a reference-type designation,
333    // followed by a referenceValue enclosed in double quotes ("). A
334    // referenceValue shall be constructed by recursively following these rules to
335    // construct a reference to either a CIM Class or CIM Instance. Any double
336    // quote character or backslash character that appears in the referenceValue
337    // shall be escaped using a preceding backslash (\) character.

338    typed_reference_value = "(reference)" "\"" referenceValue "\""
```

339   **5.7   WBEM URI Examples**

340   **5.7.1   Untyped Model Path**

341   //www.acme.com/root/cimv2

342   //www.acme.com/root/cimv2:CIM_RegisteredProfile

343   https://jdd:test@acme.com:5959/cimv2:CIM_RegisteredProfile

344   https://jdd:test@acme.com:5959/cimv2:CIM_RegisteredProfile.InstanceID="acme:1"

345   **5.7.2   Typed Model Path**

346   //www.acme.com/root/cimv2/(namespace)

347   https://jdd:test@acme.com:5959/cimv2/(class)CIM_RegisteredProfile

348   https://jdd:test@acme.com:5959/cimv2/(instance)CIM_RegisteredProfile.InstanceID=(string)"acme:1"

349   https://jdd:test@acme.com:5959/cimv2/(qualifierType)Abstract

350

351 **ANNEX A**

352 (informative)

353

354

355 # Change Log

Version	Date	Description
1.0.0	2009-07-29	
1.0.1	2013-10-23	DMTF Standard Release

356