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## 5 **WBEM URI Mapping Specification**

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## 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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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

# WBEM URI Mapping Specification

## 83 1 Scope

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

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

## 90 2 Normative References

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

### 94 2.1 Approved References

95 DMTF DSP0004, *Common Information Model (CIM) Specification 2.5*,  
96 [http://www.dmtf.org/standards/published\\_documents/DSP0004\\_2.5.pdf](http://www.dmtf.org/standards/published_documents/DSP0004_2.5.pdf)

97 DMTF DSP0200, *CIM Operations over HTTP 1.3*,  
98 [http://www.dmtf.org/standards/published\\_documents/DSP0200\\_1.3.pdf](http://www.dmtf.org/standards/published_documents/DSP0200_1.3.pdf)

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

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

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

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

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

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

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

### 113 2.2 Other References

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

## 116 **3 Terms and Definitions**

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

### 118 **3.1**

#### 119 **can**

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

### 121 **3.2**

#### 122 **cannot**

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

### 124 **3.3**

#### 125 **conditional**

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

### 128 **3.4**

#### 129 **mandatory**

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

### 132 **3.5**

#### 133 **may**

134 indicates a course of action permissible within the limits of the document

### 135 **3.6**

#### 136 **need not**

137 indicates a course of action permissible within the limits of the document

### 138 **3.7**

#### 139 **optional**

140 indicates a course of action permissible within the limits of the document

### 141 **3.8**

#### 142 **shall**

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

### 145 **3.9**

#### 146 **shall not**

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

### 149 **3.10**

#### 150 **should**

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

### 153 **3.11**

#### 154 **should not**

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



## 156 4 Symbols and Abbreviated Terms

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

### 158 4.1

#### 159 **ABNF**

160 Augmented Backus-Naur Form

### 161 4.2

#### 162 **BNF**

163 Backus-Naur Form

### 164 4.3

#### 165 **CIM**

166 Common Information Model

### 167 4.4

#### 168 **URI**

169 Universal Resource Identifier

### 170 4.5

#### 171 **WBEM**

172 Web-Based Enterprise Management

## 173 5 WBEM URI

### 174 5.1 General

175 This section specifies the WBEM URI.

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

- 177 • CIM namespaces
- 178 • CIM classes
- 179 • CIM instances
- 180 • CIM qualifier types

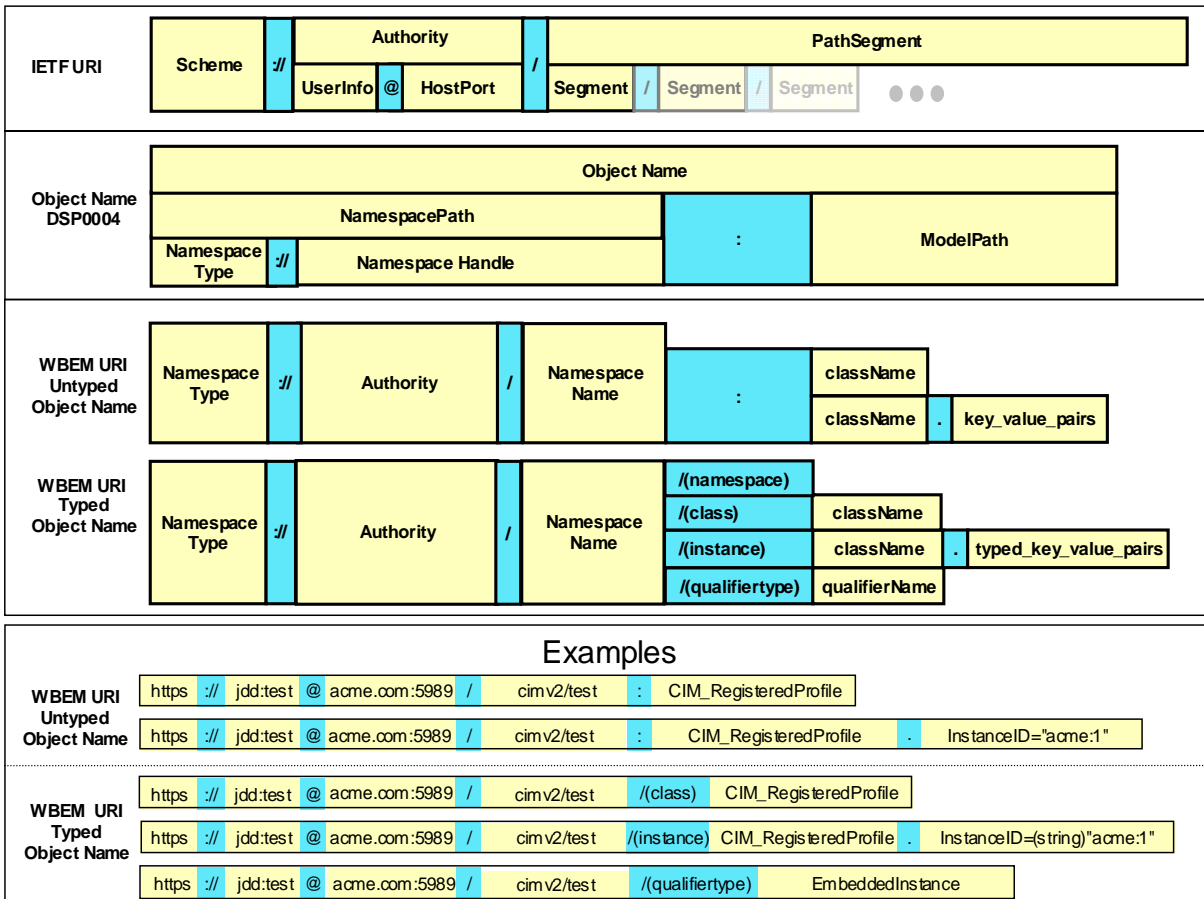
181 The following two formats of the WBEM URI are defined:

- 182 • Untyped WBEM URI is a format compatible with the CIM Object Name format defined by  
183 [DSP0004](#).
- 184 • Typed WBEM URI is a format that includes the data type of the key properties, as well as the  
185 kind of CIM object referenced.

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

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

193 Figure 1 illustrates the Mapping of the CIM Object Name to the IETF URI.



194

195

Figure 1 – WBEM URI as a Mapping of CIM Object Name to IETF URI

196 **5.2 Namespace Type or Scheme**

197 The Namespace Type is defined as <scheme> in section 3.1 of [RFC 3986](#).

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

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

205 **5.3 Authority**

206 Refer to section 3.2 of [RFC 3986](#) for the definition of the authority.

207 **5.4 Namespace Name**

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

## 209 5.5 Model Path Encoding

210 Two model path encodings are defined in this specification:

- 211 • untyped\_modelpath
- 212 • typed\_modelpath

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

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

215 If the reference is to an instance, the model path encoding shall include both the className and a  
216 key\_value\_pair or a typed\_key\_value\_pair for all key properties of the instance.

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

218 Examples of Untyped Key value pairs:

- 219 • stringProperty = "This is a string value with a double quote \" included in the string."
- 220 • char16Property='a'
- 221 • char16Property='\x32'
- 222 • booleanProperty=TRUE
- 223 • integerProperty=1000
- 224 • integerProperty=100101B
- 225 • datetimeProperty="19980525133015.000000-300"
- 226 • datetimeProperty="00000001132312.000000:000"
- 227 • CIM\_IndicationSubscription.Filter="CIM\_IndicationFilter.SystemCreationClassName=\"CIM\_Co  
228 mputerSystem\",SystemName=\"server001.acme.com\",CreationClassName=\"CIM\_IndicationH  
229 andlerCIMXML\",Name=\"Filter01\",Handler="CIM\_IndicationHandlerCIMXML.SystemCreation  
230 ClassName=\"CIM\_ComputerSystem\",SystemName=\"server001.acme.com\",CreationClassNa  
231 me=\"CIM\_IndicationHandlerCIMXML\",Name="Handler01"
- 232 • ACME\_DoubleQuoteExample.Antecedent="ACME\_AntecedentClass.Name =\"Before double  
233 quote \"\" after double quote\",ACME\_DependentClass.Name="Before backslash \\\\ after  
234 backslash\""

235 Examples of Typed Key value pairs:

- 236 • stringProperty = (string)"This is a string value with a double quote \" included in the string."
- 237 • char16Property=(char16)'a'
- 238 • char16Property=(char16)\x32'
- 239 • booleanProperty=(boolean)TRUE
- 240 • integerProperty=(sint32)1000
- 241 • integerProperty=(uint32)100101B
- 242 • integerProperty=(sint64)-12310
- 243 • datetimeProperty=(datetime)"19980525133015.000000-300"
- 244 • datetimeProperty=(datetime)"00000001132312.000000:000"

- 245 • CIM\_IndicationSubscription.Filter=(reference)"CIM\_IndicationFilter.SystemCreationClassName  
246 =(string)"CIM\_ComputerSystem",SystemName=(string)"server001.acme.com",CreationClass  
247 Name=(string)"CIM\_IndicationHandlerCIMXML",Name=(string)"Filter01",Handler=(reference  
248 )"CIM\_IndicationHandlerCIMXML.SystemCreationClassName=(string)"CIM\_ComputerSystem"  
249 ,SystemName=(string)"server001.acme.com",CreationClassName=(string)"CIM\_IndicationHa  
250 ndlerCIMXML",Name=(string)"Handler01"
- 251 • ACME\_DoubleQuoteExample.Antecedent=(reference)"ACME\_AntecedentClass.Name  
252 =(string)"Before double quote \" after double  
253 quote\"",ACME\_DependentClass.Name=(string)"Before backslash \\ after backslash\""

## 254 5.6 Collected BNF for WBEM URI

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

258 This BNF conforms to ABNF as specified by [RFC 5234](#).

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

```

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

```

```

291
292 // Note: The production rules for authority are defined in IETF
293 // RFC 3986 (Uniform Resource Identifiers (URI): Generic Syntax).
294 namespaceHandle      = [ "/" authority ] "/" [ namespaceName ]
295
296 // Note: IDENTIFIER is an identifier for CIM naming as defined in Appendix F
297 // (Unicode Usage) of DMTF DSP0004, CIM Infrastructure Specification.
298 namespaceName       = IDENTIFIER * ( "/" IDENTIFIER )
299
300 // Note: The production rules for stringValue, charValue, booleanValue,
301 // integerValue, and realValue are defined in Appendix A (MOF Syntax
302 // Grammar Description) of DMTF DSP0004, CIM Infrastructure Specification.
303 // The production datetimeValue is a datetime value as defined in
304 // Section 2.2.1 (Datetime Type) of DMTF DSP0004, CIM Infrastructure
305 // Specification.
306
307 // Untyped key value pairs
308 key_value_pairs      = key_value_pair * ( "," key_value_pair )
309 key_value_pair       = key_name "=" key_value
310 key_value            = stringValue / charValue / booleanValue /
311                       integerValue / realValue /
312                       "\" datetimeValue "\" /
313                       "\" referenceValue "\"
314
315 // Typed key value pairs
316 typed_key_value_pairs = typed_key_value_pair * ( "," typed_key_value_pair )
317 typed_key_value_pair  = key_name "=" typed_key_value
318 typed_key_value      = typed_string_value / typed_char_value /
319                       typed_integer_value / typed_boolean_value /
320                       typed_datetime_value / typed_real_value /
321                       typed_reference_value
322 typed_string_value    = "(string)" stringValue
323 typed_char_value      = "(char16)" charValue
324 typed_boolean_value   = "(boolean)" booleanValue
325 typed_integer_value   = "(uint8)" / "(sint8)" / "(uint16)" / "(sint16)" /
326                       "(uint32)" / "(sint32)" / "(uint64)" /
327                       "(sint64)" integerValue
328 typed_real_value      = "(real32)" / "(real32)" realValue
329 typed_datetime_value  = "(datetime)" "\" datetimeValue "\"
330
331 // Note: A typed-reference-value shall consist of a reference-type designation,
332 // followed by a referenceValue enclosed in double quotes ("). A
333 // referenceValue shall be constructed by recursively following these rules to
334 // construct a reference to either a CIM Class or CIM Instance. Any double
335 // quote character or backslash character that appears in the referenceValue
336 // shall be escaped using a preceding backslash (\) character.
337 typed_reference_value = "(reference)" "\" referenceValue "\"

```

## 338 **5.7 WBEM URI Examples**

### 339 **5.7.1 Untyped Model Path**

340 //www.acme.com/root/cimv2

341 //www.acme.com/root/cimv2:CIM\_RegisteredProfile

342 https://jdd:test@acme.com:5959/cimv2:CIM\_RegisteredProfile

343 https://jdd:test@acme.com:5959/cimv2:CIM\_RegisteredProfile.InstanceID="acme:1"

### 344 **5.7.2 Typed Model Path**

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

346 https://jdd:test@acme.com:5959/cimv2/(class)CIM\_RegisteredProfile

347 https://jdd:test@acme.com:5959/cimv2/(instance)CIM\_RegisteredProfile.InstanceID=(string)"acme:1"

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

349

350  
351  
352  
353  
354

## **ANNEX A** (informative)

### **Change Log**

<b>Version</b>	<b>Date</b>	<b>Author</b>	<b>Description</b>
1.0.0	July 29, 2009		DMTF Standard Release

355