



OASIS Service Provisioning Markup Language (SPML) v2 - DSML v2 Profile

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Abstract:

This specification defines usage of DSML v2 as a data model (profile) for SPML v2.

34 Status:

35 This is a candidate Committee Specification that is undergoing a vote of the OASIS
36 membership in pursuit of OASIS Standard status.

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82 **1. Introduction (non-normative)**

83 **1.1. Concepts**

84 SPML Version 2 (SPMLv2) defines a core protocol **[SPMLv2]** over which different data models can
85 be used to define the actual provisioning data. The combination of a data model with the SPML
86 core specification is referred to as a profile. The use of SPML requires that a specific profile is
87 used, although the choice of which profile is used to negotiated out-of-band by the participating
88 parties.

89 This document describes the use of the DSML protocol as a data model for SPML based
90 provisioning. This profile is optional.

91 **1.1.1. DSML Protocol**

92 The DSML v2 protocol **[DSMLV2]** was designed to perform LDAP type operations using web
93 services. The DSML V2 protocol defines synchronous request/response semantics and a data
94 model based on attribute/value pairs. DSML V2 does not define an attribute/value pairs schema
95 mechanism.

96 **1.1.2. Schema**

97 The DSML v2 standard does not define a schema mechanism. A schema mechanism is defined as
98 part of this binding.

99 **1.2. Terminology**

100 Within this document:

- 101 - The term “requestor” always refers to a [Requesting Authority \(RA\)](#).
- 102 - The term “provider” always refers to a [Provisioning Service Provider \(PSP\)](#).
- 103 - The term “target” always refers to a [Provisioning Service Target \(PST\)](#).
- 104 - The term “object” (unless otherwise qualified) refers to a [Provisioning Service Object \(PSO\)](#).
- 105 - The term “client” (unless otherwise qualified) refers to a [Requesting Authority \(RA\)](#).
- 106 - The term “server” (unless otherwise qualified) refers to a [Provisioning Service Provider \(PSP\)](#).

107 **2. Notation**

108 This specification contains schema conforming to W3C XML Schema and normative text to
109 describe the syntax and semantics of XML-encoded policy statements.

110 The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD",
 111 "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this specification are to be
 112 interpreted as described in IETF RFC 2119 [RFC2119]

113 *"they MUST only be used where it is actually required for interoperation or to limit*
 114 *behavior which has potential for causing harm (e.g., limiting retransmissions)"*

115 These keywords are thus capitalized when used to unambiguously specify requirements over
 116 protocol and application features and behavior that affect the interoperability and security of
 117 implementations. When these words are not capitalized, they are meant in their natural-language
 118 sense.

119 This specification uses the following typographical conventions in text:

Format	Description	Indicates
attributeName	monospace font with <i>first letter lower-cased</i>	The name of an XML <i>attribute</i> .
SPMLElementName	monospace font with <i>first letter capitalized</i>	The name of an XML <i>element</i> that is defined as part of SPMLv2.
ns:ForeignElementName	monospace font with <i>namespace prefix</i>	The name of an XML element that is <i>defined by another specification</i> .
<SPMLElement>	monospace font <i>surrounded by <></i>	<i>An instance of an XML element</i> that is defined as part of SPMLv2.
<ns:ForeignElement>	monospace font with <i>namespace prefix</i> <i>surrounded by <></i>	An instance of an XML element that is <i>defined by another specification</i> .

120 Terms in ***italic bold-face*** are intended to have the meaning defined in the Glossary.

121 Listings of SPML schemas appear like this.

122

123 Example code listings appear like this.

124 Conventional XML namespace prefixes are used throughout the listings in this specification to
 125 stand for their respective namespaces as follows, whether or not a namespace declaration is
 126 present in the example:

127 - The prefix `dsml` : stands for the Directory Services Markup Language namespace [DSML].

128 - The prefix `saml` : stands for the SAML assertion namespace [SAML].

129 - The prefix `ds` : stands for the W3C XML Signature namespace [DS].

130 - The prefix `xsd` : stands for the W3C XML Schema namespace [XS].

131 3. Overview (non-normative)

132 3.1. DSML PSOs

133 A PSO is represented in this binding by a set of attribute/values pairs that is associated with a
 134 target-unique identifier. All PSOs are categorized by one or more object classes. The object class
 135 for a given PSO is denoted by an attribute named with the reserved name of "objectclass".

136 3.1.1. PSO Identifier

137 The PSO Identifier may be an X.509 Distinguished Name (DN), or any identifier that is unique for
138 the target..

```
139 <spml:pso>  
140   <spml:psoId ID="CN=John Doe,OU=accounting,DC=acme.com" targetID="acme.com"/>  
141   ...  
142 </spml:pso>
```

143 3.1.2. PSO Data

144 The PSO Data element contains dsml:attr elements, as defined in [DSML]. Additional data may be
145 included via the Open Content Model.

```
146 <spml:pso>  
147   ...  
148   <spml:data>  
149     <attr name="cn">  
150       <value> John Doe </value>  
151     </attr>  
152     <attr name="uid">  
153       <value>jdoe</value>  
154     </attr>  
155     <attr name="email">  
156       <value>jdoe@acme.com</value>  
157     </attr>  
158     <attr name="objectclass">  
159       <value>user</value>  
160     </attr>  
161   </spml:data>  
162 </spml:pso>
```

163 3.2. Schema

164 The schema defines the allowed attributes and object classes.

```
165 <spml:schema>  
166   <spml:dsml:schema>  
167     <spml:dsml:attributeDefinition name="cn" description="Common Name" />  
168     <spml:dsml:attributeDefinition name="uid" description="User ID" />  
169     <spml:dsml:attributeDefinition name="email" description="Email Address" />  
170     <spml:dsml:objectClassDefinition name="person">  
171       <spml:dsml:memberAttributes>  
172         <spml:dsml:memberAttributes name="cn" required="true" />  
173         <spml:dsml:memberAttributes name="uid"/>  
174         <spml:dsml:memberAttributes name="email"/>  
175       </spml:dsml:memberAttributes>  
176     </spml:dsml:objectClassDefinition>  
177   </spml:dsml:schema>  
178 </spml:schema>
```

179 3.3. Core Operations

180 3.3.1. Add Request

181 The Add Request creates PSOs. The Add Request must contain a <data> element that contains
182 DSML v2 <attr> elements that define the new PSO. The Add Request may also pass a PSO
183 Identifier (<psoid> element), a container PSO ID (<containerID> element), or a target ID
184 (<targetID> element). If a PSO identifier is not defined in the Add Request, the new PSO Identifier
185 must be returned in the Add Response.

```
186 <spml:addRequest>  
187   <spml:containerID ID = "OU=accounting,DC=acme.com " targetID = "acme.com "/>  
188   <spml:data>  
189     <attr name="CN">  
190       <value> John Doe </value>  
191     </attr>  
192     <attr name="uid">  
193       <value>jdoe</value>  
194     </attr>  
195     <attr name="objectclass">  
196       <value>user</value>  
197     </attr>  
198   </spml:data>  
199 </spml:addRequest >
```

200 3.3.2. Add Response

201 The Add Response message will contain the new PSO ID (unless it was specified in the Add
202 Request). If the creation of the new PSO resulted in attributes being adding or modified in the new
203 PSO, the entire PSO Data should be returned in the response.

```
204 <spml:addResponse status = "success">  
205   <spml:psoid ID="CN=John Doe,OU=accounting,DC=acme.com" targetID="acme.com "/>  
206   <spml:data>  
207     <attr name="CN">  
208       <value> John Doe </value>  
209     </attr>  
210     <attr name="uid">  
211       <value>jdoe</value>  
212     </attr>  
213     <attr name="email">  
214       <value>jdoe@acme.com</value>  
215     </attr>  
216     <attr name="objectclass">  
217       <value>user</value>  
218     </attr>  
219   </spml:data>  
220 </spml:addResponse>
```

221 3.3.3. Modify Request

222 The Modify Request modifies the specified PSO. The Modify Request must always contain the
223 PSO Identifier.

```
224 <spml:modifyRequest>  
225   <spml:psoid ID="CN=John Doe,OU=accounting,DC=acme.com" targetID="acme.com "/>  
226   <spml:modification>  
227     <modification name ="CN" operation ="replace">
```

```
228     <value>Jane Doe</value>
229     </modification>
230 </spml:modification>
231 </spml:modifyRequest >
```

232 **3.3.4. Modify Response**

233 If the Modify Request causes the PSO ID to change, then the Modify Response must contain the
234 new PSO ID.

```
235 <spml:modifyResponse status = "success">
236     <spml:psoId ID="CN=Jane Doe,OU=accounting,DC=acme.com" targetID="acme.com "/>
237 </spml:modifyResponse>
```

238 **3.3.5. Delete Request**

239 The Delete Request deletes a specified PSO.

```
240 <spml:deleteRequest>
241     <spml:psoId ID="CN=John Doe,OU=accounting,DC=acme.com" targetID="acme.com "/>
242 </spml:deleteRequest >
```

243

244 **3.3.6. Lookup Request**

245 The Lookup Request is used to retrieve the data for a specified PSO.

```
246 <spml:lookupRequest>
247     <spml:psoId ID="CN=John Doe,OU=accounting,DC=acme.com" targetID="acme.com "/>
248 </spml:lookupRequest>
```

249 **3.3.7. Lookup Response**

250 The Lookup Response contains the retrieved PSO data.

```
251 <spml:lookupResponse status = "success">
252     <spml:psoId ID="CN=John Doe,OU=accounting,DC=acme.com" targetID="acme.com "/>
253     <spml:data>
254         <attr name="CN">
255             <value> John Doe </value>
256         </attr>
257         <attr name="uid">
258             <value>jdoe</value>
259         </attr>
260         <attr name="email">
261             <value>jdoe@acme.com</value>
262         </attr>
263         <attr name="objectclass">
264             <value>user</value>
265         </attr>
266     </spml:data>
267 </spml:lookupResponse>
```


268 3.4. Search Operations

269 If the Search Capability is supported, the DSML filters and attribute declarations should be used to
270 scope the results of the search.

271 3.4.1. Search Request

272 The search request can specify DSML filters and attribute declarations, as defined in [DSML].

273

```
274 <spmlsearch:searchRequest>  
275   <spmlsearch:query scope = "spmlsearch:oneLevel">  
276     <spml:basePSOID ID="CN=John Doe,OU=accounting,DC=acme.com"  
277     targetID="acme.com">  
278       <dsml:filter>  
279         <dsml:substrings name = "cn">  
280           <dsml:initial>John</dsml:initial>  
281         </dsml:substrings>  
282       </dsml:filter>  
283       <dsml:attributes>  
284         <dsml:attribute name = "cn" />  
285         <dsml:attribute name = "email" />  
286       </dsml:attributes>  
287     </spmlsearch:query>  
288 </spmlsearch:searchRequest>
```

289

290 3.4.2. Search Response

291

```
292 <spml:searchResponse status = " success">  
293   </spml:psO>  
294   <spml:psOId ID="CN=John Doe,OU=accounting,DC=acme.com"  
295   targetID="acme.com"/>  
296   <spml:data>  
297     <dsml:attr name="cn">  
298       <dsml:value>John Doe</dsml:value>  
299     </dsml:attr>  
300     <dsml:attr name="email">  
301       <dsml:value>jdoe@acme.com</dsml:value>  
302     </dsml:attr>  
303   </spml:data>  
304 </spml:psO>  
305 </spml:psO>  
306   <spml:psOId ID="CN=John Smith,OU=accounting,DC=acme.com"  
307   targetID="acme.com"/>  
308   <spml:data>  
309     <dsml:attr name="cn">  
310       <dsml:value>John Smith</dsml:value>  
311     </dsml:attr>  
312     <dsml:attr name="email">  
313       <dsml:value>jsmith@acme.com</dsml:value>  
314     </dsml:attr>  
315   </spml:data>  
316 </spml:psO>  
317 </spml:searchResponse>
```

318 4. Specification (Normative)

319 4.1. Namespaces

320 The DSMLv2 Profile uses the DSML v2 namespace which is defined as:

```
321 urn:oasis:names:tc:DSML:2:0:core
```

322 The specification uses the prefix dsml: to refer to this namespace.

323 The DSMLv2 Profile defines some elements that are specific to the profile. The namespace for the
324 profile itself is defined as:

```
325 urn:oasis:names:tc:SPML:2:0:DSML
```

326 The specification uses the prefix spml: to refer to this namespace.

327 4.2. Core Capability

328 4.2.1. Element <spml:data>

329 The <spml:data> element MUST contain zero or many <dsml:attr> elements.

330 4.2.2. Element <spml:modification>

331 The <spml:modification> element MUST contain zero or many <dsml:modification> elements. The
332 “modificationType” on the <spml:modification> MUST NOT be specified since the
333 <dsml:modification> defines the modification type.

334 4.2.3. Element <spml:schema>

335 If the schema is defined in-band, the <spml:schema> element MUST contain one or more
336 <spml:dsml:schema> elements. If the schema is defined out-of-band, the “ref” attribute on the
337 <spml:schema> element MUST be set to the URN of the referenced schema.

338 If only a subset of the object classes defined in the schema are supported for the target, then the
339 <spml:schema> element MUST include <spml:supportedSchemaEntity>. If no
340 <spml:supportedSchemaEntity> are defined in the <spml:schema> element, then it is assumed all
341 object classes are supported by the target.

342 4.2.4. Element <supportedSchemaEntity>

343 The “entityName” attribute on the <spml:supportedSchemaEntity> element MUST refer only to
344 object classes defined in the referenced schema. All attributes on the referenced object classes are
345 assumed to be supported.

346 **4.3. Search Capability**

347 **4.3.1. Element <spmlsearch:query>**

348 The <spmlsearch:query> element MAY contain <dsml:filter> and <dsml:attributes> to filter the
349 results of the search.

350 **4.4. DSML Profile Schema**

351 **4.4.1. Element <spmldsml:schema>**

352 The <spmldsml:schema> element defines the DSML schema for the target. The
353 <spmldsml:schema> element contains zero or more <spmldsml:objectClassDefinition> elements
354 and zero or more <spmldsml:attributeDefinition> elements.

355 **4.4.2. Element <spmldsml:objectClassDefinition>**

356 The <spmldsml:objectClassDefinition> element defines DSML v2 object classes supported by the
357 target. The <spmldsml:objectClassDefinition> element contains zero or more
358 <spmldsml:memberAttributes> elements which define the attributes that may be included on
359 objects of the specified object class. The <spmldsml:objectClassDefinition> element contains zero
360 or more <spmldsml:superiorClasses> which define the superior object classes to the specified
361 object class.

362 **4.4.3. Element <spmldsml:attributeDefinition>**

363 The <spmldsml:attributeDefinition> element defines DSML v2 attributes supported by the target.
364 The <spmldsml:attributeDefinition> element has the following attributes:

- 365 • description – textual description of the attribute
- 366 • multivalued – true if the attribute is multivalued, false if it is single valued
- 367 • type – attribute syntax
- 368 • name – attribute name (e.g. “cn”)

369 .

370 Appendix A. References

371

- 372 **[AES]** National Institute of Standards and Technology (NIST), FIPS-197:
373 Advanced Encryption Standard,
374 <http://csrc.nist.gov/publications/fips/fips197/fips-197.pdf>, National
375 Institute of Standards and Technology (NIST)
- 376 **[ARCHIVE-1]** OASIS Provisioning Services Technical Committee, email archive,
377 [http://www.oasis-](http://www.oasis-open.org/apps/org/workgroup/provision/email/archives/index.html)
378 [open.org/apps/org/workgroup/provision/email/archives/index.html](http://www.oasis-open.org/apps/org/workgroup/provision/email/archives/index.html),
379 OASIS PS-TC
- 380 **[DS]** IETF/W3C, *W3C XML Signatures*, <http://www.w3.org/Signature/>,
381 W3C/IETF
- 382 **[DSML]** OASIS Directory Services Markup Standard, *DSML V2.0 Specification*,
383 <http://www.oasis-open.org/specs/index.php#dsmlv2>, OASIS DSML
384 Standard
- 385 **[GLOSSARY]** OASIS Provisioning Services TC, *Glossary of Terms*, [http://www.oasis-](http://www.oasis-open.org/apps/org/workgroup/provision/download.php)
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- 391 **[SAML]** OASIS Security Services TC, [http://www.oasis-](http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=security)
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393 TC
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- 395 **[SPML-Bind]** OASIS Provisioning Services TC, SPML V1.0 Protocol Bindings,
396 [http://www.oasis-](http://www.oasis-open.org/apps/org/workgroup/provision/download.php/1816/draft-pstc-bindings-03.doc)
397 [open.org/apps/org/workgroup/provision/download.php/1816/draft-](http://www.oasis-open.org/apps/org/workgroup/provision/download.php/1816/draft-pstc-bindings-03.doc)
398 [pstc-bindings-03.doc](http://www.oasis-open.org/apps/org/workgroup/provision/download.php/1816/draft-pstc-bindings-03.doc), OASIS PS-TC
- 399 **[SPML-REQ]** OASIS Provisioning Services Technical Committee, *Requirements*,
400 [http://www.oasis-](http://www.oasis-open.org/apps/org/workgroup/provision/download.php/2277/draft-pstc-requirements-01.doc)
401 [open.org/apps/org/workgroup/provision/download.php/2277/draft-](http://www.oasis-open.org/apps/org/workgroup/provision/download.php/2277/draft-pstc-requirements-01.doc)
402 [pstc-requirements-01.doc](http://www.oasis-open.org/apps/org/workgroup/provision/download.php/2277/draft-pstc-requirements-01.doc), OASIS PS-TC
- 403 **[SPML-UC]** OASIS Provisioning Services Technical Committee, *SPML V1.0 Use*
404 *Cases*, [http://www.oasis-](http://www.oasis-open.org/apps/org/workgroup/provision/download.php/988/draft-spml-use-cases-05.doc)
405 [open.org/apps/org/workgroup/provision/download.php/988/drfat-](http://www.oasis-open.org/apps/org/workgroup/provision/download.php/988/draft-spml-use-cases-05.doc)
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- 407 **[SPMLv2-Profile-DSML]** OASIS Provisioning Services Technical Committee, SPMLv2
408 DSMLv2 Profile, OASIS PS-TC
- 409 **[SPMLv2-Profile-XSD]** OASIS Provisioning Services Technical Committee, SPML V2
410 XSD Profile, OASIS PS-TC
- 411 **[SPMLv2-REQ]** OASIS Provisioning Services Technical Committee, Requirements, OASIS
412 PS-TC

413	[SPMLv2-ASYNC]	OASIS Provisioning Services Technical Committee, XML Schema
414		Definitions for Async Capability of SPMLv2, OASIS PS-TC
415	[SPMLv2-BATCH]	OASIS Provisioning Services Technical Committee, XML Schema
416		Definitions for Batch Capability of SPMLv2, OASIS PS-TC
417	[SPMLv2-BULK]	OASIS Provisioning Services Technical Committee, XML Schema
418		Definitions for Bulk Capability of SPMLv2, OASIS PS-TC
419	[SPMLv2-CORE]	OASIS Provisioning Services Technical Committee, XML Schema
420		Definitions for Core Operations of SPMLv2, OASIS PS-TC
421	[SPMLv2-PASS]	OASIS Provisioning Services Technical Committee, XML Schema
422		Definitions for Password Capability of SPMLv2, OASIS PS-TC
423	[SPMLv2-REF]	OASIS Provisioning Services Technical Committee, XML Schema
424		Definitions for Reference Capability of SPMLv2, OASIS PS-TC
425	[SPMLv2-SEARCH]	OASIS Provisioning Services Technical Committee, XML Schema
426		Definitions for Search Capability of SPMLv2, OASIS PS-TC
427	[SPMLv2-SUSPEND]	OASIS Provisioning Services Technical Committee, XML Schema
428		Definitions for Suspend Capability of SPMLv2, OASIS PS-TC
429	[SPMLv2-UPDATES]	OASIS Provisioning Services Technical Committee, XML Schema
430		Definitions for Updates Capability of SPMLv2, OASIS PS-TC
431	[SPMLv2-UC]	OASIS Provisioning Services Technical Committee., SPML V2.0 Use
432		Cases, OASIS PS-TC
433	[WSS]	OASIS Web Services Security (WSS) TC, http://www.oasis-
434		open.org/committees/tc_home.php?wg_abbrev=wss , OASIS SS-TC
435	[X509]	RFC 2459 - Internet X.509 Public Key Infrastructure Certificate and CRL
436		Profile, http://www.ietf.org/rfc/rfc2459.txt
437	[XSD]	W3C Schema WG ., <i>W3C XML Schema</i> ,
438		http://www.w3.org/TR/xmlschema-1/ W3C
439		
440		
441		

442 **Appendix B. Acknowledgments**

443 The following individuals were voting members of the Provisioning Services committee at the time
444 that this version of the specification was issued:

445 Jeff Bohren, BMC
446 Robert Boucher, CA
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