
SAML V2.0 Metadata Extensions for Login and Discovery User Interface Version 1.0

Working Draft 068

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OASIS Security Services TC

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Related Work:
This specification defines extensions for use with SAML V2.0 Metadata [SAML2Meta].

Declared XML Namespace(s):
`urn:oasis:names:tc:SAML:metadata:ui`

Abstract:
This document defines a set of extensions to SAML metadata that provide information necessary for user agents to present effective user interfaces and, in the case of identity provider discovery, recommend appropriate choices to the user.

Status:
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1 Introduction

SAML V2.0 metadata [SAML2Meta] provides a mechanism for expressing information necessary for SAML entities to successfully communicate with each other. However in most SAML profiles there is also a user agent involved, usually representing an actual person, that also participates in the profiled message exchanges. This document defines a set of extensions to metadata that provide information necessary for user agents to present effective user interfaces and, in the case of identity provider discovery, provide for recommendation of appropriate choices to the user.

There are existing, though incomplete, metadata elements that carry some of this information, but existing practice around their use is inconsistent, and defining extensions with more well-defined semantics is less disruptive to existing metadata deployments.

1.1 Terminology and Notation

The keywords "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this specification are to be interpreted as described in IETF RFC 2119. These keywords are thus capitalized when used to unambiguously specify requirements over protocol and application features and behavior that affect the interoperability and security of implementations. When these words are not capitalized, they are meant in their natural-language sense.

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

Prefix	XML Namespace	Comments
md:	urn:oasis:names:tc:SAML:2.0:metadata	This is the SAML V2.0 metadata namespace defined in the SAML V2.0 metadata specification [SAML2Meta].
mdui:	urn:oasis:names:tc:SAML:metadata:ui	This is the SAML V2.0 metadata extension namespace defined by this document and its accompanying schema [MetaUI-XSD].
xsd:	http://www.w3.org/2001/XMLSchema	This namespace is defined in the W3C XML Schema specification [Schema1]. In schema listings, this is the default namespace and no prefix is shown.

This specification uses the following typographical conventions in text: `<ns:Element>`, `Attribute`, **Datatype**, `OtherCode`.

This specification uses the following typographical conventions in XML listings:

```
Listings of XML schemas appear like this.
```

```
Listings of XML examples appear like this. These listings are non-normative.
```

1.2 Normative References

- [MetaUI-XSD] — OASIS Working Draft, *Metadata Extension Schema for SAML V2.0 Metadata Extensions for Login and Discovery User Interface Version 1.0*, November 2010. <http://docs.oasis-open.org/security/saml/Post2.0/sstc-saml-metadata-ui-v1.0.xsd>
- [RFC2119] S. Bradner. *Key words for use in RFCs to Indicate Requirement Levels*. IETF RFC 2119, March 1997. <http://www.ietf.org/rfc/rfc2119.txt>

93 **[RFC4632]** V. Fuller et al. *Classless Inter-domain Routing (CIDR): The Internet Address*
94 *Assignment and Aggregation Plan*. IETF RFC 4632, August 2006.
95 <http://www.ietf.org/rfc/rfc4632.txt>

96 **[RFC5870]** A. Mayrhofer et al. *A Uniform Resource Identifier for Geographic Locations ('geo'*
97 *URI)*. IETF RFC 5870, June 2010. <http://www.ietf.org/rfc/rfc5870.txt>

98 **[SAML2Errata]** OASIS Approved Errata, *SAML V2.0 Errata*, October 2009. [http://docs.oasis-](http://docs.oasis-open.org/security/saml/v2.0/sstc-saml-approved-errata-2.0.pdf)
99 [open.org/security/saml/v2.0/sstc-saml-approved-errata-2.0.pdf](http://docs.oasis-open.org/security/saml/v2.0/sstc-saml-approved-errata-2.0.pdf)

100 **[SAML2Meta]** OASIS Standard, *Metadata for the OASIS Security Assertion Markup Language*
101 *(SAML) V2.0*, March 2005. [http://docs.oasis-open.org/security/saml/v2.0/saml-](http://docs.oasis-open.org/security/saml/v2.0/saml-metadata-2.0-os.pdf)
102 [metadata-2.0-os.pdf](http://docs.oasis-open.org/security/saml/v2.0/saml-metadata-2.0-os.pdf)

103 **[Schema1]** H. S. Thompson et al. XML Schema Part 1: Structures. World Wide Web
104 Consortium Recommendation, May 2001. [http://www.w3.org/TR/2001/REC-](http://www.w3.org/TR/2001/REC-xmlschema-1-20010502/)
105 [xmlschema-1-20010502/](http://www.w3.org/TR/2001/REC-xmlschema-1-20010502/)

106 **[Schema2]** Paul V. Biron, Ashok Malhotra. XML Schema Part 2: Datatypes. World Wide Web
107 Consortium Recommendation, May 2001. [http://www.w3.org/TR/2001/REC-](http://www.w3.org/TR/2001/REC-xmlschema-2-20010502/)
108 [xmlschema-2-20010502/](http://www.w3.org/TR/2001/REC-xmlschema-2-20010502/)

2 Metadata Extensions for Login and Discovery User Interface

2.1 User Interface Information

The user interface extension elements are oriented towards the requirements of user agent presentation of entities represented by SAML metadata, typically as part of identity provider discovery or representing services requesting information from a user's identity provider. The specifics of such presentation and the use of the elements that follow is not in scope for this specification, but communities of use SHOULD establish guidelines and even proscriptive requirements to encourage consistency and understandability for users.

The `<mdui:UIInfo>` container element, defined below, MUST appear within the `<md:Extensions>` element of a role element (one whose type is based on `md:RoleDescriptorType`). The use of the `<mdui:UIInfo>` element, or any other element defined in this section, outside of that context is not defined by this specification.

Finally, this element MUST NOT appear more than once within a given `<md:Extensions>` element.

2.1.1 Element `<mdui:UIInfo>`

The `<mdui:UIInfo>` element contains information which pertains to (but is not specifically limited to) the creation of user interfaces for tasks such as identity provider selection/discovery, user authentication, attribute release consent, etc.

This element contains any number of the following elements, in any order:

`<mdui:DisplayName>`

Localized names for the entity operating in the containing role.

`<mdui:Description>`

Localized descriptions of the entity operating in the containing role.

`<mdui:Keywords>`

Localized search keywords, tags, categories, or labels for the containing role.

`<mdui:Logo>`

Localized logo graphic for the entity operating in the containing role.

`<mdui:InformationURL>`

URLs to localized information about the entity operating in the containing role.

`<mdui:PrivacyStatementURL>`

URLs to localized information about the privacy practices of the entity operating in the containing role.

In addition, this element MAY contain an arbitrary number of extension elements from other namespaces, the definitions/semantics of which must be supplied elsewhere.

The schema for the `<mdui:UIInfo>` element, and its corresponding `mdui:UIInfoType` complex type, is as follows:

```
<element name="UIInfo" type="mdui:UIInfoType"/>
```

```

146 <complexType name="UIInfoType">
147   <choice minOccurs="0" maxOccurs="unbounded">
148     <element ref="mdui:DisplayName"/>
149     <element ref="mdui:Description"/>
150     <element ref="mdui:Keywords"/>
151     <element ref="mdui:Logo"/>
152     <element ref="mdui:InformationURL"/>
153     <element ref="mdui:PrivacyStatementURL"/>
154     <any namespace="##other" processContents="lax"/>
155   </choice>
156 </complexType>

```

157 2.1.2 Element <mdui:DisplayName>

158 The <mdui:DisplayName> element specifies a set of localized names fit for display to users. Such
159 names are meant to allow a user to distinguish and identify the entity acting in a particular role. The
160 content of this element should be suitable for use in constructing accessible user interfaces for those with
161 disabilities.

162 There MUST NOT be more than one <mdui:DisplayName> element with the same xml:lang attribute
163 value within a single role descriptor.

164 The schema for the <mdui:DisplayName> element is as follows:

```

165 <element name="DisplayName" type="md:localizedNameType"/>

```

166 2.1.3 Element <mdui:Description>

167 The <mdui:Description> element specifies a brief, localized description fit for display to users. In the
168 case of an <md:SPSSODescriptor> role, this SHOULD be a description of the service being offered. In
169 the case of an <md:IDPSSODescriptor> role this SHOULD be a description of the user community
170 serviced.

171 In all cases this text MUST be standalone, meaning it is not to be used as a template requiring additional
172 text (e.g., "This service offers \$description").

173 There MUST NOT be more than one <mdui:Description> element with the same xml:lang attribute
174 value within a single role descriptor.

175 The schema for the <mdui:Description> element is as follows:

```

176 <element name="Description" type="md:localizedNameType"/>

```

177 2.1.4 Element <mdui:Keywords>

178 The <mdui:Keywords> element specifies a list of localized search keywords, tags, categories, or labels
179 that apply to the containing role. This element extends the **mdui:listOfStrings** schema type with the
180 following attribute:

181 xml:lang [Required]

182 Language specifier.

183 The content of this element is a "list" of strings in the XML Schema [Schema2] sense, which means the
184 keyword strings are space-delimited. Spaces within individual keywords are encoded with a "plus" (+)
185 character.

186 There MUST NOT be more than one `<mdui:Keywords>` element with the same `xml:lang` attribute
187 value within a single role descriptor.

188 The schema for the `<mdui:Keywords>` element, and its corresponding `mdui:KeywordsType` complex
189 type, is as follows:

```
190 <element name="Keywords" type="md:KeywordsType"/>
191 <complexType name="KeywordsType">
192   <simpleContent>
193     <extension base="mdui:listOfStrings">
194       <attribute ref="xml:lang" use="required"/>
195     </extension>
196   </simpleContent>
197 </complexType>
198 <simpleType name="listOfStrings">
199   <list itemType="string"/>
200 </simpleType>
```

201 2.1.5 Element `<mdui:Logo>`

202 The `<mdui:Logo>` element specifies the external location of a localized logo fit for display to users. This
203 element extends the `anyURI` schema type with the following attributes:

204 `height` [Required]

205 The height of the logo measured in pixels.

206 `width` [Required]

207 The width of the logo measured in pixels.

208 `xml:lang`

209 Optional language specifier.

210 In order to facilitate the usage of logos within a user interface, logos SHOULD:

- 211 • use a transparent background where appropriate
- 212 • use PNG, or GIF (less preferred), images
- 213 • use HTTPS URLs in order to avoid mixed-content warnings within browsers

214 The order of logo elements is not significant, and a consumer MAY select any logo that meets its
215 presentation and internationalization requirements. Communities of use SHOULD establish guidelines or
216 requirements for logo size, aspect ratio, etc. to ensure consistency. If logos without an `xml:lang`
217 attribute are present, then they SHOULD be considered the default logos for use when logos in the user's
218 preferred language are not available.

219 The schema for the `<mdui:Logo>` element, and its corresponding `mdui:LogoType` complex type, is as
220 follows:

```
221 <element name="Logo" type="mdui:LogoType"/>
222 <complexType name="LogoType">
223   <simpleContent>
224     <extension base="anyURI">
225       <attribute name="height" type="positiveInteger" use="required"/>
226       <attribute name="width" type="positiveInteger" use="required"/>
227       <attribute ref="xml:lang"/>
228     </extension>
```

```
229     </simpleContent>  
230 </complexType>
```

231 **2.1.6 Element <mdui:InformationURL>**

232 The <mdui:InformationURL> specifies an external location for localized information about the entity
233 acting in a given role meant to be viewed by users. The content found at the URL SHOULD provide more
234 complete information than what would be provided by the <mdui:Description> element.

235 There MUST NOT be more than one <mdui:InformationURL> element with the same xml:lang
236 attribute value within a single role descriptor.

237 The schema for the <mdui:InformationURL> element is as follows:

```
238 <element name="InformationURL" type="md:localizedURIType"/>
```

239 **2.1.7 Element <mdui:PrivacyStatementURL>**

240 The <mdui:PrivacyStatementURL> specifies an external location for localized privacy statements.
241 Such statements are meant to provide a user with information about how information will be used and
242 managed by the entity acting in a given role.

243 There MUST NOT be more than one <mdui:PrivacyStatementURL> element with the same
244 xml:lang attribute value within a single role descriptor.

245 The schema for the <mdui:PrivacyStatementURL> element is as follows:

```
246 <element name="PrivacyStatementURL" type="md:localizedURIType"/>
```

247 **2.2 Discovery Hinting Information**

248 The discovery hinting extension elements provide information which may hint at the identity provider with
249 which a user is associated. A server-side selection mechanism could leverage such hints in conjunction
250 with client-supplied information to adjust likely choices. Information provided by the content of this
251 element is meant only as a hint and SHOULD NOT be used to definitively select an identity provider
252 without user intervention or confirmation.

253 The <mdui:DiscoHints> container element, defined below, MUST appear within the
254 <md:Extensions> element of an <md:IDPSSODescriptor> element. The use of the
255 <mdui:DiscoHints> element, or any other element defined in this section, outside of that context is not
256 defined by this specification.

257 Finally, this element MUST NOT appear more than once within a given <md:Extensions> element.

258 **2.2.1 Element <mdui:DiscoHints>**

259 The <mdui:DiscoHints> element contains information which may be used by an identity provider
260 selection/discovery service as hints in determining with which identity provider(s) the user may be
261 associated.

262 This element contains any number of the following elements, in any order:

263 <mdui:IPHint>

264 IP address blocks associated with, or serviced by, the entity operating in the containing role.

265 <mdui:DomainHint>
266 DNS domain names associated with, or serviced by, the entity operating in the containing role.
267 <mdui:GeolocationHint>
268 Geographic coordinates associated with, or serviced by, the entity operating in the containing
269 role.

270 In addition, this element MAY contain an arbitrary number of extension elements from other namespaces,
271 the definitions/semantics of which must be supplied elsewhere.

272 The schema for the <mdui:DiscoHints> element, and its corresponding **mdui:DiscoHintsType**
273 complex type, is as follows:

```
274 <element name="DiscoHints" type="mdui:DiscoHintsType"/>  
275 <complexType name="DiscoHintsType">  
276   <choice minOccurs="0" maxOccurs="unbounded">  
277     <element ref="mdui:IPHint"/>  
278     <element ref="mdui:DomainHint"/>  
279     <element ref="mdui:GeolocationHint"/>  
280     <any namespace="##other" processContents="lax"/>  
281   </choice>  
282 </complexType>
```

283 2.2.2 Element <mdui:IPHint>

284 The <mdui:IPHint> element specifies an [RFC4632] block associated with, or serviced by, the entity.
285 Both IPv4 and IPv6 CIDR blocks MUST be supported.

286 The schema for the <mdui:IPHint> element is as follows:

```
287 <element name="IPHint" type="string"/>
```

288 2.2.3 Element <mdui:DomainHint>

289 The <mdui:DomainHint> element specifies a DNS domain associated with, or serviced by, the entity.

290 The schema for the <mdui:DomainHint> element is as follows:

```
291 <element name="DomainHint" type="string"/>
```

292 2.2.4 Element <mdui:GeolocationHint>

293 The <mdui:GeolocationHint> element specifies a set of geographic coordinates associated with, or
294 serviced by, the entity. Coordinates are given in URI form using the geo URI scheme [RFC5870].

295 The schema for the <mdui:GeolocationHint> element is as follows:

```
296 <element name="GeolocationHint" type="anyURI"/>
```

297 2.3 Security Considerations

298 The information contained in these extensions, as well as the content identified by various URLs, is
299 intended for the construction of user interfaces. As such, special consideration by implementers and
300 deployers is warranted.

301 Any URLs MUST be carefully sanitized and encoded to protect against cross-site scripting and related
302 vulnerabilities. Schemes other than "https", "http", or "data" SHOULD NOT be used.

303 Since it is generally impractical to guarantee the continued safety of content behind a particular URL, the
304 use of "https" URLs is RECOMMENDED, and control over the URLs in question must be carefully
305 established by the publisher of metadata containing these extensions. Consumers of metadata using
306 these extensions to construct UIs must ensure the provenance of metadata and that the processes by
307 which the extensions are managed by the publisher are sufficiently sound.

308 This is particularly relevant for the `<mdui:Logo>` element, since such URLs are often dereferenced by
309 the user agent without intervention. Where practical, the use of server-side image processing may
310 enable a higher degree of safety and control over the presentation of images than direct embedding of
311 links to logos.

312 **2.4 Relationship with Existing Metadata Elements**

313 **2.4.1 `<md:Organization>` Elements**

314 SAML metadata defines localized organizational names, display names, and URLs at both the entity and
315 role level. These elements are meant to reflect information about the organization that "owns" or operates
316 a particular entity. To date, most known identity provider discovery interfaces have relied on entity-level
317 `<md:OrganizationDisplayName>` element content. Some applications will also display the
318 organization name for service providers as a means of identifying the service.

319 However, such usage is based on two implicit assumptions:

- 320 • the organization name is recognizable and can be understood by the user within the context that
321 it is used
- 322 • the organization only has one entity operating in a given role at any specific time

323 There are many cases, however, where one or both of these assumption are not true. An example
324 conflicting with the first assumption may be Virginia Polytechnic Institute and State University, which the
325 world knows as "Virginia Tech". An example that conflicts with both assumptions might be a third-party
326 hosting service. Its name would not be recognized by any user and it could operate many entities at any
327 given time.

328 However, the organizational display name may still be useful, for example within "owned by..." or
329 "operated by..." statements.

330 **2.4.2 Service Name and Description**

331 Entities with a `<md:SPSSODescriptor>` role may optionally include one or more
332 `<md:AttributeConsumingService>` elements which in turn contain `<md:ServiceName>` and
333 `<md:ServiceDescription>` elements. These elements are normally used to expose the attribute
334 requirements for various service "levels" and to associate certain names and descriptions with them.

335 The following issues make these elements inappropriate for carrying a general display name and
336 description for the service:

- 337 • other role elements have no analogous elements
- 338 • some services do not require attributes, but the `<md:AttributeConsumingService>` element
339 requires the inclusion of one or more `<md:RequestedAttribute>` elements
- 340 • the typical usage for these elements do not convey a name and description for the service
341 itself

342 2.4.3 Suggested Precedence

343 Implementations that rely on display name information SHOULD rely on elements in the following order of
344 preference:

- 345 • <mdui:DisplayName>
- 346 • <md:ServiceName> (if applicable)
- 347 • entityID or a hostname associated with the endpoint of the service

348 2.5 Example

349 An elided example follows.

```
350 <EntityDescriptor entityID="https://idp.switch.ch/idp/shibboleth"  
351   xmlns="urn:oasis:names:tc:SAML:2.0:metadata"  
352   xmlns:mdui="urn:oasis:names:tc:SAML:2.0:metadata:ui">  
  
353   <IDPSSODescriptor  
354     protocolSupportEnumeration="urn:oasis:names:tc:SAML:2.0:protocol">  
  
355     <Extensions>  
  
356     <mdui:UIInfo>  
  
357       <mdui:DisplayName xml:lang="en">SWITCH</mdui:DisplayName>  
358       <mdui:DisplayName xml:lang="de">SWITCH</mdui:DisplayName>  
359  
360       <mdui:Description xml:lang="en">  
361         Switzerland's national research and education network.  
362       </mdui:Description>  
363       <mdui:Description xml:lang="de">  
364         Das schweizerische Hochschul- und Forschungsnetzwerk.  
365       </mdui:Description>  
  
366       <mdui:Logo height="16" width="16">  
367         https://switch.ch/resources/images/smalllogo.png  
368       </mdui:Logo>  
369       <mdui:Logo height="97" width="172">  
370         https://switch.ch/resources/images/logo.png  
371       </mdui:Logo>  
  
372       <mdui:InformationURL xml:lang="en">  
373         http://switch.ch  
374       </mdui:InformationURL>  
375       <mdui:InformationURL xml:lang="de">  
376         http://switch.ch/de  
377       </mdui:InformationURL>  
  
378     </mdui:UIInfo>  
  
379     <mdui:DiscoHints>  
  
380       <mdui:IPHint>130.59.0.0/16</mdui:IPHint>  
381       <mdui:IPHint> 2001:620::0/96</mdui:IPHint>  
  
382       <mdui:DomainHint>switch.ch</mdui:DomainHint>  
  
383       <mdui:GeolocationHint>geo:47.37328,8.531126</mdui:GeolocationHint>
```

```
384 |         </mdui:DiscoHints>
385 |
386 |     </Extensions>
387 |
388 |     <!-- other role-level elements -->
389 | </IDPSSODescriptor>
</EntityDescriptor>
```

390 **3 Conformance**

391 **3.1 SAML V2.0 Metadata Extensions for Login and Discovery User**
392 **Interface Version 1.0**

393 A metadata producer conforms to this profile if it has the ability to produce metadata in accordance with
394 sections 2.1 and 2.2.

395 A metadata consumer conforms to this profile if it can consume extended metadata produced in
396 accordance with sections 2.1 and 2.2.

397 An identity provider discovery service or agent conforms to this profile if it has the ability to consume and
398 utilize extended metadata produced in accordance with sections 2.1, 2.2, and 2.4.3.

Appendix A. Acknowledgments

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415

Appendix B. Revision History

416

Working Draft 08:

417

- [Fix namespace in example](#)

418

Working Draft 07:

419

- [Remove normative reference to schema \(can't be kept current with document process\)](#)

420

- [Allow for spaces in keywords using '+' escape](#)

421

- [Add security considerations section](#)

422

- [Add TC member list](#)

423

Working Draft 06:

424

- Add `<Keywords>` element as a search "catch-all"

425

Working Draft 05:

426

- Fix typo

427

- Reword "languageless logo" text and move together with other logo use guideline text

428

Working Draft 04:

429

- Migrated text to new OASIS template and filename

430

- Removed specific logo guidance in favor of generic advice

431

- Added fallback option to hostnames in addition to entityID

432

- Better guidance on intended use of elements and scope of specification

433

Working Draft 03:

434

- Fixed namespace in section 1 table

435

- Add limit on one wrapper element per Extensions block

436

- Improve example to reflect guidance in spec

437

- Add note about accessibility to DisplayName

438

Working Draft 02:

439

- Fixed missing wildcard in schema

440

- Corrected some typos

441

- Removed ODN from fallback precedence

442

Working Draft 01

443

- Initial OASIS submission

444

- Removed SAML version number from namespace for consistency with other extensions

445

- Various editorial rewording and combining of normative sections, externalized the schema.

446

- Added conformance section

447

- Changed base type of `<Logo>` to URI, and switched `<GeolocationHint>` to URI based on RFC5870

448

- Added wildcards to wrapper elements, changed them to choice bags

449

450

Presubmission Changes:

451

Changes to Draft 03:

452

- Correct typo in DiscoHints schema; the 's' was missing from Hints

453

- Add a couple examples where the assumptions noted in section 2.3.1 do not hold

454

- Minor typographical corrections

455

Changes to Draft 02:

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- Add SAML version number to declared namespace

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- Add `<UIInfo>` and `<DiscoHints>`

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Changes to Draft 01:

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- 459 • Move from the use of metadata entity attributes to direct XML elements located with in role
- 460 <Extensions> elements
- 461 • Make `xml:lang` attribute on <Logo> elements optional with the lack of language indicating the
- 462 default logo to use
- 463 • Add <PrivacyStatementURL> element