



XACML Intellectual Property Control (IPC) profile

Version 1.0

Committee draft 2

11 March 2010

Specification URIs:

This Version:

<http://docs.oasis-open.org/xacml/3.0/xacml-3.0-ipc-v1-spec-wd-02-en.doc>

Previous Version:

<http://docs.oasis-open.org/xacml/3.0/xacml-3.0-ipc-v1-spec-cd-01-en.doc> (Authoritative)

Latest Version:

<http://docs.oasis-open.org/xacml/3.0/xacml-3.0-ipc-v1-spec-en.html>

<http://docs.oasis-open.org/xacml/3.0/xacml-3.0-ipc-v1-spec-en.doc> (Authoritative)

<http://docs.oasis-open.org/xacml/3.0/xacml-3.0-ipc-v1-spec-en.pdf>

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Related work:

This specification is related to:

- eXtensible Access Control Markup Language (XACML)

Declared XML Namespace(s):

None

Abstract:

This specification defines a profile for the use of XACML in expressing policies for intellectual property control (IPC). It defines standard attribute identifiers useful in such policies, and recommends attribute value ranges for certain attributes.

Status:

This document was last revised or approved by the eXtensible Access Control Markup Language (XACML) TC on the above date. The level of approval is also listed above. Check the "Latest Version" or "Latest Approved Version" location noted above for possible later revisions of this document.

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1 Introduction

{Non-normative}

This specification defines a profile for the use of the OASIS eXtensible Access Control Markup Language (XACML) [XACML3] to write and enforce policies for the purpose of providing access control for resources deemed intellectual property (hereinafter referred to as IP). Use of this profile requires no changes or extensions to the [XACML3] standard.

This specification begins with a non-normative discussion of the topics and terms of interest in this profile. The normative section of the specification describes the attributes defined by this profile and provides recommended usage patterns for attribute values.

This specification assumes the reader is somewhat familiar with XACML. A brief overview sufficient to understand these examples is available in [XACMLIntro].

For our purposes, IP may be defined as legal property rights over mental creations. IP owners can receive exclusive rights to their creations, if certain conditions are met. These exclusive rights can be exploited by the owner for profit, either directly through sales of products, or indirectly through licensing.

IP is an asset; perhaps the most valuable asset an organization has. IP can be licensed to other organizations in cases of outsourcing and/or to generate revenue from IP sharing arrangements.

IP value tends to increase when properly protected, though there are differing points of diminishing returns. IP protection doesn't guarantee security; it just provides a compensation mechanism for cases of unlawful exploitation. IP valuation and protection are often criteria for venture capital investors.

Broadly speaking, there are four main categories of intellectual property: copyrights, trademarks, trade secrets, and patents. Copyrights confer time-limited exclusive rights of ownership and/or use to the creator of the work. A copyright is typically used to protect artistic works such as photographs, music, books, etc. Copyrights are internationally recognized, though there are differences in the terms and enforcement.

Trademarks are the IP protection scheme of names, logos, symbols, products, etc. For example, in the U.S. there are 2 main types:

- For general usage, or for not-yet-registered trademarks ™
- For trademarks registered with the USPTO ®

Trademarks are also internationally recognized through the Madrid system, which requires registration through the World Intellectual Property Organization (WIPO), a United Nations agency. The World Trade Organization also sets legal minimum standards for IP protection among member nations.

Patents are property rights granted to an inventor to prevent others from profiting from the invention for a limited time in exchange for public disclosure of the invention when the patent is granted. Patents apply to processes, machines, articles of manufacture, or composition of matter (including biological), or derived innovations. Patents require detailed disclosure of information, designs, processes, etc. Patents are administered in U.S. by the USPTO, and are internationally recognized by WTO TRIPS, WIPO, and European Patent Convention.

Trade secrets are IP protection of formulae, processes, designs, information, etc. that are not easily obtainable that a business uses for competitive advantage. They are often protected by legal contracts such as non-disclosure agreements, non-compete agreements, or proprietary information agreements. Trade secrets are the most common form of industrial IP protection, and outnumber patents. However, trade secrets are often categorized as "proprietary" information, and may not be discovered as trade secrets unless litigated. They are not federally protected in the U.S., though most states have adopted the Uniform Trade Secrets Act. However, theft of trade secrets is prohibited by U.S. Economic Espionage Act of 1996. Trade secret status requires less disclosure than patents. Trade secrets are well protected by European Patent Convention as "know how". No international treaties protect trade secrets, though WTO TRIPS, GATT, and NAFTA have provisions for trade secret protection.

Other IP related concepts, such as **public domain**, **Pll**, **proprietary**, and **third-party proprietary** will be defined in the glossary section.

50 The attributes and glossary terms defined below are not an exclusive or comprehensive list of all the
51 attributes that may be required for rendering authorization decisions concerning IP. For example, PDPs
52 would have to evaluate other entitlements, such as group membership, from PIPs. This profile is meant
53 as a point of reference for implementing IP controls, and may be extended as needed for organizational
54 purposes. Software vendors who choose to implement this profile should take the attributes herein as a
55 framework for IP controls, but allow individual implementers some flexibility in constructing their own
56 XACML-based authorization policies and PDPs.

57 The goal of this profile is to create a framework of common IP-related attributes upon which authorization
58 decisions can be rendered. This profile will also provide XACML software developers and authorization
59 policy writers guidance on supporting IP control use cases.

60 1.1 Glossary

61 Authority

62 The entity which is responsible for authorizing the transaction. This can be a particular company,
63 organization, or contract.

64 Copyright

65 A form of limited and temporary government-granted monopoly which gives the creator of an
66 original work some rights for a certain time period in relation to that work, including its publication,
67 distribution and adaptation; after which time the work is said to enter the public domain. Copyright
68 applies to concrete expressions of information, but not the information itself.

69 Country

70 A national political administrative unit recognized for diplomatic and trade purposes by
71 governments and other international organizations.

72 IP-Designee

73 A designation for the persons or entities with designated intellectual property rights.

74 IP-Owner

75 A designation for the entity which owns the intellectual property.

76 License

77 An agreement granting rights in Intellectual Property.

78 Location

79 The **location** of the requesting principal. Values of acceptable locations may be specified by
80 legal contract, and may be specific to implementations. PDPs and PEPs SHOULD be configured
81 for mutual understanding of said values.

82 Nationality

83 A country of which a person is a citizen.

84 Organization

85 A company or other legal entity of which a person can be an employee or agent.

86 Patent

87 A set of exclusive rights granted by a government to an inventor or his assignee for a limited
88 period of time in exchange for a disclosure of an invention.

89 PII

90 Personally identifiable information. For example, U.S. Social Security Numbers.

91 Proprietary

92 Information protected by an organization by technical controls. May sometimes be used
93 synonymously with "trade secret".

- 94 **Public domain**
- 95 Information that has been demoted from copyright, trademark, trade secret, or patented status.
- 96 No intellectual property controls are usually necessary for items considered public domain.
- 97 **Third-party proprietary**
- 98 Intellectual property which has been legally entrusted to the care and use of another organization.
- 99 **Trademark**
- 100 A distinctive sign or indicator used by an individual, business organization, or other legal entity to
- 101 identify that the products, and/or services to consumers with which the trademark appears
- 102 originate from a unique source of origin, and to distinguish its products or services from those of
- 103 other entities.
- 104 **Trade secret**
- 105 A formula, practice, process, design, instrument, pattern, or compilation of information which is
- 106 not generally known or reasonably ascertainable, by which a business can obtain an economic
- 107 advantage over competitors or customers. In some jurisdictions, such secrets are referred to as
- 108 "confidential information" or "classified information".

109 1.2 Terminology

110 The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD

111 NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described

112 in [RFC2119].

113 1.3 Normative References

- 114 **[RFC2119]** S. Bradner, *Key words for use in RFCs to Indicate Requirement Levels*,
- 115 <http://www.ietf.org/rfc/rfc2119.txt>, IETF RFC 2119, March 1997.
- 116 **[XACML3]** E. Rissanen, ed., *eXtensible Access Control Markup Language (XACML) Version*
- 117 *3.0*, Working draft 10, [http://docs.oasis-open.org/xacml/3.0/xacml-3.0-core-spec-](http://docs.oasis-open.org/xacml/3.0/xacml-3.0-core-spec-cd-02-en.doc)
- 118 [cd-02-en.doc](http://docs.oasis-open.org/xacml/3.0/xacml-3.0-core-spec-cd-02-en.doc)
- 119 **[XACML2]** T. Moses, ed., *eXtensible Access Control Markup Language (XACML) Version*
- 120 *2.0* [http://docs.oasis-open.org/xacml/2.0/access_control-xacml-2.0-core-spec-](http://docs.oasis-open.org/xacml/2.0/access_control-xacml-2.0-core-spec-os.pdf)
- 121 [os.pdf](http://docs.oasis-open.org/xacml/2.0/access_control-xacml-2.0-core-spec-os.pdf)
- 122 **[XACML1]** S. Godik and T. Moses, eds. *eXtensible Access Control Markup Language*
- 123 *(XACML) Version 1.0* [http://www.oasis-](http://www.oasis-open.org/committees/download.php/2406/oasis-xacml-1.0.pdf)
- 124 [open.org/committees/download.php/2406/oasis-xacml-1.0.pdf](http://www.oasis-open.org/committees/download.php/2406/oasis-xacml-1.0.pdf)
- 125

126 1.4 Non-Normative References

- 127 **[XACMLIntro]** OASIS XACML TC, *A Brief Introduction to XACML*, 14 March 2003,
- 128 [http://www.oasis-](http://www.oasis-open.org/committees/download.php/2713/Brief_Introduction_to_XACML.html)
- 129 [open.org/committees/download.php/2713/Brief_Introduction_to_XACML.html](http://www.oasis-open.org/committees/download.php/2713/Brief_Introduction_to_XACML.html)
- 130 <http://www.myersbigel.com/library/viewdoc.php?id=26>
- 131 <http://www.uspto.gov>
- 132 <http://www.wipo.int>
- 133 http://www.wto.org/english/tratop_E/TRIPS_e/trips_e.htm
- 134 **[ISO3166]** ISO 3166 Maintenance agency (ISO 3166/MA),
- 135 http://www.iso.org/iso/country_codes.htm
- 136

137 **1.5 Scope**

138 Many intellectual property access control decisions can be made on the basis of the resource's
139 **copyright, trademark, patent, trade secret**, or other **custom** classification. This profile defines standard
140 XACML attributes for these properties, and recommends the use of standardized attribute values.

141 In practice, an organization's intellectual property protection policies will be a mixture of rules derived
142 from laws and regulations, along with enterprise-specific rules derived from government-approved
143 bilateral or multilateral agreements with other organizations.

144 **1.6 Use cases**

145 PDPs may need to consider intellectual property protection schemes when evaluating authorization
146 decisions. This profile is designed to provide a framework of additional <Attributes> for such decisions.

147

148 Copyright use case: an authorization decision depends on whether or not the resource in question is
149 protected by copyright.

150

151 Trademark use case: an authorization decision depends on whether or not the resource in question is a
152 designated trademark.

153

154 Patent use case: an authorization decision depends whether or not the resource in question is protected
155 by a patent. Patent designation may follow.

156

157 Trade secret use case: an authorization decision depends whether or not the resource in question is
158 designated as a trade secret.

159

160 PII use case: an authorization decision depends whether or not the resource in question is designated as
161 personally identifiable information.

162

163 Third-party proprietary: an authorization decision depends whether or not the resource in question is
164 designated as a third-party proprietary resource.

165

166 License: a calling PEP may need to log that a particular license applies to the authorization decision
167 rendered by the PDP.

168

169 **1.7 Disclaimer**

170 NOTHING IN THIS PROFILE IS INTENDED TO BE A LEGALLY CORRECT INTERPRETATION OR
171 APPLICATION OF U.S. OR ANY GOVERNMENT INTELLECTUAL PROPERTY LAWS OR
172 REGULATIONS. USE OF THIS PROFILE IN AN ACCESS CONTROL SYSTEM DOES NOT
173 CONSTITUTE COMPLIANCE WITH ANY INTELLECTUAL PROPERTY RESTRICTIONS. THIS
174 PROFILE HAS NOT BEEN REVIEWED OR ENDORSED BY THE U.S. OR ANY OTHER GOVERNMENT
175 AGENCIES RESPONSIBLE FOR ENFORCING INTELLECTUAL PROPERTY LAWS, NOR BY ANY
176 LEGAL EXPERT IN THIS FIELD.

177 Organizations that use this profile should ensure their intellectual property protection by engaging
178 qualified professional legal services.

179 2 Profile

180 2.1 Resource Attributes

181 2.1.1 IPC-Type

182 The IPC-Type classification value shall be designated with the following attribute identifier:

183 `urn:oasis:names:tc:xacml:3.0:ipc:resource:ipc-type`

184 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
185 data may contain multiple values. Examples of acceptable values of the attribute SHALL be “PUBLIC”,
186 “PII”, “COPYRIGHT”, “TRADEMARK”, “PATENT”, “TRADESECRET”, “PROPRIETARY”, or “THIRD-
187 PARTY PROPRIETARY”. Other values may also be defined later, depending on an organization’s
188 authorization needs.

189 The use of “THIRD-PARTY PROPRIETARY” may introduce ambiguity in a federated authorization model.
190 In that case, “PROPRIETARY” with a corresponding **IP-Owner** value SHOULD be used to distinguish IP
191 owned by an entity other than the PDP’s home organization.

192 2.1.2 IPC-Data

193 IPC-Data classification values shall be designated with the following attribute identifier:

194 `urn:oasis:names:tc:xacml:3.0:ipc:resource:ipc-data`

195 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
196 data may contain multiple values. The purpose of this attribute is to convey additional data about the
197 intellectual property resource, such as author names, patent numbers, proprietary tracking information,
198 etc.

199 2.1.3 IP-Owner

200 IP-Owner classification values shall be designated with the following attribute identifier:

201 `urn:oasis:names:tc:xacml:3.0:ipc:resource:ip-owner`

202 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
203 data may contain multiple values. This attribute names the owner of the IP.

204 2.1.4 IP-Designee

205 IP-Designee classification values shall be designated with the following attribute identifier:

206 `urn:oasis:names:tc:xacml:3.0:ipc:resource:ip-designee`

207 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
208 data may contain multiple values. This attribute names the designated custodian of the IP.

209 2.1.5 License

210 License classification values shall be designated with the following attribute identifier:

211 `urn:oasis:names:tc:xacml:3.0:ipc:resource:license`

212 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
213 data may contain multiple values.

214 This attribute can be used to indicate whether or not a specific resource is governed by a particular
215 license arrangement.

216 2.2 Subject Attributes

217 2.2.1 Nationality

218 Nationality classification values shall be designated with the following attribute identifier:

219 `urn:oasis:names:tc:xacml:3.0:ipc:subject:nationality`

220 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
221 data may contain multiple values. The value of this attribute MUST be in the range of 2-letter country
222 codes defined by [ISO3166].

223 Nationality shall denote the country in which the subject currently has legal status as a “national” or
224 citizen.

225 2.2.2 Organization

226 Organization classification values shall be designated with the following attribute identifier:

227 `urn:oasis:names:tc:xacml:3.0:ipc:subject:organization`

228 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
229 data may contain multiple values.

230 Organization shall denote the organization to which the subject in the request belongs. A common
231 scheme such as DUNS SHOULD be used to promote interoperability.

232 2.3 Environment Attributes

233 2.3.1 Location

234 Location classification values shall be designated with the following attribute identifier:

235 `urn:oasis:names:tc:xacml:3.0:ipc:environment:location`

236 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
237 data should have a single value.

238 2.4 Action Attributes

239 2.4.1 Read

240 Read classification values shall be designated with the following attribute identifier:

241 `urn:oasis:names:tc:xacml:3.0:ipc:action:read`

242 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#boolean>.

243 2.4.2 Edit

244 Edit classification values shall be designated with the following attribute identifier:

245 `urn:oasis:names:tc:xacml:3.0:ipc:action:edit`

246 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#boolean>.

247 2.4.3 Storage

248 Storage classification values shall be designated with the following attribute identifier:

249 `urn:oasis:names:tc:xacml:3.0:ipc:action:storage`

250 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#boolean>.

251 **2.4.4 Physical transmission**

252 Physical transmission classification values shall be designated with the following attribute identifier:

253 `urn:oasis:names:tc:xacml:3.0:ipc:action:physical-transmission`

254 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#boolean>. The best
255 example of this type of action would be printing.

256 **2.4.5 Electronic transmission**

257 Electronic transmission classification values shall be designated with the following attribute identifier:

258 `urn:oasis:names:tc:xacml:3.0:ipc:action:electronic-transmission`

259 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
260 data may contain multiple values. Examples of this action would be emailing, file transfer, or moving from
261 one electronic location to another.

262 **2.4.6 Encryption type**

263 Encryption type classification values shall be designated with the following attribute identifier:

264 `urn:oasis:names:tc:xacml:3.0:ipc:action:encryption-type`

265 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
266 data may contain multiple values. Examples of valid data would be AES128-CBC, RSA2048, etc.

267 **2.4.7 Marking**

268 Marking classification values shall be designated with the following attribute identifier:

269 `urn:oasis:names:tc:xacml:3.0:ipc:action:marking`

270 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
271 data may contain multiple values. Examples of marks could be "Proprietary", "Confidential", etc. Other
272 schemes may refer to this activity as "labeling", but marking and labeling are considered synonymous for
273 these purposes.

274 **2.4.8 Disposal**

275 Disposal classification values shall be designated with the following attribute identifier:

276 `urn:oasis:names:tc:xacml:3.0:ipc:action:disposal`

277 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
278 data may contain multiple values. An example of a disposal value would be "delete" in the case of
279 electronic storage. Additional disposal related actions may be defined as obligations.

280 **2.4.9 Authority**

281 Authority classification values shall be designated with the following attribute identifier:

282 `urn:oasis:names:tc:xacml:3.0:ipc:action:authority`

283 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
284 data may contain multiple values.

285 This attribute can be used to describe the associated contract or statement of work authorizing the
286 access. Other types of values could be used depending on an organization's needs.

287 **3 Identifiers**

288 This profile defines the following URN identifiers.

289 **3.1 Profile Identifier**

290 The following identifier SHALL be used as the identifier for this profile when an identifier in the form of a
291 URI is required.

292 `urn:oasis:names:tc:xacml:3.0:profiles:ipc`

293

294 **4 Conformance**

295 Conformance to this profile is defined for *policies* and *requests* generated and transmitted within and
296 between XACML systems.

297 **4.1 Attribute Identifiers**

298 Conformant XACML *policies* and *requests* SHALL use the attribute identifiers defined in Section 2 for
299 their specified purpose.

300 **4.2 Attribute Values**

301 Conformant XACML *policies* and *requests* SHALL use attribute values in the specified range or patterns
302 as defined for each attribute in Section 2 (when a range or pattern is specified).

303 NOTE: In order to process conformant XACML *policies* and *requests* correctly, *PIP* and
304 *PEP* modules may have to translate native data values into the datatypes and formats
305 specified in this profile.

306

307 A. Acknowledgements

308 The following individuals have participated in the creation of this specification and are gratefully
309 acknowledged:

310 **Participants:**

311 John Tolbert, The Boeing Company

312

313 **Committee members during profile development:**

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Masum Hasan	Cisco Systems, Inc.*	Member
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Craig Forster	IBM	Member
Richard Franck	IBM	Member
Michiharu Kudo	IBM	Member
Michael McIntosh	IBM	Member
Vernon Murdoch	IBM	Member
Ron Williams	IBM	Member
David Chadwick	Individual	Member
Bill Parducci*	Individual	Chair
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Seth Proctor	Sun Microsystems	Voting Member
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Martin Smith	US Department of Homeland Security*	Member
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B. Non-Normative Text

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C. Revision History

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Revision	Date	Editor	Changes Made
CD 1	6/18/2009	John Tolbert	Initial committee draft.
WD 2	2/25/2010	John Tolbert	Revised committee draft.

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