



# XACML Intellectual Property Control (IPC) Profile

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**Technical Committee:**

OASIS eXtensible Access Control Markup Language (XACML) TC

**Chair(s):**

Bill Parducci, <[bill@parducci.net](mailto:bill@parducci.net)>  
Hal Lockhart, Oracle <[hal.lockhart@oracle.com](mailto:hal.lockhart@oracle.com)>

**Editor(s):**

John Tolbert, The Boeing Company, <[john.w.tolbert@boeing.com](mailto:john.w.tolbert@boeing.com)>

**Related work:**

This specification is related to:

- [eXtensible Access Control Markup Language \(XACML\)](#)

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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.

Technical Committee members should send comments on this specification to the Technical Committee's email list. Others should send comments to the Technical Committee by using the "Send A Comment" button on the Technical Committee's web page at <http://www.oasis-open.org/committees/xacml/>.

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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-en.doc)  
118 [en.doc](http://docs.oasis-open.org/xacml/3.0/xacml-3.0-core-spec-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 [ISO3166] ISO 3166 Maintenance agency (ISO 3166/MA),  
131 [http://www.iso.org/iso/country\\_codes.htm](http://www.iso.org/iso/country_codes.htm)  
132

## 133 1.5 Scope

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

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

## 140 **1.6 Use cases**

141 PDPs may need to consider intellectual property protection schemes when evaluating authorization  
142 decisions. This profile is designed to provide a framework of additional <Attributes> for such decisions.  
143

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

146  
147 Trademark use case: an authorization decision depends on whether or not the resource in question is a  
148 designated trademark.

149  
150 Patent use case: an authorization decision depends whether or not the resource in question is protected  
151 by a patent. Patent designation may follow.

152  
153 Trade secret use case: an authorization decision depends whether or not the resource in question is  
154 designated as a trade secret.

155  
156 PII use case: an authorization decision depends whether or not the resource in question is designated as  
157 personally identifiable information.

158  
159 Third-party proprietary: an authorization decision depends whether or not the resource in question is  
160 designated as a third-party proprietary resource.

161  
162 License: a calling PEP may need to log that a particular license applies to the authorization decision  
163 rendered by the PDP.

164

## 165 **1.7 Disclaimer**

166 NOTHING IN THIS PROFILE IS INTENDED TO BE A LEGALLY CORRECT INTERPRETATION OR  
167 APPLICATION OF U.S. OR ANY GOVERNMENT INTELLECTUAL PROPERTY LAWS OR  
168 REGULATIONS. USE OF THIS PROFILE IN AN ACCESS CONTROL SYSTEM DOES NOT  
169 CONSTITUTE COMPLIANCE WITH ANY INTELLECTUAL PROPERTY RESTRICTIONS. THIS  
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171 AGENCIES RESPONSIBLE FOR ENFORCING INTELLECTUAL PROPERTY LAWS, NOR BY ANY  
172 LEGAL EXPERT IN THIS FIELD.

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

---

## 175 2 Profile

### 176 2.1 Resource Attributes

#### 177 2.1.1 IPC-Type

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

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

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

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

#### 188 2.1.2 IPC-Data

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

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

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

#### 195 2.1.3 IP-Owner

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

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

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

#### 200 2.1.4 IP-Designee

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

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

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

#### 205 2.1.5 License

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

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

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

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

## 212 2.2 Subject Attributes

### 213 2.2.1 Nationality

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

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

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

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

### 221 2.2.2 Organization

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

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

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

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

## 228 2.3 Environment Attributes

### 229 2.3.1 Location

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

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

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

## 234 2.4 Action Attributes

### 235 2.4.1 Read

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

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

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

### 239 2.4.2 Edit

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

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

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

### 243 2.4.3 Storage

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

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

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

## 247 **2.4.4 Physical transmission**

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

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

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

## 252 **2.4.5 Electronic transmission**

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

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

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

## 258 **2.4.6 Encryption type**

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

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

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

## 263 **2.4.7 Marking**

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

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

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

## 270 **2.4.8 Disposal**

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

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

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

## 276 **2.4.9 Authority**

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

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

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

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

---

## 283 **3 Identifiers**

284 This profile defines the following URN identifiers.

### 285 **3.1 Profile Identifier**

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

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

289

---

## 290 4 Conformance

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

### 293 4.1 Attribute Identifiers

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

### 296 4.2 Attribute Values

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

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

302

---

## 303 A. Acknowledgements

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306 **Participants:**

307 John Tolbert, The Boeing Company

308

309 **Committee members during profile development:**

Person	Organization	Role
Erik Rissanen	Axiomatics AB	Voting Member
Ludwig Seitz	Axiomatics AB	Member
Paul Tyson	Bell Helicopter Textron Inc.	Member
Ronald Jacobson	CA*	Member
Masum Hasan	Cisco Systems, Inc.*	Member
Anil Tappetla	Cisco Systems, Inc.*	Member
Tim Moses	Entrust*	Member
Guy Denton	IBM	Member
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
Abbie Barbir	Nortel	Member
Harry Haury	NuParadigm Government Systems, Inc.	Member
Kamalendu Biswas	Oracle Corporation	Member
Willem de Pater	Oracle Corporation	Member
Rich Levinson	Oracle Corporation	Secretary
Hal Lockhart	Oracle Corporation	Chair
Prateek Mishra	Oracle Corporation	Member
Anil Saldhana	Red Hat	Voting Member
Darran Rolls	SailPoint Technologies	Member
Daniel Engovatov	Stream Dynamics, Inc.	Member
Dilli Arumugam	Sun Microsystems	Voting Member
Seth Proctor	Sun Microsystems	Voting Member
Aravindan Ranganathan	Sun Microsystems	Member
John Tolbert	The Boeing Company*	Voting Member
Martin Smith	US Department of Homeland Security*	Member
Duane DeCouteau	Veterans Health Administration	Voting Member
David Staggs	Veterans Health Administration	Voting 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.
CD 2	5/5/10	John Tolbert	Revised committee draft, fixed links and formatting.

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