



XACML Intellectual Property Control (IPC) Profile

Version 1.0

Working Draft 3

9 August 2011

Specification URIs:

This Version:

<http://docs.oasis-open.org/xacml/3.0/ipc/xacml-3.0-ipc-v1.0-spec-wd-03-en.doc> (Authoritative)
<http://docs.oasis-open.org/xacml/3.0/ipc/xacml-3.0-ipc-v1.0-spec-wd-03-en.pdf>
<http://docs.oasis-open.org/xacml/3.0/ipc/xacml-3.0-ipc-v1.0-spec-wd-03-en.html>

Previous Version:

<http://docs.oasis-open.org/xacml/3.0/ipc/xacml-3.0-ipc-v1-spec-cd-02-en.doc> (Authoritative)
<http://docs.oasis-open.org/xacml/3.0/ipc/xacml-3.0-ipc-v1-spec-cd-02-en.pdf>
<http://docs.oasis-open.org/xacml/3.0/ipc/xacml-3.0-ipc-v1-spec-cd-02-en.html>

Latest Version:

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

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Related work:

This specification is related to:

OASIS Standard, "eXtensible Access Control Markup Language (XACML) Version 3.0", April 2010. <http://docs.oasis-open.org/xacml/3.0/xacml-3.0-core-spec-en.doc>

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.

48 Other IP related concepts, such as **public domain and proprietary** will be defined in the glossary
49 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 **Effective date**

73 The date on which an intellectual property license takes effect, thereby implying access for
74 authorized purposes.

75 **Expiration date**

76 The date on which an intellectual property license expires, thereby terminating access.

77 **IP-Designee**

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

79 **IP-Owner**

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

81 **License**

82 An agreement granting rights in Intellectual Property.

83 **Location**

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

87 **Nationality**

88 A country of which a person is a citizen.

89 **Organization**

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

91 **Patent**

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

94 **PII**

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

96 **Proprietary**

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

99 **Public domain**

100 Information that has been demoted from copyright, trademark, trade secret, or patented status.
101 No intellectual property controls are usually necessary for items considered public domain.

102 **Third-party proprietary**

103 Intellectual property which has been legally entrusted to the care and use of another organization.

104 **Trademark**

105 A distinctive sign or indicator used by an individual, business organization, or other legal entity to
106 identify that the products, and/or services to consumers with which the trademark appears
107 originate from a unique source of origin, and to distinguish its products or services from those of
108 other entities.

109 **Trade secret**

110 A formula, practice, process, design, instrument, pattern, or compilation of information which is
111 not generally known or reasonably ascertainable, by which a business can obtain an economic
112 advantage over competitors or customers. In some jurisdictions, such secrets are referred to as
113 "confidential information" or "classified information".

114 **Use restrictions**

115 Terms used to convey restrictions associated with the object.

116 **1.2 Terminology**

117 The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD
118 NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described
119 in [RFC2119].

120 **1.3 Normative References**

121 **[RFC2119]** S. Bradner, *Key words for use in RFCs to Indicate Requirement Levels*,
122 <http://www.ietf.org/rfc/rfc2119.txt>, IETF RFC 2119, March 1997.

123
124 **[XACML3]** OASIS Standard, "eXtensible Access Control Markup Language (XACML)
125 Version 3.0", April 2010. [http://docs.oasis-open.org/xacml/3.0/xacml-3.0-core-](http://docs.oasis-open.org/xacml/3.0/xacml-3.0-core-spec-en.doc)
126 [spec-en.doc](http://docs.oasis-open.org/xacml/3.0/xacml-3.0-core-spec-en.doc)

127
128 **[XACML2]** OASIS Standard, "eXtensible Access Control Markup Language (XACML)
129 Version 2.0", February 2005. [http://docs.oasis-](http://docs.oasis-open.org/xacml/2.0/access_control-xacml-2.0-core-spec-os.pdf)
130 [open.org/xacml/2.0/access_control-xacml-2.0-core-spec-os.pdf](http://docs.oasis-open.org/xacml/2.0/access_control-xacml-2.0-core-spec-os.pdf)

131
132 **[XACML1]** OASIS Standard, "eXtensible Access Control Markup Language (XACML)
133 Version 1.0", February 2003. [http://www.oasis-](http://www.oasis-open.org/committees/download.php/2406/oasis-xacml-1.0.pdf)
134 [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)

135

136 1.4 Non-Normative References

137 [XACMLIntro] OASIS XACML TC, *A Brief Introduction to XACML*, 14 March 2003,
138 [http://www.oasis-](http://www.oasis-open.org/committees/download.php/2713/Brief_Introduction_to_XACML.html)
139 [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)

140
141 [ISO3166] ISO 3166 Maintenance agency (ISO 3166/MA),
142 http://www.iso.org/iso/country_codes.htm
143

144 1.5 Scope

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

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

151 1.6 Use cases

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

154

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

157

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

160

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

163

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

166

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

169

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

172

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

175

176 **1.7 Disclaimer**

177 NOTHING IN THIS PROFILE IS INTENDED TO BE A LEGALLY CORRECT INTERPRETATION OR
178 APPLICATION OF U.S. OR ANY GOVERNMENT INTELLECTUAL PROPERTY LAWS OR
179 REGULATIONS. USE OF THIS PROFILE IN AN ACCESS CONTROL SYSTEM DOES NOT
180 CONSTITUTE COMPLIANCE WITH ANY INTELLECTUAL PROPERTY RESTRICTIONS. THIS
181 PROFILE HAS NOT BEEN REVIEWED OR ENDORSED BY THE U.S. OR ANY OTHER GOVERNMENT
182 AGENCIES RESPONSIBLE FOR ENFORCING INTELLECTUAL PROPERTY LAWS, NOR BY ANY
183 LEGAL EXPERT IN THIS FIELD.

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

186 2 Profile

187 2.1 Resource Attributes

188 2.1.1 IPC-Type

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

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

191 The `DataType` of this attribute is <http://www.w3.org/2001/XMLSchema#string>. This attribute
192 data may contain multiple values. Examples of acceptable values of the attribute SHALL be “PUBLIC”,
193 “COPYRIGHT”, “TRADEMARK”, “PATENT”, “TRADESECRET”, “PROPRIETARY”. Other values may
194 also be defined later, depending on an organization’s authorization needs.

195 2.1.2 IPC-Data

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

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

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

202 2.1.3 IP-Owner

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

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

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

207 2.1.4 IP-Designee

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

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

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

212 2.1.5 License

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

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

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

217 This attribute can be used to indicate whether or not a specific resource is governed by a particular
218 license arrangement. Examples of acceptable values of the attribute SHALL be “NON-DISCLOSURE
219 AGREEMENT”, “PROPRIETARY INFORMATION AGREEMENT”, “TECHNICAL DATA LICENSE
220 AGREEMENT”, “PATENT LICENSE”, “TRADEMARK LICENSE”, “NO LICENSE REQUIRED”,
221 “ROYALTY BEARING”, and “NO LICENSE EXISTS”. Other values may also be defined later, depending
222 on an organization’s authorization needs. This attribute may also contain specific references to license
223 numbers.

224 **2.1.6 Effective-Date**

225 Effective-date values shall be designated with the following attribute identifier:

226 `urn:oasis:names:tc:xacml:3.0:ipc:resource:effective-date`

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

228 This attribute can be used to indicate the date on which an intellectual property license takes effect,
229 thereby implying access for authorized purposes. This attribute may also convey the date on which other
230 resource attributes become valid; for example, when a copyright or patent is granted.

231 **2.1.7 Expiration-Date**

232 Expiration-date values shall be designated with the following attribute identifier:

233 `urn:oasis:names:tc:xacml:3.0:ipc:resource:expiration-date`

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

235 The date on which an intellectual property license expires, thereby terminating access. This attribute may
236 also convey the date on which other resource attribute elements are no longer valid; for example, when a
237 copyright or patent expires.

238

239 **2.1.8 Use-Restrictions**

240 Use-restrictions values shall be designated with the following attribute identifier:

241 `urn:oasis:names:tc:xacml:3.0:ipc:resource:use-restrictions`

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

243 Terms used to convey restrictions associated with the object. Examples of acceptable values of the
244 attribute SHALL be "DISTRIBUTION LIMITED TO", "INTERNAL ONLY", "DO NOT COPY", "FOIA",
245 "DESTRUCTION NOTICE", and "RELEASE AUTHORITY". Other values may also be defined later,
246 depending on an organization's authorization needs.

247

248 **2.2 Subject Attributes**

249 **2.2.1 Nationality**

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

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

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

255 Nationality shall denote the country in which the subject currently has legal status as a "national" or
256 citizen.

257 **2.2.2 Organization**

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

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

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

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

264 2.3 Environment Attributes

265 2.3.1 Location

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

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

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

270 2.4 Action Attributes

271 2.4.1 Read

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

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

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

275 2.4.2 Edit

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

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

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

279 2.4.3 Storage

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

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

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

283 2.4.4 Physical transmission

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

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

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

288 2.4.5 Electronic transmission

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

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

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

294 2.4.6 Encryption type

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

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

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

299 **2.4.7 Marking**

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

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

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

306 **2.4.8 Disposal**

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

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

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

312 **2.4.9 Authority**

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

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

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

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

319 **3 Identifiers**

320 This profile defines the following URN identifiers.

321 **3.1 Profile Identifier**

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

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

325

326 4 Conformance

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

329 4.1 Attribute Identifiers

330 Conformant XACML *policies* and *requests* SHALL use the attribute identifiers defined in Section 2 for
331 their specified purpose, and SHALL NOT use any other identifiers for the purposes defined by attributes
332 in this profile. The following table lists the attributes that must be supported.

333 Note: “M” is mandatory “O” is optional.

334

Identifiers	
urn:oasis:names:tc:xacml:3.0:ipc:resource:ipc-type	M
urn:oasis:names:tc:xacml:3.0:ipc:resource:ipc-data	O
urn:oasis:names:tc:xacml:3.0:ipc:resource:ip-owner	M
urn:oasis:names:tc:xacml:3.0:ipc:resource:ip-designee	O
urn:oasis:names:tc:xacml:3.0:ipc:resource:license	O
urn:oasis:names:tc:xacml:3.0:ipc:resource:effective-date	O
urn:oasis:names:tc:xacml:3.0:ipc:resource:expiration-date	O
urn:oasis:names:tc:xacml:3.0:ipc:resource:use-restrictions	O
urn:oasis:names:tc:xacml:3.0:ipc:subject:nationality	M
urn:oasis:names:tc:xacml:3.0:ipc:subject:organization	M
urn:oasis:names:tc:xacml:3.0:ipc:environment:location	M
urn:oasis:names:tc:xacml:3.0:ipc:action:read	M
urn:oasis:names:tc:xacml:3.0:ipc:action:edit	M
urn:oasis:names:tc:xacml:3.0:ipc:action:storage	M
urn:oasis:names:tc:xacml:3.0:ipc:action:physical-transmission	M

urn:oasis:names:tc:xacml:3.0:ipc:action:electronic-transmission	M
urn:oasis:names:tc:xacml:3.0:ipc:action:encryption-type	M
urn:oasis:names:tc:xacml:3.0:ipc:action:marking	M
urn:oasis:names:tc:xacml:3.0:ipc:action:disposal	M
urn:oasis:names:tc:xacml:3.0:ipc:action:authority	M

335

336 4.2 Attribute Values

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

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

342

343 **A. Acknowledgements**

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

346 **Participants:**

347 John Tolbert, The Boeing Company
348 Crystal Hayes, The Boeing Company

349

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B. Non-Normative Text

352

C. Revision History

353

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.
WD 3	8/9/2011	John Tolbert/Crystal Hayes	Added resource attributes for "Effective Date", "Expiration Date", and "Use Restrictions"; changed text for "License"; updated membership list.

354