

# Request / Response Interface based on JSON and HTTP for XACML 3.0 Version 1.0

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#### Related work:

This specification is related to:

- *eXtensible Access Control Markup Language (XACML) Version 3.0*. 22 January 2013. OASIS Standard. <http://docs.oasis-open.org/xacml/3.0/xacml-3.0-core-spec-en.html>.

#### Abstract:

The aim of this profile is to propose a standardized interface between a policy enforcement point and a policy decision point using JSON. The decision request and response structure is specified in the core XACML specification. This profile leverages it.

#### Status:

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

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# 1 Introduction

[All text is normative unless otherwise labeled]

## {Non-normative}

The XACML architecture promotes a loose coupling between the component that enforces decisions, the policy enforcement point (PEP) and the component that decides based on XACML policies, the policy decision point (PDP).

The XACML standard defines the format of the request and the response between the PEP and the PDP. As the default representation of XACML is XML and is backed by a schema, the request and response are typically expressed as XML elements or documents. Depending on the PDP implementation, the request and response could be embedded inside a SOAP message or even a SAML assertion as described in the SAML profile of XACML.

With the rise in popularity of APIs and its consumerization, it becomes important for XACML to be easily understood in order to increase the likelihood it will be adopted. In particular, XML is often considered to be too verbose. Developers increasingly prefer a lighter representation using JSON, the JavaScript object notation.

This profile aims at defining a JSON format for the XACML request and response. It also defines the transport between client (PEP) and service (PDP).

In writing this document, the authors have kept three items in mind:

1. Equivalence: a XACML request and response expressed in XML need not be strictly equivalent in structure to a XACML request expressed in JSON so long as the meaning remains the same and so long as the JSON and XML requests would lead to the same response (decision, obligation, and advice).
2. Lossless behavior: it MUST be possible to translate XACML requests and responses between XML and JSON representations in either direction at any time without semantic loss.
3. Transport-agnostic nature: the JSON representation MUST contain all the information the XACML request and / or response contains: this means the transport layer cannot convert XACML decisions into HTTP codes e.g. HTTP 401 for a Deny decision.

## 1.1 Terminology

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

## 1.2 Normative References

- |            |  |
|------------|--|
| [RFC2119]  | S. Bradner, <i>Key words for use in RFCs to Indicate Requirement Levels</i> , <a href="http://www.ietf.org/rfc/rfc2119.txt">http://www.ietf.org/rfc/rfc2119.txt</a> , IETF RFC 2119, March 1997.   |
| [RFC4627]  | D. Crockford, <i>The application/json Media Type for JavaScript Object Notation (JSON)</i> , <a href="http://tools.ietf.org/html/rfc4627">http://tools.ietf.org/html/rfc4627</a> , IETF RFC 4627, July 2006.   |
| [XACMLMDP] | OASIS Committee Draft 03, <i>XACML v3.0 Multiple Decision Profile Version 1.0</i> . 11 March 2010. <a href="http://docs.oasis-open.org/xacml/3.0/xacml-3.0-multiple-v1-spec-cd-03-en.html">http://docs.oasis-open.org/xacml/3.0/xacml-3.0-multiple-v1-spec-cd-03-en.html</a> |
| [ECMA262]  | S. Bradner, <i>ECMAScript Language</i> , <a href="http://www.ecma-international.org/publications/files/ecma-st/ECMA-262.pdf">http://www.ecma-international.org/publications/files/ecma-st/ECMA-262.pdf</a> , Standard ECMA 262, June 2011.                                   |

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48 W3C Recommendation 26 November 2008, available at  
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51 Recommendation 28 October 2004, available at  
52 <http://www.w3.org/TR/xmlschema-2/>
- 53 **[XPATH]** James Clark and Steve DeRose, XML Path Language (XPath), Version 1.0, W3C  
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### 55 **1.3 Non-Normative References**

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- 59 **[HTTP]** *Hypertext Transfer Protocol*. June 1999. IETF RFC 2616.  
60 <http://tools.ietf.org/html/rfc2616>
- 61 **[HTTPS]** *HTTP over TLS*. May 2000. IETF RFC 2818. <http://tools.ietf.org/html/rfc2818>  
62
- 63 **[BASE64]** *The Base16, Base32, and Base64 Data Encodings*. October 2006. IETF RFC  
64 4648. <http://tools.ietf.org/html/rfc4648>  
65

---

66 **2 Vocabulary**

67 **{Non-normative}**

68 XML introduces the notion of elements. The equivalent notion in JSON is an object. XML introduces the  
69 notion of attributes. The equivalent notion in JSON is a member.

---

## 70 3 Overview of the translation mechanisms

### 71 3.1 Assumed default values

72 To avoid bloating the JSON request and response, certain parts of a request and response have default  
73 values which can then be omitted. As an example, the default value for the data-type of an attribute value  
74 is `String` (<http://www.w3.org/2001/XMLSchema#string>).

75 The user should refer to the XACML 3.0 specification document for a normative definition of the request  
76 and response elements.

### 77 3.2 Object names

78 Unless otherwise stated, JSON object names MUST match the XACML XML element and / or attribute  
79 names exactly, including case.

### 80 3.3 Object cardinality

81 When in the XACML specification, an object (XML element) can occur more than once (e.g. 0..\* or 1..\*),  
82 the JSON equivalent MUST use an array of objects.

83 The class diagram in 4.1. Class Diagram states the cardinality and relationship between objects.  
84

### 85 3.4 Data Types

86 This section defines how data-types are represented and handled in the JSON representation. Chapter  
87 10, section 10.2.7 in the XACML 3.0 specification as well as section A.2 list the data-types that are  
88 defined in XACML. These are listed in the table below in section 3.4.1. It lists the shorthand value that  
89 MAY be used when creating a XACML attribute in the JSON representation.

#### 90 3.4.1 Supported Data Types

91 The full XACML data type URI can also be used in JSON as the JSON shorthand type codes are a  
92 convenience, not a replacement.

93 It is also possible to omit for certain XACML data types the JSON property `DataType` when it can safely  
94 be inferred from the value of the attribute.

XACML data type identifier	JSON shorthand type code	Mapping / Inference Rule
<a href="http://www.w3.org/2001/XMLSchema#string">http://www.w3.org/2001/XMLSchema#string</a>	string	JavaScript "String"
<a href="http://www.w3.org/2001/XMLSchema#boolean">http://www.w3.org/2001/XMLSchema#boolean</a>	boolean	JavaScript "Boolean"
<a href="http://www.w3.org/2001/XMLSchema#integer">http://www.w3.org/2001/XMLSchema#integer</a>	integer	JavaScript "Number" with no fractional portion and within the integer range defined by the XML schema in <a href="#">[XMLDatatypes]</a> .
<a href="http://www.w3.org/2001/XMLSchema#double">http://www.w3.org/2001/XMLSchema#double</a>	double	JavaScript "Number" with fractional portion or out of integer range as

		defined in <a href="#">[XMLDatatypes]</a> .
<a href="http://www.w3.org/2001/XMLSchema#time">http://www.w3.org/2001/XMLSchema#time</a>	time	None – inference must fail.
<a href="http://www.w3.org/2001/XMLSchema#date">http://www.w3.org/2001/XMLSchema#date</a>	date	None – inference must fail.
<a href="http://www.w3.org/2001/XMLSchema#dateTime">http://www.w3.org/2001/XMLSchema#dateTime</a>	dateTime	None – inference must fail.
<a href="http://www.w3.org/2001/XMLSchema#dayTimeDuration">http://www.w3.org/2001/XMLSchema#dayTimeDuration</a>	dayTimeDuration	None – inference must fail.
<a href="http://www.w3.org/2001/XMLSchema#yearMonthDuration">http://www.w3.org/2001/XMLSchema#yearMonthDuration</a>	yearMonthDuration	None – inference must fail.
<a href="http://www.w3.org/2001/XMLSchema#anyURI">http://www.w3.org/2001/XMLSchema#anyURI</a>	anyURI	None – inference must fail.
<a href="http://www.w3.org/2001/XMLSchema#hexBinary">http://www.w3.org/2001/XMLSchema#hexBinary</a>	hexBinary	None – inference must fail.
<a href="http://www.w3.org/2001/XMLSchema#base64Binary">http://www.w3.org/2001/XMLSchema#base64Binary</a>	base64Binary	None – inference must fail.
<a href="urn:oasis:names:tc:xacml:1.0:data-type:rfc822Name">urn:oasis:names:tc:xacml:1.0:data-type:rfc822Name</a>	rfc822Name	None – inference must fail.
<a href="urn:oasis:names:tc:xacml:1.0:data-type:x500Name">urn:oasis:names:tc:xacml:1.0:data-type:x500Name</a>	x500Name	None – inference must fail.
<a href="urn:oasis:names:tc:xacml:2.0:data-type:ipAddress">urn:oasis:names:tc:xacml:2.0:data-type:ipAddress</a>	ipAddress	None – inference must fail.
<a href="urn:oasis:names:tc:xacml:2.0:data-type:dnsName">urn:oasis:names:tc:xacml:2.0:data-type:dnsName</a>	dnsName	None – inference must fail.
<a href="urn:oasis:names:tc:xacml:3.0:data-type:xpathExpression">urn:oasis:names:tc:xacml:3.0:data-type:xpathExpression</a>	xpathExpression	None – inference must fail

95 For all of the XACML data types that cannot be inferred from the value, the following MUST be observed:

- 96 • The JSON `DataType` property MUST be specified and the value expressed in the XACML string
- 97 representation of the value.
- 98 • JavaScript code may choose to parse the XACML string values into internal numeric
- 99 representations for internal use, such as for `DateTime` or `*Duration` values, but the JSON
- 100 transport representation must always express the value in the XACML string representation of the
- 101 XACML data type.

### 102 3.4.2 Arrays of values

103 In the case of an array of values, and if the `DataType` member is not specified, it may not be possible to

104 infer the `DataType` until all the values have been inspected.

105 For example, an array that contains integers except for the last value which is a double e.g. [4,3,5,2.5] is

106 in fact an array of double values.

107 An array of values that are all integer is inferred to be an array of values of the integer datatype rather

108 than double.

### 109 3.4.3 The `xpathExpression` Datatype

110 Values of the `xpathExpression` data-type are represented as JSON objects. Each such object contains

111 the following properties:

Attribute	Type	Mandatory/Optional	Default value
<code>XPathCategory</code>	URI	Mandatory	None
<code>Namespaces</code>	Array of	Optional	None

	NamespaceDeclaration		
XPath	String	Mandatory	None

112 The XPath property contains the XPath expression [XPATH] from the XACML value. The Namespaces  
 113 property contains namespace declarations for interpreting qualified names [NAMESPACES] in the XPath  
 114 expression.

115 A NamespaceDeclaration object contains the following properties:

Attribute	Type	Mandatory/Optional	Default value
Prefix	String	Optional	None
Namespace	URI	Mandatory	None

116 Each NamespaceDeclaration object describes a single XML namespace declaration [NAMESPACES].  
 117 The Prefix property contains the namespace prefix and the Namespace property contains the namespace  
 118 name. In the case of a namespace declaration for the default namespace the Prefix property SHALL be  
 119 absent.

120 The Namespaces array MUST contain a NamespaceDeclaration object for each of the namespace  
 121 prefixes used by the XPath expression. The Namespaces array MAY contain additional  
 122 NamespaceDeclaration objects for namespace prefixes that are not used by the XPath expression. There  
 123 SHALL NOT be two or more NamespaceDeclaration objects for the same namespace prefix.

### 124 3.4.3.1 Example

125 {Non-normative}

126 This example shows the XML representation of an XACML attribute with a value of the xpathExpression  
 127 data-type and its corresponding representation in JSON.

- 128 • As XML:

```
129
130 <Attribute xmlns="urn:oasis:names:tc:xacml:3.0:core:schema:wd-17"
131   AttributeId="urn:oasis:names:tc:xacml:3.0:content-selector">
132   <AttributeValue xmlns:md="urn:example:med:schemas:record"
133     XPathCategory="urn:oasis:names:tc:xacml:3.0:attribute-category:resource"
134     DataType="urn:oasis:names:tc:xacml:3.0:data-type:xpathExpression"
135   >md:record/md:patient/md:patientDoB</AttributeValue>
136 </Attribute>
```

- 137 • As JSON:

```
138   "Attribute": {
139     "Id" : "urn:oasis:names:tc:xacml:3.0:content-selector",
140     "DataType" : "xpathExpression",
141     "Value" : {
142       "XPathCategory" : "urn:oasis:names:tc:xacml:3.0:attribute-category:resource",
143       "Namespaces" : [{
144         "Namespace" : "urn:oasis:names:tc:xacml:3.0:core:schema:wd-17"
145       }],
146       {
147         "Prefix" : "md",
148         "Namespace" : "urn:example:med:schemas:record"
149       }
150     },
151     "XPath" : "md:record/md:patient/md:patientDoB"
152   }
}
```

### 153 3.4.4 Special numeric values

154 The following special numeric values MUST also be handled

- 155 • JavaScript NaN -> "NaN"

- 156 • JavaScript positive infinity -> "INF"
- 157 • JavaScript negative infinity -> "-INF"
- 158 • JavaScript positive zero -> 0
- 159 • JavaScript negative zero -> 0 (-0 is a valid text representation, but the sign will be ignored by
- 160 XACML in comparisons, per XML #double defined in [XMLDatatypes](#))

### 161 3.5 Example

162 {Non-normative}

163 The example below illustrates possible notations and the behavior of the JSON interpreter:

Equivalent examples	
Attribute representation explicitly stating the data-type	Attribute representation omitting the data-type
<pre>"Attribute": {   "Id"      : "document-id"   "DataType": "integer"   "Value"   : 123 }</pre>	<pre>"Attribute": {   "Id"      : "document-id"   "value"   : 123 }</pre>

164

165 In the latter example where the JSON `DataType` property is omitted, the JSON translation must use the  
 166 closest data type, in this case integer.

167

## 4 The XACML request

168

### 4.1 Class Diagram

169

The following class diagram represents the XACML request structure for the JSON representation. It is not a representation of the XACML request as expressed in XML.

170

171

The key differences are:

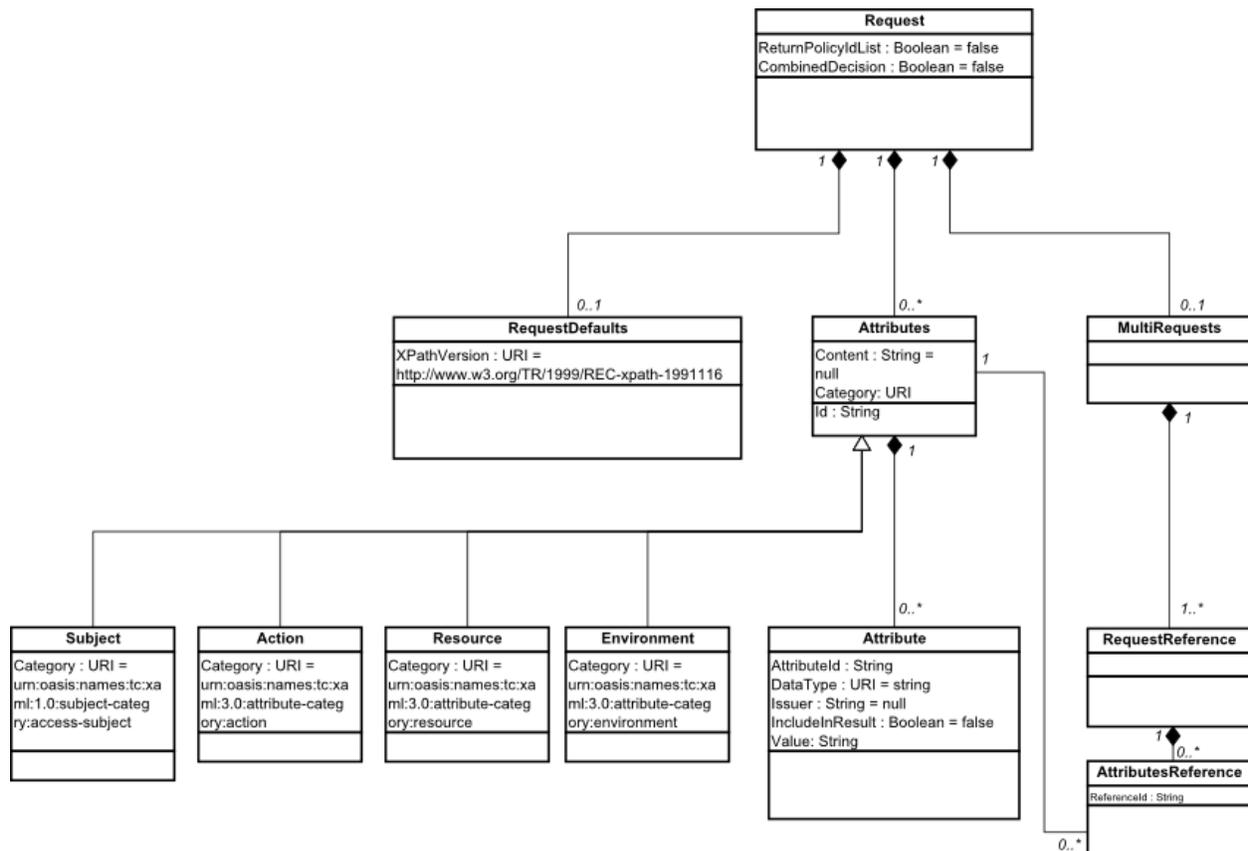
172

- The AttributeValue element in the XML representation no longer exists. The information it bears in XML is moved to the parent Attribute object in the JSON representation.

173

174

- There are 4 new objects for attributes belonging to the most commonly used categories.



175

176

177

### 4.2 Representation of the XACML request in JSON

178

#### 4.2.1 The Request object representation

179

The JSON object name for the request will be `Request`

180

The `Request` object contains the following properties:

181

- `ReturnPolicyIdList` of type Boolean

182

- `CombinedDecision` of type Boolean

183

- `XPathVersion` of type String

184 These properties are represented as members. The JSON representation assumes the following default  
 185 values

Attribute	Type	Default value
ReturnPolicyIdList	Boolean	False. The ReturnPolicyIdList can be omitted in the JSON representation.
CombinedDecision	Boolean	False. The ReturnPolicyIdList can be omitted in the JSON representation.
XPathVersion	String	http://www.w3.org/TR/1999/REC-xpath-19991116 . The XPathVersion can be omitted in the JSON representation.

186  
 187 In addition to these properties, the Request element also contains the following objects:

- 188 • Category: this is represented as a JSON array of Category objects; the Category object  
 189 corresponds to the XML Attributes element. Much like the Attributes element is specific to a given  
 190 attribute category, the Category object in JSON is specific to a given category.
- 191 • MultiRequests: this is an optional object and can be omitted. It serves to support the Multiple  
 192 Decision Profile [XACMLMDP].

193 The representation of these objects is elicited in the following relevant sections.

194 Note that, in the XACML XML schema, the XML Request element contains a RequestDefaults element.  
 195 To simplify things and since the RequestDefaults element contained a single element XPathVersion with  
 196 a single value, the RequestDefaults element was flattened into a single JSON property called  
 197 XPathVersion as mentioned in the above table.

### 198 4.2.1.1 Example

```
199 {Non-normative}
200 "Request": {
201     " XPathVersion" : "http://www.w3.org/TR/1999/REC-xpath-19991116"
202 }
203 }
```

### 205 4.2.2 The Category object representation

206 The JSON `Category` object contains the following properties:

Attribute	Type	Mandatory/Optional	Default value
CategoryId	anyURI	Mandatory	None – the identifier used in the XML representation shall be used in its JSON representation except where shorthand notations have been defined.
Id	String	Optional	The Id property is optional in the JSON representation. There is no default, assumed, value for the Id in JSON. If there is a value specified in the XML representation, it must also be specified in the JSON representation.
Content	String	Optional	The value of the Content property must be escaped or encoded as explained in 4.2.3.

--	--	--	--

207

208 In addition to these properties, the `Category` object also contains:

- 209 • Attribute: this is an array of Attribute objects as defined in 4.2.4 The Attribute Object  
210 representation

211 The `Category` object is the equivalent of the `<Attributes/>` element in the XACML XML representation.

212 The structure and default values for the aforementioned are elicited in the following relevant sections.

### 213 4.2.2.1 Default Category objects

214 To simplify the JSON representation, this profile also defines four optional default objects that are  
215 semantically equivalent to the `Category` object. These default objects assume a default value for the  
216 `CategoryId` property so that it need not be explicitly written. The following table summarizes these four  
217 objects and the default values

Name	Default value for the child <code>Category</code> property
Subject	urn:oasis:names:tc:xacml:1.0:subject-category:access-subject
Action	urn:oasis:names:tc:xacml:3.0:attribute-category:action
Resource	urn:oasis:names:tc:xacml:3.0:attribute-category:resource
Environment	urn:oasis:names:tc:xacml:3.0:attribute-category:environment

### 218 4.2.2.2 Example

219 {Non-normative}

```
220 {
221   "Request": {
222     "Category": [{
223       "CategoryId": "custom-category",
224       "Attribute": [...]
225     },
226     {
227       "CategoryId": "another-custom-cat",
228       "Attribute": [...]
229     }
230   ]
231   "Subject": {
232     "Attribute": [...]
233   }
234 }
235 }
```

236

### 237 4.2.3 The Content Object representation

238 There are two possible ways to represent the XML content of a XACML request in the JSON  
239 representation: [XML escaping](#) or [Base64 encoding](#). Both ways are exclusive one of another.

#### 240 4.2.3.1 XML Escaping

241 The JSON `Content` object data-type is a string which MUST be null or contain an XML payload per the  
242 XACML specification.

243 XML Content must be escaped before being inserted into the JSON request. JSON dictates double  
244 quotes (") be escaped using a backslash (\). This profile therefore follows this behavior.  
245 In addition, since the XML content could itself contain backslashes and possibly the sequence \", it is  
246 important to also escape backslashes.

#### 247 **4.2.3.2 Base64 Encoding**

248 In the case of Base64 encoding, the XML content shall be converted to its Base64 representation as per  
249 **[BASE64]**.

#### 250 **4.2.3.3 Example:**

251 {Non-normative}

252 The following is an example using XML escaping as defined in 4.2.3.1.

253 "Request" :

```
254 {  
255     "Content" : "<?xml version=\"1.0\"?><catalog><book  
256 id=\"bk101\"><author>Gambardella, Matthew</author><title>XML Developer's  
257 Guide</title><genre>Computer</genre><price>44.95</price><publish_date>2000-  
258 10-01</publish_date><description>An in-depth look at creating applications  
259 with XML.</description></book>"  
260 }
```

261 The following is an example using Base64 encoding as defined in 4.2.3.2.

262 "Request" :

```
263 {  
264     "Content" :  
265     "PD94bWwgdmVyc2l1vbj0iMS4wIj8+PGNhdGFsb2c+PGJvb2sgaWQ9ImJrMTAxIj48YXV0aG9yPkdh  
266 bWJhcmRlbGxhLCBNYXR0aGV3PC9hdXRob3I+PHRpdGx1PlhNTCBEZXZ1bG9wZXIYBhdWlkZTwvd  
267 G10bGU+PGdlbnJlPkNvbXB1dGVyPC9nZW5yZT48cHJpY2U+NDQuOTU8L3ByaWNlPjxwdWJsaXNoX2  
268 RhdGU+MjAwMC0xMC0wMTwvcHVibGlzaF9kYXRlPjxkZXNjcmlwdGlvbj5BbiBpb1lkZXB0aCBsb29  
269 rIGF0IGNyZWZ0aW5nIGFwcGxpY2F0aW9ucyB3aXRoIFhNTC48L2Rlc2NyaXB0aW9uPjwvYm9vaz4=  
270 "  
271 }
```

#### 273 **4.2.4 The Attribute Object representation**

274 The JSON `Attribute` object contains an array of `Attribute` objects. The `Attribute` object contains  
275 the following properties:

Property name	Type	Mandatory/Optional	Default value
AttributeId	URI	Mandatory	None – the identifier used in the XML representation of a XACML attribute shall be used in its JSON representation
Value	Either of String, Boolean, Number, Object, Array of String, Array of Boolean, Array of Number, Array of Object, or a mixed Array of String and Number where the String values represent a numerical value.	Mandatory	
Issuer	String	Optional	Null
DataType	URI	Optional	The <code>DataType</code> value can be omitted in the JSON representation. Its default value will be <code>http://www.w3.org/2001/XMLSchema#string</code> unless it can be safely assumed according to the rules set in 3.4.1 Supported Data .  In the case of an array of values, the <code>DataType</code> cannot be inferred from the values in the array and the <code>DataType</code> JSON property must be specified.
IncludeInResult	Boolean	Optional	False.

#### 276 4.2.4.1 Example

277 {Non-normative}

```
278     "Attribute": [{
279         "Id": "urn:oasis:names:tc:xacml:2.0:subject:role",
280         "Value" : ["manager","administrator"]
281     }]
```

#### 282 4.2.5 The MultiRequests object representation

283 The `MultiRequests` object is optional in the JSON representation of XACML. Its purpose is to support  
284 the Multiple Decision Profile [\[XACMLMDP\]](#).

285 The `MultiRequests` object contains an array of `RequestReference` objects. There must be at least  
286 one `RequestReference` object inside the `MultiRequests` object.

#### 287 4.2.6 The RequestReference object representation

288 The `RequestReference` object contains a single property called `ReferenceId` which is an array of  
289 string. Each `ReferenceId` value must be the value of an `Attributes` object `Id` property.

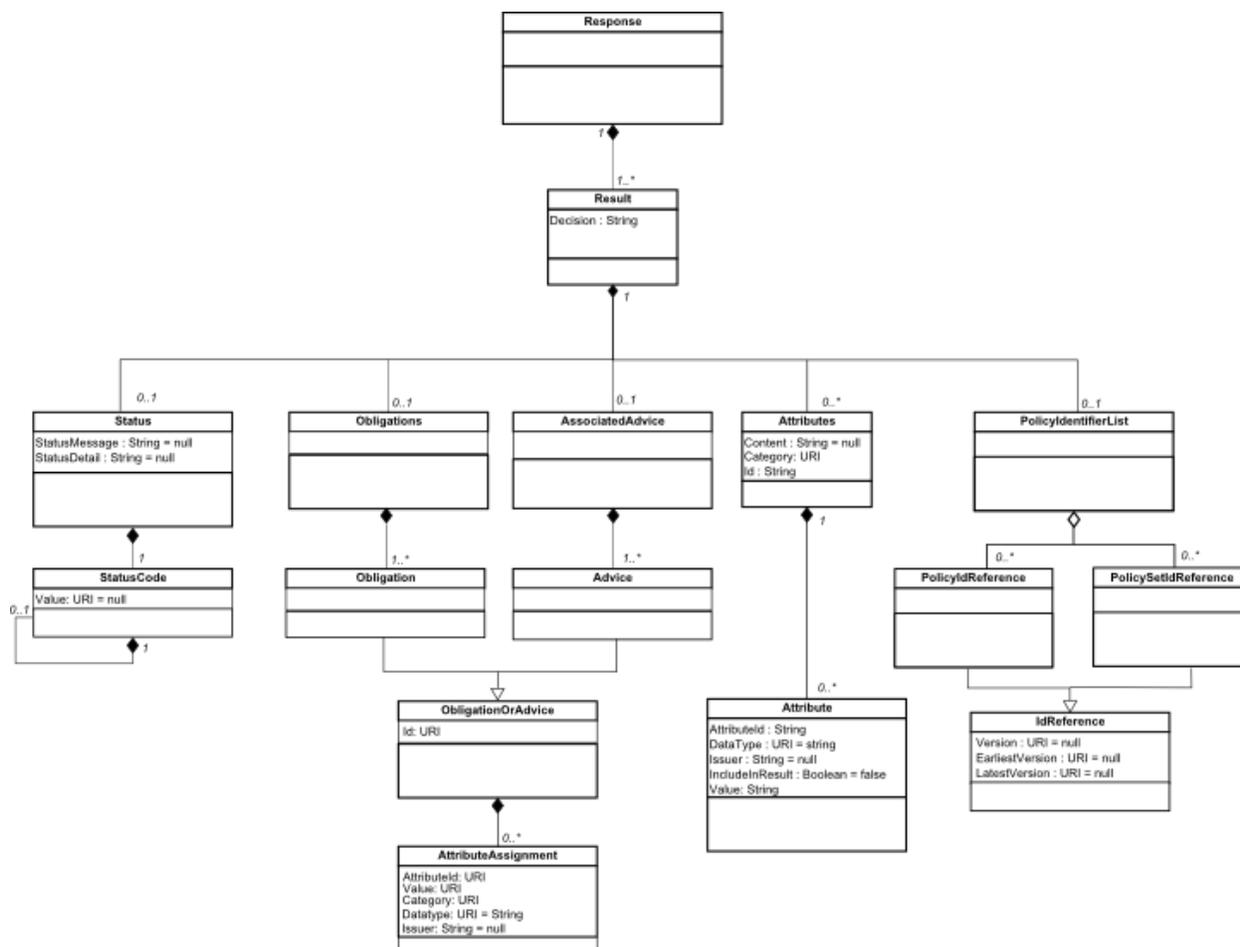
#### 290 4.2.6.1 Non-normative example

291 {

```
292 MultiRequests : {
293     "RequestReference": [{
294         "ReferenceId" : ["foo1","bar1"]
295     },
296     {
297         "ReferenceId" : ["foo2","bar1"]
298     },
299     {
300         "ReferenceId" : ["foo3","bar1"]
301     }]
302 }
303 }
```

## 304 5 The XACML response

### 305 5.1 Class Diagram



306

## 307 5.2 Representation of the XACML response in JSON

### 308 5.2.1 The Response object representation

309 The `Response` property in its JSON representation will contain an array of `Result` objects. The `Result`  
 310 object representation is detailed hereafter. The array **MUST** contain at least one `Result` object and is  
 311 unbounded.

312 The JSON representation effectively eliminates an unnecessary nesting of `Response` and `Result` as  
 313 introduced in XACML's XML schema. The notion of an array of values is used to convey the nesting.

### 314 5.2.2 The Result object representation

315 The `Result` object in JSON will contain the following properties:

Property name	Type	Mandatory/Optional	Default value
Decision	String	Mandatory	None – in addition there are only 4 valid values which are “Permit”, “Deny”, “NotApplicable”, and

			"Indeterminate". The values are case-sensitive.
--	--	--	---

316 In addition to the aforementioned properties, the `Result` object also contains the following objects:

- 317 • `Status`: this object is optional.
- 318 • `Obligations`: this object is optional.
- 319 • `AssociatedAdvice`: this object is optional.
- 320 • `Attributes`: this object is optional. It can be single-valued or an array of `Attributes` object.
- 321 • `PolicyIdentifierList`: this object is optional.

## 322 5.2.3 The Status object representation

323 The `Status` object in JSON will contain the following properties:

Property name	Type	Mandatory/Optional	Default value
<code>StatusMessage</code>	String	Optional	None.
<code>StatusDetail</code>	String	Optional	None.

324 In addition to the above properties, the `Status` object in JSON also contains a `StatusCode` object  
325 detailed hereafter.

326 `StatusDetail` can contain arbitrary XML as well. In the case that `StatusDetail` does contain XML,  
327 the XML content must be escaped using the same technique as specified in 4.2.3 The Content Object  
328 representation.

## 329 5.2.4 The StatusCode object representation

330 The `StatusCode` object in JSON contains the following properties:

Property name	Type	Mandatory/Optional	Default value
<code>Value</code>	URI	Optional	<code>urn:oasis:names:tc:xacml:1.0:status:ok.</code>

331 In addition, the `StatusCode` object may contain a sequence of `StatusCode` objects – hence potentially  
332 creating a recursive nesting of `StatusCode` objects.

### 333 5.2.4.1 Example

334 {Non-normative}

```

335 {
336   "Response": [{
337     "Decision": "Permit"
338     "Status": {
339       "StatusCode": {
340         "Value" : "http://foo.bar"
341       }
342     }
343   }]
344 }
```

## 345 5.2.5 The Obligations object representation

346 The `Obligations` property in the JSON representation is simply an array of `ObligationOrAdvice`  
347 objects. The `ObligationOrAdvice` object is detailed hereafter.

348 **5.2.6 The AssociatedAdvice object representation**

349 The `AssociatedAdvice` property in the JSON representation is simply an array of `Advice` objects. The  
350 `Advice` object is detailed hereafter.

351 **5.2.7 The ObligationOrAdvice object representation**

352 The `ObligationOrAdvice` object contains the following properties in its JSON representation:

Property name	Type	Mandatory/Optional	Default value
Id	URI	Mandatory	None.

353 Note that the `ObligationOrAdvice` object maps to either of an `Advice` or `Obligation` element in the  
354 XACML XML representation. Where in the XML representation, each element has an attribute called  
355 `AdviceId` and `ObligationId` respectively, in the JSON representation, the naming has been harmonized to  
356 `Id`.

357 The `ObligationOrAdvice` object contains an unbounded array of `AttributeAssignment` objects.

358 **5.2.8 The AttributeAssignment object representation**

359 The `AttributeAssignment` object contains the following properties in its JSON representation:

Property name	Type	Mandatory/Optional	Default value
AttributeId	URI	Mandatory	None.
Value	Variable	Mandatory	None
Category	URI	Optional	None
DataType	URI	Optional	String
Issuer	String	Optional	None

360

361 **5.2.9 The Attributes object representation**

362 The JSON representation of the `Attributes` object in a XACML response respects the representation  
363 defined in 4.2.2 The `Category` object representation.

364 TODO: add text explaining how `Attributes` is in fact an array of `Attributes`

365 Also explain that `Content` never appears in a `Response`? Check with Erik

366 **5.2.10 The PolicyIdentifier object representation**

367 The `PolicyIdentifier` object contains 2 properties in its JSON representation:

Property name	Type	Mandatory/Optional	Default value
PolicyIdReference	Array of IdReference	Optional	None.
PolicySetIdReference	Array of IdReference	Optional	None

368

369 **5.2.11 The IdReference object representation**

370 The `IdReference` object representation contains the following properties in its JSON representation:

Property name	Type	Mandatory/Optional	Default value
Id	URI	Mandatory	Represents the value stored inside the XACML XML <code>PolicyIdReference</code> or <code>PolicySetIdReference</code>
Version	String	Optional	None.

371

---

## 372 6 Transport

373 The XACML request represented in its JSON format MAY be carried from a PEP to a PDP via an HTTP  
374 **[HTTP]** POST request.

375 HTTP Headers which may be used are:

- 376 • Content-Type: application/json
- 377 • Accept: application/json

378 The REST profile of XACML [XACMLREST] defines means of sending a XACML request to a PDP and  
379 how a response is returned.

### 380 6.1 Transport Security

381 **{Non-normative}**

382 The use of SSL/TLS **Error! Reference source not found.** is RECOMMENDED to protect requests and  
383 responses as they are transferred across the network.

---

## 384 7 IANA Registration

385 The following section defines the information required by IANA when applying for a new media type.

### 386 7.1 Media Type Name

387 application

### 388 7.2 Subtype Name

389 xacml+json

### 390 7.3 Required Parameters

391 None.

### 392 7.4 Optional Parameters

393 version: The version parameter indicates the version of the XACML specification. Its range is the range of  
394 published XACML versions. As of this writing that is: 1.0, 1.1, 2.0, and 3.0. These and future version  
395 identifiers are of the form x.y, where x and y are decimal numbers with no leading zeros, with x being  
396 positive and y being non-negative.

### 397 7.5 Encoding Considerations

398 Same as for application/xml [\[RFC4627\]](#).

### 399 7.6 Security Considerations

400 Per their specification, application/xacml+json typed objects do not contain executable content.  
401 XACML requests and responses contain information which integrity and authenticity are important.  
402 To counter potential issues, the publisher may use the transport layer's security mechanisms to secure  
403 xacml+json typed objects when they are in transit. For instance HTTPS, offer means to ensure the  
404 confidentiality, authenticity of the publishing party and the protection of the request / response in transit.

### 405 7.7 Interoperability Considerations

406 XACML 3.0 uses the urn:oasis:names:tc:xacml:3.0:core:schema:wd-17 XML namespace URI. XACML  
407 2.0 uses the urn:oasis:names:tc:xacml:2.0:policy XML namespace URI.

### 408 7.8 Applications which use this media type

409 Potentially any application implementing XACML, as well as those applications implementing  
410 specifications based on XACML or those applications requesting an authorization decision from a XACML  
411 implementation.

### 412 7.9 Magic number(s)

413 Per [\[RFC4627\]](#), this section is not applicable.

### 414 7.10 File extension(s)

415 Per [\[RFC4627\]](#), .json.

416 **7.11 Macintosh File Type Code(s)**

417 Text

418 **7.12 Intended Usage**

419 Common

---

## 420 8 Examples

421 {Non-normative}

### 422 8.1 Request Example

423 {Non-normative}

424 The following is a sample XACML request expressed in JSON.

```
425 {
426     "Request" : {
427         "Subject" : {
428             "Attribute": [
429                 {
430                     "Id" : "subject-id",
431                     "Value" : "Andreas"
432                 },
433                 {
434                     "Id" : "location",
435                     "Value" : "Gamla Stan"
436                 }
437             ]
438         },
439         "Action" : {
440             "Attribute":
441                 {
442                     "Id" : "action-id",
443                     "Value" : "http://www.xacml.eu/buy",
444                     "DataType" : "anyURI"
445                 }
446         },
447         "Resource" : {
448             "Attribute": [
449                 {
450                     "Id" : "book-title",
451                     "Value" : "Learn German in 90 days"
452                 },
453                 {
454                     "Id" : "currency",
455                     "Value" : "SEK"
456                 },
457                 {
458                     "Id" : "price",
459                     "Value" : 123.34
460                 }
461             ]
462         }
463     }
464 }
```

```
462         }
463     }
464 }
```

## 465 8.2 Response Example

466 **{Non-normative}**

467 The following is a sample XACML response expressed in JSON.

```
468 {
469     "Response" : [{
470         "Decision" : "Permit"
471     }
472 ]
473 }
```

---

474 **9 Conformance**

475 An implementation may conform to this profile if and only if both the XACML request and the response  
476 are correctly encoded into JSON as previously described in sections 3 through 5 and follows the transport  
477 requirements as specified in section 6.

---

478 **Appendix A. Acknowledgments**

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

481 **Participants:**

482 Steven Legg, ViewDS  
483 Rich Levinson, Oracle  
484 Hal Lockhart, Oracle  
485 Bill Parducci,  
486 Erik Rissanen, Axiomatics  
487 Anil Saldhana, Red Hat  
488 Remon Sinnema, EMC  
489 Danny Thorpe, Dell  
490 Paul Tyson, Bell Helicopters  
491

## Appendix B. Revision History

Revision	Date	Editor	Changes Made
WD 01	2 Jul 2012	David Brossard	Initial working draft
WD 02	9 Jul 2012	David Brossard	Integrated comments from XACML list. Enhanced the section on data-types. Added a class diagram for clarity. Changed tense to present. Removed overly explicit comparisons with XML representation.
WD 03	19 Jul 2012	David Brossard	Started work on the XACML response
WD 04	20 Aug 2012	David Brossard	Finalized work on the XACML response, added a note on HTTPS. Restructured the document to extract paragraphs common to the Request and Response section.
WD 05	20 Sep 2012	David Brossard	Took in comments from the XACML TC list (technical comments and typographical corrections)
WD 06	29 Oct 2012	David Brossard	Removed the Non-normative section in the appendix. Completed the conformance section. Added non-normative tags where needed. Also added a sample response example. Added the section on IANA registration.
WD07	15 Nov 2012	David Brossard	Removed the XPathExpression from the supported DataTypes. Fixed the examples as per Steven Legg's email. Fixed the XML encoding of XML content as per conversations on the XACML TC list.
WD08	27 Nov 2012	David Brossard	Fixed the Base64 encoding section as per Erik Rissanen's comments (the section got cut out of WD07 by accident).
WD09	24 Dec 2012	David Brossard	Addressed comments and fixed errors as per emails sent on the XACML TC list in December.

WD10	4 Feb 2013	David Brossard	<p>Fixed the IANA registration section.</p> <p>Fixed inconsistent DataType spelling. DataType is always the XACML attribute and JSON property name. Data type refers to the English notion.</p> <p>Fixed the status XML content encoding to be consistent with the Request XML encoding technique.</p> <p>Fixed a non-normative section label.</p> <p>Fixed the formatting of JSON property names.</p> <p>Fixed the XACML to JSON data type inference by adding references to the relevant XML data types.</p>
WD11	5 Feb 2013	David Brossard	Fixed the AttributeAssignment section
WD12	10 May 2013	David Brossard	<p>Reinserted a section on the xpathExpression data type.</p> <p>Fixed the PolicyIdReference section (missing value).</p> <p>Fixed the Response example.</p> <p>Simplified the XPathVersion / RequestDefaults</p> <p>Renamed Attributes → Category</p> <p>Removed unnecessary nesting in Response → Result</p> <p>Renamed Attributes to Category</p>