

**IODEF Enumeration Reference Format**  
**draft-ietf-mile-enum-reference-format-00**

Abstract

The Incident Object Description Exchange Format [[IODEF](#)] provides a Reference class used to reference external entities (such as enumeration identifiers). However, the method of external entity identification has been left unstructured. This document describes a method to provide structure for referencing external entities for the [[IODEF](#)] Reference class.

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## 1 Introduction

There is an identified need to specify a format to include relevant enumeration values in an IODEF document. It is anticipated that this requirement will exist in other standardization efforts within several IETF Working Groups, but the scope of this document pertains solely to [\[IODEF\]](#).

### 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 [RFC 2119](#) [[RFC2119](#)].

## 2. Referencing External Enumerations

The need is to place enumeration identifiers and their references in [\[IODEF\]](#)'s Reference class. There are several ways to accomplish this goal, but the most appropriate at this point is to require a specific format for the ReferenceName string of the [\[IODEF\]](#) Reference class, such that an IANA table can be used to catalog a variety of reference types.

```
+-----+
| Reference      |
+-----+
|               |<-----[ ReferenceName ]
|               |<--{0..*}--[ URL           ]
|               |<--{0..*}--[ Description  ]
+-----+
```

FIGURE 1: [\[IODEF\]](#) Reference Class

Per [\[IODEF\]](#) the ReferenceName is of type ML\_STRING. This becomes problematic when specific references, especially enumerations such as [\[CVE\]](#), [\[CCE\]](#), [\[CPE\]](#) and so on, are referenced - how is an implementer to know which type of reference this is, and thus how to parse it? One solution, presented here, is to require that ReferenceName follow a particular format.

### 2.1 Reference Name Format

The Reference Name Format uses XML to provide the structure for enumeration identification, and requires that a specific Abbreviation and RegistryVersion be associated with the ID. An implementer can look up the ID type (as referenced by the logical tuple of Abbreviation and RegistryVersion) in the IANA table (see [Section 4](#))

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to understand how the ID is structured.

```
<Reference>
  <ReferenceName>
    <EnumRef>
      <Abbreviation>CXI</Abbreviation>
      <RegistryVersion>1</RegistryVersion>
      <ID>CXI-1234-XYZ</ID>
    </EnumRef>
  </ReferenceName>
  <URL>http://cxi.example.com</URL>
  <Description>Foo</Description>
</Reference>
```

Information in the IANA table (see [Section 4](#)) would include:

```
Full Name: Concept X Identifier
Abbreviation: CXI
Registry Version: 1
Enumeration Version: any
Specification URI: http://cxi.example.com/spec_url
```

## 2.3 Reference Method Applicability

While the scope of this document pertains to [[IODEF](#)], it should be readily apparent that any standard needing to reference an enumeration identified by a specially formatted string can use this method of providing structure after the standard has been published. In effect, this method provides a standardized interface for enumerations, thus allowing a loose coupling between a given standard and the enumeration identifiers it needs to reference now and in the future.



### **3 Security Considerations**

None.

### **4 IANA Considerations**

This document specifies an identifier format for the [[IODEF](#)] ReferenceName string of the Reference class.

This memo creates the following registry for IANA to manage:

Name of the Registry: "Enumeration Reference Type Identifiers"

Note that certain name requests should not be permitted as either Full Name or Abbreviation entries for the requested IANA table.

Fields to record in the registry:

Full Name: The full name of the enumeration as a string from the ASCII character set.

Abbreviation: The abbreviation of the enumeration as a string from the ASCII character set. An abbreviation may be an initialism or acronym, is free-form, but is limited to between two and ten upper-case characters (used to avoid case-specific mismatch errors) meeting the regular expression (between the quotes; Perl Regular Expressions): `^[A-Z]{2,20}$`

Registry Version: The IANA-registry-specific version to which an enumeration identifier pertains as an integer greater than zero. The Registry Version is intended to be incremented for each new entry, which permits any string representation for the Enumeration Version, but explicitly structures enumeration ID versions for the purpose of the registry.

Enumeration Version: The version of the enumeration as a free-form string from the ASCII character set.

Specification URI: A list of one or more URIs [[RFC3986](#)] from which the registered specification can be obtained. The registered specification MUST be readily and publicly available from that URI.

Initial registry contents: None.

Allocation Policy: Expert Review [[RFC5226](#)] and Specification Required [[RFC5226](#)]



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The Designated Expert is expected to consult with the MILE (Managed Incident Lightweight Exchange) working group or its successor if any such WG exists (e.g., via email to the working group's mailing list). The Designated Expert is expected to review the request and validate the appropriateness of the enumeration for the attribute. If a specification is associated with the request, it **MUST** be reviewed by the Designated Expert.

The Designated Expert will need to ensure the Full Name or Abbreviation entry under consideration is appropriate for the problem domain and that information at the Specification URI is sufficient for unambiguously parsing the identifier. The Designated Expert should also validate that the next appropriate Registry Version is being used for a new registration. Additionally, the Designated Expert should prefer short Abbreviations over long ones.

## 5 XML Schema

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  elementFormDefault="qualified">
  <xs:element name="EnumRef">
    <xs:complexType>
      <xs:sequence>
        <xs:element ref="Abbreviation"/>
        <xs:element ref="RegistryVersion"/>
        <xs:element ref="ID"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="Abbreviation" type="xs:NCName"/>
  <xs:element name="RegistryVersion" type="xs:integer"/>
  <xs:element name="ID" type="xs:NCName"/>
</xs:schema>
```

## 6 References

### 6.1 Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [IODEF] Danyliw, R., Meijer, J., and Y. Demchenko, "The Incident Object Description Exchange Format", [RFC 5070](#), December 2007.
- [3986] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", [BCP 26](#), [RFC 5226](#),

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## **6.2 Informative References**

[CCE] <http://cce.mitre.org>

[CPE] <http://cpe.mitre.org>

[CVE] <http://cve.mitre.org>

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