Abstract

This document specifies Version 5.11.1 of the OVAL Variables Model which contains constructs that allow for the specification of values for external_variables defined in content that was created using the OVAL Definitions Model. The OVAL Variables Model serves as a useful mechanism for parameterizing content based on the OVAL Definitions Model.

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1. Introduction
The Open Vulnerability and Assessment Language (OVAL) [OVAL-WEBSITE] is an international, information security community effort to standardize how to assess and report upon the machine state of systems. For over ten years, OVAL has been developed in collaboration with any and all interested parties to promote open and publicly available security content and to standardize the representation of this information across the entire spectrum of security tools and services.

OVAL provides an established framework for making assertions about an system's state by standardizing the three main steps of the assessment process: representing the current machine state; analyzing the system for the presence of the specified machine state; and representing the results of the assessment which facilitates collaboration and information sharing among the information security community and interoperability among tools.

This draft is part of the OVAL contribution to the IETF SACM WG that standardizes the representation used to analyze a system for the presence of a specific machine state. It is intended to serve as a starting point for the endpoint posture assessment data modeling needs of SACM specifically for creating parameterized Collection and Evaluation Guidance.

1.1. Requirements Language

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. oval_variables

The oval_variables type defines the base structure in the OVAL Variables Model for representing a collection of OVAL Variables and their associated values. This container type adds metadata about the origin of the content and allows for a signature.

<table>
<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Count</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>generator</td>
<td>oval:GeneratorType</td>
<td>1</td>
<td>Information regarding the generation of the OVAL Variables content. The timestamp property of the generator MUST represent the time at which the oval_variables was created.</td>
</tr>
<tr>
<td>variables</td>
<td>VariablesType</td>
<td>1</td>
<td>The variables defined in the OVAL Variables content.</td>
</tr>
<tr>
<td>signature</td>
<td>ext:Signature</td>
<td>0..1</td>
<td>Mechanism to ensure the integrity and authenticity of the OVAL Variables content.</td>
</tr>
</tbody>
</table>

Table 1: oval_variables Construct

3. VariablesType

The VariablesType provides a container for one or more OVAL Variables.
4. VariableType

The VariableType defines a variable in the OVAL Variables Model that corresponds to an instance of an external variable in content based on the OVAL Definitions Model.

<table>
<thead>
<tr>
<th>Property</th>
<th>Type</th>
<th>Count</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>oval:VariableIDPattern</td>
<td>1</td>
<td>The globally unique identifier of an external variable.</td>
</tr>
<tr>
<td>datatype</td>
<td>oval:SimpleDatatypeEnumeration</td>
<td>1</td>
<td>The datatype of the value(s) in the variable.</td>
</tr>
<tr>
<td>comment</td>
<td>string</td>
<td>1</td>
<td>The documentation associated with the variable instance.</td>
</tr>
<tr>
<td>value</td>
<td>string</td>
<td>1..*</td>
<td>The value(s) associated with the variable.</td>
</tr>
</tbody>
</table>

Table 3: VariableType Construct

5. OVAL Variables Model Schema

The XML Schema that implements this OVAL Variables Model can be found below.

```xml
<?xml version="1.0" encoding="utf-8"?>
<xsd:schema
 xmlns:xsd="http://www.w3.org/2001/XMLSchema"
 xmlns:oval="http://oval.mitre.org/XMLSchema/oval-common-5"
 xmlns:oval-var="http://oval.mitre.org/XMLSchema/oval-variables-5"
 xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
 targetNamespace="http://oval.mitre.org/XMLSchema/oval-variables-5"
 elementFormDefault="qualified" version="5.11">
  <xsd:import
      namespace="http://oval.mitre.org/XMLSchema/oval-common-5"
      schemaLocation="oval-common-schema.xsd"/>
  <xsd:import
      namespace="http://www.w3.org/2000/09/xmldsig#"
      schemaLocation="xmldsig-core-schema.xsd"/>
  <xsd:annotation>
    <xsd:documentation>The following is a description of the elements, types, and attributes that compose the core schema for encoding Open Vulnerability and Assessment Language (OVAL) Variables. This schema is provided to give structure to any external variables and their values that an OVAL Definition is expecting.</xsd:documentation>
  <xsd:appinfo>
    <schema>Core Variable</schema>
    <version>5.11.1</version>
```
The oval_variables element is the root of an OVAL Variable Document. Its purpose is to bind together the different variables contained in the document. The generator section must be present and provides information about when the variable file was compiled and under what version. The optional Signature element allows an XML Signature as defined by the W3C to be attached to the document. This allows authentication and data integrity to be provided to the user. Enveloped signatures are supported. More information about the official W3C Recommendation regarding XML digital signatures can be found at http://www.w3.org/TR/xmldsig-core/.

The GeneratorType is defined by the oval common schema. Please refer to that documentation for a description of the complex type.

The VariablesType complex type is a container for one or more variable elements. Each variable element holds the value of an external variable used in an OVAL Definition. Please refer
to the description of the VariableType for
more information about an individual
variable.</xsd:documentation>
</xsd:annotation>
<xsd:sequence>
  <xsd:element name="variable"
    type="oval-var:VariableType" minOccurs="1"
    maxOccurs="unbounded"/>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="VariableType">
  <xsd:annotation>
    <xsd:documentation>Each variable element
      contains the associated datatype and value
      which will be substituted into the OVAL
      Definition that is referencing this
      specific variable.</xsd:documentation>
    <xsd:documentation>The notes section of a
      variable should be used to hold
      information that might be helpful to
      someone examining the technical aspects of
      the variable. Please refer to the
description of the NotesType complex type
for more information about the notes
element.</xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="value"
      type="xsd:anySimpleType" minOccurs="1"
      maxOccurs="unbounded"/>
    <xsd:element name="notes"
      type="oval:NotesType" minOccurs="0"
      maxOccurs="1"/>
  </xsd:sequence>
  <xsd:attribute name="id"
    type="oval:VariableIDPattern" use="required"/>
  <xsd:attribute name="datatype" use="required"
    type="oval:SimpleDatatypeEnumeration">
    <xsd:annotation>
      <xsd:documentation>Note that the 'record'
datatype is not permitted on
variables.</xsd:documentation>
    </xsd:annotation>
  </xsd:attribute>
  <xsd:attribute name="comment"
    type="xsd:string" use="required"/>
</xsd:complexType>

6. Intellectual Property Considerations

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DHS, on behalf of the United States, owns the registered OVAL
trademarks, identifying the OVAL STANDARDS SUITE and any component
part, as that suite has been provided to the IETF Trust. A "(R)"
will be used in conjunction with the first use of any OVAL trademark
in any document or publication in recognition of DHS's trademark
ownership.

7. Acknowledgements
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8. IANA Considerations

This memo includes no request to IANA.

9. Security Considerations

While OVAL is just a set of data models and does not directly introduce security concerns, it does provide a mechanism by which to represent endpoint posture assessment information. This information could be extremely valuable to an attacker allowing them to learn about very sensitive information including, but not limited to: security policies, systems on the network, criticality of systems, software and hardware inventory, patch levels, user accounts and much more. To address this concern, all endpoint posture assessment information should be protected while in transit and at rest. Furthermore, it should only be shared with parties that are authorized to receive it.

Another possible security concern is due to the fact that content expressed as OVAL has the ability to impact how a security tool operates. For example, content may instruct a tool to collect certain information off a system or may be used to drive follow-up actions like remediation. As a result, it is important for security tools to ensure that they are obtaining OVAL content from a trusted source, that it has not been modified in transit, and that proper validation is performed in order to ensure it does not contain malicious data.

10. Change Log

10.1. -00 to -01

There are no textual changes associated with this revision. This revision simply reflects a resubmission of the document so that it remains in active status.

11. References

11.1. Normative References


11.2. Informative References


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