



Guide to Schematron Rules and Patterns

DOMEX Schematron Guide

Version 2015-AUG

August 13, 2015

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Chapter 1 - Introduction

1.1 - Purpose

This is an informative supplement for DOMEX. This guide is generated from the DOMEX Schematron rules and provides a consolidated reference for the business rules of this specification.

1.2 - Overview

Chapter 2 is a listing of all the numbered rules in DOMEX. For each rule, there is a rule description, a code description, and a code block with the Schematron rule.

Chapter 3 is a listing of abstract patterns used in DOMEX. The abstract patterns may be used in numbered rules or provided as reference for use in rules developed by users of DOMEX. Each abstract pattern has a code description and a code block with the abstract Schematron pattern.

Chapter 4 is a listing of the master ISM Schematron file with all of the imports of rules and patterns. Many of the rules and patterns listed in Chapters 3 and 4 rely on functions and variables defined in the master file.

Chapter 5 is a listing of rules that have been deleted.

1.3 - Schematron

The business rules for DOMEX are encoded using ISO Schematron. Schematron is a rule-based validation language that uses XML Path Language to make assertions about an XML document.

DOMEX uses the XSLT 2.0 implementation of Schematron by Rick Jelliffe (2010-04-14) as its reference implementation. The only available identifying descriptors for this implementation are the implementer's name and date of release. This implementation may be found at the following URL: <http://code.google.com/p/schematron/>.



Important

The Schematron rules in this specification use XSLT 2.0 query binding.

1.4 - Conformance

This guide is informative. The Schematron rules listed here are normative in the sense that they convey criteria that a document **MUST** adhere to, exactly as English may be used to convey normative criteria. It is not necessary for implementers to use the specific Schematron encoding in this specification. Implementers **MAY** use any encodings, tools, or languages desired to implement validation schemes for conformance to this specification. However, to conform to the specification, validation schemes **MUST** match the behavior of the reference Schematron implementation. That is, a validator **MUST** find a document valid *if and only if* the reference Schematron implementation would find the document valid according to DOMEX's Schematron rules.

Chapter 2 - Rules

All of the numbered Rules for DOMEX are listed in this section. These rules may depend on patterns defined in the Abstract Patterns section or on variables defined in the Schematron Schema section.

Rules identifiers are all of the format DOMEX-ID-XXXXX, with rule files named DOMEX_ID_XXXXX.sch. Any other heading indicates a supporting file that may influence a rule but is not actually a numbered rule.

2.1 - ../Rules/GeneralConstraints/DOMEX_ID_00001.sch

Rule Description

[DOMEX-ID-00001][Error] The @ism:DESVersion is less than the minimum version allowed: 12. Human Readable: The ism version imported by DOMEX must be greater than or equal to 12.

Code Description

For all elements that contain @ism:DESVersion, this rule verifies that the version is greater than or equal to the minimum allowed version: 12.

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="DOMEX-ID-00001">
  <sch:rule context="*[@ism:DESVersion]">
    <sch:let name="version"
      value="number(if (contains(@ism:DESVersion,'-')) then substring-before(@ism:DESVersion,'-') else @ism:DESVersion)"/>
    <sch:assert test="$version >= 12" flag="error">[DOMEX-ID-00001][Error] The @ism:DESVersion is less than the minimum version allowed: 12. Human Readable: The ism
version imported by DOMEX must be greater than or equal to 12.</sch:assert>
  </sch:rule>
</sch:pattern>
```

2.2 - ../Rules/GeneralConstraints/DOMEX_ID_00002.sch

Rule Description

[DOMEX-ID-00002][Error] If a TrustedDataObject element contains an assertion with a DOMEX structured statement, it must also contain an assertion with a DDMS structured statement. Human Readable: If a Trusted Data Object contains a DOMEX assertion, it must also contain a DDMS assertion.

Code Description

If a TDO has a DOMEX assertion, determined by checking if it has a tdf:StructuredStatement element with a child of domex:acquisition, verify that it also contains an DDMS assertion, verified by checking if it has a ddms:StructuredStatement element with a child of ddms:resource.

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="DOMEX-ID-00002">
    <sch:rule context="tdf:TrustedDataObject//*[namespace-uri()='urn:us:mil:ces:metadata:domex']">
        <sch:assert test="//ddms:resource" flag="error">[DOMEX-ID-00002][Error] If tdf:TrustedDataObject contains an assertion with a DOMEX structured statement, it must also
contain an assertion with a DDMS structured statement. Human Readable: If a Trusted Data Object contains a DOMEX assertion, it must also contain a DDMS assertion.</sch:assert>
    </sch:rule>
</sch:pattern>
```

2.3 - ../Rules/GeneralConstraints/DOMEX_ID_00003.sch

Rule Description

[DOMEX-ID-00003][Error] String length constraint violation - (element) Human Readable: String length constraint violation - (element).

Code Description

Checks string lengths for selected DOMEX elements in the DDMS assertion.

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="DOMEX-ID-00003">
    <sch:rule context="ddms:description">
        <sch:assert test="string-length(text()) &lt;= 4000" flag="error">[DOMEX-ID-00003][Error] String length constraint violation - (ddms:description) Human Readable: String
length constraint violation - (ddms:description)</sch:assert>
    </sch:rule>
</sch:pattern>
```


2.4 - ../Rules/GeneralConstraints/DOMEX_ID_00004.sch

Rule Description

[DOMEX-ID-00004][Error] If a TrustedDataObject element contains a DOMEX assertion, it must also contain an assertion with an IRM structured statement. Human Readable: If a Trusted Data Object contains a DOMEX assertion, it must also contain an IRM assertion.

Code Description

If a TDO has a DOMEX assertion, determined by checking if it has a tdf:StructuredStatement element with a child of domex:acquisition, verify that it also contains an IRM assertion, verified by checking if it has a tdf:Assertion/tdf:StructuredStatement element with a child of irm:ICResourceMetadataPackage.

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="DOMEX-ID-00004">
    <sch:rule context="//tdf:TrustedDataObject[tdf:Assertion/tdf:StructuredStatement/domex:acquisition]">
        <sch:assert test="tdf:Assertion/tdf:StructuredStatement/irm:ICResourceMetadataPackage"
            flag="error">[DOMEX-ID-00004][Error] If a TrustedDataObject element contains a DOMEX assertion, it must also contain an assertion with an IRM structured
statement. Human Readable: If a Trusted Data Object contains a DOMEX assertion, it must also contain an IRM assertion.</sch:assert>
        </sch:rule>
    </sch:pattern>
```

2.5 - ../Rules/GeneralConstraints/DOMEX_ID_00005.sch

Rule Description

[DOMEX-ID-00005][Error] Invalid GENC code. Human Readable: Invalid GENC code.

Code Description

Invokes GENC AllowableGencValues abstract pattern to validate GENC country code.

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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--><!-- artf14833 - Validate country codes against GENC CVEs -->
<sch:pattern id="DOMEX-ID-00005">
    <sch:rule context="*[@ddms:codespace]">
        <sch:assert test="some $term in document(concat('../..//CVE/IC-GENC/CVEnum',upper-case(substring(../@ddms:codespace,1,1)),translate(substring(../@ddms:codespace,2),':',''),'.xml'))//cve:CVE/cve:Enumeration/cve:Term/cve:Value satisfies $term=../@ddms:code"
                                flag="error">[DOMEX-ID-00005] [Error] Invalid GENC code.</sch:assert>
    </sch:rule>
</sch:pattern>
```

2.6 - ../Rules/GeneralConstraints/DOMEX_ID_00006.sch

Rule Description

[DOMEX-ID-00006][Error] Invalid sub-agency code. Human Readable: Invalid sub-agency code.

Code Description

Given a primary agency, validate the sub-agency.

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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--><!-- artf14833 - Validate sub-agency codes against DOMEX CVEs -->
<sch:pattern id="DOMEX-ID-00006">
    <sch:rule context="*[./domex:subAgency]">
        <sch:assert test="some $term in document(concat('../..//CVE/DOMEX/CVEnumDOMEXAgency',../domex:primaryAgency,'.xml'))//cve:CVE/cve:Enumeration/cve:Term/cve:Value satisfies
$term=../domex:subAgency"
                                flag="error">[DOMEX-ID-00006] [Error] Invalid sub-agency code.</sch:assert>
    </sch:rule>
</sch:pattern>
```

2.7 - ../Rules/GeneralConstraints/DOMEX_ID_00007.sch

Rule Description

[DOMEX-ID-00007][Error] Invalid sub-activiy specified. Human Readable: Invalid sub-activiy specified.

Code Description

Given a primary activity, validate the sub-activity.

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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--><!-- Issue #889 - Validate sub-activity codes against DOMEX CVEs -->
<sch:pattern id="DOMEX-ID-00007">
    <sch:rule context="domex:subActivity">
        <sch:assert test="some $term in document(concat('../CVE/DOMEX/CVEnumDOMEXActivity',translate(..domex:primaryActivity,' ',''),'.xml'))//cve:CVE/cve:Enumeration/
cve:Term/cve:Value satisfies $term=."
                                flag="error">[DOMEX-ID-00007] [Error] Invalid sub-activity specified.</sch:assert>
    </sch:rule>
</sch:pattern>
```

Chapter 3 - Abstract Patterns

There are no Abstract Patterns currently defined for DOMEX.

Chapter 4 - Schematron Schema

The top level Schematron file for DOMEX is in this section. This file imports all of the others and also defines many global variables they are all dependent on.

4.1 - ../DOMEX_XML.sch

Schematron Code

```
<?ICEA master?>
<!-- Notices - Distribution Notice:
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-->
<sch:schema queryBinding="xslt2">
    <sch:ns uri="http://www.w3.org/1999/xlink" prefix="xlink"/>
    <sch:ns uri="http://www.w3.org/2001/XMLSchema" prefix="xs"/>
    <sch:ns uri="urn:us:gov:ic:ism" prefix="ism"/>
    <sch:ns uri="urn:us:gov:ic:irm" prefix="irm"/>
    <sch:ns uri="urn:us:gov:ic:arh" prefix="arh"/>
    <sch:ns uri="urn:us:gov:ic:tdf" prefix="tdf"/>
    <sch:ns uri="urn:us:mil:ces:metadata:domex" prefix="domex"/>
    <sch:ns uri="urn:us:mil:ces:metadata:ddms:5" prefix="ddms"/>
    <sch:ns uri="urn:us:gov:ic:cve" prefix="cve"/>
    <!--*****--><!-- (U) DOMEX ID Rules --><!--*****--><!--(U) GeneralConstraints-->
<sch:include href="../Rules/GeneralConstraints/DOMEX_ID_00001.sch"/>
    <sch:include href="../Rules/GeneralConstraints/DOMEX_ID_00002.sch"/>
    <sch:include href="../Rules/GeneralConstraints/DOMEX_ID_00003.sch"/>
    <sch:include href="../Rules/GeneralConstraints/DOMEX_ID_00004.sch"/>
    <sch:include href="../Rules/GeneralConstraints/DOMEX_ID_00005.sch"/>
    <sch:include href="../Rules/GeneralConstraints/DOMEX_ID_00006.sch"/>
    <sch:include href="../Rules/GeneralConstraints/DOMEX_ID_00007.sch"/>
</sch:schema>
```

Chapter 5 - Removed Rules

There are no rules that have been removed for DOMEX.