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# **Guide to Schematron Rules and Patterns**

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## **IC-EDH Schematron Guide**

### **Version 1**

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## Chapter 1 - Introduction

### 1.1 - Purpose

(U) The following documentation is informative. The actual Schematron files are the normative record. This documentation is generated from the Schematron files via XSLT it may be missing some file or pieces of a file but whatever is here other than titles came from the original file.

(U) It is envisioned that this will be a useful resource to search and read but for questions and debates the source files should be consulted.

(U) Rules identifiers are all of the format IC-EDH-ID-XXXXX, with rule files named IC-EDH\_ID\_XXXXX.sch. Any other heading indicates a supporting file that may strongly influence a rule but is not actually a numbered rule.

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## Chapter 2 - Rules

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

---

## 2.1 - `./Rules/GeneralConstraints/IC-EDH_ID_00001.sch`

Rule Description: IC-EDH-ID-00001 [IC-EDH-ID-00001][Error] Every attribute in the EDH namespace must have a non-whitespace value.

Code Description: Make sure any attribute in the EDH namespace has a value if it is present.

Schematron Code:

```
<?ICEA pattern?><!-- Notices - Distribution Notice:
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    available for use without restriction.
-->
<sch:pattern id="IC-EDH-ID-00001">

    <sch:rule context="*[@edh:*)>
        <sch:assert test="every $attribute in @edh:*
satisfies          normalize-space(string($attribute))"
                    flag="error">
            [IC-EDH-ID-00001][Error]
            Every attribute in the EDH namespace must have a non-whitespace
value.
        </sch:assert>
    </sch:rule>
</sch:pattern>
```

---

## 2.2 - ../Rules/GeneralConstraints/IC-EDH\_ID\_00002.sch

Rule Description: IC-EDH-ID-00002 [IC-EDH-ID-00002][Error] The attribute DESVersion in the namespace urn:us:gov:ic:edh must be specified. Human Readable: The data encoding specification version number must be specified.

Code Description: Make sure that the attribute edh:DESVersion is specified.

Schematron Code:

```
<?ICEA pattern?><!-- Notices - Distribution Notice:
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    available for use without restriction.
-->
<sch:pattern id="IC-EDH-ID-00002">

    <sch:rule context="/">
        <sch:assert test="some $element in descendant-or-
self::node() satisfies $element/@edh:DESVersion"
            flag="error">
            [IC-EDH-ID-00002][Error] The attribute
            DESVersion in the namespace urn:us:gov:ic:edh must be specified.

            Human Readable: The data encoding specification version must
            be specified.
        </sch:assert>
    </sch:rule>
</sch:pattern>
```

## 2.3 - ../Rules/GeneralConstraints/IC-EDH\_ID\_00003.sch

Rule Description: IC-EDH-ID-00003 [IC-EDH-ID-00003][Error] The dataItemCreateDateTime must not be later the ism:createDate. Human Readable: Data items cannot be newer than their security markings.

Code Description: For EDH element DataItemCreateDateTime, ensure that the sibling ARH element, Security or ExternalSecurity, has ism:createDate that is not older than the data item itself.

Schematron Code:

```
<?ICEA pattern?><!-- Notices - Distribution Notice:
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    available for use without restriction.
-->
<sch:pattern id="IC-EDH-ID-00003">

    <sch:rule context="//*/edh:DataItemCreateDateTime">
        <sch:assert test="not(. > dateTime(following-
sibling::arh:*/@ism:createDate, xs:time('23:59:59Z')))"
            flag="error">
            [IC-EDH-ID-00003][Error] The dataItemCreateDateTime must not be
later the
            ism:createDate.

            Human Readable: Data items cannot be newer than their security
markings.
        </sch:assert>
    </sch:rule>
</sch:pattern>
```



---

## 2.4 - ../Rules/GeneralConstraints/IC-EDH\_ID\_00004.sch

Rule Description: IC-EDH-ID-00004 [IC-EDH-ID-00004][Error] The EDH elements cannot be used as root elements. Human Readable: EDH is not designed to stand-alone and therefore should never be used as a root element.

Code Description: we make sure that edh:Edh or edh:ExternalEdh are not used as the root element.

Schematron Code:

```
<?ICEA pattern?><!-- Notices - Distribution Notice:
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    available for use without restriction.
-->
<sch:pattern id="IC-EDH-ID-00004">

    <sch:rule context="/edh:*">
        <sch:assert test="false()" flag="error">
            [IC-EDH-ID-00004][Error] The EDH elements cannot be used as root
elements.

            Human Readable: EDH is not designed to stand-alone and therefore
should never
            be used as a root element.
        </sch:assert>
    </sch:rule>
</sch:pattern>
```

---

## 2.5 - `./Rules/GeneralConstraints/IC-EDH_ID_00005.sch`

Rule Description: IC-EDH-ID-00005 [IC-EDH-ID-00005][Error] Every element in the EDH namespace must have a non-whitespace value.

Code Description: Make sure any element in the EDH namespace has a value if it is present.

Schematron Code:

```
<?ICEA pattern?><!-- Notices - Distribution Notice:
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    available for use without restriction.
-->
<sch:pattern id="IC-EDH-ID-00005">

    <sch:rule context="*[edh:*)">
        <sch:assert test="every $element in edh:*
satisfies        normalize-space(string($element))"
                    flag="error">
[IC-EDH-ID-00005][Error]
value.        Every element in the EDH namespace must have a non-whitespace
        </sch:assert>
        </sch:rule>
    </sch:pattern>
```

---

## 2.6 - ../Rules/GeneralConstraints/IC-EDH\_ID\_00006.sch

Rule Description: IC-EDH-ID-00006 [IC-EDH-ID-00006][Error] If the Country of the ResponsibleEntity is [USA] then the value of Organization must be a term from CVEnumEDHOrganizationsUS.

Code Description: Where the edh:Country element has a value of [USA], check that following-sibling::Organization has a value from the CVE CVEnumEDHOrganization.

Schematron Code:

```
<?ICEA pattern?><!-- Notices - Distribution Notice:
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    available for use without restriction.
-->
<sch:pattern id="IC-EDH-ID-00006">

    <sch:rule context="edh:Country">
        <sch:assert test="util:containsAnyOfTheTokens(following-
sibling::edh:Organization,$countryList)"
            flag="error">
            [IC-EDH-ID-00006][Error]
            If the Country of the ResponsibleEntity is [USA] then the value
of
            Organization must be a term from CVEnumEDHOrganizationsUS. The
value [
            <sch:value-of select="following-sibling::edh:Organization"/>] is
not valid.
        </sch:assert>
    </sch:rule>
</sch:pattern>
```

## 2.7 - ../Rules/GeneralConstraints/IC-EDH\_ID\_00007.sch

Rule Description: IC-EDH-ID-00007 [IC-EDH-ID-00007][Error] The value of an IC-ID identifier must follow standardized convention.

Code Description: For element Identifier, we make sure that the text content matches the required regular expression for an IC-EDH identifier [Gg][Uu][Ii][Dd][Ee]://[0-9]{4}/[A-Za-z0-9\_-\.\.]{1,43}.

Schematron Code:

```
<?ICEA pattern?><!-- Notices - Distribution Notice:
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    available for use without restriction.
-->
<sch:pattern id="IC-EDH-ID-00007">

    <sch:rule context="edh:Identifier">
        <sch:let name="icidRegEx"
            value="'[Gg][Uu][Ii][Dd][Ee]://[0-9]{4}/[A-Za-
z0-9_-\.\.]{1,43}'"/>
        <sch:assert test="matches(string(.),$icidRegEx)"
            flag="error">
            [IC-EDH-ID-00007][Error] The value of an IC-ID identifier must
            follow
            standardized convention.
        </sch:assert>
    </sch:rule>
</sch:pattern>
```

---

## Chapter 3 - Abstract Patterns

All of the Abstract Patterns for IC-EDH are listed in this section. These patterns may depend strongly on variables defined in the Schematron Schema section.

---

## Chapter 4 - Schematron Schema

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

## 4.1 - ../IC-EDH\_XML.sch

Rule Description:

Code Description:

Schematron Code:

```

<?ICEA master?><!-- UNCLASSIFIED --><!-- Notices - Distribution Notice:
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Community Chief Information Officer
    to Federal, State, Local, Tribal, and Foreign Partners and
associated contractors. Approval for
    any further distribution must be coordinated via the Intelligence
Community Chief Information
    Officer, Mission Engagement Division at standardssupport@dni.gov--
><!-- WARNING:
    Once compiled into an XSLT the result will
    be the aggregate classification of all the CVES
    and included .sch files
-->
<sch:schema xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
queryBinding="xslt2">
    <sch:ns uri="urn:us:gov:ic:pubs" prefix="pubs"/>
    <sch:ns uri="urn:us:gov:ic:cve" prefix="cve"/>
    <sch:ns uri="http://www.w3.org/1999/xlink" prefix="xlink"/>
    <sch:ns uri="urn:us:gov:ic:ism" prefix="ism"/>
    <sch:ns uri="urn:us:gov:ic:ntk" prefix="ntk"/>
    <sch:ns uri="urn:us:gov:ic:edh" prefix="edh"/>
    <sch:ns uri="urn:us:gov:ic:arh" prefix="arh"/>
    <sch:ns uri="urn:us:gov:ic:edh:xsl:util" prefix="util"/>
    <sch:ns uri="http://www.w3.org/2001/XMLSchema" prefix="xs"/>

    <!--=====-->
    <!-- (U) Universal Lets -->
    <!--=====-->
    <sch:let name="countryList"
        value="document(' ../../CVE/IC-EDH/
CVEnumEDHOrganizationsUS.xml')//cve:CVE/cve:Enumeration/cve:Term/cve:Value"/>

    <!--*****-->
    <!-- (U) Custom XSLT function -->
    <!--*****-->

    <!--
    Returns true if any token in the attribute value matches at least one
token in the provided list.
-->
    <xsl:function name="util:containsAnyOfTheTokens" as="xs:boolean">
        <xsl:param name="attribute"/>
        <xsl:param name="tokenList" as="xs:string+"/>
        <xsl:value-of select="
            some $attrToken in
tokenize(normalize-space(string($attribute)), ' ') satisfies

```

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```
$attrToken = $tokenList      "/>
    </xsl:function>

    <!--*****-->
<!-- (U) IC-EDH ID Rules -->
<!--*****-->

<!--(U) GeneralConstraints-->
    <sch:include href="./Rules/GeneralConstraints/IC-EDH_ID_00001.sch"/>
        <sch:include href="./Rules/GeneralConstraints/IC-
EDH_ID_00002.sch"/>
            <sch:include href="./Rules/GeneralConstraints/IC-
EDH_ID_00003.sch"/>
                <sch:include href="./Rules/GeneralConstraints/IC-
EDH_ID_00004.sch"/>
                    <sch:include href="./Rules/GeneralConstraints/IC-
EDH_ID_00005.sch"/>
                        <sch:include href="./Rules/GeneralConstraints/IC-
EDH_ID_00006.sch"/>
                            <sch:include href="./Rules/GeneralConstraints/IC-
EDH_ID_00007.sch"/>
                                </sch:schema>
```



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## Chapter 5 - Removed Rules

All of the numbered Rules for IC-EDH that have been removed are listed in this section. This section is just a reference for what rule numbers have been dropped. In many but not all cases there will be a reason listed. In all cases the version that the rule was dropped in is listed.