

Top-Level Schema

This Quick Reference primarily describes ISO Schematron. See the “Difference” panel for Schamatron 1.5 and 1.6.

```
<schema id="ID" icon="URI" see="URI"
  fpi="FORMAL-PUBLIC-ID" xml:lang="LANG"
  xml:space="{ 'preserve' | 'default' }"
  schemaVersion="VERSION"
  defaultPhase="IDREF"
  queryBinding="BINDING-NAME"
  xmlns=
    "http://purl.oclc.org/dsdl/schematron">
  <title>?, <ns>*, <p>*, <let>*, <phase>*,
    <pattern>+, <p>*, <diagnostics>?, plus
    interspersed <include>
</schema>
```

```
<ns name="NAME" uri="URI"/>
```

All namespaces used in validated documents, and referenced in the schema, must be declared using <ns>.

```
<let name="NAME" value="VALUE"/>
```

```
<include href="URI"/>
```

Patterns

```
<pattern abstract="false" id="ID"
  icon="URI" see="URI"
  fpi="FORMAL-PUBLIC-ID" xml:lang="LANG"
  xml:space="{ 'preserve' | 'default' }">
  <p>*, <let>*, <rule>*, plus interspersed
  <include>
</pattern>
```

Within each pattern, only the first non-abstract <rule> whose @context matches is used.

Abstract patterns

```
<pattern abstract="true" id="ID"
  icon="URI" see="URI"
  fpi="FORMAL-PUBLIC-ID" xml:lang="LANG"
  xml:space="{ 'preserve' | 'default' }">
  <p>*, <let>*, <rule>*, plus interspersed
  <include>
</pattern>
```

Using abstract patterns

```
<pattern abstract="false" is-a="IDREF" id="ID"
  icon="URI" see="URI"
  fpi="FORMAL-PUBLIC-ID" xml:lang="LANG"
  xml:space="{ 'preserve' | 'default' }">
  <p>*, <param>*, and interspersed <include>
</pattern>
```

```
<param name="NCNAME" value="VALUE"/>
  @value must be non-empty-string
```

Phases

```
<phase id="ID" icon="URI" see="URI"
  fpi="FORMAL-PUBLIC-ID" xml:lang="LANG"
  xml:space="{ 'preserve' | 'default' }">
  <p>*, <let>*, <active>*, plus interspersed
  <include>
</phase>
```

```
<active pattern="IDREF">
  any number of text, <dir>, <emph> and
  <span>
</active>
```

Rules, Assertions and Reports

```
<rule flag="NAME" abstract="false"
  context="PATH" id="ID" icon="URI"
  fpi="FORMAL-PUBLIC-ID" xml:lang="LANG"
  xml:space="{ 'preserve' | 'default' }"
  see="URI" role="ROLE" subject="PATH">
  any number of <let>, followed by any number
  (at least one) of <assert>, <report> and
  <extends>, plus interspersed <include>
</rule>
```

```
<extends rule="IDREF"/>
  plus any foreign attributes
```

```
<assert test="EXPR" flag="NAME" id="ID"
  diagnostics="IDREFS" icon="URI" see="URI"
  fpi="FORMAL-PUBLIC-ID" xml:lang="LANG"
  xml:space="{ 'preserve' | 'default' }"
  role="ROLE" subject="PATH">
  any number of text, <name>, <value-of>,
  <emph>, <dir> and <span>
</assert>
```

```
<report test="EXPR" flag="NAME" id="ID"
  diagnostics="IDREFS" icon="URI" see="URI"
  fpi="FORMAL-PUBLIC-ID" xml:lang="LANG"
  xml:space="{ 'preserve' | 'default' }"
  role="ROLE" subject="PATH">
  any number of text, <name>, <value-of>,
  <emph>, <dir> and <span>
</report>
```

Abstract rules (used to <extends> others)

```
<rule flag="NAME" abstract="true"
  id="ID" icon="URI"
  fpi="FORMAL-PUBLIC-ID" xml:lang="LANG"
  xml:space="{ 'preserve' | 'default' }"
  see="URI" role="ROLE" subject="PATH">
  any number of <let>, followed by any number
  (at least one) of <assert>, <report> and
  <extends>, plus interspersed <include>
</rule>
```

XSL-List:
http://www.mulberrytech.com/xsl/xsl-list

Diagnostics

```
<diagnostics>
  any number of <diagnostic> and <include>
</diagnostics>
```

```
<diagnostic id="ID" icon="URI" see="URI"
  fpi="FORMAL-PUBLIC-ID" xml:lang="LANG"
  xml:space="{ 'preserve' | 'default' }">
  any number of text, <value-of>, <emph>,
  <dir> and <span>
</diagnostic>
```

Formatting Output

```
<title>
  any number of <dir> and text
</title>
```

```
<p id="ID" class="CLASS" icon="URI">
  any number of text, <dir>, <emph> and
  <span>
</p>
```

```
<dir value="{ltr" | "rtl"}">
  text
</dir>
```

```
<emph>
  text
</emph>
```

```
<span class="CLASS">
  text
</span>
```

```
<value-of select="PATH"/>
```

```
<name path="PATH"/>
```

If @path not specified, <name> returns the name of the current node.

Attribute Specification Options

{ }	alternate allowed values
bold =	required attribute
non-bold =	optional attribute

W3C XSLT 1.0 Specification:
http://www.w3.org/TR/xslt

W3C XPath 1.0 Specification:
http://www.w3.org/TR/xpath

W3C XSLT 2.0 Specification:
http://www.w3.org/TR/xslt20

W3C XPath 2.0 Specification:
http://www.w3.org/TR/xpath20

Which Patterns Are Used?

- All non-abstract <pattern>s are used if:
- there’s no <phase> in the <schema> ,
 - there’s no <phase> selected by its @id attribute, or
 - the <schema> is invoked with the #ALL option.

If there’s a @defaultPhase, and the <schema> is invoked with the #DEFAULT option, then all <pattern>s referenced in the <active> children of the default <phase> are used.

If the implementation selects a <phase> using its @id attribute, then all <pattern>s referenced in the <active> children of that <phase> are used.

How #ALL, #DEFAULT and named phases are specified is implementation-determined.

More About Attributes

@abstract indicates whether a <pattern> or <rule> is to be used as-is (if “false”) or by another <pattern> or <rule> (if “true”).

@defaultPhase (on <schema>) indicates which <phase> is used to determine which <pattern>s are selected by the #DEFAULT option.

@flag on a fired <rule>, on a failing <assert> or on a succeeding <report> sets a flag for further processing.

@fpi is a public identifier associated with the element it appears on.

@icon is the URI of the location of a graphic.

@queryBinding (on <schema>) indicates which query language is to be used. The default is “xslt” — for XSLT/XPath 1.0. Other appropriate values are: “stx”, “xslt1.1”, “exslt”, “xslt2”, “xpath”, “xpath2”, “xquery”.

@role is a name classifying the <rule>, <assert> or <report>, or the @subject, if any.

@see is the URI of information about the schema itself.

@subject is a path describing related elements and/or attributes, if other than the context of the current <rule>.

Foreign Elements and Attributes

Schema elements can have “foreign” attributes, and non-empty schema elements can contain “foreign” child elements. Foreign attributes and elements are those in a namespace other than "http://purl.oclc.org/dsdl/schematron".

Schematron 1.5
Schamatron 1.5 differs from ISO Schmatron in the following ways:

- Overall:**
- The namespace for Schematron 1.5 is: "http://www.ascc.net/xml/schematron"
 - <let> and <include> elements are not supported.
 - <key> element is supported:
`<key name="NAME" path="PATH" icon="URI"/>`
<key> is allowed anywhere in the content of <rule>. (In ISO Schematrons implementations supporting the use of XSLT "foreign" elements, <xsl:key> can be used in place of Schematron 1.5's <key>.)
 - Abstract <pattern>s are not supported.
 - Attribute pattern/@name used to name <pattern>s rather than @id. It's a required attribute.

- Unsupported Attributes:**
- These attributes are not supported anywhere: @xml:space, @flag.
 - These attributes are not supported on <rule>: @see, @xml:lang, @icon, @fpi, @subject.
 - These attributes are not supported on <diagnostics>: @see, @fpi.
 - In addition, attribute @see is not supported on <schema>, <assert> or <report>.

- Other Differences:**
- <value-of> isn't allowed as a child of <assert> or <report>.
 - Attribute @version is allowed on <schema>. (Default value is "1.5".)
 - The following attributes are optional: ns/@uri, dir/@value and span/@class.

Schematron 1.6
Schematron 1.6 differs from Schematron 1.5 in supporting most ISO Schematron features, including <let>, <include>, abstract <pattern>s and <value-of> in <assert> and <report>.

Schematron 1.5/1.6 Resources:
<http://xml.ascc.net/schematron/>

Schematron Validation Report Language
The Schematron Validation Report Language is the standard for the output of an ISO Schematron processor. It can be post-processed to produce more readable output, if required.

```
<schematron-output title="TEXT"
  phase="NMTOKEN" schemaVersion="TEXT"
  xmlns="http://purl.oclc.org/dsdl/svrl">
  <text>*, <ns-prefix-in-attribute-values>*,
    (<active-pattern>, (<fired-rule>,
      (<failed-assert> |
        <successful-report>)*))+)
</schematron-output>

<ns-prefix-in-attribute-values
  prefix="NMTOKEN" uri="TEXT"/>
```

Only namespaces from <ns> need to be reported.

```
<active-pattern id="ID" name="TEXT"
  role="NMTOKEN"/>
```

Only active <pattern>s are reported.

```
<fired-rule id="ID" context="TEXT"
  role="NMTOKEN" flag="NMTOKEN"/>
```

Only <rule>s that are fired are reported.

```
<diagnostic-reference
  diagnostic="NMTOKEN">
  <text>
  </diagnostic-reference>
```

Only references are reported, not the <diagnostic>.

```
<failed-assert id="ID" location="TEXT"
  test="TEXT" role="NMTOKEN"
  flag="NMTOKEN">
  <diagnostic-reference>*, <text>
</failed-assert>
```

Only failed <assert>s are reported.

```
<successful-report id="ID" location="TEXT"
  test="TEXT" role="NMTOKEN"
  flag="NMTOKEN">
  <diagnostic-reference>*, <text>
</successful-report>
```

Only successful <report>s are reported.

```
<text>
text
</text>
```

See other Quick References for at:
<http://www.mulberrytech.com/quickref>

ISO Schematron Quick Reference

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ISO Schematron Examples

Checking a document for good practice:

```
<schema xmlns=
  "http://purl.oclc.org/dsdl/schematron"
  queryBinding="xslt2">
  <pattern>
    <title>Check paragraphs and titles for
      content</title>
    <rule context="title">
      <report test="*">A title can only contain
        text.</report>
      <assert test="normalize-space()">A title
        must have content.</assert>
    </rule>
    <rule context="p">
      <assert test="* or normalize-space()">A
        p must have content.</assert>
    </rule>
  </pattern>
  <pattern>
    <title>Report use of HTML formatting
      elements.</title>
    <rule context="b | i">
      <report test="true()">HTML <name/>
        elements shouldn't be used (found
        in<name path=".." />).</report>
    </rule>
  </pattern>
  <pattern>
    <title>Check that titles precede
      something.</title>
    <rule context="title">
      <assert test=
        "following-sibling::*[1][not(self::title)]">
        >A title should be followed by a
        non-title element.</assert>
    </rule>
  </pattern>
</schema>
```

ISO Schematron:
Go to:
<http://www.iso.org/PubliclyAvailableStandards>
and search for "Schematron".

Other Schematron resources:
<http://www.schematron.com>