How to validate XML documents against Schematron rules

Table of Contents

Schematron Schema Overview	1
Creating and editing Schematron schemas	1
Schematron Schema	1
Combined RELAX NG / W3C XML Schemas and Schematron Schema	2
Associate Schematron Schema with the document	2
Validate an XML document against a Schematron schema	3
Validation from Editor	3
Validation from Project Tree	5

Abstract

This article is intended to show the support for Schematron validation available on <oXygen/> XML editor. You can validate XML documents against Schematron schema or against combined RELAX NG / W3C XML Schema and Schematron.

Schematron Schema Overview

The Schematron is a simple and powerful Structural Schema Language for making assertions about patterns found in XML documents. It relies almost entirely on XPath query patterns for defining rules and checks.Schematron validation rules allow the author to specify a helpful error message which will be provided to the user if an error is encountered. To get more knowledge about it please go to Schematron website http://www.schematron.com/index.html

For validation <oXygen/> uses the Skeleton XSLT processor and is Schematron 1.5 conformant.

Creating and editing Schematron schemas

Schematron Schema

In order to define a schema, <oXygen/> offers you a Schematron editor.

Choose New File and select *Schematron* from the list. A new document is generated and you can start defining rules using the content completion mechanism.





Any time you can validate the content against Schematron 1.5 XSD Schema using the Validate action. Another way to validate schemas is to check them against their own Schematron schema rules using "External validation" action. For that, select the schematron1-5-schema.sch as Schematron Schema in the "Validate With" dialog.

Combined RELAX NG / W3C XML Schemas and Schematron Schema

Schematron rules can be embedded into W3CSchema through annotation (using the appinfo element) or in any element on any level in a RELAX NG Schema (taking into account that the RELAX NG validator ignores all elements that are not in the RELAX NG namespace).

<oXygen/> accepts such documents as Schematron validation schemas and it is able to extract and use the embedded rules. To validate a document with both RELAX NG schema and with its embedded Schematron rules you need two persistence associations (see how to set these on the chapter below)

<?oxygen RNGSchema="percent.rng">
<?oxygen SCHSchema="percent.rng">

The second association will validate your document with Schematron rules extracted from the RELAX NG Schema. Similarly you can specify as Schematron Schema a W3C XML Schema having the Schematron rules embedded.

<?oxygen SCHSchema="percent.xsd">

Associate Schematron Schema with the document

If you would like to add a persistance association between your Schematron rules and the current edited XML document, use "Associate Schema" action. A custom PI (process instruction) will be added into the document <*?oxygen SCHSchema="percent.sch"?>* and the validation process will take into account the Schematron rules.

Besides the simple Schematron schema, you can associate a RELAX NG or XML Schema document having the Schematron rules embedded inside.

Figure 2. Associate a RELAX NG schema with Schematron constraints to an XML document



Validate an XML document against a Schematron schema

You can do it in two ways: using one of the *Validate* actions on the *Validate* toolbar or using one of the two batch validation actions on the contextual menu of the Project view: *Validate Selection* and *Validate Selection with*

Validation from Editor

If the document is associated with a Schematron (.sch) schema or with a W3C XML Schema with Schematron constraints or with a RELAX NG schema with Schematron constraints validation is performed with the *Validate Document* action available on the *Validate* toolbar and on the menu Document

 \rightarrow XML Document. The possible errors which might occur from the validation process are presented in a results panel at the bottom area of the <oXygen/> window.

Figure 3. Validate an XML document

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2	Total SYSTEM "percent.dtd"									
3	oxygen SCHSchema="percent.sch"?									
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Errors										

If the validation Schematron schema has phases defined, a phase chooser dialog is displayed for you to select the right phase to validate with.

Figure 4. Phase chooser dialog

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	1 2	xml version="1.0" encoding="UTF-8"?		Schematron Phas	e Chooser						
	3 🗸	<pre><rui></rui></pre> <pre></pre>		#ALL							
	4	<name>Allette Open</name>		Participants							
	5	<type>Singles</type>		Teams							
	6	<date>2001-03-20</date>									
	7 🗸	Participants nbrParticipants="3">									
	8	<name id="p1">Nick</name>									
	9	<name id="p2">Marcus</name>		e>							
	10	10 <name id="p3">Eddie</name>		>							
	11	I				Г					
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Т	ext (Grid									
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E	Errors										

Validation from Project Tree

Associating Schematron schema into the document is helpful when you want to batch validate a set of XML files using the batch validate feature from the popup menu of the tree of the Project view. If the files have the corresponding Schematron schema associated, you can simple select them and use the *Validate Selection* action. The possible errors will be presented in the results area of the <oXygen/> window.

Figure 5. Validate from project tree



If the files do not have associated Schematron schemas you can use the *Validate Selection with* ... action and set into Schematron Schema tab the corresponding Schematron schema to validate against it. You can also specify a RELAX NG or W3C XML Schema with Schematron rules embedded.

During the batch validation if Schematron schemas defines phases, the #ALL phase is used by default.