Schematron

Schematron Users Meetup 2022
Prague, June 11th 2022

What is Schematron?

It is a language for making assertions about the presence or absence of patterns in XML documents.

It was designed by Rick Jelliffe in the late 1990s and incorporated into ISO as part of the ISO Document Schema Definition Languages (DSDL) multi-part standard.

It is widely used as an adjunct or an alternative to grammar-based validation of XML documents using a DTD, W3C XML Schema, or RELAX NG.

Assertions, Rules, and Patterns

Schematron lets you express arbitrary business rules for selected parts of your XML document or data.

- An assert element contains a human-readable assertion and has a @test attribute with an expression that tests if the assertion holds true.
- A rule element groups assertions and has a @context attribute with an expression that selects a part of the document.
- A pattern element groups rules that are related in a user-defined way.

An example

1. <schema xmlns="http://purl.oclc.org/dsdl/schematron" queryBinding="xslt3">
2. <ns prefix="tei" uri="http://www.tei-c.org/ns/1.0"/>
3. <pattern>
4. <rule context="tei:rs[@type = 'person']">
5. <assert test="@ref and doc(@ref) instance of element(tei:person)">
6. A string referencing a person points to the register
7. </assert>
8. </rule>
9. </pattern>
10. </schema>

Abstract rules & patterns, properties, …

Schematron defines more elements to support:

- Schema reuse and composition (import, extends)
- Localization (diagnostics)
- Message templating (value-of, emph, span, dir)
- Rule templating (abstract patterns)
- Schema documentation (title, p)

Implementations

The "Skeleton" (XSLT)

https://github.com/schematron/schematron

- Original implementation by Rick Jelliffe and others
- Supports XSLT 1.0 and XSLT 2.0
- MIT License
- Unmaintained
- Derivatives are maintained und used in other applications

SchXslt (XSLT)

https://github.com/schxslt/schxslt

- New implementation by David Maus
- Supports XSLT 1.0, XSLT 2.0 and XSLT 3.0
- MIT License
- Version 1.9.1 released June 12th 2022

XQuery and other languages

https://github.com/Schematron/awesome-schematron

- Wrappers of "Skeleton" or SchXslt for XQuery and other languages
- Supporting XSLT 1.0 or 2.0 (depending on language environment)

ph-schematron (Java)

https://github.com/phax/ph-schematron

- Implementation by Philip Helger
- Supports XPath 3$^?$ (native Java), XSLT 1.0 and XSLT 2.0 (via "Skeleton" or SchXslt)
- Apache 2.0 License
- Version 6.3.0 released March 8th 2022

Escali Schematron (XSLT)

- Implementation by Nico Kutscherauer
- Supports XSLT 1.0 and XSLT 2.0
- Unknown License
- Version 0.2.0 released February 3rd 2019

Conformance Test Suite

https://github.com/Schematron/schematron-conformance

- Testsuite comprising of 50 test cases
- WIP Java application that runs the test cases against an implementation
- Used in the development of SchXslt

Interactive Schematron