Profile Tooling

This page gathers links for tools that help with development of FHIR resource, including Profiles/StructureDefinitions. These tools are categorized into several functional categories:

- 1 Validating Resources against the specification and Profiles
  - 1.1 Validator Status
  - 1.2 Marking that a resource conforms to a profile
- 2 Editing / Authoring Profiles
- 3 Publishing Profiles
  - 3.1 Finding Packages and Implementation Guides
  - 3.2 Creating and publishing Packages and Implementation Guides

Validating Resources against the specification and Profiles

You can validate a resource against a profile in several different ways.

- On the web
  - You can use validator.fhir.org - this is the same validator as the command line tool (Java engine)
  - On the Validation page of Simplifier.net you can, after creating a free account, validate any resource against the core FHIR specification or any published FHIR package.(DotNet engine)
  - Simplifier.net also allows you to store and validate one FHIR project for free. Other features require a paid subscription.
  - Also see Public FHIR Validation Services.
- Via API
  - You can use the [validation] interaction on any of the Public Test Servers or your own FHIR server instance.
    - use a RESTful client like [POSTman], or write code to do this in the background
    - post the resource as described by the validation operation, and tag it with the profile you wish it to be tested against (see below)
    - most servers require the profile to be hosted on the server itself
- On the command line
  - You can use the Java validator package. See Using the FHIR Validator. (Java engine)
  - You can install the Firely Terminal command line tool. Validation of individual resources is free; some other features require a paid subscription. (DotNet engine)
- In code
  - You can use the Java classes directly
    - see the java package org.hl7.fhir.instance.validation in the [FHIR GitHub]
  - Or use the corresponding .NET from the Firely .NET SDK.

Validator Status

All the options above package one of three different validation engines:

<table>
<thead>
<tr>
<th>Engine</th>
<th>Source</th>
<th>Status</th>
<th>Passes Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java</td>
<td><a href="https://github.com/hapifhir/org.hl7.fhir.core">https://github.com/hapifhir/org.hl7.fhir.core</a></td>
<td>Fully maintained</td>
<td>Yes</td>
</tr>
<tr>
<td>C#/DotNet</td>
<td><a href="https://github.com/FirelyTeam/firely-net-sdk">https://github.com/FirelyTeam/firely-net-sdk</a></td>
<td>Fully maintained</td>
<td>No</td>
</tr>
<tr>
<td>Pascal</td>
<td><a href="https://github.com/HealthIntersections/fhirserver">https://github.com/HealthIntersections/fhirserver</a></td>
<td>Not current; future undecided</td>
<td>No</td>
</tr>
</tbody>
</table>

HL7 regards any validator that passes the validator test cases as an HL7 approved validator

Marking that a resource conforms to a profile

See the explanation of meta.profile in the section on resource metadata. Note that this is only a conformance claim and no guarantee that the resource actually conforms. Every server can test these claims, test resources against any other profile and can update the values in meta.profile accordingly.

Editing / Authoring Profiles

The following choices exist for editing profiles

- By hand
  - Use a schema drive editor against Profile.xsd in the FHIR schemas
  - start with an existing profile (look for the link under the structure definition on the page for the resource)
*edit the profile as you see fit*

**Note:** profiles are full rich description of the content, and so they're pretty hard to edit by hand. You can do this but it's not the intention

Generic XML tools
- XmlSpy
- Oxygen
- Saxon XSLT2

**From spreadsheets**
- this is how some of the profiles in the specification are produced
- use the FHIR Build Process following the method used here: FHIR Profile authoring

**Using the desktop user interface tool Forge**
- see the Firely website

**Using Trifolia**
- see the Lantana Trifolia website

**Using FHIR Shorthand**
- for FHIR Shorthand specification standard, see the FHIR Shorthand website
- for documentation and tools, visit the FSH School

**Kodjin FHIR Profiler**
- The tool is available as a web-based version and a plugin to Visual Studio Code (see extensions market)
- Kodjin FHIR Profiler: [https://profiler.kodjin.com](https://profiler.kodjin.com)
- Instructions: [https://kodjin.com/fhir-profiler-instructions](https://kodjin.com/fhir-profiler-instructions)

Use of spreadsheets is no longer recommended (except for certain HL7-internal profiles) and hand editing is tedious and error prone. Generally, choose one of the other approaches.

Editing/testing profile invariants can be done with the "fhirpath-lab" it provides syntax highlighting and advanced testing capabilities

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**Publishing Profiles**

FHIR resources can be published as a stable, coherent set called a FHIR Package (see the NPM Package Specification).

This should generally be accompanied by documentation, called an Implementation Guide.

**Finding Packages and Implementation Guides**

- FHIR Package Registry - All publicly available FHIR packages (and their guides) are available in [https://registry.fhir.org](https://registry.fhir.org). For more information see FHIR Package Registry User Documentation.
- Implementation Guide Registry ([fhir.org](http://fhir.org)) - A curated list of Implementation Guides.
- Simplifier.net - A registry containing all public profiles (StructureDefinition, ValueSet, Conformances) and a platform for private development with advanced search functionality

**Creating and publishing Packages and Implementation Guides**

**On the command line**
- The Implementation Guide Publishing Tool, see IG Publisher Documentation
  - Creating an Implementation Guide with the IG publisher will run extensive validation and create a documentation page, plus a FHIR package. See the IG Publisher Documentation.
  - The Implementation Guide can be self-hosted or, in case of official HL7 projects, hosted on by HL7 following the FHIR Implementation Guide Process Flow.
  - Packages published with HL7.org or FHIR.org will automatically be published in the FHIR Registry. Others can read in the FHIR Package Registry User Documentation how to do this.

**On the web**
- Simplifier.net Implementation Guide editor - Graphical editor for FHIR Implementation Guides
  - See the documentation on Creating packages. Packages will automatically be added to the FHIR Registry on publishing.
  - See the documentation on Creating Implementation Guides. Implementation guides can be hosted or exported and self-hosted (paid).
- Trifolia on FHIR - FHIR Implementation Guide creation tool with support for editing profiles, value sets, narrative pages, and other content. Integrated with the FHIR IG Publisher

**Other**
- Create a custom website describing your FHIR resources.
- Create a Implementation Guide resource and include it in your package.
- You can still publish your FHIR resources as a FHIR package as described in the FHIR Package Registry User Documentation.