Trifolia-on-FHIR

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Welcome

Trifolia-on-FHIR is an editor for FHIR resources that uses a FHIR server natively as its back-end. All STU3-compliant FHIR servers work with Trifolia-on-FHIR.

Core Features

- Edit conformance resource types:
  - ImplementationGuide
  - StructureDefinition
  - ValueSet
  - CodeSystem
  - CapabilityStatement
  - OperationDefinition
  - Questionnaire
- Import and view any other resource in FHIR specification (such as Patient, Observation, MedicationStatement, etc.)
- Validate with the "Validation" tab on every resource editing screen, which uses FHIR.js.
- Export:
  - Implementation Guides and associated resources
  - Bundles
  - FHIR IG Publisher packages
- Import any resource or transaction bundle.

Requesting Support

Support requests are captured using JIRA Service Desk, located here: https://trifolia.atlassian.net/servicedesk/customer/portal/3. JIRA will require that you be logged in with an Atlassian account before submitting/viewing support requests.
Additionally, the FHIR Zulip chat has a channel dedicated for Trifolia-on-FHIR questions and announcements, located on chat.fhir.org in the #trifolia-on-fhir channel.

What's New

Release 1.1 on February 20, 2019

Improved support for R4

Trifolia-on-FHIR is tested with the HAPI FHIR server. Until recently, HAPI has been using an old version of the FHIR R4 specification. To work with HAPI, Trifolia-on-FHIR has had to implement some work-arounds to accommodate an old version of FHIR R4 in HAPI while supporting a newer version of the FHIR IG Publisher. Recently HAPI released updates to its R4 support. We have cleaned up the R4 logic in Trifolia-on-FHIR and have upgraded our free-to-use installation of Trifolia to include the latest version of the HAPI R4 server.

Version history

The implementation guide edit screen has a new tab for "History" which allows you to see the version history of the resource, and even load one of the historical versions into the current editor. This is being tested out on the implementation guide editing screen first. Once the functionality is refined, it will be added to the other editing screens.

Development Log

Key	Type	Summary
TRIFFHIR-32	New Feature	Value set expansion limitations and use of terminology server
TRIFFHIR-46	Improvement	Allow specifying the ID of a resource upon creation

TRIFFHIR-85	Improvement	Profiles/Extensions page - put a label on the third search dropdown "Implementation Guide"
TRIFFHIR-140	Improvement	Display the currently selected FHIR server on all screens
TRIFFHIR-107	Improvement	Prompt user to confirm when removing an implementation guide
TRIFFHIR-141	New Feature	Add support for google analytics
TRIFFHIR-118	Task	PackageID and FHIRVersion fields not saving
TRIFFHIR-135	Task	Authentication framework improvements
TRIFFHIR-142	New Feature	Display version history on implementation guide editing screen
TRIFFHIR-77	Task	Tech-editing review changes

Login

Login

Click the "Login" button on the top right side of the screen. Trifolia-on-FHIR (ToF) re-directs users to identity/configure users' profile details. If you do not already have an account, you may register via this screen. Once you have registered and logged-in with the identity provider, your browser will redirect to the ToF homepage.

If this is your first time logging-in to ToF, you must create a Practitioner resource for ToF to identify you as the author of resources and associate your Practitioner with audit records when changing resources. If you configure ToF with multiple FHIR servers, you may need to create a new Practitioner resource for each FHIR server.

Users can click on their name at the top right side of the screen to further edit the Practitioner resource on the selected FHIR server.

Navigation

Navigation

The main navigation bar is on the top of the screen. Some menu items are hidden pending log-in.

- Home - This is the first screen users see after login. It presents high-level information about ToF.
- Browse/Edit - Search, select, delete, and create new resources depending on the resource type selected in the sub-menu.
    - Implementation Guides
    - Profiles
    - Capability Statements
    - Operation Definitions
    - Value Sets
    - Code Systems
    - Questionnaires
- Export - Export implementation guides from ToF in various formats (i.e., bundles, HTML).
- Import - Import resources from other locations into ToF.

On the right-side of the navigation menu, users will find:

- Drop-down menu - Select FHIR servers
- Edit Practitioner/Profile - Edit the Practitioner resource associated with your account.
- Logout - Logs your account off ToF
- Open from Computer - Appear as an "upload" icon. Users can open a resource directly from their computers, either an XML file or JSON file, and edit the resource in ToF without saving the resource to the FHIR server. When saving, the browser prompts users to re-download the updated resource as an XML or JSON file depending on the format when opened.
- Help - Shown as a question-mark icon, which opens this help documentation in a new window.

FHIR Versions

Depending on the FHIR server and the version it supports, the screens for editing resources may appear (e.g., STU3 vs. R4). The screens in ToF reflect the changes between STU3 and R4 resources.In STU3, for example, ImplementationGuide has "packages" with "resources" inside each package. In R4, ImplementationGuide has "resources" parallel to "packages," and each resource *references* a package.

FHIR Versions

FHIR Versions

Trifolia-on-FHIR supports multiple versions of the FHIR standard. ToF currently supports STU 3 and R4. Users can select a FHIR server with the drop down menu at the top right of every screen.

Process

Process

The work-flow for authoring an Implementation Guide:

1. Create an Implementation Guide
2. Create Profiles (StructureDefinition resources):
    - Create other resources (e.g., OperationDefinition, CapabilityStatement, ValueSet and CodeSystem) as needed for the profiles and implementation guide
    - Create samples of the profiles manually and import into ToF
3. Associate profiles, other conformance resources, and samples with the Implementation Guide
4. Export Implementation Guide using FHIR IG Publisher:
    - View the results of the export via the FHIR IG Publisher on the "Browse Implementation Guides" screen
    - The results include a Q/A tab, which identifies all errors the FHIR IG Publisher found during publication. Users should fix errors, when possible, and re-execute the export with the FHIR IG Publisher.
    - Users can download or upload the exported package to the appropriate GitHub repository for the Implementation Guide project.

Guidelines and Best Practices

Guidelines and Best Practices

Trifolia-on-FHIR has the functionality to allow users to completely customize resources. By following these guidelines, users can ensure the FHIR publisher successfully processes the Implementation Guide.

Implementation Guide

- The URL of the Implementation Guide must be in the format of `http[s]://xxx.yyy/zzz/aaa/ImplementationGuide/my-ig-id`. For example: `http://myproject.com/someRoot/ImplementationGuide/myproject-ig`

- The "id" of the implementation guide must align with the URL of the implementation guide. For example: If the URL of your implementation guide is `http://myproject.com/someRoot/ImplementationGuide/myproject-ig`, the id must be "`myproject-ig`". Users can select the "Change this resource's ID" button on the "Browse Implementation Guide" screen.
- The Implementation Guide should have a description. The main screen of the FHIR IG Publisher export displays the description.
- All contacts in the Implementation Guide appear as authors in the FHIR IG Publisher export.
- ToF only exports resources referenced directly within the Implementation Guide resource. Confirm the Implementation Guide resource references all resources.

All Resources

All resources within an Implementation Guide need URLs in one format. Based on the example above, if your implementation guide's URL is `http://myproject.com/someRoot/ImplementationGuide/myproject-ig` then all profiles (StructureDefinition resources) within the Implementation Guide must have URLs that start with `http://myproject.com/someRoot/StructureDefinition/`.

Getting Started

The purpose of this page is to guide new users through Trifolia-on-FHIR:

1. Create account and Login
2. Select FHIR Release version (gear icon in top right)
3. Create new Implementation Guide
    - Option A: Create IG from scratch. Navigate to Browse Implementation Guides > click the "plus" + button at top IG list/table.
    - Option B: Import IG from a file. Import IG.xml from your computer ("Import" button at top and either drag-and-drop the IG.xml file into the "Files" tab or copy/paste the contents of IG.xml into the second tab).
4. Modify IG. Be sure to always *Save* (bottom left)
5. Create/import additional templates/profiles
    - Option A: Create Profile from scratch. Navigate to Browse Templates/Profiles > click the "plus" + button at top of Profile list/table.
    - Option B: Import profiles from directories on computer
6. Modify and constrain the templates/profiles to use case
7. Resolve all Validation errors and warnings on Validation (tab) within each profile
8. Export selected IG package. Suggested settings for initial export:
    1. Export Format: HTML (IG publisher)
    2. Run the IG Publisher: Yes
    3. Run the latest version of the IG Publisher: No
    4. Use terminology server: Yes/No (Suggest No if IG uses large standard codesets) Selecting Yes will verify applicable value sets and code systems externally
    5. Download: Yes
    6. Output format: XML
9. Confirm build logs against CI-publisher on Zulip > Notifications

System Requirements

System Requirements

Users will need a modern browser (e.g., Chrome, Firefox, Internet Explorer, Safari) to use Trifolia-on-FHIR.

Administrators must ensure the following requirements to install Trifolia-on-FHIR in their individual servers:

- Windows *or* Linux
- FHIR Server (STU3 or R4)
    - Must support creating resources via a PUT with an ID

- Must support the $validate operation
- Must support _has (reverse chaining) search criteria. For example: GET /StructureDefinition?_has:ImplementationGuide:resource:_id=<IG_ID>

Help

Help

The help documentation is available in several formats:

- CHM
- DOCX
- PDF
- EPub

Export

Export

Select Export in the tabbed tool bar on the top of the screen.

The Export page contains form fields that allow users to specify the details of their exports. Users can export the Implementation Guides (IGs) saved under the Browse/Edit tab at the top right side of the screen. Users can export IGs as bundles or HTML with the IG Publisher. Once the form fields are complete, select the Export button on the left side of the scrolling tab at the bottom of the screen.

- Bundle exports produce a single download (pretty quickly) as a single XML file. This XML file is a FHIR Bundle that can be used to import the resources for the implementation guide in another FHIR environment.
- HTML exports produce a package (ZIP file) for use with the FHIR IG Publisher. Depending on whether you select "Run IG Publisher", the IG Publisher will automatically be executed for the package, and the output from the IG Publisher will be included in the download. If you select *not* to execute the IG Publisher, the package will still be produced and can be downloaded.
  - The Export tool will take a few minutes to process. The length of time is correlated with the size of the export. Users will see the tool processing the export as lines of code executions. After completing the process, the export will automatically download to users' computers in a compressed folder.
  - When the IG Publisher is executed, the output from the IG Publisher is copied to a public location in Trifolia-on-FHIR for preview.

Import

Import

ToF allows users to import files, text, and VSAC content.

File imports allow users to drag-and-drop resources (e.g., StructureDefinitions, ValueSets, CodeSystems) from users' hard drives to the ToF tool.

VSAC imports require users' VSAC credentials, which are not persisted on the ToF server. If users select 'Remember VSAC Credentials,' the tool will store this information as cookies in the users' browser.

Users who upload more than 20 resources at once may experience a timeout error notification. In the event of a timeout error notification, users should reduce the size of the resource import.

Users can edit resource numbers based on individual needs.

GitHub Integration

Authentication

The import and export screens both contain options for GitHub. As soon as the GitHub option is selected in either screen, you are prompted to login with your GitHub credentials. Once logged in, your GitHub authentication token is stored in cookies so that you do not have to login every time you select "GitHub" under the import/export screens.
After you have logged into GitHub, a GitHub icon appears in the top-right corner of the all screens. When clicked, this icon logs you out of GitHub within ToF.
ToF uses a pop-up window to authenticate with GitHub. If your browser blocks the pop-up window, ToF will not be able to authenticate with GitHub and you will receive an error.

Work Flow

The work flow within ToF for GitHub is to
1. Import resources from a GitHub repository into the selected FHIR server
2. Edit the resources using ToF
3. Export the resources back to the GitHub repository after they have the desired changes

Extensions

When importing resources, two extensions are added to each resource representing the location within GitHub for where the resource came from. This enables ToF to know where in GItHub to export the resources back to.
If you are exporting *new* resources to GitHub, these extensions will not yet exist and you will need to specify where the resources should be stored during the export (which will create the two extensions on the resource).

Limitations

- Trifolia only exports the individual resources associated with the implementation guide, and does not include the entire IG Publication package. For example, the "framework" (html templates) folder is not included in the export.
- Trifolia only allows importing FHIR resources. Trifolia-on-FHIR allows the user to select any JSON or XML file from GitHub. If the user selects an XML or JSON file that is not a FHIR resource, the import will fail.
- GitHub does not allow retrieving/updating very large files. For example, if attempting to import/export a large ValueSet resource, GitHub may fail with a "Payload too large" error.

Signing Out

When you sign out of GitHub within Trifolia, this clears your GitHub session only within Trifolia. GitHub maintains its own session within your browser. To sign out of GitHub entirely, you will need to go to github.com and click "Sign out".

Glossary

Acronym	Definition
ToF	Trifolia-on-FHIR
FHIR	Fast Healthcare Interoperability Resources
VSAC	Value Set Authority Center
IG	Implementation Guide
VS	Value Set
CS	Code System

FAQ

General

My implementation guide has pages, but the table of contents is empty?
Make sure that the "Table of Contents" page's "Auto Generate Table of Contents?" field is set to "Yes".

Exporting/Publishing with the FHIR IG Publisher

The IG Publisher reports "Property name not found"
This may be due to dependencies being listed in the ImplementationGuide resource incorrectly.

API

Trifolia-on-FHIR's REST API is documented using Swagger. The publicly available installation of Trifolia-on-FHIR exposes the API documentation here: https://trifolia-fhir.lantanagroup.com/api-docs/