FHIR in action!

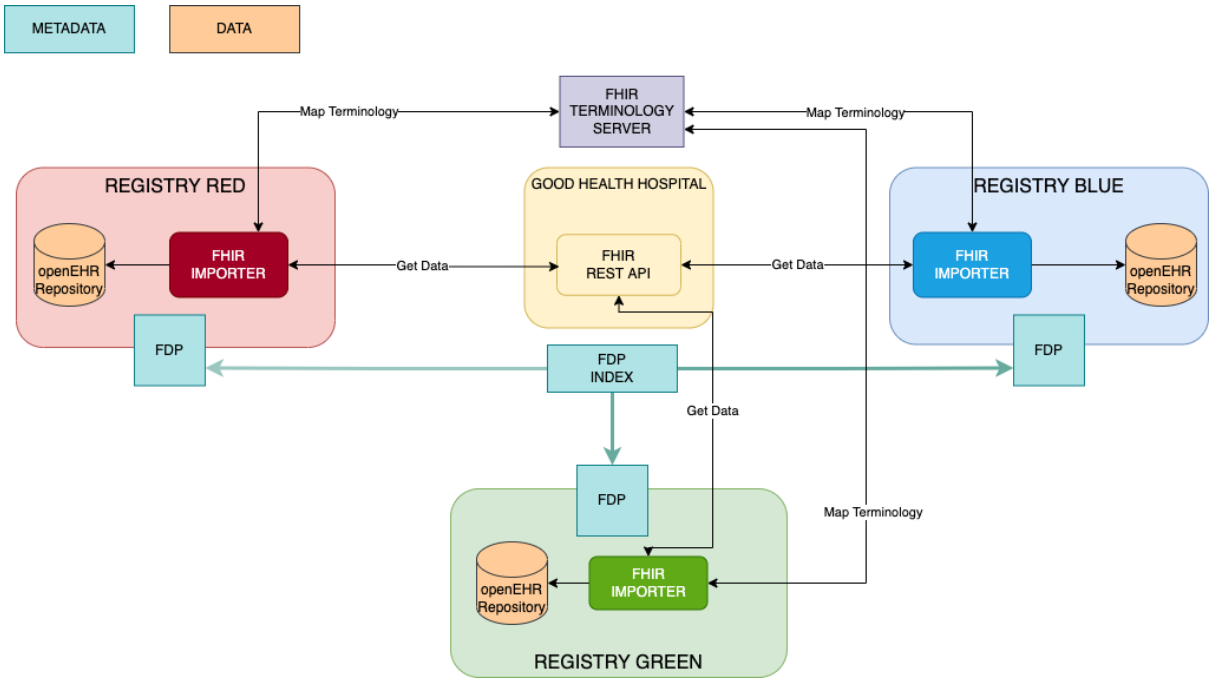
Part 0

Description: Introduction of the use case, the tutorial's goals and the steps to be done.
Expected duration: 15 min
Activity type: tutor's introduction

Source data:

- The openEHR repository of each group
- The IHSS FHIR hospital endpoint:
- The Terminology Service (see slides)

Scenario



The purpose of this running example is to deepen some aspects of the FHIR standards and demonstrate, from an interoperability point of view, its interaction with other formalisms, as openEHR.
The scenario is the following: the Inter Health Hospital provides, using FHIR, the results of some Laboratory tests that a patient has executed in the hospital during time. Among all the patients that have executed a Laboratory test in the hospital, there are many that belong to your group cohort. The purpose is to retrieve all laboratory tests information for the patients of interest and save it into your registry.

The session is divided into two parts:

- **Part 1** : You will learn how to interact with a FHIR server, with several examples of CRUD operations to query/modify a resource. There will also be some examples about how to query a terminology server.

- **Part 2** : In the context of the proposed scenario, we will interact with the IHSS FHIR endpoint, briefly exploring the exposed resources and proposing some example queries to interact with them. Then, we will try to execute a python notebook example that executes the necessary steps required to query the IHSS Fhir server, retrieve additional information about the patients and save it in your OpenEHR Registry.

Part 1

Description: Interact with a test FHIR server
Expected duration: 1h - 1h 15 min
Activity type: tutor's demonstration and individual work

Steps

- Take the Part 1 presentation (saved into github) as a guide to follow the tutorial
- Use the endpoint http://10.153.2.18:8090/fhir and Postman to perform the queries

Part 2

Description: Execute the running example implementing the scenario's use case
Expected duration: 40 min
Activity type: tutor's demonstration and individual work

Preliminary step

For this second part, we will first interact with the IHSS FHIR server, at

- http://10.153.2.16:8090/fhir

This FHIR server exposes Laboratory data related to the same patients of the cohorts composing each of your groups. Two FHIR resources have been populated:

- Patient, for patient information
- Observation, for laboratory test

Notice that each single laboratory test (i.e. Hemoglobin) is saved into a different observation resource.

Some queries to practice (may be you have already practiced some of them in Part 1):

- Get all male or female patients
- Get all patients that were born in a date interval. Use this notations to set the constraints:
    - ‘=gt’ it means “greater than”
    - ‘=lt’ it means “lower than”

  NB. Dates shall be expressed in the query in the form YYYY-MM-DD

- Get directly a patient with the unique resource identifier:
- Get all Observations related to a specific patient
- Get all Observations related to a specific test code(analyte). Possible values are:

    - LP7720-8 (White blood cells)
    - LP7536-8 (Red blood cells)
    - LP32067-8 (Hemoglobin)
    - LP70360-0 (Platelets)
    - LP418019-8 (SARS coronavirus 2 Ag)

You will find some solutions to the proposed queries in the appendix.

Main step

Let’s execute the running example together .Load the ipython notebook in github and proceed step by step together (all the description is already in the notebook’s comments). Notice that:

- Patients have a random number of observations in the FHIR server. You could also find twice or more the same analyte, whose measure has been repeated in a different date;
- We assigned to each student a different patient identifier to execute the running example. A slide with assignments will be shown before beginning.

Appendix: query solutions

- Get Patient having as identifier IHSS_PAT_100:

    http://10.153.2.16:8090/fhir/Patient?identifier=IHSS_PAT_100

- Get all male or female patients:

    http://10.153.2.16:8090/fhir/Patient?gender=male

    http://10.153.2.16:8090/fhir/Patient?gender=female

- Get all patients with the birth date in a certain interval:

  http://10.153.2.16:8090/fhir/Patient?birthdate=gt1975-01-01&birthdate=lt1998-01-01

- Get directly a patient with the unique resource identifier:

  http://10.153.2.16:8090/fhir/Patient/1

- Get all observations for a specified terminology code:

http://10.153.2.16:8090/fhir/Observation?code=http://snomed.info/sct%7c16378004