# 2022-05 TestScript and FHIR Testing

- **Short Description**: TestScript at Scale: Introduction to National FHIR Testing Programs
- **Long Description**: Explore how the FHIR Testing Framework (TestScript) is being used by several National FHIR Testing Programs. The FHIR specification includes a Testing Framework that defines a Test Execution Engine and the TestScript resource for use in validating and verifying that FHIR implementations (client and/or server) are conformant to the FHIR specification. The inclusion of testing in the FHIR specification reflects the community’s experience that the management and proper use of testing are fundamental to effective, interoperable data exchange.

  This track continues the exploration of essential TestScript functionality and testing, expanding to explore how several large programs are making use of the FHIR Testing Framework to ensure that their participants are conformant to FHIR specifications and implementation guides (IGs).

  We expect track participants to come away with a better appreciation of:

  1. Implementation and implementer experience with the FHIR Testing Framework and TestScript at scale
  2. How FHIR conformance testing drives improved capabilities of FHIR servers
  3. Potential improvements to the FHIR Testing Framework and TestScript

- **Type**: Educational: Lessons learned from FHIR testing at scale.
- **Submitting Work Group/Project/Accelerator/Affiliate/Implementer Group**: FHIR Implementers (FHIR-I)
  - Conformance
  - EHR
- **Track Lead(s)**: Jeff Helman (primary), Joe Lamy
- **Track Lead Email(s)**: jeff.helman@aegis.net; joe.lamy@aegis.net
- **Related Tracks**: Da Vinci, Carin Blue Button
- **FHIR Version**: FHIR R4, STU3

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**Specification(s) this track uses**

- Terminology Servers this track uses? TBD
- Specific Terminology Code Systems and Value Sets needed for this track? TBD

**Artifacts of focus**

- FHIR Testing Framework: (Current Build) [http://build.fhir.org/testing.html](http://build.fhir.org/testing.html); (FHIR R4) [http://hl7.org/fhir/testing.html](http://hl7.org/fhir/testing.html)
- TestScript Resource: (Current Build) [http://build.fhir.org/testscript.html](http://build.fhir.org/testscript.html); (FHIR R4) [http://hl7.org/fhir/testscript.html](http://hl7.org/fhir/testscript.html)
- TestReport Resource: (Current Build) [http://build.fhir.org/testreport.html](http://build.fhir.org/testreport.html); (FHIR R4) [http://hl7.org/fhir/testreport.html](http://hl7.org/fhir/testreport.html)

**Expected participants**

- Vendors and Implementers seeking implementation guidance on national testing programs
  - AEGIS - Touchstone tool and test scripts
  - Drummond - Payer and Patient Access FHIR® API Certification Program, ONC 2015 Edition Cures Update Health IT Certification
  - Da Vinci (TBD)
  - Carin Blue Button (TBD)
  - Nictiz - MedMij (TBD)

**Zulip stream**

[https://chat.fhir.org/#narrow/stream/274423-TestScript-Resource/topic/May.202022.20Connectathon](https://chat.fhir.org/#narrow/stream/274423-TestScript-Resource/topic/May.202022.20Connectathon)

**Track Kick Off Call**

**Track Details**

**Prerequisites**

- For all levels of testing the required prerequisite is the fundamental requirement that all FHIR implementations SHALL support the capabilities interaction.
- Review and have a basic understanding of the FHIR TestScript Resource Type definition.
- Review and have a basic understanding of the FHIR Testing Framework definition.

**Track Kick Off**

- TBD

**Whova Sessions**

(Scheduled TBD) - Session 1

- FHIR TestScript QuickStart: From zero to hero

(Scheduled TBD) - Session 2

- FHIR TestScript QuickStart Results: Discuss/review QuickStart results

(Scheduled TBD) - Session 3

- TestScript at Scale: Lessons learned from XXXXX national testing program

(Scheduled TBD) - Session 4

- TestScript at Scale: Lessons learned from YYYY national testing program

(Scheduled TBD) - Session 5

- Future of FHIR Testing - e.g. Workflow, Ecosystem, Multi-version Support; Mario Hyland (TBD)

**User Roles**

These are the human actors that have the requisite subject matter knowledge and expertise.

- Test Scenario Author/SME
- TestScript Author
- Test Execution Results Reviewer

**System roles**

These are the software implementations/applications that perform the actual testing execution processes.

**FHIR Testing Engine/Platform**
Will implement the functionality and behavior as defined in the FHIR Testing Framework - http://hl7.org/fhir/testing.html
Support the TestScript resource - http://hl7.org/fhir/testscript.html
Implement the Execution behavior and functionality - http://hl7.org/fhir/testing.html#execution
Support execution of TestScript operations acting as the origin (client) test system actor if no external origin (client) is defined

FHIR Client (System Under Test)
- The external FHIR Client actor system under test.

FHIR Server (System Under Test)
- The external FHIR Server actor system under test.

Advanced preparation - TBD

Scenarios (STILL EVOLVING)

Scenario 1 - TestScript Structure and Functional Review
This scenario is an introductory overview (breakout session) of the current TestScript resource definition and will focus on the overall structure and intended functionality of the TestScript. A review of specific TestScript elements and coded values will be done to determine correct usage and, if needed, any updates/additions, etc.

Potential Outcomes:
- Recommendations on improvements to the TestScript resource definition
- HL7 FHIR JIRA issues - new and/or existing

Scenario 2 - TestScript ImplementationGuide Integration
This scenario will explore how the TestScript Resource integrates into an Implementation Guide.

The following is an initial list of topics to discuss:
- Include in IG validation packages
- Availability for download as a separate package (ZIP archive)
- How do we integrate/represent TestScripts in a published IG?
- IG Profiles - Can/should every IG profile have TestScript(s) for documentation and validation

Potential Outcomes:
- Recommendations on improvements to IG Publishing
- HL7 FHIR JIRA issues - new and/or existing

Scenario 3 - TestScript Usage - How can/should TestScript be used in the FHIR specification?
This scenario will explore areas of how and where TestScript is useful/needed/required. This is similar to the IG Integration scenario but focused on the base FHIR specification.

Possible discussion areas:
- Implementing a Base FHIR Resource
  - Can/should every resource type definition have TestScript(s) for documentation and validation?
- Defining the Base FHIR REST API
  - Can/should we define TestScript(s) that clearly document the conformance rules for the FHIR operations?
- Implementing the FHIR $ Extended Operations
  - Can/should we define TestScript(s) that clearly document the conformance rules for the FHIR $ extended operations?

Potential Outcomes:
- Recommendations on incorporating TestScripts as conformance rules documentation in the base FHIR specification
- HL7 FHIR JIRA issues - review existing, create new

Scenario 4 - Gap Analysis - Gap Analysis of TestScript Narrative in Spec
This scenario will explore the narrative documentation in the FHIR specification around TestScript authoring and find gaps. The intent is that for any particular test plan a layman in TestScript should be able to read the spec and know how to express that in the resource.

Possible discussion areas:
Operations for the common: Search, Read, Update, Create
Asserts for basic confirmation: Content-Type, Custom Header values, HTTP request types, Response codes
More complex asserts: validation, minimumId, compareToSource
Operators vs different types: collection vs single value, for both strings and values

Potential Outcomes:

- HL7 FHIR JIRA issues - new tickets for clarifications to resolve any new and existing narrative issues

TestScript(s):

Security and Privacy Considerations: