



FHIR Testing with Touchstone

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Mohawk College, Hamilton, ON - 16, October 2019 | @TouchstoneTest | @AEGISNet | @techknowman

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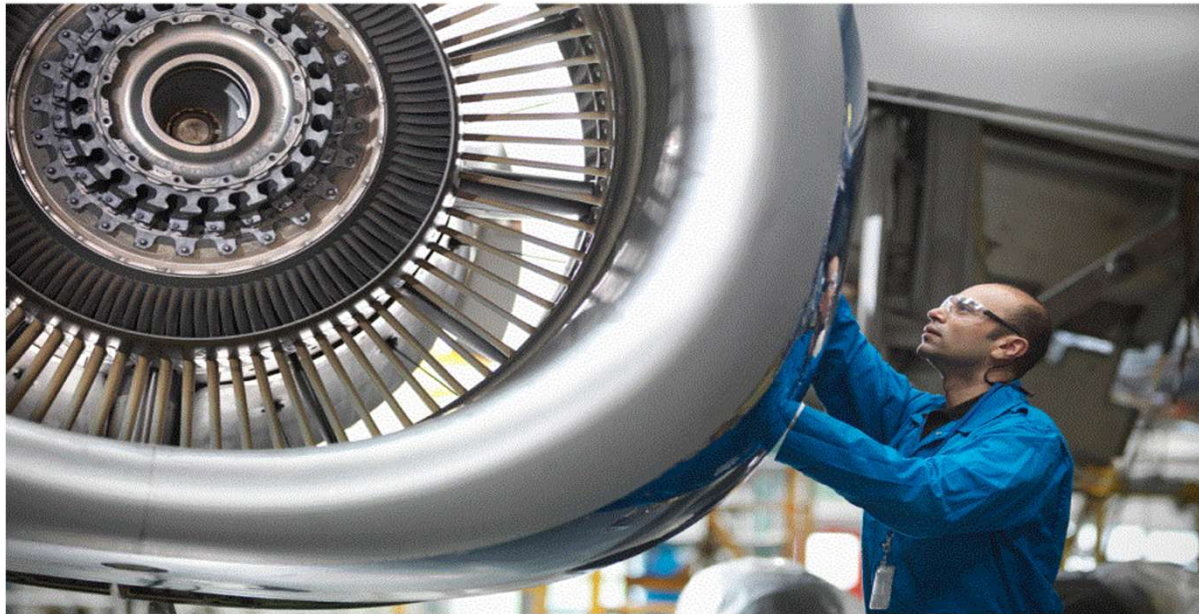
Presented by

- **Name:** Richard Ettema
- **Position:**
 - Lead Consultant, AEGIS.net, Inc.
 - HL7 FHIR® Proficient Certified
- **Background:**
 - 36+ years IT industry experience
 - 16+ years leading HIT development/implementation efforts
 - 6+ years contributing to the HL7® FHIR® specification (focus on testing)
 - Sr. Architect / Lead Developer for the Touchstone Project
 - Author of the AEGIS WildFHIR public test server and client



What would happen if airlines practiced “one and done” testing?

How important is on-going or continuous testing?



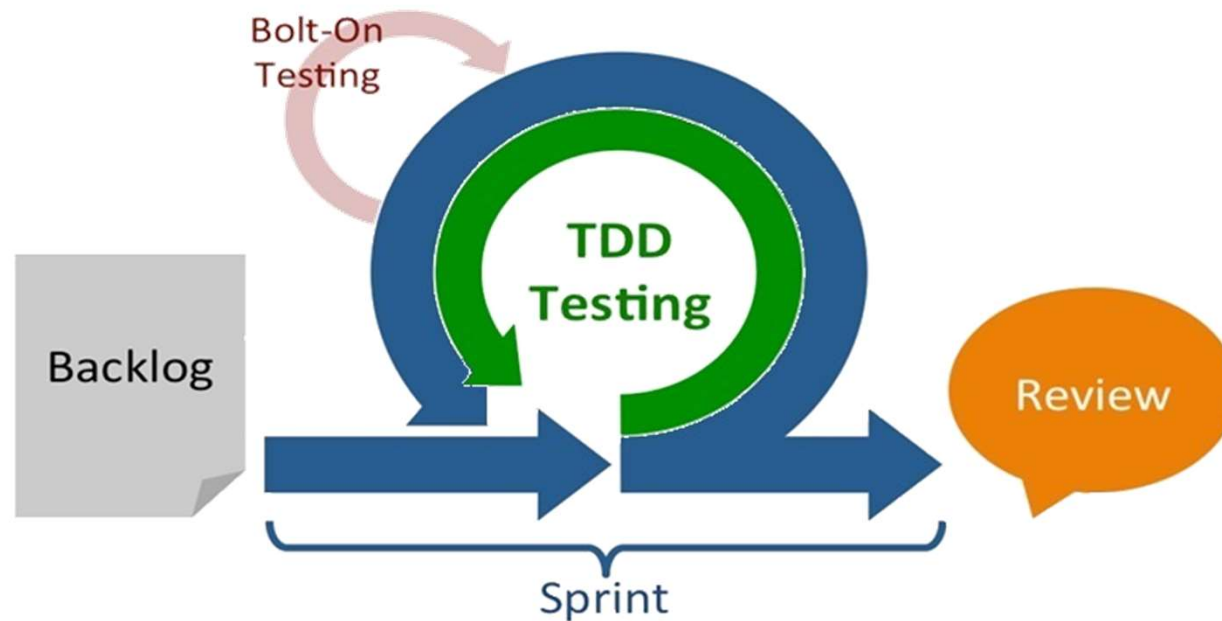


Test Driven Development Philosophy

- Software development technique that implements short development cycles
- Building on the Agile technique of coding to User Stories; Test Driven Development asks developers to build functionality to pass very specific Test Cases
- Each short development cycle requires that the software pass these Test Cases



How to integrate TDD into the development lifecycle







Test Driven Development with FHIR

- To ensure interoperability between applications claiming conformance to the specification, a testing framework has been established within the FHIR specification itself
<https://www.hl7.org/fhir/testing.html>
- This framework defines a Test Engine for processing a TestScript resource as a natural language, computable format of a test case
<https://www.hl7.org/fhir/testscript.html>



FHIR Testing Framework

<http://hl7.org/fhir/testing.html>



HomeGetting StartedDocumentationResourcesProfilesExtensionsOperationsTerminologies

Implementation Support > Testing FHIR

This is the current officially released version of FHIR, which is [R4](#) (v4.0.0). For a full list of all versions, see the [Directory of published versions](#).

7.2 Testing FHIR

FHIR Infrastructure Work Group	Maturity Level: 2	Standards Status: Draft
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The FHIR specification describes a set of [resources](#), and several different frameworks for exchanging resources between different systems. Because of its general nature and wide applicability, the rules made by the specification are fairly loose. As a consequence, and in order to have interoperability between applications claiming conformance to this specification, a testing framework has been established within the FHIR specification. To this end, the [TestScript](#) resource provides an implementation-agnostic description of tests that can be executed to evaluate if a FHIR implementation conforms with the FHIR specification. Providing a clear and concise test methodology for the FHIR specification through the TestScript resource helps to enable interoperability among various FHIR server and client implementations.

Furthermore, the TestScript resource provides clear examples of the appropriate use of the FHIR specification through test-based documentation. The TestScript resource stands as a form of executable documentation allowing developers to examine the operations defined by the tests in order to understand how various RESTful API interactions and resources should be used in coordination. The tests can also be automatically executed against systems under development to determine how well the systems adhere to the specification.



TOUCHSTONE

AEGIS' FHIR Testing Platform

- Available as a publicly accessible, cloud-based, Testing as a Service (TaaS) platform
- Provides automated, internet-based interoperability testing of a test system against the HL7[®] FHIR[®] specification
- Tests the capabilities of and interoperability between both FHIR Server and Client implementations
- Is a FHIR Testing Framework conformant FHIR Test Engine and environment for storing and executing TestScripts, and reporting test results



Touchstone Demo

<http://www.touchstone.com>





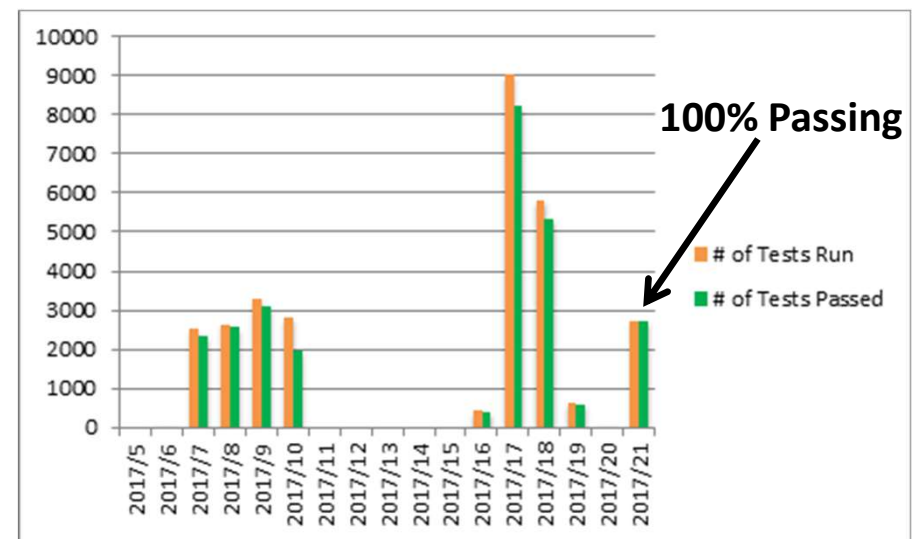
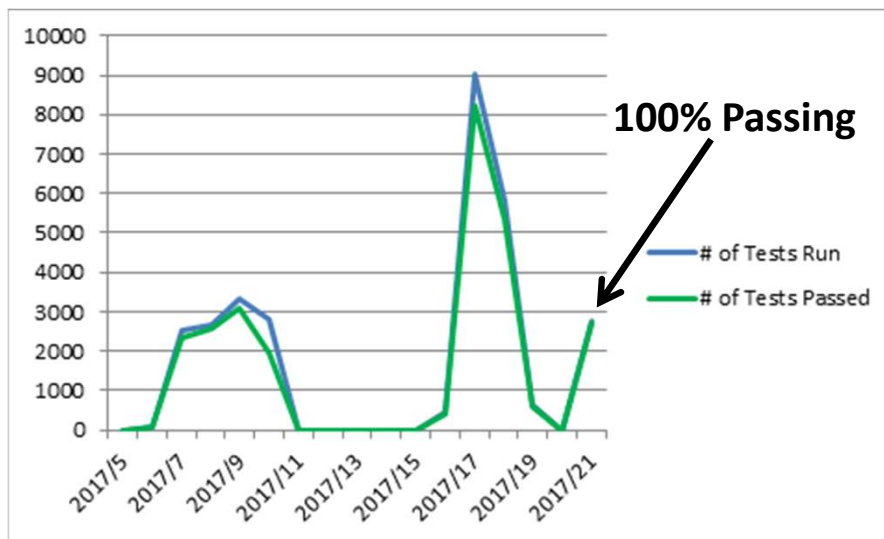
Evidence-Based Quality Assurance

- Continuous Testing against a defined standard ensures ‘no surprises’ when publishing new releases
- Continuous Testing generates data used in analytics which can
 - show patterns and predict trouble areas
 - pinpoint issues in development
 - help show continuous interoperability to your customers, highlighting your competence and reliability
 - provide metrics that can tell the story about problem areas or where there is little volatility



Benefits of using Touchstone – A Real world example

- The following graphs show the progression of testing for an organization using the Touchstone production environment.



**Data used with organization's permission*



How can your organization use Touchstone?

- First and foremost, Touchstone can help your organization with FHIR conformance testing
- Second, organizations can utilize the Touchstone test suites during software build cycles
- And, organizations can write, upload and run their own TestScripts within Touchstone

★ AEGIS offers Multi-day tutorials and training on Touchstone, FHIR Testing and TestScript Authoring

<https://touchstone.aegis.net/touchstone/features#Training>



Exercises

- Getting Started – registration and test system setup
- Test Setup and Execution - FHIR Basic Operations
 - Read, Search, Create, Update and Delete
 - /FHIRSandbox/AEGIS/FHIR3-0-1-North19
 - /FHIRSandbox/AEGIS/FHIR4-0-0-North19
- Presentation Slides and Exercise Documents and TestScripts available on Github: <https://github.com/rettema/FHIRNorthPresentation>



Discussion (Q & A)





Thank you!

See you at the FHIR Testing table!

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