Office of the National Coordinator for Health Information Technology

Lighting the Way for FHIR API Implementation

ONC Tech Forum

Friday, August 18th, 2023 | 1:00 – 2:30 PM ET

Agenda

- Lantern Update
  - Wesley Barker, Chief, Data Analysis Branch, ONC
  - Wei Chang, Public Health Analyst, Data Analysis Branch, ONC
- Inferno Update
  - Scott Bohon, Public Health Analyst, Tools & Testing Branch, ONC
- HTI-1 Proposal: API Service Base URL Publication
  - Keith Carlson, Public Health Analyst, Tools & Testing Branch, ONC
- Patient Access Brands
  - Gino Canessa, Principal Software Engineer, Microsoft
- Q&A/Discussion with Audience

Office of the National Coordinator for Health Information Technology

Lantern Update

Wesley Barker, Chief, Data Analysis Branch, ONC

Wei Chang, Public Health Analyst, Data Analysis Branch, ONC

About Lantern

Lantern monitors and publicly provides nationwide analytics about the availability and standardization of FHIR API service base URLs (“FHIR Endpoints”) deployed by healthcare organizations.

- Lantern gathers and combines data from the following sources:
  - FHIR Endpoints
  - The Certified Health IT Product List (CHPL) database
  - The National Plan & Provider Enumeration System (NPPES)

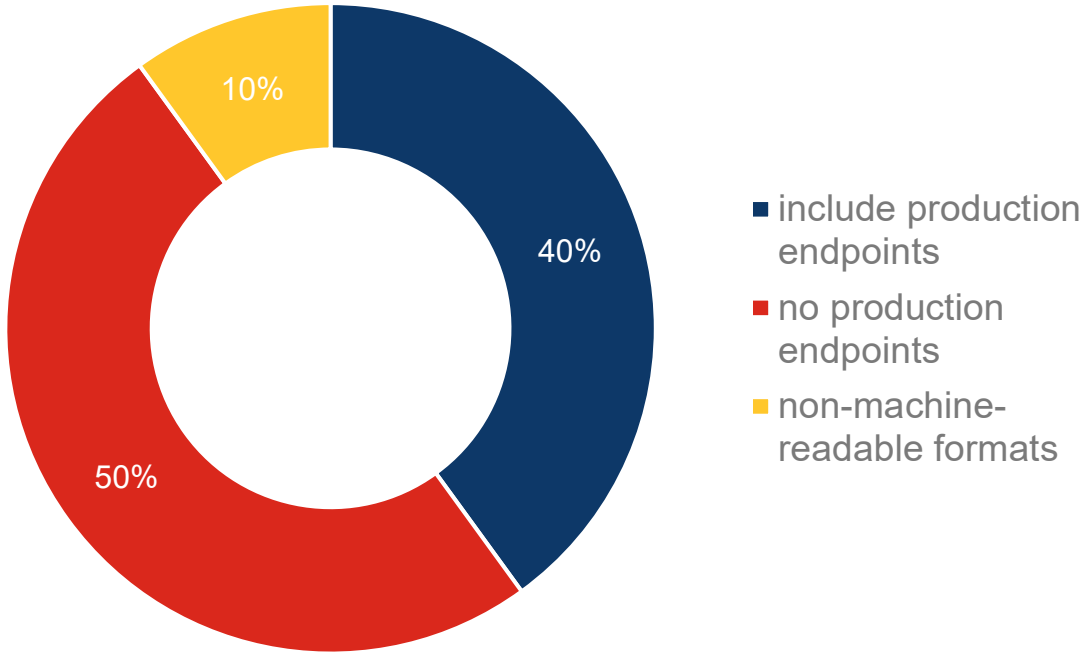
Lantern

FHIR API Monitoring Tool

Current State

- Certified API developers are required to meet the current Standardized API requirements
- Daily downloads

Percent breakdown of 200 unique endpoint lists across all certified API modules (2022)



Note: Includes all health IT modules certified to the *Standardized API for Patient and Population Services* as of January 1, 2023.

Challenges

- lack of standardization for endpoint list publication
- difficulty mapping endpoints to health care organizations

→ a consensus-driven, coordinated approach can foster more uniform endpoint list publication by developers

Solutions

- Lantern Report
  - lack of standardization for endpoint list publication

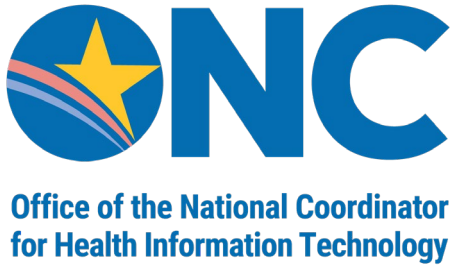
    → FHIR Bundles containing FHIR Endpoint resources
  - difficulty mapping endpoints to health care organizations

    →FHIR Organization resources publicly available; Argonaut Project

Lantern Demo

Lantern Resources

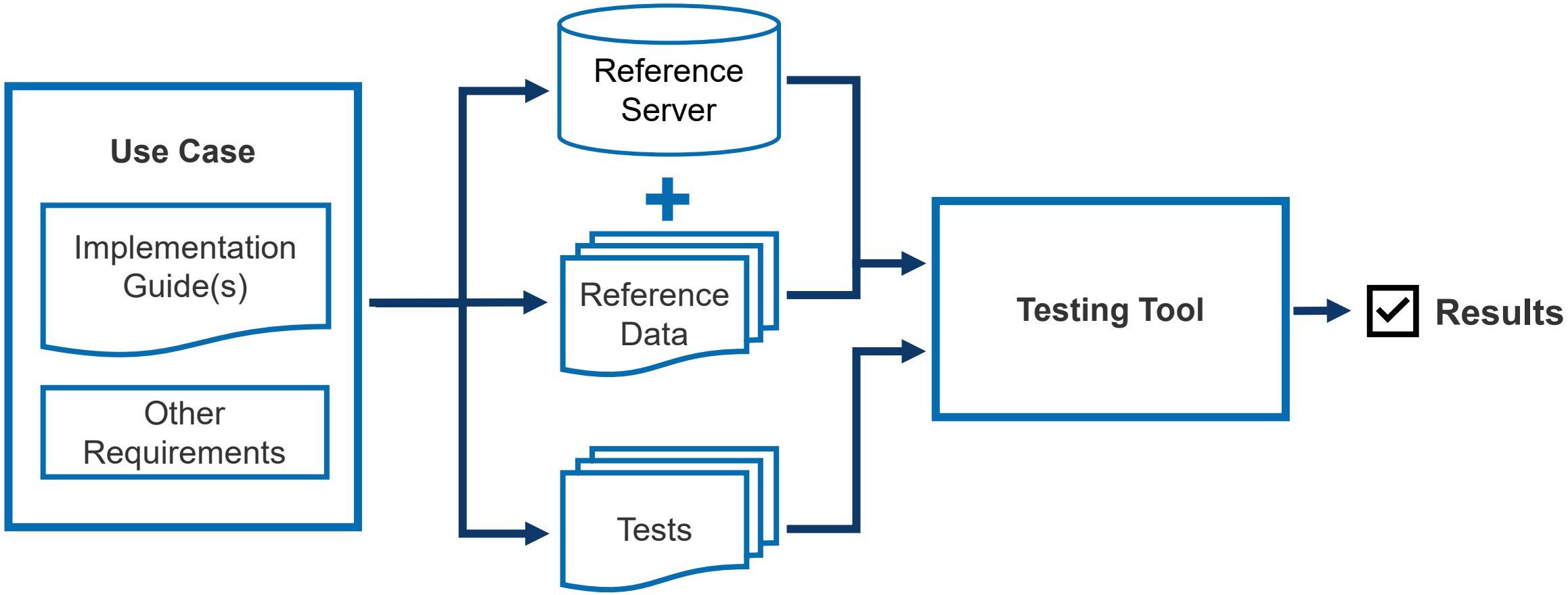
- 2020 ONC Tech Forum
- 2021 Lantern Workshop
- 2022 ONC Tech Forum
- ONC Buzz Blog: Shining a Light on FHIR Implementation: Progress Toward Publishing FHIR Endpoints
- **ONC Buzz Blog: Lantern: Lighting the Way on FHIR Implementation (NEW)**
- **Lighting the Way for FHIR API Implementation Report (NEW)**
- **Daily Downloads on ONC's GitHub (NEW)**



Inferno Update

Scott Bohon, IT Specialist, Tools & Testing Branch, ONC

FHIR Testing Workflow



Step 1:
Define Requirements

Step 2:
Establish baseline artifacts

Step 3:
Test system

Step 4:
Verify conformance

FHIR Testing Tools

- **Inferno**
  - Supports ONC Certification Program and FHIR community testing
  - Supports testing beyond FHIR (Security standards, SMART standards)
  - Uses an alternative to FHIR's "TestScript" testing resource (Ruby programming language)

- **AEGIS Touchstone**
  - Supports variety of FHIR implementation guides
  - Used in an Alternative Test Method for API testing in the ONC Certification Program
  - Executes tests via FHIR "TestScript" resource plus extensions

- **NIST FHIR Toolkit**
  - Supports testing intersection of IHE standards and FHIR
  - Executes tests via FHIR "TestScript" resource plus extensions

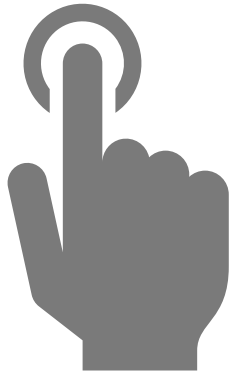
Inferno Features

Certification Testing

Is an official testing tool for the ONC Certification Program

FHIR Profile Testing

Designed to test FHIR, including US Core, Bulk Data, SMART, and more



Interactive and Automated

Tests support both user guided and automated interfaces

Open Source & Transparent

Freely available code and documentation for open and accessible testing

FHIR API Testing in the ONC Certification Program

Inferno supports the ONC Certification program as a testing tool

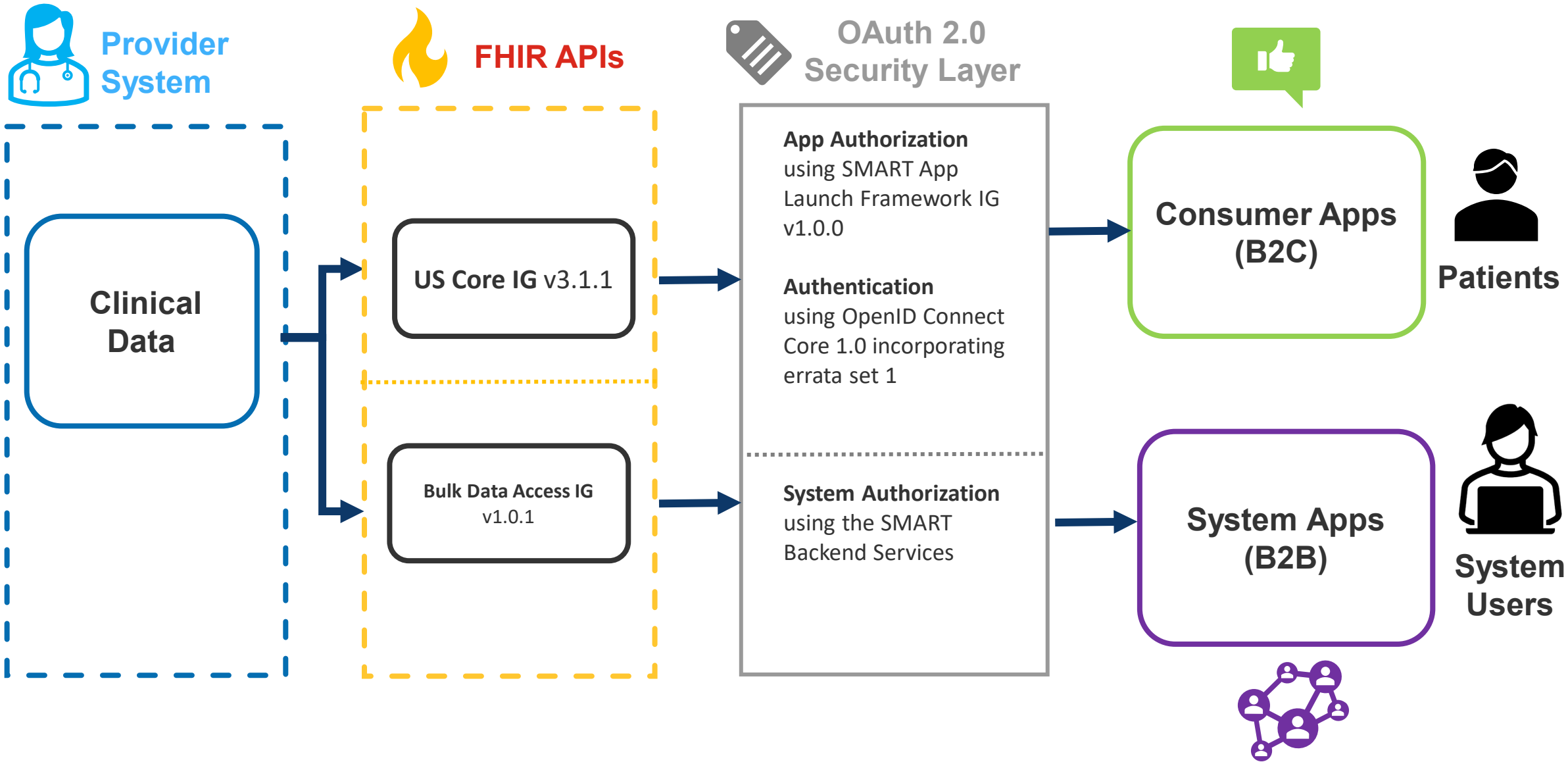
Tests the (g)(10) "Standardized API for patient and population services" FHIR API criterion:

- Endpoint capability discovery
- Authorization and authentication security tests
- Single patient and bulk data access verification
- FHIR resource validation, and more!

Inferno designed for making new test kits for ONC and FHIR community

Ongoing pilot (CARIN IG for BB) to inform future Inferno testing collaborations

§ 170.315(g)(10) Criterion in ONC Program



Inferno Demo

HTI-1 Proposal: API Service Base URL Publication

Keith Carlson, IT Cybersecurity Specialist, Tools & Testing Branch, ONC

Standardized API for Patient and Population Services - API Conditions & Maintenance of Certification

- **Proposal(s):** ONC proposes to reference specific standards for publicly publishing service base URLs in § 170.404(b)(2) using HL7 FHIR and US Core IGs. Additionally, developers with Health IT Modules certified to § 170.315(g)(10) would be required to review these URLs quarterly and, as necessary, update.

- **Benefits:** In conjunction with existing requirements that service base URLs for all customers be published at no charge for use, regardless of whether the Health IT Modules certified to § 170.315(g)(10) are centrally managed by the Certified API Developer or locally deployed by an API Information Source, these proposals would:
  - Align industry approaches to publishing service base URLs based on familiar standards
  - Improve the availability of service base URLs for patient access to their information without special effort
  - Ensure that service base URLs are actively monitored for errors or defects and updated, as needed, quarterly
  - Support scalable endpoint directories for Trusted Exchange Framework and Common Agreement (TEFCA)

Standardized API for Patient and Population Services - FHIR Endpoint Specifics

The Acme Example

Experience to-date indicates that the name of the organization associated is typically formatted as free text (i.e., String), with no unique identifier to know which organization is being supported by the service base URL. For example, the organization name given by the endpoint, "Acme Children's Hospital," could be mapped to six possible organization names, including "Acme's Children's Hospital Anesthesiology," "Acme's Children's Hospital - Urgent Care," and "Acme Children's Hospital – Ambulatory Care Center Pharmacy," among others. This endpoint might map to any one of these organizations, making a definite match difficult to determine. Even more complicated is the possibility of a single endpoint representing all six of the "Acme Children's Hospital"

- ONC proposes to require that service base URLs must be formatted as follows:
  - "Endpoint" resource format according to the standard adopted in § 170.215(a) (FHIR R4)
  - "Organization" resource formatted according to the implementation specifications adopted in § 170.215(b)(1) (US Core), containing
    - organization name, location, and provider identifiers (e.g., National Provider Identifier (NPI), CMS Certification Number (CCN), or health system ID) for each service base URL
  - Collected in a Bundle resource formatted according to the adopted standard in § 170.215(a) (FHIR R4)
- This information would give the public a standard way of knowing how published "Endpoint" and published "Organization" resources are linked and which organizational details apply to which service base URLs.

Patient Access Brands: Connecting With Your FHIR

Gino Canessa

Microsoft

HL7® FHIR® ARGONAUT PROJECT

HL7® International

Agenda

- About me
- Problem framing and scoping
  - Patient, Provider, Vendor, App Developer
  - Context: Argonaut's role
- Solution Overview
  - Specification
  - Example
- Q&A / Discussion (All Speakers Panel)

About Me

- Principal Software Engineer @ Microsoft
  - MSR – Health Futures
  - Healthcare Standards and Interop
- Focused on FHIR since 2019
  - Infrastructure / Tooling
  - Code generation
  - Specification Development
- DICOM-centric before
  - Apologies for the CDs!
- Contact
  - Gino.Canessa@microsoft.com
  - Zulip (chat.fhir.org)
  - YouTube (FHIR Educational Content)

Patient Question:

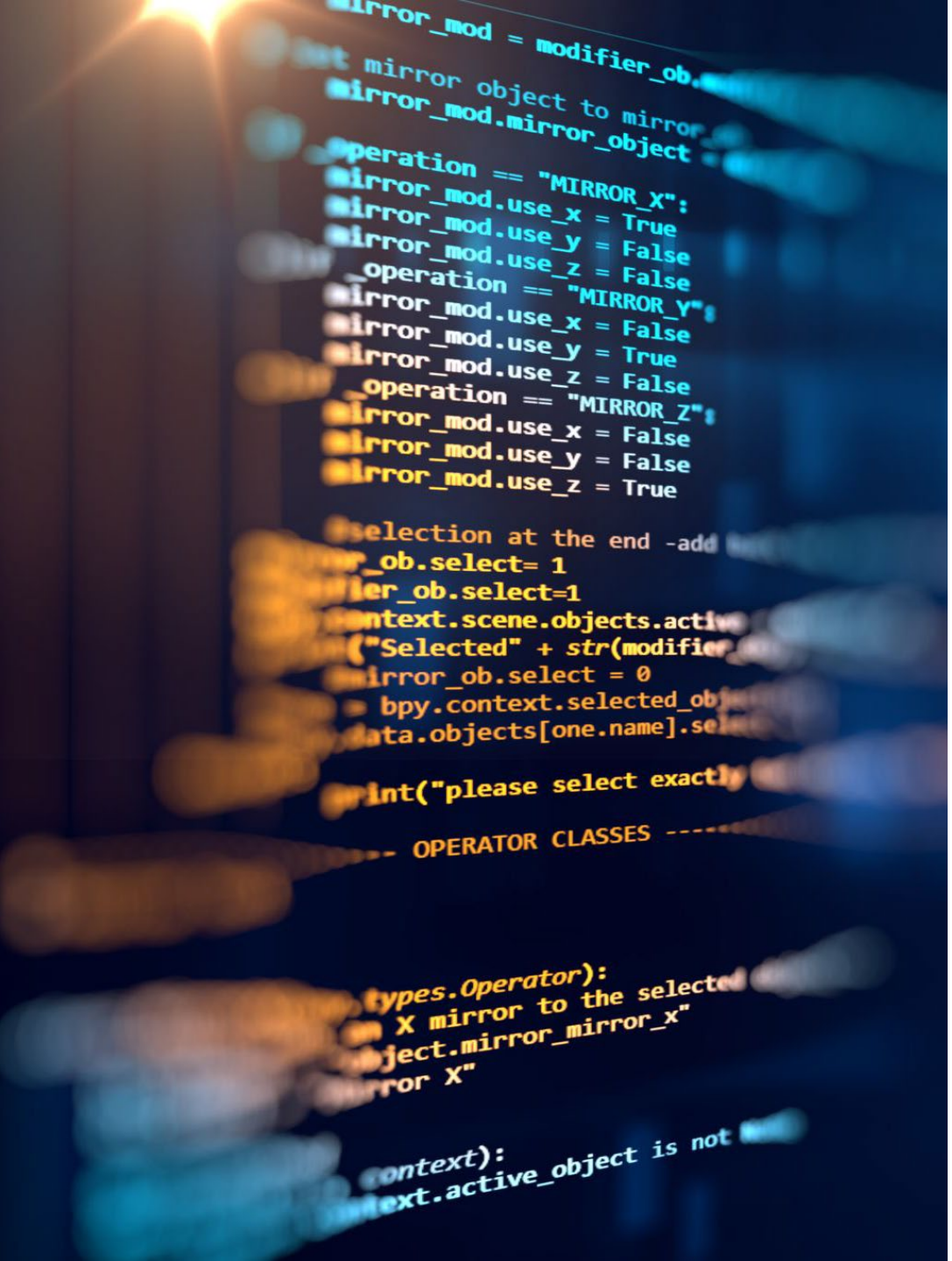
How do I connect to *MY* provider?

Patients:
Connecting to Providers

- FHIR Server URLs should be published
- Do not know facilities by URL
- May not use the correct/current name
- Navigating divisions and orgs can be challenging

Providers:
Issuing Brands

- No recommended format / location to publish
- Need to build/maintain branding for each vendor
- Different requirements mean duplicating work

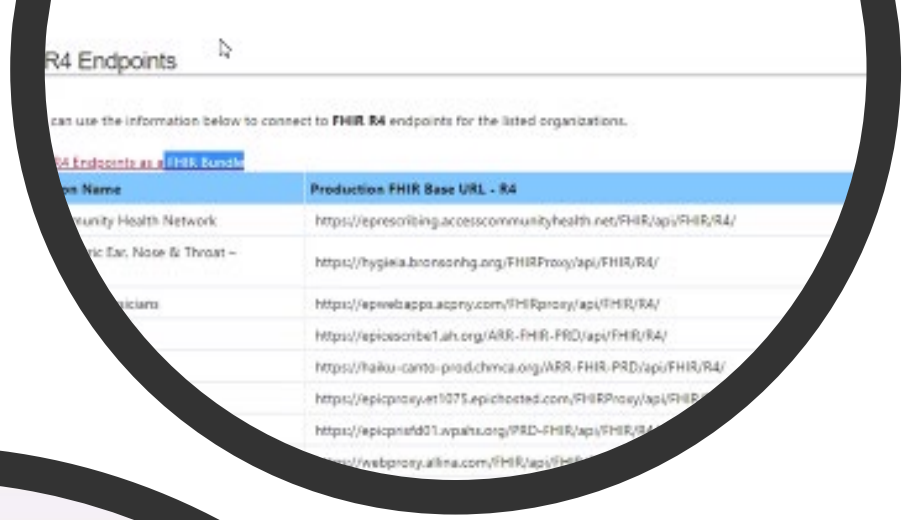


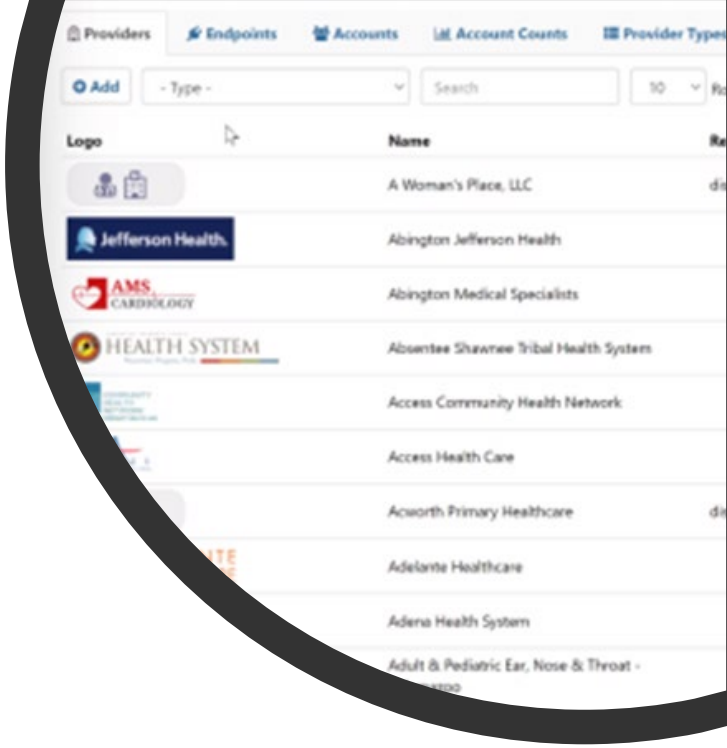
EHR Vendors: Publishing Information

- Required to publish *something*
- No recommended format (FHIR, HTML, XLS)
- Building custom solutions
- Overhead in "provider portals"

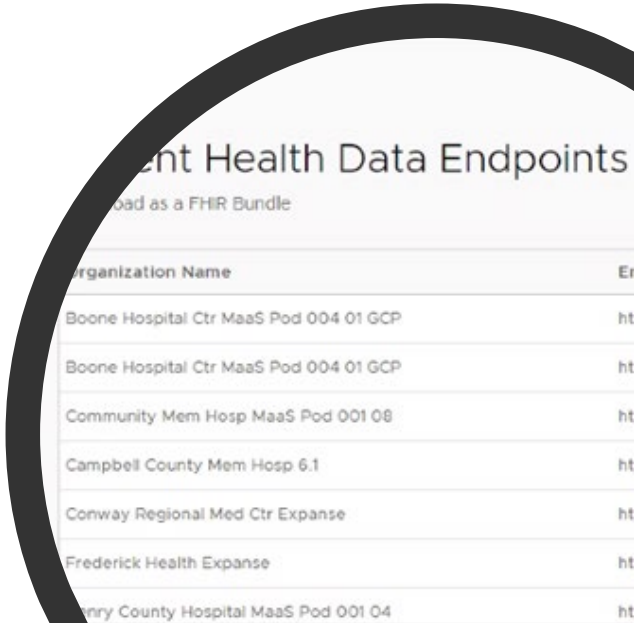
Client Developers: User Experience

- Only minimal information guaranteed
- Producers "hack" to get desired display
- Confused and lost users



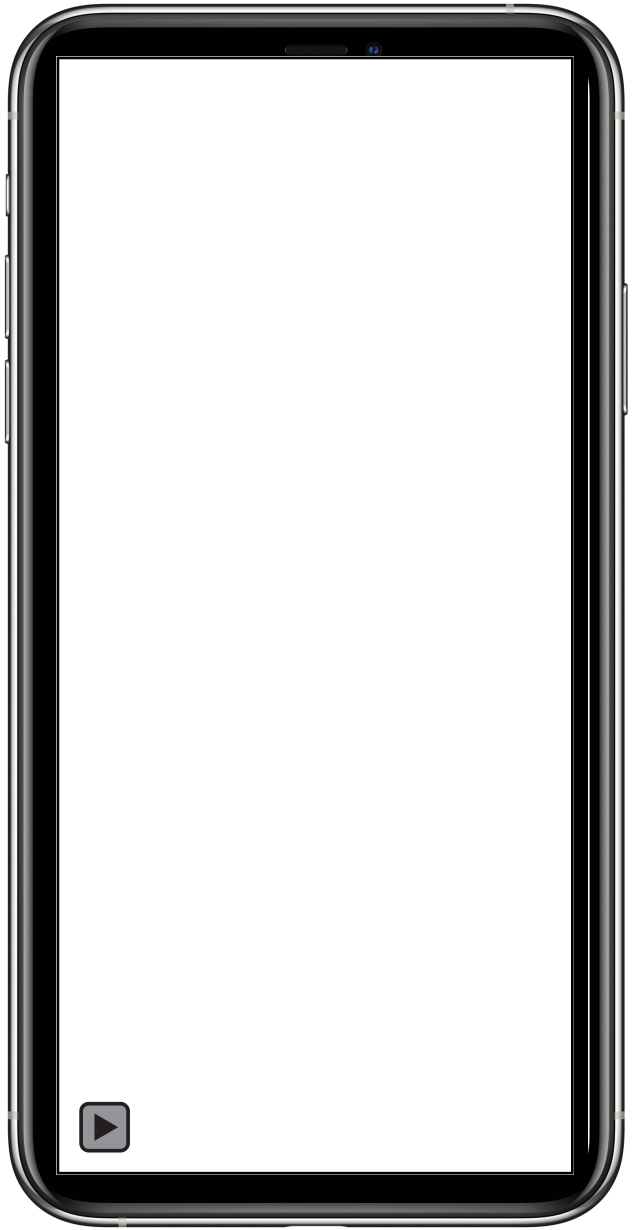


Patients In Practice: Inconsistency



Vendors In Practice: Custom Solutions

- Vendors incentivized to meet needs
- Complicated space
- Solutions depend on market segment



Why Argonaut?

- Quick alignment for production work
- Develop a "universal" solution
- Path forward through HL7

The Project

- Argonaut Patient Access Brands (was: FHIR Endpoint and Structure)
- 2022 "mini" project (Confluence)
- Limit scope
  - Focus on building blocks
  - Not a directory
- Regular attendance of 20+ organizations
- Connectathons in 2022-06 and 2023-05

The Solution

- Profiles
  - Organization
  - Endpoint
- Handful of extensions
- Discovery in SMART Well-Known
- Clarify core concepts

The Details: Endpoints

- Profile
  - Status, Connection Type
  - Organization Reference
  - Contact Information
- Extensions
  - FHIR Version

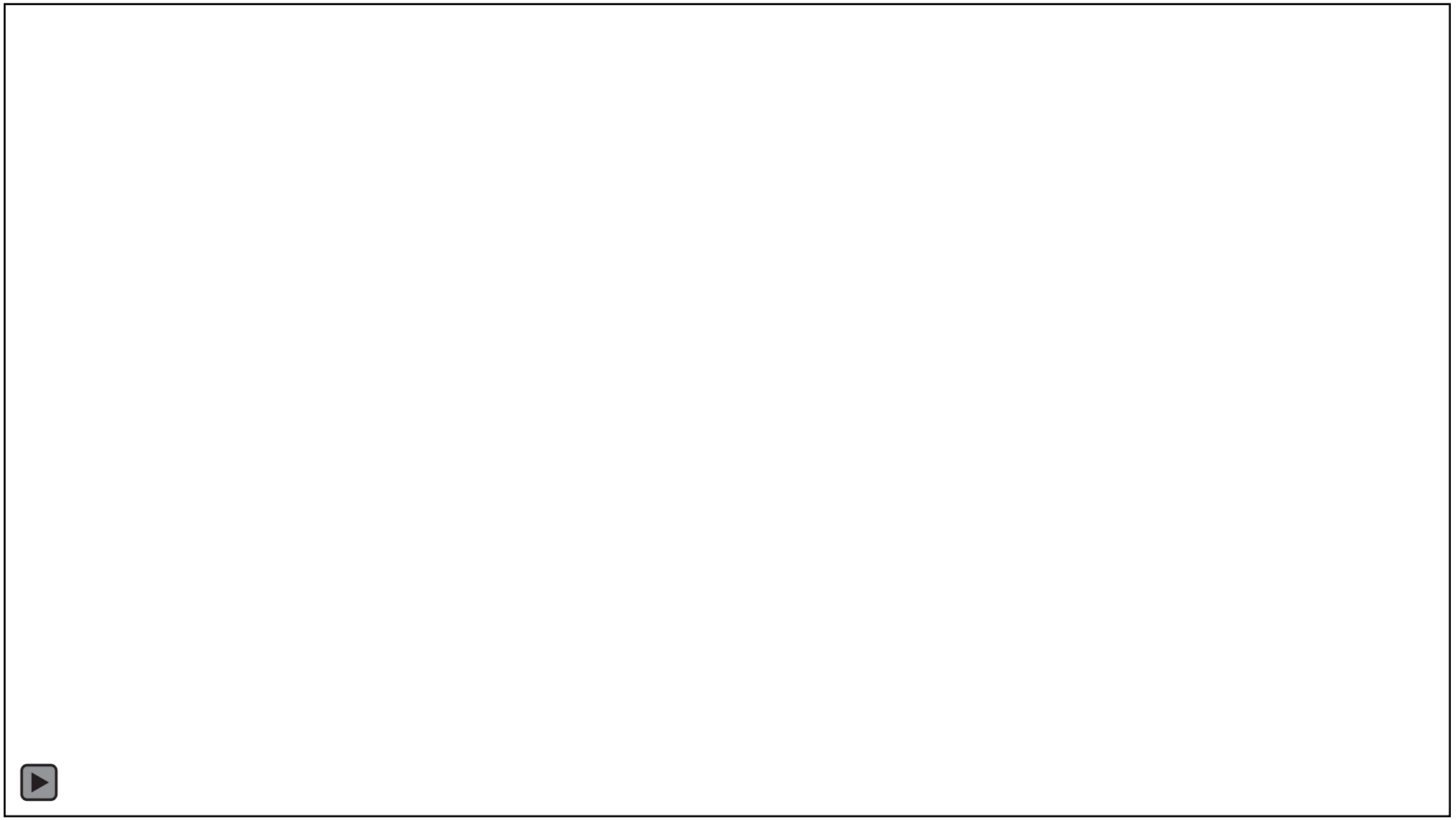
The Details: Organizations

- Profile
  - Type of Organization
  - Name, Alias, Telecom, and Address
  - PartOf (for nesting)
- Extensions
  - Flags (e.g., not user selectable)
  - Brand Logo, Logo Use (usage agreement)
  - Portal Name, URL, Description, Logo, and Logo Use

The Specification (Draft)

- SMART Patient Access Brands and Endpoints
  - CI Build: SMART App Launch
  - Organization Profile
  - Endpoint Profile
  - Examples
- Extensions MAY move to the core FHIR Extensions IG

Brand Building: SMART Brand Editor



The Results

- Simplified management for Providers and Vendors
- Better consistency for patients
- Improved access to records

Thank You!

Gino Canessa

Microsoft

HL7® FHIR®

ARGONAUT PROJECT

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Q&A/ Discussion with Audience

- What are your reflections on the value of Lantern, Inferno, and Brands?
- What barriers or issues do you face implementing FHIR-based APIs?
- How can Lantern, Inferno, and Brands further support implementation and address these barriers?

Office of the National Coordinator for Health Information Technology

Contact ONC

Lantern: lanternproject@hhs.gov

Inferno: Health IT Feedback and Inquiry Portal | chat.fhir.org

Argonaut: chat.fhir.org

Phone: 202-690-7151

Health IT Feedback Form: https://www.healthit.gov/form/healthit-feedback-form

Twitter: @onc_healthIT

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