Lantern Project Education Session

January 2, 2022.

The Office of the National Coordinator for
Health Information Technology

Introduction & Agenda

Vaishali Patel, ONC

Agenda for Today

- **Vaishali Patel** of ONC will provide a brief overview of Lantern

- **Brianna Mathiowetz** of MITRE will demo of the Lantern Project and explain the features of Lantern's public dashboard.

- **Keith Carlson** of ONC will discuss clarifications to the certification companion guide for the *Standardized API* criterion that recommends a common format to publish endpoint lists.

- **Jeff Brown** of MITRE will present on work to build consensus on addressing variability in the publication of the endpoint lists

- **Q&A Protocol**
  - Please type your questions about the Lantern Project in the Q&A section. We will monitor and respond to the questions as they're asked either in written format or verbally.
  - We are planning to also have time for Q&A at the end for questions that involve broader discussion.

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What is Lantern? How does it work?

Lantern is a monitoring tool that provides analytics about the availability and adoption of FHIR API service base URLs across healthcare organizations in the U.S.

http://lantern.healthit.gov

- Lantern gathers and combines data from the following sources:
  - FHIR API endpoints
    - Discovered in publicly available Endpoint Lists
  - The Certified Health IT Product List (CHPL) database for product and vendor information
  - The National Plan & Provider Enumeration System (NPPES) for provider organization information

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The Potential Value of Lantern for ONC and others in the health IT community

- **Endpoint List Validation**

  - How many endpoints from list X are active?

  - How many FHIR endpoints support resource X?

  - How many endpoints from list X support Y (e.g., FHIR version)?

- **Endpoint Discovery**

  - Ease the burden of having to discover and parse each different vendor-provided endpoint lists

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Endpoint List Publication Assessment

- As a consumer of these endpoints, Lantern monitors and analyzes the representation and content of endpoints: variability does exist in the publication of endpoints.

- Lantern seeks to build consensus on how endpoint lists should be formatted and how data should be made available on the endpoint.

- A consensus-driven, coordinated approach can foster more uniform endpoint list publication by developers.
  - Certified API developers do not need to develop their own approach (recommendations use existing FHIR resources.)

  - More predictable, standardized way for app developers, patients, and others to consume the lists

Demo of Lantern

Brianna Mathiowetz, MITRE

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FHIR Endpoint List Publishing

Keith Carlson, ONC

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API Requirements finalized in ONC Cures Act Final Rule

Technical capabilities

Standardized API for patient and
population services

+

Compliance requirements

API Conditions and Maintenance of
Certification requirements

=

API access without special effort

API Requirements finalized in ONC Cures Act Final Rule

- **Service base URL publication at 45 CFR 170.404(b)(2):**

    (2) *Service base URL publication.* A Certified API Developer must publish the service base URLs for all Health IT Modules certified to § 170.315(g)(10) that can be used by patients to access their electronic health information. The Certified API Developer must publicly publish the service base URLs:

    (i) For all of its customers 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; and

    (ii) In a machine-readable format at no charge.

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<u>Certification Companion Guide Clarifications</u> to 45 CFR 170.404(b)(2)

- Certified API Developers must make available appropriately scoped service base URLs that can be used by patients to access their EHI for Health IT Modules certified to § 170.315(g)(10).

- As discussed in section VIII.C.6.c of the ONC Cures Act Final Rule, API Information Sources who locally manage their FHIR servers without Certified API Developer assistance cannot refuse to provide to Certified API Developers the FHIR service base URL(s) that is/are necessary for patients to use to access their EHI. Equally, pursuant to this Maintenance of Certification requirement, they would be required to publish the FHIR service base URLs they centrally manage on behalf of API Information Sources.

Certification Companion Guide Clarifications to 45 CFR 170.404(b)(2)

- *One (large) clarification broken up for readability:*
- To be open and transparent to the public, developers must provide a hyperlink to the list of service base URLs to be published with the product on the ONC Certified Health IT Product List (CHPL)
- Certified API Developers are encouraged to use a standardized format when publishing the service base URLs for all of its customers
  - ONC recommends Certified API Developers leverage the HL7 FHIR 4.0.1 "Endpoint" resource, or profiles of this resource such as the Validated Healthcare Directory Implementation Guide STU1 "vhdir-endpoint" profile, to represent service base URLs that can be used by patients to access their health information
- ONC also encourages developers to provide as much information about the service base URLs as available, including the API Information Source's organization details, such as name, location, and provider identifiers (e.g., NPI, CCN, or health system ID)
- These steps will help industry coalesce around standards that enable application developers to more easily and consistently provide patients access to their electronic health information.

Thank you!

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Addressing variability in the publication of endpoint lists

Jeff Brown, MITRE

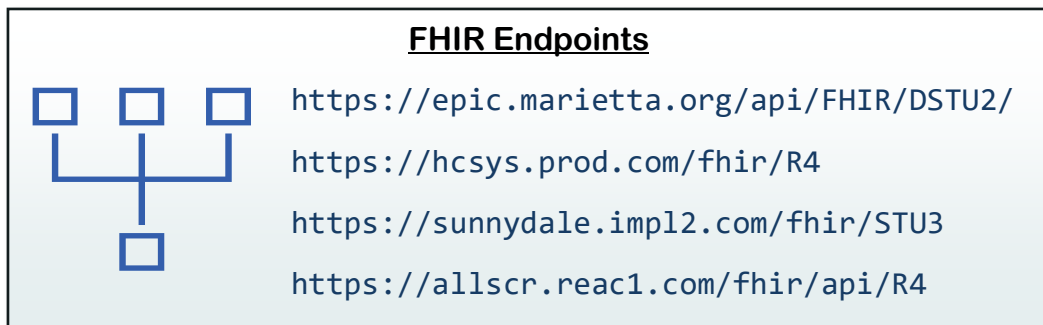# Issues Being Addressed by ONC

1. Endpoint Publication Format Standardization

2. Accessing Necessary Organization Information

3. Identifying All Software Supported by FHIR Capability Statement

1. Endpoint information publication format standardization

The ONC Final Rule contains a specific requirement that "*an API Technology Supplier must support the publication of Service Base URLs for all of its customers*" and also *"make such information publicly available (in a computable format) at no charge."*

FHIR Endpoints

```
https://epic.marietta.org/api/FHIR/DSTU2/
https://hcsys.prod.com/fhir/R4
https://sunnydale.impl2.com/fhir/STU3
https://allscr.reac1.com/fhir/api/R4
```

These Service Base URLs are commonly referred to as "FHIR Endpoints", and for this data to be publicly available there cannot be any requirements for authorization or credentials.

To provide the appropriate level of information regarding FHIR endpoints, including all the organizations that are serviced by a particular FHIR Endpoint, a more structured approach is necessary than is currently in place within this requirement to publish endpoint information.

MITRE

1. Endpoint information publication format standardization

The initial step in solving the problem at hand would be to recommend all endpoint information to be published, and accessible, in the FHIR Endpoint resource format[1]. This would allow for standardized and consistent ingestion of the required endpoint publications, without the need for potential customizations to tailor processing for individual vendors.

A few key stakeholders (e.g., Epic) have already begun doing this of their own accord, but it is still a rare situation.

Name	Flags	Card.	Type
Endpoint	TU		DomainResource
identifier	Σ	0..*	Identifier
status	?! Σ	1..1	code
connectionType	Σ	1..1	Coding
name	Σ	0..1	string
managingOrganization	Σ	0..1	Reference(Organization)
contact		0..*	ContactPoint
period	Σ	0..1	Period
payloadType	Σ	1..*	CodeableConcept
payloadMimeType	Σ	0..*	code
address	Σ	1..1	url
header		0..*	string

[1] At a July 2021 ONC Workshop, it was noted that a large majority of participants supported the idea of using the FHIR Endpoint resource for their published lists.

MITRE

2. Accessing necessary organization information

While the critical need and requirement for endpoint information is evident, it is also necessary to know about the organizations related to the endpoint – not only the one that manages the endpoint (i.e., controls or owns it), but it has also been determined that multiple organizations may be serviced by a single endpoint.

Endpoint

MITRE
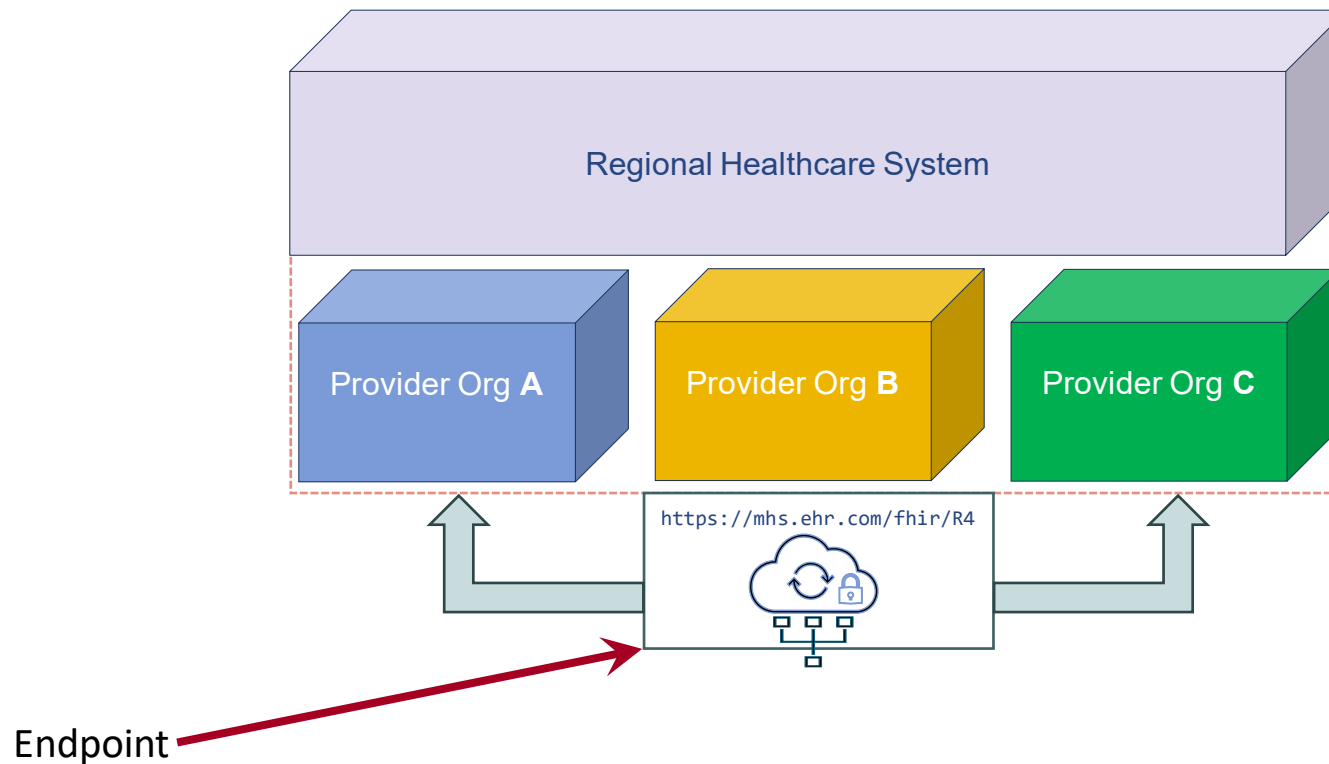
2. Accessing necessary organization information

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payloadType	Σ	1..*	CodeableConcept
payloadMimeType	Σ	0..*	code
address	Σ	1..1	url
header		0..*	string

Assuming the initial step seeking publication of endpoint information to be as FHIR **Endpoint** resources materializes, the current structure of the FHIR Endpoint resource contains only one element referencing an Organizationallows for a maximum of only 1 occurrence of the managingOrganization element (Cardinality 0..1).

This design would not satisfy the current need, as multiple organizations may often be serviced by a single endpoint.

MITRE

2. Accessing necessary organization information

The Lantern team from MITRE reviewed the responses and feedback received during the July Workshop to develop a solution that would provide the necessary information availability while remaining a feasible lift for implementers and vendors.

Initial Considerations:

- ✗ Change the Endpoint resource `managingOrganization` element cardinality from 0..1 to 0..*

- ✗ Create FHIR Operation to allow retrieval of organization resources upon demand.

- ✗ Adding a `servicedOrganization` element to the Endpoint resource

- ✗ Creating an associative entity for `Organization` and `Endpoint` resources

MITRE

# 2. Accessing necessary organization information

Final Proposed Solution:

Organization resources to be accessible on published endpoints external to Authentication/Security frameworks.

Publicly accessible FHIR Organization resource instances should be offered on the endpoint and support queries of those resources (i.e., outside of any authentication security framework). This would allow a user to query a publicly accessible endpoint's system for associated organizations and retrieve them in the standardized FHIR format already supported by the system.

Requires no modification to the FHIR Specification and only moderate additional effort on endpoint publishers.

Organization   Organization
Organization

Endpoint
(resource)
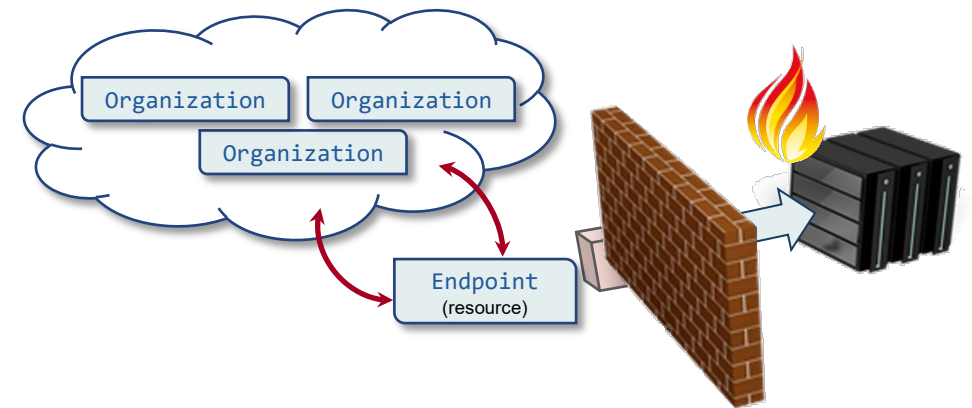
3. Identifying all software supported by Capability Statement

It is common to house multiple different software products behind a FHIR server. There needs to be a way to communicate each of those software products to the consumer of the CapabilityStatement.

The FHIR CapabilityStatement resource does provide an element to capture this information, but…

Unfortunately, the 'software' element has a cardinality of 0..1 and thus ONLY supports a maximum of one software application to be listed.

Name	Flags	Card.	Type
CapabilityStatement	I N		DomainResource
url	Σ	0..1	uri
version	Σ	0..1	string
name	Σ I	0..1	string
title	Σ	0..1	string
status	?! Σ	1..1	code
purpose		0..1	markdown
copyright		0..1	markdown
kind	Σ I	1..1	code
instantiates	Σ	0..*	canonical(CapabilityStatement)
imports	Σ TU	0..*	canonical(CapabilityStatement)
software	Σ I	0..1	BackboneElement
name	Σ	1..1	string
version	Σ	0..1	string
releaseDate	Σ	0..1	dateTime
implementation	Σ I	0..1	BackboneElement

MITRE

3. Identifying all software supported by Capability Statement

It is unlikely that every software product will be associated with a single unique capability statement. A capability statement can and often will need to be used to cover multiple products.
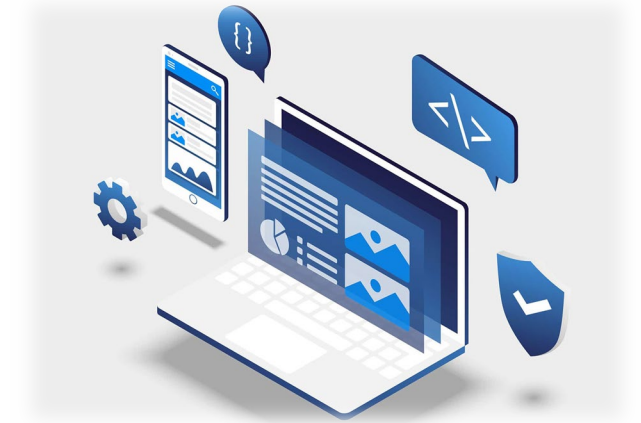
There is a reality of multiple distinct products being represented via a single endpoint, and we on MITRE's Lantern team working with ONC feel this will become more and more common due to the regulation requiring endpoint publication.

The ability to acquire all product information, including an identifier that references the registration source, is necessary for understanding the landscape around usage and compliance. The current limitation of 0..1 for CapabilityStatement.software is a hindrance to the industry consensus on properly and adequately providing this important software information to the public.

MITRE

Thank you!

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Q&A:
Please Type your Questions

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Thank You!

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