

The Office of the National Coordinator for  
Health Information Technology



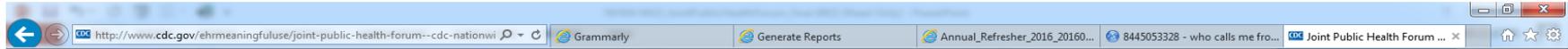
Joint Public Health Forum & CDC Nationwide  
Webinar

Healthcare Directory Interoperability Standards

April 19, 2018

Putting the **I** in Health **IT**  
[www.HealthIT.gov](http://www.HealthIT.gov)

<https://www.cdc.gov/ehrmeaningfuluse/joint-public-health-forum--cdc-nationwide.html>



## Meaningful Use

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### Joint Public Health Forum & CDC Nationwide



### Community Profile

The Office of the National Coordinator for Health IT (ONC) and the Centers for Disease Control & Prevention (CDC) jointly sponsor this initiative, which features monthly webinars to foster collaboration amongst the public health jurisdictions across the nation, in response to the widespread adoption of electronic health records (EHRs) for Meaningful Use.

The objectives for this initiative include:

- Identify common questions and concerns around meaningful use
- Provide updates on federal partner activities in preparing for meaningful use
- Allow public health jurisdictions to share useful practices and current progress
- Identify technical assistance needs and priorities

*Note: Webinar pre-registration is required and the instructions to register are provided in the Monthly Webinar Registration section below.*

Please send in your feedback, questions, and/or suggestions for these Joint Public Health Forum & CDC Nationwide Webinars to the Meaningful Use Mailbox ([meaningfuluse@cdc.gov](mailto:meaningfuluse@cdc.gov)).

### Meeting Schedule and Webinar Information

#### Meeting Schedule:

# Question and Answer Session

## How to submit or ask questions for the panel members?



### • Submit or Ask Questions

- Submit your text question and comments using the Question Panel
- Please raise your hand to be unmuted for verbal questions.



# Healthcare Directory Interoperability Standards

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April 19<sup>th</sup>, 2018

Daniel Chaput, ONC – Alex Kontur, ONC



# Agenda

- The business need & operational need
- The background
- The current effort
- Public Health considerations
- FHIR (very briefly)
- Validated Healthcare Directory Implementation Guide

# The business and operational need

- “A recent Booz & Company analysis for CAQH estimates that payers alone spend \$2.1 to \$2.3 billion annually to maintain provider databases. It further estimated that 75 percent of those costs could be offset by directly integrating to an external ‘single source of truth’, if such a source existed.” (1)
- “Federal officials this month warned 21 Medicare Advantage insurers with high rates of errors in their online network directories that they could face heavy fines or have to stop enrolling people if the problems are not fixed by Feb. 6.” (2)
- Provider burden (from Medical Group Management Association (MGMA))
  - » Average of 19 credentialing applications for each physician each year. 13 for insurance companies, 6 for clinical practice.
  - » Average of 7 credentialing applications for each non-physician each year. 13 for insurance companies, 6 for clinical practice.

1. Issue Brief: Administrative Provider Data. CAQH [Analysis completed by Booz & Co., now Strategy&, Inc.] - <https://www.caqh.org/sites/default/files/solutions/events/2011/q4/IssueBrief.pdf>

2. <https://khn.org/news/21-medicare-health-plans-warned-to-fix-provider-directory-errors/>

## **DEPARTMENT OF HEALTH AND HUMAN SERVICES**

**Office of the Secretary**

**45 CFR Part 170**

**RIN 0991-AB93**

**2015 Edition Health Information  
Technology (Health IT) Certification  
Criteria, 2015 Edition Base Electronic  
Health Record (EHR) Definition, and  
ONC Health IT Certification Program  
Modifications**

## We proposed; you commented

- ❑ **We proposed** a new 2015 Edition “healthcare provider directory—query request” certification criterion and;
- ❑ “Many **commenters confirmed** the value of provider directories and the ability for EHRs to query a provider directory” and
- ❑ “Most **commenters stated** that the proposed IHE HPD standard was immature” and that there were “issues related to federated queries” and;
- ❑ “**Commenters also noted**, to ensure quality data, there needs to be: Centralized directories; a governance model for a centralized approach; and uniform directory sharing strategies among providers, organizations, and intermediaries ” and;
- ❑ “**Some commenters stated a preference** for an approach that utilized a RESTful Architecture”

## in addition

- » We note[ed] that **HHS remains committed** to advancing policies related to provider directories as a means of **furthering health information exchange and interoperability**.
- » We **believe that continued work in this space can inform the development and implementation of provider directory standards** for consideration in future rulemaking.

# Provider Directory Workshop

- Two-day workshop organized by FHA and ONC was held at the MITRE Headquarters in McClain, VA on April 5/6.
- First day focused on presentations and questions, second day was focused on use cases
- One Hundred and ten (110) in-person attendees ( including 27 federal staff) and an additional ninety-four (94) virtual
- Attendees included the following:
  - Federal: ONC, HHS, CMS, DoD/DHA, VA, SSA, CDC
  - State (HIE/Medicaid/Govt): Michigan, Oregon, Rhode Island, Colorado, California, Illinois, Ohio
  - Payers and Payer Organizations: AHIP, CA BCBS, CIGNA, Humana, United, Wellmark
  - HIT Vendors: Cerner, Epic, NextGen
  - Not for Profit Interoperability: CAQH, NATE, Direct Trust, Sequoia Project
  - Professional: AMA, Kaiser, Johns Hopkins
  - National Networks: Surescripts

# PD Workshop Summary

- Strong interest in the federal government providing, at a minimum, a validated core data set for PD
  - expand the scope of NPPES or
  - create a central resource for all local directories to use / reference
- Many use case – all important for interoperability and care delivery
  - Need to prioritized and define data / validation / exchange requirements
- Focus is now on use of FHIR for PD interoperability (not on IHE HPD)
- Need for coordination of PD effort between Federal agencies (including ONC), state initiatives and commercial efforts to minimize/avoid duplication of effort

# To find all the background material

ONC Tech Lab Standards Coordination

PAGE TREE

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## Provider Directory Workshop

Created by Scott Starkey, last modified by Caitlin Ryan on Oct 17, 2017

Please see child pages in the page tree on the left for further information.

## Provider Directory Workshop

April 5-6, 2016

McLean, VA

**Purpose Statement:**

- The purpose of the Provider Directory Workshop will be to convene public and private stakeholders to review past and current challenges, share success stories, and generate new ideas around provider directory standards and solutions.

**Intended Audience:**

- Health IT developers with an interest in provider directory standards and implementation.
- Organizations and vendors that are developing or implementing provider directory solutions.

**Focus:**

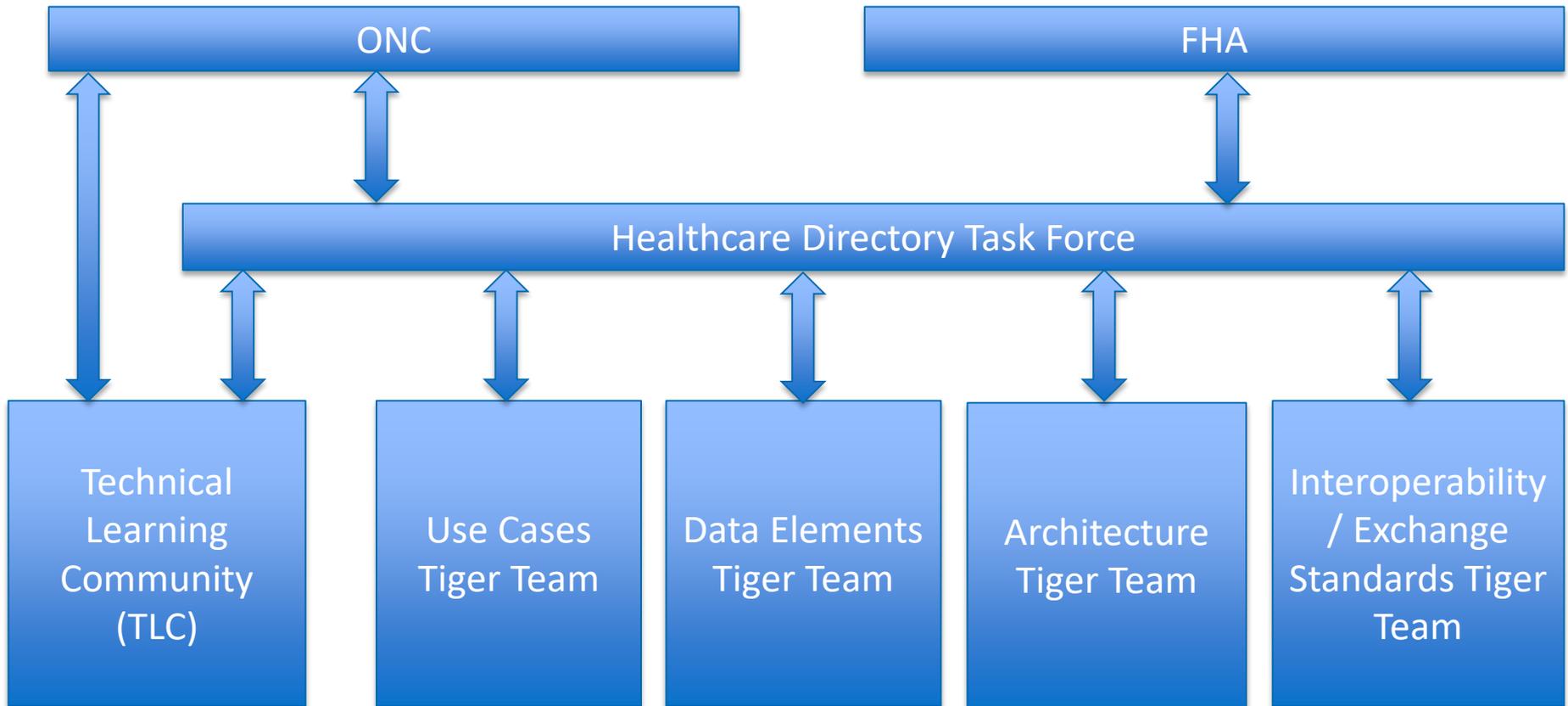
- The workshop will approach provider directory from the point of view of interoperability, data quality, existing and evolving standards, and other technical considerations. We recognize that technical solutions alone are insufficient for successful implementation, we will consider non-technical (governance, sustainability, etc.) considerations as appropriate.

<https://oncprojecttracking.healthit.gov/wiki/display/TechLabSC/Provider+Directory+Workshop>

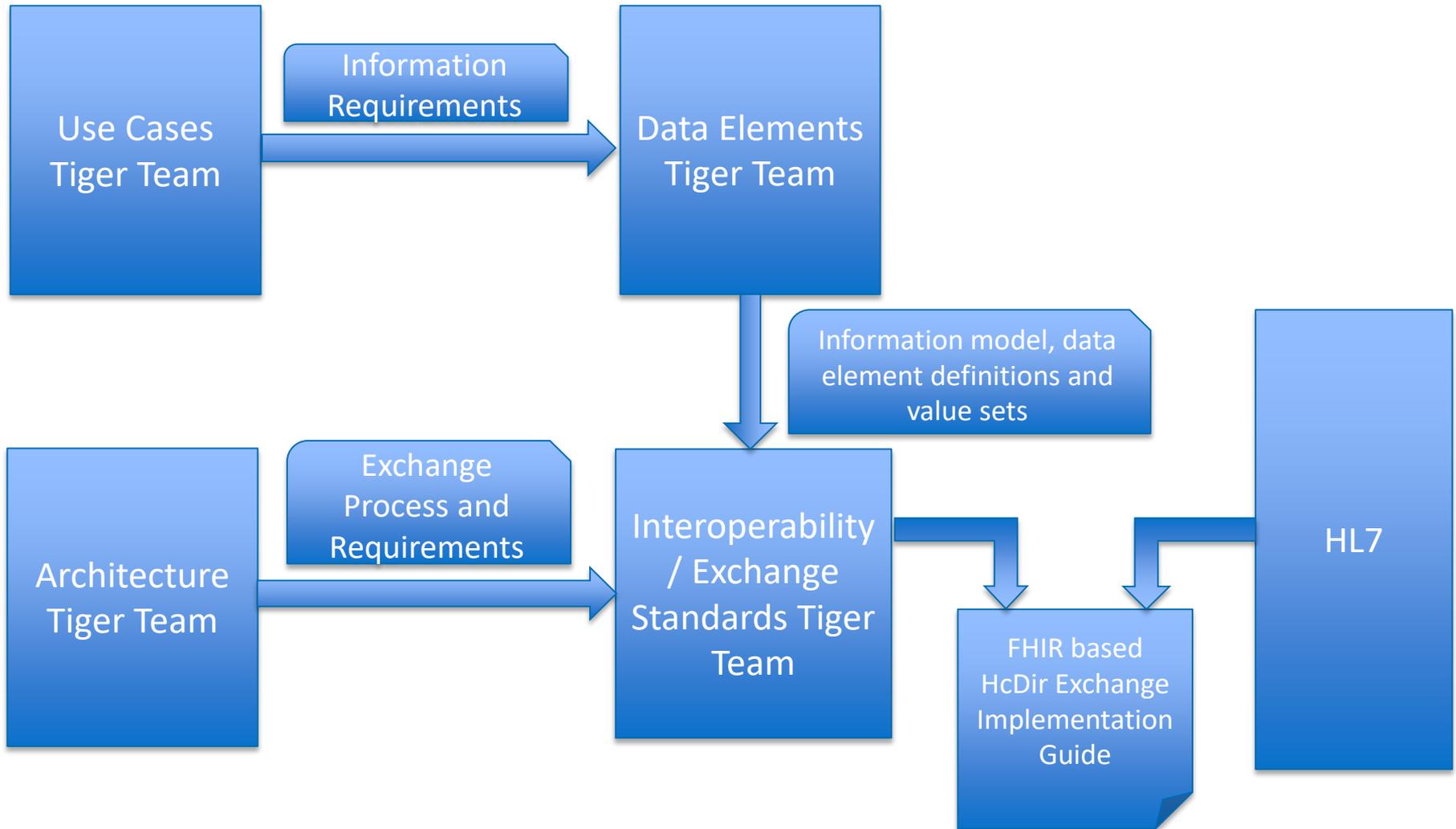
# Healthcare Directory Project Overview

- Goal: develop a national resource with a core set of validated data that can be used for local implementations of healthcare directories
- Approach:
  - » ONC/FHA Task Force
  - » Technology Learning Community – periodic meetings
  - » Tiger Teams (Use Cases, Data Elements, Architecture, Interoperability)
  - » A Basecamp site (now confluence) for collaboration and sharing

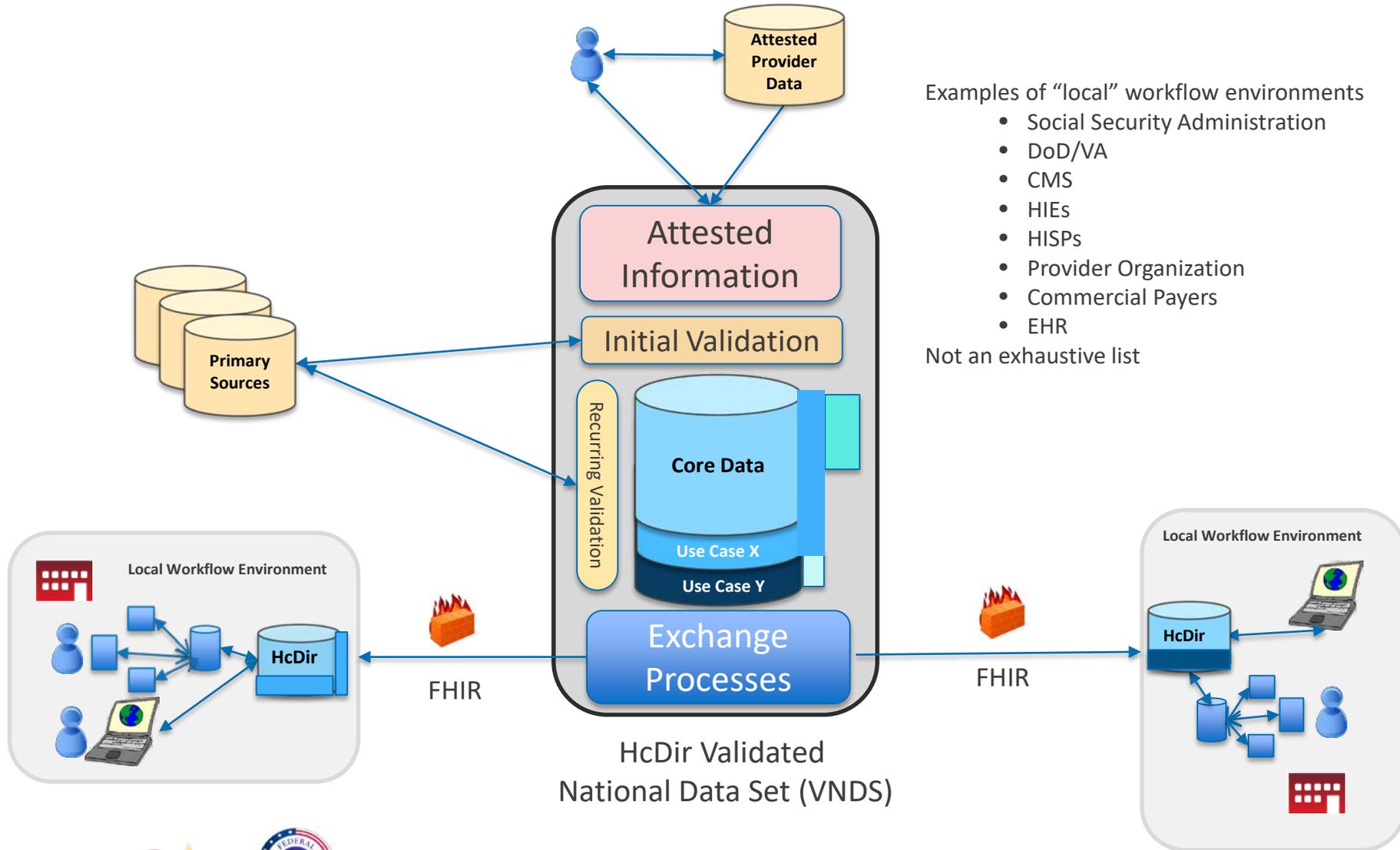
# ONC-FHA Healthcare Directory Organizational Structure



# ONC-FHA Healthcare Directory Tiger Team Dependencies



# HcDir Conceptual Architecture -- Draft



# Public Health Considerations

- Licensing of MDs, Dos, APRN, RN and other licensed professionals
  - » May be both consumers and suppliers of information
- Medicaid
  - » Improved accuracy of provider network details
  - » Single source would allow reuse of information across borders
- Emergency preparedness and response
  - » A common source of updated data on organizations and their members for Medical Reserve Corp (MRC), Emergency System for the Advance Registration of Volunteer Health Professionals (ESAR-VHP), Disaster Medical Assistance Team (DMAT), Disaster Mortuary Operational Response Team (DMORT), National Veterinary Response Team (NVRT), National Medical Response Team (NMRT)
- Support for HIEs
- Support for interoperability

## FHIR (very briefly)

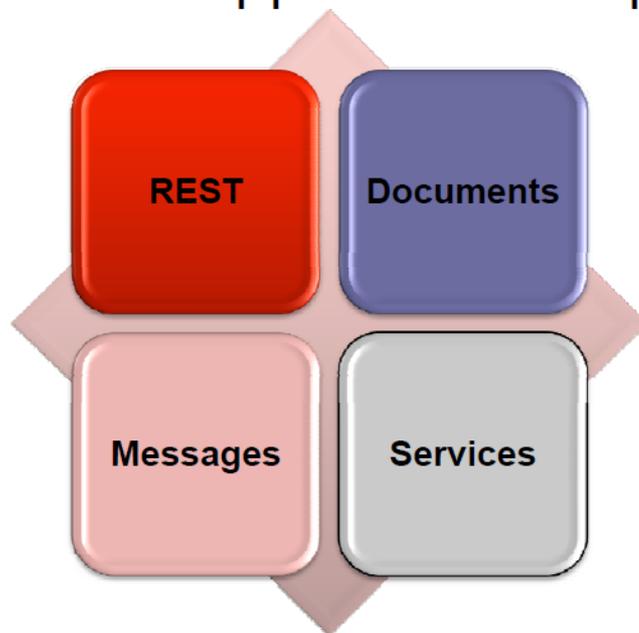
- FHIR® – Fast Healthcare Interoperability Resources ([hl7.org/fhir](http://hl7.org/fhir)) – is a next generation standards framework created by HL7. FHIR combines the best features of HL7's v2 , HL7 v3 and CDA product lines while leveraging the latest web standards and applying a tight focus on implementability.
- FHIR solutions are built from a set of modular components called "Resources". These resources can easily be assembled into working systems that solve real world clinical and administrative problems at a fraction of the price of existing alternatives. FHIR is suitable for use in a wide variety of contexts – mobile phone apps, cloud communications, EHR-based data sharing, server communication in large institutional healthcare providers, and much more.

<https://www.hl7.org/fhir/summary.html>

## Paradigms



- FHIR supports 4 interoperability paradigms



What should you use when?



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## REST



- Simple, out-of-the-box interoperability
- Leverage HTTP: GET, POST, etc.
- Pre-defined operations
  - Create, Read, Update, Delete
  - Also: History, Read Version, Search, Updates, Validate, Conformance & Batch



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# Implementation Guide (draft for illustration)



## Validated Healthcare Directory Implementation Guide CI Build



[Home](#) [General Guidance](#) [Profiles](#) [Extensions](#) [Terminology](#) [Search Parameters](#) [Capability Statements](#) [Security](#) [Downloads](#)

This is the Continuous Integration Build of the HL7 International Validated Healthcare Directory (HcDir) FHIR Implementation Guide, based on FHIR Version 3.4.0. (will be incorrect/inconsistent at times). See the [Directory of published versions](#)

### Validated Healthcare Directory Implementation Guide

This is the Continuous Integration Build of the Validated Healthcare Directory Implementation Guide, based on [FHIR Version 3.4.0](#). See the [Directory of published versions](#)

#### Introduction

The Validated Healthcare Directory (VHDir) Implementation Guide is based on [FHIR Version 4.0](#) and defines the minimum conformance requirements for accessing or exposing validated healthcare directory data. It provides a specification for the exchange of directory data between a source of validated provider data and local workflow environments (e.g. local directories). The specification is intended to support international stakeholders and meet the specific needs of the US Realm.

This implementation guide was developed in cooperation with the [Office of the National Coordinator for Health Information Technology \(ONC\)](#) and [Federal Health Architecture \(FHA\)](#) with guidance from HL7 International, the Patient Administration workgroup, and the HL7 US Realm Steering Committee.

For more information on the history of Validated Healthcare Directory see the [Validated Healthcare Directory change notes](#).

For more information on the ONC and FHA effort see the [ONC Techlab Healthcare Directory Project](#).

#### Validated Healthcare Directory Actors

The following actors are part of the VHDir IG:

- Validated Healthcare Directory Requestor: An application that initiates a data access request to retrieve directory data. This can be thought of as the client in a client-server interaction.
- Validated Healthcare Directory Responder: A product that responds to the data access request providing directory data. This can be thought of as the server in a client-server interaction.

#### Validated Healthcare Directory Local Use Cases

To determine the data elements necessary for the exchange of directory information, the authors developed a number of use cases currently supported by healthcare directories. The use cases describe the general information requirements (e.g. demographic information, endpoints, relationships between orgs/providers) needed to support the use case. From these, we devised a set of discrete data elements. This implementation guide covers all of the data elements that make sense to collect at a national level, validate, and exchange with local workflow environments. The use cases included:

##### A - Basic Information Exchange

- A1 - Enable electronic exchange (e.g. discovery of electronic end points such as IHE/EHR endpoints, FHIR server URLs, Direct addresses)
- A2 - Find an individual and/or organization (even if no electronic end point is available)

##### B -Patient/Payer focused

- B1 - Find provider accessibility information (specialty, office hours, languages spoken, taking patients)

# Implementation Guide: Key Components

- Resource profiles
  - » Modifying existing resources: Practitioner, Organization (Network), PractitionerRole, HealthcareService, Location, CareTeam, Endpoint, Consent (Restriction), Verification Result (Validation)
  - » New resources: ProductPlan, OrganizationRole
  - » Terminology – code systems & value sets
- Extensions
  - » E.g. DigitalCertificate, Accessibility, Qualification, EHR, NewPatients
- API
  - » Query parameters
  - » Server behavior

# Resource Profiles

| Name          | Flags | Card. | Type                    | Description & Constraints  |
|---------------|-------|-------|-------------------------|--|
| Practitioner  |       |       | DomainResource          | A person with a formal responsibility. Elements defined in Ancestors: <a href="#">id</a> , <a href="#">r</a><br>A identifier for the person as this ac |
| identifier    | Σ     | 0..*  | Identifier              |  |
| active        | Σ     | 0..1  | boolean                 | Whether this practitioner's record is  |
| name          | Σ     | 0..*  | HumanName               | The name(s) associated with the pr   |
| telecom       | Σ     | 0..*  | ContactPoint            | A contact detail for the practitioner  |
| address       | Σ     | 0..*  | Address                 | Address(es) of the practitioner that   |
| gender        | Σ     | 0..1  | code                    | male   female   other   unknown<br><a href="#">AdministrativeGender (Required)</a>   |
| birthDate     | Σ     | 0..1  | date                    | The date on which the practitioner v   |
| photo         |       | 0..*  | Attachment              | Image of the person  |
| qualification |       | 0..*  | BackboneElement         | Qualifications obtained by training a  |
| identifier    |       | 0..*  | Identifier              | An identifier for this qualification for   |
| code          |       | 1..1  | CodeableConcept         | Coded representation of the qualific<br><a href="#">v2 table 0360, Version 2.7 (Exempl</a>   |
| period        |       | 0..1  | Period                  | Period during which the qualificator   |
| issuer        |       | 0..1  | Reference(Organization) | Organization that regulates and issu   |
| communication |       | 0..*  | CodeableConcept         | A language the practitioner is able t<br><a href="#">Common Languages (Extensible but</a>  |

- Resources are made up of related data elements
- Each data element has a type (e.g. string, code, reference), cardinality (i.e. the number of permitted values), and other properties (e.g. min/max values, constraints, etc.)
- Profiles modify properties of the data elements and provide guidance on how to use a resource in a specific context
  - E.g. “Here is what to expect when requesting validated data about a provider”

# Example Profile - Practitioner

| Name                           | Flags | Card. | Type   | Description & Constr  |
|--------------------------------|-------|-------|--|---|
| Practitioner                   |       | 0..*  |  |   |
| ✱ usage-restriction            |       | 0..*  | Reference(vhdir-restriction)   | Restriction<br><b>URL:</b> <a href="http://hl7.org/fhi">http://hl7.org/fhi</a>                              |
| ★ endpoint-reference           |       | 0..*  | Reference(vhdir-endpoint)  | Reference to endpoint(<br><b>URL:</b> <a href="http://hl7.org/fhi">http://hl7.org/fhi</a>                   |
| ★ accessibility                |       | 0..*  | CodeableConcept  | Accessibility<br><b>URL:</b> <a href="http://hl7.org/fhi">http://hl7.org/fhi</a>                            |
| ✱ digitalcertificate           |       | 0..*  | (Complex)  | VhDir Access digitalcertificate<br><b>URL:</b> <a href="http://hl7.org/fhi">http://hl7.org/fhi</a>          |
| identifier                     |       | 0..*  | Identifier   |   |
| ★ identifier-status            |       | 1..1  | code   | Status<br><b>URL:</b> <a href="http://hl7.org/fhi">http://hl7.org/fhi</a><br><b>Binding:</b> VhDir Identifi |
| assigner                       |       | 0..1  | Reference(vhdir-organization)  |   |
| active                         |       | 1..1  | boolean  |   |
| name                           |       | 1..1  | HumanName  |   |
| family                         |       | 1..1  | string   |   |
| given                          |       | 1..*  | string   |   |
| telecom                        |       | 0..*  | ContactPoint   |   |
| ★ contactpoint-viaintermediary |       | 0..1  | Reference(vhdir-practitionerrole   vhdir-organization   vhdir-organizationrole   vhdir-location) | viaintermediary<br><b>URL:</b> <a href="http://hl7.org/fhi">http://hl7.org/fhi</a>                          |
| ✱ contactpoint-availabletime   |       | 0..*  | (Complex)  | Available time<br><b>URL:</b> <a href="http://hl7.org/fhi">http://hl7.org/fhi</a>                           |
| system                         |       | 1..1  | code   |   |
| value                          |       | 1..1  | string   |   |

- This image illustrates differences between the base practitioner resource and our profiled version
- For example, cardinality of name was changed from 0..\* (a name is optional and a practitioner may have many names) to 1..1 (a name is required and a practitioner may only have one name)
- The elements with stars are extensions

# Extensions

- FHIR is designed to support 80% of use cases/implementation needs
- Extensions address the remaining 20% and support the specific business requirements/needs of a given implementation
- For example: practitioners and organizations may not have digital certificates associated with them for most clinical activities. However, digital certificates are imperative for authenticating the identity of entities attesting to information in a directory → created an extension to represent digital certificates

# Terminology

- New resources/extensions may require development of new code systems & value sets
  - » For example, our productPlan resource includes a number of new codeable data elements:
    - Type of coverage: medical, dental, mental health, vision, drug, etc.
    - Type of benefit: inpatient, outpatient, emergency, prescription, etc.
    - Description of benefit: visits, days, generic, 30-day supply, etc.
    - Type of cost: copay, cap, coinsurance, deductible
- Profiles can modify binding of coded data elements to specific value sets
- Goal: Validated healthcare directory value sets will be accessible through NLM Value Set Authority Center

# Application Programming Interface (API)

- Together, the profiles and extensions define an underlying data model that represents all of the content we are interested in for a provider directory
- FHIR resources are instantiated as machine readable XML or JSON documents
- The RESTful API provides instructions for accessing/exchanging/managing structured content that conforms to the data model

```
<Practitioner xmlns="http://hl7.org/fhir">
  <id value="practitioner1"/>
  <meta>
    <versionId value="1"/>
    <profile value="http://hl7.org/fhir/ig/vhdir/StructureDefinition/vhdir-practitioner"/>
  </meta>
  <identifier> <!-- Practitioner's NPI number -->
    <use value="official"/>
    <type>
      <coding>
        <system value="http://hl7.org/fhir/v2/0203"/>
        <code value="PRN"/>
        <display value="Provider number"/>
        <userSelected value="true"/>
      </coding>
      <text value="NPI"/>
    </type>
    <system value="http://hl7.org/fhir/sid/us-npi"/>
    <value value="1234567893"/>
    <period>
      <start value="2005-07-16T09:00:00-05:00"/>
    </period>
    <assigner>
      <reference value="http://hl7.org/fhir/ig/vhdir/Organization/cms"/>
      <display value="CMS"/>
    </assigner>
    <extension url="http://hl7.org/fhir/ig/vhdir/StructureDefinition/identifier-status">
      <valueCode value="active"/>
    </extension>
  </identifier>
  <active value="true"/> <!-- This record is active -->
  <name> <!-- Name is George Washington -->
    <use value="official"/>
    <text value="George Washington"/>
    <family value="Washington"/>
    <given value="George"/>
  </name>
</Practitioner>
```

# API

- We will likely have multiple APIs depending on the context of use:
  - » Exchange from validated directory to local environments (mostly GETs)
  - » Attestation to the validated directory (Mostly POSTs/PUTs, some GETs)
    - Attestation by an individual licensed provider vs. attestation on behalf of an organization
- The exchange API includes a set of HTTP query parameters that we expect entities implementing the guide will support, for example:
  - » Find practitioners with any name matching the specified string
  - » GET ExampleServerURL.com/VHDir/Practitioner?name=Alex
  - » Will return all practitioner resources in which any of the attributes that are part of a name have a value that equals or begins with “Alex”
- APIs also define expected server behaviors, such as how to process batches of data, what to do if somebody requests something that isn't on the server, etc.

# FHIR Ballots/Implementation Guide

- September Ballot – Implementation Guide (updates)
- December 15, 2018 - Publication of R4
- Ballot for comment: <http://hl7.org/fhir/uv/vhdir/2018Jan/index.html>
- Continuous build: <http://build.fhir.org/ig/HL7/VhDir/index.html>
- Additional details at [http://wiki.hl7.org/index.php?title=FHIR\\_Ballot\\_Prep](http://wiki.hl7.org/index.php?title=FHIR_Ballot_Prep)

# Confluence site for ONC/FHA Healthcare Directory Efforts

- <https://oncprojecttracking.healthit.gov/wiki/display/TechLabSC/Healthcare+Directory>

Pages / ONC Tech Lab Standards Coordination Home

Edit Watch Share Tools

## Healthcare Directory

Created by Caitlin Ryan, last modified on Oct 17, 2017



The Office of the National Coordinator for Health Information Technology

### Healthcare Directory Initiatives

The Office of the National Coordinator for Health Information Technology's (ONC) Shared Nationwide Interoperability Roadmap includes a call to action to advance the nation's provider directory efforts. On April 5th and 6th, 2016, ONC and the Federal Health Architecture (FHA) jointly hosted a Provider Directory Workshop to convene public and private stakeholders to review challenges, share successes, and generate new ideas around provider directory standards and solutions. Although participants described different use cases for healthcare directories, they agreed that data quality is a persistent challenge across the industry.

To address concerns about data quality, reduce administrative burden, and improve consumer satisfaction, ONC and FHA launched a new healthcare directory effort in July 2016. The project seeks to: (1) define the architecture of a proposed national resource of validated healthcare directory data, and (2) develop an HL7 Fast Healthcare Interoperability Resources (FHIR) Based Implementation Guide describing the exchange of information between a national resource of validated healthcare directory data and local environments (e.g. provider organizations, payers, HIEs)

The proposed national resource would include a broad set of provider data that supports a variety of healthcare directory use cases. Data would be validated against primary sources (e.g. state licensing boards for licensure information) and available to local environments through a national exchange standard. Providers would only have to attest to much of their information once for the national resource, rather than for each local environment.

ONC/FHA's Healthcare Directory effort is comprised of the Technology Learning Community (TLC) and four tiger teams.

#### Provider Directory Workshop

The purpose of the Provider directory Workshop was to convene public and private stakeholders to review past and current challenges, share success stories, and generate new ideas around provider directory standards and solutions.

To read more about the workshop and to view presentation materials visit the [Provider Directory Workshop Page](#).

#### Healthcare Directory TLC

The Healthcare Directory Technology Learning Community (HcDir TLC) was developed as a response to findings from the Provider Directory Workshop. This TLC will continue discussions and collaborations centered around provider directories.

To learn more about the TLC and to view meeting materials visit the [Healthcare Directory TLC Page](#).

#### Healthcare Directory Tiger Teams

Four Tiger Teams have been established for Use Cases, Data Elements, Architecture and Interoperability. The goal is to describe the architectural and data requirements of a common resource for validated data to support healthcare directories.

To read more about these Tiger Teams and review final materials visit the [Healthcare Directory Tiger Teams page](#).





For more information please contact:

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