Zoom Meeting Interface and Basic Logistics

- All Attendees will be muted during this presentation.

- **CHAT:** The chat function is open to **ALL** participants (bottom, middle right, highlighted in orange in this image). Attendees are encouraged to provide feedback and questions via chat during the presentation.

- **BREAKOUTS:** Attendees will be pushed into their respective breakout rooms at the end of this session. Please stay logged in during the break to enable this process. If you log out and log back in you will be put back into the main session and will have to wait for the host to put you back in your assigned breakout room.

- **TECHNICAL DIFFICULTIES:** Having trouble hearing the presenters or seeing the shared screen? Put your issue in chat and the Meeting Host will help you.

*image above is a publicly available tutorial image obtained from Zoom website*
Presenters – ONC Lead & FAST Chief Architects

STEPHEN KONYA
Senior Advisor to the Deputy National Coordinator for Health IT HHS/ONC
ONC Lead, FHIR at Scale Taskforce (FAST)

PATRICK MURTA
Chief Interoperability Architect & Fellow Humana
FAST Chief Architect

PAUL OATES
Senior Enterprise Architect and Lead for the IT M&A Practice, Cigna
FAST Chief Architect
• What is FAST?
  – What is FAST?
  – FAST Structure & Mission
  – FAST & Other FHIR Collaboratives

• APIs, FHIR & FAST
  – APIs
  – FHIR and the Health Care Ecosystem
  – Importance of the Ecosystem Infrastructure and the FAST model

• FAST Solutions Summary
• FAST Solutions and Path to Execution
• FAST Pilot Testing Considerations
• FAST Conceptual Architecture
• Full Day Workshop Agenda & FAST Resources
What is *FAST*?
The FHIR at Scale Taskforce (FAST), convened by the Office of the National Coordinator for Health IT (ONC), brings together a highly representative group of motivated healthcare industry stakeholders and health information technology experts.

The group is set to identify HL7® FAST Healthcare Interoperability Resources (FHIR®) scalability gaps and possible solutions, analysis that will address current barriers and will accelerate FHIR adoption at scale.
The ONC FHIR At Scale Taskforce (FAST) (Hereinafter “Taskforce”) is committed to full compliance with existing federal and state antitrust laws.

All members involved in the Taskforce effort, including its advisory groups, will comply with all applicable antitrust laws during the course of their activities. During Taskforce meetings and other associated activities, including all informal or social discussions, each member shall refrain from discussing or exchanging competitively sensitive information with any other member. Such information includes, but may not be limited to:

- Price, premiums, or reimbursement charged or paid for products or services
- Allocation of customers, enrollees, sales territories, sales of any products or contracts with providers
- Any other competitively sensitive information that is proprietary to a member company

If you have any specific questions or concerns, seek guidance from your own legal counsel.

Members should not bring confidential information or intellectual property (hereinafter “Intellectual Property”) owned by their respective member companies into Taskforce meetings. To the extent such Intellectual Property is shared with the Taskforce that shall not be construed as a waiver of member company’s rights to, or ownership in, the Intellectual Property.
FAST Organization & Community Engagement

EXECUTIVE STEERING COMMITTEE (public-private mix)

COORDINATING COMMITTEE (public-private mix)

SEVEN TIGER TEAMS
- Ecosystem Use Cases
- Identity
- Security
- Directory, Versioning and Scale
- Exchange
- Certification and Testing
- Pilots

FEEDBACK

UPDATES

TECHNICAL LEARNING COMMUNITY (TLC)

Information Sharing with TLC through:
- Website
- Periodic Webinars
- Newsletters
- TLC Meetings
- LinkedIn Group

SUBJECT MATTER EXPERTS (SME) Panels
Paving the Way Towards FHIR “At Scale"

**FUNCTIONAL USE CASES**

**HL7® FHIR® ACCELERATOR**
- Payers/Providers
- Provider/Provider
- Consumers
- Social Determinants of Health
- Cancer Care and Research

**OTHER FHIR INITIATIVES**
- PACIO Project
- IHE

**CONTRACTUAL ENFORCEMENT**
- carequality
- commonwell HEALTH ALLIANCE

**NETWORK/CORE SERVICES**
- Careequality
- Commonwell Healthcare Alliance

**SHARED**

Technical Challenges to FHIR **SCALEABILITY**
- Patient & Provider Identity Management
- Directory Services
- Version Identification
- Scale
- Exchange Process/Metadata
- Testing, Conformance & Certification
- Security

**Rapid Industry Adoption of FHIR-Based Solutions**

**CORE SERVICES**

**INFRASTRUCTURE USE CASES**

**Common Scalability Approaches**

**FUTURE**
APIs, FHIR & FAST
APIs...

- An API is a software intermediary which allows applications to talk to each other
- APIs allow the capabilities or data of one computer program to be used by another
  - Lego blocks of data
  - Doesn’t matter what the underlying computer or technology is
- APIs are a foundational technology that drives modern computing and the API economy (Amazon, Netflix, Google, Facebook, EBay, YouTube, Twitter, & etc.)
- APIs enable innovation in an unprecedented manner
- APIs are not new... simplified, easy to use versions of them are

YOUR APP

REQUEST

API

DATA

THEIR APP

DEVELOPERS

will access your assets through your API to build Mobile Apps and Web Apps based on the data and software you share.

THE API

provides universal access to whatever assets you choose to share. Developers can "plug in" their apps and data.

END USERS

have access to apps that provide richer experiences by leveraging the data and services of other apps.

ASSETS

Your data and software (and brand) become more valuable by being leveraged by partners, developers, and third-party services.
FHIR and the Health Care Ecosystem

- Provider
- Healthcare Directory
- Patient Medical Record
- Referral/Consult
- Payers
- CDS
- Services (e.g., DME, Imaging)
- Public Health
- Research
- Patients
- Research
- Providers
- Public Health
- Health Systems

HL7 FHIR

CodeX
Gravity Project
Argonaut Project
Carin
DA VINCI
Lack of Consistent Infrastructure Impacts Flow
Well-Planned Infrastructure Creates Efficiency
Example FHIR Transaction Journey

<table>
<thead>
<tr>
<th>REQUESTING SYSTEM</th>
<th>RECEIVING SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Formulates FHIR Request</td>
<td>3 Receives Transaction, Validates Requestor, Validates Version</td>
</tr>
<tr>
<td>2 Looks Up the FHIR Endpoint for Recipient</td>
<td>4 Performs Patient Matching and Sends Back Not Found If Unable To Do So</td>
</tr>
<tr>
<td>5a Authenticates FHIR User’s Role</td>
<td>5b Filters Out Data That Does Not Have Consent</td>
</tr>
</tbody>
</table>

**DIRECTORY**

- RECEIVE Patient information from Payer

**VERSIONING**

- FORM PCP needs information from Payer

**EXCHANGE**

- CONF RCEIVING SYSTEM

**IDENTITY**

- PM

**CONFORMANCE & CERTIFICATION**

- SECURITY

**PILOTS**

- Patient visits Primary Care Physician (PCP)

- Payer receives PCP request
FAST Solutions Summary
**FAST Solution Process and Where Are We Now**

**Tiger Teams**

**FAST Solution Input**
- Tiger Teams
- TLC
- SME

**Proposed (V2) Infrastructure Solutions**
- Tiger Teams
- TLC
- SME

**Recommended (V3) Infrastructure Solutions**
- Evaluation, Feedback, and Pilots

**FAST Action Plan**
- Standards
- Process
- Regulation

**Ecosystem Use Cases**
- Identity
- Directory, Version & Scale
- Exchange Process
- Testing & Certification
- Pilots

**Technical Barriers**
- Core Capabilities

**Ecosystem Use Case**
- Directory, Version & Scale
- Identity
- Exchange Process
- Testing & Certification
- Pilots

**Operationalize Solutions**
**FAST Proposed Solutions**

- **A US Wide Solution for FHIR Endpoint Discovery (Version 2)**
- **A US Wide Methodology for Supporting Multiple Production Versions of FHIR (Version 2)**
- **US Wide Scaling Requirements for FHIR RESTful Exchange Intermediaries (Version 2)**
- **Standards Based Approaches for Individual Identity Management (Version 2)**
  - Mediated Patient Matching
  - Collaborative Patient Matching
  - Networked Identity Management
  - Distributed Identity Management
- **An HL7 FHIR Standard Based Solution for Intermediary-to-Intermediary Exchange and Reliable Routing with Metadata (Version 3 Draft)**
  - Reliable Routing with Metadata Across Intermediaries
- **A Scalable FHIR Testing & Certification Platform (Version 2)**
- **US Wide Model(s) for Scalable Security Solutions (Version 3 Draft)**
  - UDAP Trusted Dynamic Client Registration
  - UDAP Tiered OAuth for User Authentication
  - UDAP JWT-Based Client Authentication
  - UDAP JWT-Based Authorization Assertions
FAST Endpoint Directory
**FAST Endpoint Directory – Architecture and Workflow**

1. Healthcare Organizations and Providers contribute attested information
2. Authenticate/Authorize
3. Request validation of attested information
4. Authenticate/Authorize
5. Respond to validation request
6. Issuing Organizations and Assigned Parties contribute attested Endpoint information
7. Authenticate/Authorize
8. Attested Endpoint information is validated against primary sources
9. Authenticate/Authorize
10. Testing and Certification
11. Federated Directory Subscribes to specific scope of Organizations and Providers
12. Synchronize
13. On update push information to Subscriber
Overview and status

**BARRIER**
The industry lacks a generally available method to find all FHIR endpoints and their associated capabilities and attributes, as well as a common process for maintaining the information and validating its accuracy.

**SOLUTION**
One national source for validated directory information that is available to any national or local directory workflow environment.

**IN SCOPE**
Individual and entity demographics to determine endpoint relationships, computable endpoint information such as accessibility requirements, metadata for routing, trust framework, implementation guides and certification status.
- Federated access by HIEs, state directories, EHRs
- A FHIR standard implementation guide for use of the directory

**OUT OF SCOPE**
Manual / portal access, creation of a trust framework, non-FHIR related endpoints, application certification process.

**STATUS**
Incorporating feedback from industry stakeholders.

**OPEN ITEMS**
Define the minimum viable product (MVP) and outline the incremental steps/roadmap to build a directory of endpoints.

**CURRENT SOLUTION**
*FAST Endpoint directory proposed solution document (version 3 in progress)*
FAST Identity Management
Solution Options: Low to High Complexity

Multiple options progressing from low to high complexity (technical and process)

1. Collaborative Patient Matching
   - Current state enhanced with best practices e.g. roster exchanges

2. Mediated Patient Matching
   - Best practices compliant matching service using demographic data from Requestor

3. Networked Identity Management

4. Distributed Identity Management
   - Includes Patient directed workflows Focus on identity management
   - Focus on patient matching

Patient directed access to identity and demographic data, support for multiple identities, and Trusted Identity Providers as source of demographic data and metadata for matching.
Overview and status

BARRIER
The industry currently employs a range of patient matching and identity management processes with inconsistencies and limited scalability as volume and the number of participants increase.

SOLUTION
Establish a set of patient matching and identity management patterns and best practices that the industry can adopt to reduce the variations that exist today and provide a bridge to new approaches in the future.

IN SCOPE
Patient matching during payer/provider interactions: Collaborative and Mediated Patient Matching
Patient-directed workflows focusing on identity management: Networked and Distributed Identity Mgmt.

OUT OF SCOPE
Patient as a requester or responder, contractual arrangements. (Security and directory considerations are addressed by other FAST solutions)

STATUS
Incorporating feedback from industry stakeholders

OPEN ITEMS
Pursue provider identity matching. Apply proposed solutions to use cases, capture patient matching recommendations, explore steps to Distributed Identity Management, consider how regulation/policy might address challenges that can’t be solved by the market.

CURRENT SOLUTION
FAST Identity proposed solution document (version 3 in progress)
FAST Security
Proposed Solution: Trusted Ecosystem

- UDAP Tiered OAuth
- UDAP Trusted Dynamic Client Registration
- Trusted DCR
- User Authentication
- Authorization Assertions
- UDAP JWT-Based Authorization Assertions
- UDAP JWT-Based Client Authentication

PM
Today, we have limitations on our ability to ensure, in a scalable way, that the requestor of information using a FHIR based information exchange is appropriately authenticated and has the authorization to see the data requested. Current registration processes are manual and too time-consuming to support expected growth.

Leverage existing credentials and authorizations and best practice standards to establish common security processes that facilitate automated exchange and reuse existing infrastructure where possible.

Trusted Dynamic Client Registration using Unified Data Access Profiles (UDAP)

JWT-Based Client Authentication & Authorization

Directory for Endpoint Discovery, Trust Policy Governance, Requirements for a specific architecture, Patient/provider or provider/patient

Incorporating feedback from industry stakeholders

Cross-solution overlaps, explore standard authorization metadata requirements, recommendations related to privacy

FAST Security proposed solution document (version 3 in progress)
Planning for a hybrid future while learning from existing models such as CAQH CORE and clearing house patterns.

1. Requestor Actor
   - Request with routing meta-data using base resource definition

2. Intermediary Capability Actor
   - Messaging forwarded to endpoint based upon routing meta-data

3. Responder Actor
   - Request processed and returned with routing meta-data

4. Response routed to requestor

REST Headers
- “X-Originator”: "Requestor Actor ID"
- “X-Destination”: "Responder Actor ID"

http://build.fhir.org/http.html#custom
Overview and status

**BARRIER**
FHIR information exchange is typically performed “point to point” between trusted system endpoints. Because healthcare participants may also wish to leverage intermediaries in FHIR exchanges, a solution for conveying routing metadata is needed.

**SOLUTION**
Employ RESTful header parameters to send originator and destination information for use by exchange intermediaries.

**IN SCOPE**
Exchange using intermediaries in addition to point to point connections
Method for exchanging of a minimum set of metadata as HTTP REST headers, or alternatively within FHIR resource .meta tags

**OUT OF SCOPE**
Value set defining exchange identifiers
Capturing provenance information from exchange through multiple intermediary “hops”

**STATUS**
Incorporating feedback from industry stakeholders

**OPEN ITEMS**
Expand direction on usage of the alternative solution employing FHIR .meta elements

**CURRENT SOLUTION**
*FAST Exchange solution document*
*(version 3 in progress)*
FAST Testing & Certification
Proposed Solution: ONC FAST Testing & Certification Program

FAST Readiness Criteria related to...
1. End Point Discovery
2. Authentication
3. Authorization
4. Resource Version Identification
5. Reliable Patient Identity Management
6. Data Provenance
7. Reliable Provider Identity Management
8. Event/Message/Topic Subscription/Publication
9. Guaranteed Message Delivery
10. Role/Context Identification
11. Readiness Credential
12. Standard Based Endpoint Access
13. Synchronous Transaction Support
15. Reliable Payor Identification
Overview and status

**BARRIER**
FHIR testing capabilities and an associated accreditation/certification are needed to support reliable, trustable exchange between healthcare participants. It must be a process in which specification/requirements that are well established and broadly shared can be absolutely confirmed.

**SOLUTION**
Testing platform supporting the base FHIR Specification and FAST Readiness Criteria
ONC FHIR Testing & Certification Program

**IN SCOPE**
Testing and certification to the base FHIR Specification and FAST Readiness Criteria

**OUT OF SCOPE**
HL7 FHIR Validation Engine, RFP development to select entity to provide services
Validate ease of establishing connections, conformance to non-blocking requirements, conformance to HIPAA patient privacy

**STATUS**
Incorporating feedback from industry stakeholders

**OPEN ITEMS**
Capture test assertions in greater detail, clarify aspects, coordinate with related efforts

**CURRENT SOLUTION**
FAST Testing & Certification solution document (version 3 in progress)
FAST Solutions and Path to Execution
• How do we make the results of FAST persistent?

• Creating standards (examples)
  – Updating FHIR core specification
  – Creating FHIR Implementation Guide(s)
  – Updating specific artifacts and tools (e.g. FHIR version management/conversion)

• Supporting testing and piloting (e.g. making certain the solutions are implementable)

• Supporting regulatory processes

• Establish persistent process
  – Testing & Certification
  – Endpoint Directory(ies)
  – Trust Frameworks
Assessment Process

Recommended Infrastructure Solutions

Evaluation, Feedback, and Pilots

Identify relevant, existing or new standards, and work with standards bodies to include FAST recommendations where appropriate

Potential Owner(s)
HL7, NIST, ONC, etc.
Assessment Process

Recommended Infrastructure Solutions

Evaluation, Feedback, and Pilots

Process considerations examples:
1. Testing and certification support
2. Declaration of support for relevant attributes in directory metadata
3. Other processes as needed

Potential Owner(s)
HL7, NIST, ONC, etc.
Assessment Process

Recommended Infrastructure Solutions

Evaluation, Feedback, and Pilots

The potential policy or regulatory support, published guidelines, etc.

Potential Owner(s)
NIST, ONC, CMS, etc.
Assessment Process

**Recommended Infrastructure Solutions**

- Standards
- Process
- Regulation
- Evaluation, Feedback, and Pilots
- Da Vinci potential pilot, early use cases from SMEs. Addition of a testing/cert process based on certification team recommendations

**Potential Owner(s)**
HL7, NIST, ONC, etc.
FAST Pilot Testing Considerations
Example CDS/FHIR Transaction Journey – PDex (Da Vinci Payer Data Exchange)

**REQUESTING SYSTEM**

1. PCP initiates clinical referral or inpatient request
2. PCP needs prior auth requirements information from Payer

**RECEIVING SYSTEM**

3. Payer receives PCP requests
   - Payer PDex Interactions
     1) Payer receives CDS request and creates CDS card
     2) CDS Card is returned in real time & PDex bundle is available
4. Generates & Returns CDS/FHIR Response
5a. Payer receives CDS request and creates CDS card
5b. CDS Card is returned in real time & PDex bundle is available
6. Receives Transaction, Validates Requestor, Validates Version
7. Performs Patient Matching and Sends FHIR User’s Role
8. Authenticates FHIR User’s Role
9. Filters Out Data That Does Not Have Consent

**DIRECTORY**

- Requesting System Receives Data
- Directory Receives CDS Card

**EXCHANGE**

- Formulates CDS/FHIR Request
- Looks Up the CDS/FHIR Endpoint for Recipient
- Transaction Information (e.g., Header) Appropriately Configured
- directory

**IDENTITY**

- EHR PDex Interactions
- 1) [START] PCP’s EHR requests CDS Card from payer
- 2) CDS Card is processed & PDex bundle is made available to EHR for visualization and integration [END]

**VERSIONING**

- PCP views Patient information
- Transaction Information (e.g., Header)
- Appropriately Configured

**CONFORMANCE & CERTIFICATION**

- SECURITY
- PILOTS
FAST Pilots Support with Da Vinci PDex (Payer Data Exchange)

PDex (Payer Data Exchange)

FAST Solutions Tested

<table>
<thead>
<tr>
<th>Directory</th>
<th>Versioning</th>
<th>Exchange</th>
<th>Identity</th>
<th>Scale</th>
<th>Security</th>
<th>Conformance &amp; Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Get EMR Metadata
- Write constrained by write options in EMR
- Write documentReference (Optional – complete or selected DocumentBundle + PDF)

Userid
- PatientId
- EncouterId
- Appointments
- SubscriberId
- JWT for EMR API Access

Use SubscriberId if provided to search
- Or Get Patient from Pre-fetch or get CapabilityStatement from EMR to get FHIR version and get Patient record from EMR and perform Demographic-based search

Directory
- Provide Access Token with US Core Scopes
- Provide URL to Smart App
- Provide FHIR Entrypoint
- Make CapabilityStatement available
- Human Readable result of Member Query
  - No data found
  - Unable to match individual
  - N records returned

Call Hook
SMART APP

Appointment
-book
FAST Conceptual Architecture
CONFORMANCE & CERTIFICATION (Testing & Certification Program)

PILOTS (FAST Capability Vetting with Existing HL7 Accelerators)

Security (Authenticate/Authorize)
- UDAP Trusted Dynamic Client Registration
- UDAP Tiered OAuth User Authentication
- UDAP JWT-Based Client Authentication
- UDAP JWT-Based Authorization Assertions

Identity
- Collaborative/Mediated Patient Matching
- Collaborative/Mediated Identity Management

National Directory
- Endpoints
- Profiles
- Versioning
- Trust
- Conformance

Exchange Routing Meta Data
- RESTful Headers
- FHIR Meta Tags

Intermediaries
Full Day Agenda & FAST Resources
# Breakout Sessions Schedule

## Morning Breakouts - FAST Architectural Considerations

<table>
<thead>
<tr>
<th>Room #1:</th>
<th>Room #2:</th>
<th>Room #3:</th>
<th>Room #4:</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAST Solution Interdependencies</td>
<td>The Role of Trust Framework(s)</td>
<td>Testing and Certification</td>
<td>Stakeholder Nuances</td>
</tr>
</tbody>
</table>

12pm – 1pm: Lunch Break

## Afternoon Breakouts Part 1 - FAST Pathways to Implementation

<table>
<thead>
<tr>
<th>Room #1:</th>
<th>Room #2:</th>
<th>Room #3:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standards</td>
<td>Regulations</td>
<td>Process</td>
</tr>
</tbody>
</table>

2:30pm – 3:00pm: Afternoon Break

## Afternoon Breakouts Part 2 - FAST Pathways to Implementation

<table>
<thead>
<tr>
<th>Room #1:</th>
<th>Room #2:</th>
<th>Room #3:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timing Considerations / Interim Steps &amp; Solutions</td>
<td>Pilots</td>
<td>Intermediaries</td>
</tr>
</tbody>
</table>
• View the FAST Workshop Summary and Detailed Agenda
  – Morning and Closing Plenary
  – Breakout Room Sessions Schedule
  – Handouts and Resources

• Explore these FAST resources
  – New to FAST? Breakout sessions target interactive discussion and references the FAST work to date. Please consider exploring any of the following FAST artifacts before attending these breakout sessions:
    • The FAST 2020 Mid-Year Report
    • The FAST 2019 End of Year Report
    • SME Panel Session Pages

CONTINUE THE CONVERSATION!

Join the Technical Learning Community to stay up to date – receive updates about FAST presentations & events, provide additional input and follow our progress.

JOIN THE LINKEDIN GROUP & SIGN UP FOR THE TLC

All content is available on the FAST Project Page or https://tinyurl.com/ONC-FAST
Thank You – Today's Presenters

Stephen Konya
ONC FAST Lead

Patrick Murta
FAST Chief Architect

Paul Oates
FAST Chief Architect

For more information on the FAST Initiative, visit the FAST Project Page

Have any further questions/suggestions?

Please contact Stephen Konya at Stephen.Konya@hhs.gov & Diana Ciricean at Diana.Ciricean@hhs.gov