Zoom Meeting Interface and Basic Logistics

• **VIDEO:** Please enable your video using bottom left video button with camera icon. Video sharing capability is accessible for SMEs and Panelists.

• **AUDIO:** Adjust your audio settings as needed (choose computer audio, call in, mute, etc.) using audio button bottom left, microphone icon

• **PLEASE MUTE WHEN NOT SPEAKING:** Click on your video box to mute yourself or use the audio button, bottom left

• **CHAT:** Chat function allows communication directly with all participants or privately with a specific person (bottom, middle right, highlighted in orange in this image), then use the drop down to choose visibility of message

*image above is a publicly available tutorial image obtained from Zoom website*
FAST SME Panel Prep Session:
Scaling Requirements for FHIR RESTful Exchange in a Hybrid Environment
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.
Welcome & Introductions

SME Role/Expectations

What is FAST?
  – FAST Work, Challenges and Proposed Solutions
  – FAST and other FHIR Initiatives

Proposed Solution Overview
  – Technical Barriers & Proposed Future State
  – Key Topics for Upcoming SME Discussion
  – Pre-Reading Materials

Questions
Welcome

<table>
<thead>
<tr>
<th>FAST Facilitators*</th>
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<tbody>
<tr>
<td>Alex Kontur</td>
<td>ONC, FAST Lead</td>
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<tr>
<td>Alexandra (Alix) Goss</td>
<td>Imprado, FAST Directory, Versioning &amp; Scale Tiger Team Co-Lead</td>
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<td>Patrick Murta</td>
<td>Humana, FAST Chief Architect</td>
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<td>Paul Oates</td>
<td>Cigna, FAST Chief Architect</td>
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<td>Robert Dieterle</td>
<td>EnableCare, FAST Directory, Versioning &amp; Scale Tiger Team Co-Lead</td>
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<tr>
<th>SME Participants</th>
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<tr>
<td>Alan Swenson*</td>
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<td>Arien Malec</td>
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<td>Bela Labovitch</td>
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<td>Bill Gregg</td>
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<td>Cody Johansen*</td>
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<td>Eric Heflin</td>
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<td>Hans Buitendijk</td>
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<td>James Agnew</td>
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<td>Jamie Ferguson</td>
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<td>Jason Vogt</td>
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<td>Jon Copley</td>
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<td>Matt Spielman*</td>
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<td>Michael Privat</td>
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<td>Michael Shoemaker</td>
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<td>Mike Gould</td>
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<td>Patrick Haren*</td>
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<td>Paula Braun</td>
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<td>Richard Hawes</td>
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<td>Rohit Shinde*</td>
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<td>Sasha Volkov</td>
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<td>Tim Pletcher</td>
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<td>Vassil Peytchev</td>
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<td>Verghese Abraham</td>
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<td>Vijey Kris Sridharan*</td>
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<td>Walter Suarez</td>
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*Invited, pending confirmation
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<thead>
<tr>
<th>Name</th>
<th>Organization</th>
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<tr>
<td>Alix Goss <em>(Co-Chair)</em></td>
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<td>MITRE</td>
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<td>Greg Meyer</td>
<td>Cerner</td>
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<td>Linda Michaeelsen</td>
<td>Optum</td>
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<td>Brandon Neiswender</td>
<td>CRISP</td>
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SME Role

- You were selected for your domain expertise and the FAST team encourages you to provide input and perspective based upon your experience in your own field

- You will be asked to evaluate proposed solutions and provide your expert opinion and guidance on feasibility, unintended consequences, stronger alternate approaches and best implementation path forward

SME Expectations

- Attend SME Preparation Session (1 hour) – today’s session

- Pre-reading materials will expand upon the content covered in today’s session and provide context to support discussion topics included in the upcoming SME Review Session

- Attend SME Review Session (3 hours) – December 6, 3-6pm ET

  - Polling questions will be used to capture your feedback and ensure the team is aligned on the recommendations SMEs make throughout the session

  - The session will be recorded, and the FAST team will have access to the recording as well as the chat log – please note that even “private” chat messages are not private!
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 has identified HL7® Fast Healthcare Interoperability Resources (FHIR®) scalability gaps and possible solutions, analysis that will address current barriers and will accelerate FHIR adoption at scale.
Lack of Consistent Infrastructure Impacts Flow
Well-Planned Infrastructure Creates Efficiency
Example FHIR Transaction Journey

**REQUESTING SYSTEM**
1. Formulates FHIR Request
2. Looks Up the FHIR Endpoint for Recipient
3. Transaction Information (e.g., Header) Appropriately Configured

**RECEIVING SYSTEM**
3. Receives Transaction, Validates Requestor, Validates Version
4. Performs Patient Matching and Sends Back Not Found If Unable To Do So
5. Authenticates FHIR User’s Role
5a. Filters Out Data That Does Not Have Consent
5b. Generates & Returns FHIR Response

**DIRECTORY**
- Requesting System Receives Data

**EXCHANGE**
- IDENTITY
- VERSIONING

**CONFORMANCE & CERTIFICATION**
- DIRECTORY
- EXCHANGE
- VERSIONING

**SECURITY**

**PILOTS**
Conceptual Integrated Architecture

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

Exchange Routing
RESTful Headers – FHIR Meta Tags

Identity
Collaborative/Mediated Patient Matching – Collaborative/Mediated Identity Management

National Directory
Endpoints – Profiles – Versioning – Trust - Conformance

CONFORMANCE & CERTIFICATION (Testing & Certification Program)

PILOTS (FAST Capability Vetting with Existing HL7 Accelerators)
FAST Solutions in Development

- **Directory, Version & Scale**
  - An HL7 FHIR Standard Based Solution for Exchange with or without Intermediaries
    - HL7 Implementation Guide: Hybrid/Intermediary Exchange (Jan 2022 Ballot Cycle)

- **Identity**
  - FAST Proposed Infrastructure Solutions
  - A US Wide Solution for a National Healthcare Directory
    - HL7 Implementation Guides:
      3. National Directory – Attestation & Validation
  - A US Wide Methodology for Supporting Multiple Production Versions of FHIR
  - US Wide Scaling Requirements for FHIR RESTful Exchange Intermediaries
  - National Standards Based Approaches for Individual Identity Management
    - HL7 Implementation Guide: Interoperable Digital Identity and Patient Matching

- **Exchange Process**
  - FHIR Testing & Certification Platform
  - US Wide Model(s) for Scalable Security Solutions
    - HL7 Implementation Guide: Scalable Registration, Authentication, and Authorization (Sept 2021 Ballot Reconciliation)
**FAST Solution Process**

**Tiger Teams**

- Ecosystem Use Cases
  - Core Capabilities
  - Technical Barriers

**Proposed (V2) Infrastructure Solutions**

**Recommended (V3) Infrastructure Solutions**

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

**Evaluation, Feedback, and Pilots**

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

**Operationalize Solutions**

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

**Technical Barriers**

**Core Capabilities**
Collaborative Efforts Towards FHIR Adoption

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

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

**FUNCTIONAL USE CASES**

**CONTRACTUAL ENFORCEMENT**
- carequality
- commonwell

**NETWORK/CORE SERVICES**

**INCREMENTAL USE CASES**

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

**Core Services**
- Functional Use Cases
- Scalability Approaches
- Infrastructure Use Cases

**Technical Challenges to FHIR Scalability**
- Patient & Provider Identity Management
- Directory Services
- Version Identification
- Scale
- Exchange Process/Metadata
- Testing, Conformance & Certification
- Security
Solution Overview:
Scaling Requirements for FHIR RESTful Exchange in a Hybrid Environment
Supporting Both Point to Point & Intermediary Models

PROVIDER EMR/EHR

PAYER

PROVIDER EMR/EHR

PROVIDER EMR/EHR

PAYER

CLEARINGHOUSE/INTERMEDIARY

PROVIDER EMR/EHR

PAYER

PROVIDER EMR/EHR

PAYER

PROVIDER EMR/EHR
Supporting a Hybrid Model
**Intermediary:** Any entity that facilitates data exchange, including FHIR based transactions, on behalf of other actors

- Examples include:
  - Clearinghouses
  - Health Information Exchanges (HIEs)

- These entities may provide services such as routing, version translation, operational onboarding, technical support, cloud scalability, data aggregation, authentication and authorization, and other value-add services

- The community recognizes that direct point to point RESTful interaction is a primary interaction pattern. However, we also recognize that intermediaries play important roles for some healthcare actors and having a set of best practices so that we don’t put additional burdens on the client actors is key to running FHIR at scale. This is called the ‘hybrid’ model approach where connectivity is enabled both in point to point and intermediary facilitated exchange without the client actor needing to have knowledge of what model is executing.
Scaling Architecture – Current State

Regulatory
- Inconsistent federal and state regulatory and policy environments related to real-time exchange of information.
- Current issues related to privacy (e.g., minimum necessary) create barriers to national adoption of FHIR at scale.

Existing Solutions
- Current FHIR solutions may not handle anticipated volume and predictable response time requirements.
- Multiple competing, potentially incompatible, solutions for scaling (HIEs, Clearinghouses, Trust Framework based exchanges, etc.).
- Concern with multiple intermediaries and impact on performance, scaling, synchronous transactions.

Standards
- Lack of experience using FHIR to handle synchronous exchanges and maintain connection state via intermediaries.
- Impact of proprietary interoperability models on access to data endpoints.

Experience
- Limited implementation of FHIR based solutions operating at scale to support anticipated healthcare needs.
- Limited practical experience in scaling FHIR transactions via intermediaries or point to point.
- Limited intermediary support for brokering FHIR interactions.
### FAST Scaling Architecture – Technical Barriers

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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<tr>
<td><strong>MULTIPLE INTEROPERABILITY MODELS</strong></td>
<td>Hybrid exchange models (e.g., spoke/hub, direct connections/point-to-point, and regionally interconnected spoke/hub) create challenges in adopting standards for scaling FHIR and implementing consistent approaches such as authentication, endpoint detection, standards for matching, and end-to-end performance. Consistency of routing across varied exchange models is also a challenge.</td>
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<tr>
<td><strong>LACK OF PREDICTABILITY AND RESPONSE TIMES</strong></td>
<td>Scaling real-time transactions requires infrastructure that may not be currently available through existing intermediaries. The lack of predictable end-to-end response time limits specific use cases where providers require a response prior to proceeding with diagnosis or treatment. Some intermediary models do not support end-to-end synchronous real-time applications. The industry will need to adopt synchronous FHIR front-end interfaces and migrate to near real-time backend solutions.</td>
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<tr>
<td><strong>ANTICIPATING INCREASE IN FHIR-BASED VOLUME</strong></td>
<td>There are currently no models to predict the volume of FHIR-based transactions as FHIR is adopted broadly in the ecosystem. This may lead to unpredictable scaling and performance challenges. Adopting real-time (RESTful) solutions to solve real-time synchronous FHIR scalability is required by the industry. Payers and providers need to increase services (and related perception of reliability) to support significant increase in real-time transactions embedded in the clinical workflow.</td>
</tr>
<tr>
<td><strong>DATA BLOCKING</strong></td>
<td>The industry is moving to a utilization model for access to patient data using FHIR APIs. As FHIR can make information readily available within an encounter clinical workflow and through multiple mobile, portable and wearable devices in real time, the volume of transactions will increase exponentially. If there is limited access to this information, or the cost per access/transaction is too high, it could constitute a new form of data blocking.</td>
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</table>
• Support a mixed model (point to point, gateways, and via intermediaries)
• Consistent minimum availability and performance requirements for any scale architecture (including multiple intermediaries)
• Support for synchronous transactions (e.g., maintaining “state” across intermediaries)
• Support for asynchronous RESTful transactions
• Intermediaries (regardless of the number) support, transparently, all FHIR workflow operations (including subscription)
• Intermediaries capable of handling volume, response time, and routing to all available end points
• Consistent support of metadata for “routing” through multiple intermediaries
Every intermediary SHALL support the following capabilities:

- Connectivity to other intermediaries
- SLAs consistent with real-time exchanges regardless of volume
- Synchronous exchanges
- RESTful asynchronous exchanges (e.g., bulk data excluding non-RESTful exchange)
- Consistent error handling
- FHIR standards and implementation guide requirements related to transactions in which they participate except for pass-through exchanges of FHIR content
- Audit log of the received and modified data for troubleshooting for a specified period of time
FAST Scaling Architecture

**Requestor Actor**

1. RESTful Request
2. Authenticate/Authorize
3. Respond to Request
4. RESTful Response
5. Respond to Request
6. RESTful Response
7. Respond to Request
8. RESTful Response

**Intermediary One**

- Point to Point
- One Intermediary
- Two Intermediaries

**Intermediary Two**

**Responder Actor**

1. RESTful Request
2. Authenticate/Authorize
3. Respond to Request
4. RESTful Request
5. Respond to Request
6. RESTful Response
7. Respond to Request
8. RESTful Response
Session Goals

1. Solicit feedback regarding approach, architecture, and scope of performance expectations that both intermediaries and endpoints should agree to support to ensure predictable performance/availability of critical transactions (i.e., access to information in clinical workflow)
   - Validate requirements for exchange in a hybrid environment
   - Obtain feedback on missing or incorrect architecture considerations and concerns with any of the current proposed architectural solutions or design goals as defined in the solution document

2. Discuss role of intermediaries in supporting trust networks

3. Understanding the role that testing & certification should play in scalability via intermediaries

4. Solicit feedback regarding regulatory adoption and enforcement of interoperable solutions

Discussion Topics

1. Service Level Agreement (SLA) Definition
2. Intermediary-to-Intermediary Connectivity
3. Intermediary Participation in Trust Networks
4. Testing & Certification of Intermediaries
5. Regulatory Impact
6. Path Forward
Polling Question:

Of the following, choose the top 3 areas of importance for discussion in the upcoming SME Session:

- Service Level Agreement (SLA) Definition
- Intermediary-to-Intermediary Connectivity
- Intermediary Participation in Trust Networks
- Testing & Certification of Intermediaries
- Regulatory Impact
- Path Forward
- Other (please add comments via chat box)
## FAST Scaling Architecture for RESTful Exchange in a Hybrid Environment – Expert Panel Discussion

December 6\textsuperscript{th} at 3-6pm ET

<table>
<thead>
<tr>
<th>Document</th>
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<tbody>
<tr>
<td><strong>FAST Scaling Requirements for FHIR RESTful Exchange in a Hybrid Environment – Expert Panel Discussion</strong></td>
<td>SME resources including participant roster, relevant pre-reading material and SME session details and logistics</td>
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<tr>
<td><strong>Scaling Requirements for FHIR RESTful Exchange in a Hybrid Environment V2</strong></td>
<td><em>FAST</em> Scaling Architecture Proposed Solution Document</td>
</tr>
<tr>
<td><strong>FAST Action Plan, Scaling Architecture Excerpt</strong></td>
<td>The <em>FAST</em> Action Plan summarizes each <em>FAST</em> solution, describes individual solution paths to implementation for those that have been defined, and communicates how the industry can get involved</td>
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</table>
Questions?
Thank You – Today’s Presenters

Alexandra (Alix) Goss
FAST Directory, Versions & Scale Tiger Team Lead

Robert Dieterle
FAST Directory, Versions & Scale Tiger Team Lead

Patrick Murta
FAST Chief Architect

Paul Oates
FAST Chief Architect

Alex Kontur
ONC FAST Lead

Connect with us on LinkedIn to stay informed

For more information on the FAST Initiative, visit the FAST Project Page or https://tinyurl.com/ONC-FAST

Have any further questions/suggestions?

Please contact Alex Kontur at Alex.Kontur@hhs.gov