

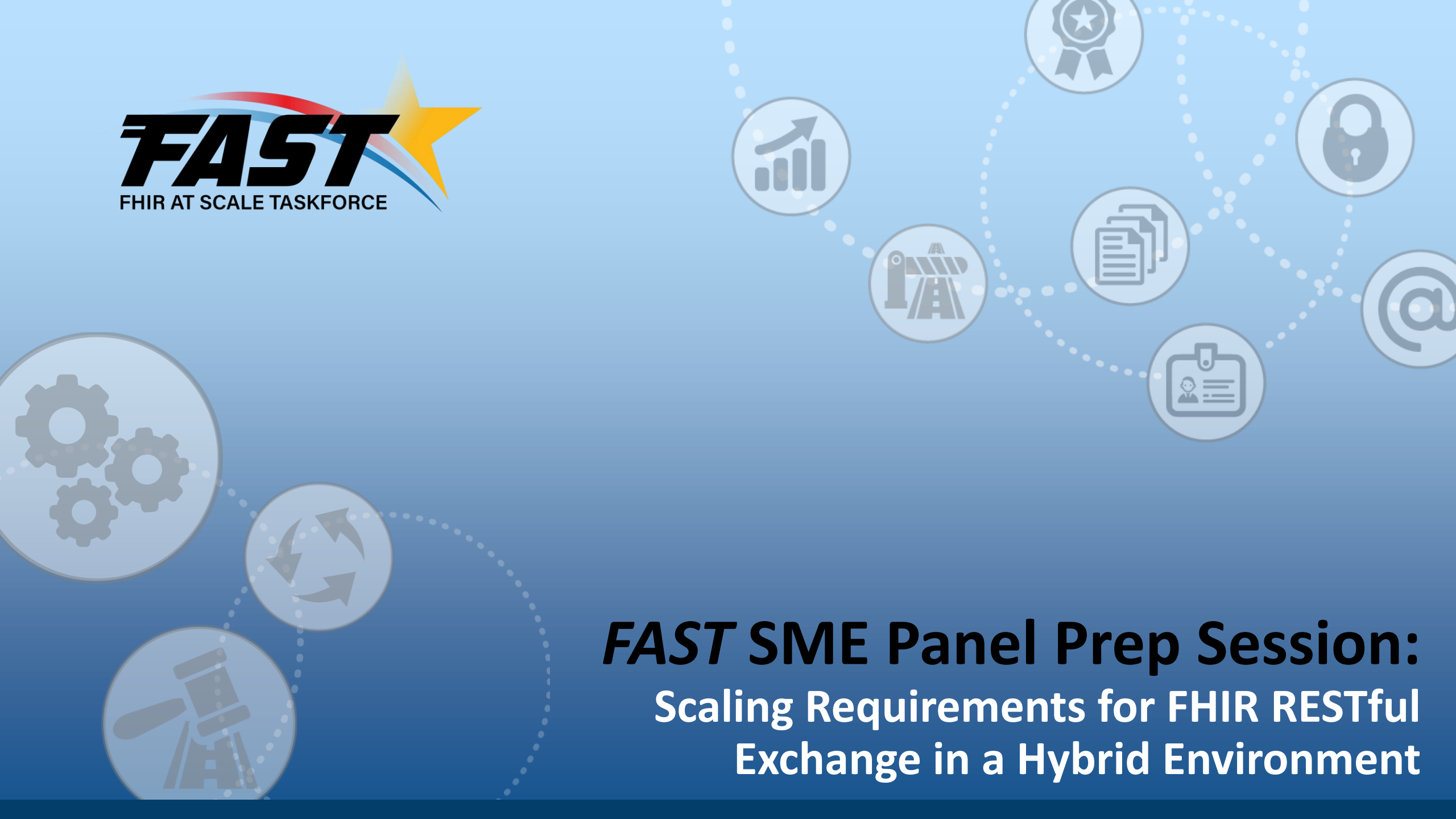


# Zoom Meeting Interface and Basic Logistics



\*image above is a publicly available tutorial image obtained from Zoom website

- **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



# ***FAST* SME Panel Prep Session:**

## **Scaling Requirements for FHIR RESTful Exchange in a Hybrid Environment**



# FAST Taskforce Antitrust Notice

- 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.



# Agenda

- **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

## FAST Facilitators`

<i>Alex Kontur</i>	ONC, FAST Lead
<i>Alexandra (Alix) Goss</i>	Imprado, FAST Directory, Versioning & Scale Tiger Team Co-Lead
<i>Patrick Murta</i>	Humana, FAST Chief Architect
<i>Paul Oates</i>	Cigna, FAST Chief Architect
<i>Robert Dieterle</i>	EnableCare, FAST Directory, Versioning & Scale Tiger Team Co-Lead

## SME Participants

<i>Alan Swenson*</i>	Carequality
<i>Arien Malec</i>	Change Healthcare
<i>Bela Labovitch</i>	Athenahealth
<i>Bill Gregg</i>	HCA
<i>Cody Johansen*</i>	UHIN
<i>Eric Hefl</i>	eHealth Exchange
<i>Hans Buitendijk</i>	Cerner
<i>James Agnew</i>	Smile CDR
<i>Jamie Ferguson</i>	Kaiser Permanente
<i>Jason Vogt</i>	CommonWell

## SME Participants

<i>Jeff Danford</i>	Allscripts/ Veradigm
<i>John Kelly</i>	Edifecs
<i>John Loonsk*</i>	Association of Public Health Laboratories
<i>Jon Copley</i>	Centene
<i>Matt Spielman*</i>	InterSystems
<i>Michael Bauer</i>	Availity
<i>Michael Shoemaker</i>	Providence St. Joseph
<i>Mike Gould*</i>	BCBSA
<i>Patrick Haren*</i>	Cigna
<i>Paula Braun</i>	CDC
<i>Richard Hawes</i>	CDC
<i>Rohit Shinde*</i>	eClinical Works/ Healow
<i>Sasha Volkov</i>	Optum
<i>Tim Pletcher</i>	MIHIN
<i>Vassil Peytchev</i>	Epic
<i>Verghese Abraham</i>	Sutter Health
<i>Vijey Kris Sridharan*</i>	United
<i>Walter Suarez</i>	Digital Bridge

\*Invited, pending confirmation

AK



# FAST Directory, Versions & Scale Team Members

Alix Goss ( <i>Co-Chair</i> )	Imprado
Robert Dieterle ( <i>Co-Chair</i> )	EnableCare
Patrick Murta ( <i>Chief Architect</i> )	Humana
Matt Becker	Epic
Brett Blackman	HealthSplash
Dan Chaput	ONC
Rick Geimer	Lantana
Alex Kontur	ONC
Jeff Brown	MITRE
Greg Meyer	Cerner
Linda Michaelson	Optum
Brandon Neiswender	CRISP



# SME Role/Expectations

## 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!



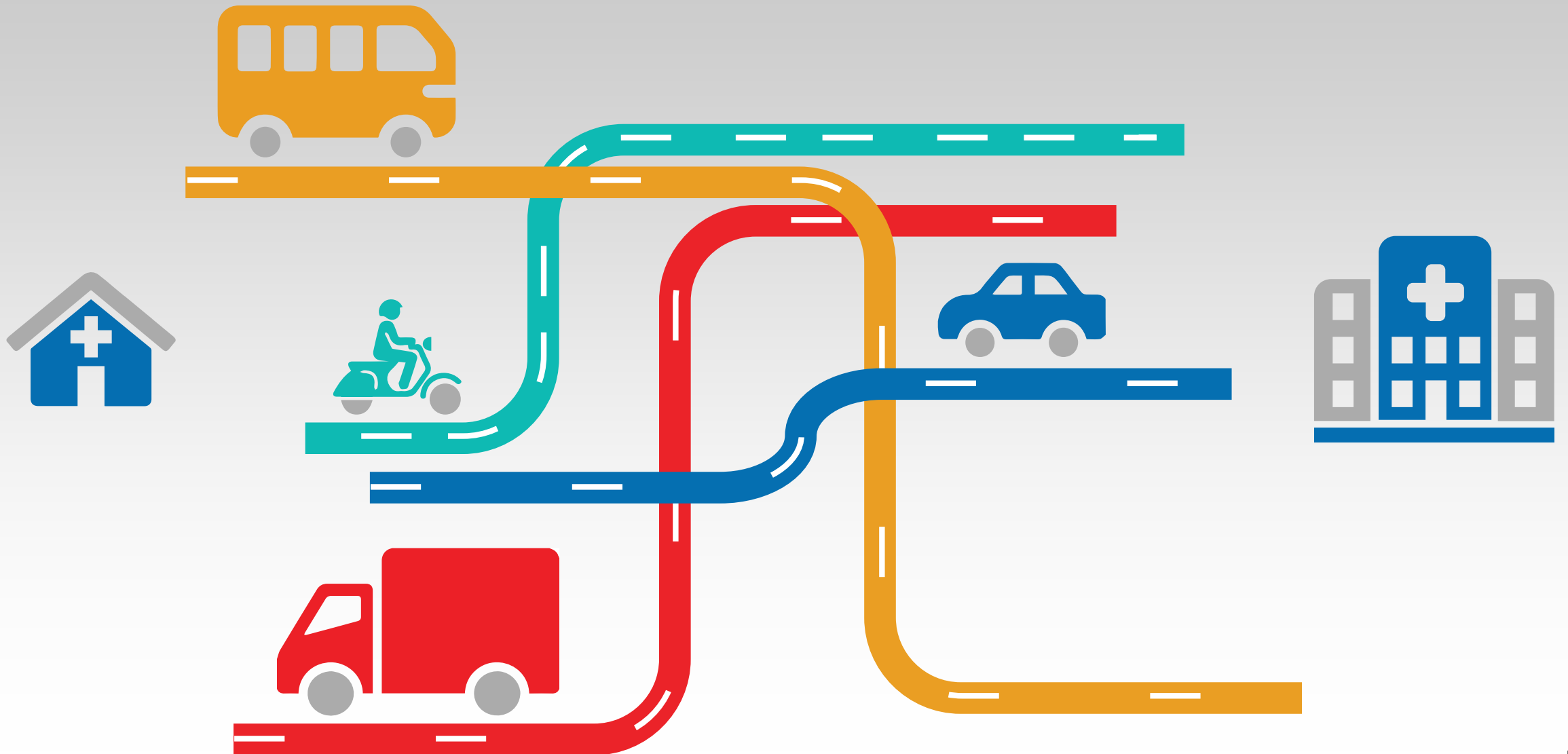
## What is *FAST*?

*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 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.*



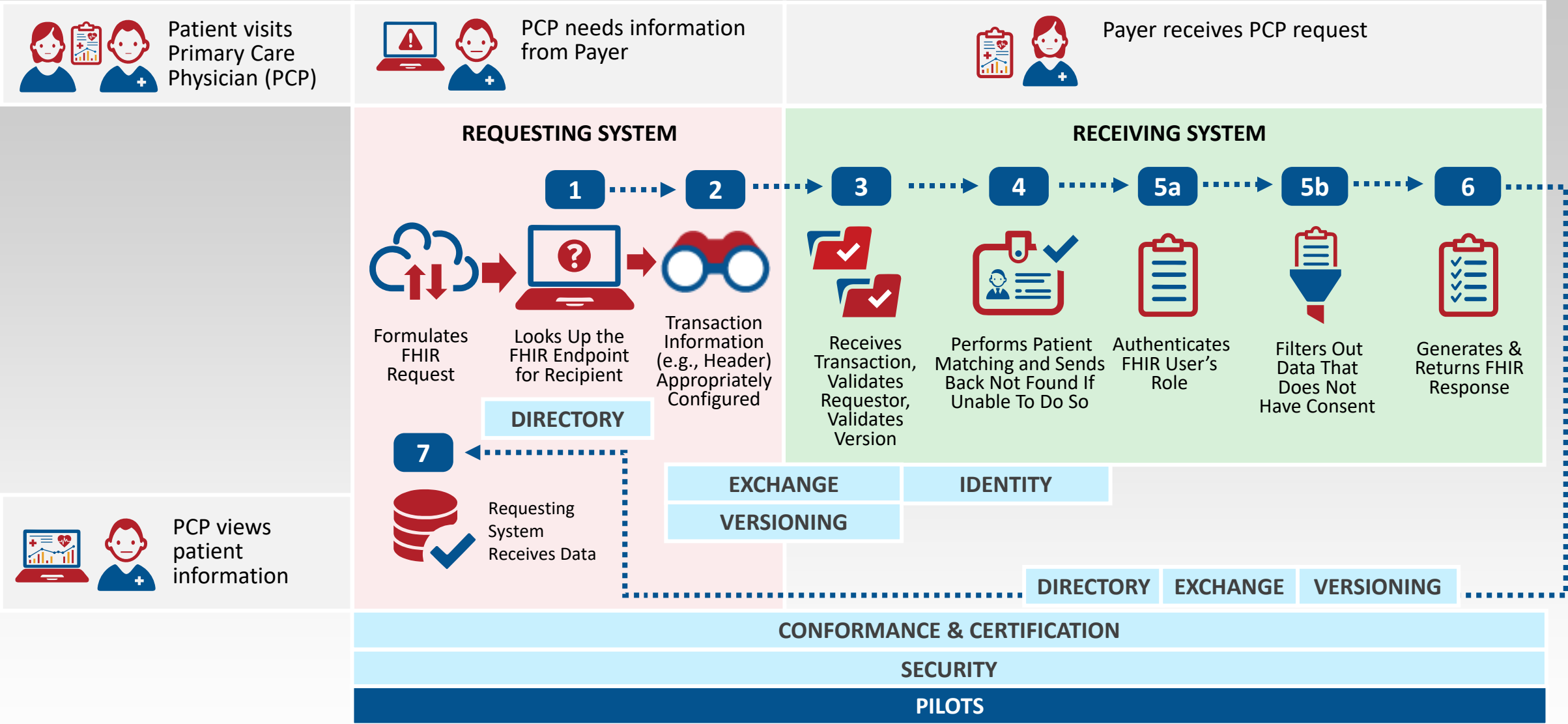
# Lack of Consistent Infrastructure Impacts Flow



# Well-Planned Infrastructure Creates Efficiency



# Example FHIR Transaction Journey



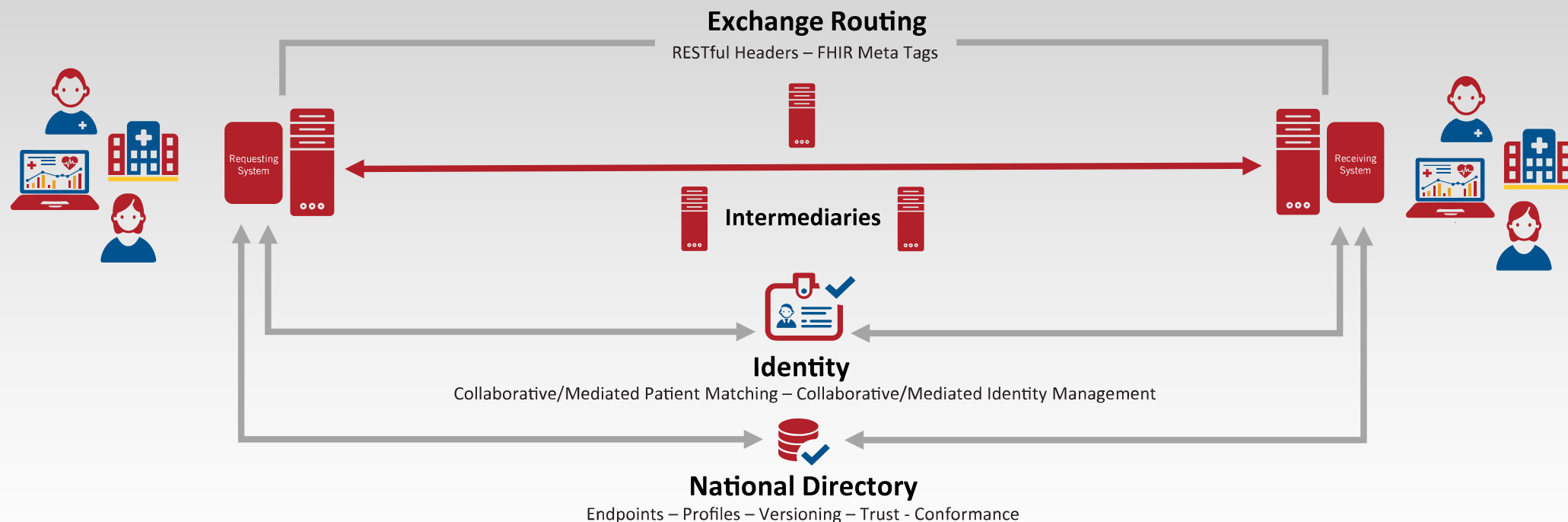


# Conceptual Integrated Architecture



## Security (Authenticate/Authorize)

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



CONFORMANCE & CERTIFICATION (Testing & Certification Program)

PILOTS (FAST Capability Vetting with Existing HL7 Accelerators)



# FAST Solutions in Development

■ Directory, Version & Scale

■ Identity

■ Exchange Process

■ Testing & Certification

■ Security

## ⚙️ A US Wide Solution for a National Healthcare Directory

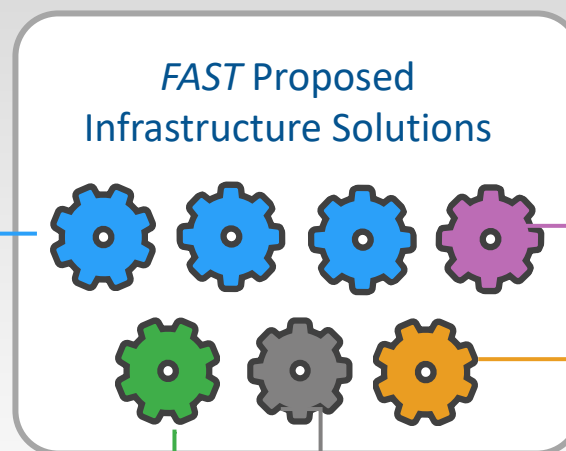
- HL7 Implementation Guides:
  - (1) National Directory – Exchange
  - (2) National Directory – Endpoint Query
  - (3) National Directory – Attestation & Validation

## ⚙️ 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



## ⚙️ An HL7 FHIR Standard Based Solution for Exchange with or without Intermediaries

- HL7 Implementation Guide: Hybrid/ Intermediary Exchange (Jan 2022 Ballot Cycle)

## ⚙️ FHIR Testing & Certification Platform

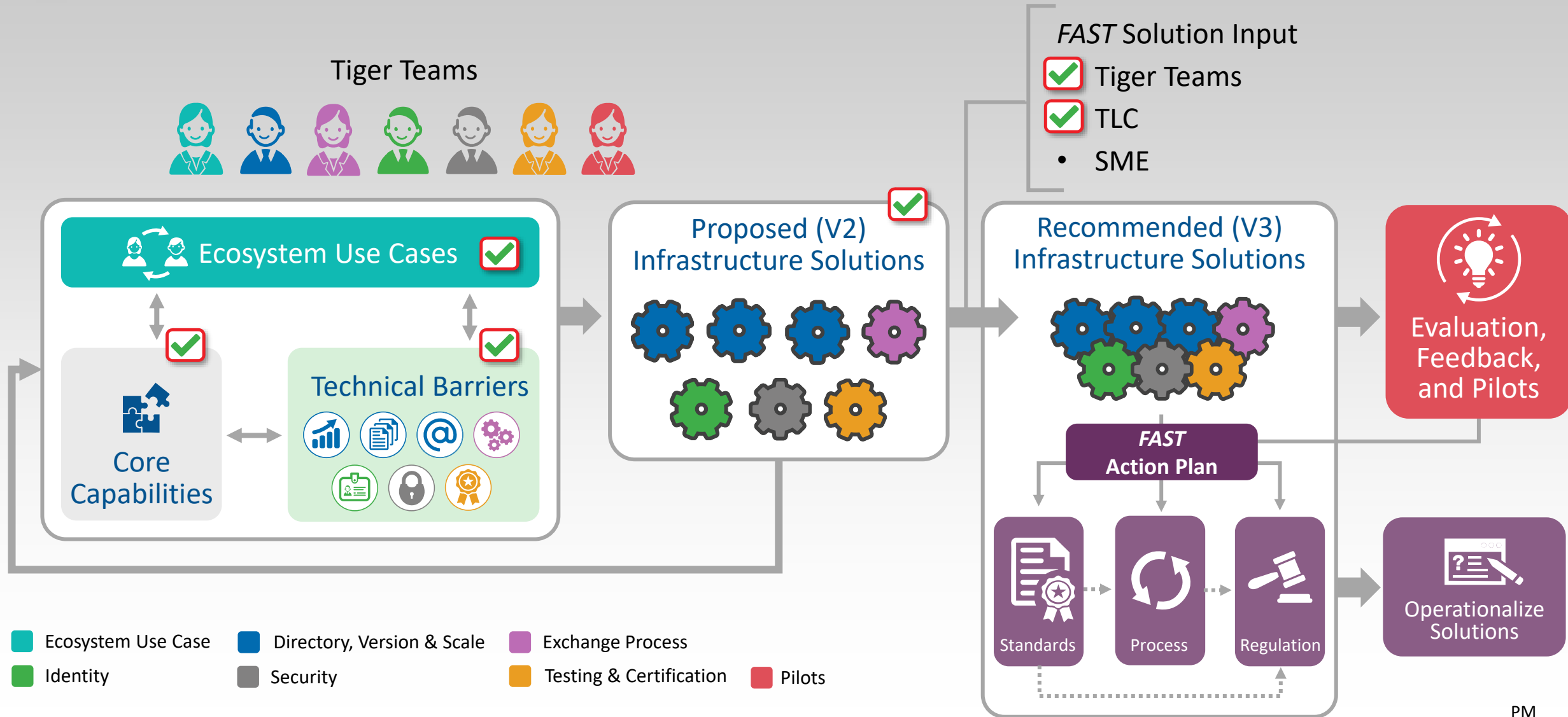
## ⚙️ US Wide Model(s) for Scalable Security Solutions

- HL7 Implementation Guide: Scalable Registration, Authentication, and Authorization (Sept 2021 Ballot Reconciliation)



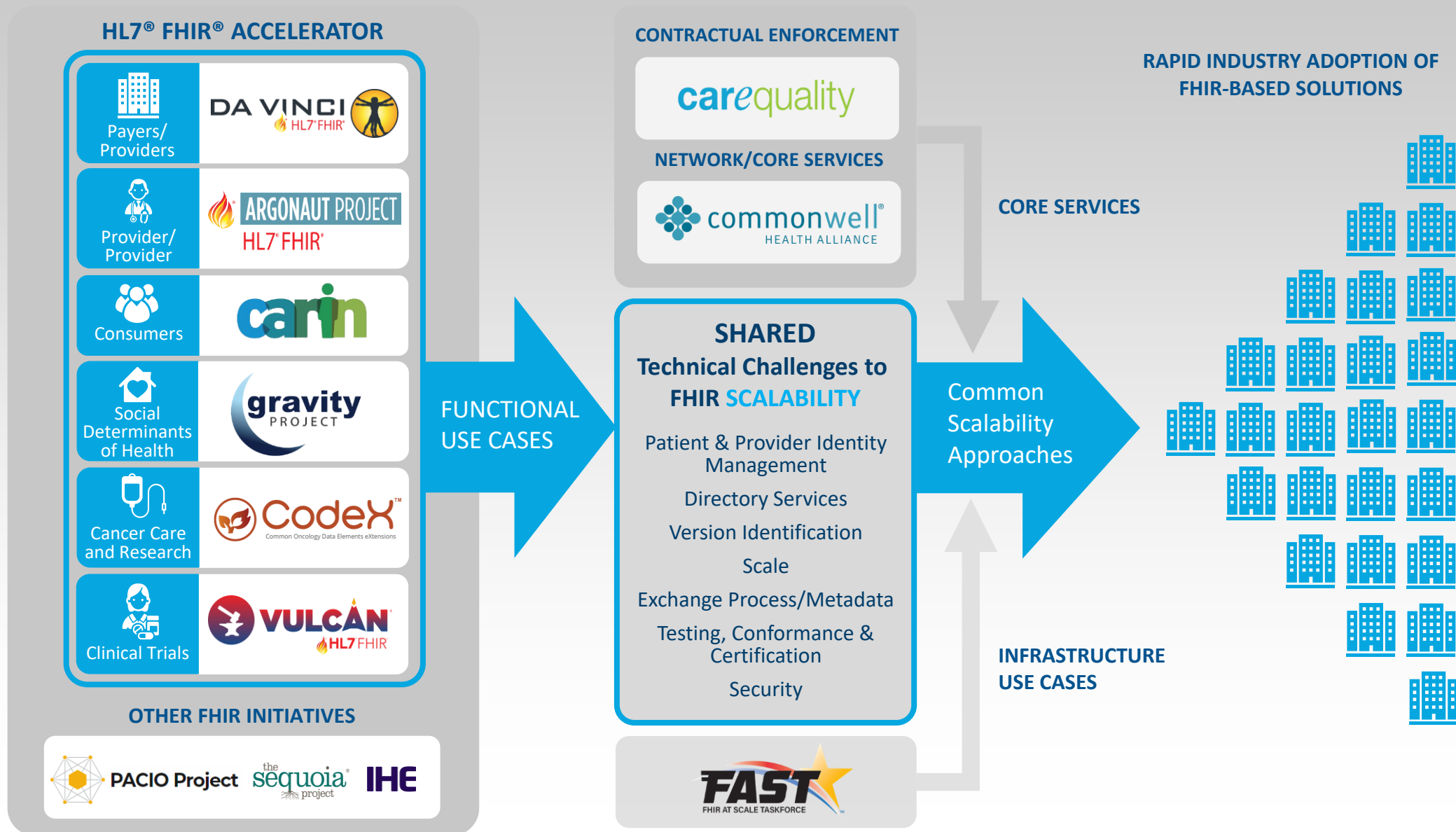
# FAST Solution Process

Tiger Teams





# Collaborative Efforts Towards FHIR Adoption



# **Solution Overview:**

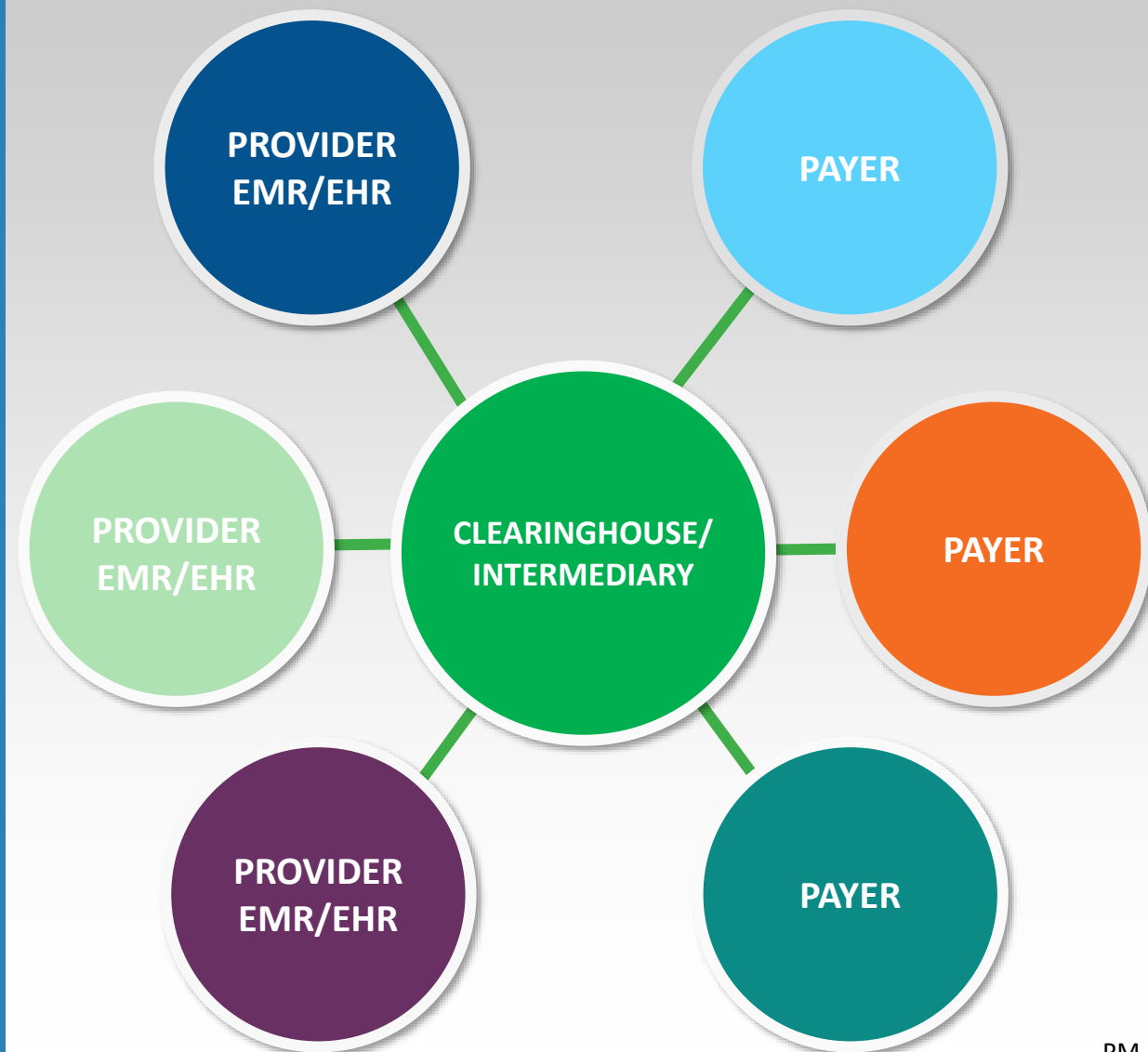
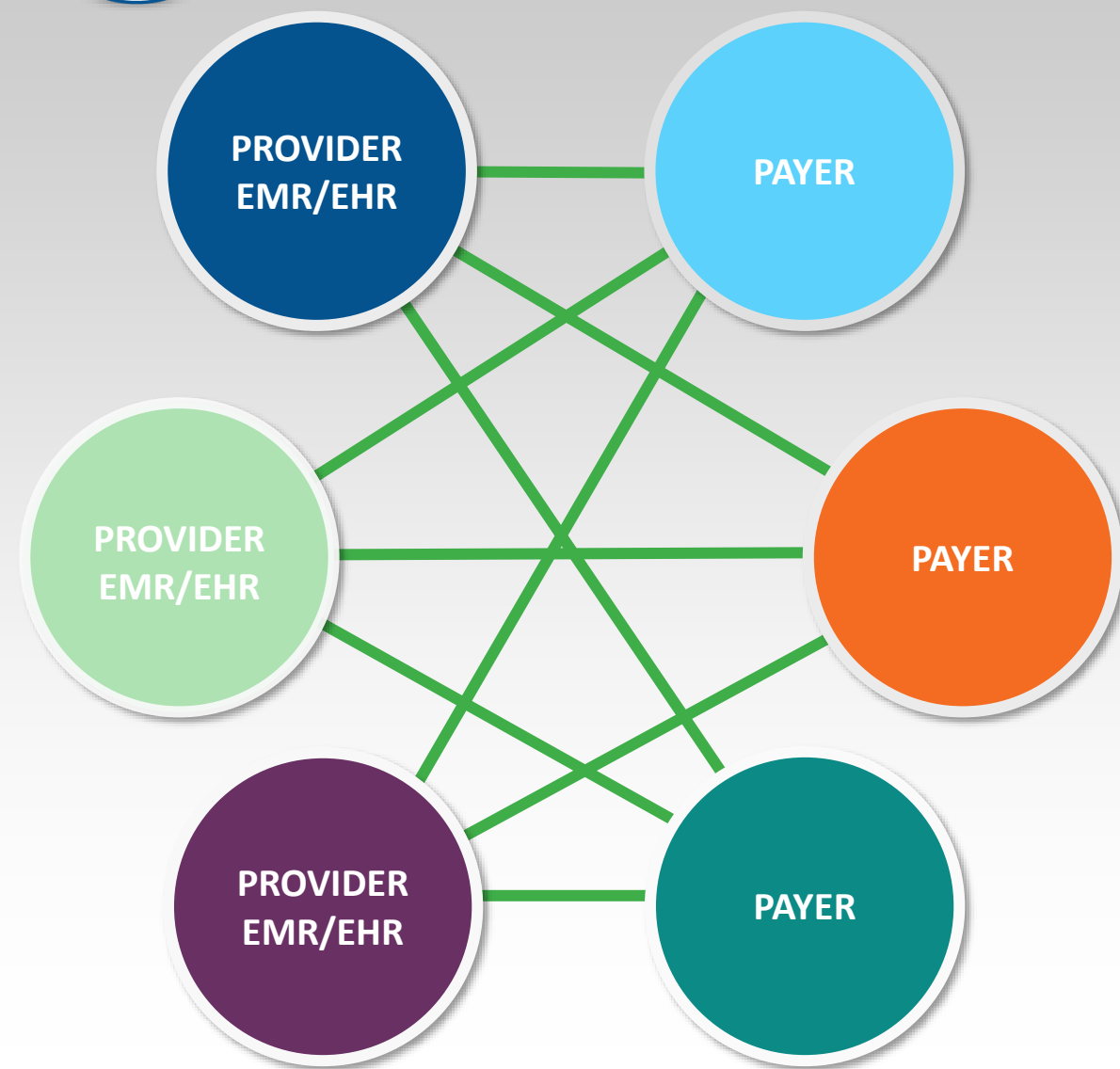
## **Scaling Requirements for FHIR RESTful Exchange in a Hybrid Environment**





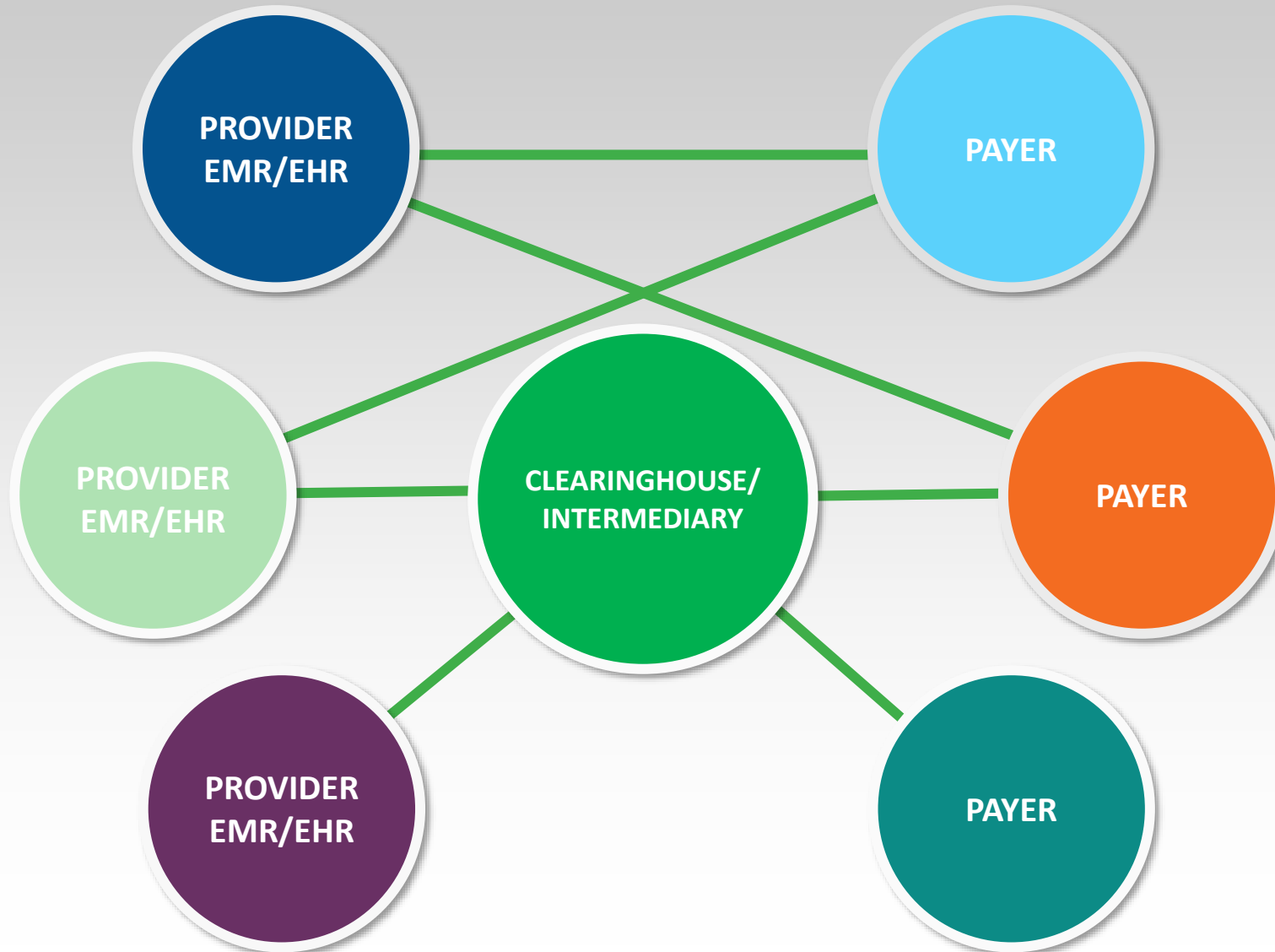


# Supporting Both Point to Point & Intermediary Models





# Supporting a Hybrid Model





## Definition: Intermediary

**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



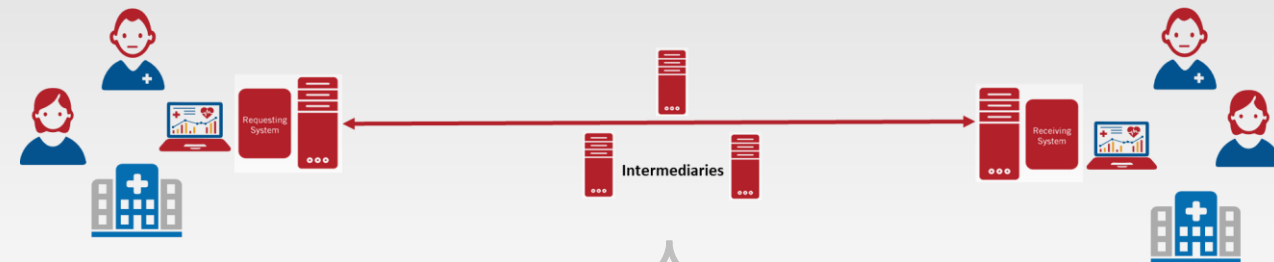
## Standards



- 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

## 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



## 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

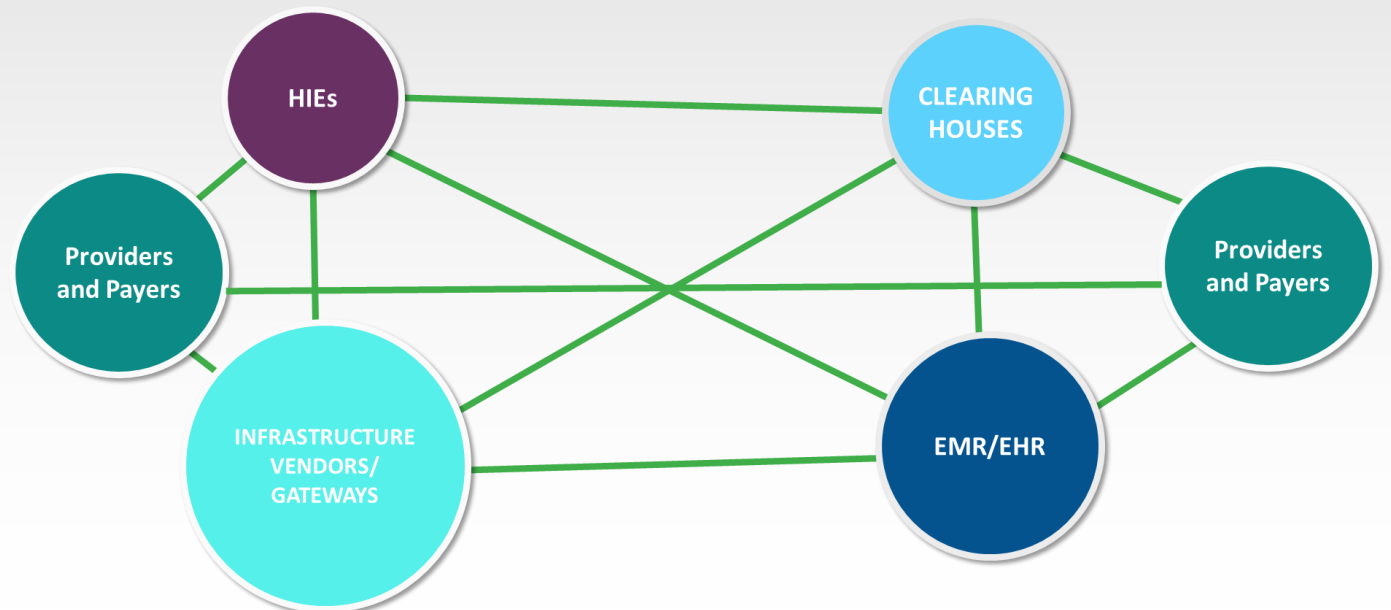
<b>MULTIPLE INTEROPERABILITY MODELS</b>	Hybrid exchange models (e.g., spoke/hub, direct connections/point-to-point, and regionally interconnected spoke/hub) create challenges in adopting standards for scaling FHIR and implementing consistent approaches such as authentication, endpoint detection, standards for matching, and end-to-end performance. Consistency of routing across varied exchange models is also a challenge.
<b>LACK OF PREDICTABILITY AND RESPONSE TIMES</b>	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.
<b>ANTICIPATING INCREASE IN FHIR-BASED VOLUME</b>	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.
<b>DATA BLOCKING</b>	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.



# FAST Scaling Architecture – Future State

- 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

## Mixed (Hybrid) Model Environment with Full Connectivity





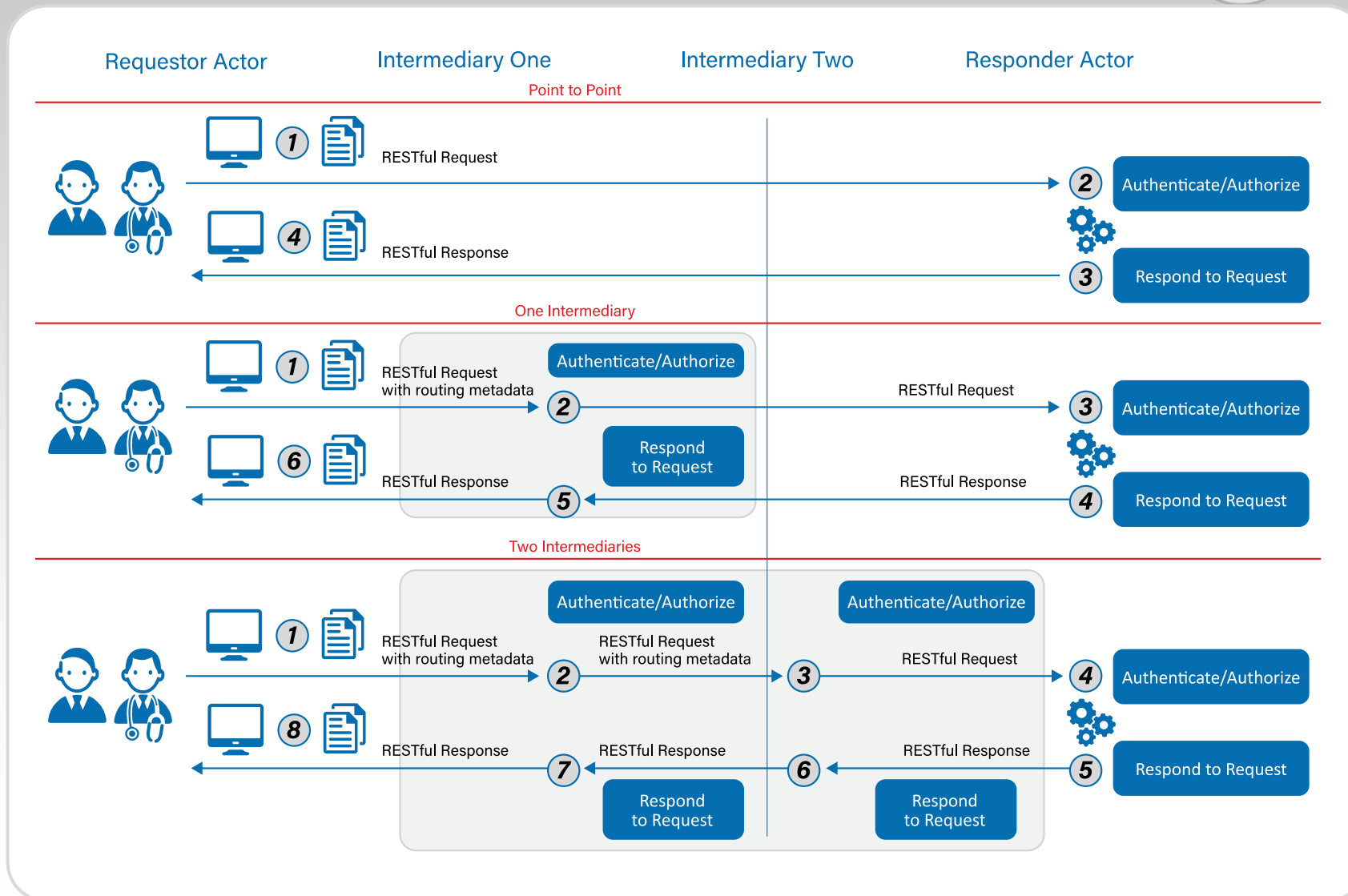
# Intermediary Expectations

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







# Scaling Architecture: Key Topics for SME Discussion

## 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

**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)



# Scaling Architecture Pre-Reading Material

## *FAST* Scaling Architecture for RESTful Exchange in a Hybrid Environment – Expert Panel Discussion December 6<sup>th</sup> at 3-6pm ET

[FAST Scaling Requirements for FHIR RESTful Exchange in a Hybrid Environment – Expert Panel Discussion](#)

SME resources including participant roster, relevant pre-reading material and SME session details and logistics

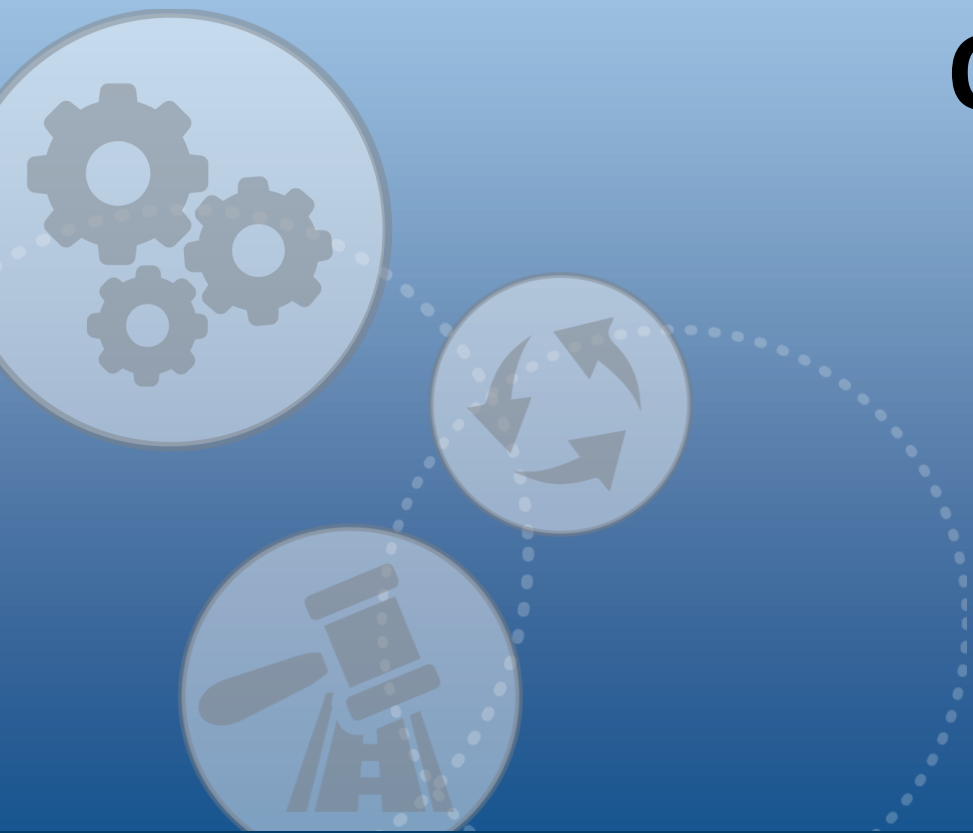
[Scaling Requirements for FHIR RESTful Exchange in a Hybrid Environment V2](#)

*FAST* Scaling Architecture Proposed Solution Document

[FAST Action Plan, Scaling Architecture Excerpt](#)

The *FAST* Action Plan summarizes each *FAST* solution, describes individual solution paths to implementation for those that have been defined, and communicates how the industry can get involved

**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](mailto:Alex.Kontur@hhs.gov)