IHE Work Item Proposal (Detailed)

# Proposed Work Item: MHD to a Federation

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Domain: IT Infrastructure

**Summary**

While MHD is designed to be an adapter over XDS/XCA/XDR, it does not support the concept of community, and this impacts XCA use cases where the community is significant to the Document Consumer. Additionally, MHD cannot currently be used as an adapter over an XCDR Initiating Gateway or an XDR Document Source with the Transmit Home Community Id Option.

# The Problem

The concept of federation is relatively underspecified in FHIR at this time. The notion of “home community” is used by numerous IHE profiles to enable complex, large-scale heterogeneous networks. See [IHE ITI TF-1] E.9 “XCA Integration with XDS and non-XDS communities” for a number of examples of federated deployments enabled by XCA for pull. XCDR enables similar federation for push. FHIR does not have an explicit analog for home community. We would like to add this (or something that would accomplish the same thing) to the IHE FHIR-based profiles. This would support all-FHIR cases requiring federation (for example, crossing security boundaries) as well as bridging FHIR with non-FHIR mechanisms such as XCA. Our initial use cases address mCSD and MHD, but other profiles could be considered, as well as Appendix Z for common capabilities, such as a consistent encoding of HCID as a business identifier.

# Use Cases

# Use case: An mCSD Care Services Selective Consumer that is grouped with an MHD Document Source wishes to push documents to a specific partner. It searches in a directory by Home Community ID and finds the partner organization, however the organization contains no Endpoint resources. Its presence in the directory implies the organization is reachable via a parent organization. The Consumer traverses the directory until it finds a suitable parent organization with an Endpoint that supports the Provide Document Bundle [ITI-65] transaction. The Document Source sends an ITI-65 request, passing the Home Community ID for the ultimate destination in some new way. The Document Recipient makes use of the HCID to route the submission, which could involve a federated XDS, XDR or XCDR system.

# Use case: An MHD Document Responder / Document Recipient provides a FHIR API to a remote federated network built on XCA and XCDR. Its clients know about the network and its participants explicitly, as the MHD system is their gateway to it.

# The MHD Document Responder is grouped with an XCA Initiating Gateway. An MHD Document Consumer sends a Find Document References [ITI-67] request to the Responder, which triggers the XCA Initiating Gateway to make XCA Cross Gateway Query [ITI-38] requests to some number of XCA Responding Gateways. The MHD Document Responder aggregates all received XDS Document Entries and converts them to FHIR DocumentReferences to return to the MHD Document Consumer. The MHD Document Responder includes the Home Community ID for each ultimate source community in some new way. The MHD Document Consumer may decide by community which documents it wishes to retrieve.

# The MHD Document Recipient is grouped with an XCDR Initiating Gateway. An MHD Document Source searches for a destination community in the remote network directory and finds it, however it is not reachable directly; it must be reached via a parent community that implements XCDR. The MHD Document Source obtains the home community IDs of the ultimate destination and the parent community, and sends a Provide Document Bundle [ITI-65] request to the MHD Document Recipient, targeting the parent community and the ultimate destination in some new way.

# Use case: A hierarchical community and its sub-organizations have entries in an mCSD directory, and individual MHD Document Responder endpoints are specified for all. According to the SLA of the parent community, when it is called, it will aggregate results from its child organizations. This allows clients to choose how wide or narrow to make their MHD query. An mCSD Care Services Selective Consumer that is grouped with an MHD Document Consumer wishes to query documents from the parent community and receive these aggregated documents, but also to know from which child organization each document originated, so it may follow up with further queries directly to that organization.

# Standards & Systems

* TBD

# Technical Approach

In XCA, the source HCID is carried in the actual metadata objects: SubmissionSet, Folder and DocumentEntry. For ITI-66 and ITI-67, we could add extensions to DocumentReference and List to accomplish the same thing.

In XCDR, the destination HCID is carried in the transport layer (SOAP header) as well as the application layer (the ebXML SubmitObjectsRequest). I’m not exactly sure the reason for both locations, but I suspect it is to offer flexibility to the recipient in the part of the stack that performs the routing. Although not mentioned directly, this would also support routing in non-SOAP cases like XDM.

I haven’t decided on a preferred technical approach (or set of approaches) yet for carrying HCID in FHIR, or even if the HCID needs to be carried explicitly.

Some potential approaches follow. We may consider combinations to support more bridging options.

Approach: Add an extension to the Provide Bundle.

Approach: HL7/ONC FAST X-Origination and X-Destination headers.

Approach: URL-based routing: in this solution, MHD Document Recipients that can route to federated servers/systems can centrally host specific URL routes for each of their federated systems, and provide these URLs to directories. This allows clients to ignore issues of federation and simply look up the organization they wish to push to.

In mCSD, we would need to profile Organization and potentially Endpoint to support these use cases. We would likely want to define a standard way to express HCID as a business identifier. Endpoint already has a value set for the various protocols we need.

**Impact on existing integration profiles**

TBD

**New integration profiles needed**

TBD

**Breakdown of tasks that need to be accomplished**

TBD

# Risks

TBD

# Open Issues

* Will the PUSH use-case need some clarifications or updates to mCSD for use with HCID discovery
* Will the PULL use-case need some clarification or updates on PDQm/PIXm use to discover HCID that a patient is known within?
* Solution might be broken up into four small work tasks all contributing to overall success needed for this work item. The small work tasks would not stand alone, but rather are useful incremental (agile) improvements.

# Effort Estimates

<The technical committee will use this area to record details of the effort estimation.>