ONC Modular Specification Provider Directory (PD) Overview

April 17, 2014

Agenda

- ➢ Modular Specification (ModSpec) Provider Directory Project
  - ➢ Goals and Process
  - ➢ Artifacts developed
  - ➢ Environment Scan Results
- Federated HPD Specification – Technical Details
  - Data Model
  - Query/Results Structure and Semantics
  - Transport and Application protocols
  - Security Requirements
  - PD Federation
  - API's, Schemas
- Lessons Learned from Pilots and Connectathon activities
- Specification Maturity and Adoption

Modular Specification Provider Directory Project - Goals and Process

- Goals

  - To identify and improve PD standards that will help with various clinical work flows where end point addresses and security information has to be discovered.
    - End point addresses include individuals and organization addresses

- Process
  - Open Process, All calls open to public, all feedback and dispositions are made publicly available

  - Real-world Implementers of specifications consulted during the artifact development process

Modular Specification Provider Directory Project - Artifacts Developed

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- Implementable, Testable, Certifiable:
  - Requirements Traceability Matrix (RTM)
  - Implementation Guide (IG)
  - Platform independent test cases

- Create a Test Implementation (TI) based on RTM and the test cases
  - Available for download as open source
  - Has the following components
    - A Provider Directory implementation based on the RTM
    - A downloadable Test Tool to test conformance of a Provider Directory conforming to the RTM
    - An online instantiation of the test tool as a cloud service for vendors to test as needed.

- Other developer friendly artifacts include
  - UML class diagrams explaining the data models
  - Documentation to help implementers understand underlying technology requirements
  - Links to PD related work performed by various pilots and organizations in the real-world

Modular Specification Provider Directory Project
- Environment Scan Results (PD Queries)

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- Multiple environment scans were performed at different times over the past year, the following were identified as deficiencies

  - Federation Facilitation
    - Absence of a centralized authoritative provider directory requires federation capability (within and across organizations) to use existing authoritative directories so that electronic addresses of providers and their systems can be discovered during workflows

  - Error Handling
    - Provide ability for a client to implement local policies and workflows based on complete/incomplete responses received

  - Lack of single specifications for vendors to target (IHE HPD and its versions, EHR|IWG HPD Plus and its versions)

Modular Specification Provider Directory Project
- Environment Scan Results Cont'd

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- Modular Specification PD project performed the following

  - Added Federation capabilities to the HPD specification
  - Add Error Handling to the HPD specification
  - Coordinated across the various organizations to harmonize towards a single specification
    - Collaborated with NYeC on the PD pilots and obtained support from EHR|IWG representatives to work with ONC on a single specification
    - Submitted changes to IHE HPD to add federation and error handling
    - IHE ITI Technical committee approved to add the Federation and Error Handling as a National Extension under the auspices of IHE USA.

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Federated HPD – Data Model

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- Data Model in alignment with the latest IHE HPD Specification (IHE HPD Base + CP 601)

  – Data Model based on ISO 21091
    - Friendly to LDAP based implementations but has been successfully implemented by organizations using relational backend

  – Supports Individual Provider , Organizational Providers

  – Supports Membership between Individuals and Organizations

  – Supports Electronic Service Addresses for Individuals and Organizational providers, certificates associated with the electronic services

Federated HPD – Data Model

class HPDwithCP601

top

HPDProviderMembership

«R»
- hpdMemberId :String = Single
- hpdHasAProvider :DN = Single
- hpdHasAnOrg :DN = Single

«O»
- hpdHasAService :DN = Multi
- telephoneNumber :TelephoneNumber = Multi
- fascimileTelephoneNumber :TelephoneNumber = Multi
- Mobile :TelephoneNumber = Multi
- Pager :TelephoneNumber = Multi
- mail :String = Multi

HPDElectronicService

«R»
- hpdServiceId :String = Single
- hpdServiceAddress :String = Single

«O»
- hpdIntegrationProfile :String = Multi
- hpdContentProfile :String = Multi
- hpdCertificate :Binary = Multi

inetOrgPerson

«R»
- uid :String = Single
- description :String = Single
- displayName :String = Single
- sn :String = Multi
- cn :String = Multi

«O»
- title :String = Single
- initials :String = Multi
- mail :String = Multi
- userSMIMECertificate :Binary = Multi
- userCertificate :Binary = Multi

«R2»
- givenName :String = Multi
- physicalDeliveryOfficeName :String = Multi
- telephoneNumber :TelephoneNumber = Multi
- Mobile :TelephoneNumber = Multi
- Pager :TelephoneNumber = Multi
- fascimileTelephoneNumber :FascimileTelephoneNumber = Multi

Organization

«R»
- uid :String = Single

«R2»
- O :String = Multi
- telephoneNumber :TelephoneNumber = Multi
- fascimileTelephoneNumber :FascimileTelephoneNumber = Multi

«O»
- businessCategory :String = Single
- description :String = Multi

HPDProviderCredential

«R»
- credentialType :DirectoryString = Single
- credentialName :DirectoryString = Single
- credentialNumber :DirectoryString = Single

«O»
- credentialDescription :DirectoryString = Single
- credentialIssueDate :Date = Single
- credentialRenewalDate :Date = Single
- credentialStatus :DirectoryString = Single

HPDProvider

- 1.3.6.1.4.1.19376.1.2.4.1 :OID

«O»
- hpdProviderStatus :DirectoryString = Single
- hpdProviderLanguageSupported :DirectoryStrig = Multi
- hpdProviderBillingAddress :PostalAddress = Multi
- hpdMedicalRecordsDeliveryEmailAddress :string = Single
- memberOf :DN = Multi
- hpdCredential :DN = Multi
- hpdProviderLegalAddress :PostalAddress = Single
- hpdHasAService :DN = Multi

«R2»
- hpdProviderMailingAddress :PostalAddress = Multi
- hpdProviderPracticeAddress :PostalAddress = Multi

HCProfessional

- 1.0.21091.1.2 :OID

«R»
- hcIdentifier :String = Multi
- hcProfession :String = Multi

«O»
- hcSigninigCertificate :Binary = Multi
- hcPracticeLocation :DN = Multi
- hcSpecialization :String = Multi

HCRegulatedOrganization

- 1.0.21091.1.4 :OID

«R»
- hcIdentifier :String = Multi
- hcRegisteredName :String = Multi

«O»
- ClinicalInformationContact :DN = Multi
- HcSpecialization :String = Multi
- HcSigningCertificate :Binary = Multi
- HcOrganizationCertificates :Binary = Multi

IndividualProvider

«O <NaturalPerson>»
- gender :String = Single

«O <groupOfURLs>»
- labeledURI :String = Multi

«R»
- createTimestamp :Date = Single
- modifyTimestamp :Date = Single

OrganizationalProvider

«R»
- createTimestamp :Date = Single
- modifyTimestamp :Date = Single

«O <groupOfURLs>»
- labeledURI :String = Multi

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- Federated HPD Specification reuses the base IHE HPD specification query and result structures and semantics

  – Query and Results semantics based on DSML v2

  – Provides the necessary mechanisms for structuring queries using the data model

  – Supports "AND", "OR", "NOT"

  – Supports "String" and "RegEx" types of matching based on attributes available in the data model

Federated HPD
– Transport and Application Protocols

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- Federated HPD Specification reuses the base IHE HPD transport and application protocols

  - SOAP 1.2 over HTTP based on the Web Services for IHE Transactions Appendix V in ITI-TF Vol2.

  - Only Synchronous Web Services are required

  - DSMLv2 with SOAP bindings over HTTP is the combined structure that is used.

Federated HPD – Security Requirements

- Federated HPD Specification reuses the base IHE HPD transport and application protocols

  - IHE Web Services use Mutual TLS to protect message traffic over the wire

  - No additional security controls specified for the query transaction

Federated HPD
– PD Federation

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- Federated HPD introduces support for federation as part of the specification explicitly

  - Introduces a "WRAPPER" to wrap the basic IHE HPD request with appropriate request and response metadata and error data

  - Metadata provides the client
    - Ability to indicate if a request should be federated or not
    - Ability to decipher the exact directory that responded to the request so that follow on requests can be issued efficiently
  - Improved error handling provides the client
    - Ability to detect partial and complete responses
    - Ability to distinguish between application faults vs SOAP faults

Federated HPD – API's and Schemas

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- Federated HPD Schemas and WSDL's differ from the base HPD specification

  – New Schemas which define the necessary Wrappers on top of the base HPD and DSML schemas

  – New WSDL that use the new schemas provided as part of the specification

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➢ Lessons Learned from Pilots and Connectathon activities

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Pilots and Connectathons Summary

- ONC sponsored NYeC Pilots feedback
  - Confusion about standards (Need a single standard to implement!!)
  - When the same standards were used the same value sets were not being used consistently (Need complete definition of value sets that are applicable)
  - Needed ONC ModSpec activity to be adopted by IHE
  - Most federated solutions are one-off and not adopting a standard
  - Complex queries are cumbersome in the existing standards
    - Snowbird Pilot
    - California Pilot
    - NATE Pilot
    - NY Pilot

Pilots and Connectathons Summary Cont'd

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- IHE NA New Directions Connectathon
  - Multiple vendors volunteered for testing Federated HPD specifications and passed the basic tests in a short time frame. (Less than 2 months)
    - SureScripts
    - CareEvolution
    - Inpriva
    - Nextgen

- HIMSS Interoperability Showcase Demonstration
  - Created a successful Federated HPD demonstration using Google like Internet search within a short time frame (Less than a month) and was show-cased as part of the Interop showcase
    - SureScripts
    - CareEvolution
    - Inpriva
    - Verizon

- General Feedback

  - Vendors appreciating the collaboration between ONC, IHE and EHR|IWG to create a single specification
    - Weekly meetings with the core team and bi-weekly meetings with vendors are being held to finalize the specifications

  - ONC Federated HPD Tools provide a quick way for organizations to learn about the specification

  - Working software along with the test tools makes it easier for companies to stand up implementations and test their implementations

  - Should support a RESTful approach in the future

Lessons Learned from Pilots and Connectathons
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- Specific Technical Feedback
  - Add support for higher level queries to avoid multiple low level queries
  - IHE Web Services implementation needs to be further clarified with respect to addressing, security and other aspects.
  - Data Model optionality should be tightened based on the use cases
  - Some vendors (especially ones implementing on a relational backend) support limited set of searches based on use cases
  - Need to identify response behavior when data is not present within a directory
  - IHE HPD Data Model Value Sets needs to be further clarified

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Specification Maturity and Adoption

- Maturity
  - Federated HPD Specification expected to be finalized via the IHE USA process in the 2014 Summer Timeframe. (July 2014 targeted)
  - Many of the changes from the connectathons and pilots are being incorporated into the base specifications
  - Test Tools and Test Implementations stable and very few changes over the past 6 months since the specifications were base-lined.
  - IHE SOAP Web Services stack adopted by vendors for various other protocols such as XDS/XCA etc.
  - DSMLv2 is a mature OASIS specification been around for more than a decade.

- Adoption
  - Approximately 18 organizations tested for HPD at the IHA NA Connectathon in 2014
  - As part of the Federated HPD vendor calls approximately 10 vendors have committed to implement the Federated HPD specifications.

Discussion