Provider Directory Lessons Learned

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Agenda

- Business and Clinical Use Cases
- eHealth Exchange Directory Lessons Learned (UDDI)
- IHE HPD Lessons Learned
- Current Active Provider Directory Work
- Recommendations
- References

Provider Directory Use Cases

- Identify human or organizational providers based on attributes
- Identify human or organizational providers based on relationships to an organization
- Keeping provider lists current (federation, subscriptions, data exchange, real-time vs. batch)
- Encapsulated or linked object retrieval
- Generic electronic services discovery (IHE SOAP, FHIR, Direct email)
- Target of an automated patient consent expression
- New: Consumer directory

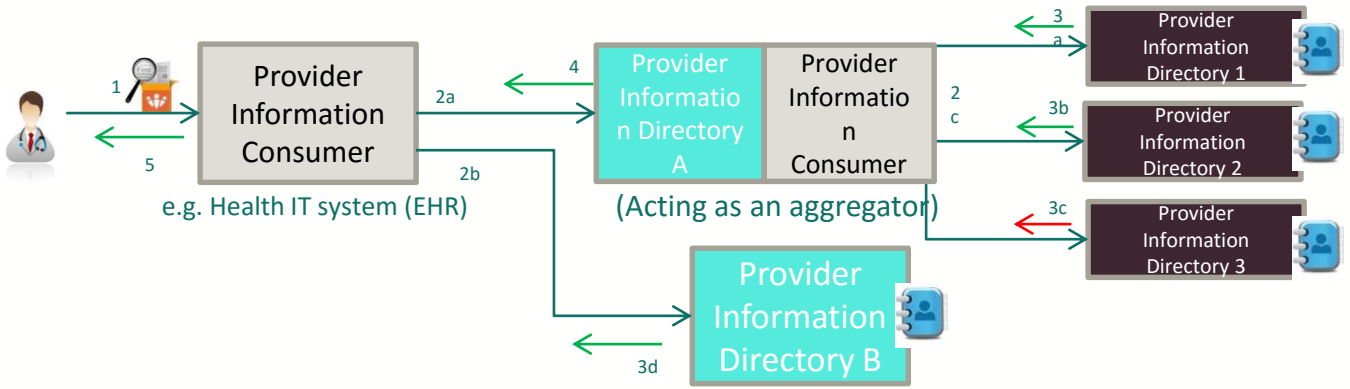
eHealth Exchange Directory Usage

- 120 Participants representing over 100m patients connected today in production
- Using and supporting current directory approximately 9 years
- Directory is based on the UDDI v3 standard, organized by business entities (primary search key), then by metadata such as contacts, then by services and end points.
- Primary use case is electronic end point service discovery
  - Query by geography, version of service supported, name of organization, or by a list of all organizations

eHealth Exchange

- Positive lessons learned
  - Directories can provide significant value
  - Many use cases require PDs
  - National-scale PD usage is viable
- Negative lessons learned
  - Manual quality assurance is important and can be costly
  - Automation is essential for efficiency
  - Interoperability of each data element is important, including all components of address, types of contacts, versions of services supported
  - Adding support for other key elements designed to allow for even more process automation between Participants such as to establish common test patients, use case compatibility, content compatibility, and other interoperability concerns such as internal architecture (federated, centralized, hybrid, or other)

HPD Actors



Workflow

1b. Healthcare provider uses their HealthIT system to locate a provider

2a. The **Provider Information Consumer** (the HealthIT system) sends the request to a **Provider Information Directory A** which federates multiple directory sources as shown in the diagram

2b. The **Provider Information Consumer** (the HealthIT system) can also send a request to a **Provider Information Directory B** that does not federate the request to any other directory sources.

2c. The **Provider Information Directory A** federates the request to a set of known additional **Provider Information Directories (1, 2, and 3)**.

3# **Provider Information Directories** provide a complete response, an error, or an incomplete response.

4. **Provider Information Provider A** aggregates responses (including complete responses, errors, and incomplete responses) back to the **Provider Information Consumer**.

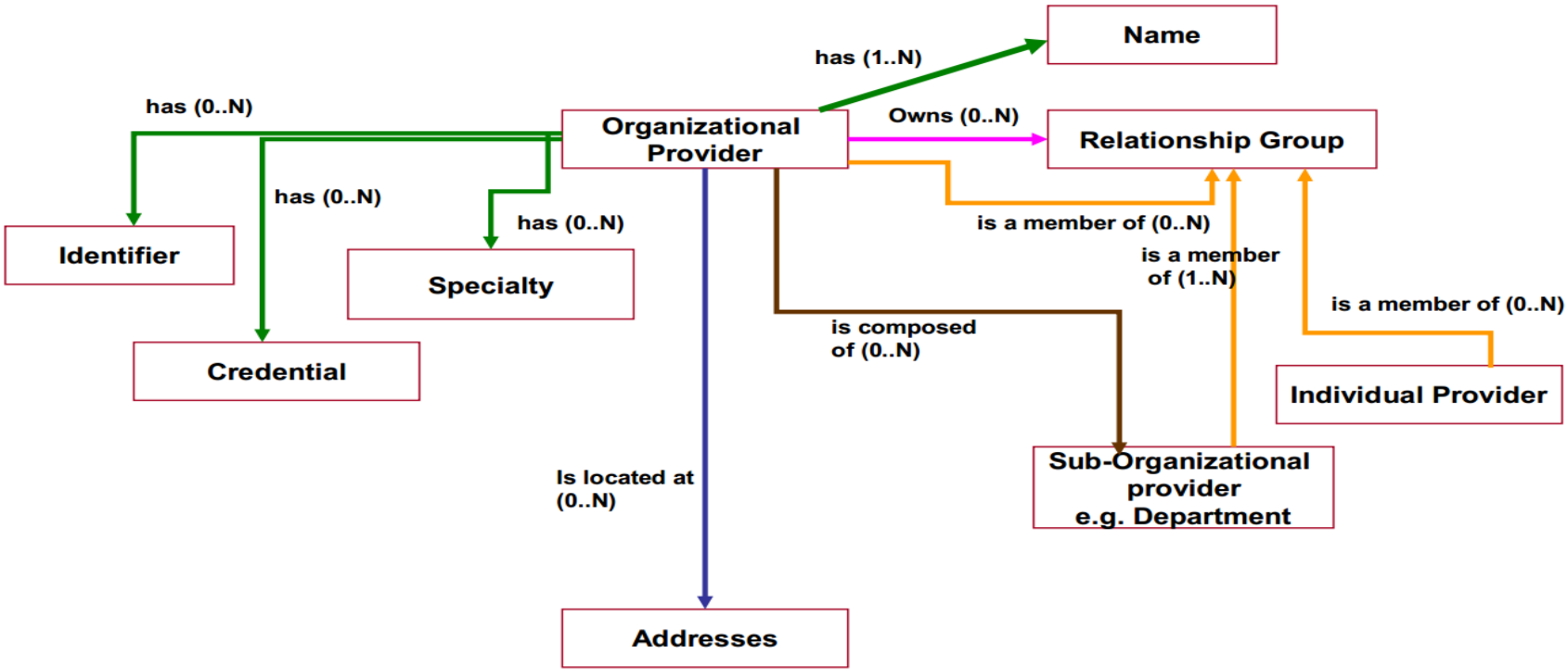
5. The **Provider Information Consumer** (the HealthIT system) receives the responses, including incomplete and error responses, and presents the data to the user.

Requests

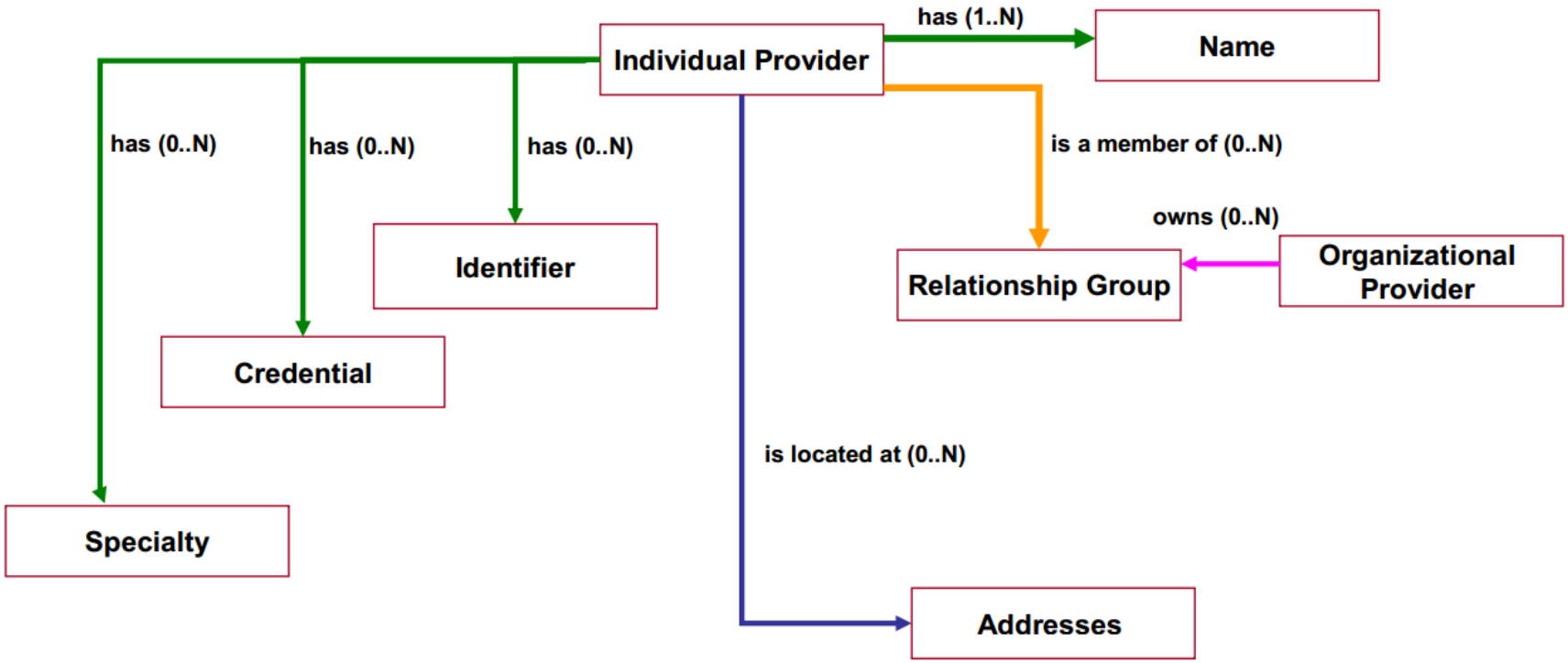
Aggregate or regular responses

Incomplete or error responses

HPD Organizational Provider Structure



HPD Individual (Human) Provider Structure



HPD Context

- Federation, or similar data aggregation/management is required for some use cases, and it is an interoperability issue
- Participation in HPD has declined about 50% from 2015 to 2016 at the IHE Connectathons
- Many are waiting for HL7's Argonauts, thus I'm participating in that with a personal goal of seeing the same use cases supported independent of the underlying directory technology

HPD Context (Cont.)

- ITI HPD has been adopted (18 organizations as per the IHE Product Registry) and we now have implementation experience
- A survey was conducted via various email lists and to implementers (on April 30th 2015 at 9:20am), asking for feedback on readiness of HPD to go to final text
- Approximately 50% stated yes
- Remainder stated a small number of significant problems exist that are preventing interoperability

HPD Negative Lessons Learned (Cont.)

- USA implementers need additional specificity that is not appropriate in the international specification
- Additional specificity is required for many (if not most) real-world implementations of HPD, and the use of these attributes in the USA are not defined clearly, thus they are not interoperable
- Real world implementations are expressing lack of interoperability and lack of clarity
- About 25% of implementers did not want to support LDAP, but LDAP syntax is required for HPD (I find it ironic that FHIR/RESTful directories will likely have similar structure and problems but be more “acceptable”)

HPD Negative Lessons Learned (Cont.)

- Some implementers erroneously thought federation was required (it is not, it's an option)
- Many objected to supporting full LDAP query capabilities such as wildcard searches, AND/OR logic
- Others indicated problems with the use of "name value pairs within name values pairs" for address objects (they looked like a single string with "$addr:$city:Austin$state:Texas$zip:78737" resulting in inefficient queries (the latest ISO base spec makes addresses first class objects with discrete data elements)
- Others felt that HPD was "chatty" requiring multiple queries to obtain the needed info, but I want to caution that I expect FHIR directories will likely have the same problem so we're in danger of repeating prior mistakes

HPD Negative Lessons Learned (Cont.)

- Other organizations did not like SOAP based web services and were seeking RESTful approaches but no viable options were found so implementers chose to wait

HPD Positive Lessons Learned

- HPD is based on DSML which is based on LDAP, LDAP provides a number of desirable capabilities
  - LDIF file format for bulk data operations is part of the official standard and means that historical backloads are in a standard format
  - Directories of people, orgs, and relationships are naturally hierarchal in the real-world, and in LDAP
  - Relationships based attributes and queries seem to be of high value, allowing for queries such as “return all specialists associated with a given organization” or “what clinics exist for a given hospital”, or “where is a specific doctor privileged”
- Use cases MUST drive the directory design, most HPD use cases persist and seem to remain of high value

HPD Positive Lessons Learned (Cont.)

- ONC helped significantly last year by
  - Being a voice at the table
  - Providing a key technical resource
- An open and transparent process works
  - Is important to make sure all interests have a voice

Current Active PD Work

- IHE USA
  - Creating a USA National Extension
  - I'm leading that effort under direction of the IHE USA Board
  - Open process – contact me to get involved
- HL7 Argonauts
  - One of their top 4 identified priorities from last year
  - Work started in earnest last week
  - I'm involved – contributed use cases
  - Not an open process but Argonauts agreed to allow me to share information both ways

Lessons Learned Summary

- Many business and clinical objectives require provider directories
- National-scale provider directories are in production today
- Automation and administration of directory data are significant issues that should not be an afterthought
- Quality and interoperability of each provider directory data element is essential
- Relationships are important and need to be expressible in a directory
- Full CRUD operations will need support in many cases
- Both query and retrieve operations are required
- ALL data elements in the PD should be tightly constrained for interoperability
- Person types (technical contact, business contact, general contact, etc.) are essential for some uses of a PD
- ONC can help by being at the table, and providing some resourcess

Recommendations

- ONC should remain involved in the provider directory discussion as “a voice at the table”
- Ensure any directory solutions selected include support all use cases identified or we won’t have a viable solution for the country
- Monitor the Argonaut work and the IHE work and industry should select a single standard to use

- GET INVOLVED!
  - Join the IHE discussion at the appropriate technical committee working on provider directory standards (IHE ITI)
  - Join the HL7 work
  - Make sure YOUR requirements are known to SDOs! Right now, SDOs need your input!!
  - Contact me, or another “standards” person for a pointer to the right venue

References

- HPD Federated as published by IHE for Trial Implementation
  - http://www.ihe.net/uploadedFiles/Documents/ITI/IHE_ITI_Suppl_HPD.pdf
- ONC Documentation:
  - http://modularspecs.siframework.org/Provider+Directories+Artifacts
- Test Tools/Data/Schemas/etc.:
- IHE Gazelle
  - http://sitenv.org/ (Check out the Provider Directory Sandbox)
  - https://github.com/siteadmin/pdti/tree/master/pdti-server/
- Initial project:
  - http://modularspecs.siframework.org/Provider+Directories+Artifacts
- Google Groups HPD:
  - https://groups.google.com/d/msg/ihe-hpd-implementors/

Contact info/References

- For HIETexas: Eric dot Heflin at THSA dot org
- For The Sequoia Project: eheflin at SequoiaProject dot org

- Thanks!

- References:
- Use Cases:
  - http://wiki.ihe.net/index.php?title=Healthcare_Provider_Directory_USA_National_Extension#Use_Cases
- IHE HPD:
  - http://wiki.ihe.net/index.php?title=Healthcare_Provider_Directory
- HIETexas computable consent draft specification:
  - http://hietexas.org/news-archive/243-thsa-releases-draft-consent-file-technical-specification-and-seeks-public-comment?highlight=WyJjb25zZW50Il0=