IBM Global Business Services

IBM NHIN Architecture

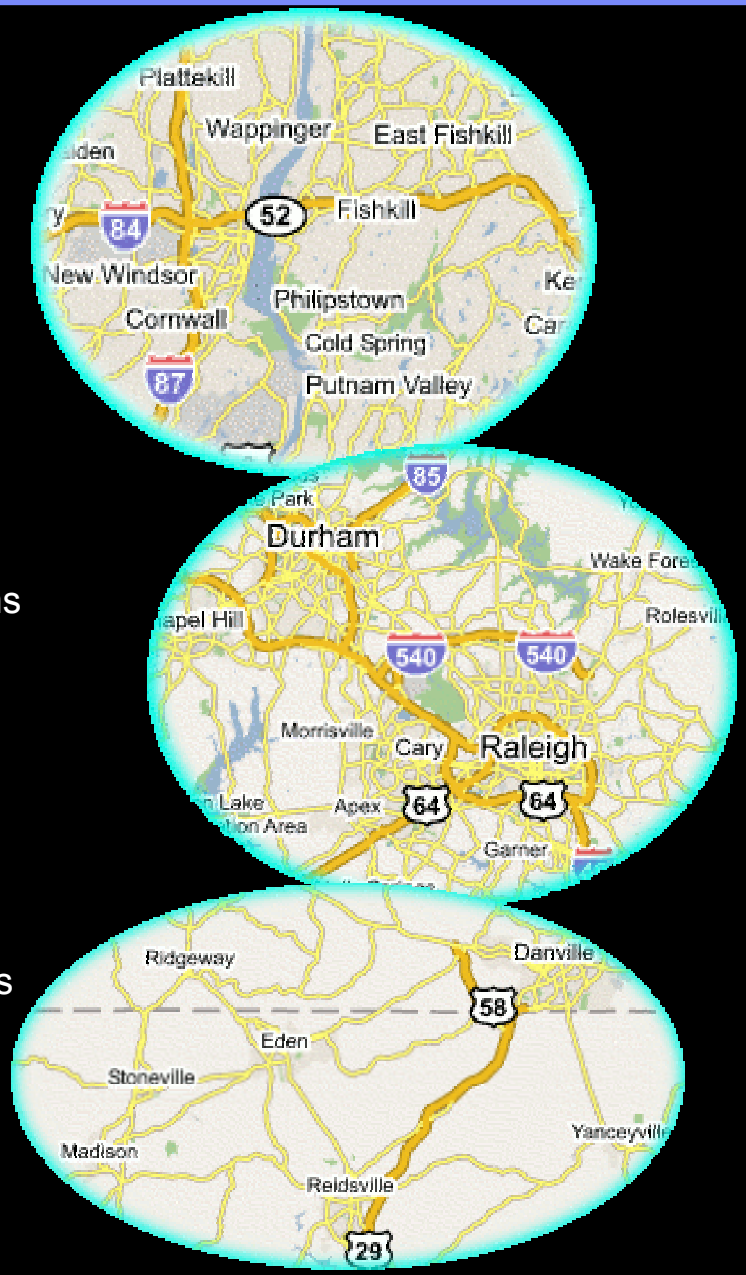
Leveraging Standards and Industry Initiatives

Kevin Julier KJulier@us.ibm.com
Casey Webster CaseyWeb@us.ibm.com

Fostering a Nationwide Healthcare Infrastructure

Community Partners

- Fishkill, New York
  - Taconic Health Information Network & Community (THINC)
  - Dr. John Blair
  - 2,300 physicians supporting 700,000 patients
  - Shared data using Healthvision
- Research Triangle, North Carolina
  - North Carolina Healthcare Information and Communications Alliance (NCHICA)
  - Holt Anderson
  - Competitive, high-tech urban environment
- Rockingham County, North Carolina
  - Also members of NCHICA
  - Rural environment with North Carolina and Virginia patients
  - Small, competitive practices and hospitals



Guiding Principles

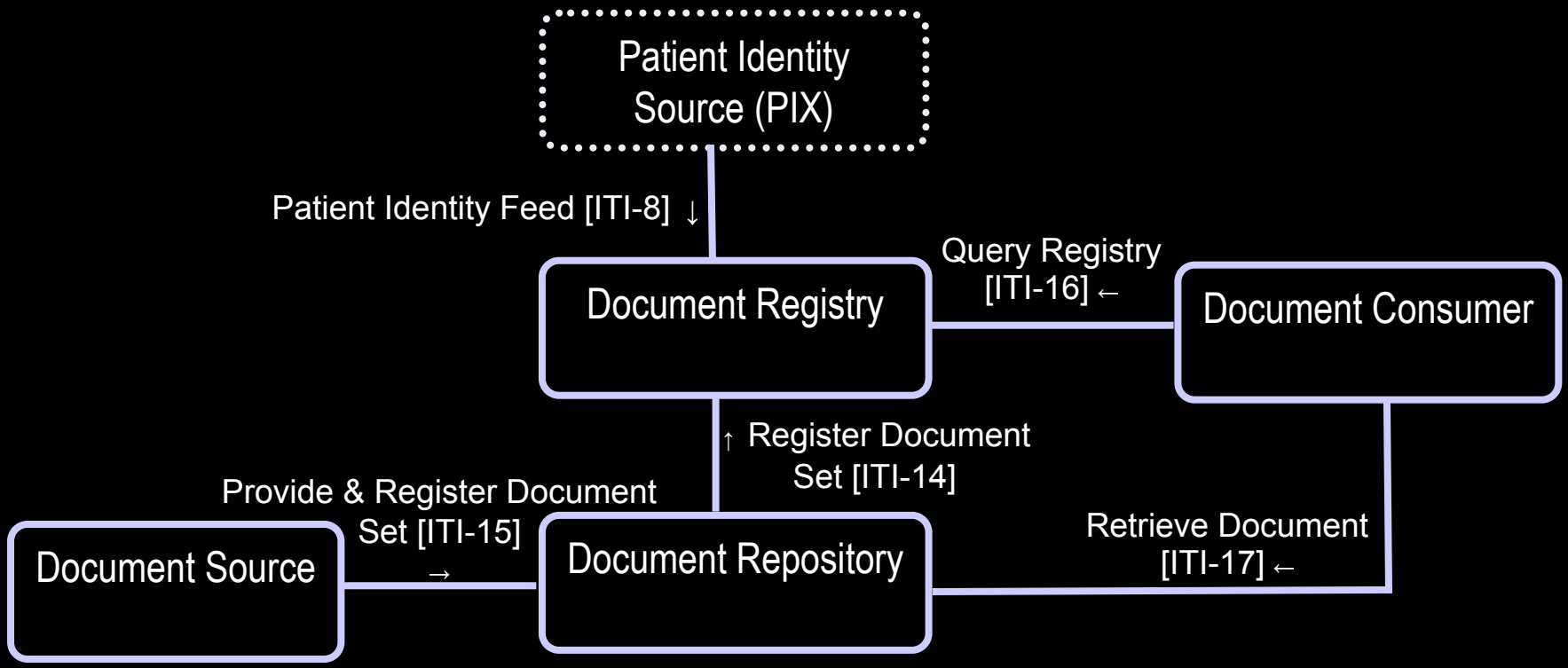
- Community-Centric
  - Document repositories normalize and store clinical data within a community
    - Can be hosted by individual hospitals/practices and/or shared within the community
  - Community hub provides MPI, document locator, security and support services
  - The community hub is the gateway to other communities
- Drive and conform to standards
  - Instantiation of IHE interoperability framework (XDS, PIX/PDQ, ATNA & CT profiles)
    - Clinical events stored as HL7 CDA(r2)-compliant documents
    - Cross-community search & retrieval
  - J2EE implementation is hardware & software vendor agnostic (JDBC, JMS, EJB)
  - WS-*, SAML and related standards for authentication, authorization, and security
- Provide security & privacy w/o sacrificing usability or research value
  - Anonymous/pseudonymous data that can be re-identified as needed/permitted
  - Supports other data aggregates (registries, biosurveillance, outcomes analysis, quality of care)
- Practical
  - Scalable and cost-effective at every level of practice
  - Point-of-care performance is critical to adoption

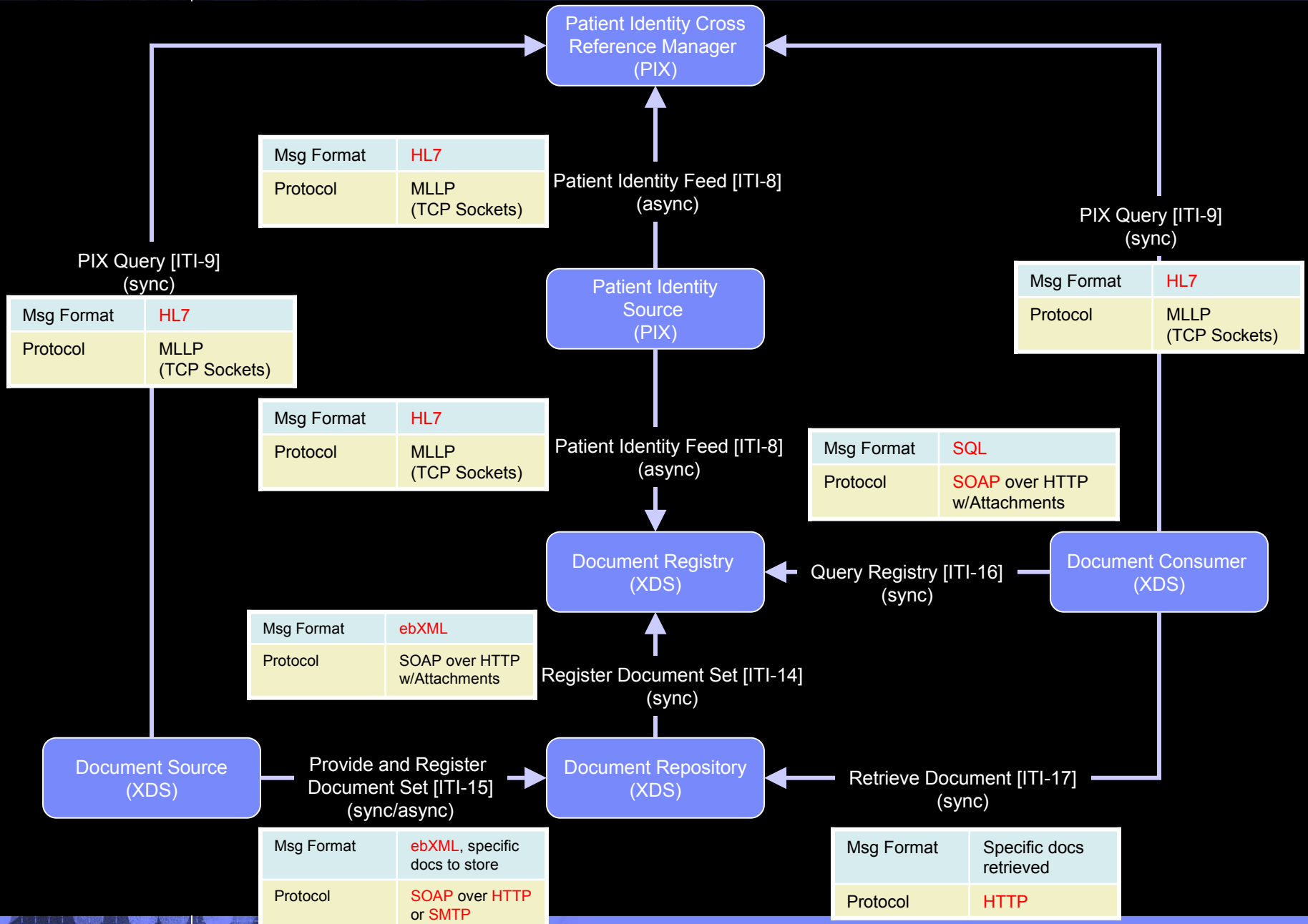
Leveraging Integrating the Healthcare Enterprise (IHE) Work

- IBM team has implemented these IHE integration profiles
  - **XDS – Cross-Enterprise Document Sharing**
    - Supports saving, registering, querying and retrieving documents across enterprises but within an administrative domain
  - **PIX – Patient Identifier Cross-referencing**
    - Supports cross referencing of patient identifiers across domains
  - **PDQ – Patient Demographics Query**
    - Supports query for patients given a minimal set of demographic criteria (e.g. ID or partial name) returning all the demographics and a patient identifier within a domain
  - **ATNA – Audit Trail and Node Authentication**
    - Supports auditing and secure communications
  - **CT – Consistent Time**
    - Supports consistent time across multiple systems

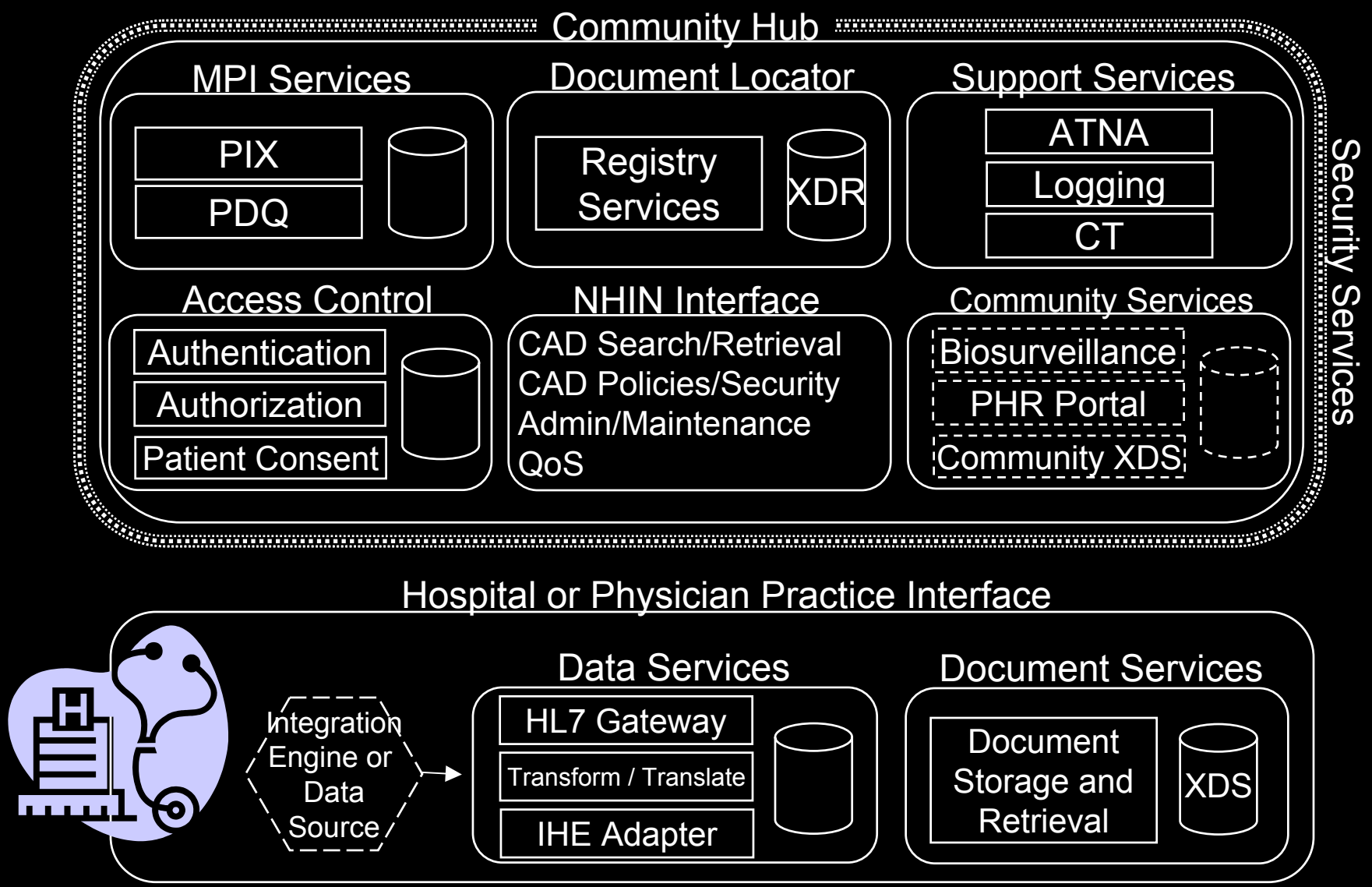
IHE XDS (Cross Enterprise Document Sharing) Profile

The XDS integration profile enables a number of healthcare enterprises belonging to a clinical affinity domain to cooperate in the care of a patient by sharing clinical records in the form of documents as they proceed with their patient's care delivery activities




Patient Identity Cross Reference Manager (PIX)
Msg Format HL7
Protocol MLLP (TCP Sockets)
Patient Identity Feed [ITI-8] (async)
PIX Query [ITI-9] (sync)
Msg Format HL7
Protocol MLLP (TCP Sockets)
PIX Query [ITI-9] (sync)
Msg Format HL7
Protocol MLLP (TCP Sockets)
Patient Identity Source (PIX)
Msg Format HL7
Protocol MLLP (TCP Sockets)
Patient Identity Feed [ITI-8] (async)
Msg Format SQL
Protocol SOAP over HTTP w/Attachments
Document Registry (XDS)
Query Registry [ITI-16] (sync)
Document Consumer (XDS)
Msg Format ebXML
Protocol SOAP over HTTP w/Attachments
Register Document Set [ITI-14] (sync)
Document Source (XDS)
Provide and Register Document Set [ITI-15] (sync/async)
Document Repository (XDS)
Retrieve Document [ITI-17] (sync)
Msg Format ebXML, specific docs to store
Protocol SOAP over HTTP or SMTP w/Attachments
Msg Format Specific docs retrieved
Protocol HTTP

Community Architecture



Cross-Community Interaction

- All cross-community interactions are brokered through the NHIN interface, using other community services as needed
- Authentication and authority uses a federated model, with trust relationships established at the NHIN level
- Cross-community patient lookup is based on demographic matching
  - Identity is established by matching demographic data between the local and remote PDQ databases, with a conservative threshold
  - IBM research is working on open issues such as patient mobility, multi-resident patients (“snowbirds”), directed searches, and undirected bounded searches
- Cross-community document retrieval is an extension of intra-community retrieval, dependent on obtaining a patient match in the second community
- Will utilize the new IHE “XDS Federation” integration profile as it develops

Questions?