

The Office of the National Coordinator for  
Health Information Technology



# Key Considerations Related to Policies for Interoperable, Federated Provider Directories

John Hall

Principal, Krysora  
Coordinator, Direct Project

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# Background

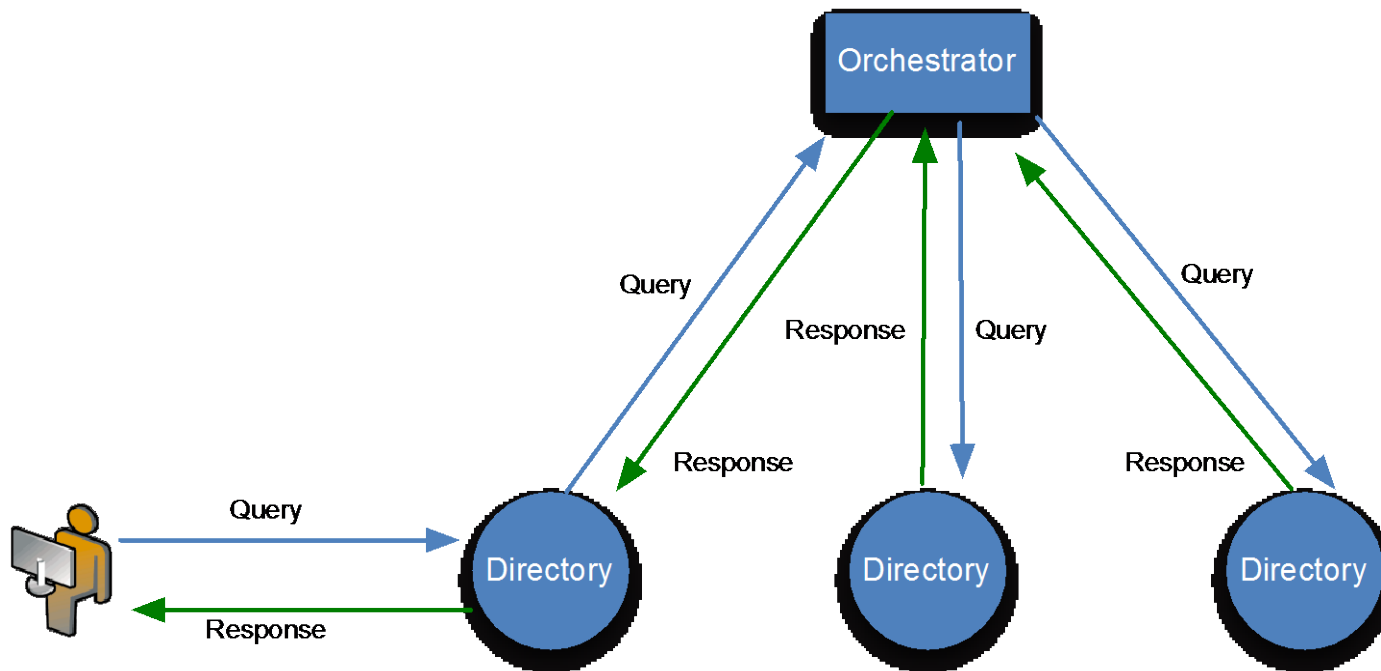
- Technology interoperability and vendor adoption have posed challenges to directory implementation.
- Recent developments, however, in the technology landscape are encouraging.
- Directories are being implemented and connected to one another, forming networks, and this will accelerate as the technology landscape continues to improve.
- Policy is a significant factor that can either impede or facilitate this.

# Provider Directory Community of Practice (PD CoP)

- Work to outline key considerations related to policies for interoperable, federated provider directories under the auspices of ONC's PD CoP.
- Based on previous efforts piloting directory policies as well as information from parties active in this space, e.g., DirectTrust, EHR/HIE Interoperability Workgroup (IWG), Healtheway, and National Association for Trusted Exchange (NATE).
- Not intended to prescribe policy – informative resource for directory operators and networks as they consider their directory policies.

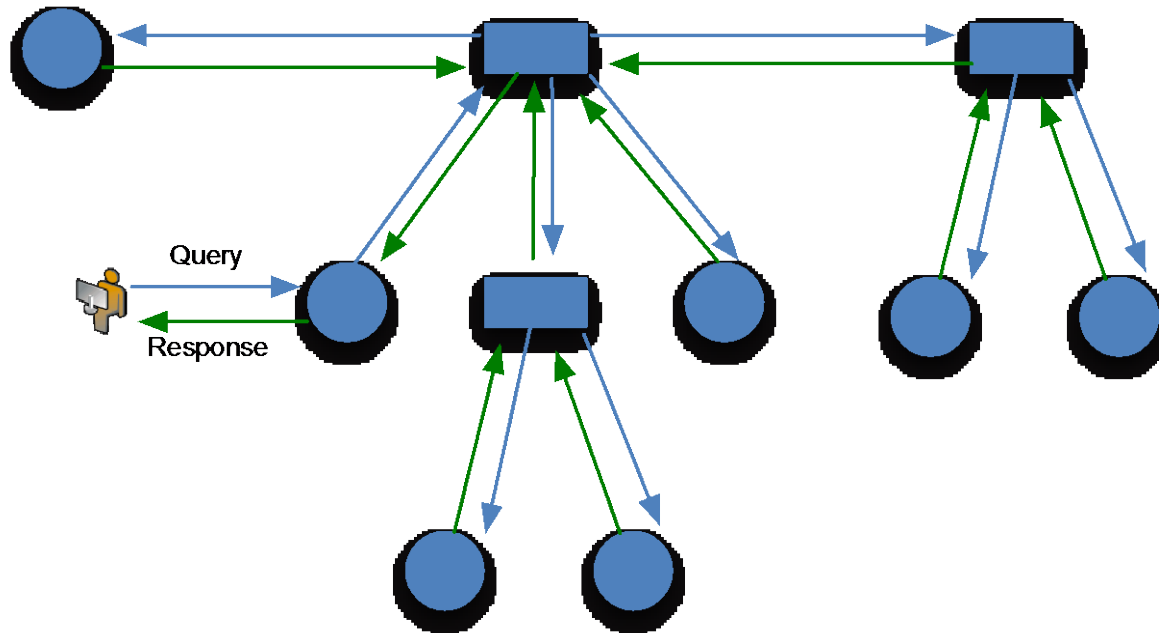
# Directory Networks

# Federated Directory Networks - 1



Directory networks forming today are often *federated*, arranged hierarchically with queries distributed to data holders.

# Federated Directory Networks - 2



These networks can be both broad and deep, with numerous peers and multiple layers.

# Key Considerations

# Overview

## Overarching Considerations

- Terminology
- Incremental Policy-Making

## Considerations for Specific Directory Policy Areas

- Electronic Service Information (ESI) Discovery
- Quality of Data
- Permitted Purposes

## Considerations for Directory Networks

- Scalability
- Federated Relationships
- Directory Intermediaries
- Security



# Overarching Considerations

- Terminology
  - Connecting to others requires some level of policy alignment.
  - Assessing alignment can be difficult if the concepts covered by a set of policies are not clearly defined and understood.
  - Clear definitions of key concepts can...
    - Help better communicate the nature and coverage of policies
    - Facilitate assessing alignment
- Incremental Policy-Making
  - Trying to anticipate out of the gate every potential use case a directory might ever serve into the future and then attempting to craft associated policies can hinder and delay serving the needs of today.
  - An incremental, iterative approach that paces policy-making to current capabilities and near-term, known needs can help keep things moving as well as provide time for those impacted to be comfortable and able to meet requirements.

# Considerations for Specific Policy Areas: ESI Discovery

- Electronic Service Information (ESI)
  - Defines how to communicate with an exchange partner, e.g., Direct addresses, query endpoints, and supported transport, content, and security options.
  - Supporting discovery across HISPs and organizations is perhaps the biggest driving factor behind the formation of directory networks today.
- Searches for ESI are based on demographics (e.g., name, specialty, physical address), affiliations, and other identifying data. It's possible a directory may choose to limit access to some of this data, not allowing searches against portions of it or returning it in responses. However, in doing so, ...
  - Providers and other users may not be able to find sought-after exchange partners easily.
  - Providers and other users may be less comfortable exchanging with the parties they do find if they feel what they can search against or what is returned is not comprehensive enough to identify their sought-after exchange partners.
  - As a result, adoption and usage may suffer, and other directories may not be as willing to connect due to the potentially low value of such a connection to their own users.

# Considerations for Specific Policy Areas: Quality of Data

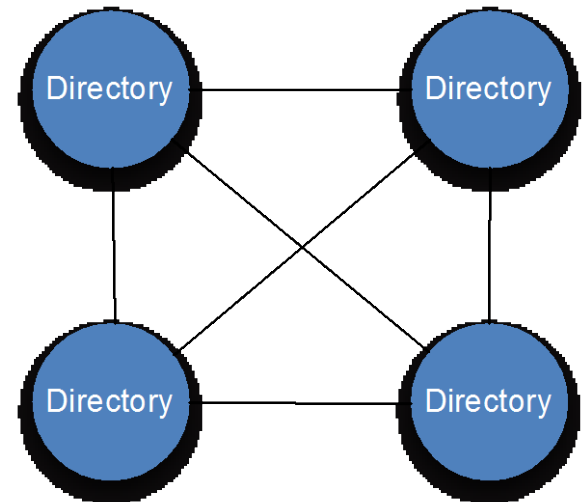
- As a source of data, a directory's value is strongly dependent on the quality of the data it delivers.
- Policies focused on establishing and maintaining data quality can help a directory to deliver the value its relying parties expect. Things to consider include:
  - Identifying information (demographics and affiliations) are fundamental data elements. Any directory that does not place an emphasis on establishing and maintaining current and accurate identifying information will be challenged to serve core use cases, including ESI discovery.
  - Information associated with entities that no longer exist or are inactive can create false expectations and result in frustration when parties rely on that information. A directory with policies and processes to minimize the presence of such information from a directory will provide higher value to relying parties.
  - When tackling quality over a broad range of data, taking an iterative approach and focusing on those data elements associated with higher priority and important use cases can be one way to make the process more tractable.

# Considerations for Specific Policy Areas: Permitted Purposes

- Past efforts in this space have shown that parties who can contribute data to a directory, as well as the entities themselves that could appear there, will participate only if they understand and accept who can access data and how data can be used.
- Clear statements within a directory's policy framework defining the permitted purposes for which data can be used and by whom can provide comfort to possible participants.
- When defining permitted uses, directory operators may want to note that ONC has called upon directory operators to make their directories open and as accessible as possible to foster health information exchange.
  - While data contributors may desire comfort, putting in place too many restrictions or restrictions generally deemed unreasonable could deter or hinder users from exchanging information, damaging a key value proposition directories seek to offer.
  - For health care-related directories, permitting data to be used in ways that go beyond health care may inhibit participation.

# Considerations for Directory Networks: Scalability

- While one-off contracts can provide a way for directory operators to begin forming relationships with other directories, continued use to create a broad network of relationships is not scalable.
  - Doing so is an “N-Squared” problem, wherein the number of contracts required grows exponentially as the number of parties involved increases.
  - Members of a network will need to consider other, more scalable ways to agree upon policies, bind one another to those policies, and manage their relationships, e.g., using a single, common, multi-party agreement that each member of the network signs once upon admittance into the group.
- Similarly, requiring each new network entrant to pass through the onboarding process of each and every directory in the network also leads to a form of the “N-Squared” problem and isn’t a scalable practice. A network may need to consider standardizing on common onboarding criteria and procedures to avoid this.

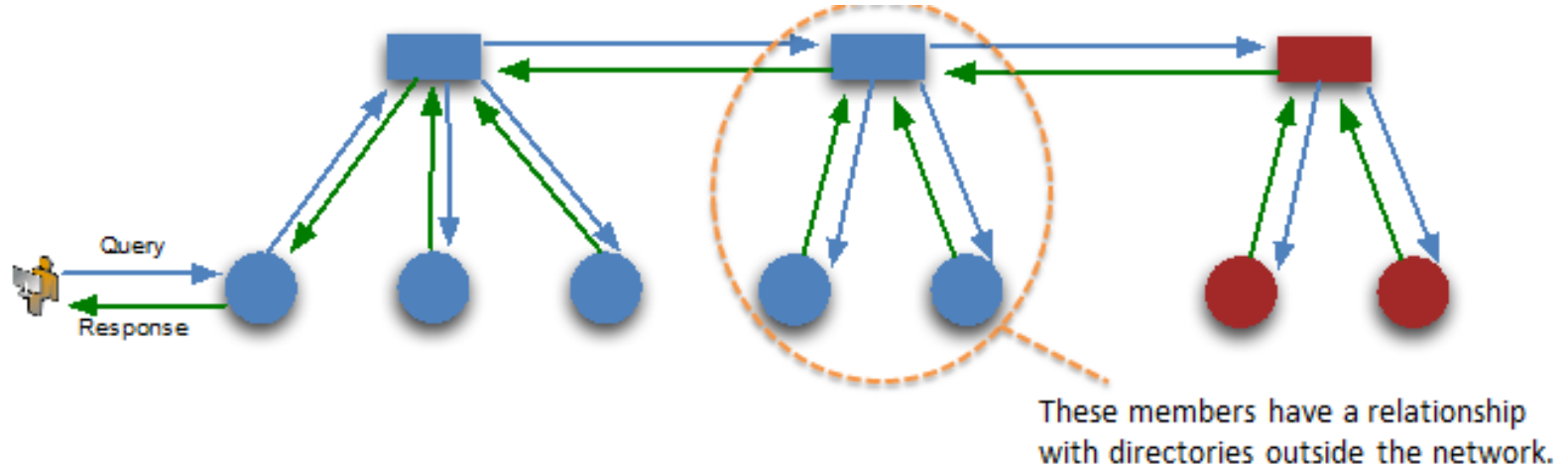


**“N-Squared”  
Problem**

**Establishing a full  
network requires  
exponential effort**

# Considerations for Directory Networks: Federated Relationships

- When a directory network features federated relationships whereby directory queries are distributed, it's possible that there could be some directories receiving queries and providing responses that are not bound by the network's policies and may not comply with them.

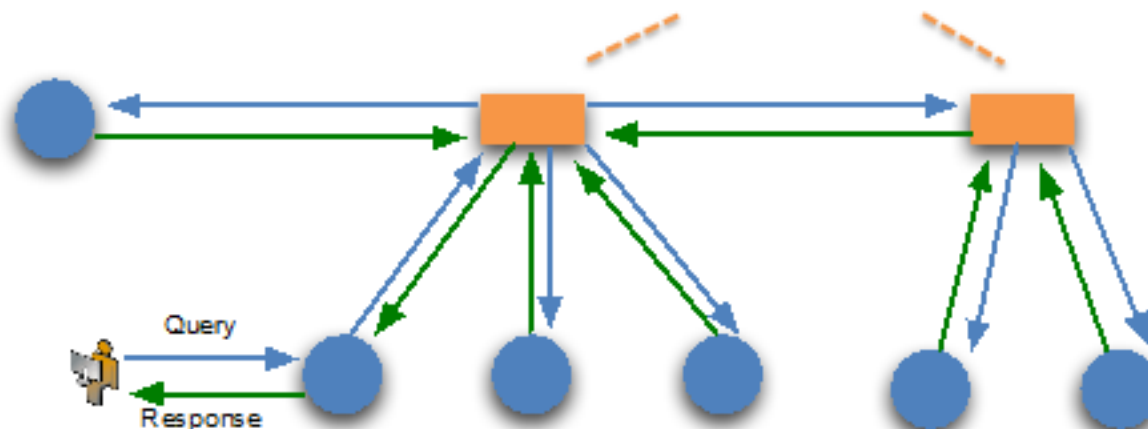


- A network may want to consider certain approaches to mitigate this:
  - Requiring orchestrators within the network to not distribute queries received over the network to non-members.
  - “Flow down” requirements in member agreements requiring members to include the network's policies and procedures as constituent components of any downstream agreements.

# Considerations for Directory Networks: Directory Intermediaries

- Networks can feature intermediaries that orchestrate directory searches by distributing queries and aggregating responses.
- Whether a given node on the network is an intermediary or an actual directory may not be obvious to other members of the network, and by their nature, intermediaries have access to all the responses from the directories they front.
- A network may want to consider whether and how intermediaries might be part of the network to ensure its policy framework applies not just to directories but also to those intermediaries.

Orchestrators have access to all the queries and responses routed through them.



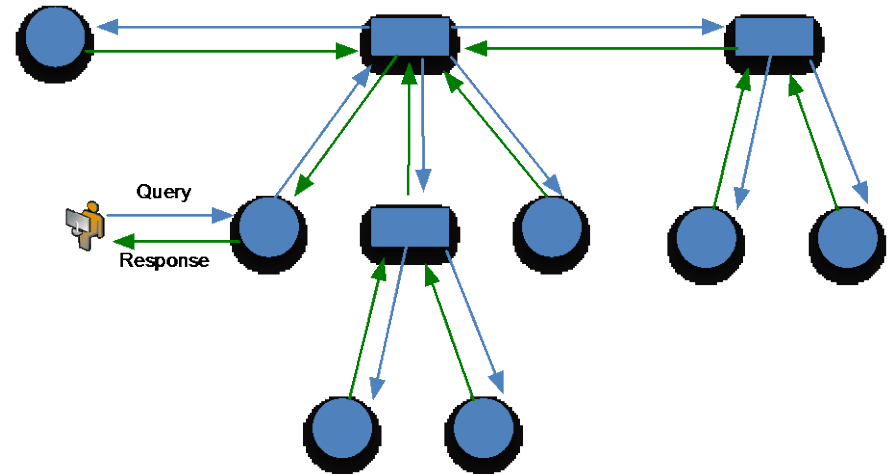
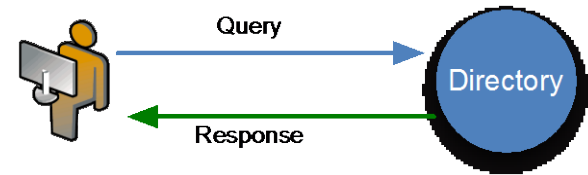
# Considerations for Directory Networks: Security

- Security is the shared responsibility of all members of a network. With data in each directory now available to all, security incidents involving one directory could lead to issues elsewhere like inappropriate access.
- To mitigate this, the security policies for a network may want to look at addressing *traceability* and *authentication*.



# Considerations for Directory Networks: Security and Traceability

- *Traceability* refers to the ability to track a specific directory transaction using an audit trail or other recorded information.
- In a single directory environment, the directory itself has all the information it needs to record and make traceability straightforward, such as the source of each search, the query itself, and whether information was returned.
- Traceability within a directory network, however, is more complicated. Once issued by the source, any number of intermediaries can relay a search request, and multiple directories can return responses.



# Considerations for Directory Networks: Security and Traceability

- Traceability within a network requires every member to maintain adequate audit logs. This means:
  - Members logging all incoming and outgoing transactions, including date and time, nature of the transaction (e.g., query or response, incoming or outgoing), from whom the query or response was actually received (if the transaction is incoming), to whom the query or response is passed (if the transaction is outgoing), and any other information that could help identify a particular transaction.
  - The directory actually first receiving a query from a user logging information that can tie the query to that user.
  - Responding directories logging enough information to later identify what was conveyed.

# Directory Networks: Security and Authentication

- *Authentication* is the process of verifying that someone or something is who or what it purports to be. While traceability helps with reacting to potential incidents and determining their impact after the fact through tracking, authentication is a proactive measure aimed at preventing certain incidents.
- In the context of a directory network, authentication can be used to establish that all the parties involved in a transaction – the user who initiated the query and the directories and intermediaries that act to answer that query – are who they say they are and are valid members of the network bound by its policies.
- If looking at addressing authentication in the security policies of their network, operators may want to consider:
  - Interoperability. Directories and intermediaries that support incompatible authentication mechanisms will not be able to communicate, so defining standard authentication mechanisms for transactions between directories and intermediaries within the network is key.
  - Authentication of users. If users are not authenticated, then they may perform actions for which they are unauthorized. As well, it may not be possible to tie transactions to them in support of traceability.

# Summary

- Directories are being implemented and connected to one another, forming networks.
  - Finding Direct addresses and other ESI across HISP and organizational boundaries is perhaps the biggest driver of network formation.
  - Continued improvements in the technology landscape is likely to accelerate things.
- Policy will be a significant factor influencing how readily directories will be able to connect and interoperate.
- These Key Considerations are meant to seed conversation and serve as a resource for directory operators and networks as they consider their policies.

Questions?