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Massachusetts HIE Integration Options

1. Direct S/MIME Client
2. Direct S/MIME Server
3. Direct XDR
4. Webmail
5. LAND
Common Message Pattern

DNS Query (address known)
Returns:
1. Public Key

Sender

Provider Query
(address unknown) Returns:
1. Address
2. Public Key

MA HIE
DNS

Receiver

1. Select Payload

Provider Query Service

5

6

Read Payload

5
Massachusetts HIE Integration Options

- Option 1 – Direct S/MIME Client
- Option 2 – Direct S/MIME Server
- Option 3 – Direct XDR
- Option 4 – Webmail
- Option 5 – LAND Gateway
Massachusetts HIE Integration Options

- **Option 1 – Direct S/MIME Client**
  - Requires EHR or Direct Gateway capable of sending messages via SMTP
  - Allows HIE to provide email server to a local email client
  - Transports payload as S/MIME attachment
  - Encrypts payload via S/MIME certificate retrieved from Provider Directory web service query
  - Receives S/MIME messages by IMAP connection to HIE web server
  - If sender uses XDR, HIE transforms XDR message to S/MIME attachment
Option 1 – Direct S/MIME Client

SMTP Client Send

Organization Provider (Direct Enabled) SMTP Client → SMTP (Push) S/MIME → Mass HIE Email Server

SMTP Client Receive

Organization Provider XDR → Encrypted XDR → Mass HIE Direct Gateway

Organization Provider SMTP Server/Client → SMTP (Push) S/MIME → Mass HIE Email Server

Transformation Service → Encrypted XDR

Organization Provider (Direct Enabled) SMTP Client → IMAP (Pull) S/MIME → Mass HIE Email Server

Organization Provider SMPT Server → SMTP (Push) S/MIME → Mass HIE Email Server
Massachusetts HIE Integration Options

• **Option 2 – Direct S/MIME Server**
  
  – Requires EHR or Direct Gateway capable of sending messages via SMTP
  
  – Allows for direct node to node communication without requiring data to be routed through HIE
  
  – Transports payload as S/MIME attachment
  
  – Encrypts payload via S/MIME certificate retrieved from Provider Directory web service query
  
  – Receives S/MIME messages by SMTP push from HIE email server
  
  – If sender uses XDR, HIE transforms XDR message to S/MIME attachment
Option 3 – Direct XDR Transfer

- Requires EHR or Direct Gateway capable of sending and receiving XDR messages
- Allows for direct node to node communication without requiring data to be routed through HIE
- Transports payload as XDR posted to a web service
- Encrypts payload via XDR certificate retrieved from Provider Directory web service query
- If sender uses S/MIME, HIE transforms payload to XDR
Option 3 – Direct XDR

**XDR Send**

- **Organization Provider XDR**
- **Encrypted XDR**
- **Mass HIE Direct Gateway**
- **SMTP (Push) S/MIME**
- **HIE Email Server**
- **IMAP (Pull) S/MIME**
- **Organization Provider SMTP Server**

**XDR Receive**

- **Organization Provider XDR**
- **Encrypted XDR**
- **Organization Provider SMTP Client**
- **SMTP (Push) S/MIME**
- **Email Server**
- **IMAP (Pull) S/MIME**
- **Organization Provider SMTP Server**
- **Encrypted XDR**
Massachusetts HIE Integration Options

• Option 4 – Webmail
  – Minimal client implementation, requires only a browser
  – Allows access to HIE regardless of provider EHR capabilities
  – Transports payload as email attachment
  – Uploaded attachments scanned by antivirus
  – All webmail traffic routed through HIE
  – HIE manages transformations from webmail attachments to S/MIME or XDR as required by receiver
Option 4 – Webmail

Webmail Send

Webmail ➔ SMTP (Push) ➔ Mass HIE Email Server ➔ IMAP (Pull) ➔ S/MIME ➔ Organization Provider SMTP Client

Webmail ➔ SMTP (Push) ➔ Mass HIE Email Server ➔ SMTP (Push) ➔ S/MIME ➔ Organization Provider SMTP Server

Webmail ➔ S/MIME ➔ Mass HIE Direct Gateway ➔ Encrypted XDR ➔ Organization Provider XDR

Webmail Receive

Organization Provider XDR ➔ Encrypted XDR ➔ Mass HIE Direct Gateway

Organization Provider SMTP Server/Client ➔ SMTP (Push) ➔ S/MIME ➔ Mass HIE Email Server ➔ SMTP/IMAP ➔ S/MIME ➔ Webmail

Organization Provider SMTP Server/Client ➔ SMTP (Push) ➔ S/MIME ➔ Mass HIE Email Server ➔ IMAP (Pull) ➔ Webmail
Option 5 – LAND Integration

• Low cost appliance securely transmits data from EHR to LAND to the HIE via multiple options
• Creates and encrypts either S/MIME or XDR payload for transmission to the HIE, depending on recipients’ capability
• Transports payload as XDR or S/MIME passed via secure protocol from LAND device to HIE Direct Gateway
Option 5 – LAND Integration

**LAND Send**

- **Provider EHR**
- **Organization Provider LAND**
  - Supported LAND Protocols
  - Encrypted LAND-HIE Connector (Push)
  - S/MIME
  - XDR
- **Mass HIE Direct Gateway**
- **Organization Provider XDR**
  - Encrypted XDR
  - IMAP (Pull)
  - S/MIME
  - SMTP (Push)
  - S/MIME
- **Organization Provider SMTP Client**
- **Organization Provider SMTP Server**

**LAND Receive**

- **Organization Provider XDR**
  - Encrypted XDR
- **Mass HIE Direct Gateway**
- **Organization Provider LAND**
  - Supported LAND Protocols
  - Encrypted HIE-LAND Connector (Pull)
  - S/MIME
  - XDR
- **Provider EHR**
  - SMTP
  - S/MIME
  - IMAP (Pull)
  - S/MIME
- **Organization Provider SMTP Server/Clien**t
  - SMTP
  - S/MIME
  - IMAP (Pull)
  - S/MIME
LAND Integration Options
(Connecting to the LAND Device)

- **Send Directory (Folder) and Receive Directory (Folder)**
  - Files placed by the sender into the **Send** Directory/Folder will be sent securely to the HIE router. Prior to placement in the Directory, the Provider Directory Query Service will be accessed by the local system via the LAND device. Response information will be passed to LAND (e.g., embedded file name, attached metadata package, CDA metadata, etc.). LAND will construct the appropriate DIRECT envelope. Files sent to the practices will be put into the **Receive** Directory/Folder.

- **Send and Receive via FTP**
- **XDR client and server**
  - Allows an EMR to communicate with the HIE using XDR without having to use secure web services
  - LAND device would receive the non-secure version via a local network connection and convert to secure version to transmit to HIE

- **HL7 v2 via TCP**
- **Simple Web service interface**
  - Very simple web services to send messages and retrieve messages
- **REST service interface**
  - Similar to the web service interface but using RESTful web service calls
LAND Integration

Current Status
- Open tunnel for IDE
- Open tunnel for LAND control (restart LAND device, restart server etc)

Protocol:
- Rhapsody Connector
- Find Provider
- Get certificate
- XDR
- Send Mail
- Get Mail
- Archive Logs

Hosted SaaS Environment
- Monitoring Server
- HIE
  - Direct Gateway

Local site Network
- EHR Systems
  - Directory Drop
  - FTP
  - XDR Client/Server
  - HL7 via TCP
  - Web Services
  - REST

LAND
- S/MIME or XDR

Web Services
- REST
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Golden Spike Schedule

Declare integration preference: 8/20/12

Confirm Integration Preference: 8/24/12

EMR Vendor engagement with ORION: 8/28/12

HIE Test Systems Ready: 8/31/12

Rolling “Go-Live” to Commence 10/15/12

Golden Spikers
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# Participant Agreement Types

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<th>Description</th>
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<tr>
<td>Participation Agreement</td>
<td>Governs Participant’s access to and use of the HIE and its related online tools and services.</td>
<td>The ‘Head of the Organization’ or their designee</td>
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<tr>
<td>Access Administration Agreement</td>
<td>Governs Participant’s creation, oversight, and termination of Authorized HIE Users.</td>
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<tr>
<td>Service Addendum</td>
<td>Confirms Participant’s agreement to adhere to the policies and procedures related to the services being offered by the HIE.</td>
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Last Mile
Providers

- Thought leadership on health information exchange, Meaningful Use, continuity of care, etc.
- Education materials: available online and distributed to practices
- Regional meetings and training sessions

Consumers/Patients

- Patient materials, such as patient tool kit available in the provider practice and online

EHR Vendors

- Information on Last Mile Program
- Vendor technical assistance with Direct integration
Enable connections to the HIE from existing applications or web portals

- Technical assistance for EHR vendors and providers to accelerate the development of Direct messaging interfaces

**Direct**: the national standard for secure transport of health information

- Implementation support services

Supporting the three methods of connecting to the Commonwealth’s HIE
**Last Mile Program Complete (under HIE Federal Grant)**
1/31/14

- **HIE Backbone 'Go-Live'**
  10/15/12

- **Last Mile Support Vendor Starts**
  September 2012

- **Last Mile Vendor Contracted**
  September 2012

- **EHR Assessment Complete**
  7/15/12

- **Education & Outreach**
  8/8/12

- **EHR Vendors Developing and Deploying HIE Connections**
  8/20/12

- **Enroll Providers in Statewide HIE**
  9/16/12

- **Provider Practice Deployment**
  10/16/12

- **Last Mile Support Vendor Starts**
  September 2012