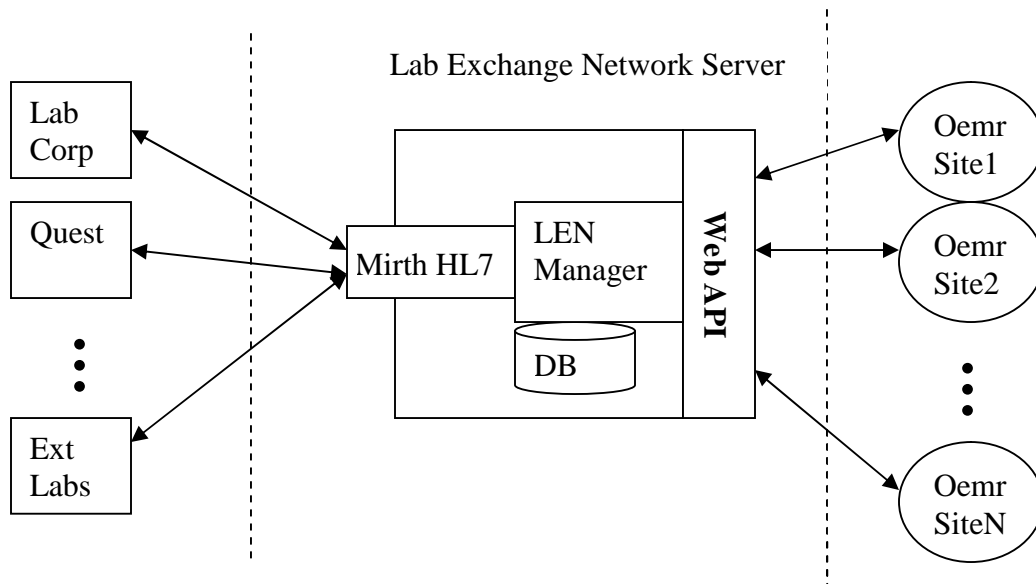# Lab Exchange Network

Summary

Provide a Lab Exchange Network (LEN) that will electronically route lab requests and results to and from external labs such as Quest and LabCorp. The LEN will provide a central and certified connection to all external labs for multiple OpenEMR sites.

Architecture

Mirth HL7 interface server

- Provides outbound and inbound channels to external labs and the LEN Manager
- Forwards lab orders in lab specific HL7 to external labs
- Receives lab results from external labs
- Handles all parsing and transformations of messaging between external labs and the LEN Manager

LEN Manager

- Provides multi-tenant business logic for lab results/orders routing between OpenEMR sites and external lab
- Ensures that lab results from external labs are stored in the DB for retrieval from OpenEMR sites.
- Handles security and access control from OpenEMR sites (HIPAA compliance), tracks usage.

- Implements the secure web based API that OpenEMR sites will use to communicate with the LEN.

LEN Web API

- REST based API similar to Google's data API and many other web APIs
- Uses HTTPS (encrypted) POST/GET with XML
- Uses a token for authentication
- Easy to implement in PHP. A PHP LEN client API will be released to OpenEMR community.

OpenEMR Sites

- Has to be authenticated with LEN server to ensure a secure bi-directional channel
- Communicates with the LEN server using the web API
- Sends lab orders to LEN
- Retrieves lab results from LEN

Use Case Summaries

Registration of OpenEMR site

OpenEMR user registers his/her site with the LEN. Each OpenEMR site will receive a site ID and a "token" that will be used to identify and authenticate the site when using the web API. Any required information from the OpenEMR site, such as physician IDs and such shall also be entered at this process.

OpenEMR sends demographic information to external lab

OpenEMR sends its patient demographic (insurance info included) information to the external lab it wants to connect to. This is required by most labs before it can process orders.

OpenEMR sends lab orders to external lab

OpenEMR sends a lab order to an external lab. This will be part of the larger CPOE lab ordering use case/workflow.

LEN receives lab results from external lab

An external labs sends results to LEN. The result is stored in the LEN database for retrieval from the appropriate OpenEMR site.

OpenEMR requests lab results from LEN

OpenEMR requests lab results from LEN. LEN sends it only new lab results for the specific OpenEMR site. OpenEMR can poll LEN for lab results periodically to make this process transparent to the user.

Gaps

Need relationship with LabCorp and Quest for their proprietary HL7 protocols and also for running a pilot with them.

Example API

Send Lab Orders
(TBD)

Get Lab Results
(TBD)