

# Connecting for Health's Record Locator Service in Mendocino



**Will Ross**

**December 2005**

*[wross@openbre.org](mailto:wross@openbre.org)*

[m]

# Mendocino Health Records Exchange

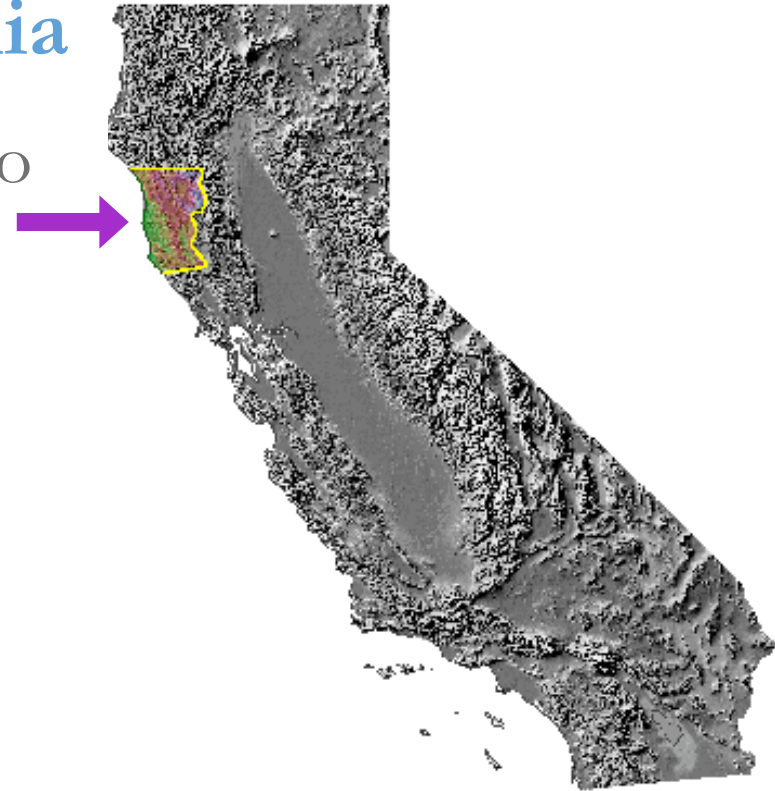
Open HRE

Connecting for Health

Record Locator Service Prototype

## Mendocino County, California

- >120 miles north of San Francisco
- 3,500 square miles >(DE + RI)
- Population 89,000 (26 / sq. mi.)
- Largest city 15,000 inhabitants
- No Interstate Highway
- 3 hospitals, 165 total beds
- Long distances between small towns (1 hour anywhere)



## Mendocino County typifies the rural Health Information Technology (HIT) environment


- Low public health status indicators  
*(Ranks in the bottom 25% of counties in California)*
- Small hospitals as satellite operations with HIT data centers hundreds of miles away
- Few enterprise HIT installations among hospitals, clinics and other healthcare sites
- Minimal broadband availability
- Minimal cell phone reception

## Mendocino Health Care Stakeholders

- Redwood MedNet -- a nonprofit network of solo and small group physician practices
- Alliance for Rural Community Health -- local consortium of 6 Community Health Centers
- 3 Indian Health Service Clinics
- 1 Veterans Administration Clinic (part time)
- 3 small rural Hospitals (165 beds total)
- Mendocino County Department of Public Health
- Laboratory, Radiology & Pharmacy


# Mendocino Health Records Exchange (HRE)

**Project Funded** / *Project Proposed*

project	name	function
 <b>RLS</b>	Record Locator Service	CFH Reference Implementation
<b>CFH</b>	NHIN Prototype for ONC	CFH Reference Implementation
<b>RHIC</b>	Redwood Health Information Collaborative	HIE Governance
<b>MeRN</b>	Mendocino e-Referral Network	Clinical Messaging Infrastructure
<i>MPBRN</i>	<i>Mendocino Practice-Based Research Network</i>	<i>HIE Population Health Pilot Test</i>

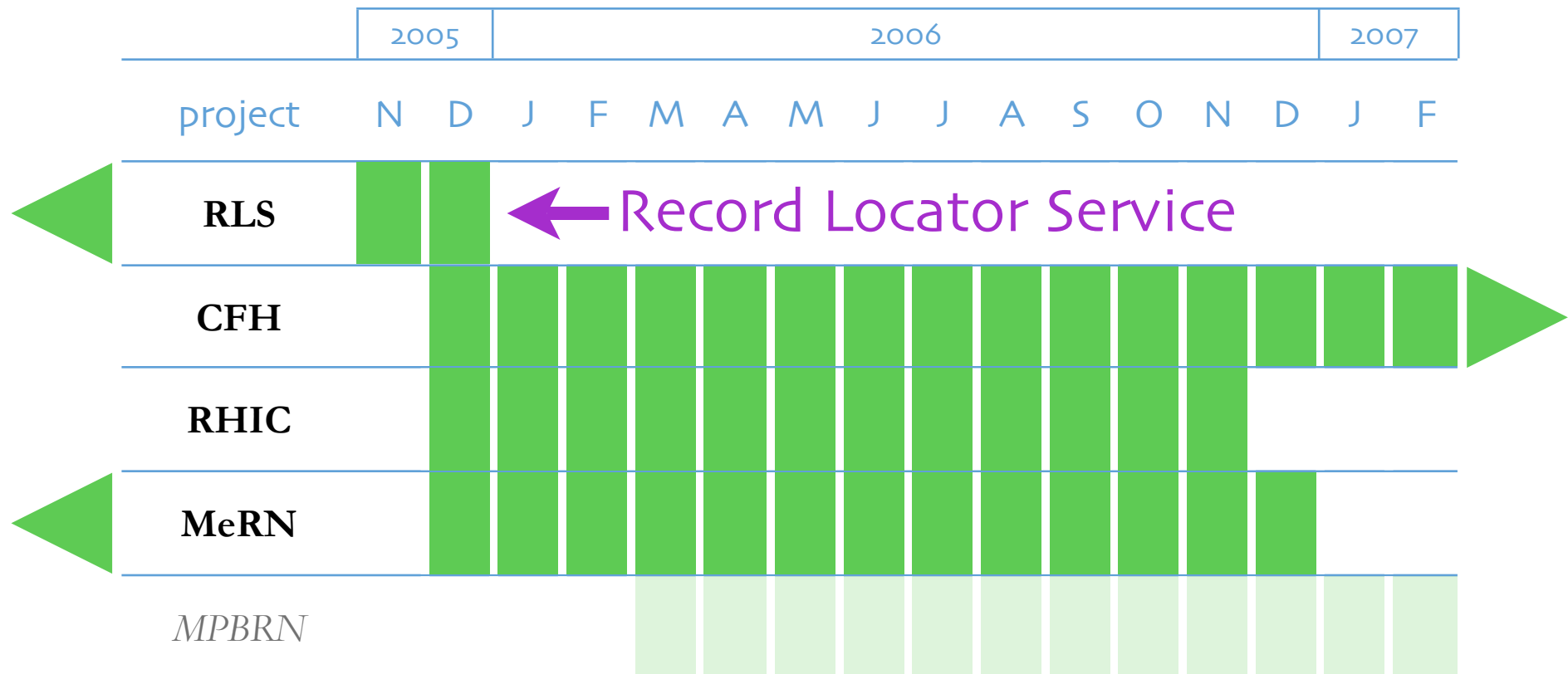
# Mendocino HRE Funding

**Project Funded** / *Project Proposed*

project	name	funder
 <b>RLS</b>	Record Locator Service	Connecting for Health
<b>CFH</b>	NHIN Prototype for ONC	Office of the National Coordinator
<b>RHIC</b>	Redwood Health Information Collaborative	Robert Wood Johnson Foundation
<b>MeRN</b>	Mendocino e-Referral Network	Blue Shield of California Foundation
<i>MPBRN</i>	<i>Mendocino Practice-Based Research Network</i>	<i>AHRQ</i>

# Mendocino HRE Project Timeline

**Project Funded** / *Project Proposed*



## Mendocino HRE Future Projects

- HRE use cases for local health care stakeholders
  - ◆ CMR Origination (*proposal submitted to AHRQ*)
  - ◆ EKG Online Access (*in development*)
  - ◆ Longitudinal Medication History (*requested*)
- Use cases from AHIC for NHIN Prototype
- Personal Health Record (e.g., PING)
- Realtime Online Disease Surveillance system (e.g., RODS Server)

# Mendocino Health Records Exchange

## **Open HRE**

Connecting for Health

Record Locator Service Prototype

## What is OpenHRE?

- **OpenHRE**, short for Open Health Records Exchange
- **OpenHRE** is open source software, released under the GPL
- **OpenHRE** is not an EHR
- **OpenHRE** is a standards-based, scalable multi-level record locator service with federated records exchange and secure access control
- **OpenHRE** implements the NHIN prototype as defined by *Connecting for Health*

## Origin of OpenHRE Software

- Mendocino SHARE -- a collaborative of local hospitals, safety net clinics and Public Health formed in 2003 to build a “Virtual Case Management System”
- Alliance for Rural Community Health -- a consortium of safety net clinics in Mendocino County and manager of Mendocino SHARE
- OpenHRE -- software developed under contract to Mendocino SHARE by Browsersoft, Inc

<http://www.browsersoft.com>

## With OpenHRE only a browser is needed to:

- Positively identify an individual patient
- Assemble an index of a patient's health records
- Securely retrieve clinical data, within HIPAA compliant security policies
- Display retrieved data, including longitudinal expressions assembled from separate sources

## OpenHRE Software Services

- **Record Locator Service (RLS)**
- **Record Exchange Service (RES)**
- **Authentication/Access Service (AAS)**
- **Lexical Translation Service** *(planned)*

## OpenHRE Record Locator Service (RLS)

- Use RLS within a network to build an enterprise Master Person Index (MPI)
- Use RLS across enterprise networks to build a community MPI for a RHIO
- Available as a J2EE-based CORBA service
- Available as an Apache Axis web service

<http://openhre.org>

## OpenHRE Record Exchange Service (RES)

- Retrieve patient health record from EHR system (or its proxy) using federated queries within a RHIO
- Retrieve patient health record from an external RHIO
- Health record can be cached, de-identified and formatted for presentation
- Parallel query, caching, de-identification and transformation services via UCLA's DataServer -- an open source service built on Apache Cocoon

<http://www.mii.ucla.edu/dataserver/>

## OpenHRE Authorization/Access Service (AAS)

- Kerberos and LDAP-based user authentication, encryption and password management
- Authorization based on roles and groups
- Sun XACML access control service implementing complex policies, including content-based authorization
- OpenHRE web-based security administration tool available

<http://sunxacml.sourceforge.net/>

## OpenHRE Demonstration

### Query for Patient Records (RLS Send)

- 50,000 simulated patients at 3 clinics
- Clinical data based on 40,000 visits by 1,800 patients from PECS registry
- Patient lookup limited to three values for ease of demo

**Mendocino SHARE 0.9.0**

### Patient Lookup

User:

Last Name	First Name	Sex
<input type="text" value="wak"/>	<input type="text" value="s"/>	<input type="text" value=""/>

## OpenHRE Demonstration

### Master Patient Index Response (RLS Receive)

- Discovers and correlates identities from multiple sites
- Drill down to view single patient
- “Show Grouped” for longitudinal record view

Mendocino SHARE 0.9.0

**Patients Matching Search Criteria : PatientName = 'WAK, S'**  
 Click on the Patient name to view their extended demographics. Click on the Facility link to view their PECS history.

**Patient Records 1 thru 3 of 3**

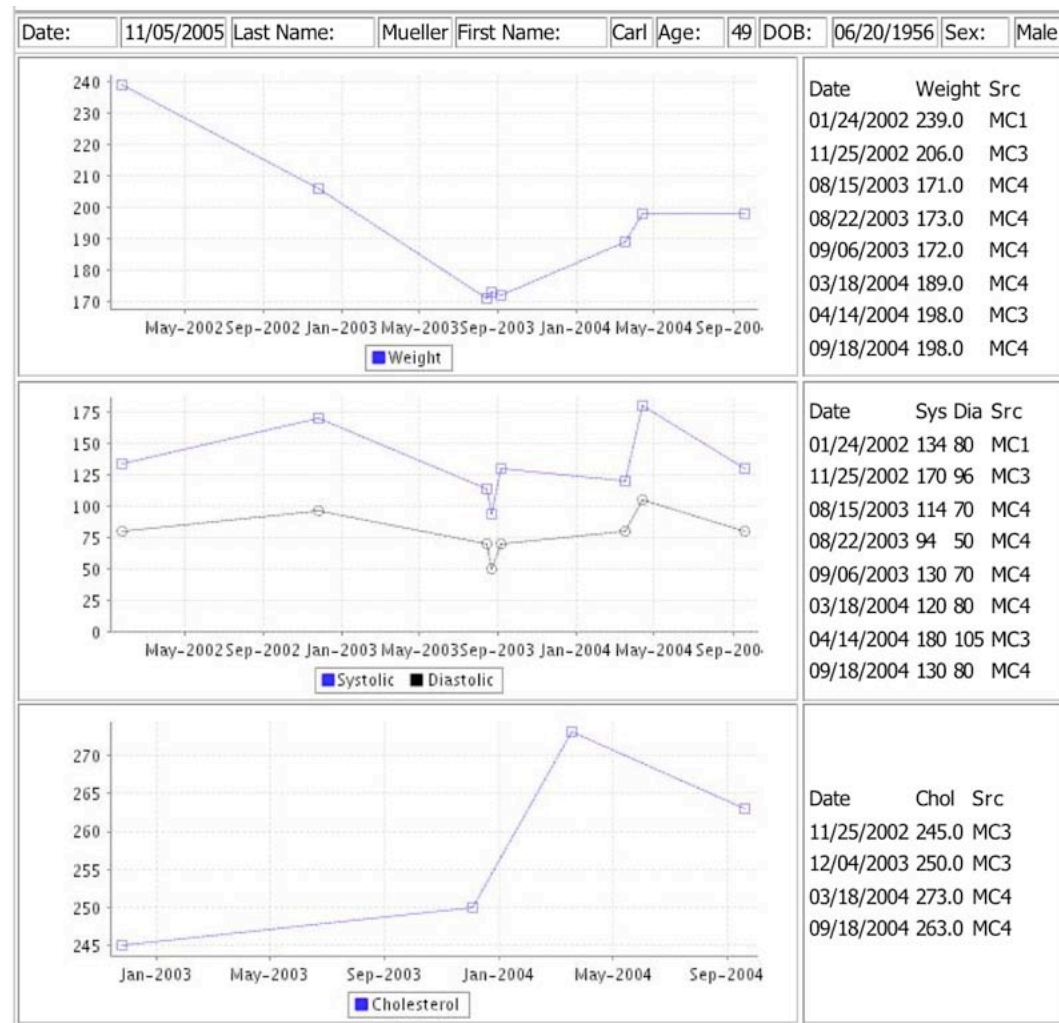
Patient	Group	Sex	DOB	Records	Security Override	Score	Display Group
<a href="#">Wakesman, Sheley</a>	<input type="checkbox"/>	F	08/06/1956	<a href="#">MC3/PECS</a>	<input type="checkbox"/>		
<a href="#">Wakesman, Shelly</a>	<input type="checkbox"/>	F	08/06/1955	<a href="#">MC4/PECS</a>	<input type="checkbox"/>	80	Show Grouped
<a href="#">Waksman, Shelley</a>	<input type="checkbox"/>	F	08/06/1955	<a href="#">MC1/PECS</a>	<input type="checkbox"/>	60	

Make Another Query
Help
Logout

# OpenHRE Demonstration

## Record Exchange Service (RES)

- Longitudinal patient data assembled for presentation
- Many data transform options (e.g., time series as a graph)
- Example shows integration with PECS



# OpenHRE Portal

- Use Cases
- Presentations
- Demonstration
- Software Plan
- Software to download
- Response to RFI from ONC

OPENHRE.ORG MAY 08, 2005 - 10:55 AM

**OpenHRE™ .org**  
Open Source Health Records Exchange

**Main Menu**

- [Home](#)
- [FAQ](#)
- [News](#)
- [Topics](#)
- [Downloads](#)
- [Discussions](#)
- [Web Links](#)
- [Search](#)
- [Recommend Us](#)

**Online**

We have 1 guest and 0 members online

Welcome Guest, become a [member](#) today.

POSTNUKE

**Welcome to OpenHRE™.org**

Please comment on our [Use Cases](#). Which of these pertains to the use you wish to make of OpenHRE™? Tell about yourself and what you are doing by clicking on [Submit News](#). In order to submit an article or comment you need to be registered as a site member. Your email address is required to register, but will be kept private unless you wish to publicize it.

- **Mission:**
  - to foster development, distribution and support of Master Patient Index and Health Record Exchange systems and components held as Free/Open Source Software
  - to build a community to this aim
  - to realize this goal via a self-sustaining business model and open collaboration among all stakeholders
- **Goal:**
  - to accelerate the National Health Information Network (NHIN) implementation by providing public domain tools to Regional Health Information Organization (RHIO) initiatives (and save the world!)

**RLS versus MPI**  
Posted by: grodecki on Saturday, April 16, 2005 - 11:14 PM 26 Reads

**OpenHRE™ .org**  
Open Source Health Records Exchange

OpenHRE consists of three Services:

1. Record Locator Service
2. Records Exchange Service
3. Authorization and Access Decision Service

Many have asked "What is the difference between a Record Locator

**Login**

Username

Password

Remember me

[Log in Problems?](#)  
[New User? Sign Up!](#)

**Categories Menu**

- [Discussions](#) (Sep 28, 2004)
- [Electronic Health Records](#) (Mar 09, 2005)
- [General](#) (Aug 03, 2004)
- [Health Records Exchange](#) (Aug 25, 2004)
- [Master Patient Index](#) (Aug 04, 2004)
- [National Health Information Network](#) (Jan 19, 2005)
- [Product Reviews](#) (Aug 20, 2004)
- [Security](#) (Apr 01, 2005)

<http://openhre.org>

## OpenEMed

OpenHRE's RLS uses the OpenEMed implementation of the CORBAmed PIDS

OpenEMed is an open source J2EE software project originally developed at Los Alamos National Laboratory



<http://openemed.org/>

## UCLA DataServer

OpenHRE's RES uses UCLA's DataServer, an open source service built on Apache Cocoon

DataServer provides parallel queries, caching, de-identification and transformation services



<http://www.mii.ucla.edu/dataserver>

Mendocino Health Records Exchange

Open HRE

**Connecting for Health**

Record Locator Service Prototype

## What is Connecting for Health?

- Broad-based, public-private collaborative
- Over 100 stakeholders on Steering Committee
- Founded and supported by the Markle Foundation
- Additional support from the Robert Wood Johnson Foundation

**MARKLE** FOUNDATION

<http://www.connectingforhealth.org>

THE  
ROBERT WOOD  
JOHNSON  
FOUNDATION®

## Connecting for Health Leadership Panels

**Develop recommendations with detailed road maps for immediate progress in key areas:**

- Health Care Policy
- Personal Health Information
- ▶ • Technical Framework for Interoperability

# Connecting for Health Technical Roadmap

## July 2004

- Shared vision of next steps
- Developed and agreed to by all major stakeholders
- Practical goals achievable in 1 to 3 years
- Building from where we are, not overhauling everything at once



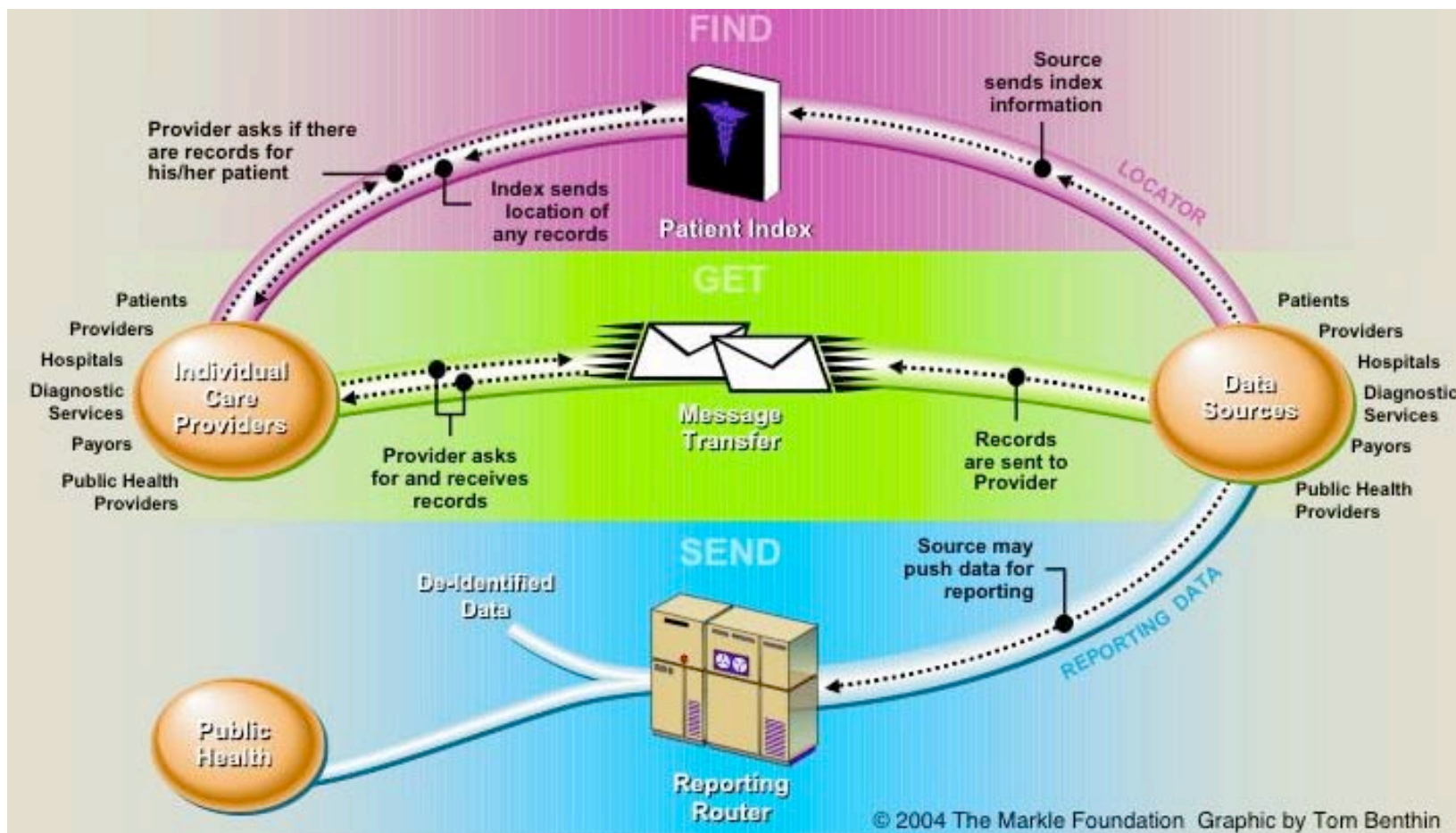
## Connecting for Health Recommendations

- Implement information exchange now over the current Internet -- no new network is needed
- Achieve interoperability with open, consensus-driven and non-proprietary standards
- Build by conforming to a **Common Framework** of technical components, standardized methodologies and explicit policies

## Connecting for Health Common Framework

- Modular suite of **interoperable standards** to allow health information transactions at local, regional and national levels
- **Technical standards** for secure transport, reliable authentication and defined interchange formats to enable unambiguous transmission of clinical data
- **Policy standards** for privacy and access in the exchange of health information
- **Uniform minimum standard** for identification of users

# Connecting for Health Schematic



## Connecting for Health Reference Implementation

- Based on the Roadmap and the Common Framework
- Concrete, functional demonstration of open, non-proprietary standards
- An interoperable, community-based infrastructure
- Bring together multiple, competing institutions
- Demonstrate ease of management and implementation

Mendocino Health Records Exchange

Open HRE

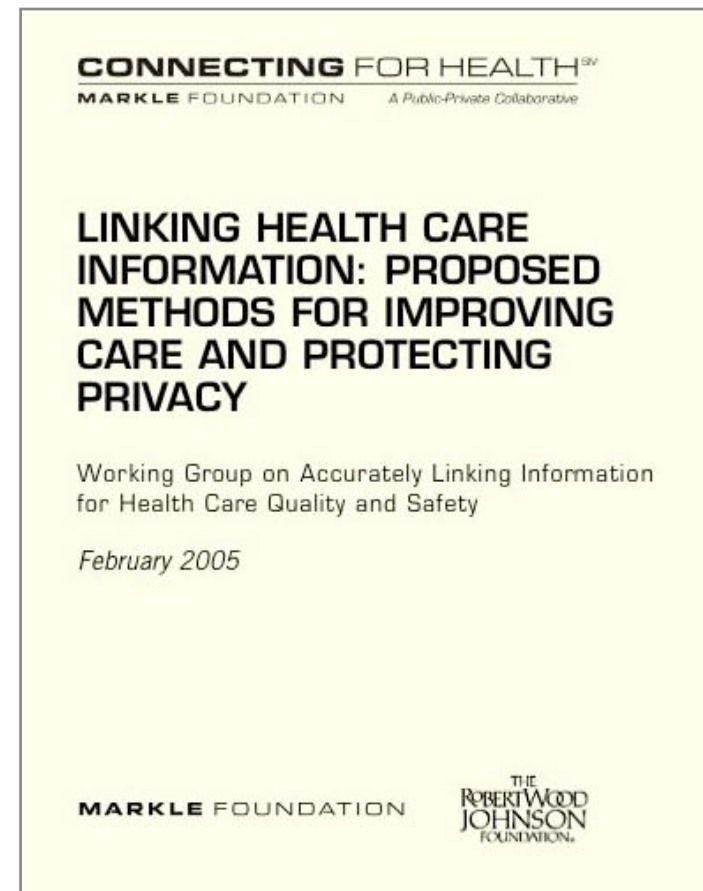
Connecting for Health

**Record Locator Service Prototype**

## Record Locator Service (RLS)

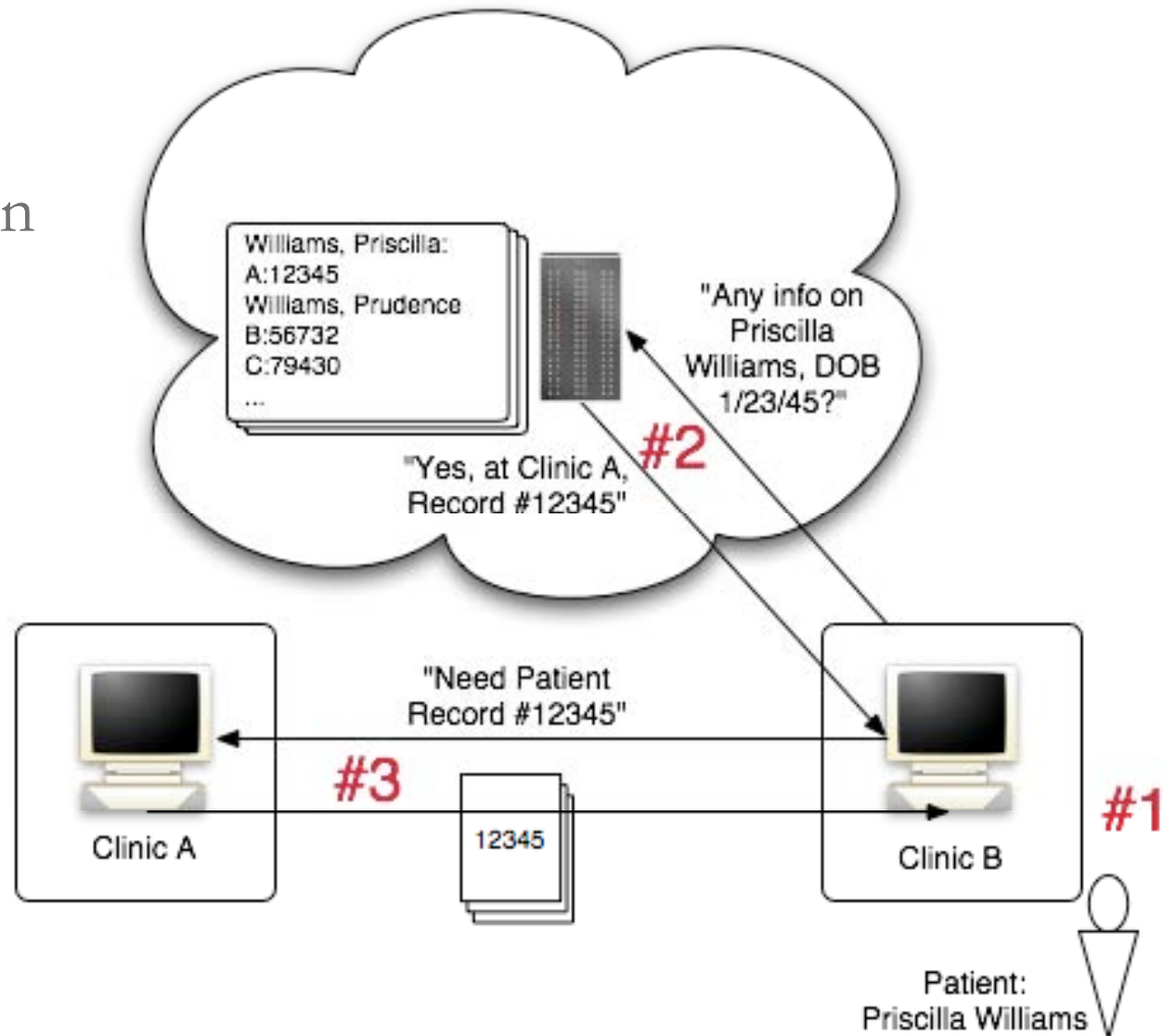
### February 2005

- Separates knowing where information is located from knowing the information
- Enables security, privacy and autonomy for all participants in the process
- Release of information subject to authorization requirements



## RLS Simplified

- **Ask** for a location
- **Receive** the location
- **Ask** for the record
- **Receive** the record



## RLS Prototype Demonstration

**June 2005**

Connecting for Health will demonstrate a nationwide Record Locator Service prototype at three sites

- Massachusetts SHARE
- Indiana HIE
- Mendocino HRE

[http://www.connectingforhealth.org/news/pressrelease\\_060105.html](http://www.connectingforhealth.org/news/pressrelease_060105.html)

## RLS Prototype Assumptions

- TCP/IP across standard Internet
- SSL session
- SOAP wrapper around HL7 payload in XML
- HL7 Bilingual (*2.4 or 3.0*)
- Display Neutral
- Minimum data field set for demonstration

## Common Framework Enables Local Variations

### Use of SSN

- Massachusetts = SSN prohibited by State law
- Indiana = SSN is a valuable identity correlation factor
- Mendocino = SSN use is legal but accuracy is low

## Common Framework Enables Local Variations

### **HL7 Version Neutral**

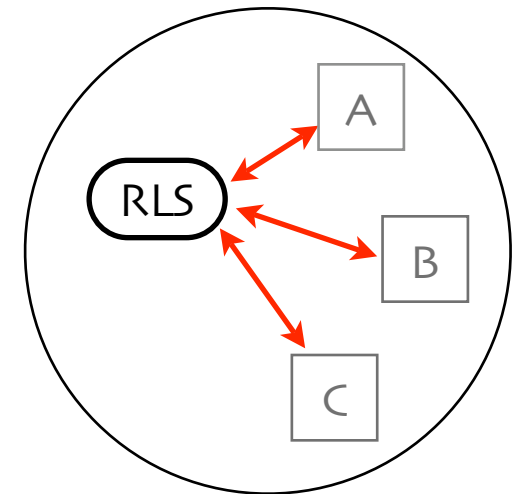
- All sites will support HL7 2.4 messaging
- Optional support for HL7 3.0 messaging

*If both support 3.0, then 3.0, else 2.4*

## Common Framework Enables Local Variations

### RLS at Massachusetts SHARE

- BizTalk on Microsoft .NET
- Gateway mediation at each node
- RLS as central service
- HL7 3.0 messaging



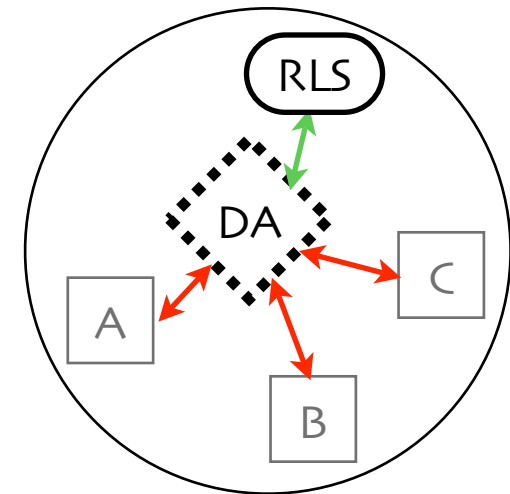
*Massachusetts SHARE*

<http://www.mahealthdata.org/ma-share>

## Common Framework Enables Local Variations

### RLS at Indiana HIE

- Java Platform (J2EE)
- Distributor Aggregator (DA)
- DA talks to RLS
- HL7 2.4 messaging



*Indiana HIE*

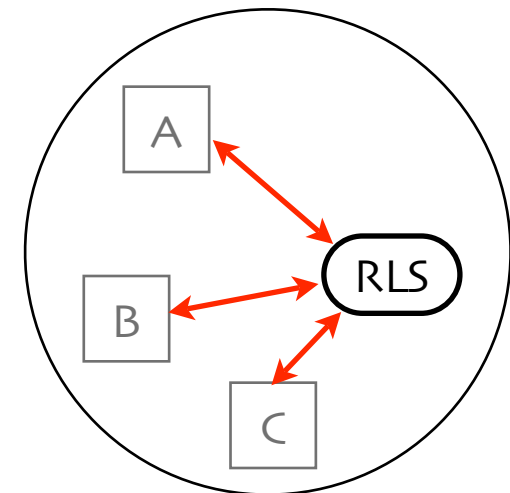
<http://www.ihie.com>

## Common Framework Enables Local Variations

### RLS at Mendocino HRE

- Java Platform (J2EE)
- OpenHRE provides RLS
- HL7 2.4 or 3.0 messaging

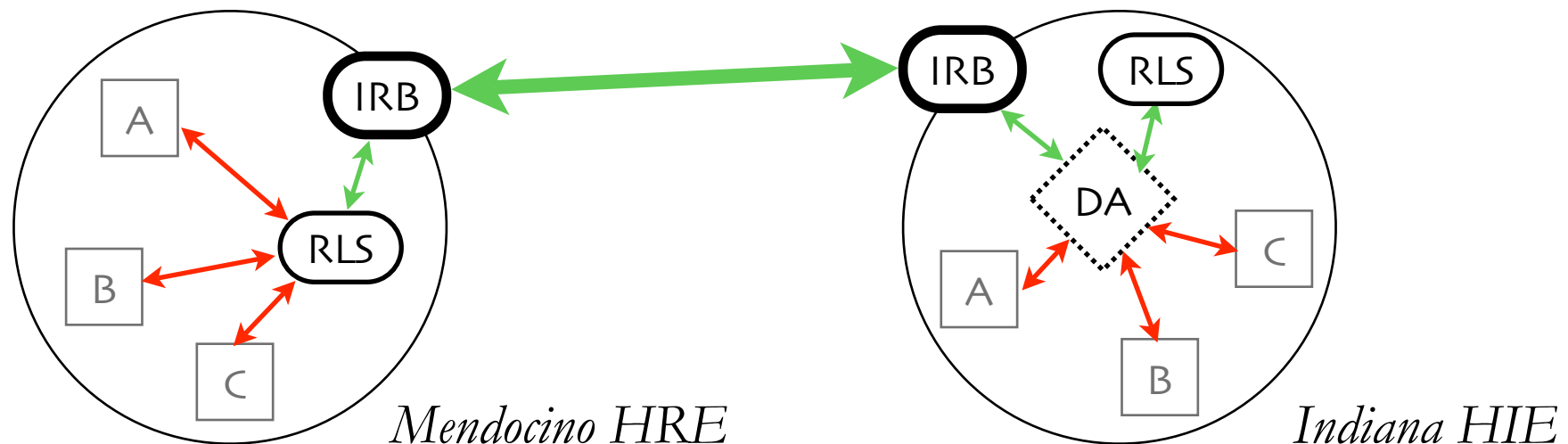
<http://mendcinohre.org>



*Mendocino HRE*

## Inter-RHIO Bridge (IRB)

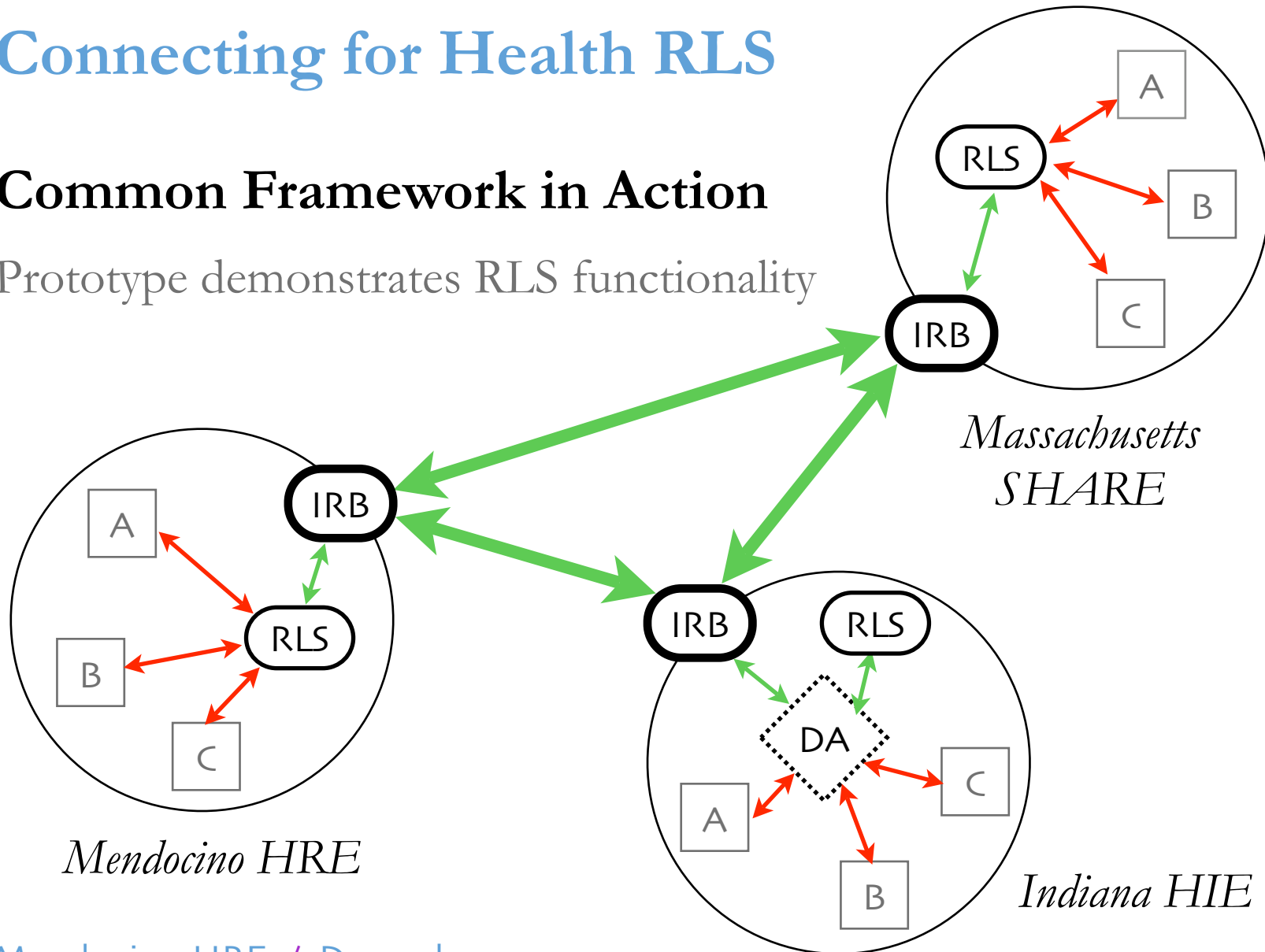
- Traffic from outside a RHIO passes through an Inter-RHIO Bridge
- IRB acts as an application, taking queries and returning aggregated pointers to records



# Connecting for Health RLS

## Common Framework in Action

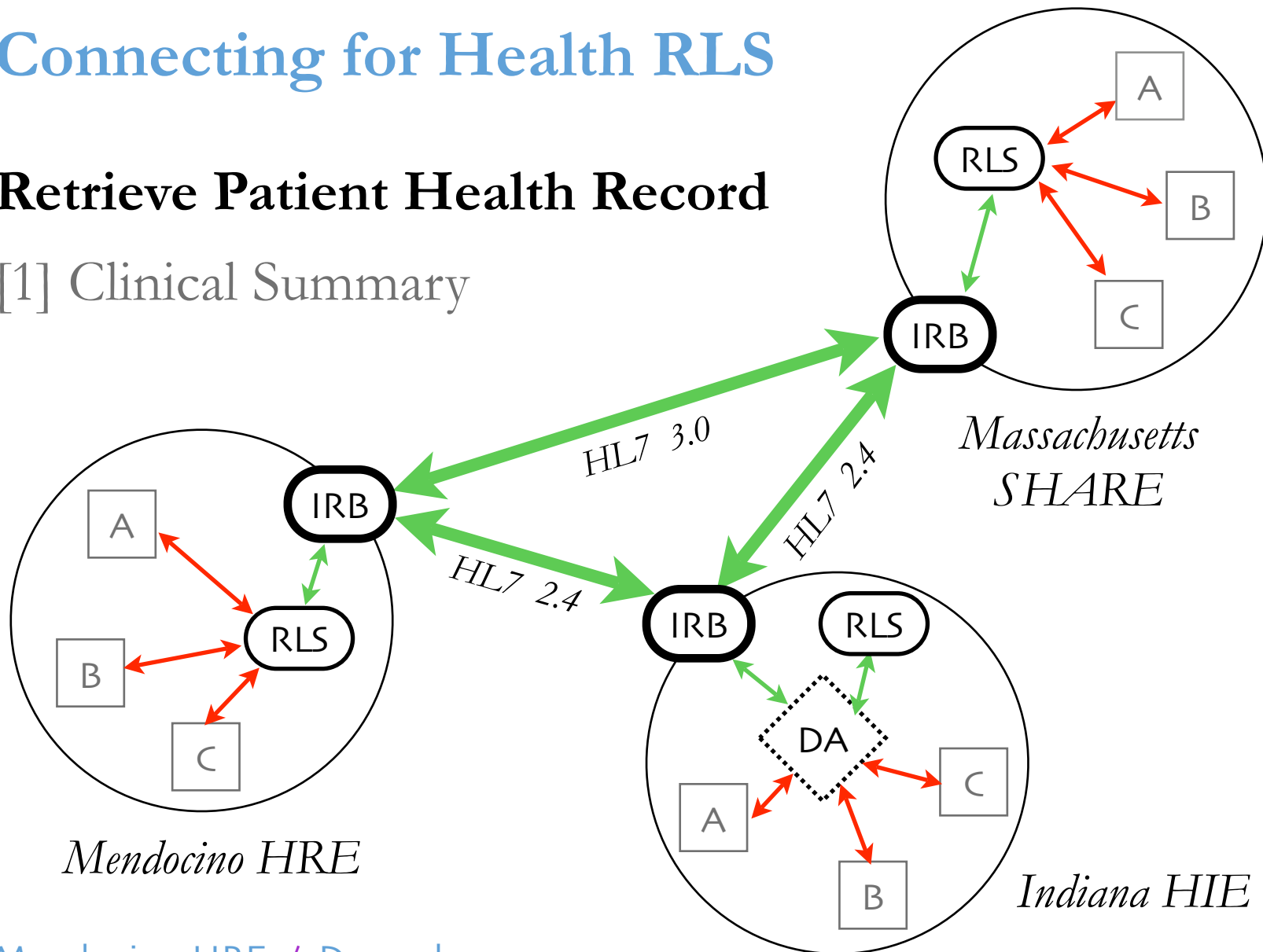
Prototype demonstrates RLS functionality



# Connecting for Health RLS

## Retrieve Patient Health Record

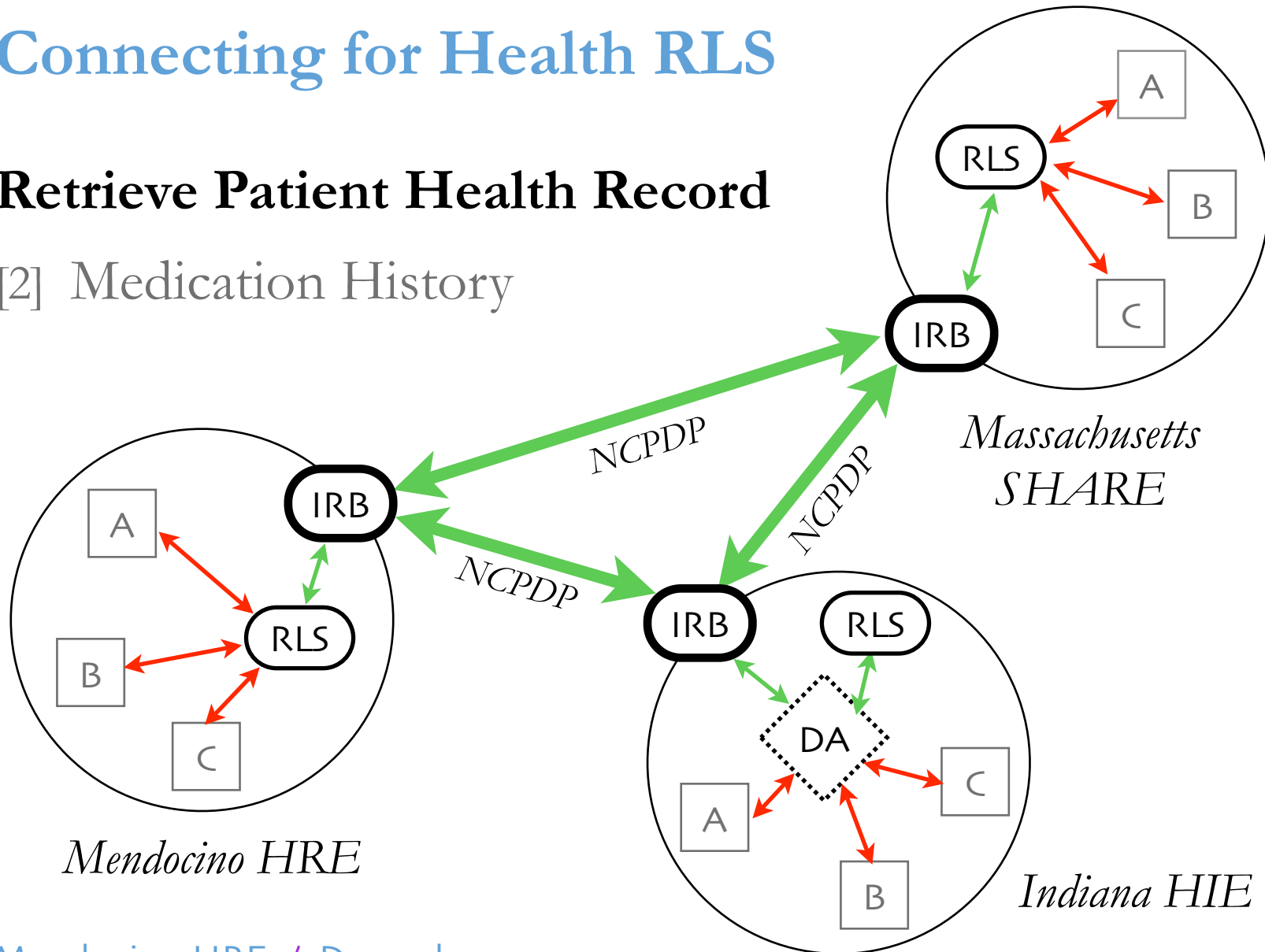
[1] Clinical Summary



# Connecting for Health RLS

## Retrieve Patient Health Record

[2] Medication History



Will Ross / [wross@openbre.org](mailto:wross@openbre.org)

