



ROPP: Problem

Background:

Radiation Oncology patients typically do not have the ability to easily view their schedule, treatment plan/prescriptions/precautions, medications, medical workup results, etc., since this data resides on clinical systems to which the patient has no access. In addition, patients provide treatment outcome information, such as QoL (Quality of Life) assessments, which then have to be either coded and hand entered into the RT-EMR/OIS or scanned and imported as either PDF or DICOM secondary capture. The Treatment Course for the patient typically includes a variety of forms that the patient needs to fill out during various times.

Patients need to be able to view their demographic information and treatment schedule, as well as some way of submitting change requests to either one.

Patients are empowered, when given the ability to view their own clinical information including diagnosis, procedure, toxicities, dose, tumor volume, medications, allergies, etc. The sense of involvement in their own treatment is thought to improve overall outcome.

A patient's coordinated care team can also be more involved in their care through quality alerts triggered by roles, metrics, tasks and form completion. Real-time aggregate quality data collected on a patient, site and population health level are necessary for quality care and treatment.



ROPP: Key Use Case

The Radiation Oncology Patient Portal (ROPP) provides a patient with authenticated and authorized access to a set of patient specific reports and alerts for Meaningful Use as required by the ARRA HITECH Act. This actor (the Patient Portal) isolates the rest of the clinical environment from access by the patient by negotiating of all HIPAA requirements related to internal authorization and authentication concerns. At the same time, clinical staff will use the portal to access an appropriate subset of data, alerts and real time quality metrics, depending on their role (i.e. physician, researcher, nurse, etc.).

Patient Portal Attributes:

- **Secure Patient Login** - patient can login to the portal from a computer outside the enterprise.
- **PRO Completion** - Patients can complete QoL assessments in their secure portal. Assessments can be delivered at specified time points (i.e. pre-treatment, 3 month, 6 month, 12 month, etc).
- **Reminders & Messaging** – triggers set by the provider will send email/SMS text alerts and reminders to the patient and medical team to correspond with lab results, QoL assessment due dates, appointment and medication information.
- **Registration / Health History** - Patients can provide registration and health history information using the portal.

Patient supplied information must propagate from the Patient Portal to those systems responsible for maintaining that information. This is typically mediated by staff interacting with the Patient Portal.

Information to be supplied to the patient must be transferred from those systems responsible for maintaining information. Existing clinical implementations use bi-directional data exchange that may be triggered by configurable data elements and their values. The data interchange between clinical systems will occur via a simple, application agnostic transport framework, connecting with a secure, modular, interoperable patient portal. While it is possibly outside the scope of IHE, the application providing Patient Portal capabilities should also be responsible for enabling:

- Pharmacy, Lab Results, Procedure Eligibility data access, as well as payment capability.
- Download educational materials (outside IHE environment) including Clinical Treatment Summary (meeting ARRA requirements).
- Visibility of appropriate ongoing clinical trials, clinical trial matching (outside IHE environment).
- Connectivity to remote/home monitoring systems. Reminders, messages and forms are triggered based on data values.
- Data analysis and trends can be graphed on the medical team side, patient-level reporting (outside IHE environment).



ROPP: Key Use Case / Meaningful Use Criteria

ARRA HITECH: Act Core Measure (15 Must Be Met)*	ROPP
1. Record Patient Demographics	X
2. Record Vital Signs & Chart Changes	
3. Maintain Up-To-Date Problem List & Active Diagnosis	
4. Maintain Active Medication List	X
5. Maintain Active Allergy Medication List	X
6. Record smoking status for patients 13+ yrs old	X
7. Provide Clinical Summary / Hosp. Discharge Instructions	X
8. On Request, Provide ePHR	X
9. Generate & Transmit ePrescriptions	
10. Computer Provided Order Entry (CPOE) for Medications	
11. Implement Drug/Allergy Interaction Check	X
12. Implement Prov./Pt. Exchange of Clinical Information	X
13. Implement & Track One Clinical Decision Support Rule	
14. Implement System to Protect Privacy & Security of PHI	X
15. Report Clinical Quality Measures to CMS / State	

ARRA HITECH: Act Menu Measure (7 of 12 Must Be Met)*	ROPP
1. Implement Drug Formulary Check	
2. Incorporate Lab Results in Structure Data Format	X
3. List Patients by Condition for Quality Improvement, Research	
4. Identify Patient-Specific Resources and Provide to Patients	X
5. Perform Medication Reconciliation Between Care Settings	X
6. Provide Summary of Care Record for Patients Referred	X
7. Submit Electronic Immunization Data to Registries	
8. Submit eSyndromic Surveillance Data to Public Health Agencies	
9. For Hospitals Record Advance Directives	
10. For Hospitals, Submit eLab Data to Public Health Registries	
11. Send Reminders to Patients for Preventive/ Follow-Up Care	X
12. Provide Patients with Timely ePHR Access	X

* Highlighted Measures represent those that can benefit from connectivity with or use of a ROPP.

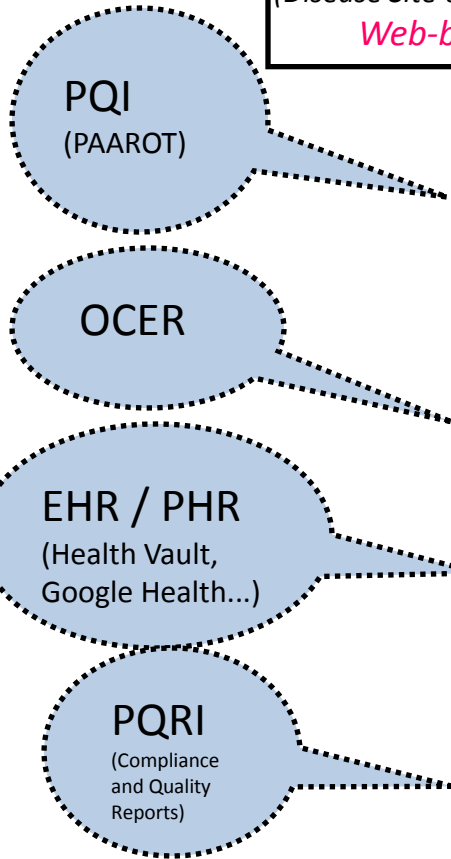
**ARRA HITECH Act Meaningful Use Core and Menu Measures can be found at: <http://healthit.hhs.gov>.



ROPP: Collect / Report PROs

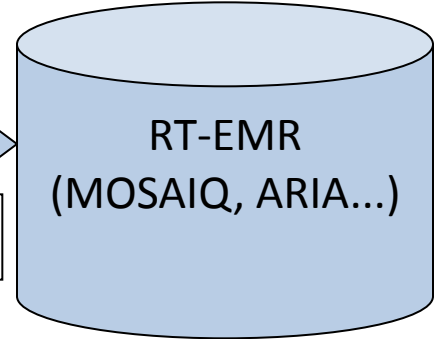
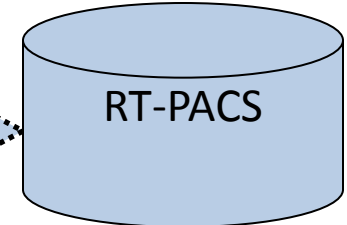
National Radiation Oncology Registry (NROR)*
(Disease Site-specific CRO and PRO Data Elements for Each Patient)
Web-based Data Entry / Reporting Template

ROPP can facilitate the development of a National Radiation Oncology Registry (NROR). ROPP use case will allow abstraction of NROR data elements from RT_EMR, patient/ clinician portal and generation of quality reports. ROPP use case is an essential step to achieve "Meaningful Use" of RT-EMR.

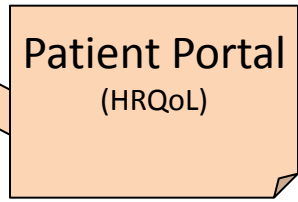


X	✓	X	X	X
X	*	✓	✓	✓
✓	✓	X	*	X
X	X	*	X	✓
*	✓	X	✓	✓
✓	X	✓	*	✓

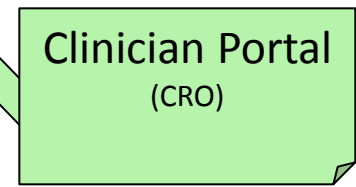
URL Redirect



Query/Retrieve Data element "X"



Data element "✓"



Data element "*" (with star icon)

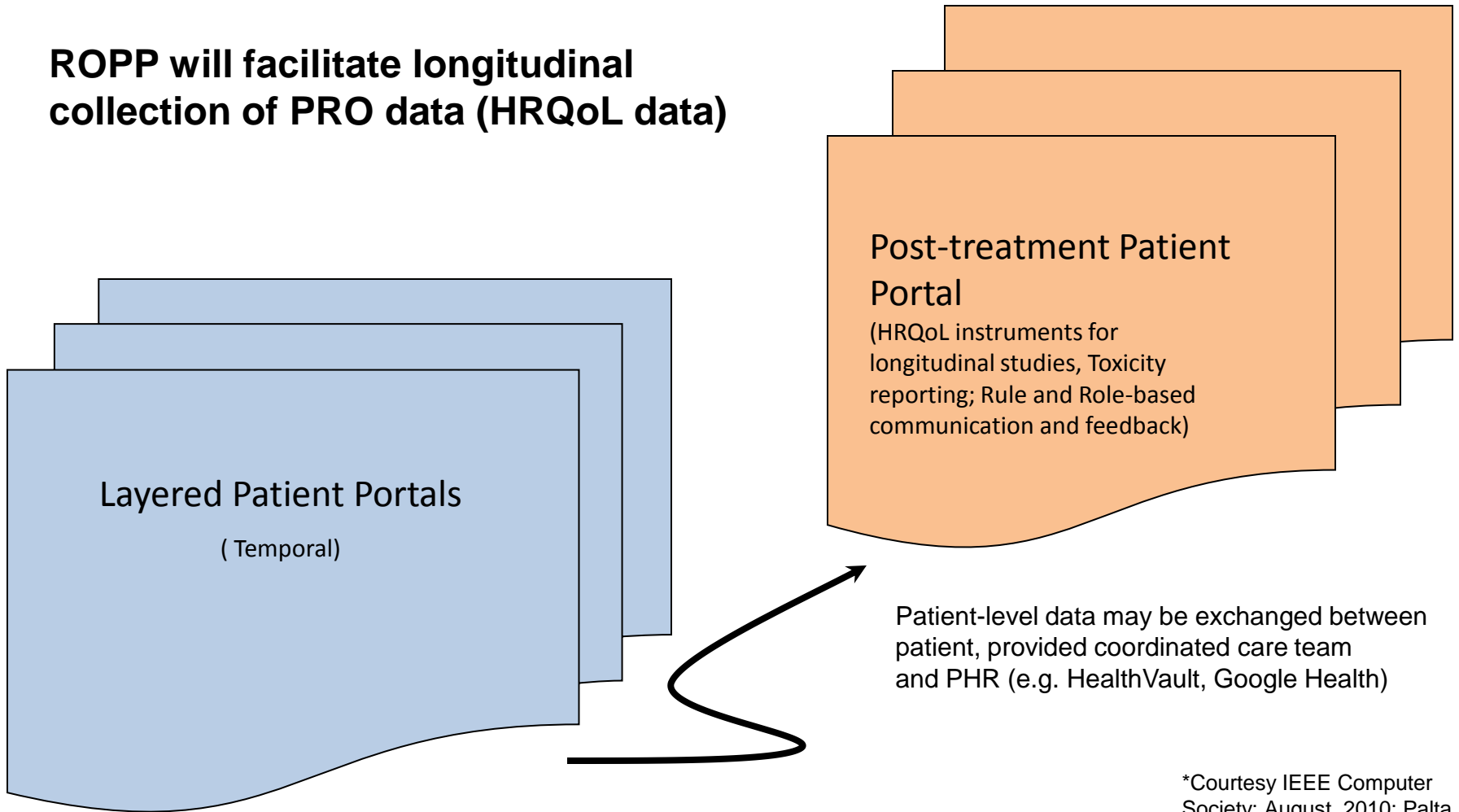
Data elements independently validated by clinical team (with purple box icon)

*Courtesy IEEE Computer Society; August, 2010; Palta, Frouhar, Zlotecki



ROPP: Layered Patient Portals in Care Continuum

ROPP will facilitate longitudinal collection of PRO data (HRQoL data)



*Courtesy IEEE Computer Society; August, 2010; Palta, Frouhar, Zlotecki

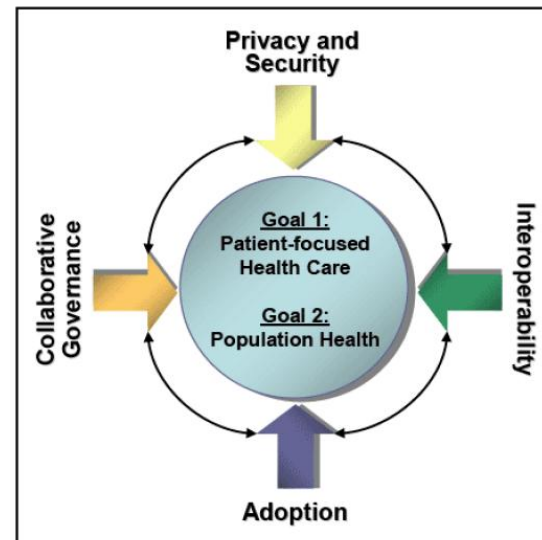
Existing Systems - that are/could be involved in the problem/solution:
RT-EMR, TMS, RIS, HIS, OIS, RT-PACS

Possible Actors:

Scheduler, Results Manager, Prescription Manager, QA Manager

Data Interchange Standards - which might be relevant to the solution:
DICOM, CCD, CCR, HL7

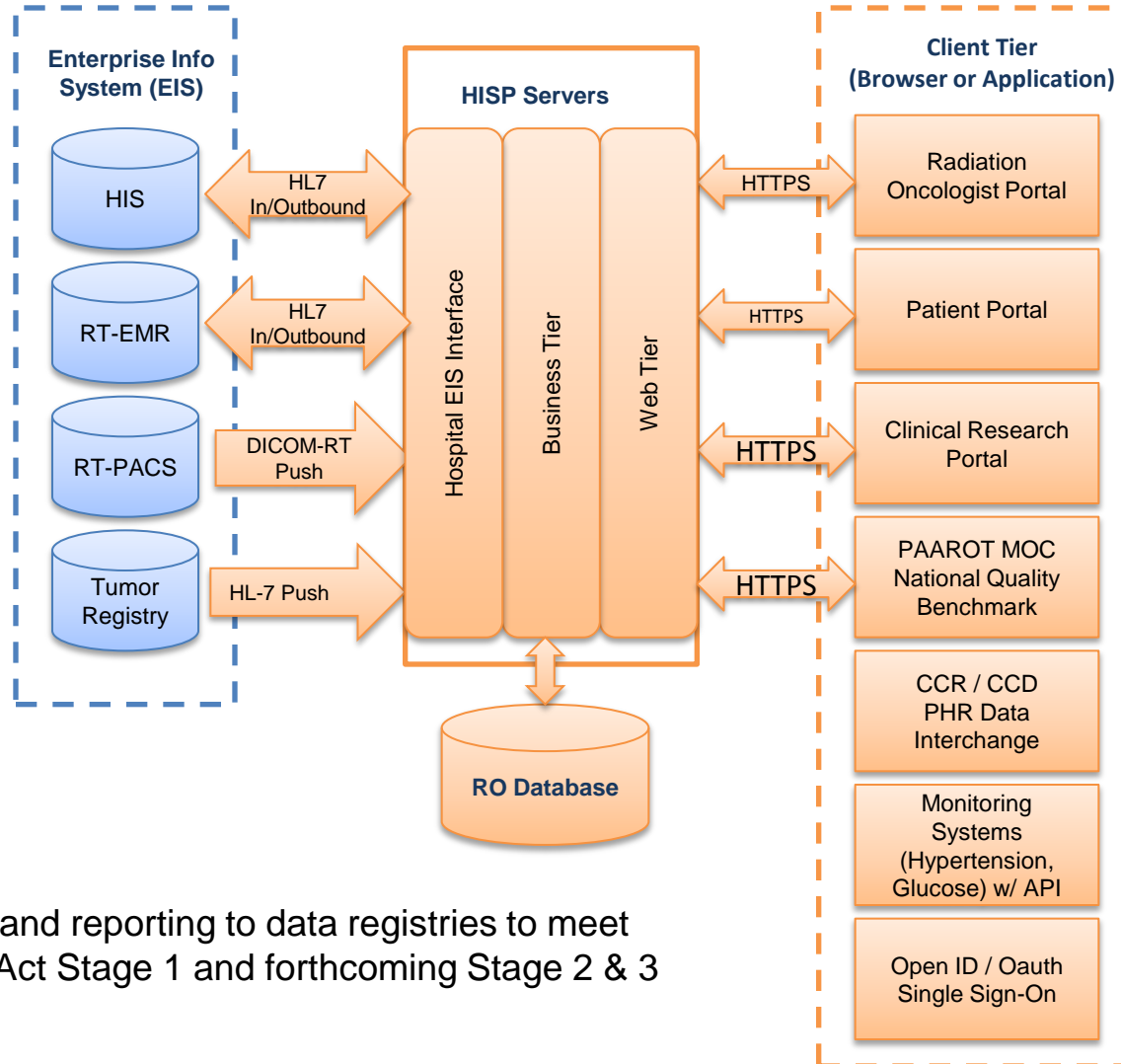
HHS Strategic Plan Summary Overview



* Courtesy of the Office of the National Coordinator for HIT (ONC): <http://healthit.hhs.gov>



ROPP: Standards & Systems



- Data exchange and reporting to data registries to meet ARRA HITECH Act Stage 1 and forthcoming Stage 2 & 3 Requirements.



ROPP: Attributes / Data Management

The Patient Portal Actor has two primary user types, Patient and Staff (all clinical team members).

Some of the key user actions that will need to be supported include (CRUD – Create, Read, Update, Delete):

Patient Portal Attributes

- **Consent Management** - for permission to data collection, participation in clinical trial and propagation to other relevant clinical systems. Note: consent management can be handled on the Patient Portal, HISP and Provider Levels - Create / Update / Delete.
- **Patient Demographics** - Read / Update / Delete.
- **Patient's Schedule** - Read / Update.
- **Patient Level Clinical Data** (diagnosis, tumor site, toxicity, tumor vol. treatment type) - Read
- **Patient Self-Reported Data:** QoL assessments, health history, registration, education and report review- Create
- **Patient Appointment** – Read / Update.
- **Request Refill of Prescriptions** – Read / Update.
- **Patient & Medical Team Alerts** - triggered by demographic data and patient reported adverse events tracking – Read / Update.



ROPP Discussion: Roles & Quality Alerts

Based on a user's role (i.e. physician, researcher, nurse, or other medical team member will be able to:

- **Patient Account Management** - create, access, update, send/receive messages.
- **Update Patient Portal Data** - schedule modifications, medications / refills based on patient request.
- **Set patient specific alerts**
- **Read / Respond to patient specific alerts**
- **Send / Receive Quality Alerts** - triggered by roles, metrics, tasks and form completion & outcomes data collection, toxicity grades, lab results & related adverse events and messaging are necessary for quality care and treatment.
- **Generate Quality Metrics Reports** - including identifying QA performed on behalf of patient, e.g. IMRT QA or lack thereof and real-time national quality benchmark data.

ROPP Discussion: Overarching Data Exchange

Using the Power of Health IT to Transform Health and Care



* Courtesy of Office of the National Coordinator for HIT (ONC): <http://healthit.hhs.gov>



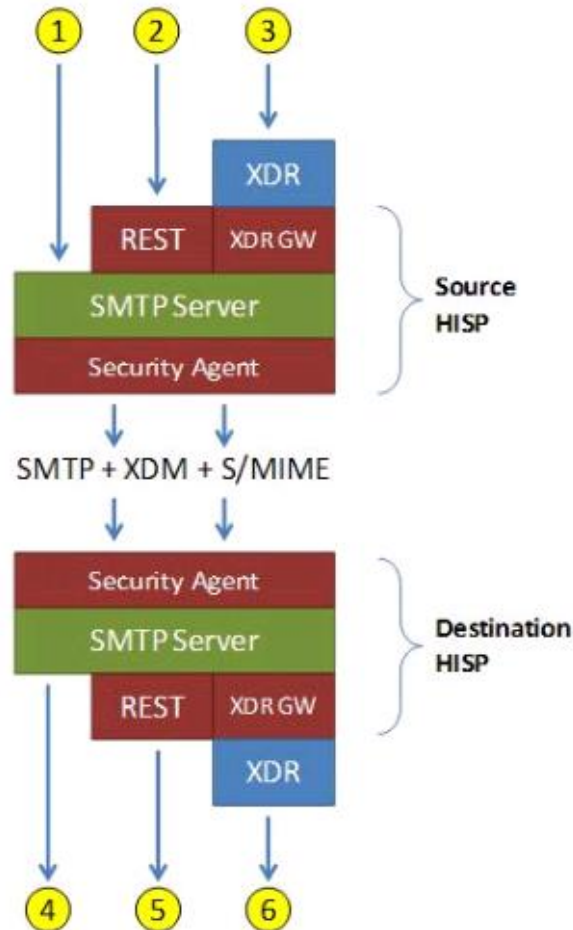
ROPP Discussion: Connectivity Overview

Point-to-Point Patient-Level Data Exchange Model that may be used for the ROPP

Example with two HISPs & six endpoints

- ① Email source
simple@source.com
- ② EHR module source using REST
module@source.com
- ③ Full EMR source using XDR
emr@source.com

- ④ Email destination
simple@destination.com
- ⑤ EHR module destination using REST
module@destination.com
- ⑥ Full EMR destination using XDR
emr@destination.com



* Courtesy of NHIN Direct: <http://nhindirect.org>



ROPP Discussion: Sending a Message

Example message contains a text message and x-ray JPEG

	simple	module	emr
Sender experience	Opens mail client, types a message, attaches x-ray, hits "send"	Accesses module web page, types a message, uploads x-ray file, adds metadata and hits "send"	From within EMR, selects x-ray, types a message and hits "send"
Submission to HISP	MIME via SMTP	POST via HTTP	XDR via SOAP
Transformation for backbone	None	Assembly of MIME message from POST	Gateway extraction of attachments; assembly of MIME message
Wire format	2 MIME Parts: <ul style="list-style-type: none">• text/plain• image/jpeg	3 MIME Parts: <ul style="list-style-type: none">• text/plain• image/jpeg• application/xdm+zip	3 MIME Parts: <ul style="list-style-type: none">• text/plain• image/jpeg• application/xdm+zip

Note that all messages are identical on the wire, except that the "simple" message is lacking an XDM MIME part

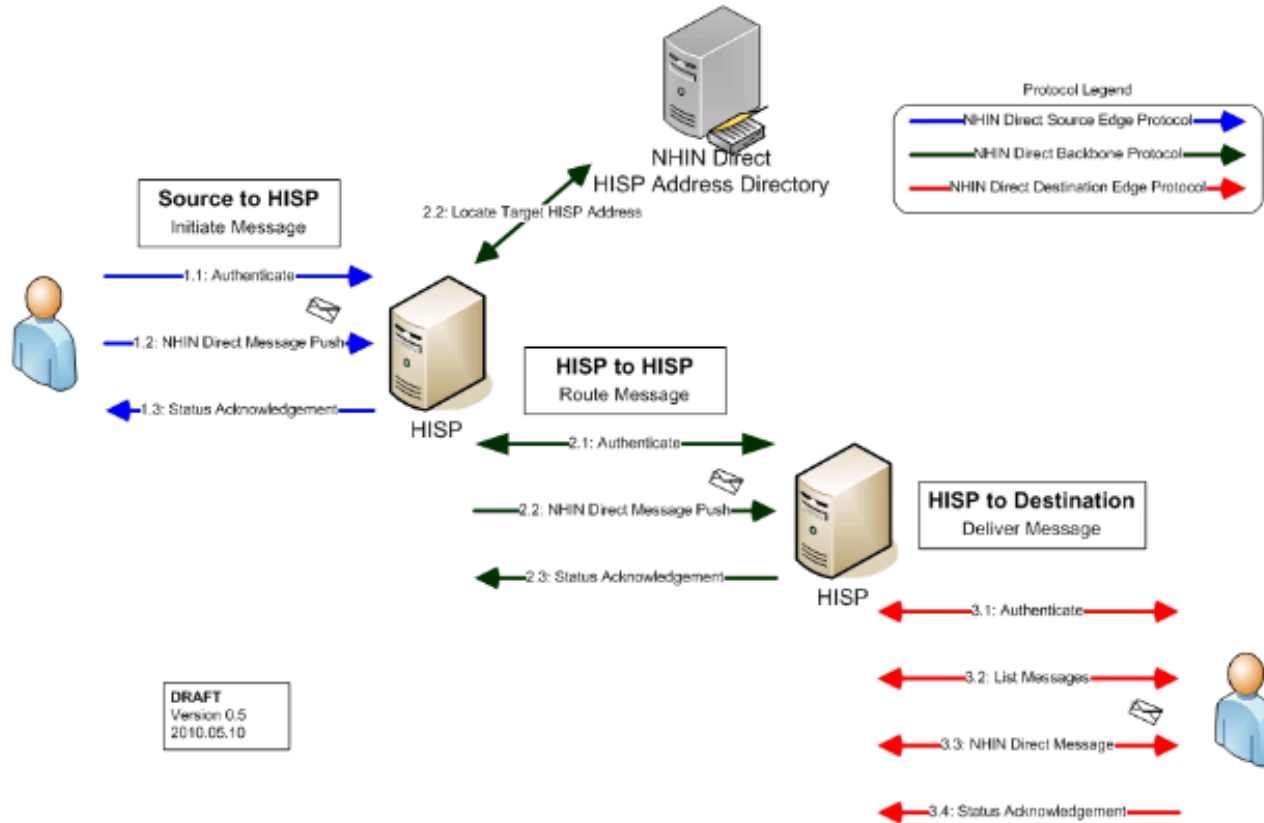
* Courtesy of NHIN Direct: <http://nhindirect.org>

ROPP Discussion: Data Interchange Overview

Example 1

This example shows a simple visual representation of the [NHIN Direct Abstract Model](#) actors and transactions. The source file can be found [here](#).

*Note in the event that Source and Destination are associated with the same HISP, the HISP to HISP messages would not apply. A depiction of that scenario can be seen [here](#).



* Courtesy of NHIN Direct: <http://nhindirect.org/Abstract+Model+Examples>