

Health Information Exchange

DRAFT

Building cost-effective interface solutions

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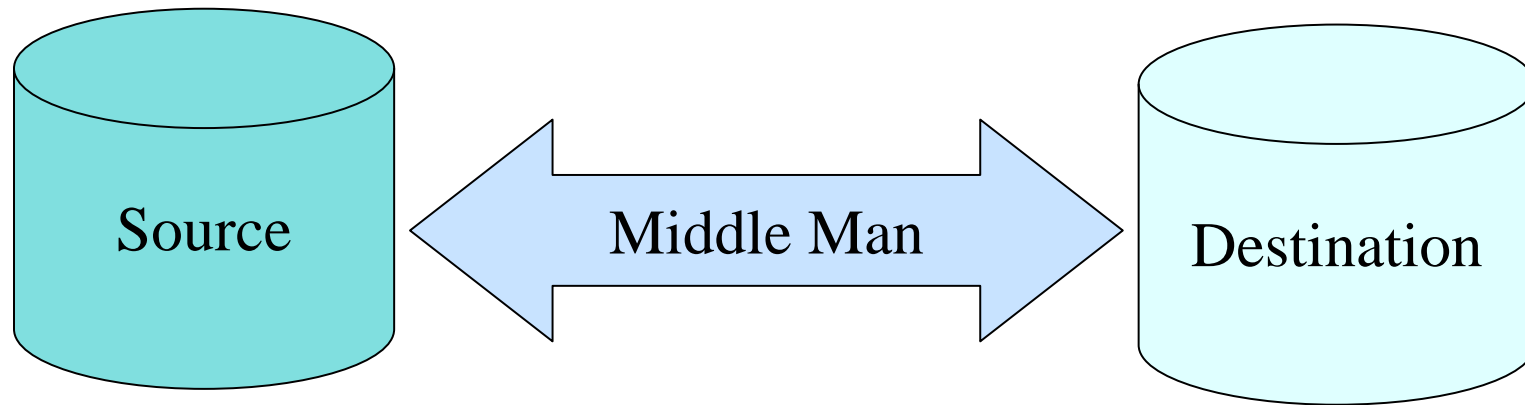
What is HIE?

- Health Information Exchange (HIE)
The exchange of electronic protected health information (PHI) across organizations within a region, community or hospital system.

HIE WHY?

- Patient Care
 - Improve care coordination
 - Sharing medical information instantly
 - Decreasing medical duplicates and errors
- Data/Report standardization
 - Interoperability between medical data from different sources
- Incentives
 - medical home and meaningful use requirements

HIE How?



Data flows from a source to a destination, in between we need to send the data and make sure it is interoperable

Middle Man or the interface engine is critical to this operation

Bronx RHIO participation

- Collaboration of Health Centers and Hospitals in the Bronx region
- MHHC is one of those health centers
- Incentive for medical home and meaningful use

The good old DTS

- What is it?
- The relations pre-defined in the export
- The benefits of DTS – simple, easy to setup relations
- The limitations – non-flexible definitions, tedious cross-reference tables, interface language that's from another planet

Interface code from IXP files

```
_BID_=UniversalServiceID~~4 // customization; use 5th instead of 2nd subcomponent
```

```
AcceptTruncateAppend={ Summary }
```

```
_SAP_=_N_->Summary+=
```

```
#IFNOTEXIST _LABSUMMARYREPORT_=_OBR_[]0->_BID_==;;_SAP__ORC_->_OBR_[]0-  
>_BID_#_SAP__OBR_[]0->_BID_#;  
!_OBR_[]1->_BID_==;;_SAP_", "#;  
!_ORC_->_OBR_[]1->_BID_==;;_SAP_", "#;  
_OBR_[]1->_BID_==;;_SAP__ORC_->_OBR_[]1->_BID_#_SAP__OBR_[]1->_BID_#;  
!_OBR_[]2->_BID_==;;_SAP_", "#;  
!_ORC_->_OBR_[]2->_BID_==;;_SAP_", "#;  
_OBR_[]2->_BID_==;;_SAP__ORC_->_OBR_[]2->_BID_#_SAP__OBR_[]2->_BID_#;  
!_OBR_[]3->_BID_==;;_SAP_", "#;
```

Interface Engine requirements

- Budget need to be cost-effective
- Learning Curve - Limited in-house resources and skill set, need some ease of use
- Control of interface engine is preferred
- Scalability and in-house staff development
- Product support and dependability

Interface Engine Selection

- Cloverleaf (formerly Quovadx)
 - Used by GE's CCG interface solution
 - Direct vendor
- Ignis systems solution
- Mirth
 - Open source interface engine
- Iguana
 - 30 day trail

Scoring Scale:

1. Limited
2. Standard
3. Extra value

Budget

Learning Curve

Control

Scalability

Support

Cloverleaf GE (CCG)

2

3

1

3

2

Cloverleaf direct

2

2

2

3

2

Mirth

3

2

2

3

2

Iguana

-

2

2

-

2

The solution

- So many to choose from, what's efficient and economical?
- A FREE product? It can't be good. But what about the almighty LINUX, MYSQL, and other products that don't cost a penny
- JAVA based – perfect for cross platforms
- Ease of use – intuitive GUI
- Support is there if we need it, otherwise in-house staff will be manning and maintaining

MIRTH

- It's free! Support cost is reasonable
- Minimal system requirement
- Universal platform support
- The Swiss Army knife healthcare integration engine
- Specifically designed for HL7 message integration, though not limited to

Channel Definition

Channels mirthconnect

Status	Protocol	Name	Id	Description
● Disabled	XML	Exit Care Hand Out - PartII	067f3aca-ad8e-4bf1-9597-3ffd6e2935cf	
● Disabled	HL7 v2.x	RHIO_CONSENT	54d4d159-017b-4c7b-8233-d1ccd95e896f	
● Disabled	HL7 v2.x	RHIO_FINAL	d5fc7818-a7a5-457b-a9d9-b57b55f416fb	
● Disabled	XML	RHIO_MEDS	543dcabb-514f-4a15-8b71-6139823adab5	
● Disabled	XML	Exit Care Hand Out	eec7b7dd-dd06-439e-b8e5-b15b19412fde	
● Disabled	XML	Exit Care Hand Out - Spanish	3f212c4e-8222-41ff-a351-ce7db236c1ad	
● Disabled	HL7 v2.x	MorrisHeight	142a59a5-dd94-452d-81c1-635e1c4e723d	
● Disabled	HL7 v2.x	RHIO_TEST	f1fdc84c-fae5-4553-a1c3-bf73b4510ab4	
● Disabled	XML	CONSENT BACK LOG	75050768-450a-491b-a0d0-33c7a0ae9032	
● Enabled	XML	Exit Care Hand Out - Spanish PartII	ea882c42-7cdb-4d38-8439-38b297adf2eb	

Channel Tasks

- Refresh
- Deploy All
- Edit Global Scripts
- Edit Code Templ...
- New Channel
- Import Channel
- Export All Chan...

Other

- Help on this topic
- About Mirth Con...
- Visit mirthcorp.com
- Report Issue
- Logout

Connected to: <https://localhost:8443>

Input Connector

The screenshot displays the Mirth Connect web interface for editing a channel named 'RHIO_MEDS'. The interface is divided into a left sidebar and a main configuration area.

Left Sidebar:

- Mirth Connect:** Dashboard, Channels, Users, Settings, Alerts, Events, Plugins.
- Channel Tasks:** Validate Connector, Edit Filter, Edit Transformer (27), Import Connector, Export Connector, Export Channel.
- Other:** Help on this topic, About Mirth Connect, Visit mirthcorp.com, Report Issue, Logout.

Main Configuration Area:

Edit Channel - RHIO_MEDS (mirthconnect logo)

Summary | Source | Destinations | Scripts

Connector Type: Database Reader

Database Reader

Driver: Oracle 10g Release 2 [Insert URL Template]

URL: jdbc:oracle:thin:@mhtemr:1521:emr

Username: custom

Password: [Masked]

Polling Type: Interval Time

Polling Frequency (ms): 5000

Polling Time (daily): 10:06 AM

Process Results in Order: Yes No

Use JavaScript: Yes No

Generate: [Connection] [Select]

SQL:

```
1 SELECT USRINFO_LOGINNAME AS USRINFO_LOGINNAME,
2 USRINFO_PVID AS USRINFO_PVID,
3 USRINFO_LASTNAME AS USRINFO_LASTNAME,
4 USRINFO_FIRSTNAME AS USRINFO_FIRSTNAME,
5 USRINFO_MIDDLENAME AS USRINFO_MIDDLENAME,
6 USRINFO_DEANUMBER AS USRINFO_DEANUMBER,
   USRINFO_LICNUMBER AS USRINFO_LICNUMBER,
```

Run On-Update Statement: Yes No

Generate: [Connection] [Update]

On-Update SQL:

```
1 UPDATE RXMEDS
2 SET RHIO_EXPORT_TIMESTAMP = TO_CHAR(SYSTIMESTAMP, 'HHMMSS.FF')
3 WHERE PRESCRIB_PTID=?(prescrib_ptid)
4
5
6
```

Field list on the right: usrinfo_loginname, usrinfo_pvid, usrinfo_lastname, usrinfo_firstname, usrinfo_middlename, usrinfo_deanumber, usrinfo_licnumber.

Connected to: https://localhost:8443

Filters

The screenshot shows the Mirth Connect 'Edit Channel' interface for a channel named 'RHIO_FINAL - Consent Filter'. The main area displays a JavaScript script for a filter rule. The script connects to an Oracle database, queries the 'RHIO_LOG_CONSENT' table for a specific record, and returns true or false based on the result.

Mirth Views

- Back to Channel

Filter Tasks

- Add New Rule
- Delete Rule
- Import Filter
- Export Filter
- Validate Script

Other

- Help on this topic
- About Mirth Connect
- Visit mirthcorp.com
- Report Issue
- Logout

Edit Channel - RHIO_FINAL - Consent Filter

#	Operator	Name	Type
0		New Rule	JavaScript

```
1 //basic database connection
2 var driver = "oracle.jdbc.OracleDriver";
3 var username = "rhio";
4 var password = "rhio";
5 var url = "jdbc:oracle:thin:@mhtem:1521:rhio";
6 var dbConn = DatabaseConnectionFactory.createDatabaseConnection (driv
7
8 //get the dclid from PV1.19
9 var dclid = msg['PV1']['PV1.19']['PV1.19.1'].toString();
10 logger.error("dclid: "+dclid);
11 //get the consent from RHIO_LOG_CONSENT
12 //there should always be one row
13 var consent = null;
14 var consentQuery = "SELECT * FROM RHIO_LOG_CONSENT WHERE DCRID="+dcli
15 var consentResult = dbConn.executeCachedQuery(consentQuery);
16 consentResult.first();
17 var con = consentResult.getString(5);
18 dbConn.close();
19 logger.error({con==null}.toString());
20 if (con == null){
21     return false;
22 }
23 else {return true;}
24
25
26
27
28
29
30
31
32
```

Reference | Message Trees | Message Templates

Filter: All

- All
- Convert HL7 to XML
- Convert XML to HL7
- Convert X12 to XML
- Convert XML to X12
- Convert EDI to XML
- Convert XML to EDI
- Convert NCPDP to XML
- Convert XML to NCPDP
- Perform Database Query
- Perform Parameterized Database Query
- Perform Database Update
- Perform Parameterized Database Update

Available Variables

Visit Info

Connected to: https://localhost:8443

Transformers

The screenshot displays the Mirth Connect interface for editing a channel. The main window shows a JavaScript transformer script for a step named 'New Step'. The script performs a database query to retrieve consent information and updates the message structure accordingly.

Mirth Views

- Back to Channel

Transformer Tasks

- Add New Step
- Delete Step
- Import Transformer
- Export Transformer
- Validate Script

Other

- Help on this topic
- About Mirth Connect
- Visit mirthcorp.com
- Report Issue
- Logout

Edit Channel - RHIO_FINAL - Consent Transformer

#	Name	Type
0	New Step	JavaScript

```
1 msg['MSH']['MSH.9']['MSH.9.1'] = "ADT";
2 msg['MSH']['MSH.9']['MSH.9.2'] = "A08";
3 msg['EVN']['EVN.1']['EVN.1.1'] = "A08";
4
5 tap['MSH'] = msg['MSH'];
6 tap['PID'] = msg['PID'];
7 tap['PV1'] = msg['PV1'];
8 tap['EVN'] = msg['EVN'];
9
10 //basic database connection
11 var driver = "oracle.jdbc.OracleDriver";
12 var username = "rhio";
13 var password = "rhio";
14 var url = "jdbc:oracle:thin:@mhtear:1521:rhio";
15 var dbConn = DatabaseConnectionFactory.createDatabaseConnection (driver, url, username, password);
16
17 //get the dclid from PV1.19
18 var dclid = msg['PV1']['PV1.19']['PV1.19.1'].toString();
19
20 //get the consent from RHIO_LOG_CONSENT
21 //there should always be one row
22 var consent = null;
23 var consentQuery = "SELECT * FROM RHIO_LOG_CONSENT WHERE DCRID='"+dclid+"'";
24 var consentResult = dbConn.executeCachedQuery(consentQuery);
25 consentResult.first();
26 var con = consentResult.getString(5);
27 if (con != null){
28     consent = createSegment('PD1',tap,0);
29     consent['PD1.12']['PD1.12.1'] = con;
30 }
31 else {
32     delete tap['PD1'];
33 }
34
```

Reference | Message Trees | Message Templates

Filter: All

- Convert HL7 to XML
- Convert XML to HL7
- Convert X12 to XML
- Convert XML to X12
- Convert EDI to XML
- Convert XML to EDI
- Convert NCPDP to XML
- Convert XML to NCPDP
- Perform Database Query
- Perform Parameterized Database Query
- Perform Database Update
- Perform Parameterized Database Update

Available Variables

Visit Info

Connected to: https://localhost:8443

Output Connectors

The screenshot displays the Mirth Connect interface for editing a channel named 'RHIO_FINAL'. The interface is divided into several sections:

- Left Sidebar:** Contains navigation links for 'Mirth Connect' (Dashboard, Channels, Users, Settings, Alerts, Events, Plugins) and 'Channel Tasks' (Validate Connector, New Destination, Delete Destination, Clone Destination, Disable Destination, Move Dest. Down, Edit Filter, Edit Transformer (1), Import Connector, Export Connector, Export Channel). There is also an 'Other' section with links for help, about, visit mirthcorp.com, report issue, and logout.
- Header:** 'Edit Channel - RHIO_FINAL' with the Mirth Connect logo.
- Navigation Tabs:** Summary, Source, Destinations, Scripts.
- Table:** A table listing output connectors. All are 'File Writer' type and 'Enabled' status.

Status	Destination	Connector Type
Enabled	Visit Info	File Writer
Enabled	Consent	File Writer
Enabled	Problems	File Writer
Enabled	Allergy	File Writer
- Connector Configuration:** The 'File Writer' connector is selected. The 'Method' is 'file' with a 'Test Write' button. The 'Directory' is 'C:/James_Mirth_Test/Visit'. There are fields for 'ftp://' and 'File Name' (set to '\${ORIGINALNAME}.hl7'). Other options include 'Anonymous' (Yes), 'Username' (anonymous), 'Password' (masked), 'Secure Mode' (Yes), 'Passive Mode' (Yes), 'Validate Connection' (Yes), 'Append to file' (Yes), 'File Type' (ASCII), 'Encoding' (Default), and 'Template' (message.encodedData).
- Destination Mappings:** A list of available mappings for the destination, including Message ID, Raw Data, Transformed Data, Encoded Data, Message Source, Message Type, Message Version, Date, Formatted Date, Timestamp, Unique ID, Original File Name, Count, Entity Encoder, CDATA Tag, DICOM Message Raw Data, and Message with Attachment Data.
- Footer:** 'Connected to: https://localhost:8443'

Back to business - Implementation

- Exporting a document when it's signed in the EMR – finding the DCRID
- Pull all information from EMR database that's related to the document in question
- The downside – needs a separate DB and

What is RHIO?

- A scenario that requires clinical information to be shared – the ER
- What and when to share? Everything or only minimal when absolutely necessary?
- What about HIPA?
- What it means for the future?

Credit

- Managing Interfaces with EMR
 - http://support.centricityservices.com/logician/emr_2005/documentation.html
- Mirth Web Site
 - www.mirthcorp.com
- HL7 Documentation
 - <http://www.hl7.org/implement/standards/index.cfm>

Interface Building Demonstration

Q & A