

MUCH MORE
THAN I.T.

POSSIBILITY

INTRODUCTION TO THE
MIRTH CONNECT INTERFACE ENGINE

December 2, 2015



Solving for Today. Preparing for Tomorrow.

Your phone has been automatically muted. Please use the Q&A panel to ask questions during the presentation!

The screenshot displays the Cisco WebEx Event Center interface. The main presentation area shows a slide with the GALEN Healthcare Solutions logo and the text "MUCH MORE THAN I.T. POSSIBILITY". Below this, it says "Welcome to Today's Webcast" and "The webcast will begin shortly...". The slide features a background image of a car driving on a dirt road. The interface includes a top menu bar with "File", "Edit", "View", "Communicate", "Participant", "Event", and "Help". A "Public_Webc..." tab is active. On the right side, there are icons for "Participants" and "Q&A". A red box highlights the "Q&A" icon, with a red arrow pointing to it and the text "Click to open Q&A Panel". Another red box highlights a small icon in the top right corner of the presentation area, with a red arrow pointing to it and the text "Click for Full Screen Mode". At the bottom right, a red box highlights the Q&A input area, which includes a dropdown menu set to "All Panelists", a text input field with the placeholder "Select a panelist in the Ask menu first and then type your question here. There is a 256-character limit.", and a "Send" button. The status bar at the bottom indicates "Connected".

INTRODUCTIONS

- Ryan Hunt
- Nate Bessa

How Galen Has Utilized Mirth

- Complex Data Transformer
- Centralized Hub
- Interface Engine Alternative

AGENDA

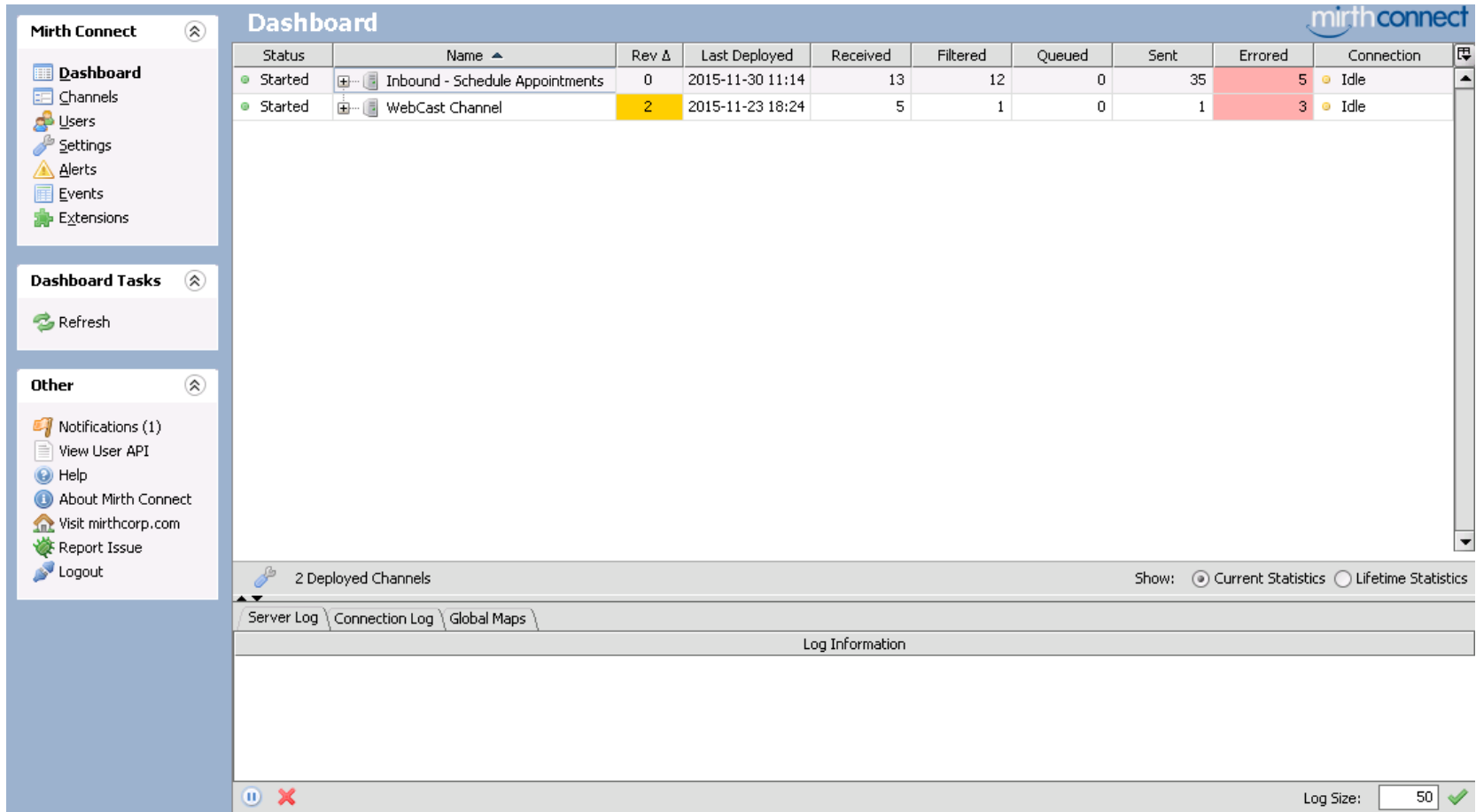
- Overview
- Dashboard
 - Tasks
- Channels
 - Summary
 - Source
 - Destination
 - Transformer
 - Filter
 - Code Templates
- Logging
 - Searching
 - Error Handling
- Maintenance
 - Alerts
 - Events
- TouchWorks Interface Demo
 - Message Processing

Poll Question #1

Mirth Connect

- Operating System
 - Windows - XP, Vista, 7, Server
 - Linux - 2.4 kernel or newer
 - Mac - 10.X
 - <https://www.mirth.com/Downloads>
- Database
 - PostgreSQL 8.3+
 - MySQL 5.0+
 - Oracle 10gR2+
 - SQL Server 2005+
- Data Types
 - Delimited Text, HL7 v 2.x, HL7 v 3.x DICOM, XML, JSON
- Connection Protocols
 - Files, TCP/MLLP, HTTP(S), FTP/SFTP, Database, Web Service, etc.

Dashboard



The screenshot shows the Mirth Connect Dashboard. On the left is a sidebar with navigation links: Mirth Connect (Dashboard, Channels, Users, Settings, Alerts, Events, Extensions), Dashboard Tasks (Refresh), and Other (Notifications (1), View User API, Help, About Mirth Connect, Visit mirthcorp.com, Report Issue, Logout). The main area is titled 'Dashboard' and features a table of deployed channels. The table has columns: Status, Name, Rev Δ, Last Deployed, Received, Filtered, Queued, Sent, Errored, and Connection. Two channels are listed: 'Inbound - Schedule Appointments' and 'WebCast Channel'. The 'WebCast Channel' row has a yellow highlight in the 'Rev Δ' column with the value '2'. Below the table, there is a status bar showing '2 Deployed Channels' and a 'Show:' dropdown with 'Current Statistics' selected. At the bottom, there are tabs for 'Server Log', 'Connection Log', and 'Global Maps', with 'Log Information' displayed below them. A footer bar shows a log size of 50 with a green checkmark.

Status	Name	Rev Δ	Last Deployed	Received	Filtered	Queued	Sent	Errored	Connection
Started	Inbound - Schedule Appointments	0	2015-11-30 11:14	13	12	0	35	5	Idle
Started	WebCast Channel	2	2015-11-23 18:24	5	1	0	1	3	Idle

2 Deployed Channels

Show: ☒ Current Statistics ☐ Lifetime Statistics

Server Log | Connection Log | Global Maps

Log Information

Log Size: 50

Web Dashboard

mirthconnect

Dashboard Statistics

 admin ▾

Current Statistics

[Lifetime Statistics](#)

Name	Status	Received	Filtered	Queued	Sent	Errored
▶ WebCast Channel	Started	5	1	0	1	3
▶ Inbound - Schedule Appointments	Started	13	12	0	35	5

Channels

Mirth Connect

Dashboard

Channels

Users

Settings

Alerts

Events

Extensions

Channel Tasks

Refresh

Redeploy All

Edit Global Scripts

Edit Code Templates

New Channel

Import Channel

Export All Channels

Other

Notifications (1)

View User API

Help

About Mirth Connect

Visit mirthcorp.com

Report Issue

Logout

Channels

Status	Data Type	Name	Id	Description	Rev Δ	Last Deployed
Enabled	HL7 v2.x	Inbound - Schedule Appointments	539b4d4c-fe62-47f5-af83-08841ffb5647	This channel recei...	0	2015-11-30 11:14
Disabled	HL7 v2.x	WebCast Channel	caecf7ed-460f-47be-9f86-4e8073a71709		2	2015-11-23 18:24

2 Channels, 1 Enabled

Channels - Summary

- **Channel Properties**
 - Name
 - Data Types - Define inbound/outbound message types
 - Dependencies - Associate custom libraries and code templates
 - Initial State
 - Attachment - extract attachments from messages
- **Message Storage**
- **Message Pruning**
- **Channel Tags**
- **Custom Metadata**
- **Channel Description**

Channels - Source

- **Connector Type**
 - Channel Reader
 - DICOM Listener
 - Database Reader
 - File Reader
 - HTTP Listener
 - JMS Listener
 - JavaScript Reader
 - TCP Listener
 - Web Service Listener
- **Source Settings - ACK, Batches, and Queues**
- **Connection specific settings**

Channels - Destination

- **Connector Type**
- **Queue Settings**
 - Defines when messages are to be queued
 - Advanced settings define retry counts/intervals

Channels - Scripts

- **Deploy**
- **Undeploy**
- **Preprocessor**
- **Postprocessor**

Channels - Message Templates

- **Inbound**
 - Used to analyze data from a message to set filters and create transformer steps
- **Outbound**
 - Defines the format of the outbound message. Only should be used when transforming original message from one protocol or type to another.

Channels - Filter

- **Series of rules that determines routing of messages**
- **Created with the Rule Builder UI or JavaScript.**
- **Conditions**
 - Exists
 - Not Exists
 - Equals
 - Not Equals
 - Contains
 - Not Contain
- **Value can be a string literal or variable**

Channels - Transformer

- **Steps that are executed on messages in order to transform, extract, or create new messages.**
- **Types of Transformers**
 - **Mapper** - Extract field data from a message and save as a variable
 - **Connector** - Available to later steps in the same Transformer
 - **Channel** - Available later in the same Channel
 - **Global Channel** - Available to all parts of a Channel
 - **Global** - Variables available to all Channels
 - **Response** - Variables available for ACKs in all Sources
 - **Message Builder** - Update values in the message
 - **JavaScript** - has functionality of Mapper/Message builder
 - **External Script** - similar to JavaScript but code is stored externally
 - **XSLT Step** - Converting data formats i.e. XML to plain text

Channels - Code Templates

- **User defined functions that can be used in JS based filters, transformers, and scripts**
 - Limit the amount of visible code
 - Limit instances of repeating code within Channels
 - Considered best practice
- **Configuration**
 - Library - A way to organize code templates, typically by type
 - Type
 - Function - includes function signature with drag & drop option
 - Code - JavaScript
 - Context - What components in Mirth have access to the code templates
 - Global Scripts
 - Channel Scripts
 - Source
 - Connectors

Poll Question #2

Channel Messages

Mirth Connect

- Dashboard
- Channels
- Users
- Settings
- Alerts
- Events
- Extensions

Message Tasks

- Refresh
- Send Message
- Import Messages
- Export Results
- Remove All Messages
- Remove Results
- Remove Message
- Reprocess Results
- Reprocess Message

Other

- Notifications (1)
- View User API
- Help
- About Mirth Connect
- Visit mirthcorp.com
- Report Issue
- Logout

Channel Messages - Inbound - Schedule Appointments

Start Time:

09:37 AM

All Day

End Time:

09:37 AM

Text Search:

Page Size:

20

Advanced...

Reset

Search

RECEIVED

TRANSFORMED

FILTERED

QUEUED

SENT

ERROR

Current Search

Max Message Id: 38
Date Range: (any) to (any)
Statuses: (any)
Connectors: (any)

Results 1 - 2 of 2

Count

Page 1 of 1

Go

< Prev

Next >

Id	Connector	Status	Received Date	Response Date	Errors	
38	Source	TRANSFORMED	2015-12-02 11:48:07:530	2015-12-02 11:48:07:546	--	00
	Stored Procedure: FileAppointmentTypeDE - Creates Appointment Type	SENT	2015-12-02 11:48:07:546	2015-12-02 11:48:08:124	--	00
	Stored Procedure: FileInsuranceClassDE - Creates Insurance Class	SENT	2015-12-02 11:48:08:124	2015-12-02 11:48:08:483	--	00
	Stored Procedure: FileReferringProviderDE - Creates Referring Provider	SENT	2015-12-02 11:48:08:483	2015-12-02 11:48:09:108	--	00
	Stored Procedure: FileAppointment_CMS - Creates Appointment	SENT	2015-12-02 11:48:09:108	2015-12-02 11:48:10:576	--	00
32	Source	TRANSFORMED	2015-11-30 11:14:29:351	2015-11-30 11:14:29:414	--	00
	Stored Procedure: FileAppointmentTypeDE - Creates Appointment Type	FILTERED	2015-11-30 11:14:29:414	--	--	00
	Stored Procedure: FileInsuranceClassDE - Creates Insurance Class	FILTERED	2015-11-30 11:14:30:506	--	--	00
	Stored Procedure: FileReferringProviderDE - Creates Referring Provider	FILTERED	2015-11-30 11:14:30:615	--	--	00
	Stored Procedure: FileAppointment_CMS - Creates Appointment	ERROR	2015-11-30 11:14:30:740	2015-11-30 11:14:31:302	--	00

Messages \ Mappings

Raw

Transformed

Encoded

Sent

Response

Status:

ERROR

Response:

No patient matches found

Connected to: https://10.2.0.145:8443 | 11:57 AM EST (UTC -5)

Email Alerts

Mirth Connect

Dashboard
Channels
Users
Settings
Alerts
Events
Extensions

Alert Edit Tasks

Save Alert
Export Alert

Other

Notifications (1)
View User API
Help
About Mirth Connect
Visit mirthcorp.com
Report Issue
Logout

Edit Alert - Inbound Schedule Appointments Failures

mirthconnect

Alert Name: ☒ Enabled

Errors (select all that apply)

Error
<input checked="" type="checkbox"/> Any
<input type="checkbox"/> Source Connector
<input type="checkbox"/> Destination Connector
<input type="checkbox"/> Serializer
<input type="checkbox"/> Filter
<input type="checkbox"/> Transformer
<input type="checkbox"/> User Defined Transformer
<input type="checkbox"/> Response Validation
<input type="checkbox"/> Response Transformer
<input type="checkbox"/> Attachment Handler
<input type="checkbox"/> Deploy Script
<input type="checkbox"/> Preprocessor Script
<input type="checkbox"/> Postprocessor Script
<input type="checkbox"/> Undeploy Script

Regex (optional)

Channels

Filter:

[Expand All](#) [Collapse All](#)

<input type="checkbox"/> [New Channels]
<input checked="" type="checkbox"/> Inbound - Schedule Appointments
<input type="checkbox"/> Inbound - Sunquest ORU Switches
<input type="checkbox"/> Inbound - Sunquest Results
<input type="checkbox"/> Outbound - Sunquest Lab Order

Actions

Protocol	Recipient	Add	Remove
Email	nate.bessa@galenhealthcar...		
Email			

Subject (only used for email messages)

Template

At \${date}, a message processed by the \${channelName} channel failed with the error message \${errorMessage}.

Alert Variables

alertId
alertName
serverId
globalMapVariable
date
systemTime
error
errorMessage
errorType
channelId
channelName
connectorName
connectorType
messageId

Event Logs

Mirth Connect

- Dashboard
- Channels
- Users
- Settings
- Alerts
- Events**
- Extensions

Event Tasks

- Refresh
- Export All Events
- Remove All Events

Other

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Events

Start Time: 01:28 PM ☐ All Day ☐ INFORMATION ☐ WARNING ☐ ERROR
End Time: 01:28 PM
Name:
Page Size: 100

Current Search
Max Event Id: 382130
Date Range: (any) to (any)
Levels: (any)

Results 1 - 10
Page

Level	Date & Time	Name	Server ID	User	Outcome	IP Address
	2015-11-23 13:28:03:531	Get server settings	941c9da0-c4af-4c79-b7e4-0ed20a45471c	5 (nate.bessa)	✓	10.2.0.145
	2015-11-23 13:28:03:500	Update alerts	941c9da0-c4af-4c79-b7e4-0ed20a45471c	5 (nate.bessa)	✓	10.2.0.145
	2015-11-23 13:24:05:582	Update alerts	941c9da0-c4af-4c79-b7e4-0ed20a45471c	5 (nate.bessa)	✓	10.2.0.145
	2015-11-23 13:24:00:787	Get server settings	941c9da0-c4af-4c79-b7e4-0ed20a45471c	5 (nate.bessa)	✓	10.2.0.145
	2015-11-23 13:22:04:473	Get alert info	941c9da0-c4af-4c79-b7e4-0ed20a45471c	5 (nate.bessa)	✓	10.2.0.145
	2015-11-23 13:20:11:048	Update channel	941c9da0-c4af-4c79-b7e4-0ed20a45471c	5 (nate.bessa)	✓	10.2.0.145
	2015-11-23 13:00:00:008	Data Pruner	941c9da0-c4af-4c79-b7e4-0ed20a45471c	0 (System)	✓	
	2015-11-23 12:51:54:721	Get messages by page limit	941c9da0-c4af-4c79-b7e4-0ed20a45471c	1 (admin)	✓	10.3.2.19
	2015-11-23 12:51:25:711	Get messages by page limit	941c9da0-c4af-4c79-b7e4-0ed20a45471c	1 (admin)	✓	10.3.2.19
	2015-11-23 12:47:44:900	Get message content	941c9da0-c4af-4c79-b7e4-0ed20a45471c	1 (admin)	✓	10.3.2.19
	2015-11-23 12:47:31:358	Get messages by page limit	941c9da0-c4af-4c79-b7e4-0ed20a45471c	1 (admin)	✓	10.3.2.19
	2015-11-23 12:03:29:576	Get message content	941c9da0-c4af-4c79-b7e4-0ed20a45471c	5 (nate.bessa)	✓	10.2.0.145
	2015-11-23 12:03:27:639	Get message content	941c9da0-c4af-4c79-b7e4-0ed20a45471c	5 (nate.bessa)	✓	10.2.0.145
	2015-11-23 12:03:21:984	Get messages by page limit	941c9da0-c4af-4c79-b7e4-0ed20a45471c	5 (nate.bessa)	✓	10.2.0.145
	2015-11-23 12:03:20:985	Reprocess messages	941c9da0-c4af-4c79-b7e4-0ed20a45471c	5 (nate.bessa)	✓	10.2.0.145
	2015-11-23 12:02:48:804	Get message content	941c9da0-c4af-4c79-b7e4-0ed20a45471c	5 (nate.bessa)	✓	10.2.0.145
	2015-11-23 12:00:00:008	Data Pruner	941c9da0-c4af-4c79-b7e4-0ed20a45471c	0 (System)	✓	
	2015-11-23 11:35:14:039	Get server settings	941c9da0-c4af-4c79-b7e4-0ed20a45471c	1 (admin)	✓	10.3.2.19
	2015-11-23 11:35:05:925	Get status invoked through Data...	941c9da0-c4af-4c79-b7e4-0ed20a45471c	1 (admin)	✓	10.3.2.19

Name	Value
filter	MessageFilter[maxMessageId=17,minMessageId=<null>,originalIdUpper=<null>,ori
channelId	539b4d4c-fe62-47f5-af83-08841ffb5647

Message Pruning and Archival

Mirth Connect

Dashboard

Channels

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Settings

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Channel Tasks

Export Channel

Deploy Channel

Other

Notifications (1)

View User API

Help

About Mirth Connect

Visit mirthcorp.com

Report Issue

Logout

Edit Channel - Inbound - Schedule Appointments

Summary | Source | Destinations | Scripts

Channel Properties

Name: Inbound - Schedule Appointments ☒ Enabled

Data Types: Set Data Types ☐ Clear global channel map on deploy

Dependencies: Set Dependencies

Initial State: Started

Attachment: None Properties ☐ Store Attachments

Message Storage

Development

Content: All

Metadata: All

Durable Message Delivery: On

Performance:

☐ Encrypt message content

☐ Remove content on completion ☐ Filtered only

☐ Remove attachments on completion

Message Pruning

Metadata:

☐ Store indefinitely

☒ Prune metadata older than 7 days

Content:

☐ Prune when message metadata is removed

☒ Prune content older than 7 days

☒ Allow message archiving

(incomplete, errored, and queued messages will not be pruned)

Channel Tags

Tag
Inbound
Test

AddDelete

Custom Metadata

Column Name
SOURCE
TYPE

Poll Question #3

TouchWorks Interface Demo



Mirth Connect

- Flexible and accessible
- Most features come free
- Large online community
- Galen is ready to provide additional assistance
 - Mirth development for an existing installation
 - Migration from your current interface engine

Thank you for joining us today.

To access the slides from today's presentation, as well as our past webcasts, please visit:

<http://wiki.galenhealthcare.com/Category:Webcasts>

For additional assistance or to request information about our many services and products, please contact us through our website:

www.galenhealthcare.com

The screenshot displays the Galen Healthcare Solutions website. The header includes the company logo, navigation links (Blog, Wiki, Webcasts, Forum, Careers), a search bar, and a 'Company' dropdown menu. The 'Company' dropdown is open, showing options: 'Executive Team', 'Careers', and 'Contact Us' (highlighted with a red box). The main content area is titled 'Contact Us' and features a large image of healthcare professionals. Below the image is a contact form with the following fields: 'First Name *', 'Last Name *', 'Company *', 'Phone *', and 'Email *'. A sidebar on the left contains links to 'HIMSS15', 'Who We Serve', 'Products & Services', 'Knowledge Center', and 'Company' (highlighted in orange). The 'Company' section in the sidebar lists 'Executive Team', 'Careers', and 'Contact Us'.

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