How did that data get there ?

Introduction

Integration Team Super Heroes

Brett Willis ***Chris Howard***

Nick Mitrovich ***Chad Cochran***

Dawn Nichols

Presenter ***Loretta Gaul***

- Grandma and Data Management & Integration
  - Epic System Bridges Certified
  - Clarity Data Model – Optime, Willow, ASAP Certified
  - Hyperspace & chronicles Install Utilities Certified

Be a DATA Superhero

How many of you are ….

System Analysts

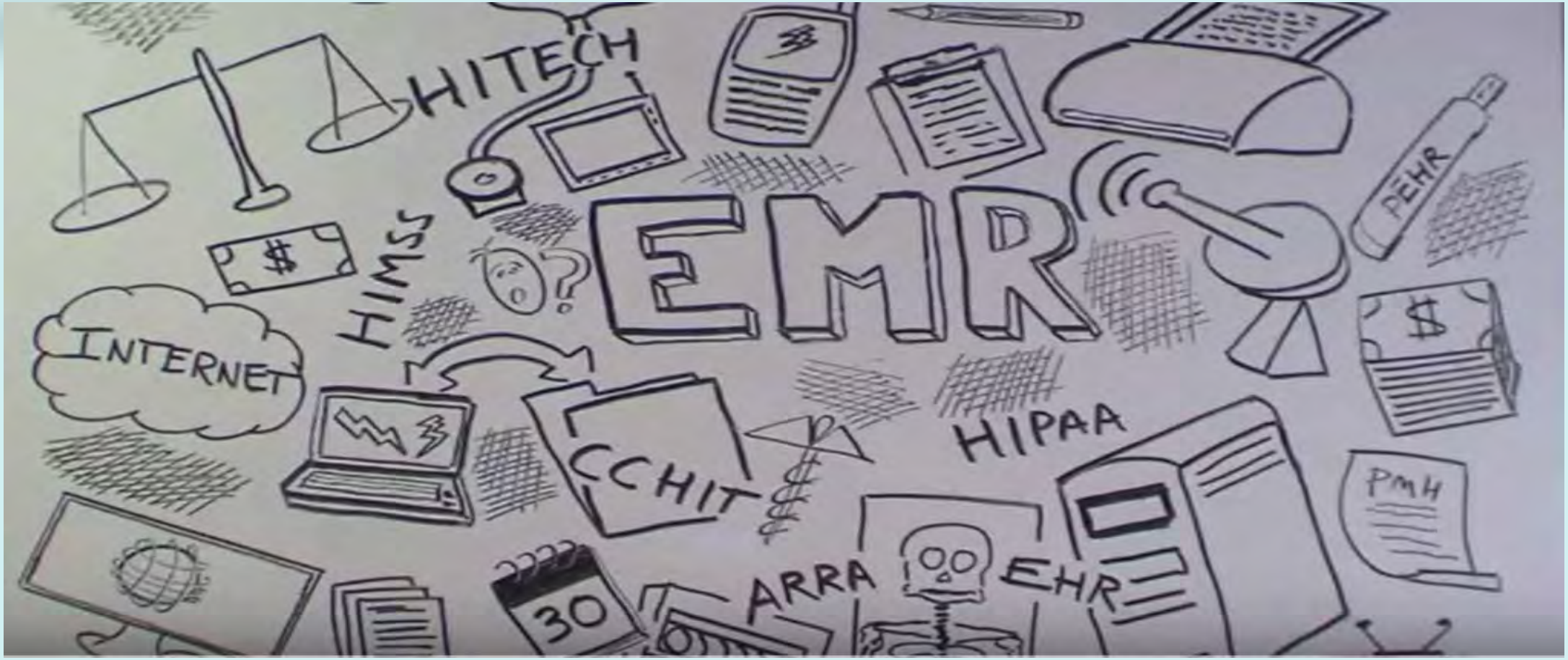
Developers

Application Analysts

Managers

And wonder where / when / why / who / how is all of this data moving around ?

Where does all the data go ?



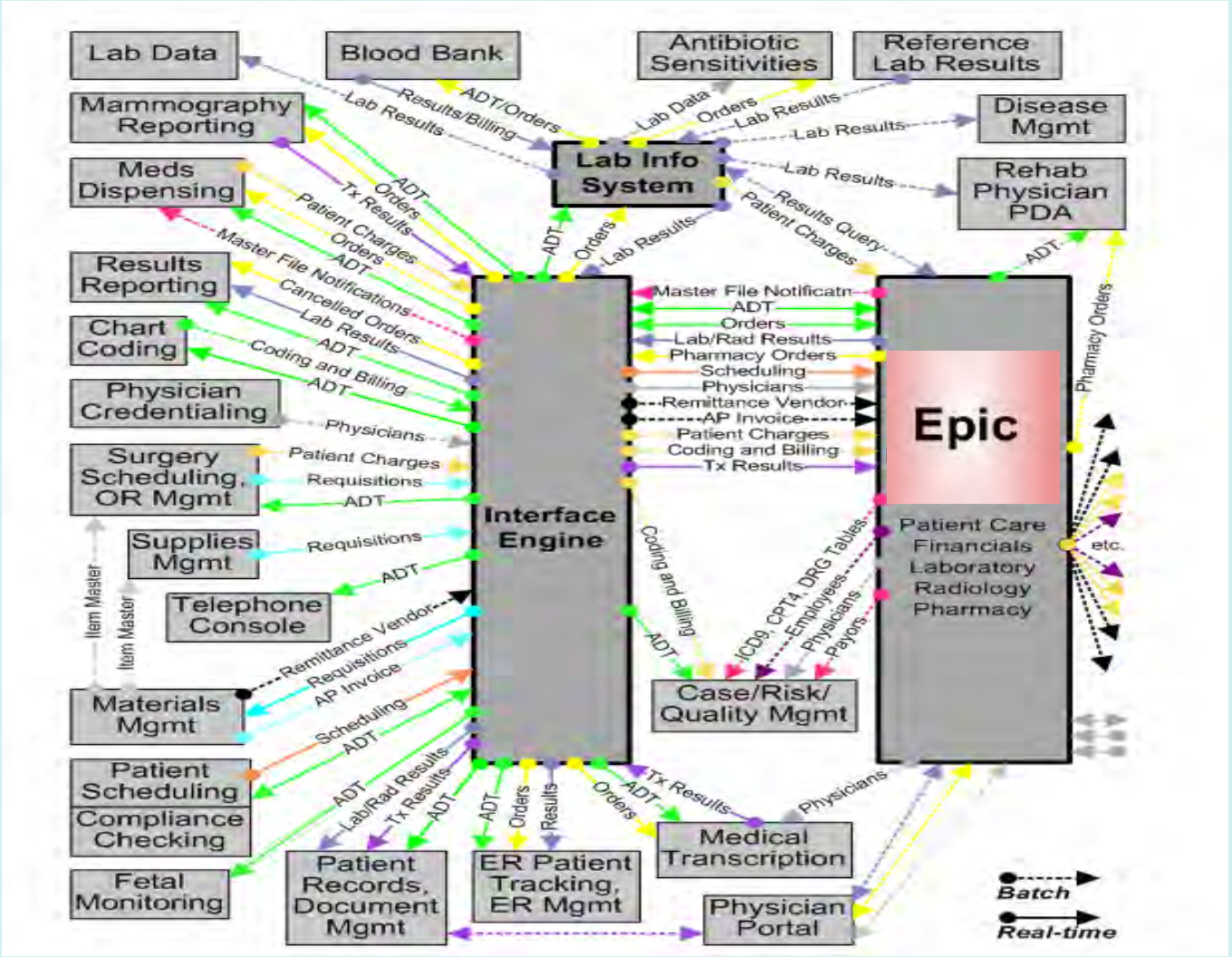
Where does all the data go ?

6 rights of data delivery

- **Rights of Data Delivery**
  - Right Practice
  - Right Provider
  - Right Patient
  - Right Result
  - Right Time
  - Right delivery method
    - How we can achieve this ……. ?

Why Exchange Data ?

- The Big Picture



Be a DATA Superhero

What is EDI

- **E**lectronic **D**ata **I**nterchange
- Communication of data between systems
- Variety of messaging standards – not made up by Epic

HL7

ASC X12
The Accredited Standards Committee

National Council for Prescription Drug Programs
NCPDP

FHIR®©

Be a DATA Superhero

What is HL7

- **Health Level 7**
- Not a programming language
- Human readable format of data that is separated into various segments

```
MSH|^~\&|HOSP|Facility_NPI^12345^NPI|1|||20110110045504||ADT^A03|59|P|2.3.1||||
EVN|A03|20110110045502|||||
PID|0|PFX123456789|MRN12345||SIMPSON^HOMER^J||19811012|F|||100 MAIN ST^APT
10B^ANYTOWN^AL^35244||(205)555-1212| (205)681-2000 X999||M||a12345|999999999
PD1|||HEALTHCENTRE^^|123456789^STEVENS^IZZIE^A^^^MD^^^^^^^
PV1|1|R|||||SHEPARD^DEREK|GREY^MEREDITH|||||||||||||||||||||||||||||||||||20110221
```

What is ASCI X12

ASCX12
The Accredited Standards Committee

- **Financial Data Standard**
- Not a programming language
- Human readable format of data that is separated into data segments
- Where is this used ?
  - Claims, Invoices, Remits

A sample EDI file

```
ISA*00*          *00*          *ZZ*SENDERISA      *14*007
GS*PO*SENDERGS*007326879*19960807*1548*000001*X*004010~
ST*850*000000001~
BEG*00*SA*A99999-01**19971207~
REF*0B*12345**11>ABCDEF~
ITD*01*3*1**15**16~
DTM*002*19971219~
N1*BT*ABC Inc.*9*1234567~
N3*P.O. BOX 0000~
N4*TEMPLE*TX*76503~
N1*ST*BUYSNACKS PORT*9*1223334445~
N3*1000 N. SAMPLE HIGHWAY~
N4*ATHENS*GA*30603~
PO1**16*CA*12.34**CB*000111111*UA*002840022222~
```

Be a DATA Superhero

What is NCPDP

National Council for Prescription Drug Programs
NCPDP

- **Not-for-profit Standards Development Organization**
  - **Representing all sector of pharmacy services industry**
  - **SCRIPT Standard for e-Prescribing**
  - Not a programming language
  - Currently using SureScripts as the 3rd party to support

What is CDA/CCD

- **CCD - Continuity of Care Document**
  - **Shares summary information about the patient**
- **CDA - Clinical Document Architecture**
  - **XML-based electronic standard**
  - **Flexible standard**
  - **Unique – can be read by human eye or processed by machine**

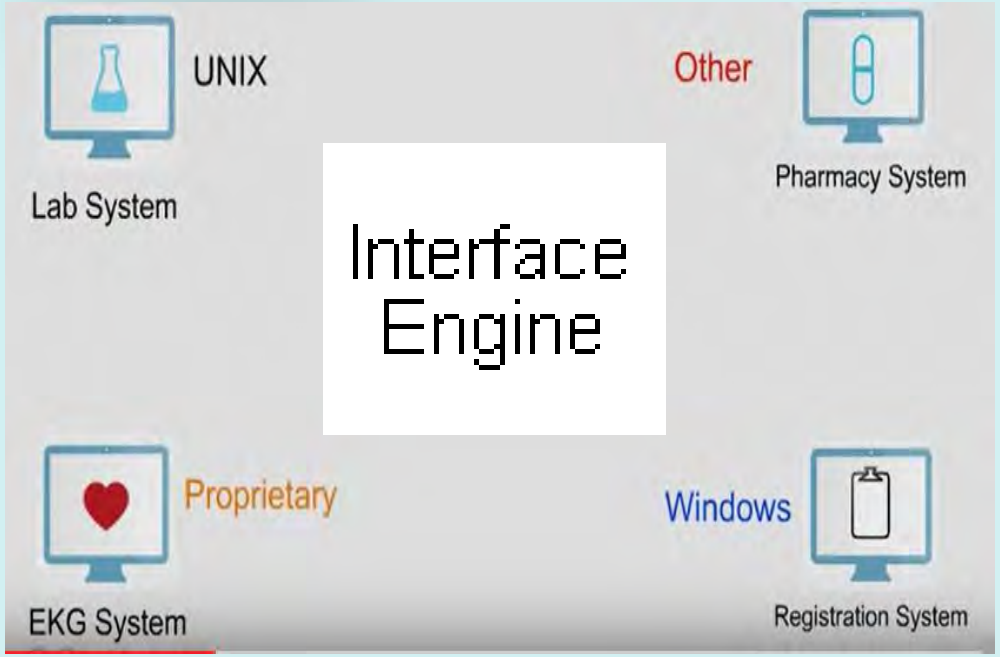
What is FHIR

- **FHIR – Fast Health Interoperability Resources**
  - **New standard developed by HL7**
  - **Address some limitations with previous HL7 standard**
  - **Potential enable quick integration of web and mobile applications**

Summary

HOW STANDARDS PROLIFERATE:
(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC)
SITUATION: THERE ARE 14 COMPETING STANDARDS.
14?! RIDICULOUS! WE NEED TO DEVELOP ONE UNIVERSAL STANDARD THAT COVERS EVERYONE'S USE CASES.
YEAH!
SOON:
SITUATION: THERE ARE 15 COMPETING STANDARDS.

How does this all work



Data Innovations®
Delivering Tomorrow's Lab, Today

Lab Instruments to Integration Engine

OARRS | OHIO AUTOMATED RX REPORTING SYSTEM

NARxCHECK PLUS
Data as of: 4/6/2015

KHN NARX check – RX request

DataCaptor™

Medical Devices to Epic

CompuNet
CLINICAL LABORATORIES

Epic

Be a DATA Superhero

How does this all work

UNIX

Lab System

Interface Engine

Proprietary

EKG System

Data Innovations®

ring Tomorrow's Lab, Today

ts to Integration Engine

RxCHECK PLUS

Data as of: 4/6/2015

request

DataCaptor™

Medical Devices to Epic

CompuNet

CLINICAL LABORATORIES

Epic

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Bridges

- **Epic Module for Interface Management**
- **Provides infrastructure**

ID	Interface	Queue	Time Since Last Msg	Total Recv'd/Sent	Last Recv
991101	KHN INCOMING TRANSCRIPTION	991101	00:01:14	652003	
991107	KHN INCOMING SCANS FROM ONBASE2	991107	00:01:11	4977726	
991277	KHN ANSI X12 5010 RESPONSE	991277	00:00:07	8312446	
991281	UHC ADMISSION NOTIFICATION 279 - INCOMING	991281	00:01:45	85372	
991285	KHN INCOMING RTA RESPONSE	991285	00:05:11	349942	
991301	KHN INCOMING SUNQUEST LAB RESULTS	991301	00:08:34	17952219	
991303	KHN INCOMING LAB RESULTS WITH CHARGES	991303	00:22:15	28632	
991305	KHN INCOMING LAB RESULTS FROM LABCORP	991305	00:03:23	468386	
991307	KHN INCOMING LAB RESULTS FROM MAYO	991307	00:18:20	134908	
991309	KHN INCOMING LAB RESULTS FROM HCLL	991309	00:10:15	704413	
991311	KHN INCOMING RADIOLOGY RESULTS	991311	00:00:08	7527958	
991313	KHN INCOMING BEACON RESULTS	991313	04:01:20	2314	
991317	KHN RESULTS FROM COMPUNET	991317	00:08:57	689184	

- **Bridges**
  - Outbound 36
  - Inbound 29

Be a DATA Superhero

Bridges

- **Interface Management options**

  - Monitors and Alerts
  - Error Management
  - Volume Analytics
  - Data Courier Interfaces
  - Mobile Bridges

Interface Engine

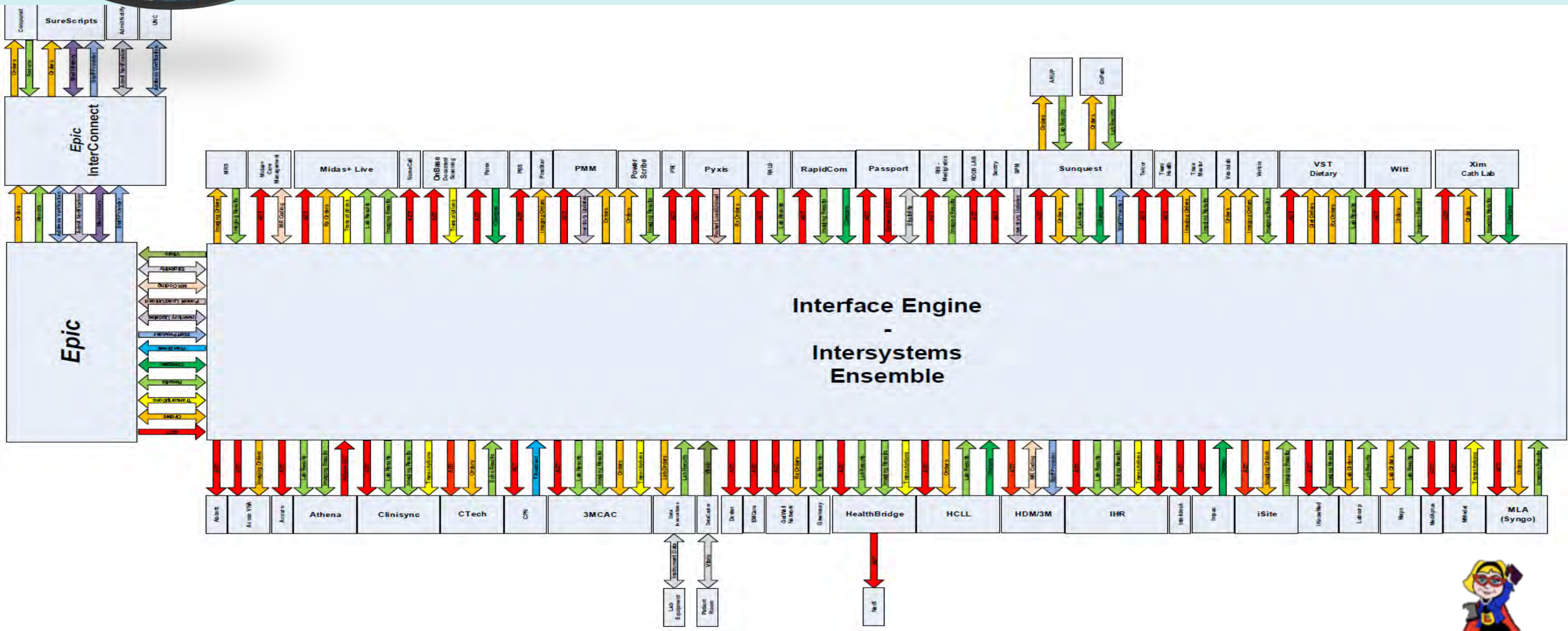
- Sometimes called an Integration Engine
- Specialized server that is the hub of much of the healthcare data exchange in a hospital

Interface Engine

- The “traffic cop”
- The “interpreter”

- KHN uses Ensemble Integration Engine

Kettering Interfaces 2015



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Interface Engine

- **KHNPrd - Ensemble**
  - Outbound 204
  - Inbound 105
  - Data Transformations 395

Kettering

Incoming

Coding
3M-HDM

Dispense
Pyxis

Inventory Updates
PMM
SPM

Transcription
3M-360MD
Medidoc
Mmodal
OnBase

Results
Abbot/P-Web
AGAFA
AS
Ctech
DataInnov
HCLL
HeartSuite
iSite
Labcorp
Mayo
MLA
MRS
PaceArt
Powerscribe
RapidCom
Sunquest
Telcor
Tracemaster
Vericis
Witt
Xim

Eligibility
Passport

Charges
3M-Profee
AS
HCLL
Mosaiq
Optum
Parex
Sunquest
RapidCom
Xim

ADT
Athena

Flowsheet
CPN
DataCaptor
Narx
RadRisk

ADT
3M-CAC
3M-HDM
Abott/P-Web
Accuro
AGFA
AS
Clinisync
CPN
Ctech
Dexter
EMCare
GetWell
HCLL
Healthbridge
Heartsuite
IHR
iKnowMed
IntelliDesk
iSite
KitCheck
MBMS
MedAptus
Medidoc
Medigistics
Midas
MLA
Mmodal
Mosaiq
NurseCall
OnBase
PaceArt
ParEx
PBS
PMM
PRI
Pyxis
RadRisk
RapidCom
Sentry
Sunquest
SyndromicSur
TeamHealth
Telcor
VST
XIM

Orders
AccuoVNA
AGFA
AS
Ctech
DataInnov
HCLL
iSite
Labcorp
Mayo
MLA
MRS
PaceArt
PMM
Powescribe
Pyxis
RapidCom
Sunquest
Telcor
Tracemaster
Vericis
VST

Results
3M-CAC
51OakWood
Athena
Clinisync
Healthbridge
iSite
MBMS
Medigistics
Midas
RadRisk
VST

Provider Updates
3M-CAC
3M-HDM
MRS

Inventory Updates
PMM

Med Admin
KitCheck

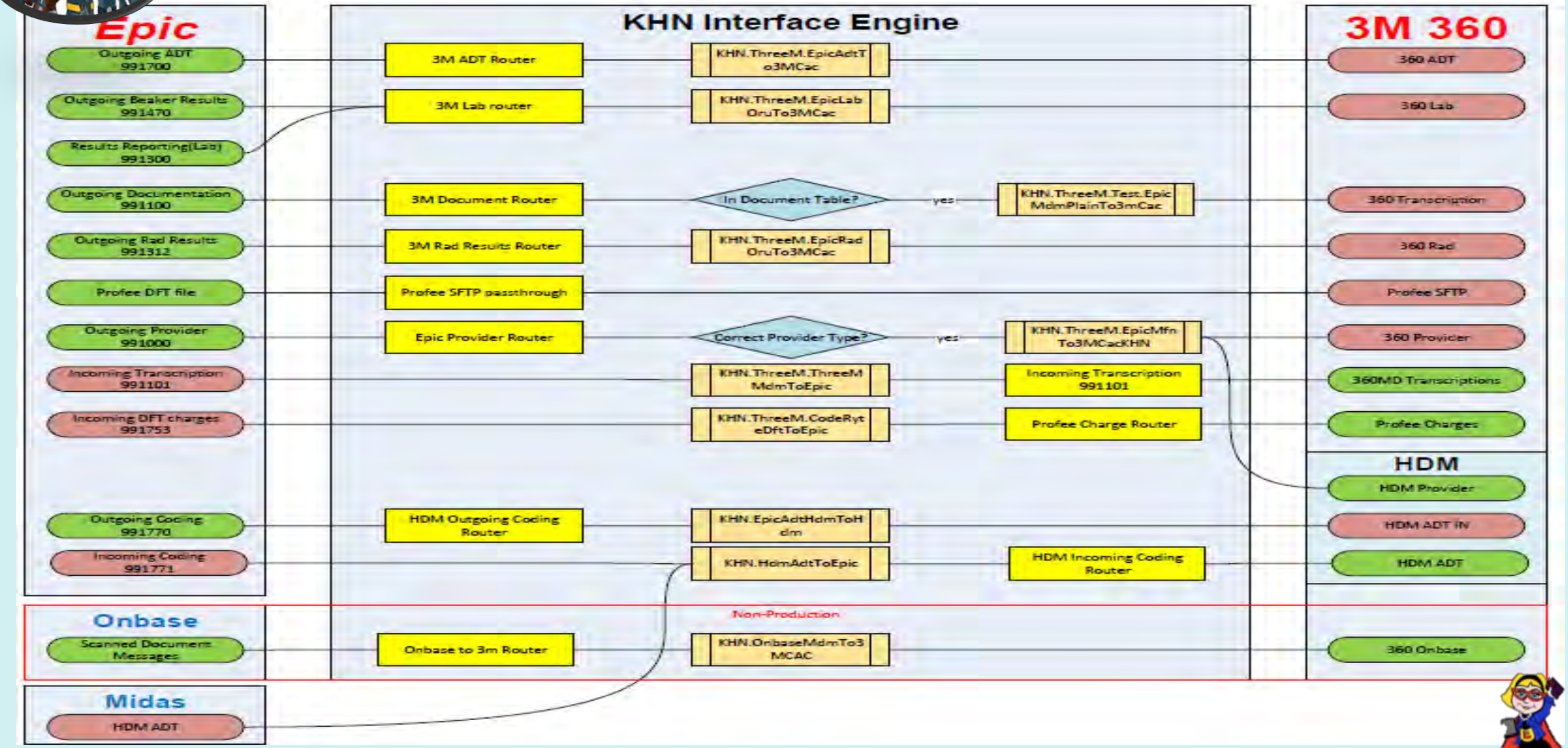
Eligibility
Passport

Transcription
3M-CAC
3M-Profee
3M-360MD
Athena
Clinisync
Healthbridge
Midas
OnBase

Vaccination
HealthBridge

Outgoing

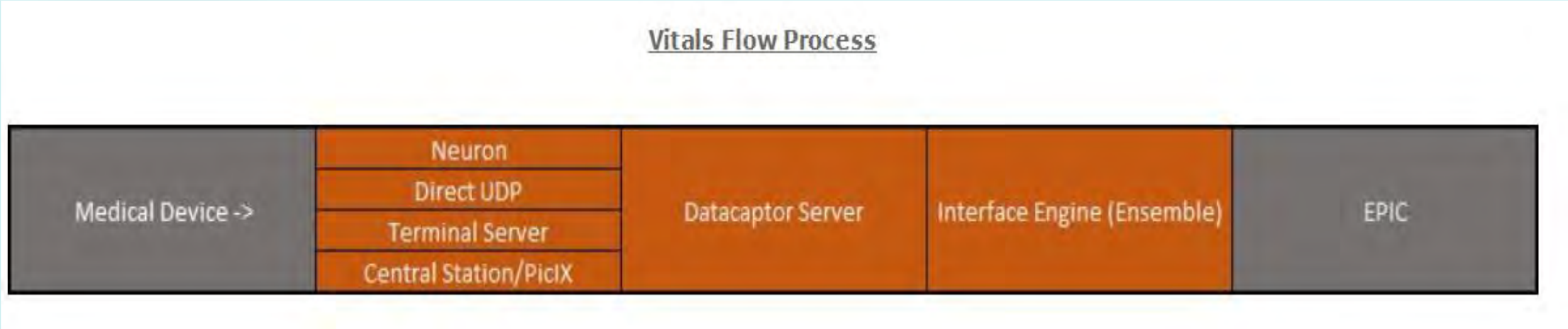
Be a DATA Superhero



Be a DATA Superhero

Interface Engine

DataCaptor™



- Uses HL7 standard
- Connects Medical Devices
- Sends device data to EMR
- Files in flowsheets

Outbound 7

Inbound 11

Data Transformations 6

Be a DATA Superhero

Interface Engine

DataCaptor™

- Integrated Medical Devices

Cardiac Monitor
Anesthesia Machine
Phillips Central Station

Medical Ventilator

Be a DATA Superhero

Interface Engine

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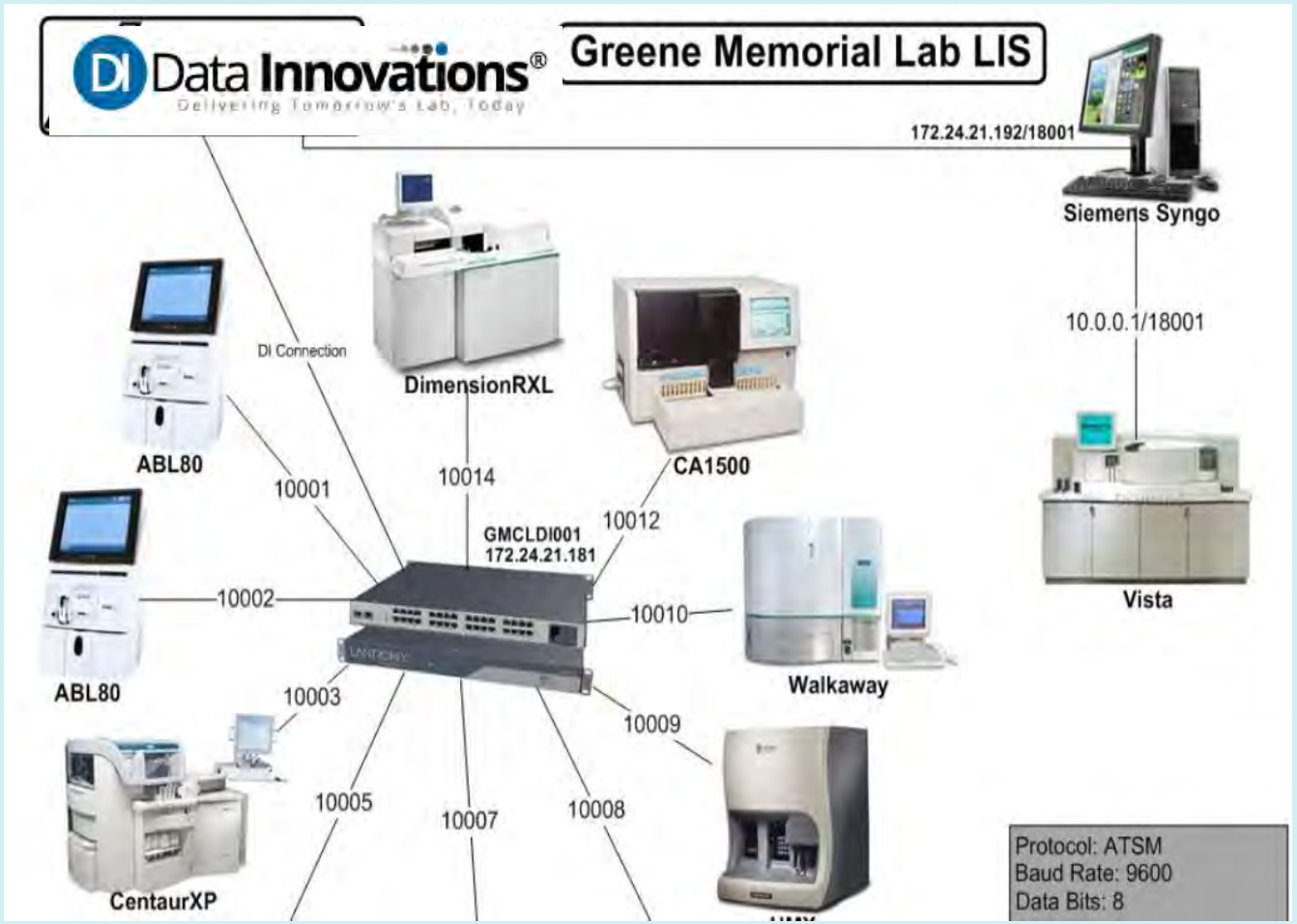

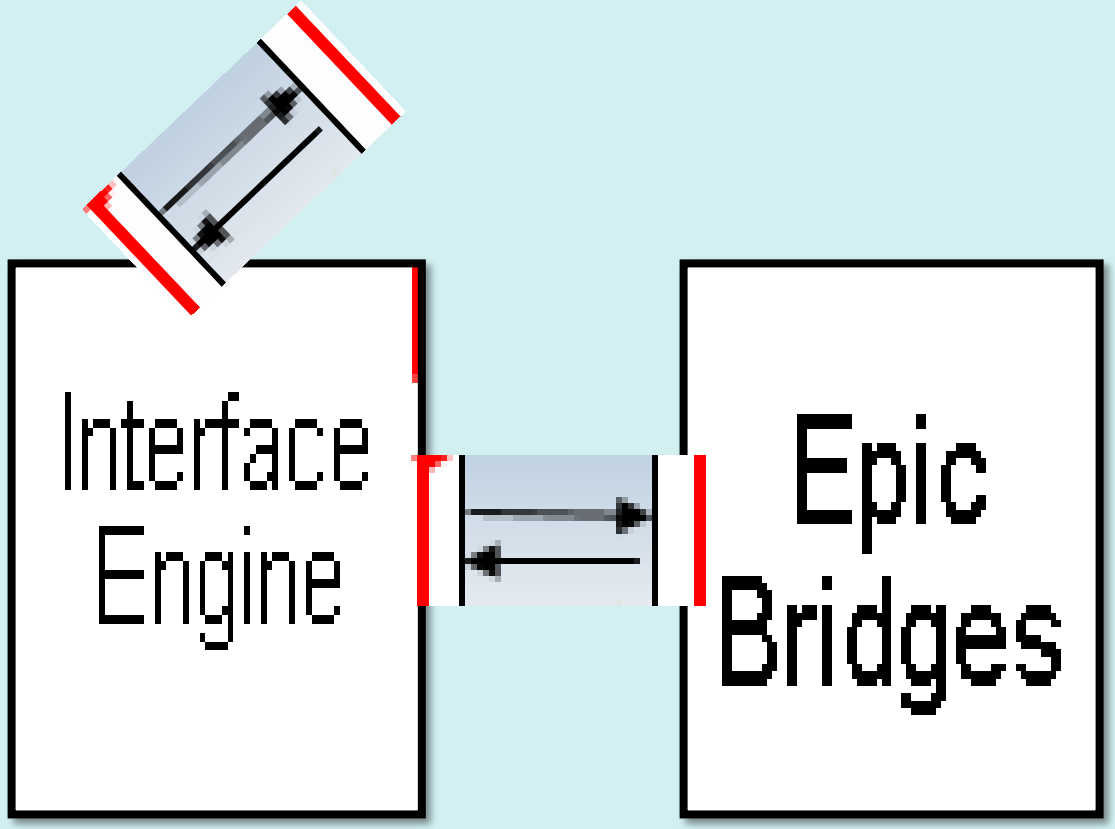

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Interface Engine

- Uses HL7 standard
- Orders - trigger from Beaker workflow

- Interfaces –
  - Outgoing Lab Instrument Orders
  - Incoming Lab Instrument Results

Interface Engine

- Other ways to communicate data to other systems
  - Secure File Transfer Protocol (SFTP)
  - Direct database updates
  - XML

Interface Engine

- **FTP - Ensemble**
  - Outbound 690
  - Inbound 369
  - Data Transformations 29

Interface Engine

- **SFTP - SSH file Transfer Protocol**
  - Data connection is encrypted

  - Billing files
  - Discharge Summaries in PDF format
  - Revenue Cycle Data
  - Access Logging Data

Interface Engine

Vendors with FTPs

3MCAC	CSI	EmCare	HDM	KAA_Zotec	MedAssets	Orthonet	Sentry
51OakWood	ChardSnyder	Epremis	HealthBridge	KeyBank	Medicount	PAREX	SYUS
AHS	Chase	(NDCHealth)	HRS	LTAC	Medigistics	PBS	TSI
APCheck	CompMed	EdAssist	Hartford	M&D	MedInform	PCB	TeamHealth
APS	ComplyTracks	Eligibil	HealthSpot	MBI	Metlife	PDM	UHC
ARMS	Convergence	Equifax	HealthStream	MBMS	NAVICURE	PressGaney	Ultipro
ASAP	Crimson	Fidelity	HearthSuite	MDBIZ	NAVIGANT	PRI	Uniform
BAXA	CrossChx	FifthThird	HumanArc	MRA	OakCreek	Passport	VSP
CardinalHealth	DataArk	FirstSource	Humana	MVS	Onbase	MOSAIQ	WealthEngine
CBA	DaytonResp	FlexBank	I3	Med3000S	Optum	RevSpring	ZIRMED
CBCS	GlenwoodSys	Gem					

Be a DATA Superhero

Interface Engine

- Monitoring the Integrated Environment
  - Real time Alerts
  - SMS, Email, Pager
  - Web Based Monitor - KHN developed

Interface Engine

- Monitoring the Integrated Environment
  - Bridges options

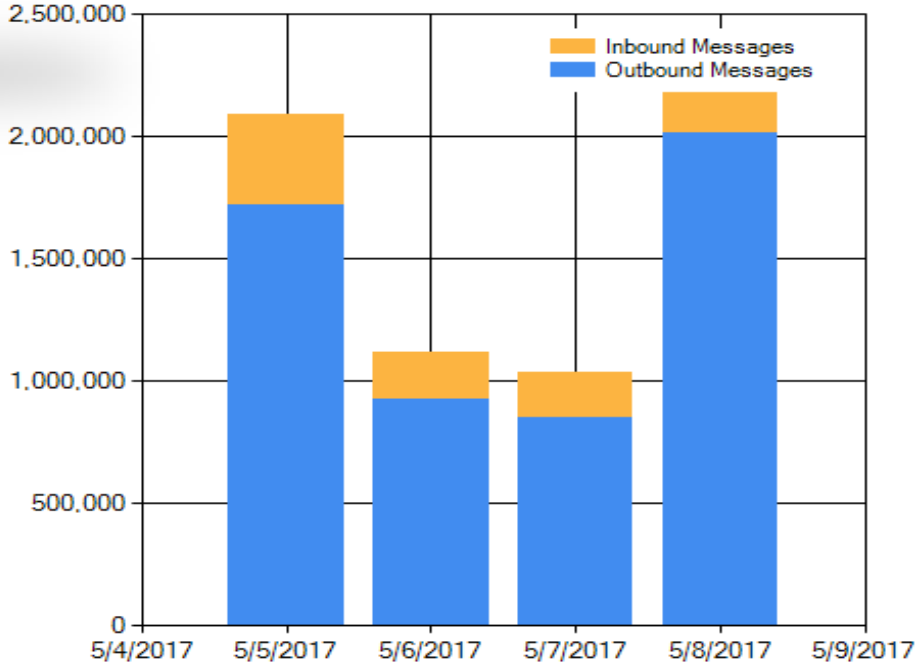
Additional Details	
Alert email From Address:	InterfaceMonitor@greenacres.com
Alert email Subject:	No messages on AIP {{AIPID}} in last 60 minu
Email Addresses to Notify	
interfaceteam@greenacres.com	

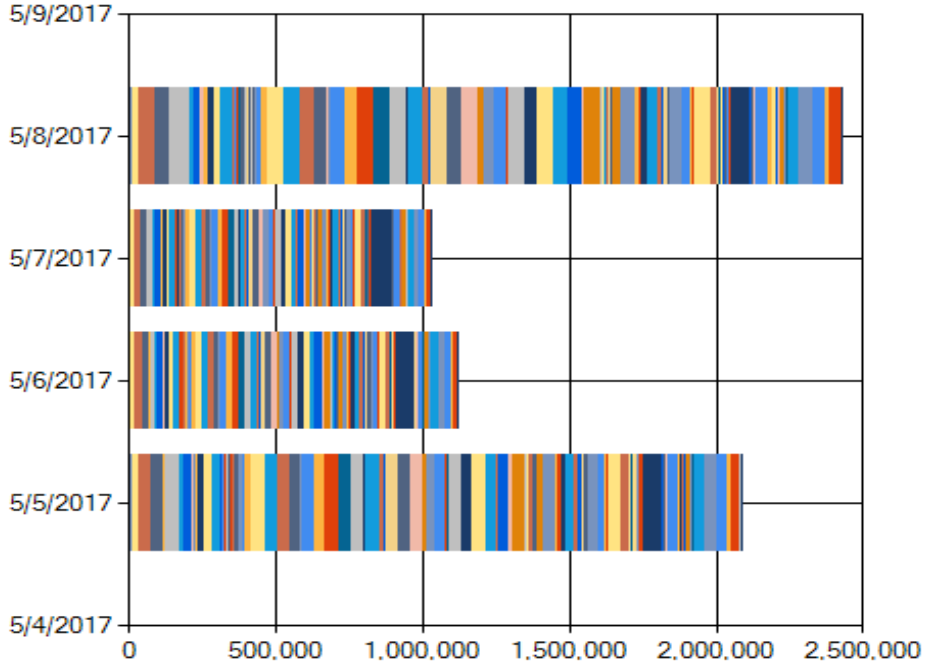
Alert Conditions

- Day of Week
- Day of Month
- Month of Year
- Time Since Interface Started/Stopped
- Time Since Last Message
- Last Message Timestamp
- Interface Running Status
- Manually Stopped Interfaces
- Interface Direction
- Interface ID
- Interface Name
- Interface Queue
- Interface on Monitor
- Queued Message Count
- Is Holiday?
- Is Weekend?

Interface Engine

05/05/20 To: 5/9/2017 Go





Input and Output Numbers

DATE	INBOUND	OUTBOUND	TOTAL
05/05/2017	368,703	1,718,221	2,086,924
05/06/2017	197,399	921,701	1,119,100
05/07/2017	181,984	848,955	1,030,939
05/08/2017	419,106	2,010,688	2,429,794
Total	1,167,192	5,499,565	6,666,757

Thank you Brett !

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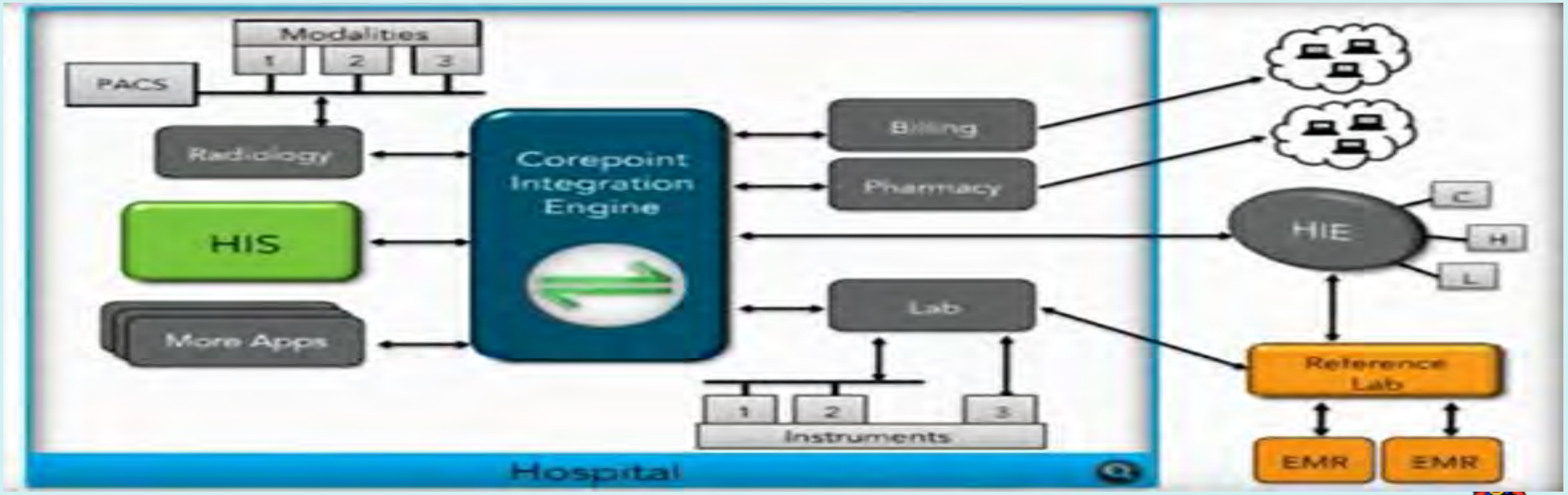
Health Information Exchange

- HITECH & Meaningful Use changed EDI



Health Information Exchange

- Information to Health Information Exchange

CliniSync

THE HEALTH COLLABORATIVE

Epic

Organizations on the Care Everywhere Network

The sequoia project

carequality

Be a DATA Superhero

Health Information Exchange

- **Active Interfaces**
  - ADT
  - Lab – General, Microbiology, Blood Bank, Pathology
  - Radiology
  - Transcriptions

Results Delivered this month - 83,868
Results delivered Year to Date - 168,869

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Health Information Exchange

Live

- Community Health Centers of Greater Dayton (NextGen)
- Gandhi GI (athenahealth)
- Health Partners of Western Ohio (Greenway)
- Health Source of Ohio – Hillsboro Office (NextGen
- Hospice of Dayton (iNbox)
- Obstetrics Gynecology South (Greenway)
- Ohio Pediatrics Inc. (Greenway)
- Orthopedic Associates of SW Ohio (iNbox/PDF)
- Pulmonary and Medicine of Dayton (Greenway/CodeHero)
- Stephen W. Blatchly MD (iNbox)
- Wilson Health Medical Group (athenaHealth)
- Wright State Physicians (athenaHealth)
- Wright Patterson Medical Center (iNbox)

CliniSync

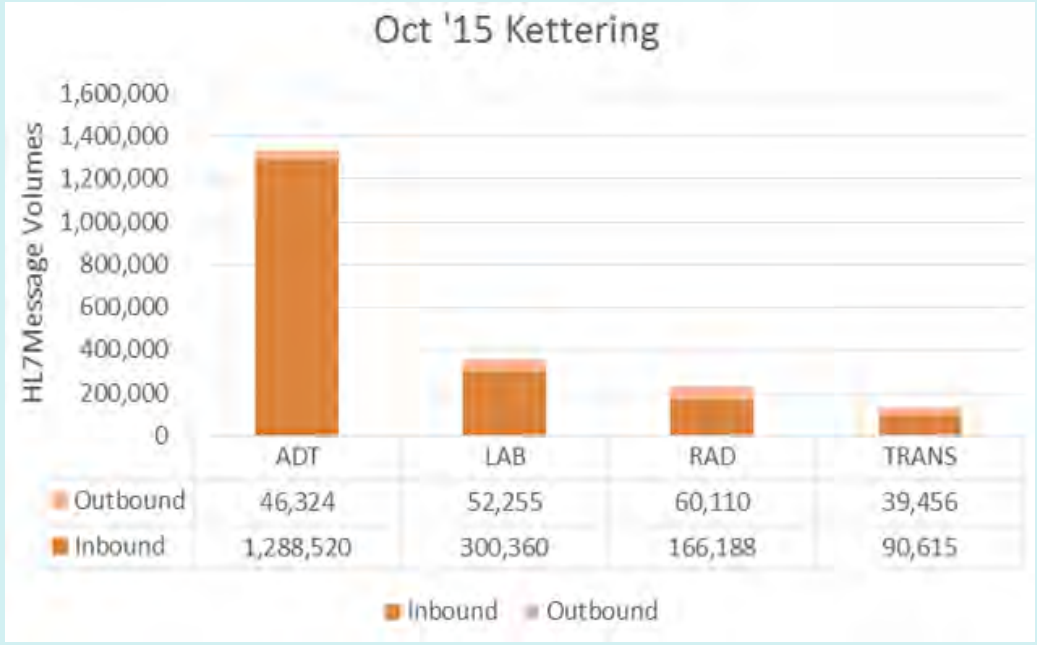
Be a DATA Superhero

Health Information Exchange

- **Active Interfaces**
  - ADT
  - Lab – General, Microbiology, Blood Bank, Pathology
  - Radiology
  - Transcriptions
  - Vaccinations – batch job on nightly basis

Health Information Exchange

- Delivery Metrics



THE HEALTH COLLABORATIVE

Clinical Messaging - Practices	136
Physician EMR - Connections	109
Physician EMR - Interfaces	192

Results Delivered this month 1275 Providers 466,378

Be a DATA Superhero

Health Information Exchange

- **eHealth Exchange**
  - Largest and fastest growing health information exchange network in the US

- **Carequality**
  - Public-private collaborative building consensus on a national-level interoperability framework to inter-connect networks

Health Information Exchange

- Today, the eHealth Exchange connects:

All 50 states

4 federal agencies (DoD, VA, CMS, SSA)

30% of U.S. hospitals

13,000 medical groups

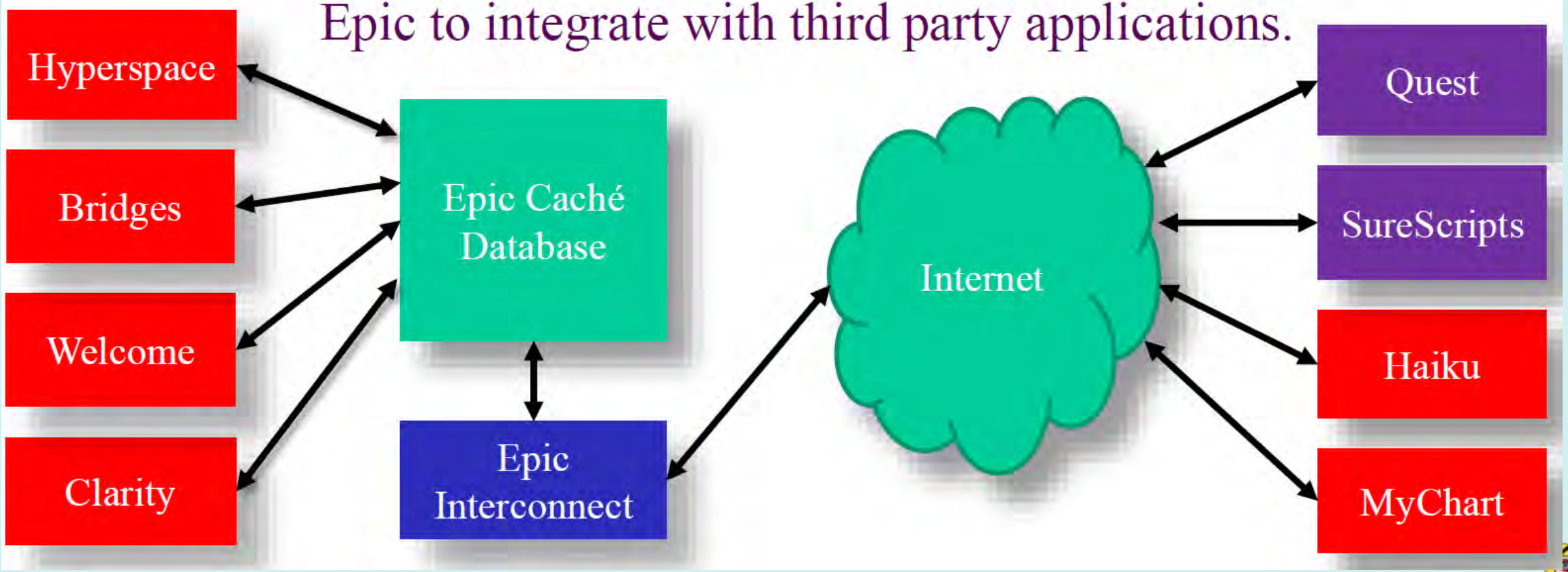
3,500 dialysis centers

8,200 pharmacies

Supporting more than 100 million patients

Interconnect

Interconnect is a web service gateway that enables Epic to integrate with third party applications.



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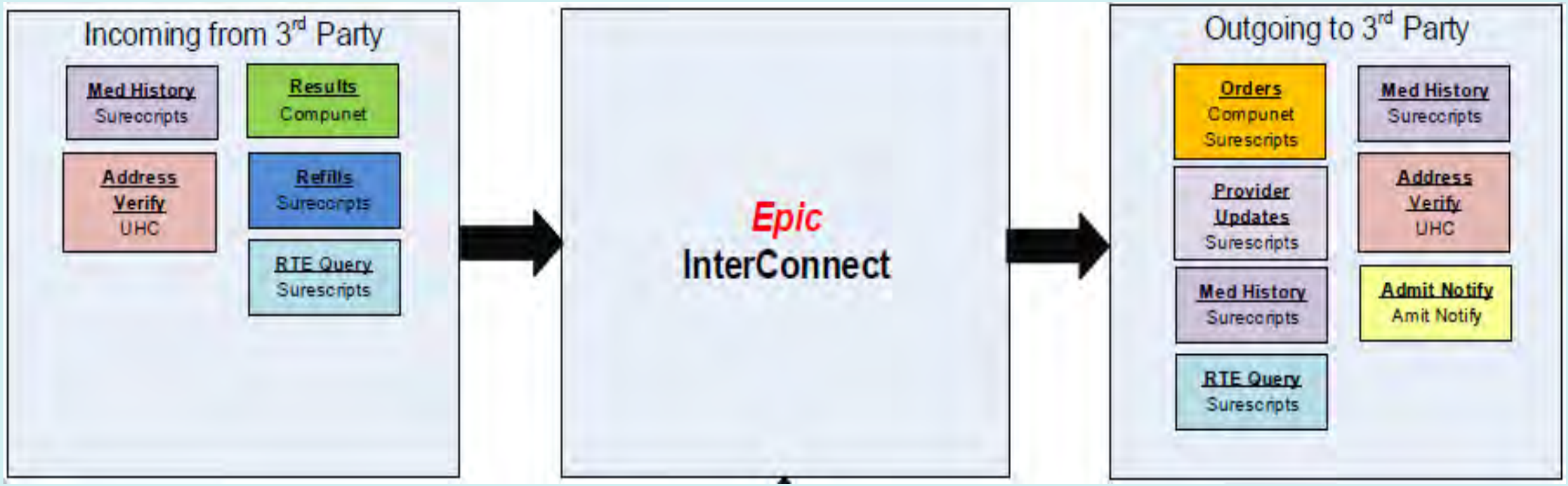
Interconnect - Kettering



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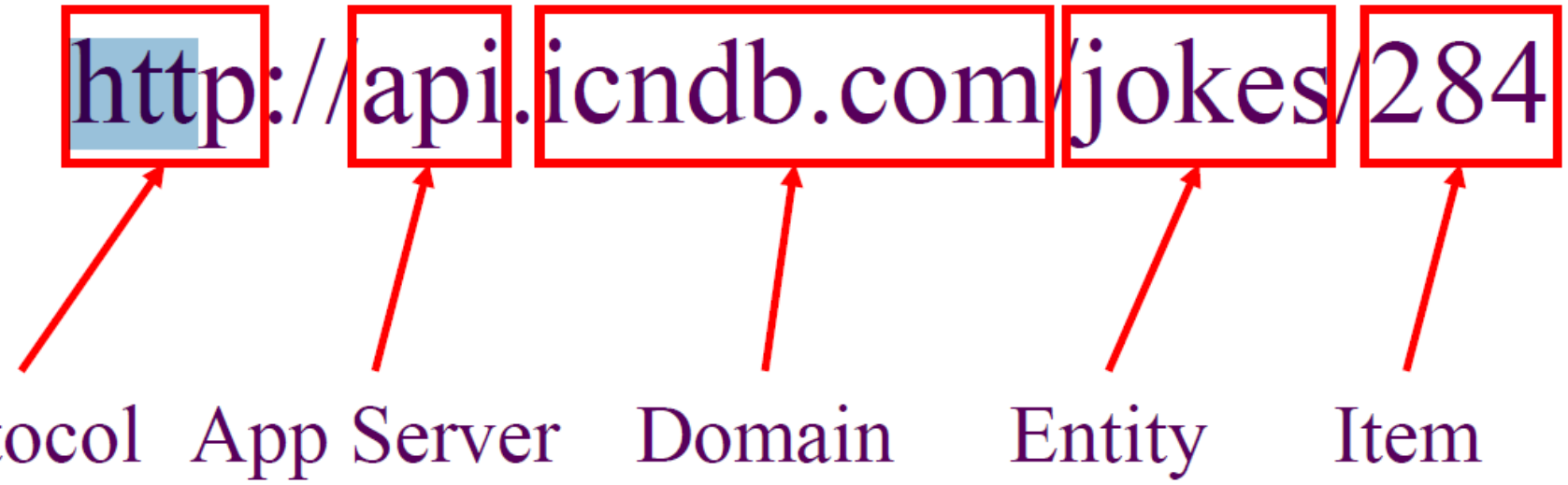
Interconnect

Be a DATA Superhero

Interconnect

A web service enables the getting, setting and deleting of data in a system via web URL.



Interconnect

The major advantage of web services is the ability to use them with MANY different client devices and languages.

C#

Objective-C

Powershell

Interconnect

Instance: **QRDA**

QRDA

*The QRDA instance connects to the Reporting environment, while other instances in this diagram connect to Production.

Instance: **Claims**

Claims

3M Core Grouper Software

Real-Time Eligibility Interface

Instance: **EDI**

ePrescribing

Willow Inpatient

Embedded Documents

Interconnect Servers: Care Everywhere

Instance:
Care Everywhere

Care Everywhere

MyChart Servers

Instance:
MyChart Mobile

MyChart Mobile

Instance: **Rover**

Rover

MobileLab

Instance: **Mobile**

Haiku/Canto

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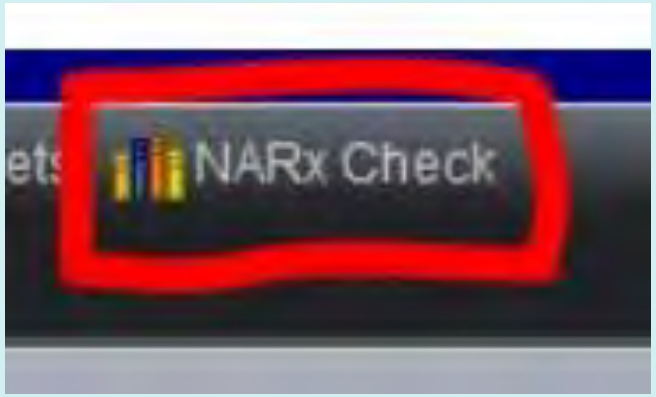
Interconnect (uses)

Interconnect Instance s	
EDI Services / E-Prescribing	Lucy
Care Everywhere	IntraConnect (Chartsync, EMPI)
MobileMeds and Haiku	Citrix Pool Manager
PQRI	Custom Web Services - NARX
Archiving (In progress at KHN)	Rover
MyChart Web Services	ARR

How does this work - NARx



- **"NARx check"**
  - Hyperspace accessed - menu bar selection for individuals who have the authorized role - physicians and pharmacists
  - Physician in patient context for NARx button to work
  - Returns a narcotic score for patient

Thank you James !

Be a DATA Superhero

How does this all work

- **"NARx check"**

http://localhost:4100/default.aspx — NARx Check

Patient Demographics:

Last Name:	Zztest
First Name:	Tina
Middle Name:	
Sex:	F
Date of Birth:	1980-01-01
Marital Status:	Single
Phone Number:	937-859-0000
City:	Dayton
State:	Ohio
Zip:	45459
County:	MONTGOMERY
Country:	UNITED STATES OF AMERICA

NARx Score:

Narcotics	Sedatives
672	480

View Detailed Report »

Disclaimer: All prescription history information is provided on an "as is," "as available" basis. You agree that you are solely responsible for the medical decisions made using this information and disclaimer: You agree to indemnify and hold harmless the providers of this service and the information for all claims based on your use thereof.

Sample report is detailed below

NARxCheck

TESTPATIENT, DAVE 115

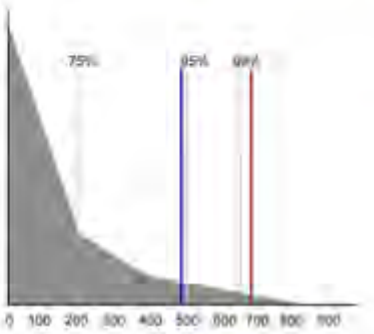
demographics score history

NARxCHECK PLUS

Data as of: 4/6/2015

NARCOTIC	**672**
SEDATIVE	**480**
STIMULANT	**000**

NARxSCORES can range from 000 to 999. The first two digits represent the composite percentile risk based on an overall analysis of prescription drug use. The third digit represents the number of active prescriptions. The distribution of scores in the population is such that approximately 75% fall below 200, 95% fall below 500 and 99% fall below 650. The information on this report is not warranted as accurate or complete. This report is based on the search criteria supplied and the data entered by the dispensing pharmacy. For more information about any prescription, please contact the dispensing pharmacy or the prescriber. NARxSCORES and Reports are intended to aid, not replace medical decision making. None of the information presented should be used as sole justification for providing or refusing to provide medications.



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Recap

- **Wow -**
  - **Data is traveling all over the place**
  - **Data is traveling in different standard formats**
  - **Data is used within the hospital walls**
  - **Data is used outside the hospital walls**

- There is a lot more to share – look for backstage passes

Thank you & Credits

- **Epic Galaxy - https://galaxy.epic.com**
  - **Search for Care Everywhere, Interconnect, Bridges**
- Internet Home Pages
  - Clinisync http://www.clinisync.org
  - Health Collab http://healthcollab.org
  - Web Services http://DataHandbook.Epic.com
  - HL7 training Utube videos

What is HL7 Message Structure

- The HL7 Message structure is key to understanding HL7 messages.
- In this tutorial we will cover HL7 Segments, Fields, and Sub-Components with both diagrams and examples of working with an actual message.
- Introduction to repeat Fields

Many (useful) Standards

- Message formats: HL7v2, HL7v2 XML, CDA, CCR, CCD, CRS, X12, NCPDP, DICOM
- Medical vocabularies: LOINC, SNOMED CT, ICD 10, CPT, RxNorm, READ
- Single sign-on: CCOW
- Governance: HIPAA

Interconnect Web Services

Types of Web Services

SOAP
Simple **O**bject **A**ccess **P**rotocol

+ Established
+ Strongly typed
× Verbose & rigid
× Requires tool support

SOAP must use **XML**
(e**X**tensible **M**arkup **L**anguage)

REST
Representation **S**tate **T**ransfer

+ Newer
+ Smaller & simpler
+ Recently popular
× Less established

REST can use XML or **JSON**
(**J**ava**S**cript **O**bject **N**otation)

Be a DATA Superhero

Clinical Interfaces

- Alaris Infusion Pumps
- Omnicell Med Dispense
- PaceArt
- Powerscribe & PACS
- Tracemaster - EKG
- Merge Hemo - Cardiac

Lab Interfaces

- Beaker - Orders & Results
- Compunet – Orders & Results
- LabCorp – Orders & Results
- Telcor – POC testing Orders & Results
- Mayo - Reference Lab Orders & Results
- HCLL - Blood Bank Orders & Results

Revenue Cycle

- 3M coding
- Transcription
- Claims
- CarePricer