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U.S. Department of Defense

MHS **MILITARY HEALTH SYSTEM**

OCIO Office of the Chief Information Officer

Chuck Campbell, SES, Military Health System Chief Information Officer

Using Service Oriented Architecture to Support Meaningful Use   07/14/10

Agenda

- Military Health System (MHS)

- Military's Electronic Health Record (EHR)

- Data Use

- Interoperability

- SOA and Healthcare

- Expanding Possibilities
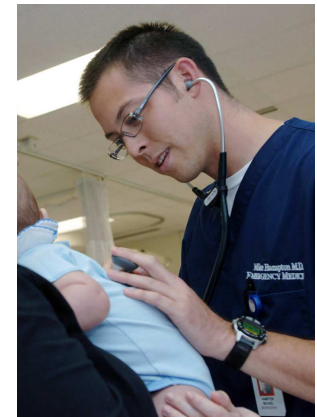
Military Health System (MHS)
A Week in the Life

- **19,600 Inpatient Admissions**
  - 5,000 direct care
  - 14,600 purchased care

- **1.8M Outpatient Visits**
  - 642,000 direct care
  - 1.17M purchased care

- **103,400 Dental Visits**
  - Direct care only

- **3.5M Claims Processed**

- **2.22M Prescriptions**
  - 948,000 direct care
  - 1.12 million retail pharmacies
  - 150,000 mail order

- **2,100 Births**
  - 1,000 direct care
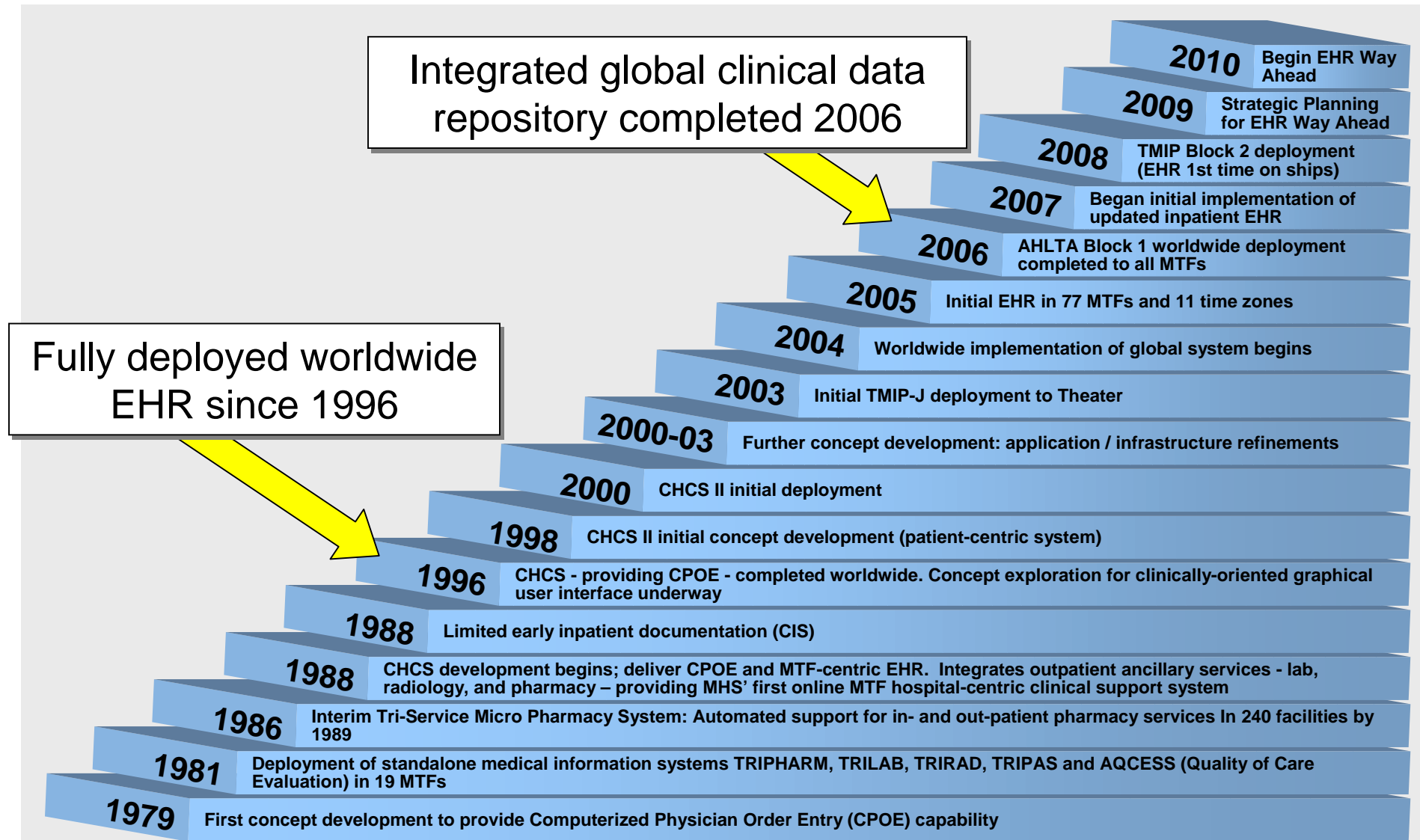 - 1,100 purchased care

Serves more than 9.6 million beneficiaries

MHS Information Technology Mission

Provide the right information to the <u>right customers</u> at the right time to improve and maintain the health status of our beneficiaries across the entire continuum of health care operations

Evolution of the Military's EHR

Integrated global clinical data repository completed 2006

Fully deployed worldwide EHR since 1996

Year	Description
2010	Begin EHR Way Ahead
2009	Strategic Planning for EHR Way Ahead
2008	TMIP Block 2 deployment (EHR 1st time on ships)
2007	Began initial implementation of updated inpatient EHR
2006	AHLTA Block 1 worldwide deployment completed to all MTFs
2005	Initial EHR in 77 MTFs and 11 time zones
2004	Worldwide implementation of global system begins
2003	Initial TMIP-J deployment to Theater
2000-03	Further concept development: application / infrastructure refinements
2000	CHCS II initial deployment
1998	CHCS II initial concept development (patient-centric system)
1996	CHCS - providing CPOE - completed worldwide. Concept exploration for clinically-oriented graphical user interface underway
1988	Limited early inpatient documentation (CIS)
1988	CHCS development begins; deliver CPOE and MTF-centric EHR. Integrates outpatient ancillary services - lab, radiology, and pharmacy – providing MHS' first online MTF hospital-centric clinical support system
1986	Interim Tri-Service Micro Pharmacy System: Automated support for in- and out-patient pharmacy services In 240 facilities by 1989
1981	Deployment of standalone medical information systems TRIPHARM, TRILAB, TRIRAD, TRIPAS and AQCESS (Quality of Care Evaluation) in 19 MTFs
1979	First concept development to provide Computerized Physician Order Entry (CPOE) capability

Military's EHR Today is…

AHLTA-Mobile

AHLTA Garrison

AHLTA-Theater

Military's EHR Family of Systems

- **AHLTA-Garrison Outpatient Documentation**
  - Covers every time zone
  - 77,000+ active users
  - 110,000+ end user devices
  - 148,000+ new encounters daily
  - 9.6+ million beneficiaries with clinical data
  - 70+ Terabytes (mostly non-image)

- **Inpatient Documentation System**
  - 33 Sites

- **Military Treatment Facilities**
  - 60+ Hospitals
  - 350+ Medical Clinics
  - White House Medical Unit

- **AHLTA-Theater (As of 28 Feb 2010)**
  - 15 Theater Hospitals, 262 Forward Resuscitative sites
  - 25 U.S. Naval Ships
  - 8.40 million orders of ancillary services (laboratory, radiology, pharmacy)
  - 3.24 million outpatient encounters captured in AHLTA-Theater

Supporting transient patient populations and transient healthcare teams

Structured Data Collected Once, Used Many Times

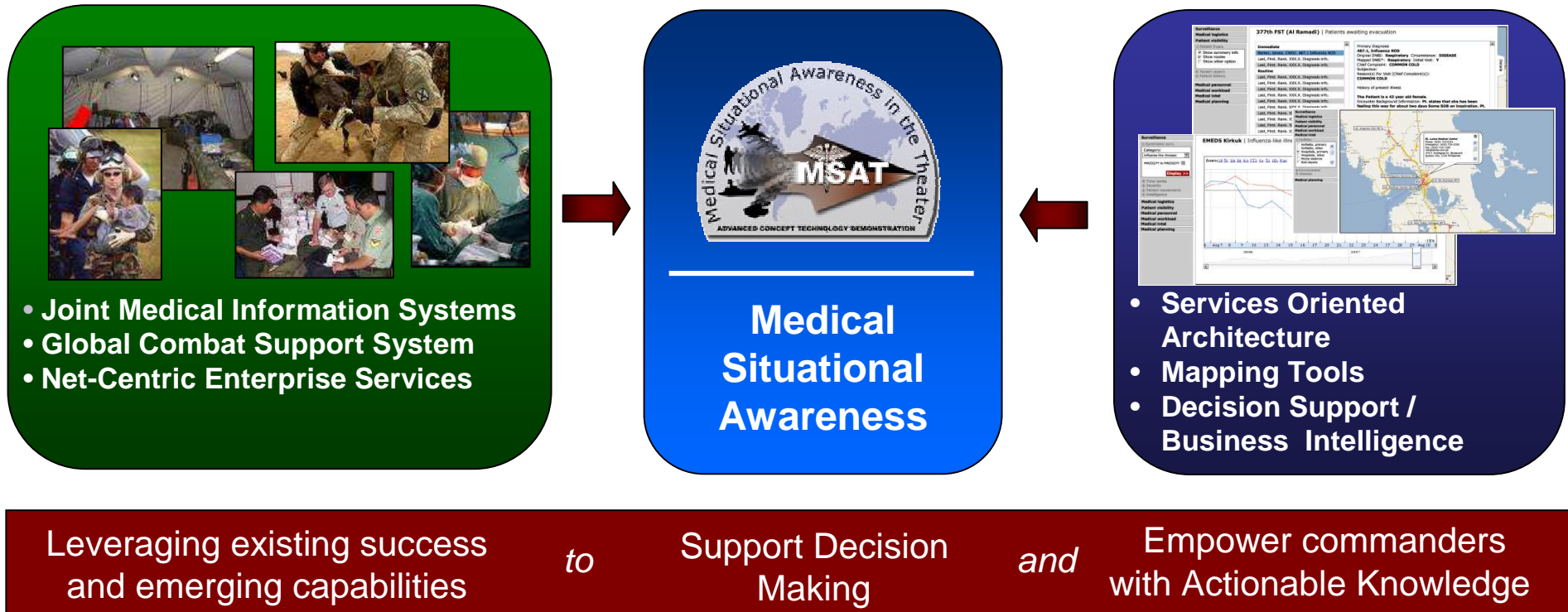| Collected Once	Stored Electronically	Available Globally

**Patient Visit
(Point of Care)**

Clinical Data Repository

Standardized, Computable Data

Beneficiary Self-Care Management
Personal Health Record

Provider Care
Patient Record, Safety Alerts, Best Practice Reminders

Business Decisions
Health System Management

Research
Clinical Practice Guidelines

Command and Control
Health Surveillance

Billing Processes
Coding, 3rd-Party Collections

MiCare -- Personal Health Records

- **Convenience --** *DoD beneficiaries can access medical information without leaving home*

- **Portability --** *Many DoD beneficiaries relocate every 2 to 3 years*

- **Safety --** *Beneficiaries needing emergency treatment or medications when away from home on temporary duty or vacation can provide essential information to non-MHS providers*

- **Information/Control --** *DoD beneficiaries maintain ultimate control over PHR content and access to that content*

- Allergies
- Medications
- Lab results
- Inpatient/ outpatient records
- Immunizations
- Conditions
- Resulted consults
- Operative reports

Medical Situational Awareness in Theater (MSAT)

Provide COCOM and JTF Surgeons and their staffs actionable knowledge and enhanced medical situational awareness for critical decision making

- Joint Medical Information Systems
- Global Combat Support System
- Net-Centric Enterprise Services

Medical Situational Awareness

- Services Oriented Architecture
- Mapping Tools
- Decision Support / Business Intelligence

| Leveraging existing success and emerging capabilities | *to* | Support Decision Making | *and* | Empower commanders with Actionable Knowledge |

Clinical Data Mart

Army providers used the Clinical Data Mart to identify more than 44,000 patients at risk for chronic kidney disease

Clinical data at your fingertips

CDM

2009 Computerworld Honors Program Laureate Award

- Key Features
  - Allows analysts and clinicians to securely report actionable clinical data
  - Measures clinical performance and outcomes
  - Supports clinical/business decisions and strategic planning
- Key Benefits
  - Reports actionable clinical data
  - Monitors adverse events from treatments or medications

Medical Surveillance

DoD's Electronic Surveillance System selected to link DoD and VA biosurveillance systems with the CDC
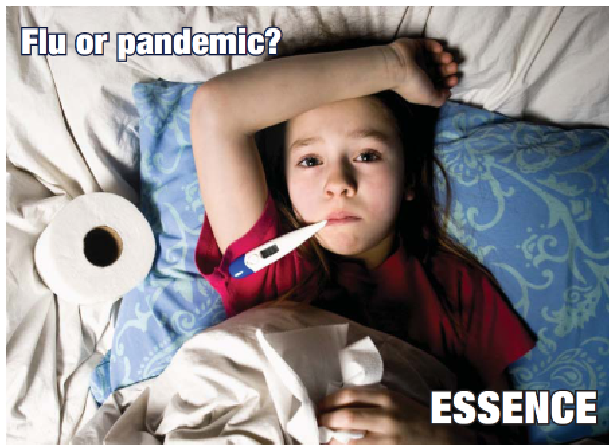
- Key Features
  - Early detection and warning of potential communicable disease outbreaks or symptoms of biological warfare
  - Alerts, interactive reporting, structured analysis, and ad hoc queries
- Key Benefits
  - Allows MHS epidemiologists and public health officers to obtain medical situational awareness and investigate reportable disease events
  - Provides actionable data for investigation and/or validation

H1N1 Tracking

Several systems are actively tracking and reporting the impact of the H1N1 Influenza A outbreak worldwide

Flu or pandemic?

ESSENCE

Detect

Clinical data at your fingertips

CDM

Analyze

Total medical asset visibility

JMAR

Respond

ESSENCE MEDICAL SURVEILLANCE
- Detecting and reporting on infectious diseases and biological out breaks

CLINICAL DATA MART (CDM)
- Reporting actionable clinical data, identifying high-risk patients and population health trends

JOINT MEDICAL ASSET REPOSITORY (JMAR)
- Providing timely data on the location, status, and identity of DoD medical supplies, pharmaceuticals, and critical inventory available to support our troops

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Virtual Lifetime Electronic Record (VLER)

Civilian Care

Recruitment

Accession/Training

VA Care

Routine Care

Transition & Benefits Assessment

Readiness/Pre-Deployment

Care at Home/ Post-Deployment

Care in Transit

Deployed/Theater Care
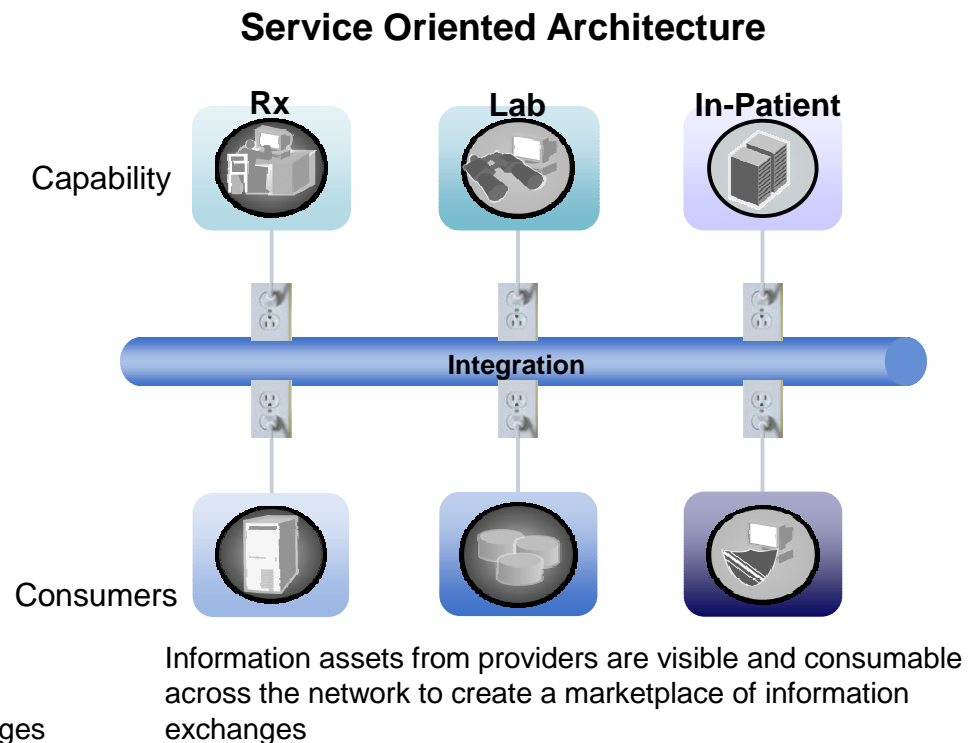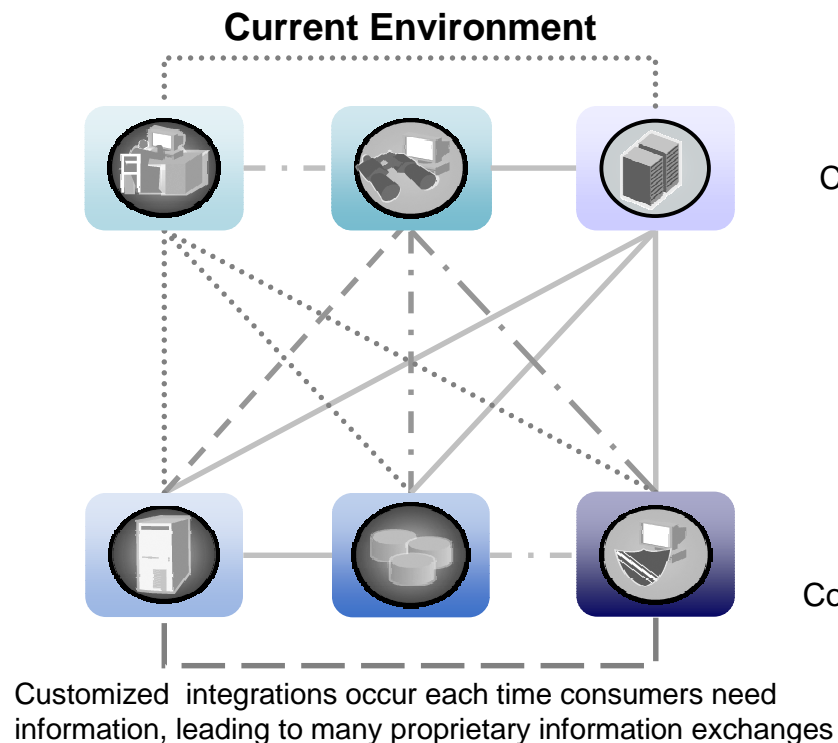
Virtual Lifetime Electronic Record (VLER)
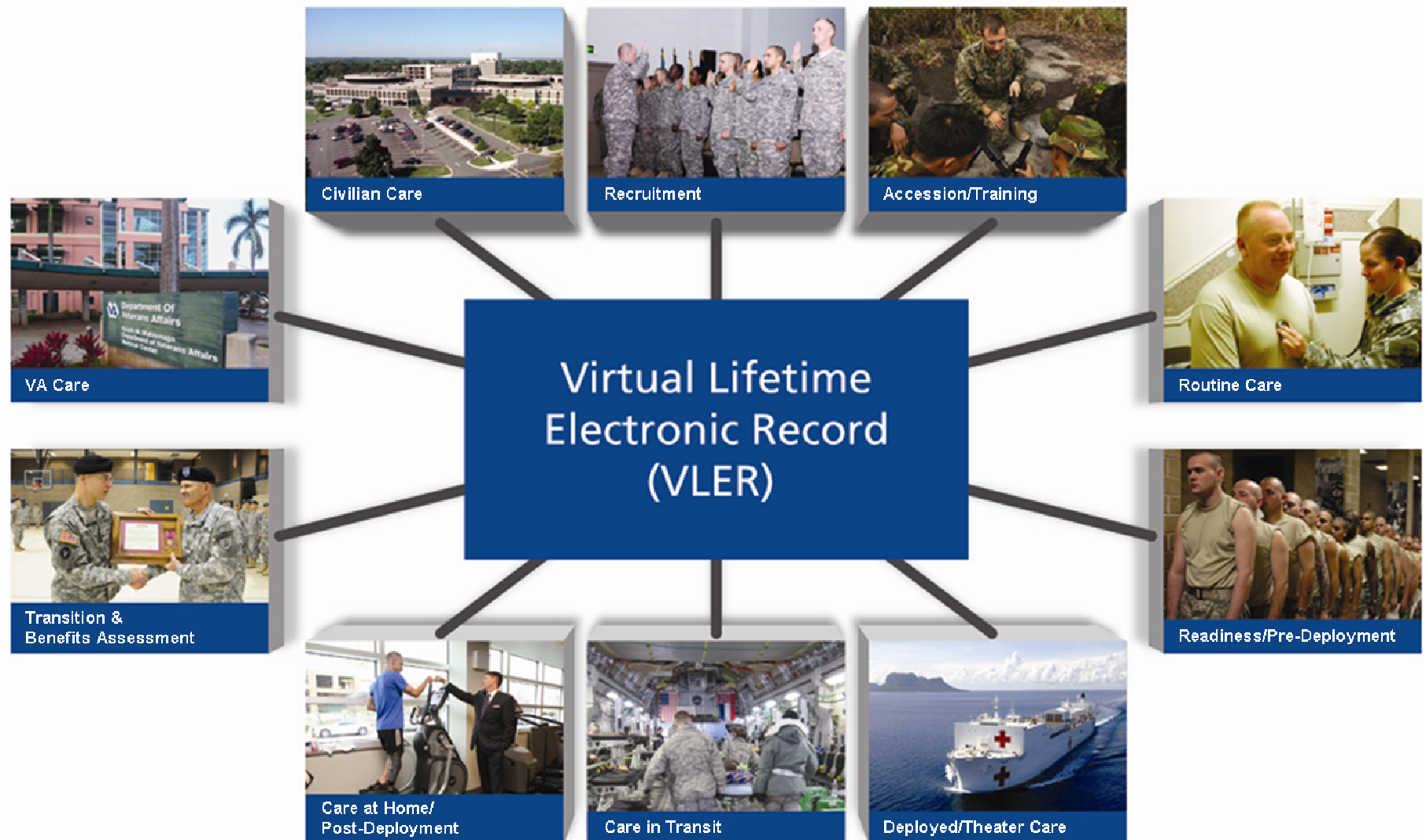
VLER Health and the Nationwide Health Information Network
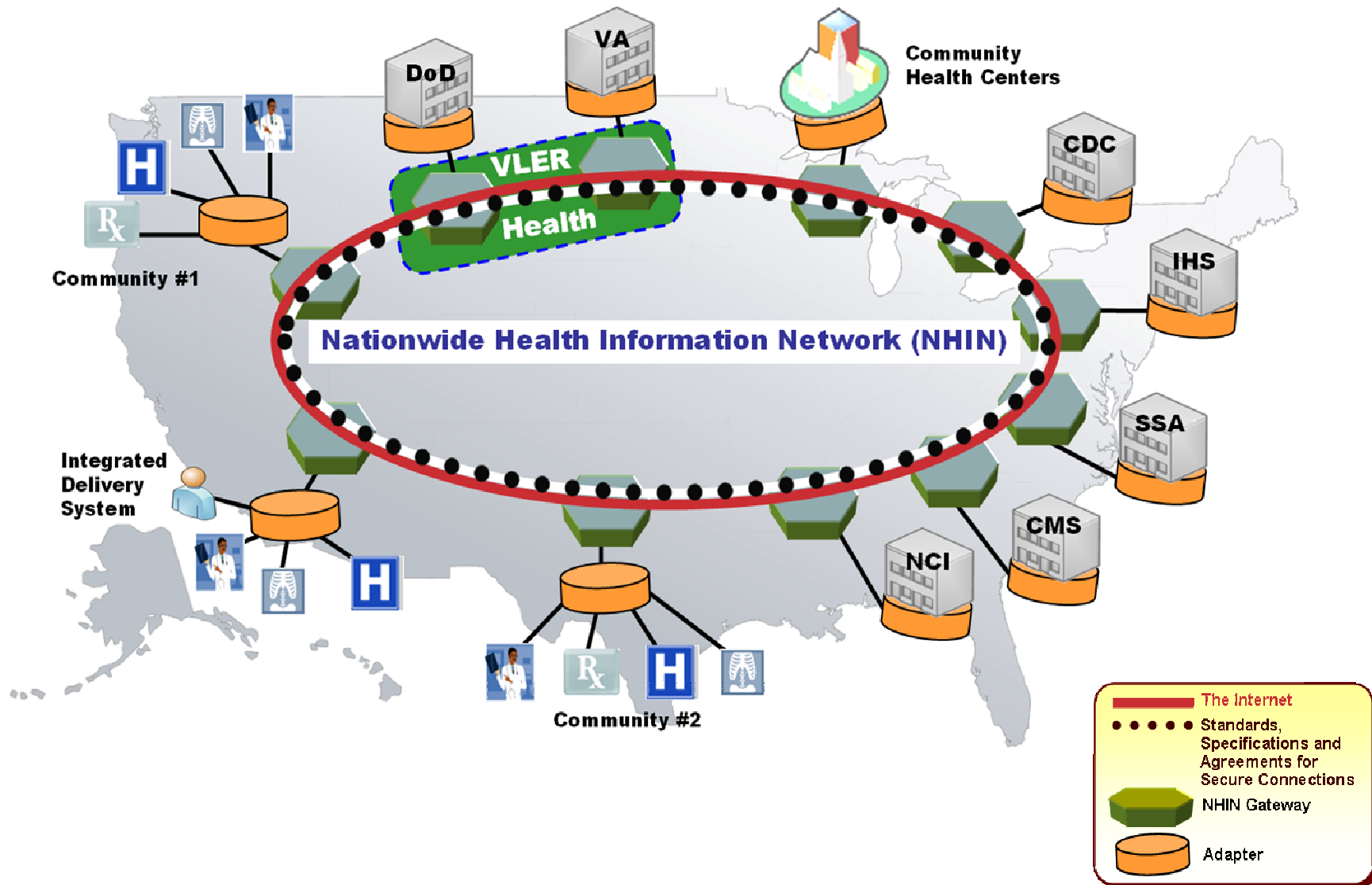
Why SOA in Healthcare?

SOA improves healthcare service delivery and quality through:

- **Decreased time-to-market** for capability implementation
- **Scalable**, **extensible,** and **integrated** architecture.
- Supports a **Plug & Play** environment.

Current Environment

Service Oriented Architecture

Rx   Lab   In-Patient

Capability

Integration

Consumers

Customized integrations occur each time consumers need information, leading to many proprietary information exchanges

Information assets from providers are visible and consumable across the network to create a marketplace of information exchanges

SOA Enables Meaningful Use – Stage I

Plug and play will enable each component of meaningful use, from e-prescribing to providing health care data to the patient.

Meaningful Use Stage I	How SOA Helps
Electronic capture of health information in a coded format	Easier reuse of captured data enables more efficient care delivery to patient
Tracking key clinical conditions and communicating outcomes for care coordination	Interoperability and modularity of systems enables better coordination and quality of care
Implementing clinical decision support tools to facilitate disease and medication management	Improved manageability and governance of data enables better use of clinical business intelligence
Reporting outcomes for public health purposes	Plug and play framework with seamless interfaces enables faster and more accurate reporting across agencies and systems

SOA and Healthcare – Plug and Play
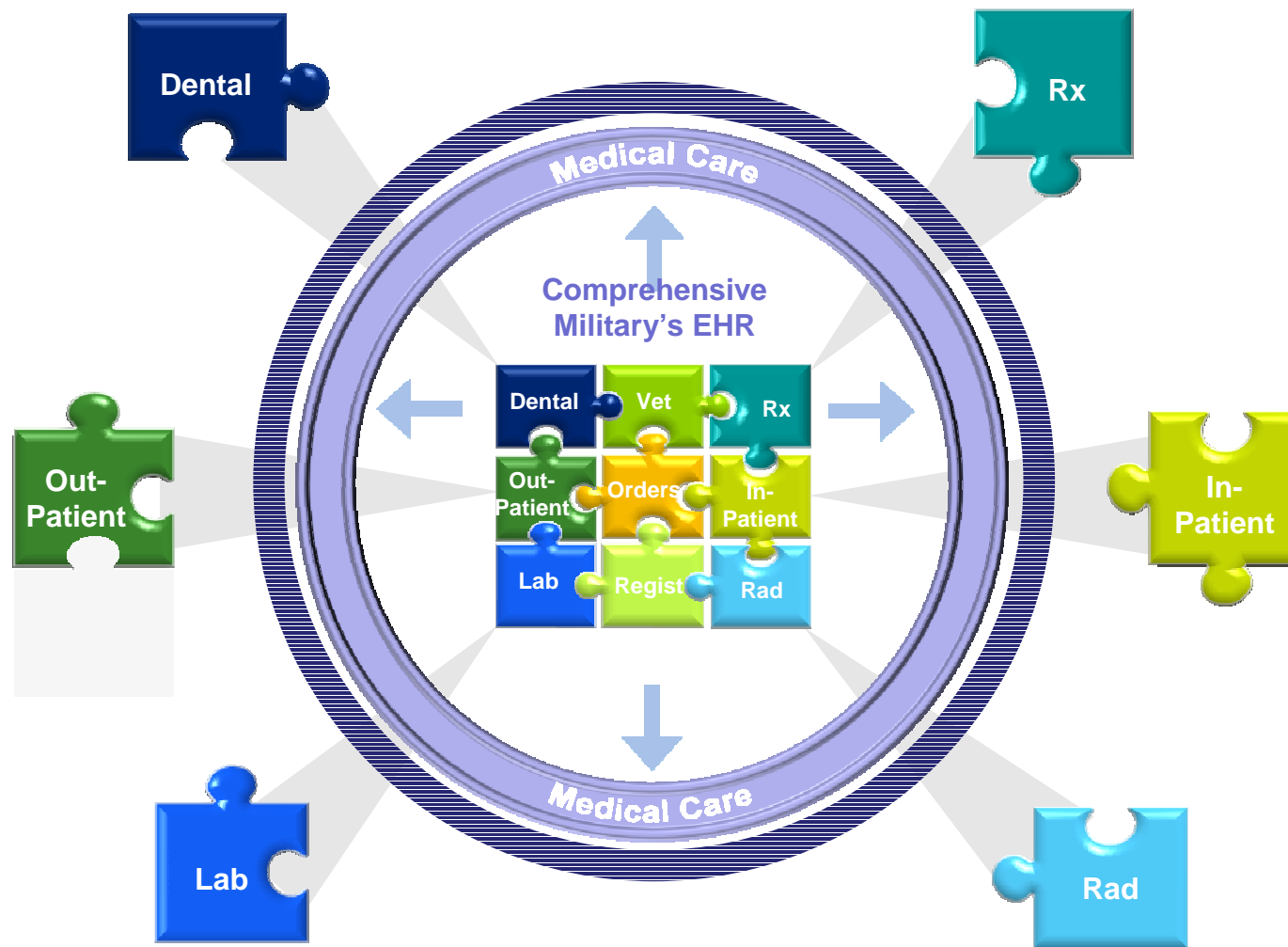
An architecture that allows for Plug & Play provides medical interoperability that results in seamless and efficient healthcare. At the same time, the healthcare provider is able to construct their per-view as it relates to their medical line of business.

Interoperability and Capability Speed-to-Market
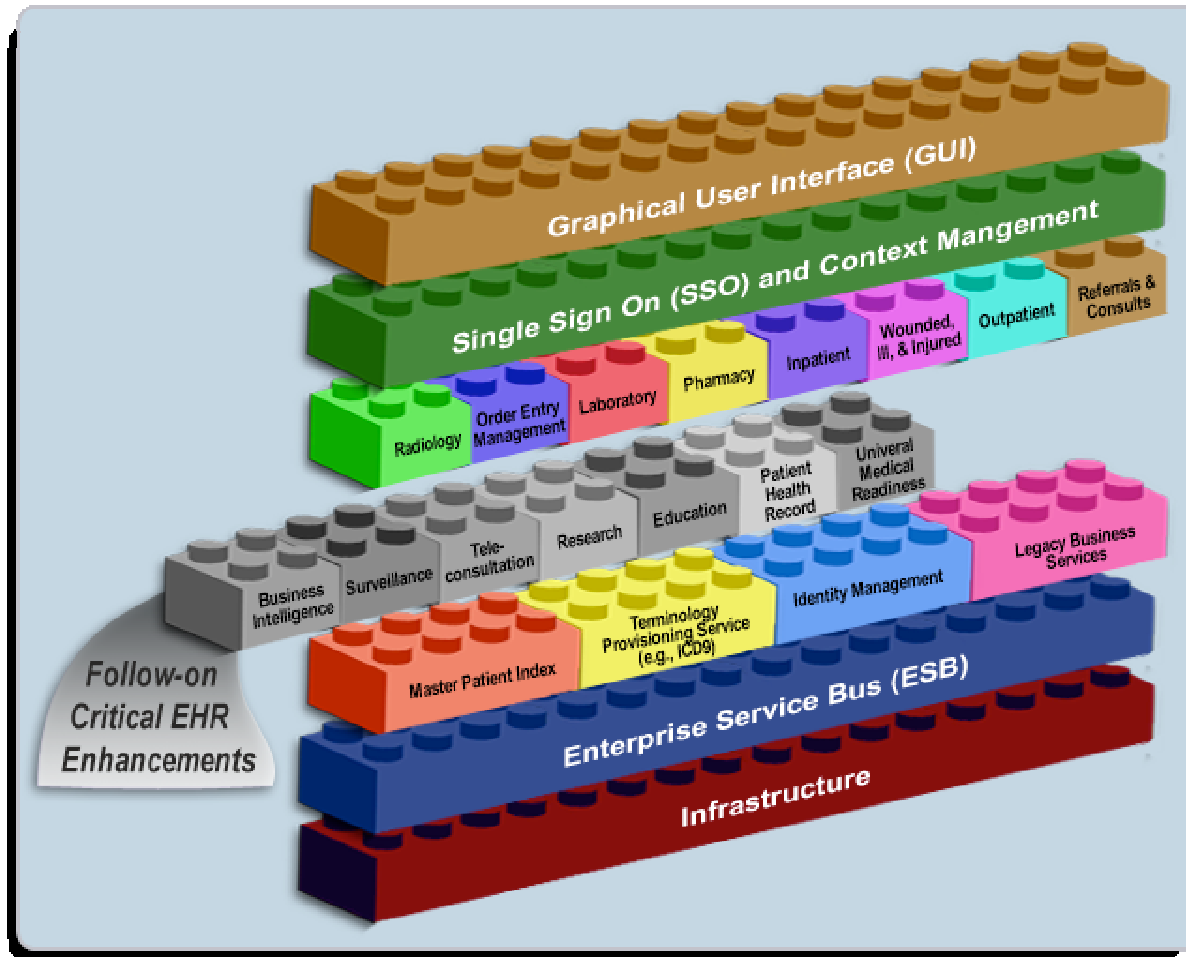
A flexible, modular backbone will improve interoperability, enabling faster delivery of needed information and capabilities as identified within the Functional Community

Expanding Possibilities

- Distributed development
- Comprehensive development and test environment
- Software development toolkit
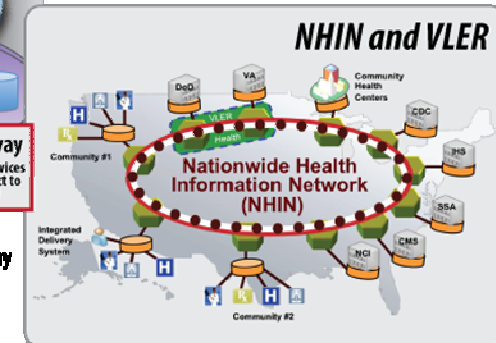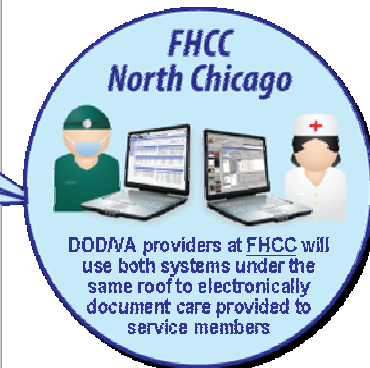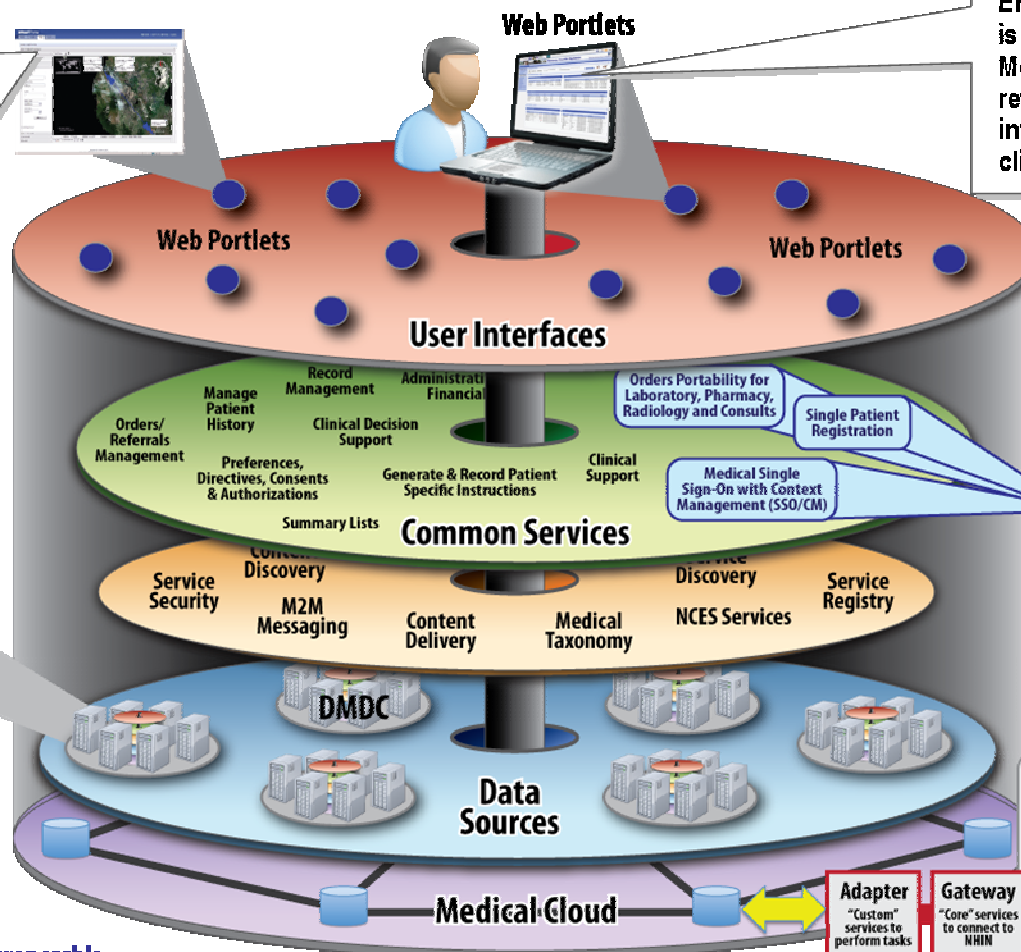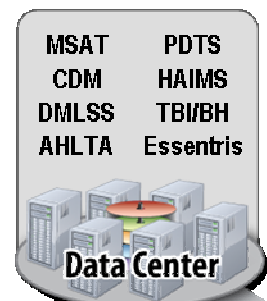- Open competition - removing barriers

QUESTIONS

MHS EHR Big Picture

Web Portlets

EHR: Operational picture is patient-based. Medical staff enter and retrieve patient information used for clinical decision support.

Web Portlets

Web Portlets

User Interfaces

MSAT   PDTS
CDM   HAIMS
DMLSS   TBI/BH
AHLTA   Essentris

Data Center

Common Services

Manage Patient History
Record Management
Administrative Financial
Orders/ Referrals Management
Clinical Decision Support
Preferences, Directives, Consents & Authorizations
Generate & Record Patient Specific Instructions
Clinical Support
Summary Lists
Orders Portability for Laboratory, Pharmacy, Radiology and Consults
Single Patient Registration
Medical Single Sign-On with Context Management (SSO/CM)

FHCC North Chicago

DOD/VA providers at FHCC will use both systems under the same roof to electronically document care provided to service members

Service Security
Content Discovery
M2M Messaging
Content Delivery
Medical Taxonomy
Service Discovery
NCES Services
Service Registry

DMDC

Data Sources

Medical Cloud

Adapter "Custom" services to perform tasks

Gateway "Core" services to connect to NHIN

Open Source FHA "CONNECT" Gateway

NHIN and VLER

Nationwide Health Information Network (NHIN)

NHIN is a secure nationwide, interoperable health information infrastructure that will connect providers, consumers, and others involved in supporting health and health care

DoD/VA will use NHIN as the technology and communication standards where applicable, to meet the health data sharing aspect of the VLER Health Initiative

VLER Health is the concept of information sharing between the DoD, VA, and private sector for Health data to better support benefits and services between both agencies

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